KATO WORKS CO., LTD.

OPERATION MANUAL IC37

0988532EN-00

OPERATION MANUAL

IC37

KATO

SERIAL NUMBER
CJ002001 ~

0988532EN-00

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 local distributor for the latest available information.

SAFETY INFORMATION

We offer you basic and important rules and precautions for safe operations.

Read, understand, and observe them before starting operation. This is the most essential way to prevent accidents.
Wrong operation, inspection, or maintenance can cause personal injury or death.

Throughout this manual and on the machine, precautions are provided with ⚠ marks and classified by the words "**DANGER**", "**WARNING**", and "**CAUTION**" according to their extent of danger.
The classification is as follows:

⚠ **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 very 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.

⚠ WARNING

- **BEFORE** inspection, operation, or maintenance of the machine, be sure to read and understand this manual.
- Incorrect operation or maintenance of the machine can cause the accident and serious injury or death.
- Keep this manual on hand during operation so that you can immediately consult it when necessary. If it should be missing or damaged, place an order from our distributor for a replacement.
- There are various kinds of federal, state, and local regulations that effect construction and industrial machinery. Since the regulations are subject to change, and differ from one locale to another, it is impossible for us to provide such information in this manual.
  It is the responsibility of the owner or user to be familiar with the regulations.
- Specifications and materials of the machine are subject to change without any obligation on the part of the manufacturer.

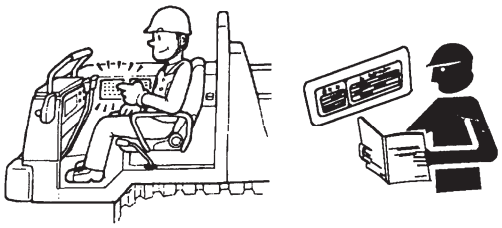
SAFETY

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

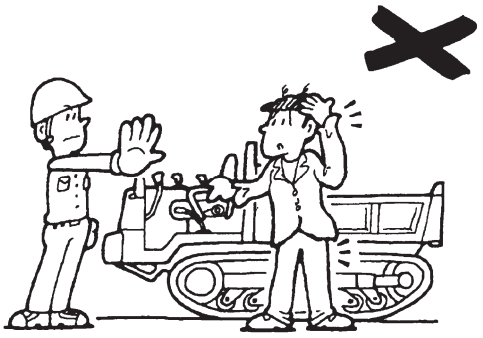


CA-C100010

- 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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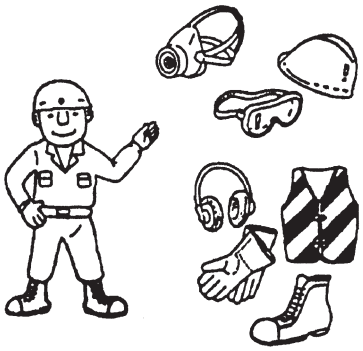
WEAR PROPER WORKING CLOTHES.



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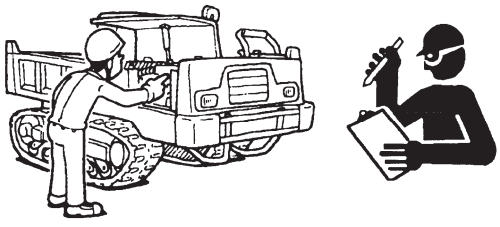
- For the sake of safety during driving, wear clothes that match your body. The sleeves of sloppy clothes can get caught in the machine and can cause unforeseen accidents.
- Always wear protective cap and safety boots.
  Wear a hard hat, protective glasses and other protective equipment as required by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

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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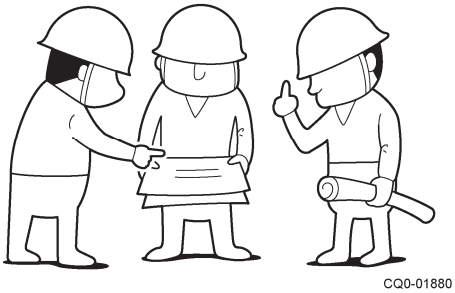
MAKE A WORK PLAN.

- 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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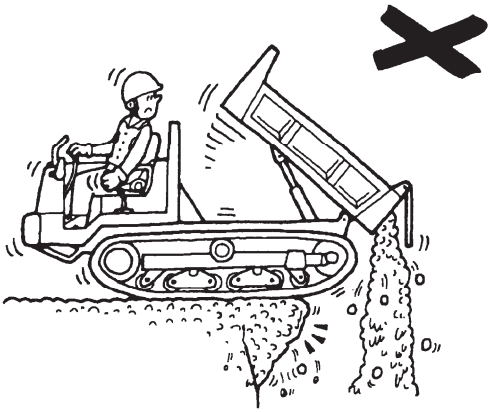
CHECK THE JOB SITE.

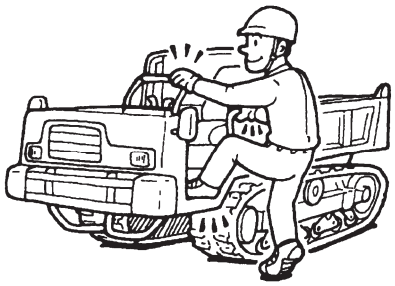
- Confirm in advance if there are any dangerous locations where the land collapses or where machine can fall off a cliff, etc.
- Take measures necessary for safety in dangerous locations.



CA-C100050

CAREFULLY GET ON AND OFF THE MACHINE.

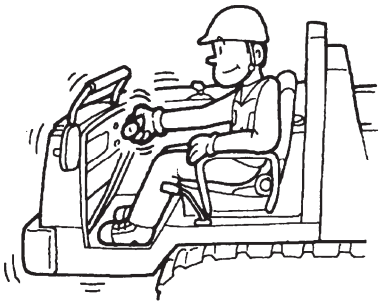
- Maintain a three point contact (Two feet and one hand or one foot and two hands contact) with the steps and handholds.
- Do not use any controls as handholds when entering or leaving the operator's station.
- When any oil or other slippery substance has got adhered to hand rails or steps, wipe them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



CA-C100060

START THE ENGINE WHILE SITTING IN THE OPERATOR SEAT

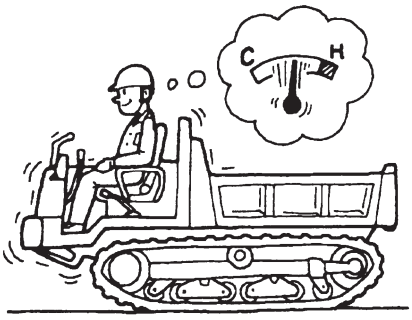
If the engine is started from a position other than sitting in the operator seat, there is the danger that the machine starts moving suddenly.
Start the engine only after carrying out checks while sitting in the operator seat.



CA-C100070

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.



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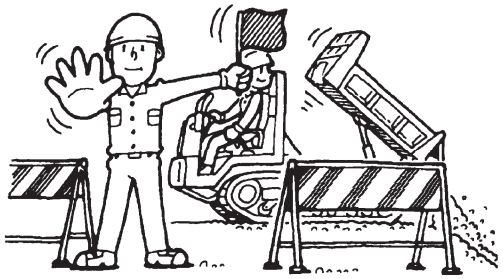
PRECAUTIONS DURING OPERATION

CLEAR ALL PERSONNEL FROM THE MACHINE AND AREA.

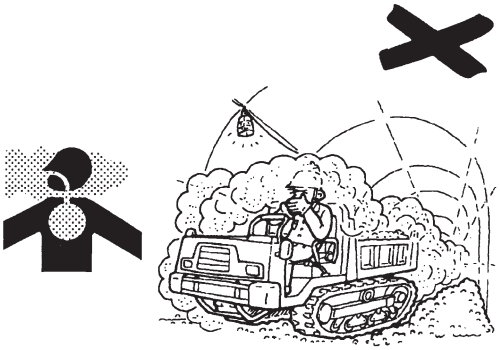
Be sure to barricade the job site to prevent entry of the unauthorized. Confirm that there is no one around the machine before starting the engine or operating the machine.



CA-C100090

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

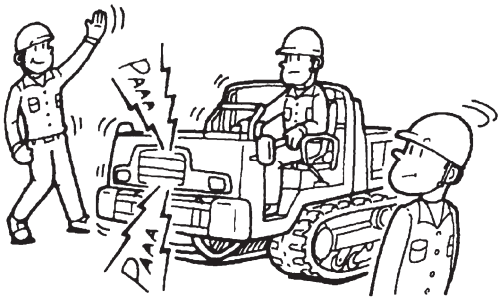
There is the danger of making wrong operations if the operating is done from a position other than the operator seat or while standing.

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.

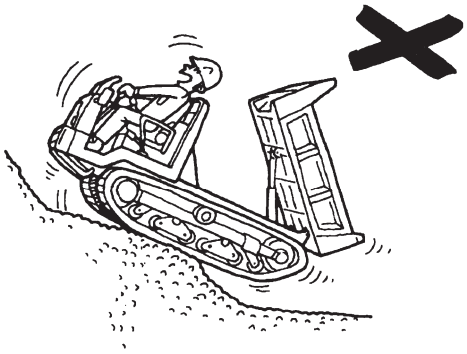


CA-C100120

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.



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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.

CA-C100140

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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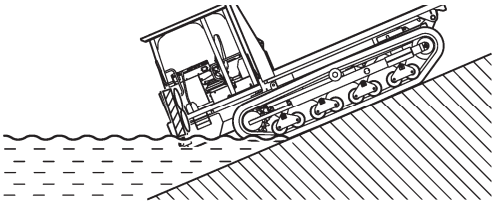

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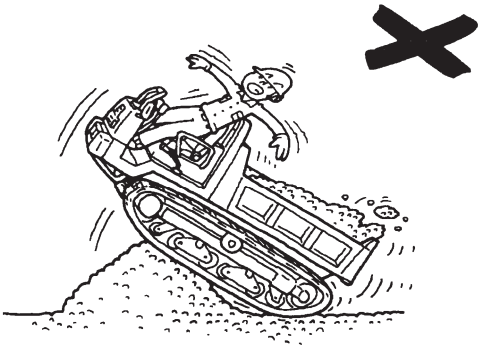
DO NOT TRY TO TRAVEL OVER OBSTRUCTIONS

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

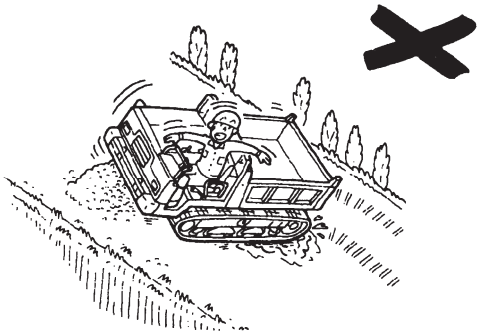
Avoid potential obstacles in your path.



CA-C100160

DO NOT CHANGE DIRECTIONS WHILE ON A SLOPE

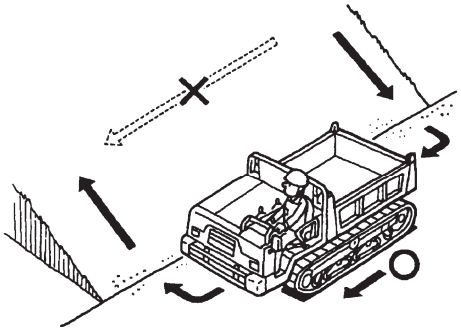
Avoid changing the direction of travel on a slope, which could result in tipping or side slipping of the machine.
When it is inevitable to change the direction, carry it out in a hard ground where the slope is gradual.



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.

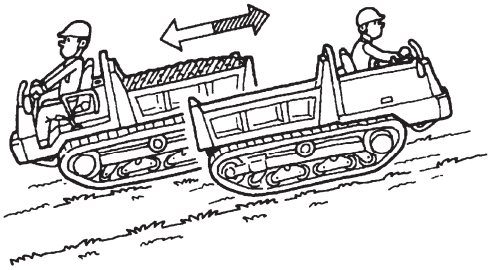


CA-C100180

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:

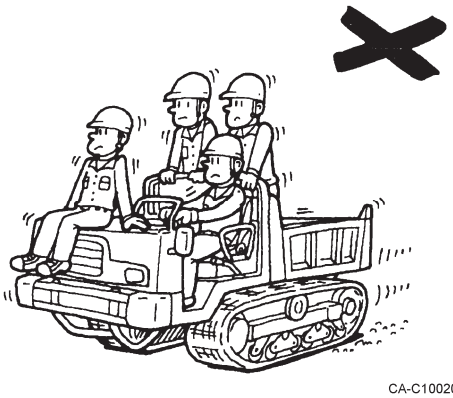
- Go forward up the hill and back down the hill WHEN NO CARRYING A LOAD.
- Reverse up the hill and go forward down the hill WHEN CARRYING A LOAD.



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

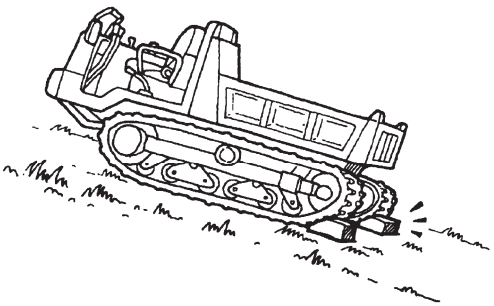
PARK IN A SAFE PLACE

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 GRADE

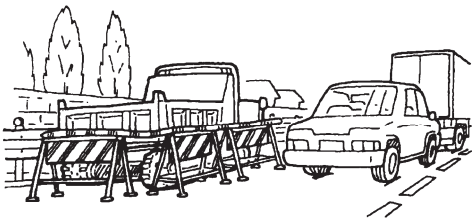
There is the danger of the machine running off wild when stopped or parked on a sloping land.
When it is unavoidable to stop or park on a slopping land, Place stopper blocks on the downhill side under both crawlers.



CA-C100220

OBSERVE PRECAUTIONS WHEN PARKING THE MACHINE ON THE ROAD.

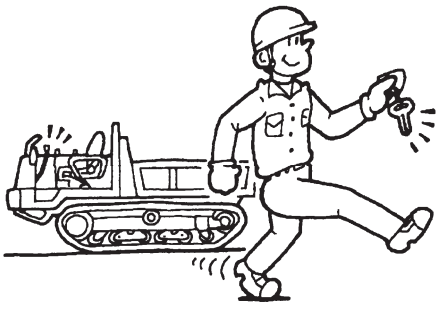
If you have to park the machine on the road, use appropriate flags, barriers, flares, and warning signals.



CA-C100230

OPERATOR LEAVING MACHINE

- Lower the vessel completely.
- Apply the parking brake.
- Set the gate lock lever 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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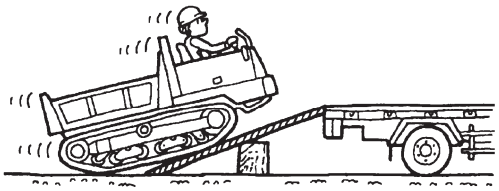
Leave the operator seat after taking the above measures.

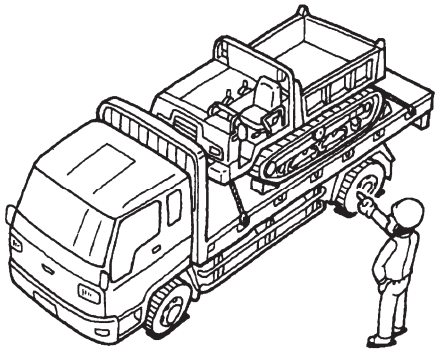
PRECAUTIONS AT TRANSPORTING

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.

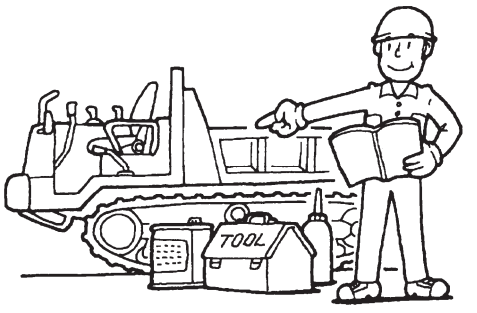
OBSERVE PRECAUTIONS ON TRANSPORTATION.


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

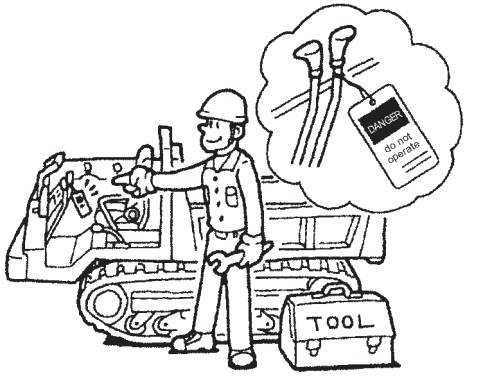


CA-C100270

- 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

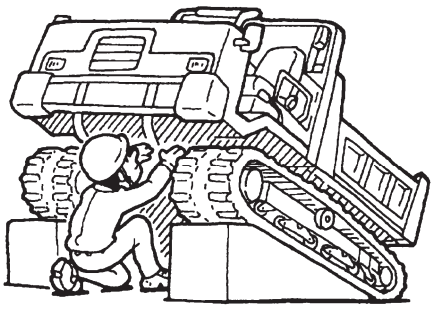
Hang a warning board saying “Under Inspection / Maintenance” at an easy to see location of the operation lever so that nobody other than the concerned persons touches it.



CA-C100280

WHEN WORKING UNDER TRACKS

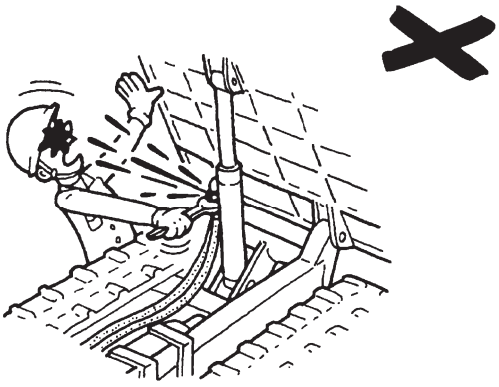
There is the danger of an accident of being caught under the machine if the machine comes down.
Place supporting pillars or blocks under the crawler and make sure that it is supported firmly.



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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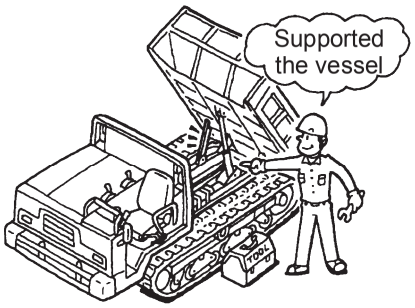
SUPPORTING THE VESSEL

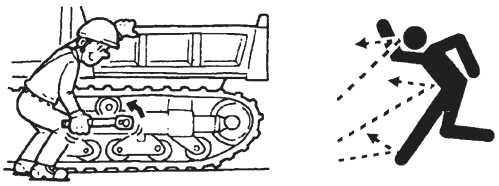
If replacement or repair of couplings or hoses is made with the vessel in the raised condition, there is the possibility that the vessel drops down.
Be sure to support the vessel using the safety bar.



CA-C100310

DO NOT WATCH THE RELIEF VALVE WHEN ADJUSTING TRACKS.

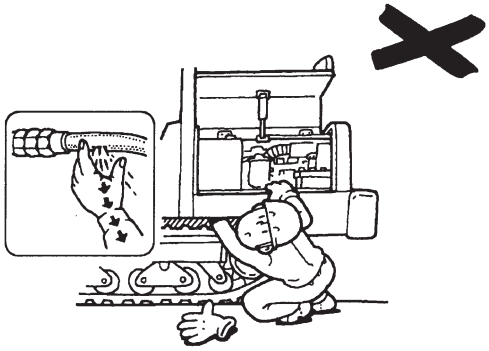
- Track adjusting grease is under high pressure. Grease coming out of the check valve under pressure can penetrate the body causing injury or death.
- Watch the track or track adjustment cylinder to see if the track is being loosened. Loosen the check valve one turn only.
- Do not put your face, hand,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



CA-C100320

PRECAUTIONS AGAINST HIGH PRESSURE OIL

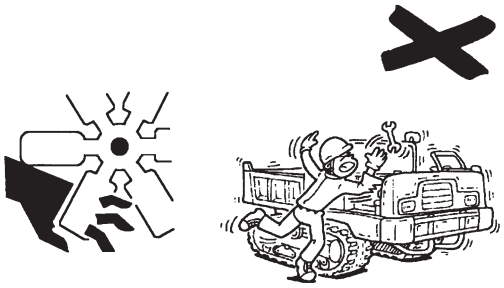
- It is very dangerous if the high pressure oil enters your skin or eyes.
- Use a thick sheet of paper or a wooden piece to test for the leakage of high pressure oil, and never test with your hands.
  Wear protective goggles for protecting your eyes.
- If oil enters your skin, immediately go to a doctor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

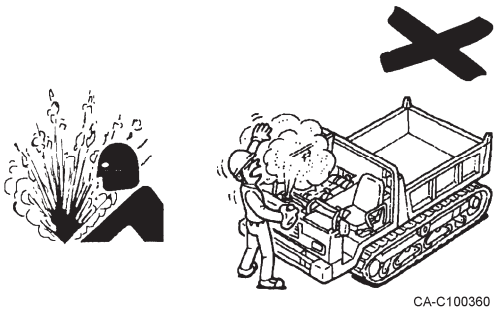
BE CAREFUL TO HOT ENGINE AFTER THE MACHINE STOPS.

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.



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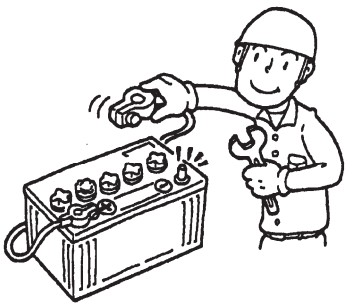
HANDLING BATTERY



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 working 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

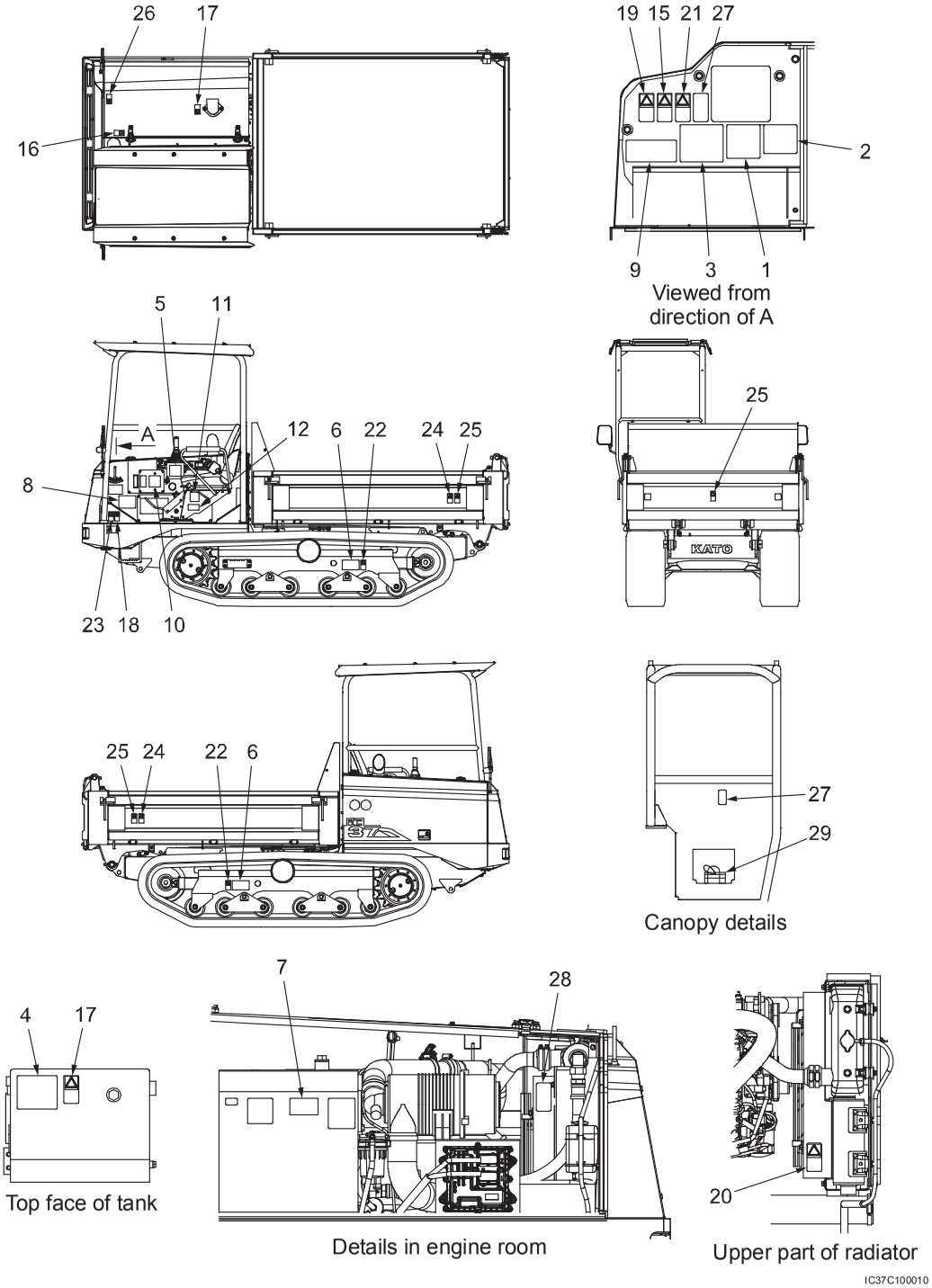
There are several specific safety signs on your machine. Their exact location and description of the hazard are reviewed in this section. Please take the time to familiarize yourself with these safety signs.

Make sure that you can read all safety signs. Clean or replace these if you cannot read the words or see the pictures. When cleaning the labels use a cloth, water and soap. Do not use solvent, gasoline, etc.

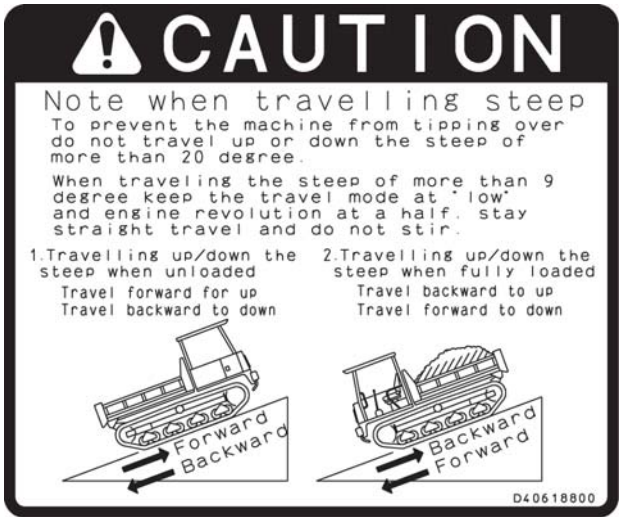
You must replace a label if it is damaged, missing or cannot be read. If a label is on a part that is replaced, make sure a new label is installed on the replaced part.

See our dealer for new labels.

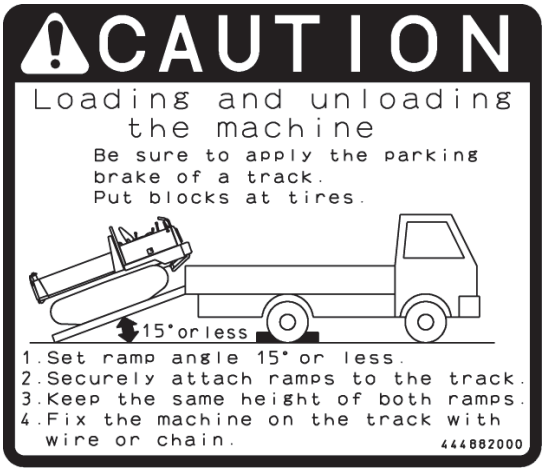
Where the warning Signs and Labels are stuck



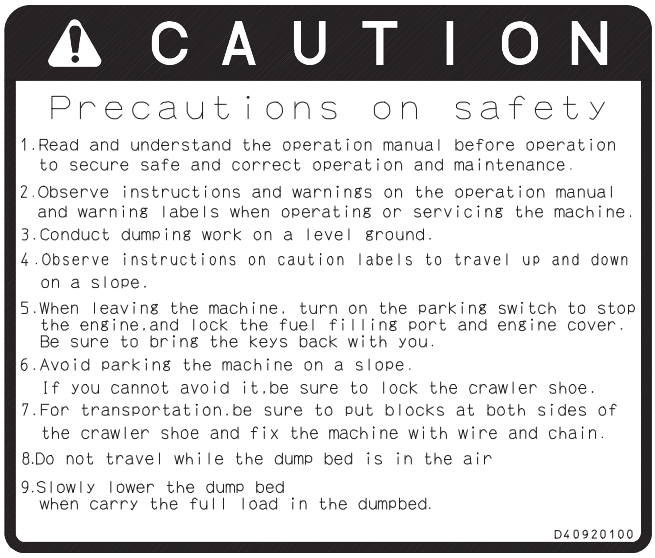
1. Traveling on a slope
(D406 188 00)



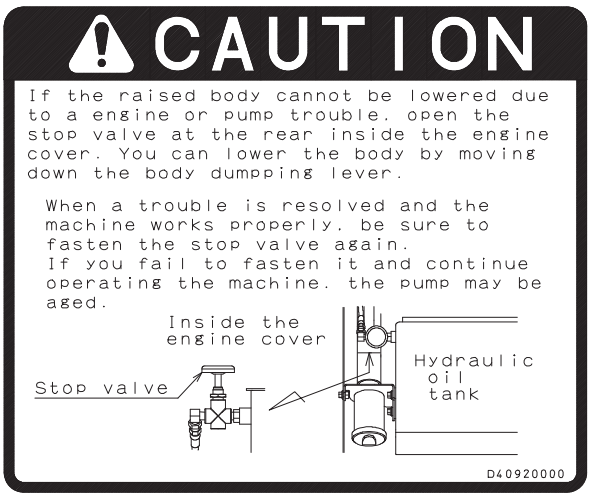
2. Loading and unloading the machine
(4448 820 00)



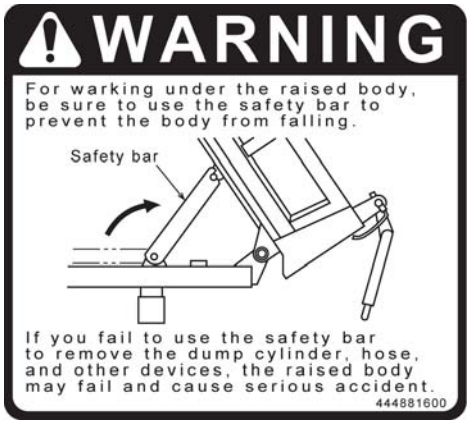
3. Precautions on safety
(D409 201 00)



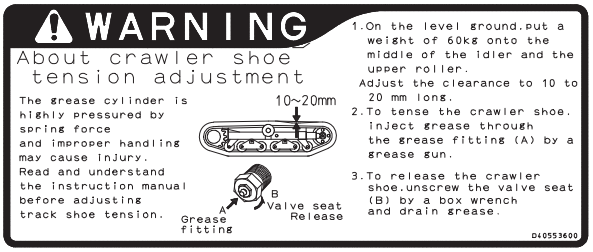
4. How to lower vessel in case of emergency
(D409 200 00)



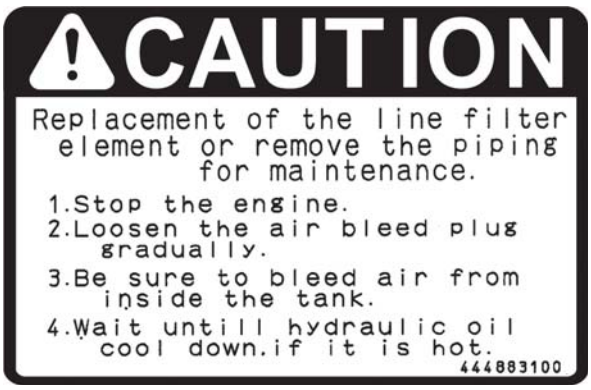
5. Precaution for working under the raised vessel
(4448 816 00)



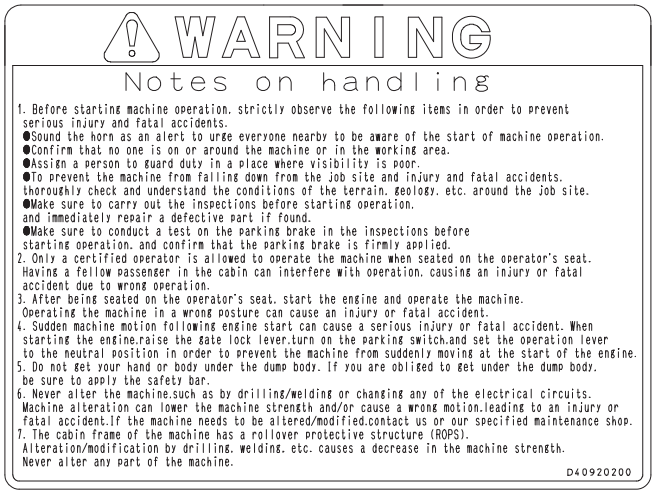
6. Crawler shoe tension adjustment
(D405 536 00)



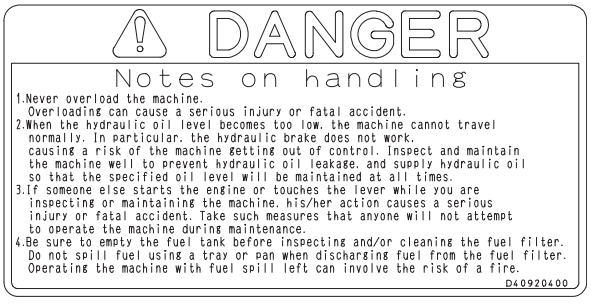
7. Precaution for maintenance of hydraulic circuit
(4448 831 00)



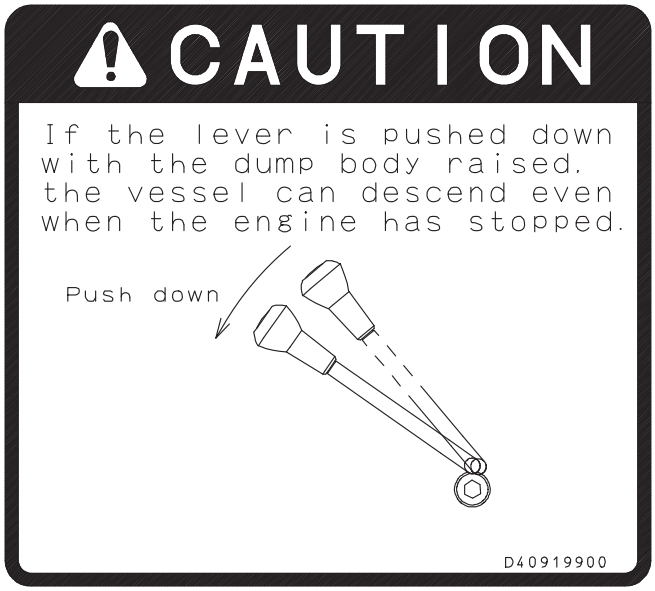
8. WARNING Precautions for handling
(D409 202 00)



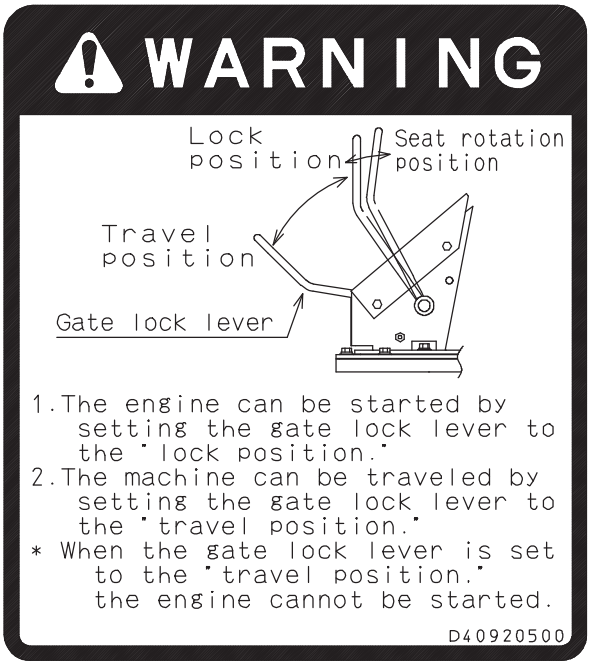
9. DANGER Precautions for handling
(D409 204 00)



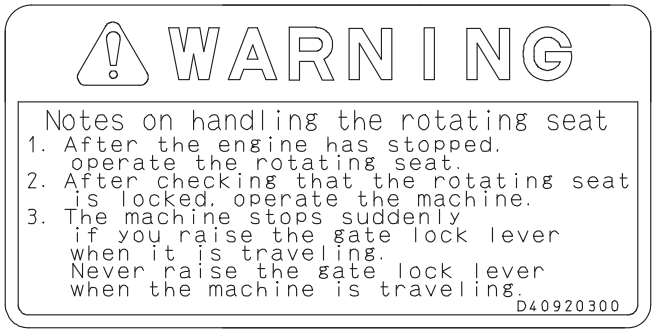
10. When the vessel moves down
(D409 199 00)



11. Precautions for gate lock lever position
(D409 205 00)

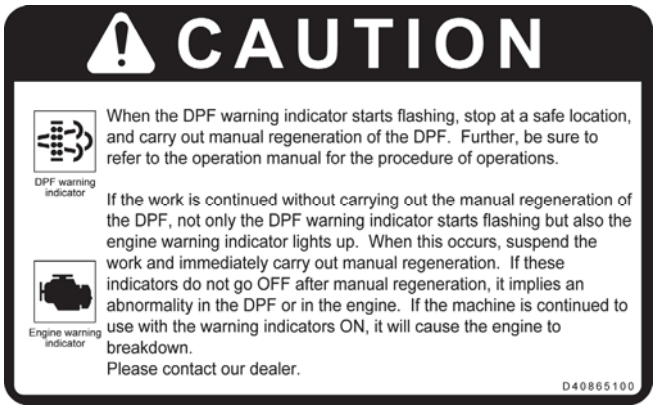


12. Precautions for handling rotary seat
(D409 203 00)

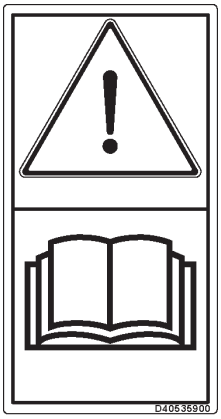


13. Precautions for DPF regeneration
(D408 650 00)

14. Precautions for DPF lamp
(D408 651 00)



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



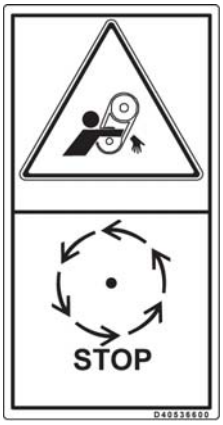
16. Sign indicates a burn hazard from spurting hot water or oil if radiator or hydraulic tank is uncapped while hot.
Allow radiator or hydraulic tank to cool before removing cap.
(D405 360 00)

17. 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 361 00)

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

19. 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)

20. Sign indicates a hazard of rotating parts, such as belt.
Turn off before inspection and maintenance.
(D405 366 00)

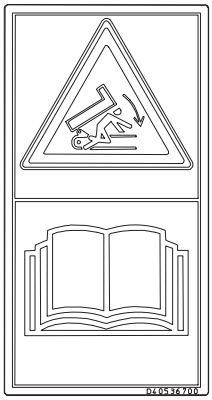


21. Sign indicates a hazard of falling out when machine goes over an obstacle.
Read manual and follow instructions for safe and proper operation.
(D405 368 00)

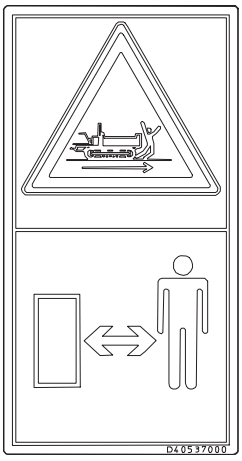
22. Sign indicates a hazard of a flying plug from track adjuster that could cause injury.
Read manual before adjusting track for safe and proper handling.
(D405 369 00)

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

24 Sign indicates a crush hazard from falling body.
Read manual and follow safety instructions when holding the body in a raised position.
(D405 367 00)

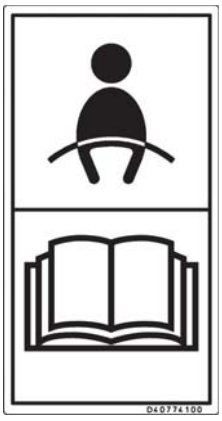


25 Sign indicates a hazard of being run over by moving equipment.
Keep away from equipment when t is moving.
(D405 370 00)

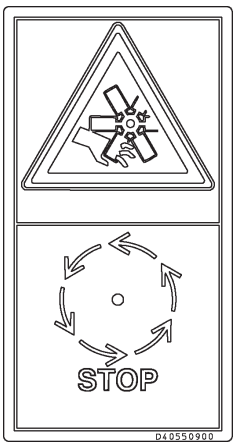


26. Sign indicates a hazard of falling.
Do not stand on this place.
(D405 365 00)

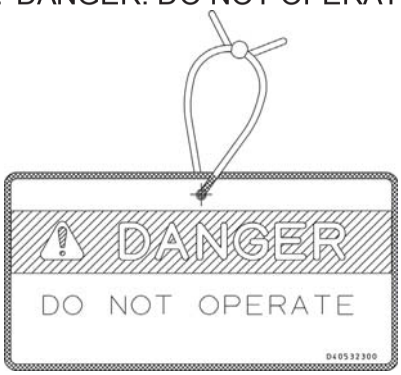
27. Sign indicates the necessity of fastening the seat belt.
Always keep the seat belt fastened while operating the machine to minimize danger caused by accidents such as falling down.
(D407 741 00)



28. Sign indicates a hazard of rotating parts, such as fan.
Turn off before inspection and maintenance.
(D405 509 00)



29. DANGER! DO NOT OPERATE tag

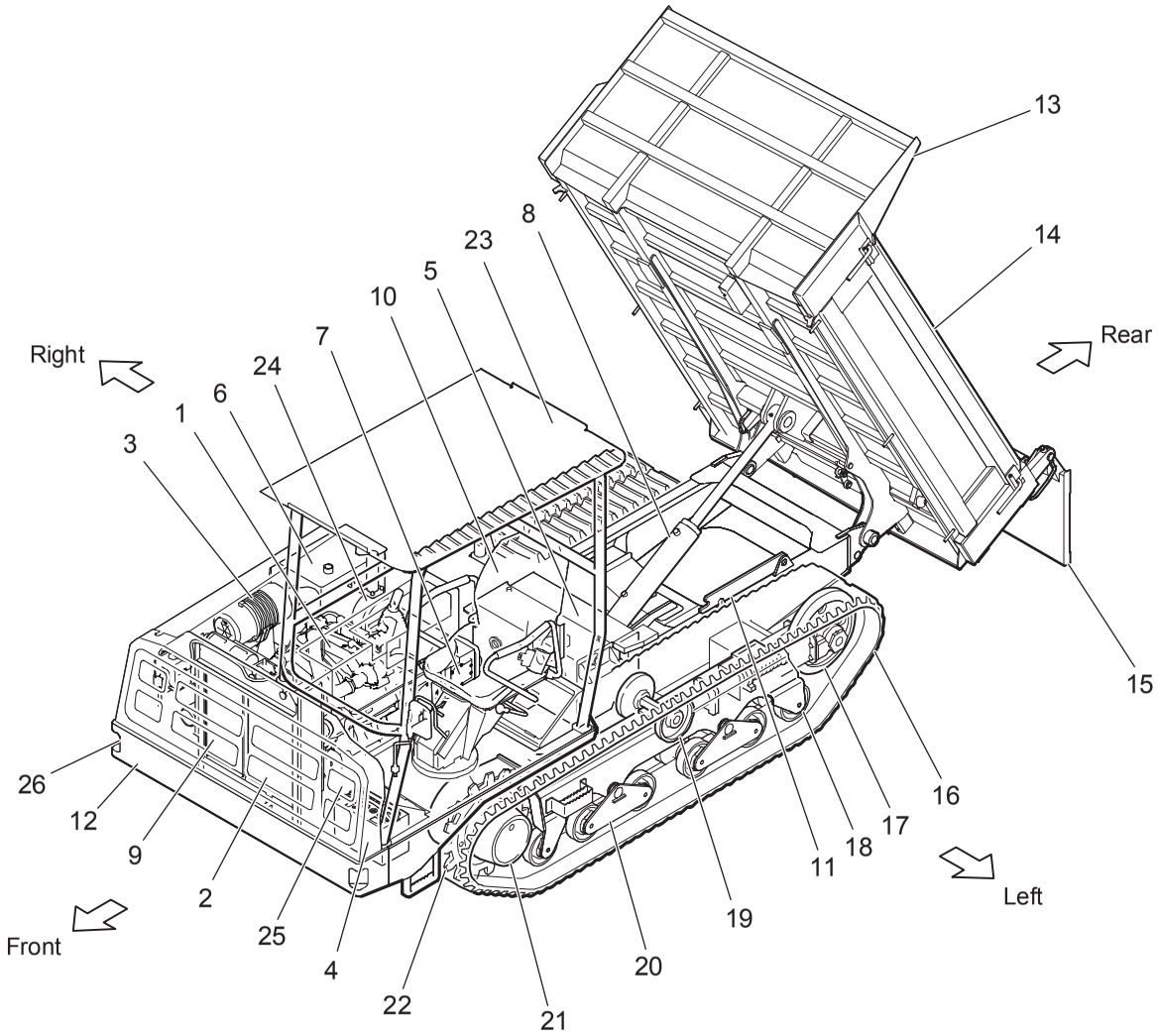


Attach a DO NOT OPERATE warning tag to start switch or controls before servicing or repairing the machine.
Do not start the engine or move any of the controls if there is DO NOT OPERATE or similar warning tag attached to the start switch or controls.
(D405 323 00)

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.

NAME OF COMPONENT

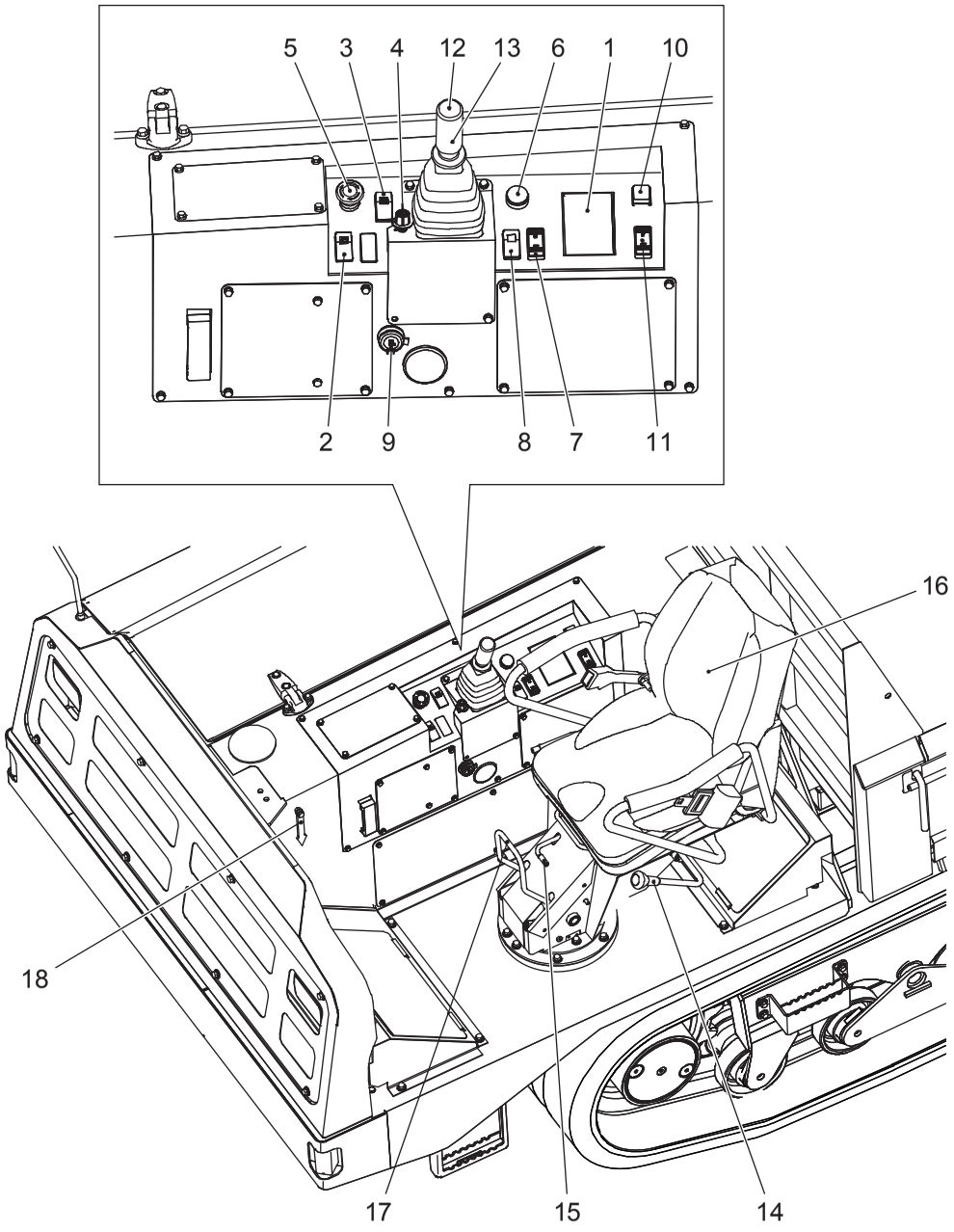


IC37C201000

No.	Name	No.	Name	No.	Name
1	Engine	10	Operator seat	19	Upper roller
2	Radiator	11	Safety bar	20	Swing link
3	Air cleaner	12	Front bumper	21	Travel drive device
4	Battery	13	Vessel	22	Drive sprocket
5	Fuel tank	14	Side gate	23	Canopy
6	Hydraulic tank	15	Rear gate	24	Postprocessor
7	Hydraulic pump	16	Rubber crawler	25	Headlight
8	Dump cylinder	17	Idle tumbler	26	Turn signal lamp
9	Oil cooler	18	Lower roller		

When the direction is indicated in this manual, it becomes the direction of the above arrow.

CONTROLS AND INSTRUMENTS



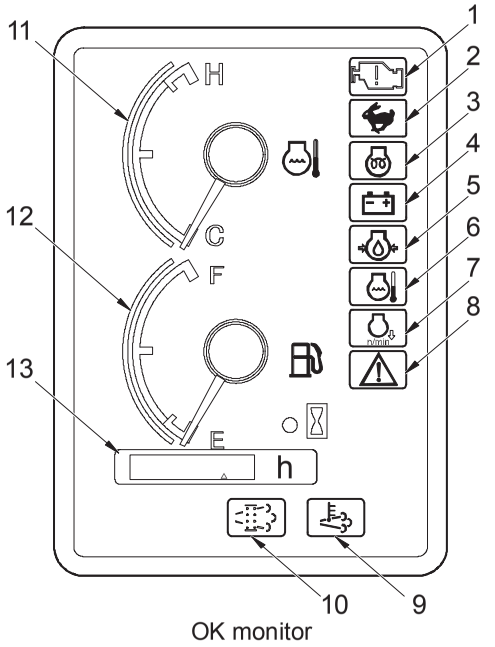
IC37C200070

No.	Name	No.	Name
1	OK monitor	10	DPF manual regeneration switch
2	Travel speed select switch	11	Auto idle switch
3	Parking switch	12	Horn switch
4	Engine speed control dial	13	Joystick lever
5	Emergency engine stop switch	14	Dump lever
6	Engine key switch	15	Dump lock lever
7	Turn signal switch	16	Operator seat
8	Light switch	17	Gate lock lever/seat rotation lever
9	12V power outlet	18	Inclinometer

1. OK monitor

When the engine key switch is set to the ON position, the engine oil pressure warning indicator and battery charge warning indicator turn on. Make sure that all warning indicators are off before starting work after the engine starts.

No.	Name
1	Engine warning indicator
2	Travel speed indicator
3	Glow indicator
4	Battery charge warning indicator
5	Engine oil pressure warning indicator
6	Water temperature warning indicator
7	Auto idle indicator
8	Gate lock indicator
9	DPF regeneration indicator
10	DPF warning indicator
11	Water temperature gauge
12	Fuel gauge
13	Hour meter



OK monitor

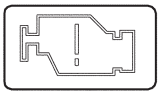
IC37C206040

NOTICE

- If some trouble occurs in the machine, the corresponding warning indicator turns on to indicate the trouble. If a warning indicator turns on during work, stop the engine immediately and check and repair the abnormal position.
- The OK monitor does not always warrant the machine condition. Take indication of the OK monitor and carry out startup inspection and daily inspection.
- Be sure to check the levels and contamination of the engine oil, cooling water, fuel tank and hydraulic oil tank visually.
- If the engine oil temperature is low, the hydraulic pressure becomes higher and the engine oil pressure warning indicator may turn on. It turns off when the engine is warmed up. Stop the engine and carry out inspection and repair work if the indicator does not turn off even after warming up.

Engine warning indicator

This indicator lights up if the ECU detects some abnormality.
When this indicator has lit up or is flashing, contact our sales and service outlet.
Perform a manual regeneration when the indicator is lit simultaneously with a blinking of the DPF warning indicator.


WS-C205040

Travel speed indicator

This indicator turns on when the travel speed select switch is set in the "🐇" mark side (high-speed mode).

This indicator turns off when the travel speed select switch is set in the side without mark (low-speed mode).

If the travel load becomes larger in high-speed mode, the automatic low-speed function changes the mode to the low-speed mode and the indicator turns off.


WC-C200050

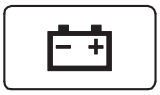
Glow indicator

This indicator turns on when the engine key switch is set to the ON position, indicating that preheat. The indicator turns off after preheat completion.


WC-C200060

Battery charge warning indicator

This indicator turns on if some trouble occurs in the charging system while the engine is running. If it turns on while the engine is running, the fan belt may be slack. Stop the engine and check it.


WC-C200070

Engine oil pressure warning indicator

This indicator turns on if the lubricating oil pressure lowers while the engine is running. Stop the engine and check the lubrication system and lubricating oil quantity if this indicator turns on while the engine is running.


WC-C200080

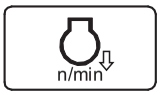
Water temperature warning indicator

This indicator turns on if the water temperature is higher abnormally. Stop the engine and check the cooling system if this indicator turns on while the engine is running.


WC-C200090

Auto idle indicator

This indicator turns on when the Auto idle switch is on and turns off when the Auto idle switch is off.



WC-C200120

Gate lock indicator

This indicator turns on if the engine key switch is set to the START position though the gate lock lever is not at its locked position. The engine cannot be started in such a condition. Put the gate lock lever in its locked position to start the engine.


WC-C200110

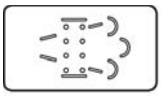
DPF regeneration indicator

This indicator turns on during DPF regeneration.


IC37C201230

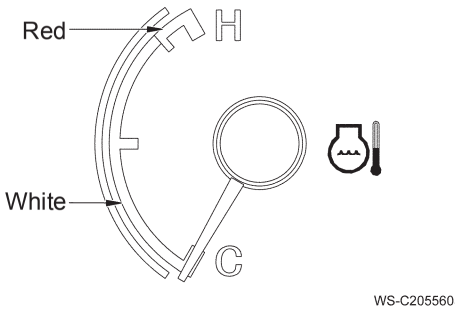
DPF warning indicator

The indicator will blinks if soot builds up in the DPF.
Perform the manual regenerating as soon as possible if the DPF warning indicator blinks. For details, refer to OPERATION.


WG-C206030

Water temperature gauge

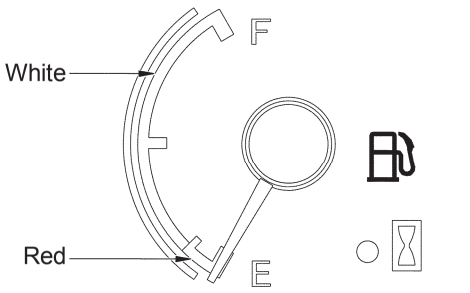
- This gauge indicates the temperature of engine cooling water.
- It is proper if the pointer indicates a temperature in the white range during operation.
- After starting the engine, carry out warming up operation of the engine until the needle points in the horizontal direction.
- Idle the engine and wait until the temperature lowers to the white range if the pointer indicates a temperature in the red range during operation. Check the water level in the subtank, water leak from the engine and radiator and fan belt.



WS-C205560

Fuel gauge

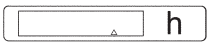
- This gauge indicates the fuel level in the fuel tank.
  F: The fuel tank is full.
  E: Fuel is insufficient. Refill the tank with fuel.



WS-C305140

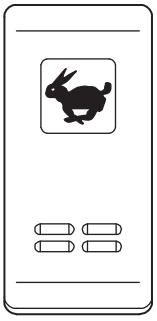
Hour meter

This meter indicates the accumulative running time in units of 1/10 hour (six minutes).
It advances as long as the engine is running, even if the machine is not working.



WS-C205590

2. Travel Speed Select Switch

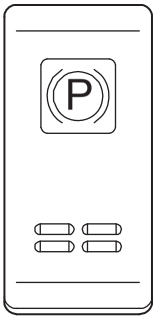

IC55C200180

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 goes on.

Brake OFF: Press the side without the mark. The mark indicator lamp goes off.

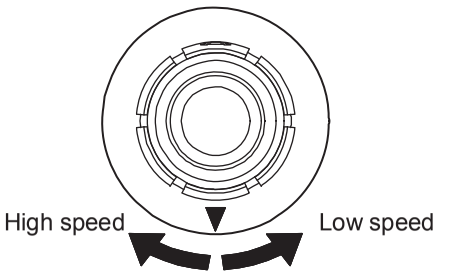
The parking brake safety function is provided to prevent erroneous travel after the engine key switch is turned ON. After the engine key switch is turned ON, the machine cannot travel unless the parking brake is turned ON once and then released.

4. Engine speed control dial

Adjust the minimum engine speed.

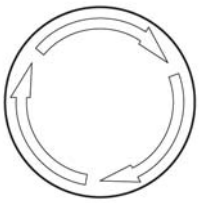
High speed: Rotate the dial clockwise.

Low speed: Rotate the dial counterclockwise.



IC37C201040

5. 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.

6. Engine key switch

WK-C200050

Use this switch to start and stop the engine.

OFF (stop)

The key may be inserted and removed at this position. Power of all electrical systems is cut off and the engine stops.

ON (run)

Power is supplied to the electrical systems and the OK monitor indicators turn on. When turning the key to ON position, the preheat function automatically starts operating and the glow indicator turns on. As the glow indicator will turn off within 10 seconds, start the engine after confirming the glow indicator turns off.

START (start)

Set the switch to this position to start the engine. Release the fingers from the key immediately after the engine starts.

The key returns to the ON position automatically.

7. Turn signal switch

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

Use this switch to operate the turn signal lamp.

⇨ : The right direction indicator lamp blinks.

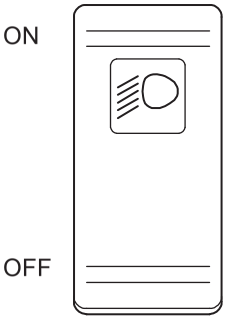
OFF : The direction indicator lamps turn off.

⇦ : The left direction indicator lamp blinks.

IC37C200010

8. Light switch

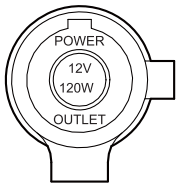
Use this switch to turn on and off the headlight.
When the key switch is set at the ON position,
the "" indicator turns on and the headlight can be used.
Headlight ON : Press the "" mark side.
Headlight OFF : Press the side without the mark.



IC55C200150

9. 12V power outlet

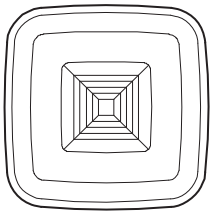
This is a power socket for standby power source. Use it within the following capacity. Always keep the cap closed when this socket is not used.
Capacity: 12 V, 120 W



WC-C200200

10. DPF manual regeneration switch

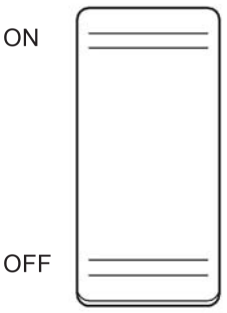
This switch is used to perform DPF manual regeneration. This switch is used when the DPF warning indicator on the OK monitor is blinking.


IC37C200080

11. Auto idle switch

When the Auto idle switch is set at the ON position, the engine revolution changes into low automatically to reduce fuel consumption in idle state approximately 4 seconds after the operation lever is returned to the neutral position. The previous engine revolution is restored when some operation lever is moved again.

ON: The auto idle function is enabled and the auto idle indicator on the OK monitor turns on.
OFF: The auto idle function is canceled and the auto idle indicator on the OK monitor turns off.



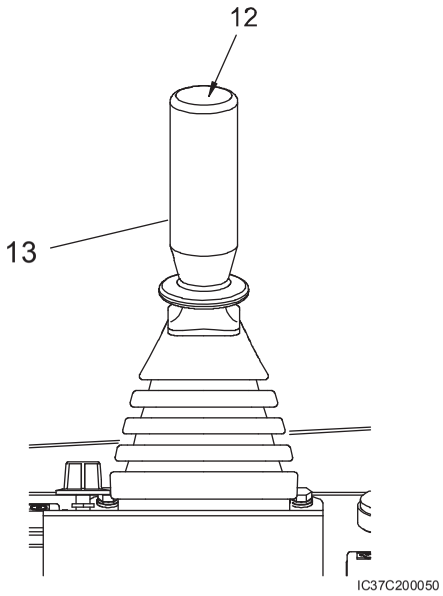
IC37C200090

⚠ WARNING

If the lever is operated in the condition where the Auto idle switch is set at the ON position and the engine revolution is reduced, the engine revolution increases quickly, the operation speed changes suddenly, and a serious accident may occur. Set the Auto idle switch at the OFF position during work that may cause dangerous accidents if the operation speed changes suddenly such as loading or unloading of the machine, turning, etc.

12. Horn switch

Press this switch to sound the horn.



13. Joystick lever

Use this lever to perform forward, backward, stop and route change operation of the mahine and adjust the travel speed.

For detailed explanation about travel lever operation, refer to OPERATION.

14. Dump lever

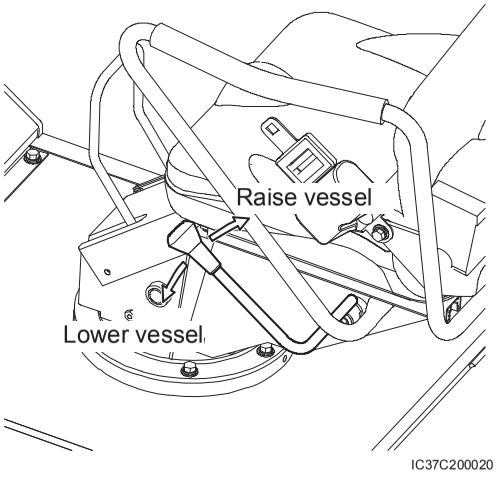
> **⚠ CAUTION**
>
> To raise the vessel and perform maintenance under it, be sure to stop the engine, set the safety bar on the vessel, and set the dump lock lever at the lock position.

The dump lever is located at the right and left of the operator seat.

Use this lever to raise and lower the vessel.

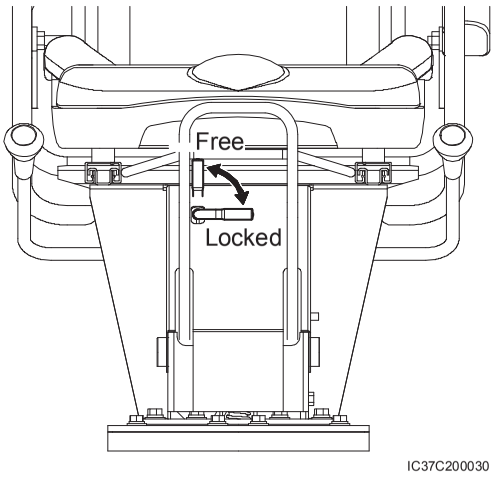
Raise: Pull the lever up.

Lower: Push the lever down.



15. Dump lock lever

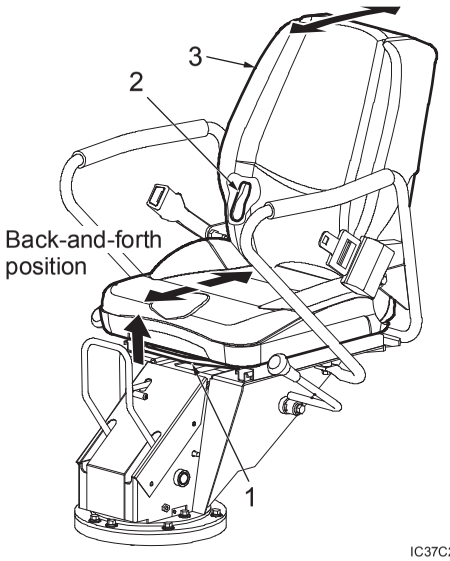
Use this lever to lock and unlock the dump lever.



16. Operator seat

⚠ CAUTION

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



IC37C200040

Sit on the seat and adjust it to allow free lever operations.

- Adjusting the back-and-forth position
  Move the seat forward or backward while pulling the slide lever (1) to adjust the back-and-forth position.
- Adjusting seat back
  Move the seat back (3) while pulling the lever (2) to adjust the angle of the seat back.

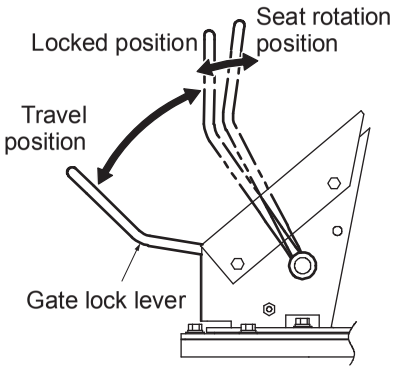
Rotating the operator seat

- The operator seat rotates by 180 degrees clockwise by setting the gate lock lever at the seat rotation position.
- The operator seat can be rotated while sitting, but be fully careful not to fall down from the machine.
- The operator seat can be rotated in the state in which the engine is started. However, do not rotate the seat while the machine is moving.

17. Gate lock lever/seat rotation lever

The position of gate lock lever determines the operation that can be performed.

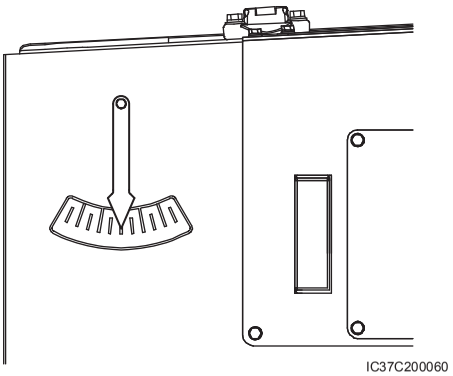
- When the lever is set at the “Locked position,” the engine can be started.
- When the lever is set at the “Travel position,” the machine can travel.
- When the lever is set at the “Seat rotation position,” the operator seat can be rotated.



IC37C300100

18. Inclinometer

- This inclinometer indicates the longitudinal inclination of the body.
- Align the orientation of the body with the inclination direction to measure the inclination angle and travel according to the precautions. (Refer to the explanation of Caution for Travel on a Slope in Chapter 3.)



IC37C200060

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OPERATION

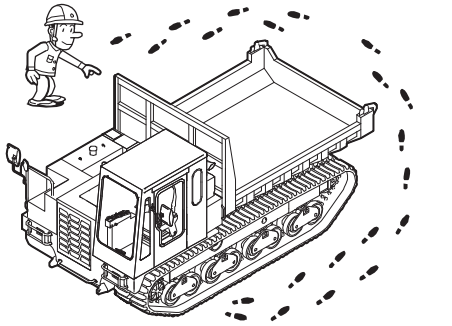
This section describes the proper operation procedures of this machine.
Always look to the safety and observe the given operation instructions and cautions to carry out works safely.

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 soil and sand, etc. excessively adhering to the traveling mechanisms.
- Check oil leak and water leak from the engine.
- Remove dust and foreign matters from the engine, radiator and peripheral parts.
- Check leak and damages of intake/exhaust piping around the air cleaner and postprocessor.
  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.

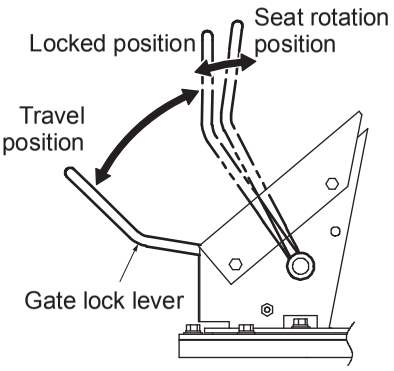
- Check the coolant quantity. Refill if necessary.
- Check the engine oil quantity. Refill if necessary.
- Check the fuel quantity. Refill if necessary.
- Check the water sedimentation tank.
- Check the hydraulic oil quantity. Refill if necessary.
- Check the dust indicator.
- Make sure that the manual regeneration indicator turns on.

STARTING ENGINE

Check before Starting Engine

1. Sit on the operator seat and adjust it to the condition where the operation levers and pedals may be used smoothly.

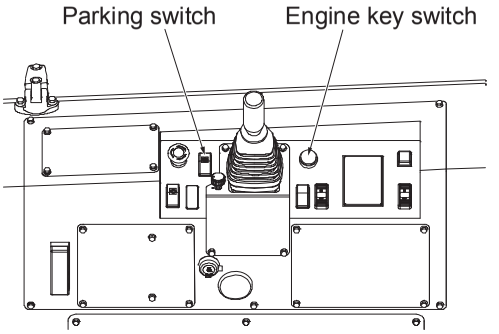
2. Make sure that the gate lock lever is set at the travel position.
   * When the gate lock lever is set at the travel position, the engine cannot be started.



IC37C300100

3. Make sure that the parking switch is set at the parking position.

4. Make sure that each lever is set at the neutral position.



IC37C300010

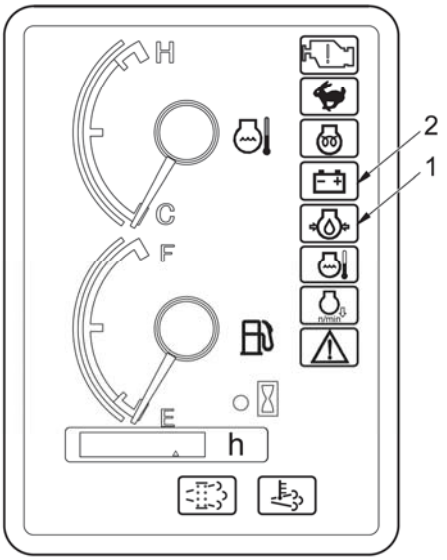
5. Insert the key into the engine key switch. Turn it to the ON (run) position and make sure of the following.

   - The engine oil pressure warning indicator (1) and battery charge warning indicator (2) are lit continuously.
     (It is normal if the engine oil pressure warning indicator and battery charge warning indicator turn off when the engine starts.)

   - Push the light switch and make sure that the front lights are turned on.

   - Push the joystick horn switch and make sure that the horn sounds.

Engine key switch

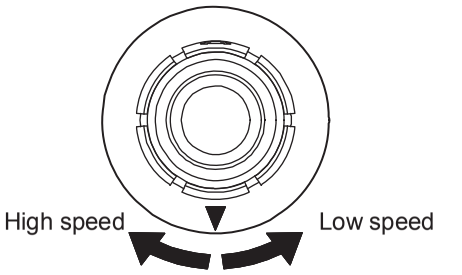


OK monitor

IC37C300020

Normal Starting

1. To prepare for unexpected travel, set the engine speed control dial at the low-speed position.
2. Turn the engine key switch to the START position to start the engine.
3. Release the hand from the key when the engine starts. The key returns to the ON position automatically.
4. Set the gate lock lever down to the travel position to start work.



IC37C201040

⚠ CAUTION

- Check if there are no persons or obstacles around the machine, turn on the horn, and start then.
- Be sure to sit on the operator seat and start the engine.
- Set the gate lock lever to the lock position and restart the engine, if the engine stops with the gate lock lever set at the travel position.

NOTICE

Do not turn the starting motor for 15 seconds or more. If the engine fails to start, return the key to the OFF position, wait for 30 seconds, and try to start the engine again.

Starting in Cold Seasons

Preheat the engine in cold seasons to make it easy to start the engine.

1. To prepare for unexpected travel, set the engine speed control dial at the low-speed position.
2. Turn the key clockwise and keep it at the ON (run) position. The preheating starts and the glow indicator turns on. Wait until it turns off (10 seconds at the maximum, the value of which depends on the cooling water temperature).
   The engine oil pressure warning indicator and battery charge warning indicator also turn on when the key is set at the ON (run) position. However, this does not imply any abnormality.
3. Turn the key to the START position to start the engine after the glow indicator turns off.
4. Release the hand from the key when the engine starts. The key returns to the ON position automatically.

Starting With Jumper Cables

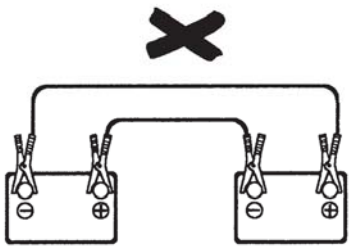
⚠ WARNING

- 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.

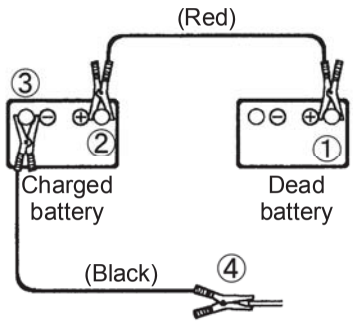
Never connect the positive and negative terminals.



WC-C200410

Connecting the jumper cables

1. Set the engine key switches 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-C300120E

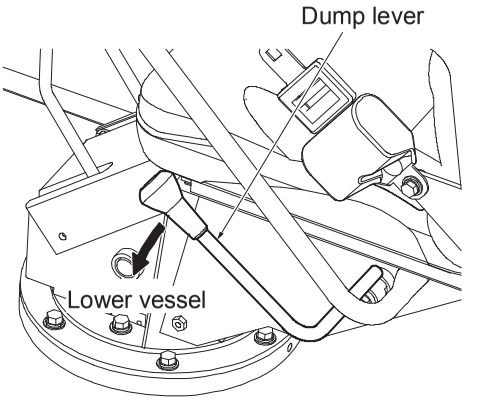
After Starting the Engine

1. Checking operation of the OK monitor
   Make sure that all indicators on the OK monitor are off.
2. Check if engine exhaust color, sound and vibrations are not abnormal.

NOTICE
• Do not accelerate the engine or apply loads to it quickly when the cooling water temperature is low. • If some abnormality is found, stop the engine immediately, find the cause and repair the defective part.

Warming Up the Machine

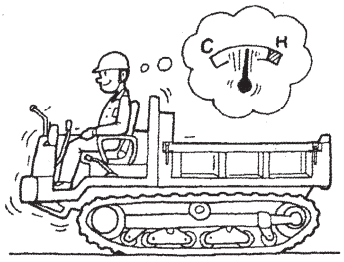
NOTICE
Do not increase the engine speed quickly when hydraulic oil is cold (below 20°C). The proper hydraulic oil temperature is approximately 50°C to 80°C. If you should carry out works at low temperature, warm up the engine until the hydraulic oil temperature rises to approximately 20°C before starting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



IC37C300040

1. Warm up the engine.
   Set the engine throttle lever at the low-speed position and perform no-load operation until the engine water temperature gauge points at the green range.
2. Idle the engine for approximately 5 minutes to warm it up after starting it.
3. With the dump lever set at the “Lower” position, run the engine for 3 to 5 minutes to raise the hydraulic oil temperature.
4. Move the machine forward and backward and raise and lower the vessel several times to warm up the mechanisms.

Warm-up operation

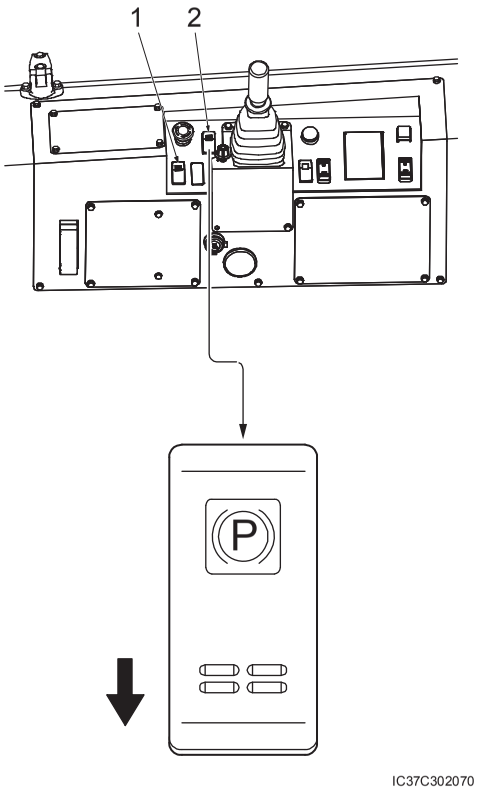


BASIC OPERATION

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.



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

2. Press down on the no-mark position of the parking switch (2) to deactivate the brake.
   Make sure that the mark lamp of the parking switch (2) and the parking mark on the display are off.

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

Joystick Lever Operation Procedure (Forward Posture)

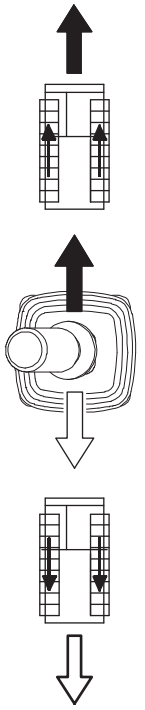
Use the joystick lever as shown below.

Forward: Push the joystick forward.

Stop: Set the travel joystick lever to the neutral position.

Backward: Pull the joystick lever backward.

NOTICE
Do not turn on the parking switch to apply the brake and stop the machine during travel except the case of emergency. Doing so causes the brake disc to be damaged. Be sure to stop travel completely and then turn on the parking switch.



IC37C301080

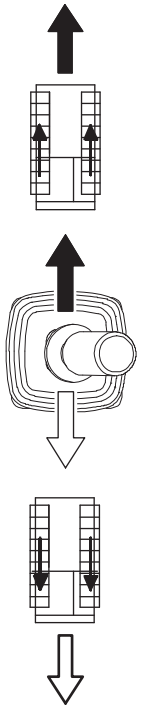
Joystick Lever Operation Procedure (Backward Posture)

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.



IC37C301090

⚠ WARNING
• Travel lever operation is different depending on operation seat direction. • Confirm if travel lever operation matches seat direction before travel. Otherwise the machine may move unexpectedly and it may lead serious injury. • Ask service shop if travel lever operation does not match to seat direction.

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.

Forward Posture

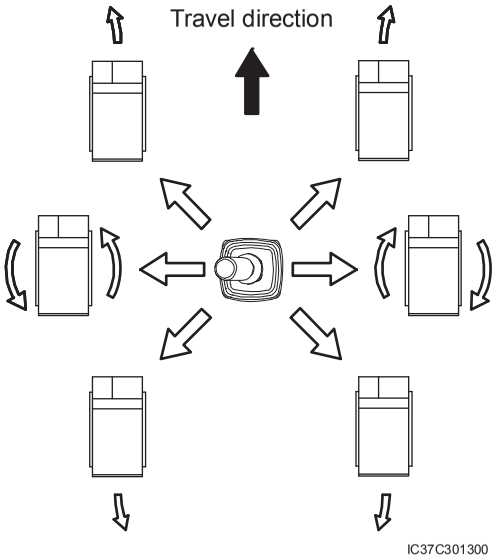
- **Turn**

  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.

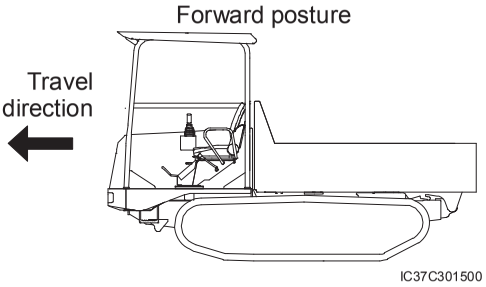
  Right turn and backward: Pull the joystick lever in the left backward direction.



- **Spin Turn**

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

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



⚠ WARNING

- Travel lever operation is different depending on operation seat direction.
- Confirm if travel lever operation matches seat direction before travel. Otherwise the machine may move unexpectedly and it may lead serious injury.
- Ask service shop if travel lever operation does not match to seat direction.

Backward Posture

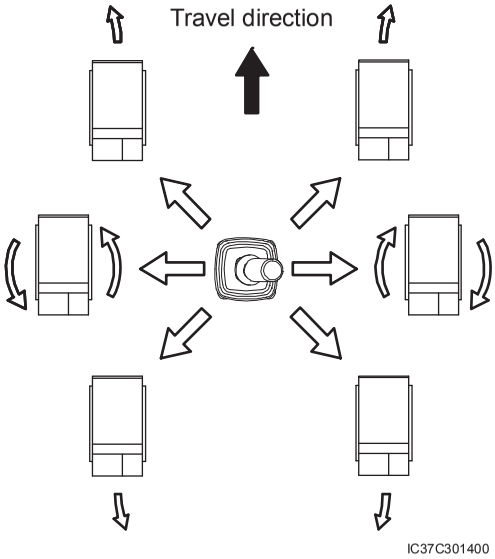
- **Turn**

  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.

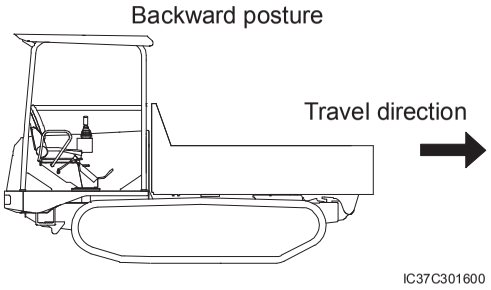
  Right turn and backward: Pull the joystick lever in the left backward direction.



- **Spin Turn**

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

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

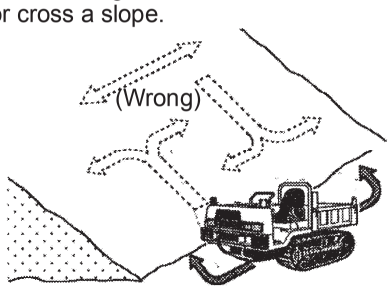


⚠ WARNING

- Travel lever operation is different depending on operation seat direction.
- Confirm if travel lever operation matches seat direction before travel.
  Otherwise the machine may move unexpectedly and it may lead serious injury.
- Ask service shop if travel lever operation does not match to seat direction.

Caution for Travel on a Slope

Never change the tranvel direction on or cross a slope.



Make a detour on a flat ground.

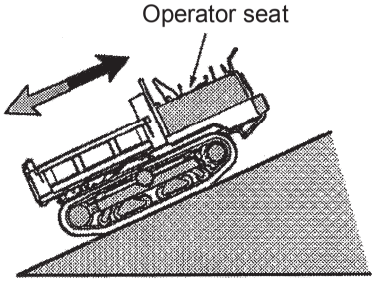
⚠ WARNING

- Do not travel on a slope with a slope angle exceeding 20 degrees in order to avoid turnover. (Use the inclinometer to check the slope angle.)
- On a slope with a slope angle exceeding 9 degrees, travel straight with the engine speed select switch set to low-speed mode at low travel speed and middle or lower engine speed without traveling in the lateral direction and in the oblique direction (including a zigzag manner).
- Never change the travel direction on a slope. Direction change may cause turnover or slip. If it is necessary to change the travel direction, move to a solid ground with a gentle slope and change the direction.
- Never travel across a slope. Such operation may cause slip. Move down to a flat ground once and then make a detour to travel safely.

Travel on a slope as shown below.

1. Travel on a slope with an unloaded machine

Traveling on slope with an unloaded machine

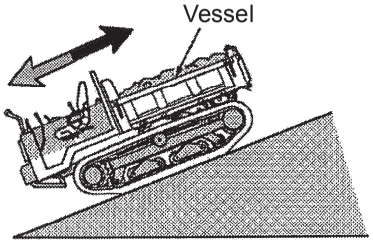


Travel with the operator seat facing the upper side of a slope. This posture ensures stable travel since the center of gravity of the machine is located on the operator seat side.

2. Travel on a slope with a loaded machine

- Travel with the vessel side facing the upper side of a slope. This posture ensures stable travel since the center of gravity of the machine is located on the vessel side.
- When moving down a steep slope, reduce the engine speed and travel.
- When moving over an obstacle, reduce the speed and travel with care not to turn over.
- Do not accelerate or decelerate or stop the machine or change the speed quickly.

Traveling on slope with a loaded machine.



3. Stop travel when a machine moves down a slope

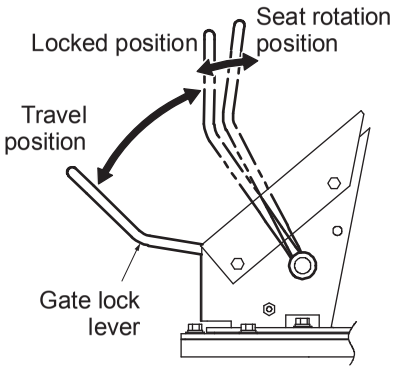
- Return the travel lever to the neutral position slowly. The travel brake is automatically applied to stop travel.
- When parking, be sure to apply the parking brake and raise the gate lock lever after travel stops completely.

⚠ CAUTION

Never raise the gate lock lever during travel or before stop. This operation may activate the parking brake, possibly leading to a sudden brake as well as parking brake trouble.

4. When the engine stops

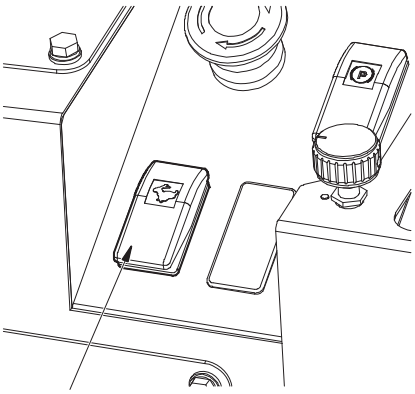
- When the engine stops during travel, return the travel lever to the neutral position and then start the engine.
- The engine can be started when the gate lock lever is set at the “Locked position.”
- The machine can travel when the gate lock lever is set at the “Travel position.”
- The engine cannot be started when the gate lock lever is set at the “Travel position.”



IC37C300100

Travel Speed Select Switch

Use this switch to change the travel speed of the machine. Change the travel speed according to the load state of the machine and the travel road surface condition at site.



Travel speed select switch

IC37C300080

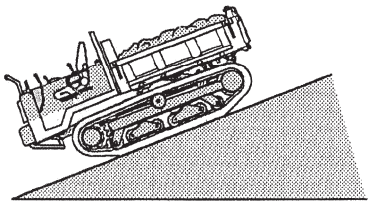
Travel condition and travel mode change

- Low-speed ( ) mode

  Use this mode when traveling up and down a slope with a loaded machine and traveling on an irregular ground which requires large travel force.

  After traveling up a slope in the low-speed mode, travel down the slope in low-speed mode as well.

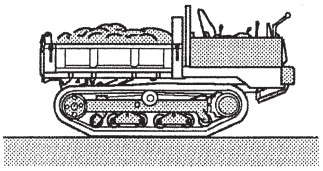
Low-speed ( ) mode

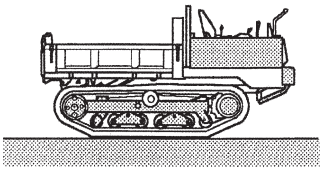


- High-speed ( ) mode

  When traveling on a flat ground, the machine can travel at high speed.

High-speed ( ) mode



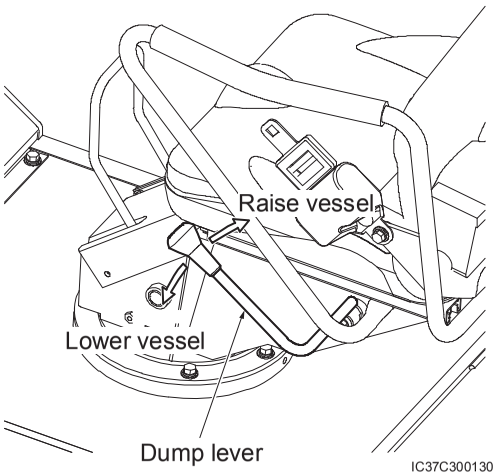


DUMP OPERATION

Dump operation procedure

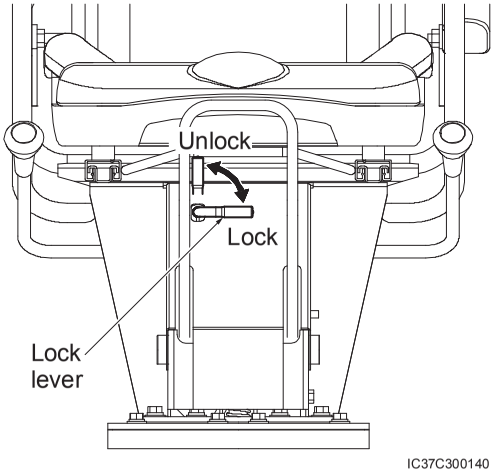
The vessel is operated as shown below.

1. Stop the machine and confirm the safety of a dumping place.
2. Set the dump lock lever at the unlock position.
3. Use the dump lever to raise or lower the vessel.
   - Raise: Pull the lever up.
   - Lower: Push the lever down.
4. Adjust the dump speed by changing the stroke of the dump lever.
5. The rear gate of the vessel automatically opens or closes as the vessel is raised or lowered.



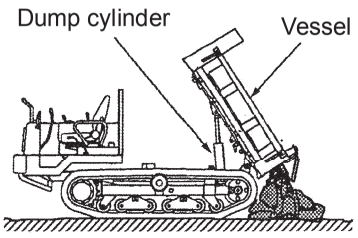
⚠ CAUTION

1. To carry out dumping, use the operation lever to raise the vessel gradually and avoid quick dumping.
2. To lower the vessel, reduce the engine speed and lower it slowly.
3. Set the dump lock lever at the locked position when dumping is not operated.



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 of the machine 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 as far as possible.
   If it is necessary to carry out dumping in such places, use wheel blocks 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. Make sure that the vessel has lowered completely before starting the machine.
5. Do not travel while the vessel is raised. ALWAYS travel keeping the vessel lowered.



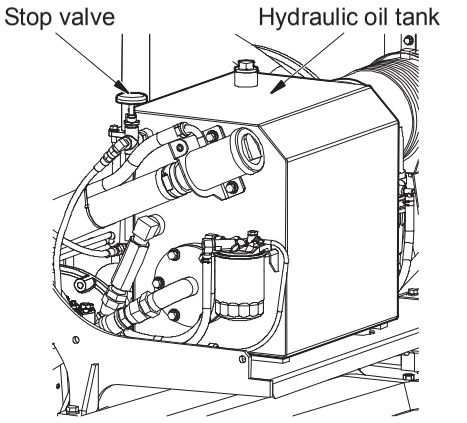
Dump at a level and stable place.

How to Lower Vessel in Case of Emergency

⚠ CAUTION

- Lower the vessel by opening the stop valve only when trouble occurs.
- When the stop valve is opened, the parking brake is applied and the machine cannot travel.
- Close the stop valve completely and carry out work.
  If the stop valve is closed insufficiently, the parking brake is not released completely to cause reduction in the travel force and earlier wear of the brake plates by drag of the brake.

If the engine is stopped with the vessel raised or due to trouble in the pump, the vessel cannot be lowered. In such case, when the stop valve on the rear inside the engine cover is opened, the vessel can be lowered by pushing the dump lever down.



IC37C300090

1. Make sure that there are no persons under and around the vessel.
2. Turn the handle of the stop valve counterclockwise to open the valve.
3. Push the dump lever down and lower the vessel.
   The vessel lowers slowly.
4. After the vessel has lowered completely, turn the valve clockwise and close it firmly.

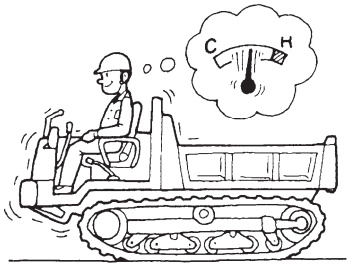
⚠ WARNING

Never enter between the vessel and the machine. It may cause serious injury or death.

“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-C300130E

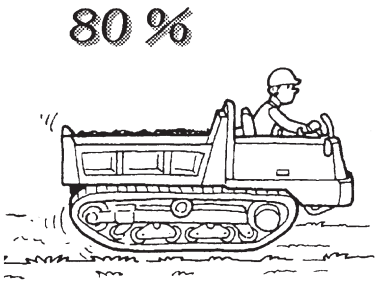
Pay attention to the following when breaking in a new machine.

- 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

AFTER FINISHING WORK

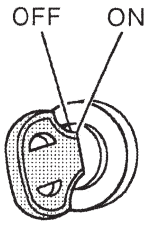
⚠ WARNING

- Be sure to lower the vessel completely, stop the engine and pull out the key before leaving the operator seat.
- When the engine is not stopped on a slope, be sure to apply the parking brake. (Set the parking switch to the P mark side.)

Parking the machine

1. Park the machine at a safe place that has a flat and solid ground and is free from rockfall and landslide.
   If it is necessary to park the machine on a slope, apply wheel blocks on the lower side of the crawler.
2. Lower the vessel completely.
3. Change the parking switch to “P” and set the dump lock lever at the locked position.

Stopping the engine



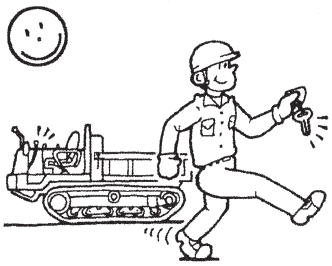
1. Place the engine in low idling state for about 5 minutes and lower the engine temperature.
2. Set the engine key switch at the “Stop” (OFF) position and stop the engine.
3. Pull out the key of the engine key switch.

Inspection and locking after stopping the engine

1. Check necessary parts for oil leak, water leak and damages.
   Repair defective parts if leak or damages are found.
2. Fill the fuel tank with fuel.
3. Remove soil and sand from the vessel and traveling mechanisms in particular.

Locking

Lock the fuel filler port, engine hood and all other lockable parts.



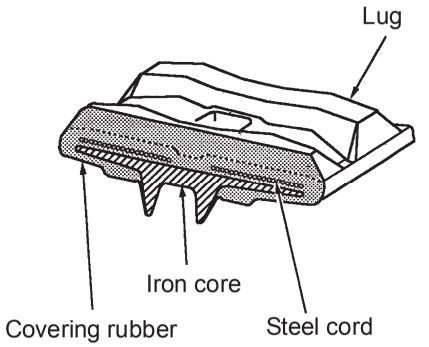
PRECAUTION ON USE OF RUBBER CRAWLER SHOE

⚠ 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

The structure of rubber crawler shoe. It consists of steel cord to sustain tension, iron core to support it, and covering rubber to 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 distributor.

Cautions while working and traveling

Avoid the following while traveling.

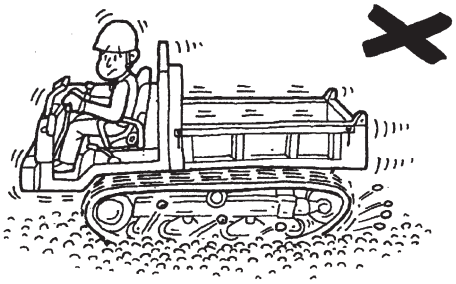
DO NOT TRAVEL OR WORK ON STONE FOUNDATIONS OR SHARP ROCKS

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

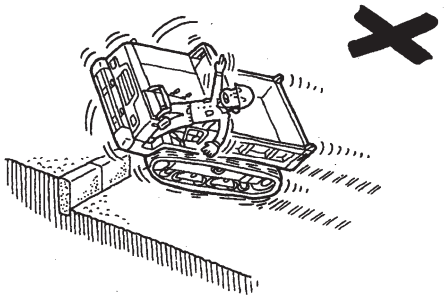
DO NOT TRAVEL OR WORK ON STEEL OR SCRAP MATERIAL

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

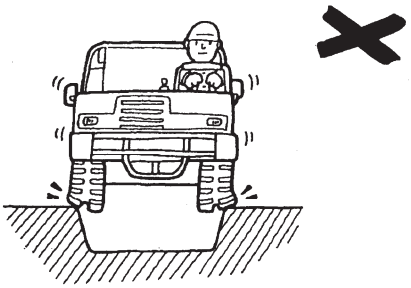
- Move slowly directly up steps.
- While moving up the steps, avoid places where the road surface changes.



CA-C300480

DO NOT TRAVEL OR WORK WHILE SPANNING A DITCH ETC.

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

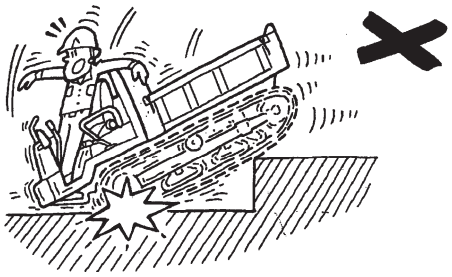


CA-C300490

AVOID LOCATIONS WHERE THE MACHINE MIGHT FALL

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

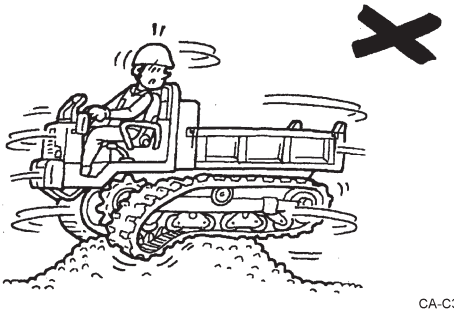
This might damage or break the iron core.



CA-C300500

AVOID TRAVELING OVER LARGE RUTS OR PROTRUSIONS ON THE ROAD

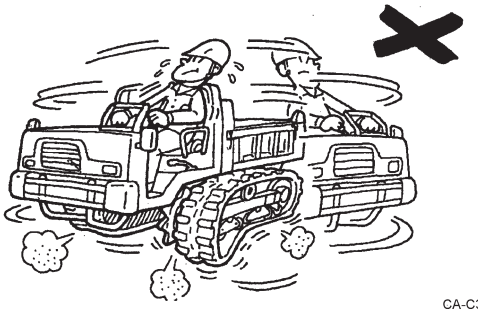
- Travel slowly and take care not to let the crawlers come off the rollers.
- Do not change directions when the crawlers may have lost tension at the high and low parts of ruts and protrusions. This may cause the crawlers to come off.



CA-C300510

AVOID SUDDEN CHANGES IN DIRECTION WHEN STEERING

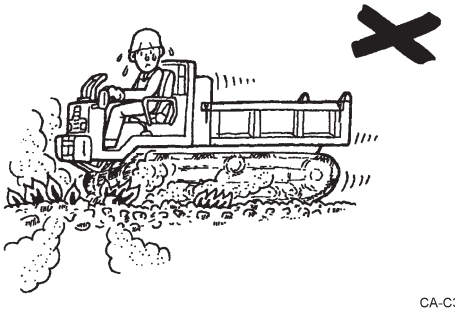
- Make direction changes in several smaller steering movements.
- Avoid sudden changes in direction.
  This causes early wear on the lug and may cause the crawlers to slip off.



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.

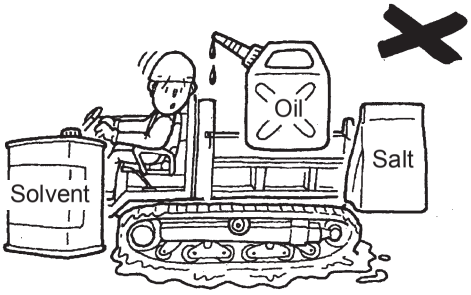


CA-C300530

OTHER ITEMS FOR CAUTION

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

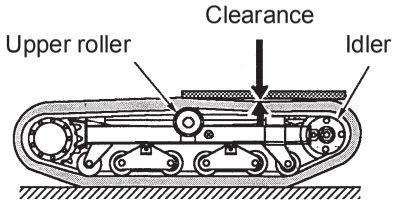
- If fuel, transmission fluid or paint should adhere to the rubber crawlers wipe it away quickly.
- Wash away with water after working in locations with a large salt content. Salt can cause the iron core to rust or peel.



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.

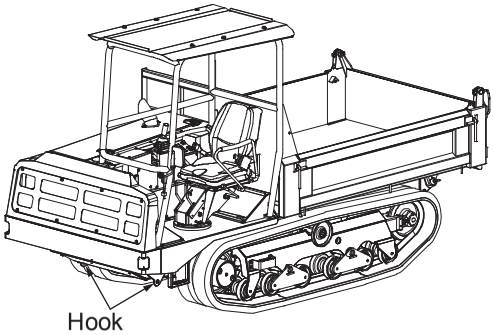


CA-C300550E

TOWING

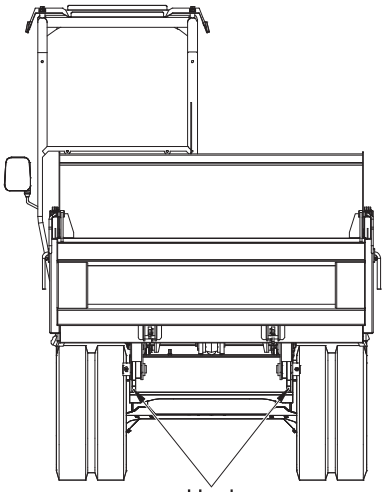
⚠ WARNING

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



Towing the machine

When the machine 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 machine can now be towed.



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 belt from rotating so the machine cannot be towed. Contact our sales and service shop.

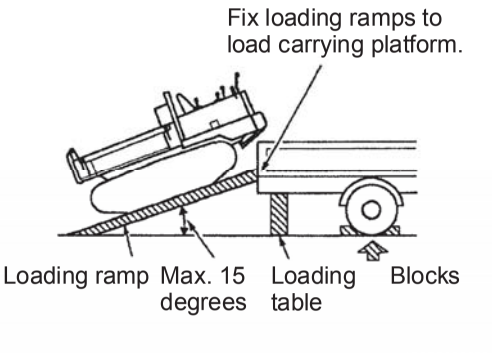
TRANSPORT

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 the low speed mode 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 lading 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.



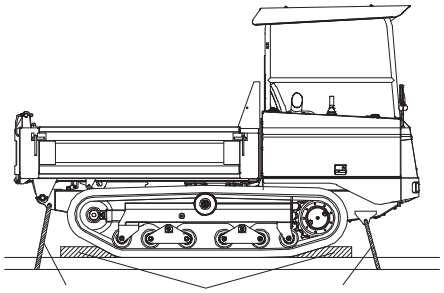
1. Apply the truck brake firmly. Fix the trailer wheels with blocks to prevent them from moving.
2. Adjust the center line of the machine to the center line of the truck. Adjust the loading ramp interval to the crawler width.
3. Maintain the slope of loading ramps within 15 degrees.
4. Drive the machine slowly 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 truck.

Fixation at Transport

⚠ CAUTION

During transportation, the machine may shift and move due to vibration and sway.
Fix it firmly on the load carrying platform of the truck with wheel blocks and wire ropes.

1. Stop the engine and pull out the key of the engine key switch.
2. Apply wheel blocks in front of and behind the crawler and fix the machine.
3. Hook wire on the crawler frame and fix it on the truck platform.



NOTICE

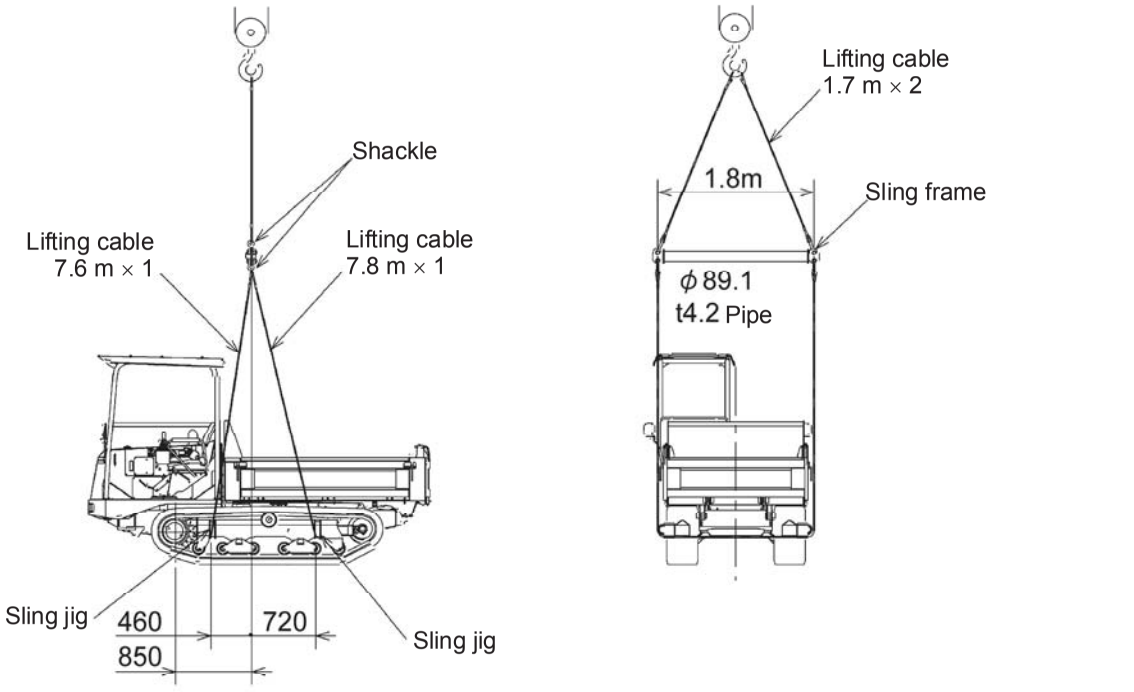
The rubber crawler is damaged if wire is hooked directly on the rubber crawler when fixing the machine.

Apply cushion in front of and behind the crawler frame, respectively and fix the machine on the truck platform.

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.



1. Prepare the wire ropes, shackles, and sling frame having sufficient strength against the lifting load shown in the above figure.
2. Lower the vessel completely and stop the engine.
3. Hook the wire rope on the crawler frame shown in the above figure.
4. Install the wire rope to the sling frame with the shackle.
5. Install the wire rope to the crane hooks and lift upward so the crawler is a little bit above the ground, then stop lifting.
6. Continue carefully lifting the machine if the balance is good.

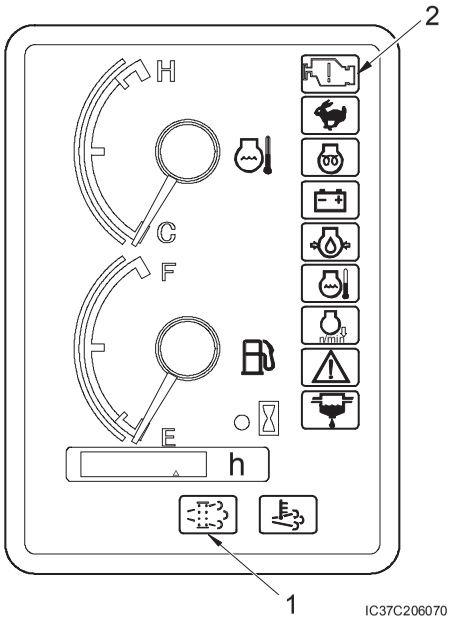
Weight during transportation (kg)
2910

DPF HANDLING

⚠ WARNING

- 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.



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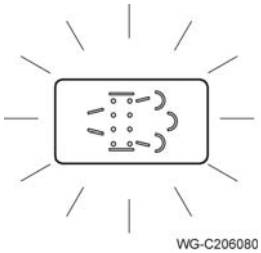
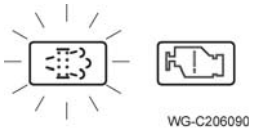
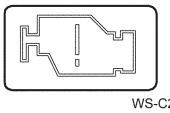
- **When the DPF warning indicator is blinking**
  Perform the manual regenerating at your earliest convenience.
  The engine warning indicator may turn on if you continue your work with the DPF warning indicator still on.


WG-C206080

- **When the DPF warning indicator is blinking and the Engine warning indicator is lit**
  Stop your work and immediately perform the manual regenerating.
  Only the engine warning indicator (2) will be left lit if you still continue your work in this state and manual regeneration becomes impossible to perform.


WG-C206090

- **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 output decreases, or the engine stops.
  The engine becomes impossible to be restarted.
  Contact our sales and service shop.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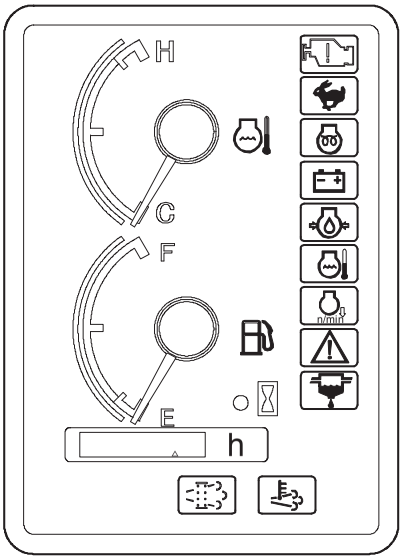
DPF MANUAL REGENERATING

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

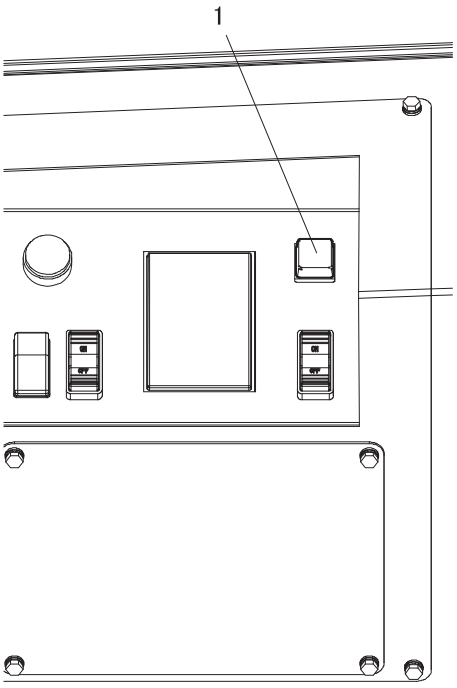


IC37C206060

⚠ WARNING

- 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.
- Never drive the machine and carry out dumping during manual regeneration.

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. Set the gate lock lever at the “Locked position.”
2. When the water temperature is low, perform the warming up operation till the water temperature gauge points around the middle position.
3. Run the engine in the idling mode.
4. Continue pressing the DPF manual regenerating switch (1) till the DPF warning indicator changes from blinking to solid.
   When the regeneration starts, the rotation speed of the engine automatically increases. When the regeneration is finished, the engine returns to the idling state.
5. The manual regenerating is operating when the DPF warning indicator is lit. The period of the manual regenerating is 30 to 40 minutes, becoming longer or shorter depending on the temperature of the manual regenerating and the accumulated amount of soot. The DPF warning indicator turns off when the manual regenerating is completed.



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- **Stopping the manual regenerating halfway**

1. The manual regenerating will stop when the engine is stopped.
2. The regenerating is not completed when the regenerating is stopped halfway. The DPF warning indicator will blink. Perform the manual regenerating again.

NOTICE

- Engine oil
  Use specified oil (API CJ-4) for DPF exclusively.
- Fuel
  Use fuel that conforms with JIS K2204 standard.
- At the time of automatic regenerating
  The noise of engine becomes louder than usual, but it is not a failure.
- Dilution of engine oil
  When a part of the fuel is mixed with the engine oil during the regenerating, and as the result the amount of engine oil in the engine is increased, the quality of the engine oil is degraded. Make sure to change the oil by observing the replacement time.

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, stop the engine, and pull out the key from the engine key switch.
- Put a tag, which indicates that maintenance is being carried out at an easy-to-see position.

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.

Be sure to observe the precautions in particular to prevent accidents during maintenance.
Also refer to Maintenance in the Safety Manual provided separately.

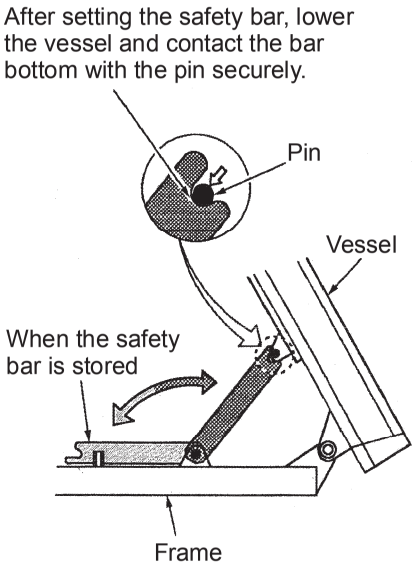
Use the Safety Bar

⚠ DANGER

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

1. Setting the safety bar

(1) Raise the vessel completely.
(2) Raise the safety bar and set it to the bracket under the vessel.
(3) Stop the engine, set the dump lever at the “Lower” position, and lower the vessel by self-weight.
Make sure that the safety bar and vessel support bracket pin have contacted securely.



Setting or storing safety bar

⚠ CAUTION

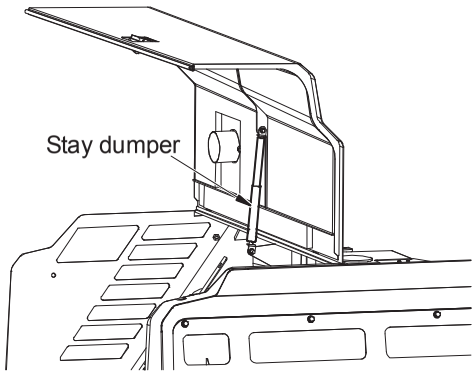
Do not start the engine and lower the vessel while the safety bars are used.
Such an action may cause breakage of the safety bar or vessel.

2. Store the safety bar

(1) Start the engine, set the dump lever at the “Raise” position and raise the vessel completely.
(2) Remove the safety bar from the bracket and store the bar onto the frame.

Use the Stay Dumper

1. When performing maintenance with the engine hood opened, open the engine hood to the stroke end of the stay dumper and place it in the locked state.
2. When closing the engine hood, push the (PRESS) marked section on the stay dumper to unlock the engine hood and close the engine hood.



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PERIODICAL EXCHANGE 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 System

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)	2	
Fuel hose (between fuel main filter and engine)	1	
Fuel hose (between engine and fuel cooler)	1	
Fuel hose (between fuel cooler and T-connector)	1	
Fuel hose (between fuel filter and fuel tank)	3	

Coolant System

Parts to be replaced periodically	Q'ty	Replace interval
Radiator hose (upper)	1	Every 2 years
Radiator hose (lower)	1	
Between radiator and subtank	1	

Hydraulic System

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)	3	

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 ○: Replacement

Inspection and maintenance location		Description of inspection and maintenance	Interval of inspection and maintenance									
			Daily	Every 50 hours	Every 100 hours	Every 150 hours	Every 250 hours	Every 500 hours	Every 1000 hours	Every 1500 hours	Every 2000 hours	Irregular
Pins around vessel		Grease.		○								
Swing 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.							○			
	Line filter	Change cartridge.		First time ○				○				
	Hoses, pipes	Inspect for leaks and damages.	○									
Lubrication system	Engine oil	Inspect oil level and replenish.	△									
		Change engine oil.		First time ○			○					
	Oil filter	Change cartridge.		First time ○			○					
Fuel system	Fuel tank	Check fuel level and replenish.	△									
	Water separator	Inspect and drain.	△									
		Clean and change cartridge.						△				○
	Fuel filter	Change cartridge.					○					

△: Inspection ○: Replacement

Inspection and maintenance location		Description of inspection and maintenance	Interval of inspection and maintenance									
			Daily	Every 50 hours	Every 100 hours	Every 150 hours	Every 250 hours	Every 500 hours	Every 1000 hours	Every 1500 hours	Every 2000 hours	Irregular
Cooling system	Subtank	Inspect coolant level and replenish.	△									
	Radiator	Clean.							△			
		Change coolant.							○ or annually			
	Radiator oil cooler fin	Change cartridge.					△					
	Fan belt	Inspect tension and adjust.		First time △	△							
		Inspect for cracks.		First time △	△							○
Air intake and exhaust system	Air cleaner	Inspect dust indicator.	△									
		Clean and change element.		First time △	△							
		Change element.						○				
Hoses	Fuel hoses Radiator hoses Hydraulic hoses	Check for leaks and replace.	△								○ or biennially	
Engine and others	Intake valve head and exhaust valve head	Adjust clearance.	● Every 800 h									
	Fuel injector	Check, clean, and check operation.	● Every 3000 h									
	EGR cooler	Check.								●		
	Engine oil separator	Replace element.								●		
	PCV valve	Check.								●		
	Turbo charger	Check.	● Every 3000 h									
	DPF	Clean.	● Every 3000 h									
Electrical system	Battery	Inspect battery fluid and replenish.		△								
		Clean terminals.						△				
	Fuses	Change.										○
	Fusible link	Change.										○

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

USE FUEL AND OIL ACCORDING TO THE TEMPERATURE

Fuel and oil

Use fuel and oil properly according to the temperature as listed in the following table.

Coolant

When the temperature becomes 0°C or lower, see the “Cooling system” column to adjust the condensation of antifreeze.

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	SAE30 SAE10W SAE40 * SAE10W-30	H: 7.6 L L: 5.8 L
Hydraulic oil tank	Hydraulic oil	Abrasion-resistant	* ISO-VG46 ISO-VG32	Whole system: 54 L Tank level: 40 L
Travel reduction gear	Gear oil	API GL-4	* SAE90	0.9 L
Fuel tank	Light oil	JIS K2204	* JIS No. 2 JIS No. 3 JIS special No. 3	71 L
Cooling system	Coolant	LLC	Long-life coolant (LLC) 50% added	Engine: 3.7 L Total q’ty: 10.0 L

At the time of factory shipment, the oil marked with an asterisk (*) is used.

LUBRICATE THE GREASE

Refill the grease nipples with grease using a grease gun.

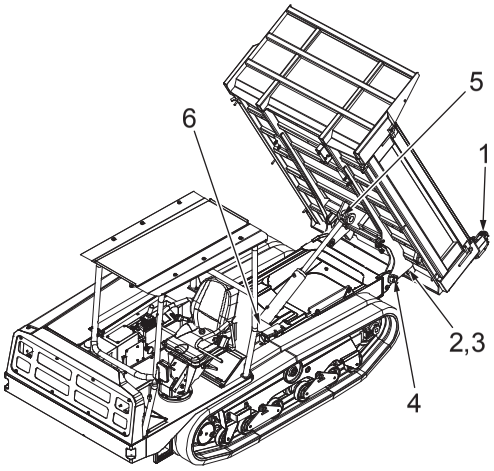
Remove oozed old grease after refilling.

Vessel Related Pins

⚠ WARNING

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

- 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) 1 position
- Dump cylinder foot pins (6) 1 position



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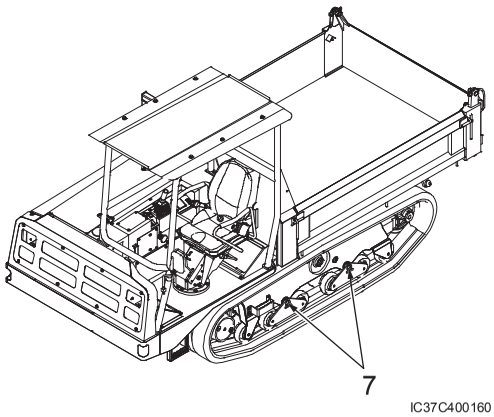
Swing Link

- Swing link pins (7) 4 positions

NOTICE

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



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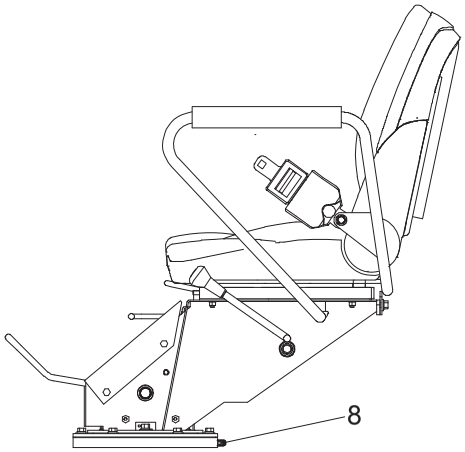
Turntable of Operator Seat

- Turntable flange (8) 1 position



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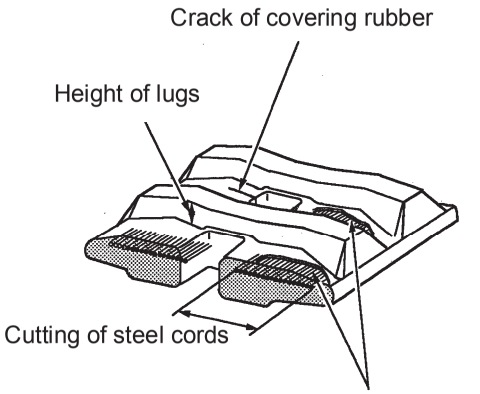
RUBBER CRAWLER

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.



CJ-C400061E

- **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.

Check and Adjust Tension of Rubber Crawler

The progress of wear and looseness of the rubber crawler varies depending on the work site conditions.

Check and adjust the tension of the rubber crawler as needed since using the loose rubber crawler causes the crawler to come off.

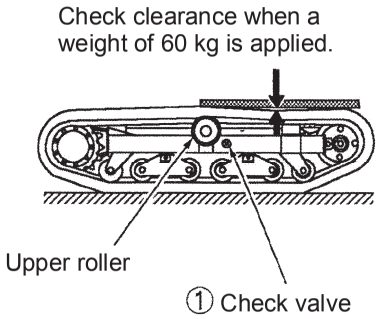
1. Checking tension of the rubber crawlers

(1) Place the machine on a flat and rigid ground.

(2) Raise the vessel completely.

Put a timber of approximately 1.5 m long on the crawler above the idler and upper roller and check the clearance between the timber and the crawler when a person (of 60 kg in weight) gets on the center of crawler between the idler and upper roller.

The standard clearance is 10 to 20 mm.



2. Adjustment

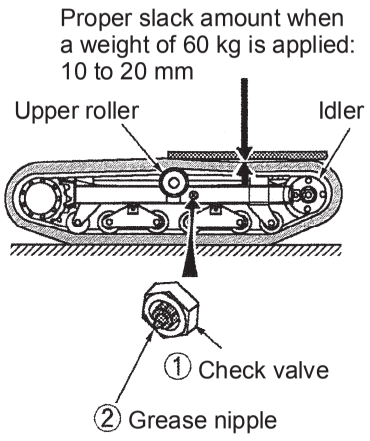
⚠ WARNING

- 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.
- When the crawler shoe is not loosened by taking the step described here, ask our sales service dealer for repair.

Tensioning the rubber crawlers

(1) Fill grease through the grease nipple (2) of the check valve (1) 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.

Loosening the rubber crawlers

(1) Remove dirt and soil from around the idle tumblers.

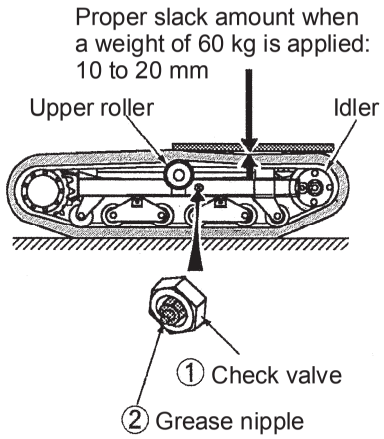
(2) Loosen the check valve (1) until grease is discharged (by a maximum of one turn) little by little. Do not loosen it when grease is discharged.

(3) Rotate the rubber crawlers forward and backward slightly if grease is hardly discharged.

(4) Tighten the check valve (1) when the slack in the rubber crawlers becomes proper.

NOTICE
Tighten the check valve (1) at a torque of 59 to 69 N·m (6 to 7 kgf·m). Be careful not to over-tighten the check valve.

(5) After rotating the rubber crawlers forward and backward, check the tension of the rubber crawlers and re-adjust it if necessary.

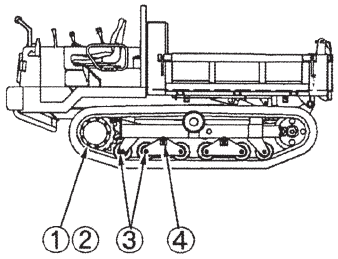


CHECK THE FIXED BOLT TORQUE

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 passed. 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 the bolts and nuts at these positions have been replaced, be sure to apply molybdenum disulfide grease to the screws and the bearing surface of nuts and tighten them at the specified torque.



Traveling-rated

No.	Special tightening	Thread size	Wrench size (mm)	Tightening torque	
				(N·m)	(kgf-m)
1	Travel reduction gear	M14	22	157	16.0
2	Drive sprocket	M14	22	157	16.0
3	Lower roller	M16	24	245	25.0
4	Oscillating link	M20	30	476	48.5

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	206	21.0	220	22.4
M20	30	412	42.0	450	45.9
M24	36	715	72.9	813	82.9

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

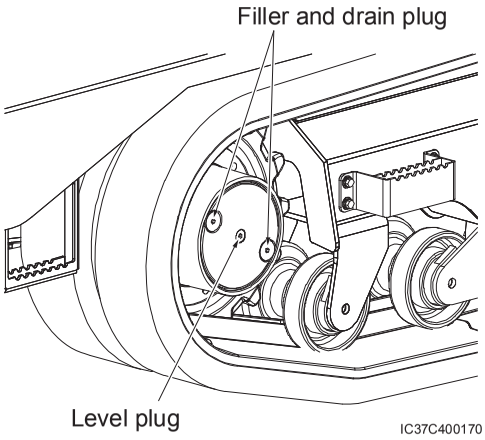
Check the Travel Reduction Gear Oil Level and Refill

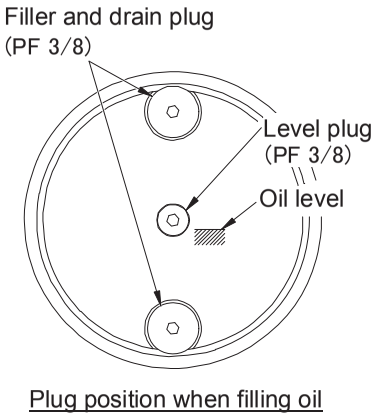
> **⚠ CAUTION**
>
> Immediately after traveling, the gear case, oil, etc. are hot. Start work after they have cooled down.

1. Set the filler and drain plug and level plug at the positions shown in the right figure.
2. Put the oil receiving container under the level plug.
3. Use the hexagon wrench to remove the level plug. If the oil level is near the bottom of the plug hole, it is proper.
4. Refill oil through the filler and drain plug if oil is insufficient.

Specified oil	Gear oil API GL-4 grade, SAE90

5. Wind the seal tape around the level plug and filler and drain plug and attach them.



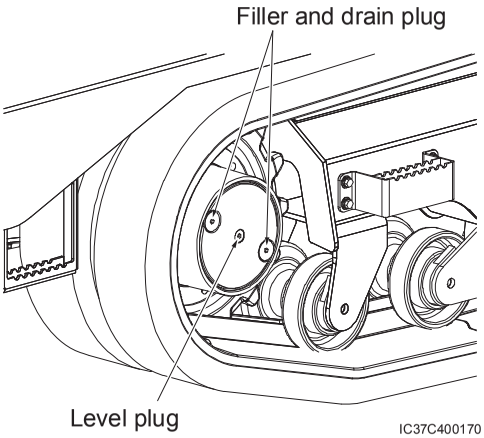


Plug position when filling oil

Replace the Travel Reduction Gear Oil

⚠ CAUTION

The gear case, oil, etc. are hot immediately after traveling is stopped.
Start work after they have cooled down.



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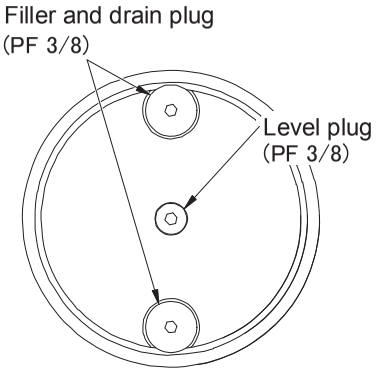
1. Set the filler and drain plug at the lowest position as shown in the right figure.
2. Put the oil receiving container that can accommodate oil of 1.0 L or more under the filler and drain plug.
3. Use the hexagon wrench to remove the level plug and filler and drain plug and discharge oil.
4. Travel to rotate the reduction gear and set it at the plug positions when filling oil shown in the right figure.
5. Fill the specified quantity of oil through the filler and drain plug hole.

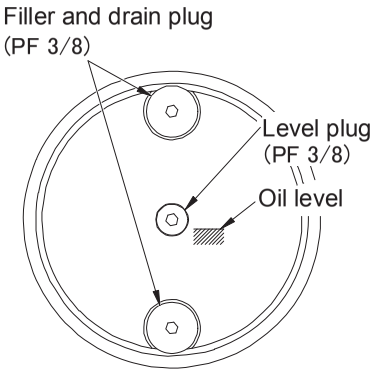
Specified oil	Gear oil API GL-4 grade, SAE90
Capacity	0.9 L



Plug position when draining oil

IC37C400020

6. Wind the seal tape around the level plug and attach it when oil is discharged from the level plug hole.



Plug position when filling oil

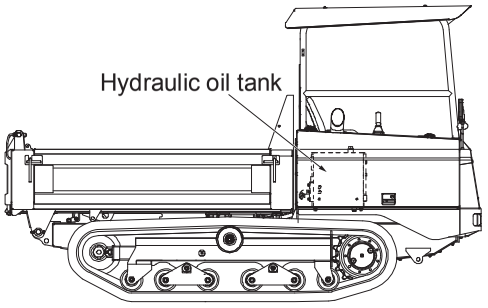
IC37C400010

HYDRAULIC SYSTEM

Check the Hydraulic Oil Level

⚠ CAUTION

1. Do not travel when the hydraulic oil level is L level or less.
2. If oil has been filled at H level or more, loosen the drain plug and discharge excess oil.

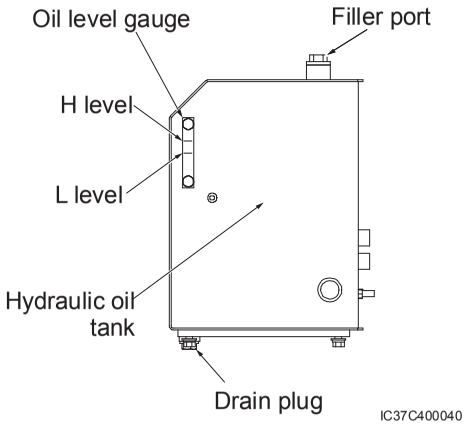


Posture for checking the hydraulic oil level IC37C400030

1. Place the machine on a horizontal position, lower the vessel completely, and stop the engine.

2. Check the oil level gauge. 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)



IC37C400040

3. If the oil level is below the L level, refill hydraulic oil through the filler port. (For the brand, see Page 4-6.)

Replace the Hydraulic Oil and Clean the Strainer

⚠ CAUTION

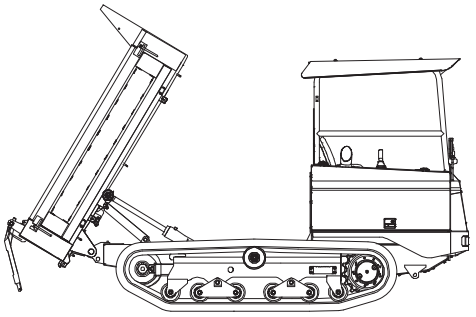
- Oil is hot immediately after operation. Touching oil may cause burns. Start work after the oil has cooled down.
- Be sure to discharge internal pressure air of the hydraulic oil tank and then start work.

1. Stop the engine.
2. Loosen the filler plug of the hydraulic oil tank to relieve the internal pressure of the tank.
3. Put the oil receiving container under the drain plug at the bottom of the hydraulic oil tank, and remove the drain plug to discharge residual oil.
   Tighten the drain plug after discharging oil.
   When removing the drain plug, be careful not to splash oil on you.
4. Remove the bolt and take out the strainer cover.
5. Drop dust and foreign materials adhering to the strainer, and clean and attach the strainer.
6. Secure the strainer cover with the bolt.
7. Fill the tank with the specified quantity of hydraulic oil through the filling port.
   Make sure that the oil lever is between H and L of the level gauge.

Oil to be used	Capacity
Abrasion-resistant hydraulic oil VG-46	Total quantity of oil: 54 L Quantity of level oil: 40 L

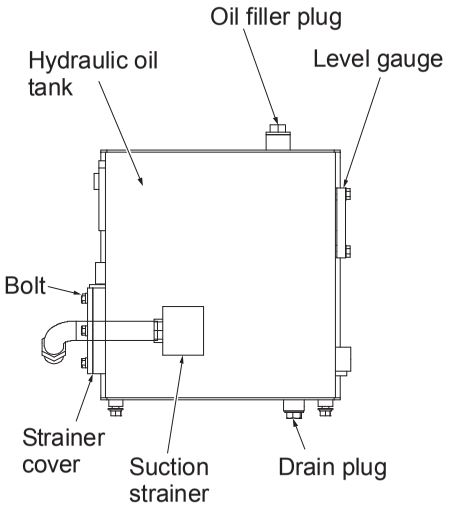
(For hydraulic oil No., see Page 4-6.)

8. Attach the filler plug.
9. Start the engine, perform no-load operation for about 5 minutes, perform traveling and move the dump cylinder slowly several times. Then, bring the machine into the posture for checking the hydraulic oil level, and stop the engine.
10. Make sure that the hydraulic oil level is within the proper range. Refill hydraulic oil if it is insufficient.

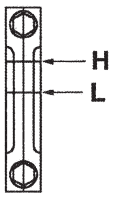


Posture for replacing the hydraulic oil

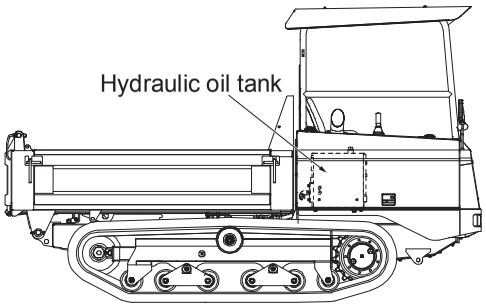
IC37C402800



IC37C400060



Level gauge



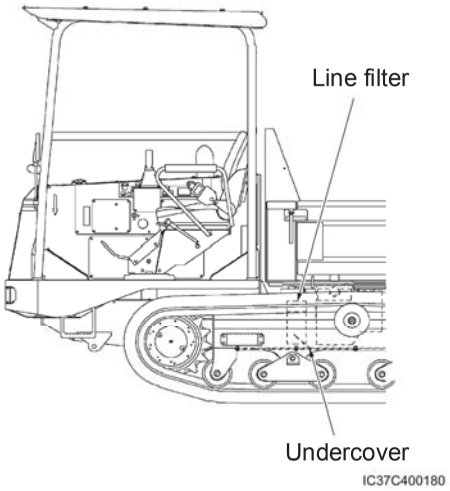
Posture for checking the hydraulic oil level

IC37C400030

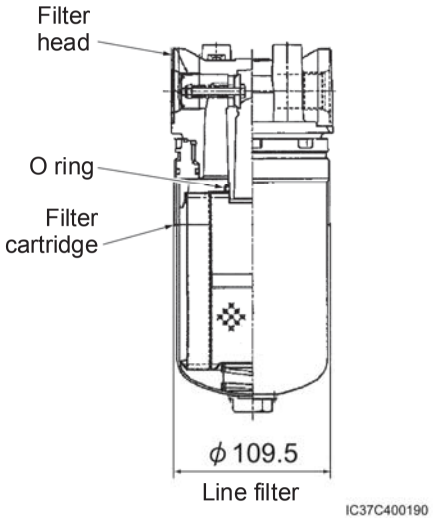
Replace the Line Filter Element

⚠ CAUTION

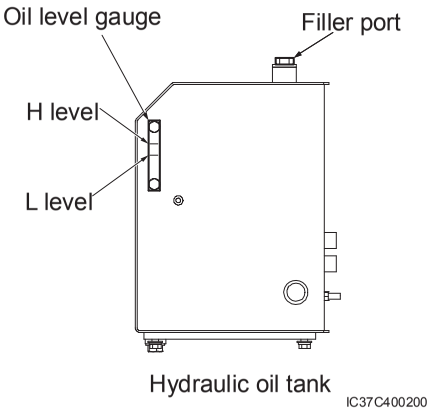
- Oil is hot immediately after operation. Start work after oil has cooled down.
- The hydraulic oil tank is air pressurized. Removing the filter as is causes oil to be spouted, which is dangerous.
  Stop the engine, remove the filler plug, and relieve the internal pressure. Then, replace the filter.



1. Stop the engine.
2. Remove the filler plug of the hydraulic oil tank to discharge the air of the tank.
3. Take out the undercover at the bottom of the line filter, and use the filter wrench to remove the filter cartridge.
4. Clean the filter mounting part of the filter head.
5. Apply clean hydraulic oil to the O ring of a new filter cartridge.
6. Attach the new filter cartridge, and use the filter wrench to tighten it. Tighten the filter cartridge until the O ring is crushed and the cartridge top surface contacts the head.
7. Start the engine, and make sure that there is no oil leak from the mounting part of the filter cartridge.
8. Check the level of the hydraulic oil tank.
   The oil level is proper if the oil level is between H and L of the level gauge with the vessel lowered completely.
   Refill hydraulic oil when it is insufficient.



☆ At the first time, replace the line filter cartridge 50 hours.



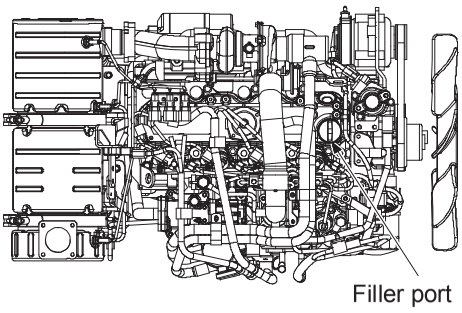
ENGINE OIL SYSTEM

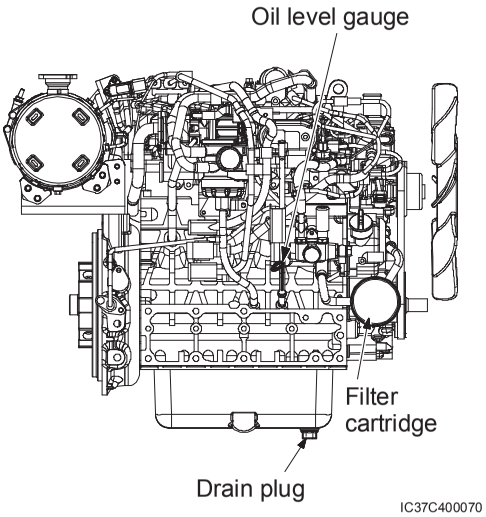
Check the Engine Oil Level and Refill

1. Pull out the oil level gauge, clean it with cloth, insert it fully again, and pull it out slowly.

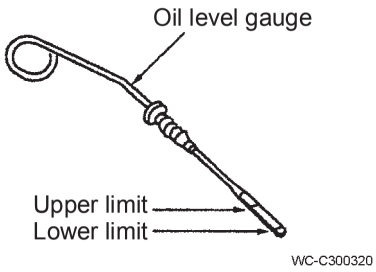
2. The oil level is proper if it is between the marks of the upper and lower limits.
   Refill the engine with engine oil through the filler port if the oil level is below the lower limit.

3. Discharge excess oil through the drain port if the oil level is over the upper limit. Check the oil level again.





NOTICE
• Make the machine horizontal before checking the oil level. • Check the oil level 10 minutes or more after stopping the engine, if the engine has started. • Do not start the engine if the oil level exceeds the upper limit or below the lower limit.



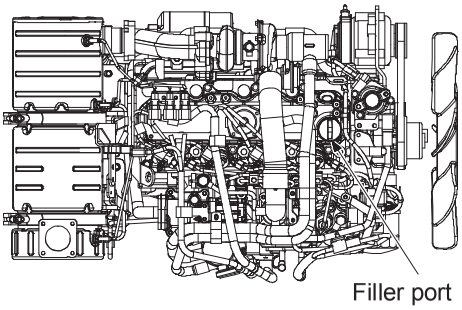
Replace the Engine Oil and Engine Oil Filter Cartridge

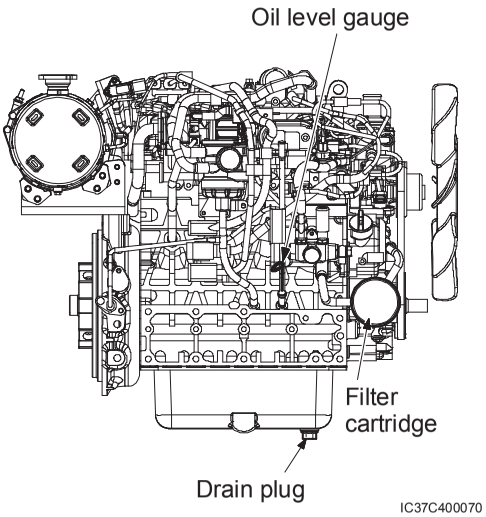
⚠ CAUTION

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

Discharge engine oil

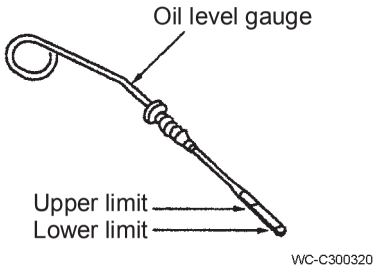
1. Stop the engine.
2. Put the drain oil receiver just under the drain plug of the engine.
3. Clean the periphery of the oil filler cap to prevent foreign matters from entering, and remove the oil filler cap.
4. Remove the drain plug slowly so that oil will not splash on you, and discharge oil.
5. Check drain oil. Contact our sales service dealer if it contains much metallic powder, foreign matters, etc.





Replace the filter cartridge

1. Use the filter wrench to turn the filter cartridge counterclockwise and remove it.
2. Wipe off dirt and dust from the cartridge mounting part.
3. Apply engine oil thinly to the gasket surface of a new filter cartridge.
4. Screw the filter cartridge by hand until the gasket contacts with the seal surface. Then, use the filter wrench to tighten the filter cartridge by about 3/4 turn from this condition.



Fill the engine oil

1. Attach the drain plug.
2. Fill engine oil through the filling port up to a point between the H and L levels of the level gauge.
3. Keep the engine idling for several minutes, then stop the engine. Check the engine oil level 10 to 20 minutes later, and fill the engine oil up to the specified level.

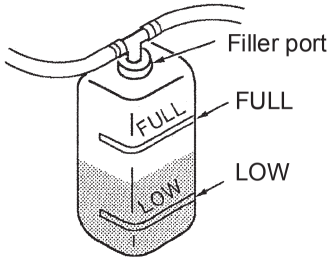
COOLING SYSTEM

Check the Coolant Level and Refill

⚠ WARNING

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

1. Open the engine 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.



Subtank level

NOTICE

1. Use a mixture of Long-Life-Coolant (LLC) and tap water for the coolant.
2. For the mixing ratio, see “Change the Coolant” in MAINTENANCE below.

Change the Coolant

⚠ CAUTION

- 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. Engine coolant

- A new machine is filled with coolant containing Long-Life-Coolant (LLC). This coolant has effects of preventing freezing and corrosion.
  It effects for long and may be used all over the year.
- Change coolant every year (in autumn every year).
- Use LLC when changing coolant.

⚠ WARNING

- The Long-Life-Coolant is toxic.
- If someone should swallow 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.

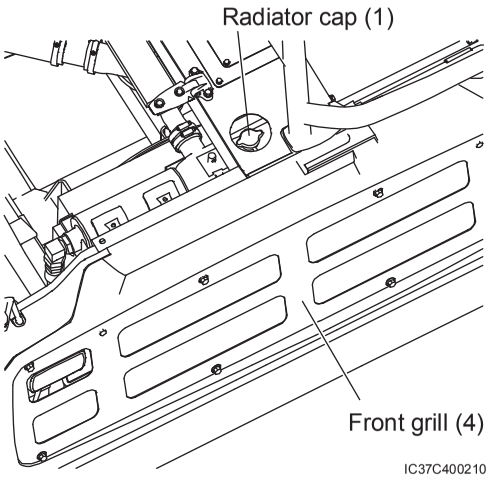
2. Mixing Ratio of Long-Life-Coolant

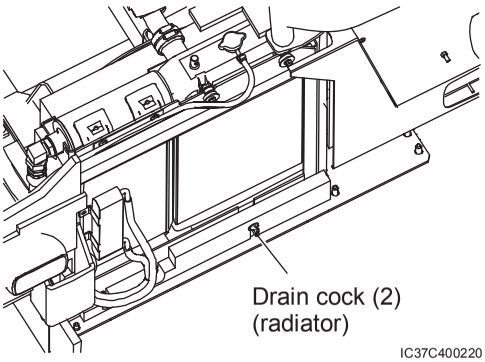
The mixing ratio of Long-Life-Coolant with water determines the freezing point.
This machine is shipped with the mixing ratio of Long-Life-Coolant set at 50% in order to maintain effects of preventing corrosion of the cooling system regardless of the external temperature.
Set the mixing ratio of Long-Life-Coolant at 50% in all areas all over the year.
Use “tap water” for the water to be mixed.

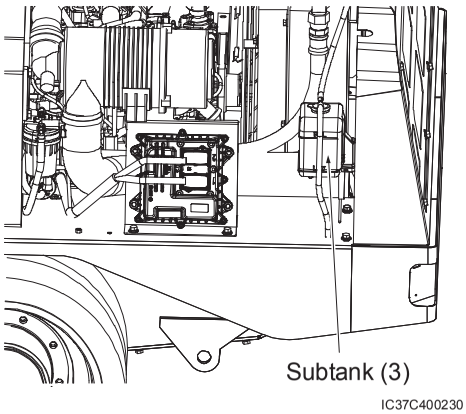
Lowest ambient temperature (ºC)		-35
Mixing ratio (%)		50
Mixing q’ty (L)	Quantity of LLC (L)	5.0
	Quantity of water (L)	5.0
Coolant total amount: 10.0 L		Engine: 3.7 L Radiator and others: 5.5 L Reserve tank: 0.8 L

3. Replace the coolant

1. Stop the engine
2. Remove the radiator cap (1).
3. Remove the front grill (4) and loosen the drain cock (2) at the bottom of the radiator to discharge coolant.
4. Close the drain cock (2), fill tap water and cleaner (radiator cleaner), and run the engine in slightly higher idling than low idling state for about 10 minutes.
5. Stop the engine and loosen the drain cock (2) to discharge water.
6. After discharging water, pour tap water and clean the radiator till the discharged water becomes clean.
7. Close the drain cock and fill coolant with tap water and LLC mixed up to the opening of the filler port.
8. Run the engine in low idling state for 5 minutes and then stop the engine.
   The internal air is discharged and the coolant level lowers. Refill coolant up to near the filling port and close the cap.
9. Discharge coolant in the subtank (3) and clean the inside of the tank. Fill coolant up to the FULL mark.







Clean the Inside of the Radiator

Clean the inside of the cooling system in the following cases.

- Clean the inside of the radiator according to the periodic inspection table.
- Clean the inside of the radiator when replacing coolant.

Check the Fan Belt

⚠ WARNING

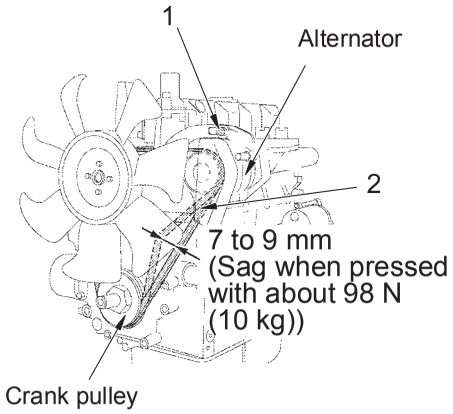
- The engine is hot immediately after stopping it. You may get burnt if you touch the engine. Wait until each part cools down.
- Stop the engine and keep the key of the starter switch in safe.

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 crank pulley and alternator pulley at approximately 98 N (10 kg). The belt tension is proper if the belt slacks by approximately 7 to 9 mm.



WG-C305170

2) Replace the belt if the belt has cracks.

2. Adjustment

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

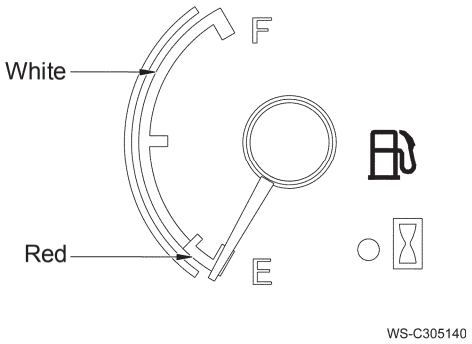
2) Turn the adjust bolt to move the alternator so that the belt slackens by approximately 7 to 9 mm by a pushing force of about 98 N (10 kg).

3) Tighten the bolts.

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

FUEL SYSTEM

Check the Fuel Level



WS-C305140

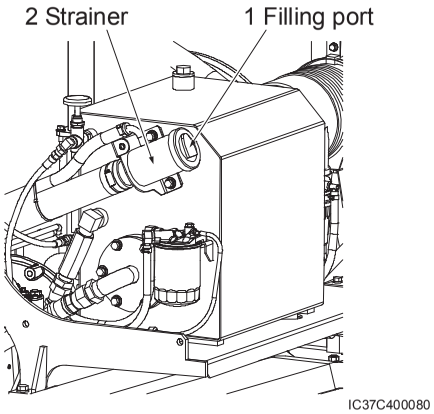
⚠ CAUTION

1. Overflowed or spilt fuel may cause a fire. Wipe it off completely if it overflows or spills.
2. Removing the strainer (2) to refill fuel may cause engine troubles. Do not remove it.

1. Turn the engine key switch to the ON position and check the quantity of remaining fuel.
   Fuel tank capacity: 71 L

2. Refill the tank with fuel from the filling port (1) if the quantity of remaining fuel is insufficient.

3. Close the cap and lock the key after refilling.

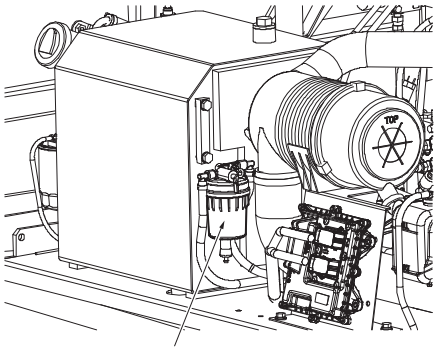


IC37C400080

Check the Water Separator

⚠ CAUTION

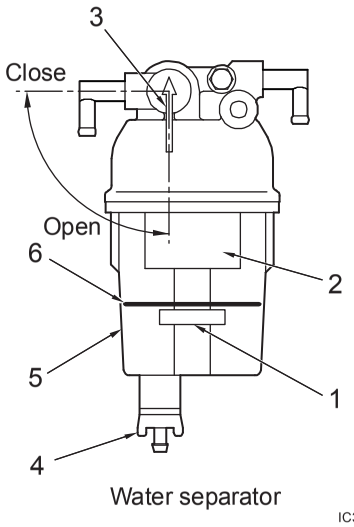
- Start work after the parts of the engine have cooled down.
- Keep away from fire.
- Spilt fuel causes fire. Wipe it off sufficiently.



IC37C400240

When the water separator float (1) is floating, the water separator contains water up to below the float.
Discharge water before float (1) reaches the specified line (6).

1. Stop the engine.
2. Turn the lever (3) until it stops at the Close position, and cut off the fuel.
3. Open the drain plug (4) to discharge water and dirt into the container.
4. Remove the cup (5) and take out the float (1) in the cup.
5. Discharge water and sediment into the container.
6. Clean the element (2) and the inside of cup with new fuel oil. Replace the element if it is damaged or broken.
7. Attach the element and O ring to the body.
   Replace the O ring if it is broken.
8. Place the float in the cup.
9. Turn the cup and attach it to the body. Over-tightening causes breakage. Be sure to turn the cup by hand.
10. Turn the lever (3) until it stops at the Open position.
11. Discharge the air from the water separator.
    Turn the key of the engine key switch to the Run position (ON) and keep it at that position for about 20 seconds. The automatic air reliever discharges air automatically, and the engine can be started.



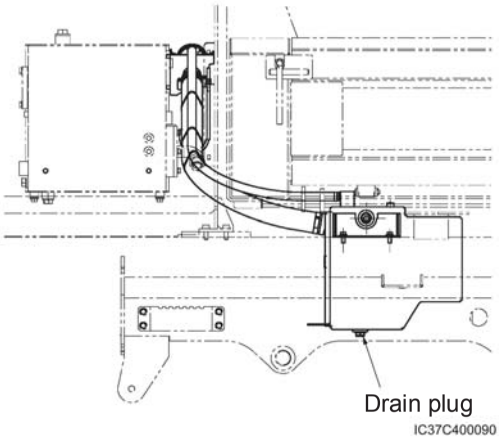
Water separator

IC37C305180

Drain the Fuel Tank

1. Loosen the drain plug at the bottom of the fuel tank to discharge water and sediment before starting work.

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



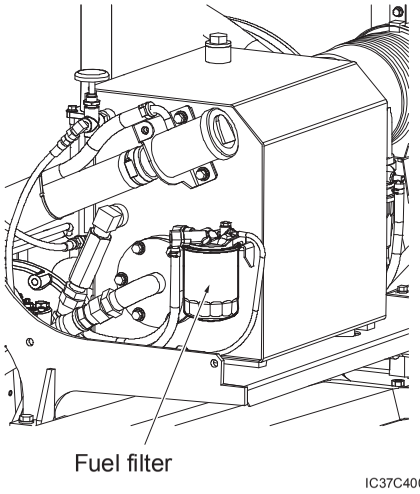
Replace Fuel Filter

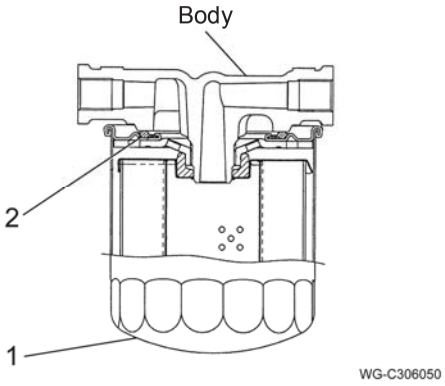
1. Turn the filter (1) counterclockwise with the filter wrench to detach it.

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 approximately 20 seconds. 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. It may cause a fire.

Check and Clean the Fuel Injector and Check the Operation

⚠ WARNING

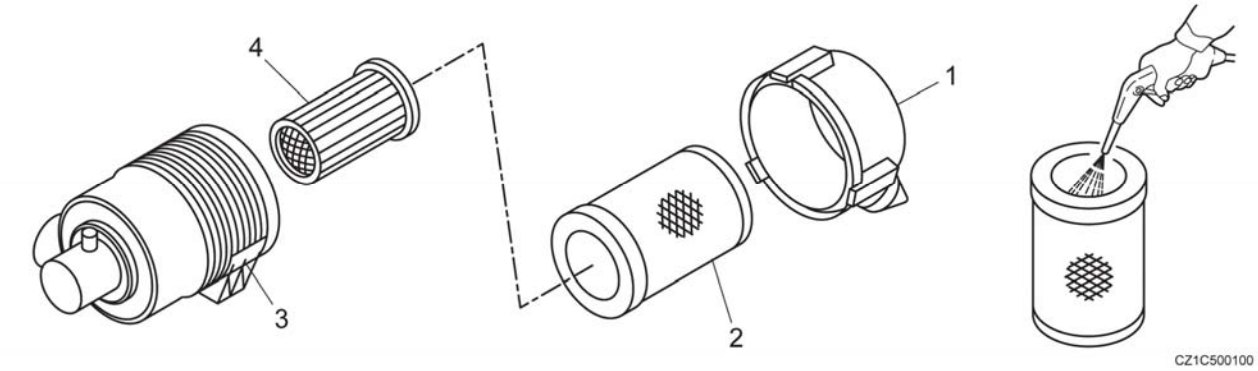
- Prevent high-pressure sprayed fuel such as leaking from broken fuel injection pipe adhering to your skin. High-pressure sprayed fuel intrudes your skin to cause inflammation. Consult a doctor immediately if fuel adheres to your skin.
- Do not check fuel for leak by hand. Be sure to use a piece of wood or cardboard. Ask our sales service dealer to repair the damaged position.

The fuel injector must be operated normally to optimize the fuel injection state so that the engine performance can be sufficiently delivered. Contact our sales service dealer about the work related to this.

INTAKE SYSTEM

Inspect and Clean Air Cleaner Element

When the air cleaner clogging warning lamp is lit on the display, it indicates the element becomes 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 the element with the arrow mark (↑) upward, 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 slap, 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.

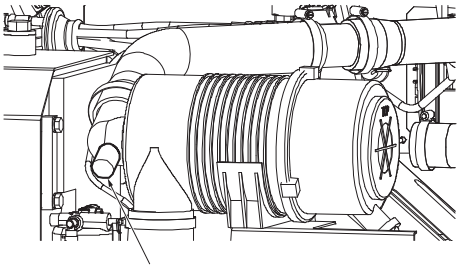
⚠ CAUTION

- Be sure to stop the engine when carrying out maintenance of the air cleaner.
  If it is carried out while the engine is running, dust is sucked and the engine may be damaged.
- Put on protective goggles when cleaning the element using compressed air.
  Otherwise, dust may be put in your eyes, which is dangerous.

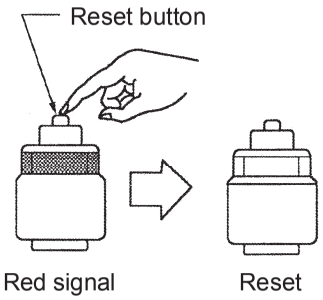
Check the Dust Indicator

1. Check if the signal of the dust indicator on the suction pipe of the air cleaner is red.

2. Clean or replace the element immediately if the red signal appears.
   For how to carry out maintenance of the element, see Pages 4-30 and 4-31.



3. Push the reset button of the dust indicator to return the red signal to its original state after cleaning or replacing the element.



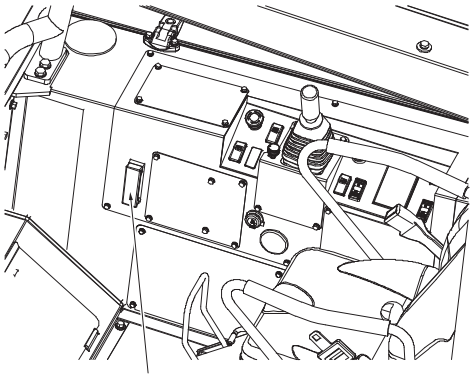
Adjust the Valve Clearance

The valve clearance must be adjusted according to correct procedure to correctly maintain the open/close timing of the intake and exhaust valves. Otherwise, the noise of the engine increases, the performance is deteriorated, and the engine is damaged. Contact our sales service dealer about how to adjust the valve clearance.

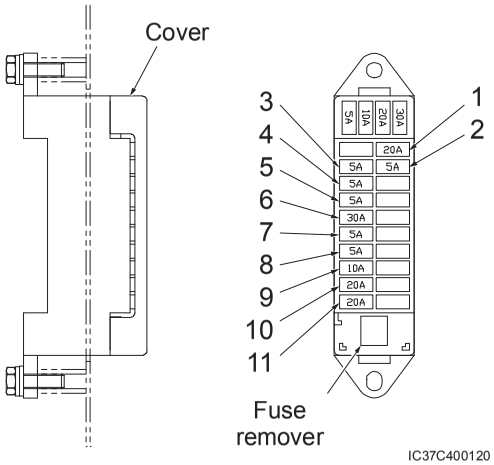
ELECTRIC SYSTEM

Change the Fuses

NOTICE
• Before changing fuses, be sure to always set the engine key switch 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.



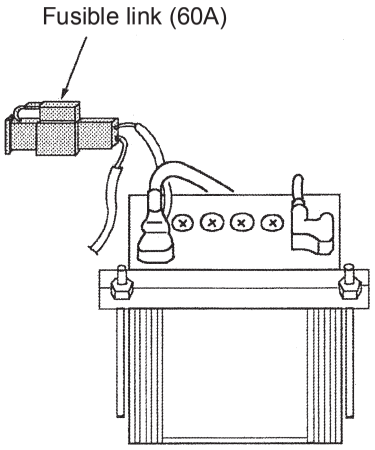
1. Set the engine key switch to the OFF position.
2. Take off the fuse cover.
3. Replace the blown fuse with a new fuse of the same capacity using the fuse remover set in the fuse box.



	Fuse capacity (A)	Circuit name
1	20 A	Accesory
2	5 A	EGR valve
3	5 A	OK monitor
4	5 A	Emergency engine stop switch
5	5 A	OK monitor backup
6	30 A	ECU power, CPU power, fuel pump
7	5 A	Neutral start relay
8	5 A	Forward/backward switching solenoid, lever lock switch, DPF parking relay
9	10 A	12V power outlet
10	20 A	Engine speed select solenoid, parking solenoid
11	20 A	Backup power supply

Change the Fusible Link

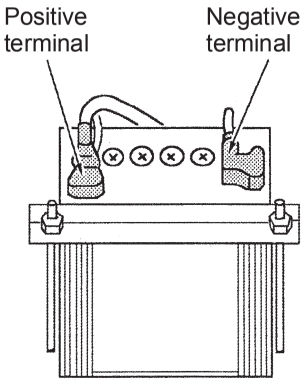
If power is not turned on even though the engine key switch is set to the ON position, the fusible link (60 A) between the battery and the engine key switch circuit may have blown out. Detach and check the fusible link. Replace it with a new fusible link, if it has blown out.



Cleaning the Battery Terminals

NOTICE
• 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. Remove the terminal cover.
2. 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.)
3. Detach the terminals and polish them with a wire brush or sandpaper if they are corroded remarkably.
4. Apply grease, etc. thinly to the terminals after cleaning and tightening.
5. Attach the terminal cover.



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 tot start the engine.
Use fuel (diesel fuel) appropriate for the temperature.
Freezing temperature of diesel fuel (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. A mark at a temperature on the label stuck behind the radiator shows the freezing point.
If the lowest temperature may be lower than it, refer to the antifreeze mixing ratio table and adjust the concentration.
Exchange Long-Life-Coolant every two years (in autumn every other year).

IC37C400260

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

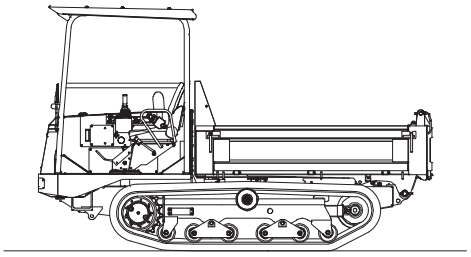
In cold seasons, larger discharge current flows when starting the engine and the battery performance is also reduced. If the battery is almost discharged, battery liquid may be frozen. Recharge the battery almost fully and keep it warm to start the engine free from troubles next morning.

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

NOTICE
Lower the vessel down to the lowest position while storing in order to protect the cylinder rod from rust as shown on the right.



Position for long term storage IC37C400130

Before Storage

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.
5. Add antifreeze to coolant when the temperature becomes below 0°C.
   Refer to the explanation of “Change the Coolant” in MAINTENANCE to adjust the concentration.
   Usually, Long-Life-Coolant is added at the time of factory shipment.

During Storage

⚠ CAUTION
If you have to operate the machine indoors to prevent rust, keep good ventilation and avoid gas poisoning by opening windows or doors.

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, be sure to crank the engine with the starter and make sure that the engine oil pressure warning lamp goes out.
3. Warm up the engine at low speed. Increase the engine speed after the water temperature reaches the proper temperature.

After Storage

Lubricate or grease every necessary part, check the coolant level and refill coolant if necessary, before using the machine after long-term storage.

TROUBLE SHOOTING

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.	• Damage or disconnection of electric wires.	• Repair or replace parts.*
	• Defect of solenoid valve for speed selection	• Repair or replace parts.*
Machine curves during travel.	• Catching debris	• Remove debris
	• Unequal tension of right and left	• Adjust tension of right and left to regular value.
Machine does not travel smoothly.	• Catching stone and debris	• Remove debris.
	• 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 machine and engine.
Regarding parts not listed in this parts list, please contact our service dealer.
When ordering any of the parts listed below, please notify the model, serial number, part name and quantity.

Consumable Parts List * Make sure to use genuine parts.

Part Name	Part No.	Quantity/Unit	Remarks
Fuel filter cartridge	HH1J0-43172	1	KUBOTA
Water separator cartridge	RD451-51940	1	KUBOTA
Engine oil filter cartridge	HH164-32430	1	KUBOTA
Air cleaner element	074527203	1	
Hydraulic oil line filter element	075914701	1	
Fuse 5A	0830 107 12	6	
Fuse 10A	0830 107 06	1	
Fuse 20A	0830 107 08	3	
Fuse 30A	0830 107 10	1	
Fusible link 60A	0830 106 00	2	
Headlight	0854 010 29	2	
Headlight bulb	0853 012 67	2	
Turn signal lamp	0854 520 UA	2	
Turn signal lamp bulb	-	2	12 V 23 W
Turn signal lamp lens	0854 520 03	2	

SPECIFICATIONS

MAIN SPECIFICATIONS

SPEED AND GRADEABILITY

Travel speed (low/high)	10.0/6.3 km/h
Gradeability	36% (20 degrees)

ENGINE

Engine model	Kubota V2403-CR-TE4B-CRIH-1
Type	Vertical in-line, water cooled, 4-cycle diesel engine
No. of cyl. - bore x stroke	4-ϕ87 mm $\times$ 102.4 mm
Displacement	2.434 L
Max. rated output (SAE J1349)	46.1 kW $\pm$ 5%/2700 min^{-1}
Max. torque (SAE J1349)	193.4 kW $\pm$ 5%/1600 min^{-1}

MASS

Machine mass (kg)		2910
Base machinery mass (kg)		3700
Average ground bearing pressure	Empty	25.9 kPa
	Loaded	59.6 kPa

CAPACITY

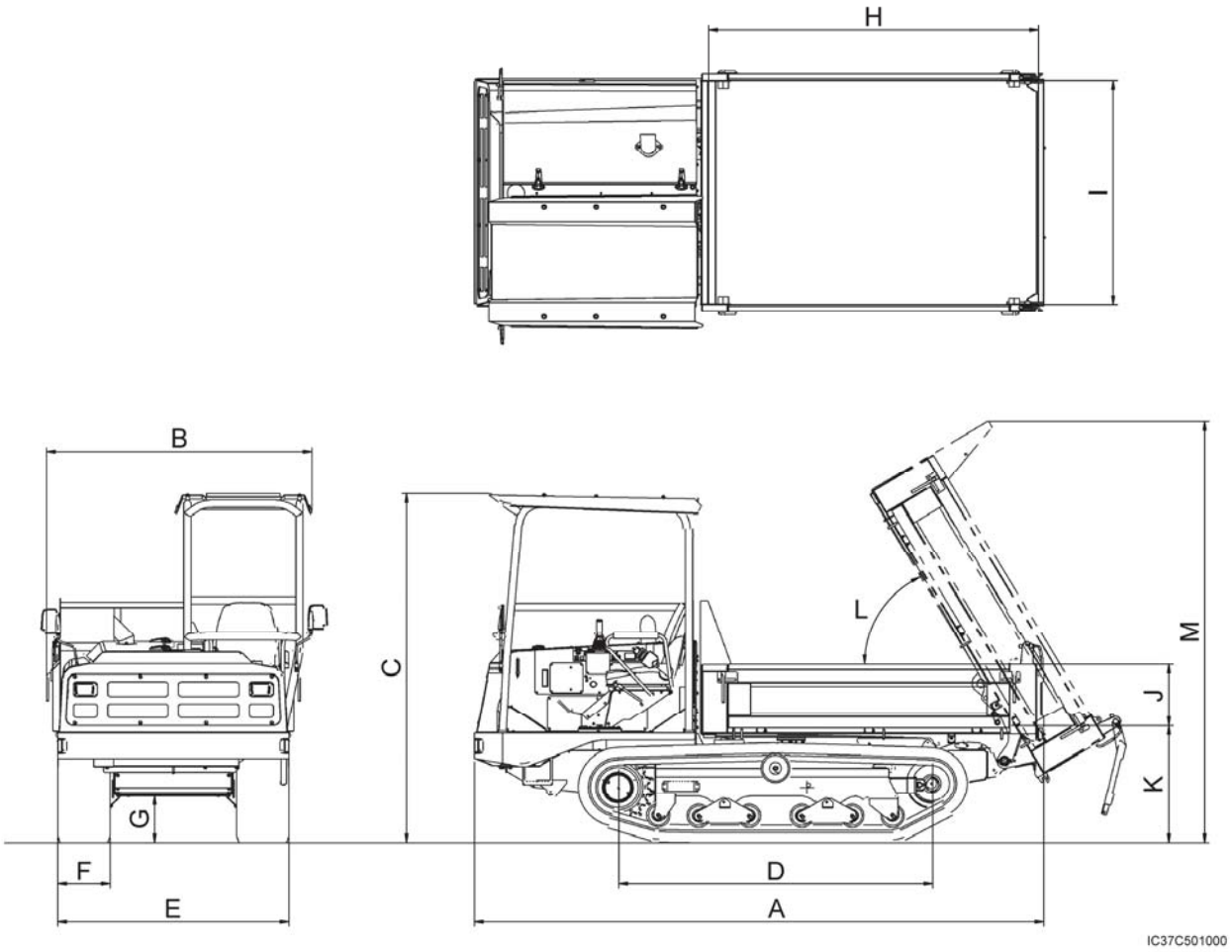
Vessel capacity	Fully loaded	2.0 m^3
	Flat loaded	1.4 m^3

Fuel		71 L
Hydraulic oil	Tank level	40 L
	Total quantity	54 L
Engine oil	Maximum	7.6 L
	Minimum	5.8 L
Coolant	Engine only	3.7 L
	Total quantity	10 L

TRAVEL DRIVE

Travel drive system	HST
Shifting system	2-speed travel motor
Number of shift stages	2 (Standard: L, high speed: H)
Brake system	HST brake + parking brake
HST setting pressure	34.5 MPa

SPECIFICATIONS AND DIMENSIONS



			STD
A	Overall length	mm	3820
B	Overall width	mm	1780
C	Overall height	mm	2370
D	Tumbler center distance	mm	2100
E	Overall crawler width	mm	1550
F	Crawler width	mm	350
G	Minimum height from ground	mm	320
H	Vessel length	mm	2200
I	Inner vessel width	mm	1520
J	Vessel height	mm	420
K	Vessel floor height from ground	mm	790
L	Maximum dumping angle	degree	60
M	Maximum height in dumping	mm	2860

KATO