

KATO

INSTRUCTION MANUAL

Applicable serial No. : IC100-5 : CB005500

CRAWLER CARRIER

IC100-5

⚠ WARNING

- Be sure to read and understand this manual fully before operating or servicing this product.
Serious accidents including fatal accidents may occur if you perform operation or service without understanding the contents of this manual.
- Store this manual on the machine so that all persons who work on the machine can read it at any time. Check its contents periodically and repeatedly.
- Consult our distributor if you need a manual in another language.

0988571EN-00

背厚 7.5 mm (中)

KATO

IC100-5

INSTRUCTION MANUAL 0988571EN-00

1. Introduction (01E0-0001-1E)

Thank you for choosing KATO.

Correct operation and handling of this machine is essential for maximum safety and performance and will help to improve working efficiency and work rate.

We have prepared this manual to help you to do just that. Do not start using this machine before you have read this manual thoroughly and understood its contents.

WARNING

(1) Using this machine

The country in which you are using this machine may require alterations to its specifications or to the safety devices fitted.

Be sure to investigate the standards and regulations in the country concerned before you start to use the machine.

If alteration is required before you can use the machine, you should use it according to the standards and regulations.

(2) Modifications

If you modify the machine from the state in which it left our factory, you may impair its safety or performance.

(3) Optional parts and attachments

Refer to the instruction manuals provided when you install genuine optional parts.

Attachments not designated by KATO may impair safety or performance. They may cause tip-over accidents or have an adverse effect on the lifespan of the machine.

KATO bears no responsibility for accidents or malfunctions which arise as a result of the fitting of unauthorised attachments.

(T0988566-160-0E)

2. Designated operations for this machine (T0988566-001-0E)

Use this machine for the following main type of work.

- Transporting

3. How to use this manual (T0988552-079-0E)

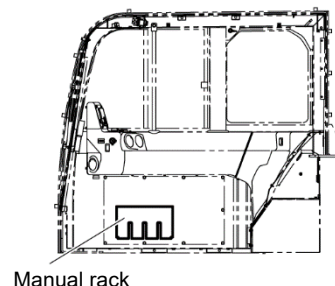
- You must read this manual fully and understand its contents before you operate, inspect or service this machine.

This manual is intended to be a guide to safe operation and regular servicing, so it should be kept in the manual rack on the foot of the operation cab available to all those who use the machine.

- The sections in this manual and safety signs on this machine include safety information.

The labels " ⚠ DANGER", " ⚠ WARNING" and " ⚠ CAUTION" are used in this manual and safety signs on this machine so that you can understand the important items for safety operations and procedures fully.

Read them fully and understand them before you operate, inspect or service this machine.



10988566-001-0E



DANGER

Indicates warnings concerning direct risks of serious injury or death.

(01E0-0005-0E)



WARNING

Indicates warnings concerning potential risks of serious injury or death.

(01E0-0006-0E)



CAUTION

Indicates warnings concerning potential risks of injury or major damage to the machine.

(01E0-0007-0E)

- If this manual is lost or seriously damaged, order a replacement immediately from your authorised KATO dealer.
- When the user changes through resale or other circumstances, the instruction manuals must be transferred together with the machine.
- This manual has been written as a standard for general handling in specified operations.

It is not intended to cover its handling under special conditions and unusual circumstances. Before attempting any operations not covered by this manual or when you are unsure of any aspect of its contents, contact your authorised KATO dealer.

- We are unable to predict every hazard which may accompany traveling, operation, inspection and servicing in any kind of environment.

Therefore the danger, warning and other safety labels which appear in this manual and on the machine itself do not cover every eventuality.

If you travel, operate, inspect or service this machine in ways not covered in this manual, you are fully responsible for all safety considerations.

If you have any questions about traveling, operation, inspection and servicing, or if any points are unclear, contact your authorised KATO dealer.

- The illustrations in this manual are intended to attract attention and supplement the main text. They do not give a full and detailed account of the content of the text.

- Any operations which do not conform to the contents of this manual are at the operator's own risk and responsibility. KATO will bear no responsibility for any accident or damage which occurs as a result.
- If you intend to use the machine in operations or conditions other than those designated, consult your authorised KATO dealer.
- In addition to the contents of this manual, further safety information and requirements are to be found on the safety signs on the machine and are contained in laws, regulations, ordinances, insurance conditions and other sources. You must also adhere to these conditions.
Further observe the safety regulations and laws of the country where the machine is used.
- Please also refer to the separate engine instruction manuals.

4. Inspection and servicing (T218081-208-0E)

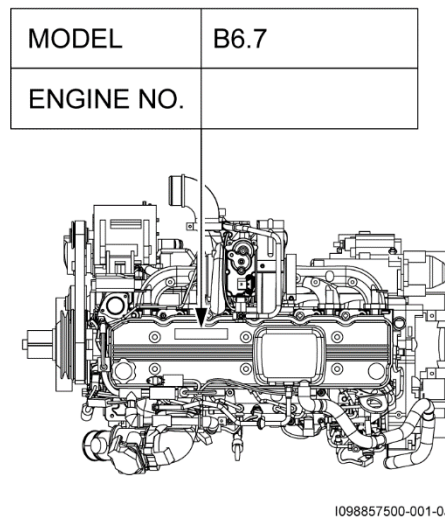
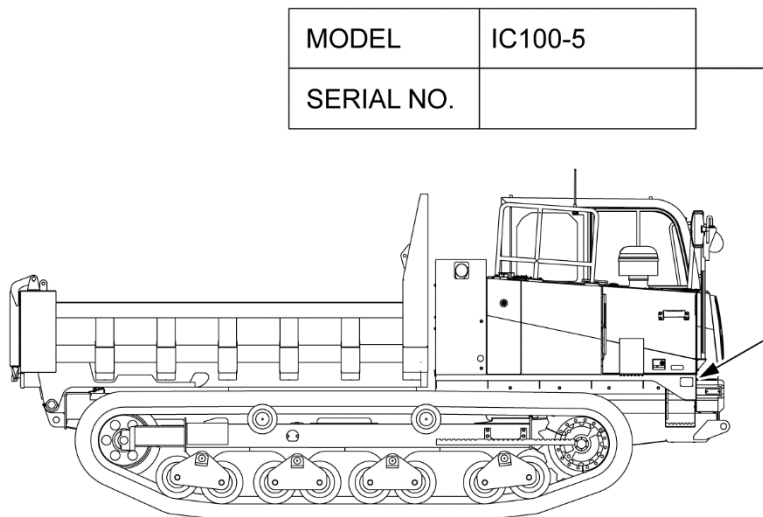
The inspection and servicing operations listed in this manual are a guide for extending the lifespan of the machine, improving its work rate and running it safely. Carry out the regular inspection and servicing tasks on the basis of this manual and regulations of the country where the machine is used without fail.

This manual details the procedures for preoperational, monthly and yearly inspection and servicing. Record the results of each inspection and servicing measures taken in the "Inspection Sheet".

Refer to the separate "Service Manual" for servicing procedures for breakdowns and disassembly.

5. Product identification number and engine serial number (01E0-0009-1E)

The product identification number and engine serial number will assist in smooth administrative processing of orders for parts and servicing from your authorised KATO dealer, so please provide these numbers when ordering.



6. Operation qualifications (T0988566-161-0E)

WARNING

- Indicates warnings concerning potential risks of serious injury or death.
- You must not operate without these qualifications.

(01E0-0012-0E)

7. Safety parts for periodic replacement (T0988566-003-0E)

For the long-term safe operation of the machine, we ask you to inspect and service it regularly. However it is difficult to evaluate the lifespan of parts by external visual inspection, so certain important parts such as the parts related to a fire should be replaced at set intervals regardless of their apparent condition. If inspection and servicing reveals any abnormality whatever in these parts, replace them even before their regulation time.

Ask your authorised KATO dealer to carry out the replacement of these safety parts.

Fuel system

Periodic replacement parts	Quantity	Replacement interval
Fuel hose (Fuel tank - Fuel pre-filter)	1	Every 2 years
Fuel hose (Fuel pre-filter - Electromagnetic fuel pump)	1	
Fuel hose (Electromagnetic fuel pump - Fuel filter)	1	
Fuel hose (Fuel filter - Engine)	1	
Fuel hose (Engine - Fuel cooler)	1	
Fuel hose (Fuel cooler - Fuel tank)	1	

(T0988575-001-0E)

Hydraulic system

Periodic replacement parts	Quantity	Replacement interval
Hydraulic hose (Pump - Right-side travel motor / Main line)	2	Every 2 years
Hydraulic hose (Pump - Left-side travel motor / Main line)	2	
Hydraulic hose (Pump - C/V - Dump cylinder - Stop valve)	5	
Hydraulic hose (Right-side travel motor - Left-side travel motor)	1	
Oil remote hose	2	

(T0988566-072-0E)

You must also inspect hydraulic hoses and fuel hoses during the following regular inspections.

Inspection interval	Inspection item
Preoperational inspection	Oil leakage from the joints and caulked sections of fuel or hydraulic hoses
Monthly inspection	- Oil leakage from the joints and caulked sections of fuel or hydraulic hoses - Damage to fuel or hydraulic hoses (cracks, wear, tearing)
Yearly inspection	- Oil leakage from the joints and caulked sections of fuel or hydraulic hoses - Interference, collapse, deterioration, twisting, damage (cracks, wear, tearing) to fuel or hydraulic hoses

(01E0-0018-0E)



CAUTION

1. Replace O-rings, gaskets etc. at the same time as you replace hoses.
2. If you find deformation or cracking of hose clamps when you inspect or replace hoses, you should also replace the affected clamps.

(01E0-0019-0E)

8. Specifications (08E0-0003-0E)

8-1-1 IC100-5 (T0988566-004-0E)



8-2 General data (T218971-004-0E)

8-2-1 IC100-5 (T0988566-005-0E)

Model	IC100-5
Specification	Boat-shaped rear-opening vessel
Machine weight	10,000 kg
Bucket capacity	11,570 kg

■Engine

Model	Cummins B6.7
Applicable regulation	EPA Tier 4 Final Non-road emission standards
Rated output	191 kW/2,000 min ⁻¹ (maximum engine speed, with the engine installed to the machine)
Max torque	N·m (kgf·m)/rpm: 1,288/1,500
Post-treatment device	DPF (Diesel Particulate Filter) SCR (Selective Catalytic Reduction)

■Key dimensions

Overall length (as shipped)	6,810 mm
Overall height (as shipped)	2,690 mm
Overall width	2,540 mm
Minimum ground clearance	580 mm
Crawler width	2,490 mm
Crawler length	4,630 mm
Shoe width	700 mm

■Traveling performance

Traveling speed	8.0/12.0 km/h (Low/High)
Grade ability	70%
Ground pressure	27.9 kPa (0.29 kgf/cm ²) non load 52.1 kPa (0.53 kgf/cm ²) maximum load

■Hydraulic system

Hydraulic pump	Variable capacity plunger (travel 2), Gear (vessel 1)
Set pressure	Travel: 40.0 MPa, Vessel: 17.2 MPa
Discharge volume	Travel: 232 L/min, Vessel: 37.3 L/min
Traveling motor	Variable capacity plunger

■Tank

Hydraulic oil tank	130 L
Fuel tank	312 L
DEF tank	46.3 L

■Battery

Starting motor	24 V - 7.8 kW
Battery	12 V - 120 Ah × 2
Generator	24 V - 70 A

(Note) Units are displayed in the international unit system (SI). The values in parentheses () are reference values displayed in conventional units (non-SI units).

I0988575-025-0E

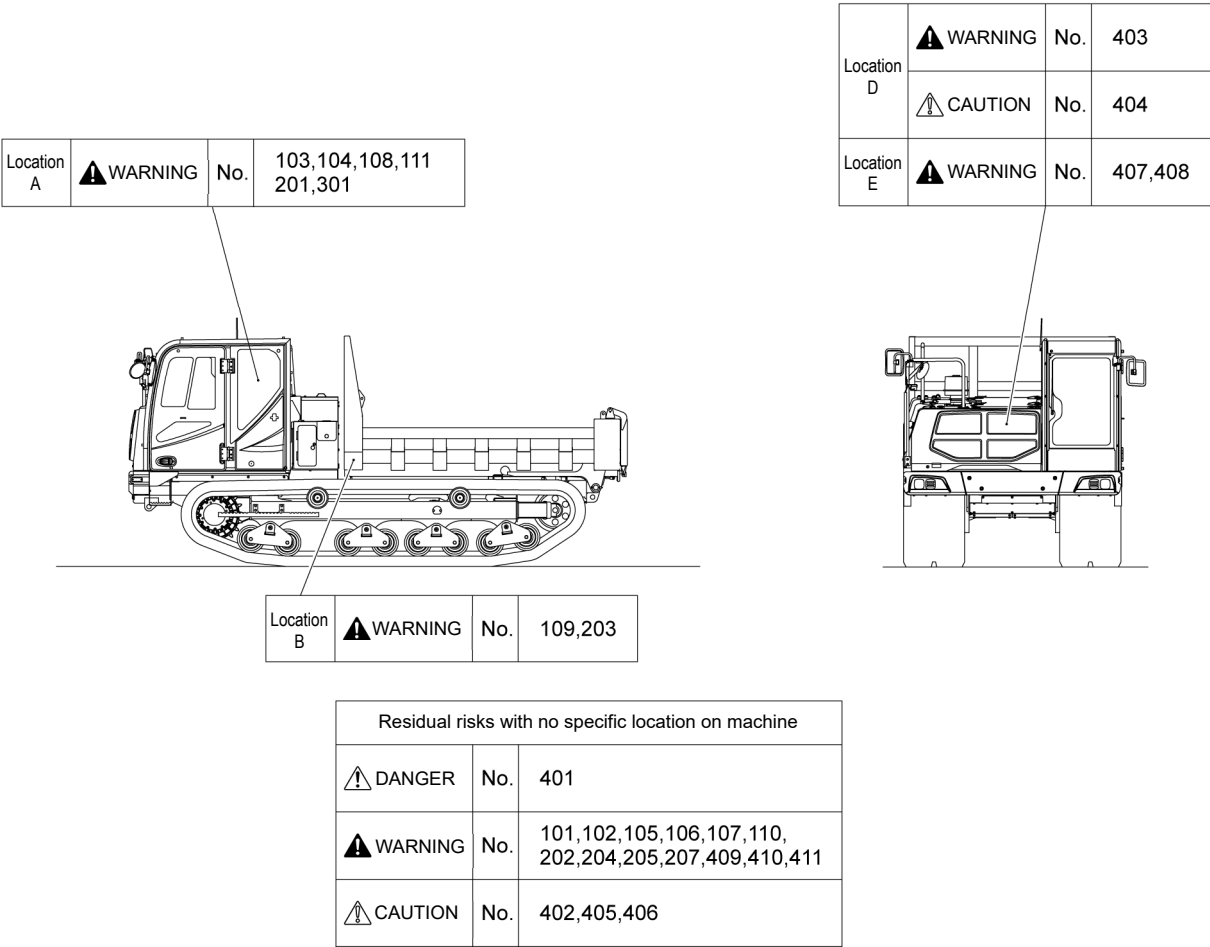
9. Residual risk map where protective measures required by machine users

(T218081-006-0E)

The symbols and numbers for the locations shown in the figure are the same as the symbols and numbers in the "Residual Risk Table". For details on specific residual risks, see the "Residual Risk Table". The definitions for ⚠DANGER, ⚠WARNING, and ⚠CAUTION are based on the information in "Using This Manual".

9-1 IC100-5

(T0988566-006-0E)



10988566-006-0E

9. Residual risk map where protective measures required by machine users

Residual Risk Table *DANGER, WARNING, and CAUTION are defined on page 2 of this manual.

No.	Applicable stage	Work	Required qualifications for work	Location on machine	Residual risk	Hazard description	Protective measures implemented by machine user	Page in instruction manual
101	Before work	Pre-operation inspection and maintenance	Skill training course for operation of crawler carrier	No specific location	WARNING	Incorrect operation or maintenance could lead to a serious injury, death, or other accident.	(1) Be sure to always read the instruction manual before starting operation and work.	P1
102	Before work	Pre-operation inspection and maintenance	Skill training course for operation of crawler carrier	No specific location	WARNING	Failing to follow the instructions and warning required for safe operation could lead to a serious injury, death, or other accident.	(1) Be sure to always check the safety signs before starting operation and work.	P1 P12
103	Before work	Pre-operation inspection and maintenance	Skill training course for operation of crawler carrier	A	WARNING	Entanglement in engine rotating parts or an out-of-control machine could lead to a serious injury, death, or other accident.	(1) Do not start the engine when a warning tag is attached indicating that inspection or maintenance is in progress.	P8 P16
104	Before work	Inspection of area around operator seat	Skill training course for operation of crawler carrier	A	WARNING	The machine could run out of control, leading to a serious injury, death, or other accident.	(1) Do not place objects in the area around the footspace and pedals. (2) Remove any mud, oil, and snow from the bottom of the shoes before entering the operator's cabin. Carefully wipe off any mud, oil, or snow on the floorboards, levers, handrails, and other locations.	P2
105	Before work	Inspection before starting work	Skill training course for operation of crawler carrier	No specific location	WARNING	The user could fail to notice a problem in the machine, leading to a serious injury, death, or other accident.	(1) Be sure to fully conduct the inspection before starting work, and immediately take corrective action if any problems are found.	P2 P45
106	Before work	Getting in and out of the machine	Skill training course for operation of crawler carrier	No specific location	WARNING	A serious accident could occur if the user falls from an elevated location.	(1) Do not jump onto or jump off the machine. (2) When getting in and out of the machine, support your body in three or more locations, such as by using the handrail, step, and crawler shoe.	P18
107	Before work	Before operation	Skill training course for operation of crawler carrier	No specific location	WARNING	Incorrect operation could lead to a serious accident.	(1) Inspect the device activation states and operation of the bucket, arm, boom, travel, and rotation.	P45
108	Before work	Before operation	Skill training course for operation of crawler carrier	A	WARNING	Incorrect operation could lead to a serious accident.	(1) Check that machine movement from the lever follows the operation pattern in the displayed plate.	P48
109	Before work	Before operation	Skill training course for operation of crawler carrier	B	WARNING	The fall of vessel could lead to a serious accident.	(1) Place a safety bar when the vessel is raised fully.	P9 P50
110	Before work	Before operation	Skill training course for operation of crawler carrier	No specific location	WARNING	Electrical shock from electrical wires could lead to a serious injury, death, or other accident.	(1) Keep the machine at a safe distance from electrical wires. (2) When performing work near electrical wires, do not allow people to come near the machine.	P15
111	Before work	Engine starting	Skill training course for operation of crawler carrier	A	WARNING	Entanglement in engine rotating parts or an out-of-control machine could lead to a serious injury, death, or other accident.	(1) Check that no objects are blocking the area inside or around the machine and that no people are around. (2) Check that warning tags, such as "Operation Prohibited" or "Under Maintenance", are attached. (3) Always operate while sitting in the operator seat. (4) Check that the levers, pedals, and other controls are in the proper operation positions. (5) Check that the safety lock lever is in the lock position. (6) Before starting operation, sound the horn to signal and warn those in the area.	P10 P15
201	During work	General operation	Skill training course for operation of crawler carrier	A	WARNING	The user could be thrown from the operator seat, leading to a serious injury, death, or other accident.	(1) During operation, sit in the operator seat and always wear a seat belt.	P4 P16
202	During work	General operation	Skill training course for operation of crawler carrier	No specific location	WARNING	Contact or entanglement with the machine could lead to a serious injury, death, or other accident.	(1) Do not go near the machine. (2) Always pay careful attention to your surroundings while doing your work.	P1
204	During work	Traveling	Skill training course for operation of crawler carrier	No specific location	WARNING	Tipping over or side slipping of the machine could lead to a serious injury, death, or other accident.	(1) Do not perform sudden operations (sudden starts, sudden stops, or switching levers back and forth). (2) Travel at low speed. (3) Do not get on or off so that the machine tilts too far to the right or left direction.	P4 P5
205	During work	Traveling on slopes	Skill training course for operation of crawler carrier	No specific location	WARNING	Tipping over or side slipping of the machine could lead to a serious injury, death, or other accident.	(1) Travel straight along the slope at low speed. (2) Do not travel on slopes where boards or iron plates without anti-slip traction are laid. (3) On sloping surfaces, do not change direction or travel by cutting across the area.	P49

9. Residual risk map where protective measures required by machine users

No.	Applicable stage	Work	Required qualifications for work	Location on machine	Residual risk	Hazard description	Protective measures implemented by machine user	Page in instruction manual
206	During work	Operating	Skill training course for operation of crawler carrier	No specific location	WARNING	Travelling up and down	Read the instruction manual. Select the 1st gear and travel straight. Do not meander.	P59
207	During work	Operating	Skill training course for operation of crawler carrier	No specific location	WARNING	Travelling up and down	Take care not to overrun.	P60
301	After work	Parking	Skill training course for operation of crawler carrier	A	WARNING	Unintended operation of the machine could lead to a serious injury, death, or other accident.	(1) When leaving the operator seat, stop at a flat, stable location. (2) Lower the vessel fully. (3) Set the safety lock lever to the lock position. (4) Stop the engine, and remove the starter key. (5) Use all keys to lock so that no one other than authorized users can operate the machine.	P57
402	Inspection and maintenance	General maintenance	None in particular	No specific location	CAUTION	Touching hot locations of the machine could result in a burn.	(1) The engine, exhaust pipes, radiator, hydraulic oil tank, hydraulic piping, and other parts can become extremely hot. Check that these parts have cooled down before starting maintenance.	P86 P95
403	Inspection and maintenance	General maintenance (Engine)	None in particular	D	WARNING	Entanglement in fans, belts, and other engine rotating parts could lead to a serious injury, death, or other accident.	(1) Always stop the engine before starting work. (2) Display warning tags in easily visible locations indicating that inspection and maintenance are in progress. (3) The worker holds onto the starter key.	P82
404	Inspection and maintenance	General maintenance (Radiator)	None in particular	D	CAUTION	Heated cooling water could spray out, resulting in a burn.	(1) Wait until the cooling water has cooled down, and then gradually loosen the radiator cap to reduce the pressure.	P83 P110
405	Inspection and maintenance	General maintenance (Hydraulic system)	None in particular	No specific location	CAUTION	High-temperature, high-pressure hydraulic oil could spray out, resulting in a burn or other injury.	(1) Use the oil temperature gauge to check that the hydraulic oil has cooled down. (2) Be sure to always release the hydraulic pressure before starting work.	P113
406	Inspection and maintenance	Opening and closing covers	None in particular	No specific location	CAUTION	Strong winds or falling could cause the worker to get trapped in the cover, resulting in an injury.	(1) When the cover is opened, mount the stopper and firmly lock in place. Be sure that the engine hood and toolbox are fully opened. (2) After the work is completed, return the cover to its original position.	P87 P95
407	Inspection and maintenance	Battery handling	None in particular	E	WARNING	Battery fluid (dilute sulfuric acid) could contact the skin and get in the eyes, resulting in a burn or blindness.	(1) Wear safety goggles, long-sleeve work clothes, and safety gloves, and use caution when handling the battery.	P92
408	Inspection and maintenance	Battery handling	None in particular	E	WARNING	The hydrogen gas generated from the battery could explode, resulting in a severe accident.	(1) Do not bring the battery near an open flame. (2) Inspect the battery fluid level, and refill if it is low. (3) When charging, remove the battery from the machine, and charge it in a well-ventilated location.	P121
409	Inspection and maintenance	Handling of accumulator and gas damper	None in particular	No specific location	WARNING	The sealed high-pressure nitrogen gas could cause a rupture, resulting in a severe accident.	(1) Do not attempt to repair or disassemble. (2) Do not bring near an open flame. (3) Before disposing, remove the sealed gas.	P44
410	Inspection and maintenance	General maintenance	None in particular	No specific location	WARNING	Be sure to use the safety bar during inspection.	Read the instruction manual. Be aware of hazard prediction.	P50
411	Inspection and maintenance	Vessel lowering	None in particular	No specific location	CAUTION	Emergency lowering	Do not perform two-person operation. Operate with caution. Make sure to perform opening and closing check.	P14

(T0988566-162-OE)

9. Residual risk map where protective measures required by machine users

Please fill in newly added residual risks here.

No.	Applicable stage	Work	Required qualifications for work	Location on machine	Residual risk	Hazard description	Protective measures implemented by machine user	Page in instruction manual

(T218081-009-OE)

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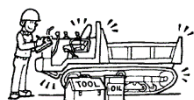
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Operation

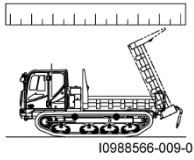
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1. For safe operation (T0988566-163-0E)

- This section lists precautions you should observe when operating this machine.
- Make sure you fully understand these points before you start operation and observe them to operate safely.
- In this section, pictures which illustrate dangerous situations or working practices are marked with a large "X".
- The illustrations in this section are intended to attract attention and supplement the main text. They do not give a full and detailed account of the content of the text.

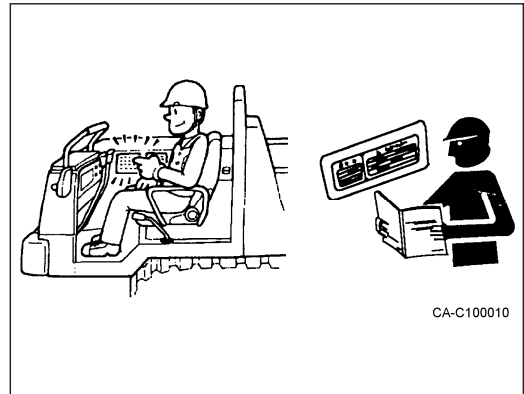
1-1 Precautions before operation (01E0-0030-0E)

(1) Read and understand the warnings signs and labels

- 1) 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.

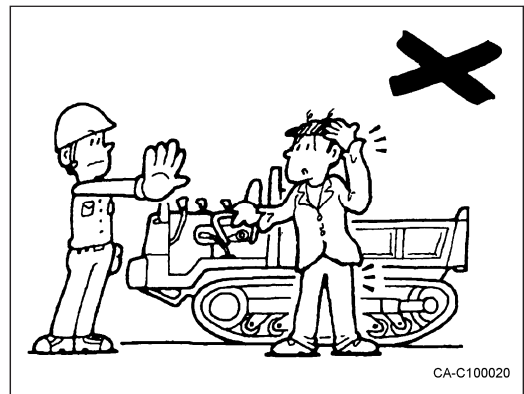
- 2) You must replace a label if it is damaged, missing or cannot be read. If a label is on a part that is replaced, make sure a new label is installed on the replaced part.



(2) 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.

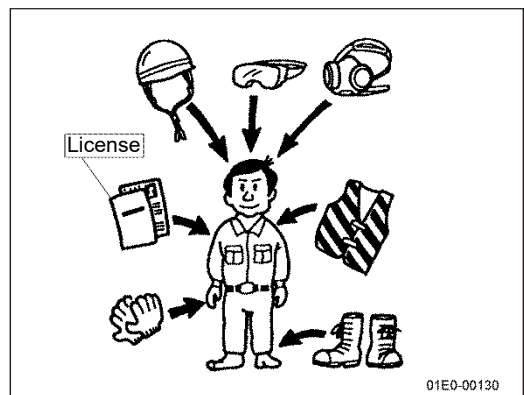


(3) Wear proper working clothes

- 1) 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.

- 2) Always wear protective cap and safety boots.

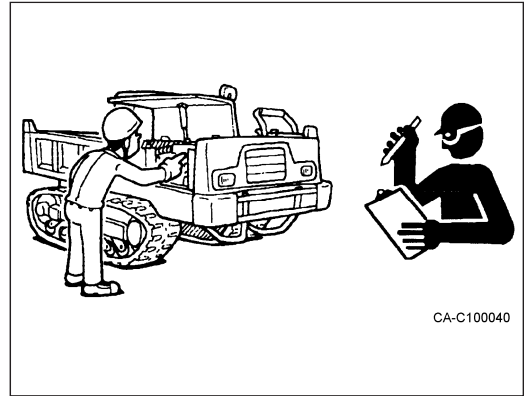
Wear a hard hat, protective glasses and other protective equipment as required by job conditions.



! WARNING 1. For safe operation

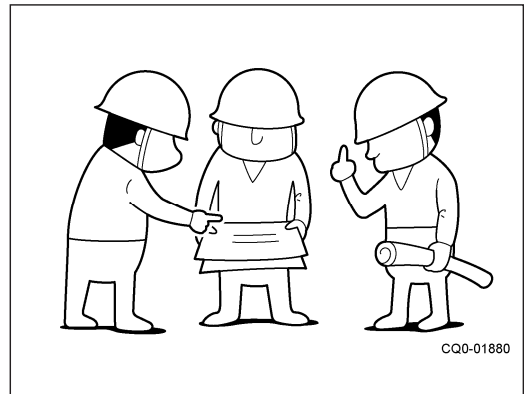
(4) Perform "walk-around" inspection

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.



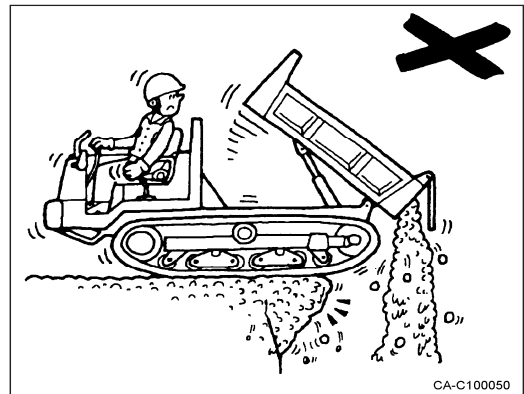
(5) Make a work plan

- 1) 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.
- 2) When working together with other persons, determine the signals and who is to give those signals.



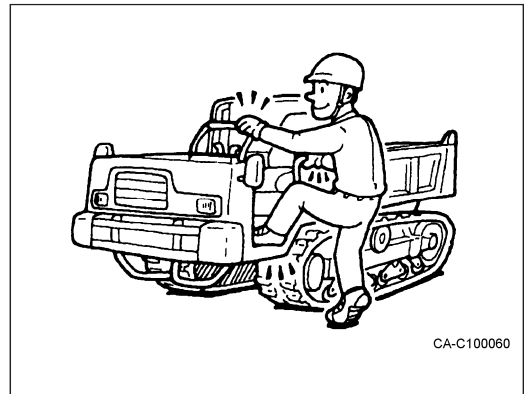
(6) Check the job site

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



(7) Carefully get on and off the machine

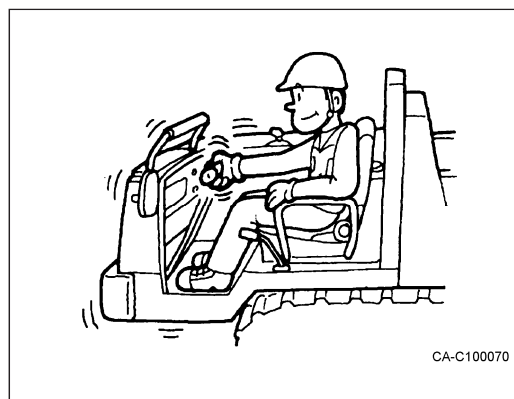
- 1) Maintain a three point contact (Two feet and one hand or one foot and two hands contact) with the steps and handholds.
- 2) Do not use any controls as handholds when entering or leaving the operator's station.
- 3) When any oil or other slippery substance has got adhered to hand rails or steps,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



(8) Start the engine while sitting in the operator seat

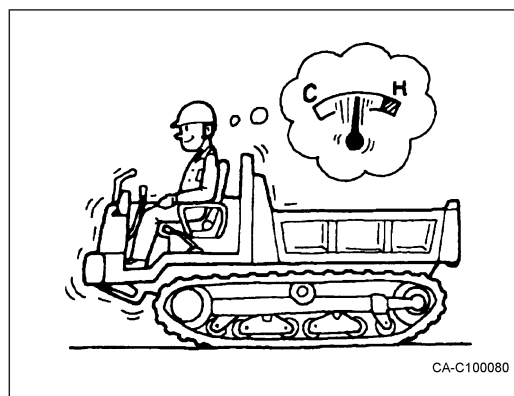
If the engine is started from a position other than sitting in the operator seat, there is the danger that the machine starts moving suddenly.

Start the engine only after carrying out checks while sitting in the operator seat.



(9) Conduct warm-up before operation

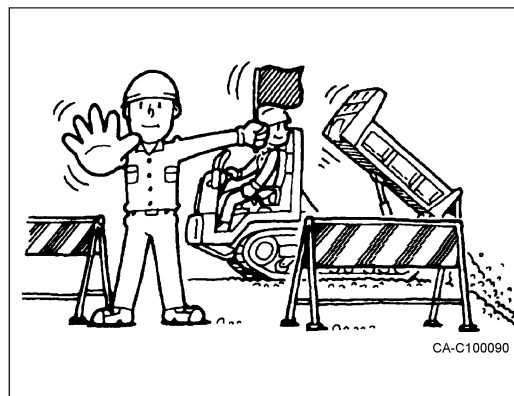
If the machine is operated without carrying out sufficient warming up operation, it can lead to movements not intended by the operator, and can lead to accidents. Always carry out sufficient warming up operation.



1-2 Precautions during operation (T0988566-010-0E)

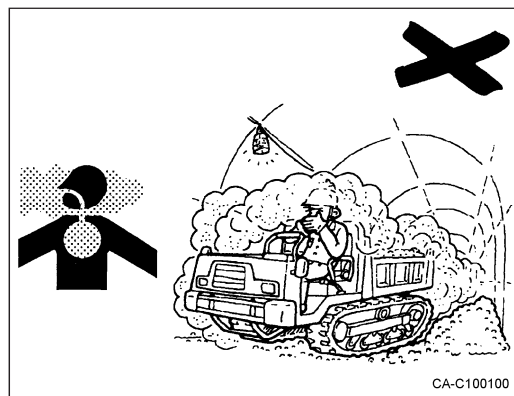
(1) Clear all personnel from the machine and area

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.



(2) 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.

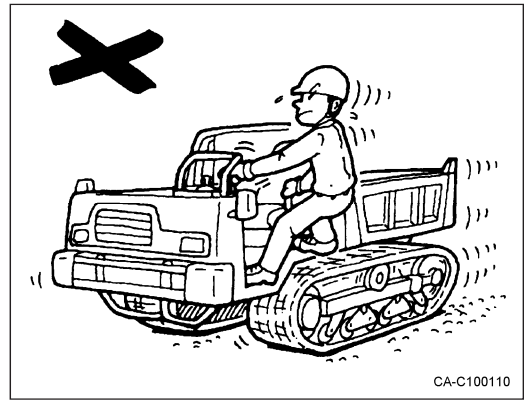


! WARNING 1. For safe operation

(3) Stay seated while operating

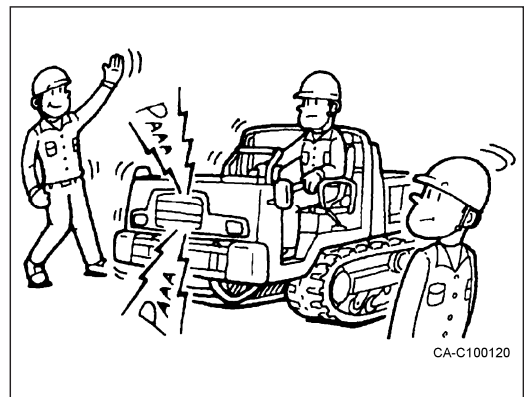
There is the danger of making wrong operations if the operating is done from a position other than the operator seat or while standing.

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



(4) Prevent accidents while moving

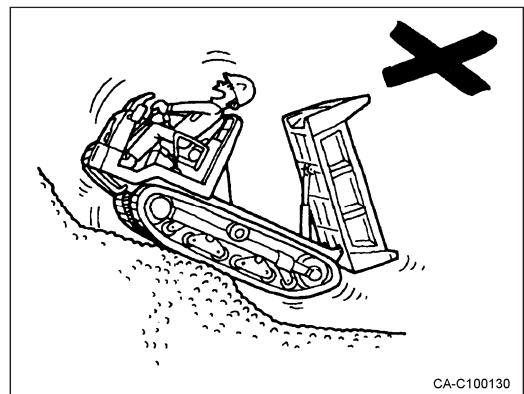
- 1) Always sound the horn to signal others nearby that you are moving the machine. Check that no one is within the working area of the machine before attempting to move it.
- 2) Position a guiding person to guide and check when necessary or when the field of view is bad.



(5) Do not travel with the vessel in dump position

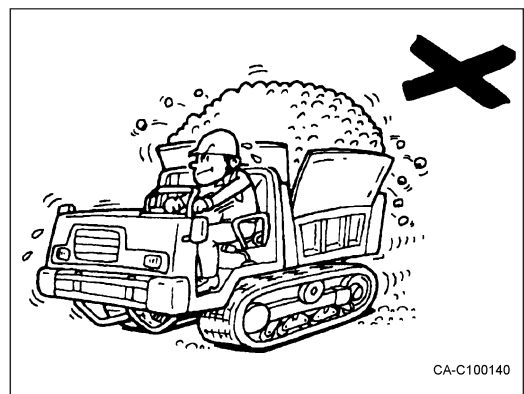
Traveling with the vessel in dump position not only makes the machine unstable but limits operator visibility causing hazardous situations.

Never attempt to travel with the vessel in dump position.



(6) Do not overload

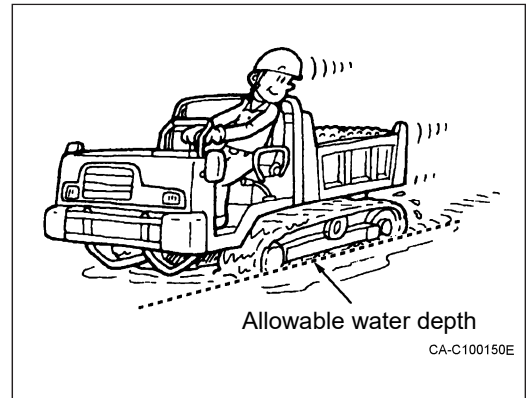
- 1) Working with loads exceeding the performance of the machine can cause loss of safety or reduction in the functionality or life of the machine.
- 2) Never exceed the maximum load limits.
- 3) Never place a load onto the sideracks.



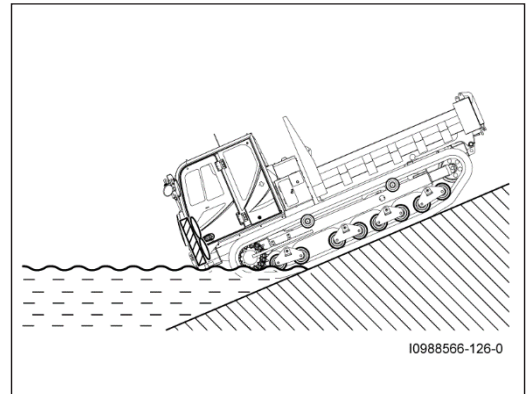
(7) Do not exceed the water depth limit

1) 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.



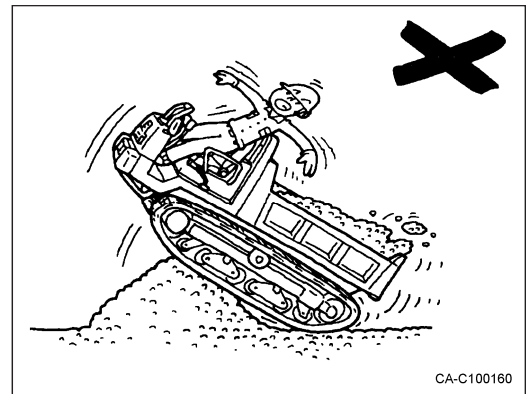
2) If the machine goes into water in a descending posture on a steep slope, water may splash on the radiator and peripheral parts, resulting in damages of the radiator fan. Be careful.



(8) Do not try to travel over obstructions

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

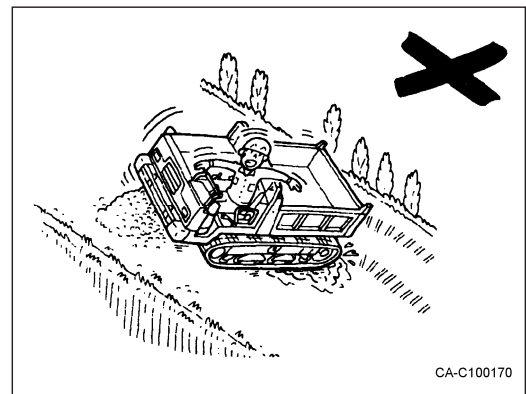
Avoid potential obstacles in your path.



(9) 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.

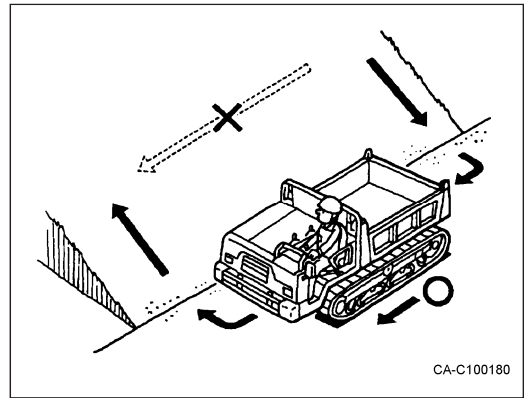


! WARNING 1. For safe operation

(10) 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.



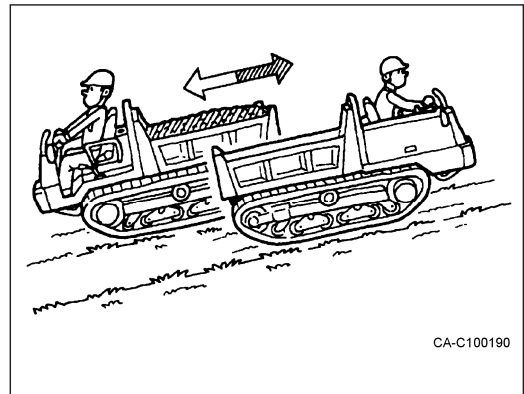
(11) Watch the machine position while traveling on slopes

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:

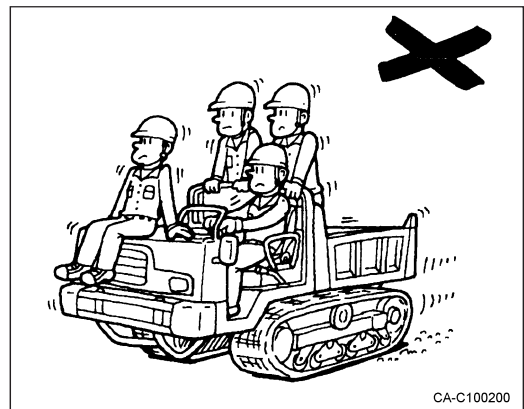
- 1) Go forward up the hill and back down the hill WHEN NO CARRYING A LOAD.
- 2) Reverse up the hill and go forward down the hill WHEN CARRYING A LOAD.



(12) 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.

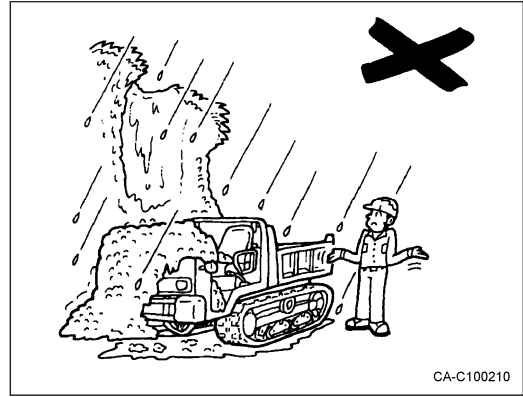
Only operator is authorized to be on the machine during operation. Never let unauthorized personnel ride on the machine.



1-3 Precautions after operation (T0988566-011-0E)

(1) Park in a safe place

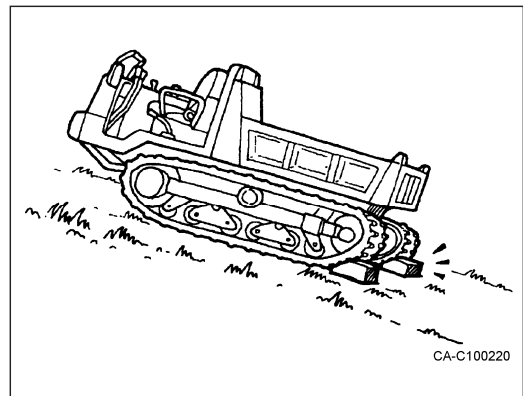
For parking, select a flat ground with good foothold and where there is no danger of land or mud slides, and also, near a river, select a place which is safe even if the river water level becomes high.



(2) Do not park the machine on a slope

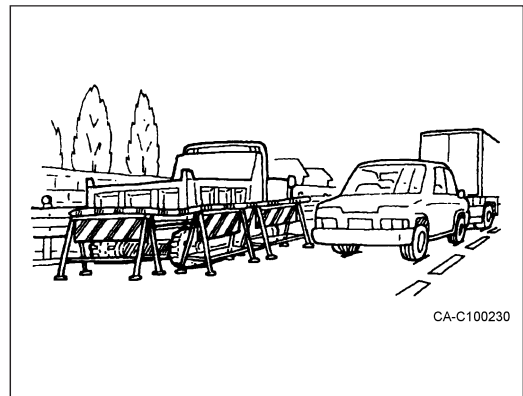
There is the danger of the machine running off wild when stopped or parked on a sloping land.

When it is unavoidable to stop or park on a slopping land, Place stopper blocks on the downhill side under both crawlers.



(3) Observe precautions when parking the machine on the road

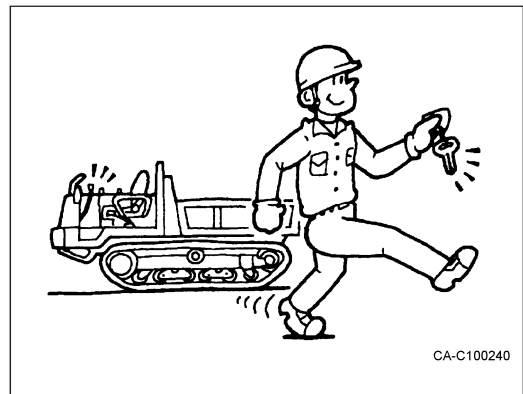
If you have to park the machine on the road, use appropriate flags, barriers, flares, and warning signals.



(4) Operator leaving machine

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

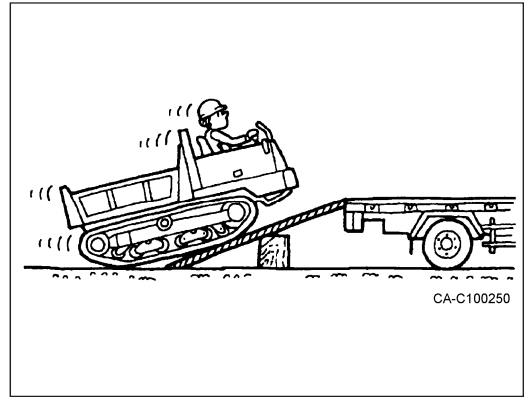
Leave the operator's seat after taking the above measures.



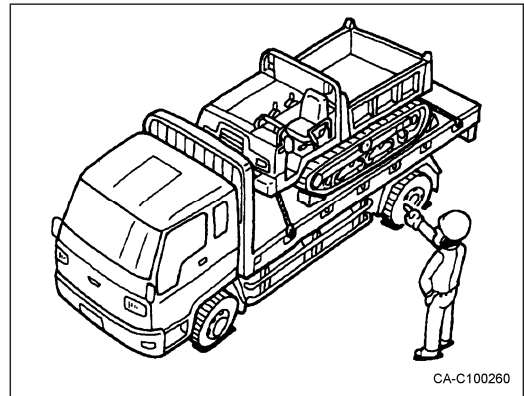
! WARNING 1. For safe operation

1-4 Precautions at transporting (T0988566-012-0E)

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

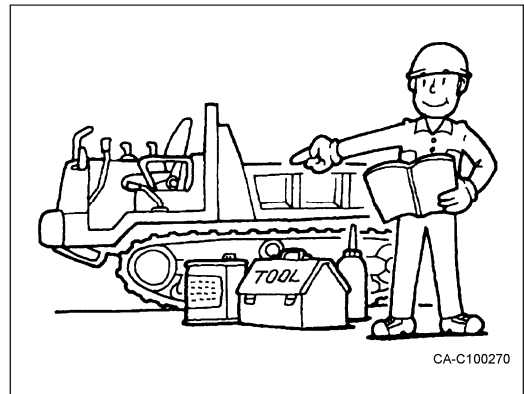


- (2) Observe precautions on transportation
 - 1) Blocks tracks and secure the machine to the truck before transporting.
 - 2) Securely fix the machine to the platform using a wire rope, etc.
 - 3) Transport safely strictly following the concerned laws.



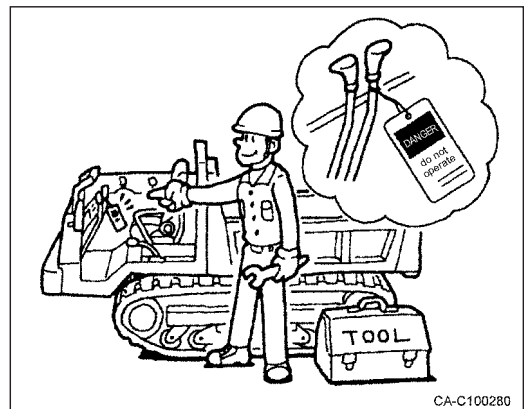
1-5 Precautions at maintenance (T0988566-013-0E)

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



- (2) Indications during inspection and maintenance

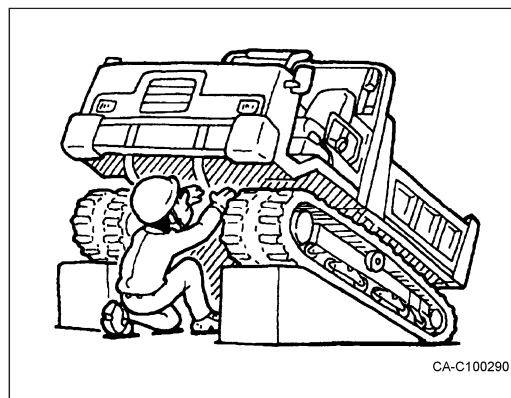
Hang a warning board saying "Under Inspection / Maintenance" at an easy to see location of the operation lever so that novessel other than the concerned persons touches it.



(3) When working under tracks

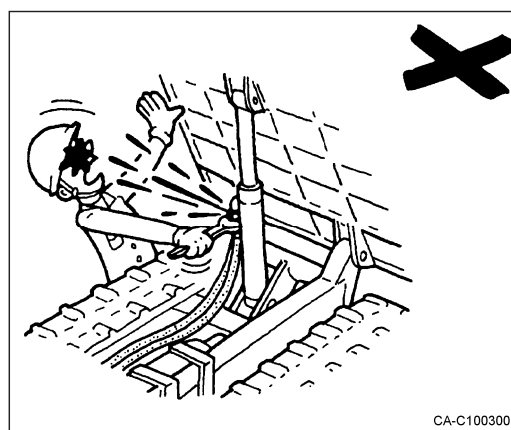
There is the danger of an accident of being caught under the machine if the machine comes down.

Place supporting pillars or blocks under the crawler and make sure that it is supported firmly.



(4) Always release pressure before disconnecting hydraulic lines

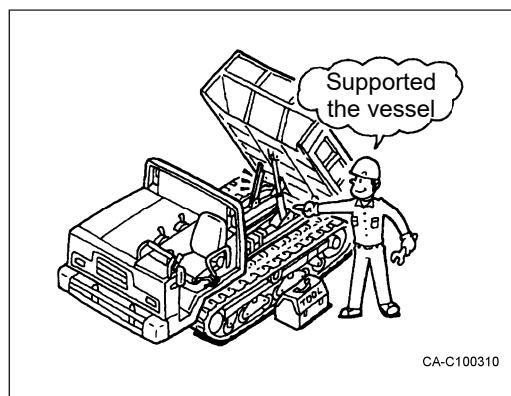
There is the danger of high pressure oil jetting out if a piping or a hose is removed without releasing the internal pressure of the hydraulic system. Start the work only after completely releasing the internal pressure.



(5) 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.

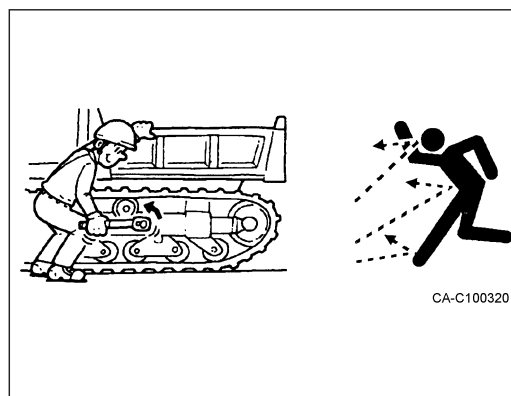
Be sure to support the vessel using the safety bar.



(6) Do not watch the check valve when adjusting tracks

1) Track adjusting grease is under high pressure. Grease coming out of the check valve under pressure can penetrate the body causing injury or death.

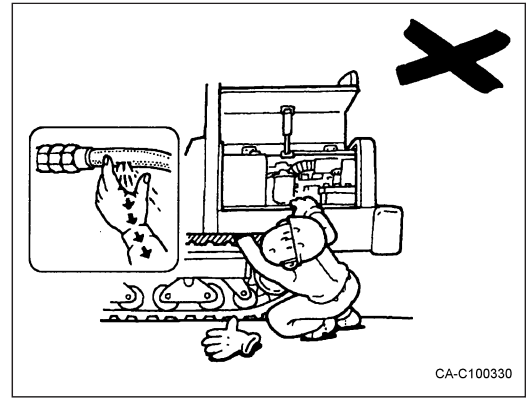
- Watch the track or track adjustment cylinder to see if the track is being loosened. Loosen the check valve one turn only.
- Do not put your face, hand, foot, or body in front of the check valve.



! WARNING 1. For safe operation

(7) Precautions against high pressure oil

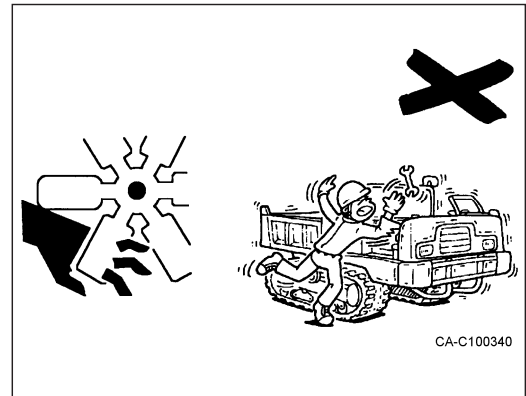
- 1) It is very dangerous if the high pressure oil enters your skin or eyes.
- 2) Use a thick sheet of paper or a wooden piece to test for the leakage of high pressure oil, and never test with your hands. Wear protective goggles for protecting your eyes.
- 3) If oil enters your skin, immediately go to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



(8) 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.

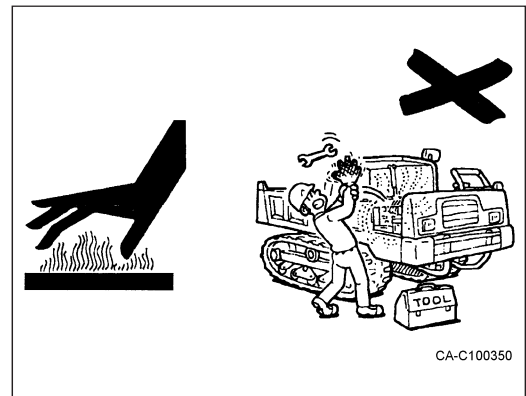
Always carry out maintenance work with the engine switched off.



(9) Be careful to hot engine after the machine stops

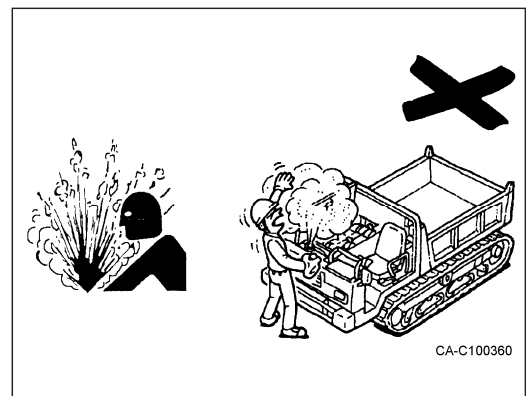
Do not touch the engine or muffler right after the machine is stopped. It is very hot and causes burns.

Start inspection and maintenance only after the temperatures of the different parts have gone down sufficiently,



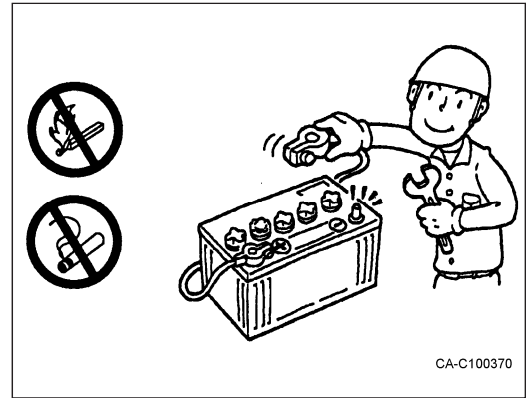
(10) Never open the radiator cap or coolant tank cap when they are hot

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.



(11) Handling battery

- 1) When maintaining the electrical system or when carrying out welding, remove the lead connected to the negative terminal (-) of the battery.
- 2) 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.



(12) Fire prevention

- 1) 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.
- 2) Stop the engine during refueling, and take care not to bring sparks or fire near the fuel.
- 3) Inspect for leakage of fuel, oil, and hydraulic oil and repair if there is any defect, and wipe off all oil that has leaked.
- 4) Make sure where a fire extinguisher is placed and know how to use it.



! WARNING 1. For safe operation

1-6 Safety signs (T0988566-014-0E)

The safety signs are stuck on in the places shown in the diagram. Check all of them before you start to travel or operate the machine.

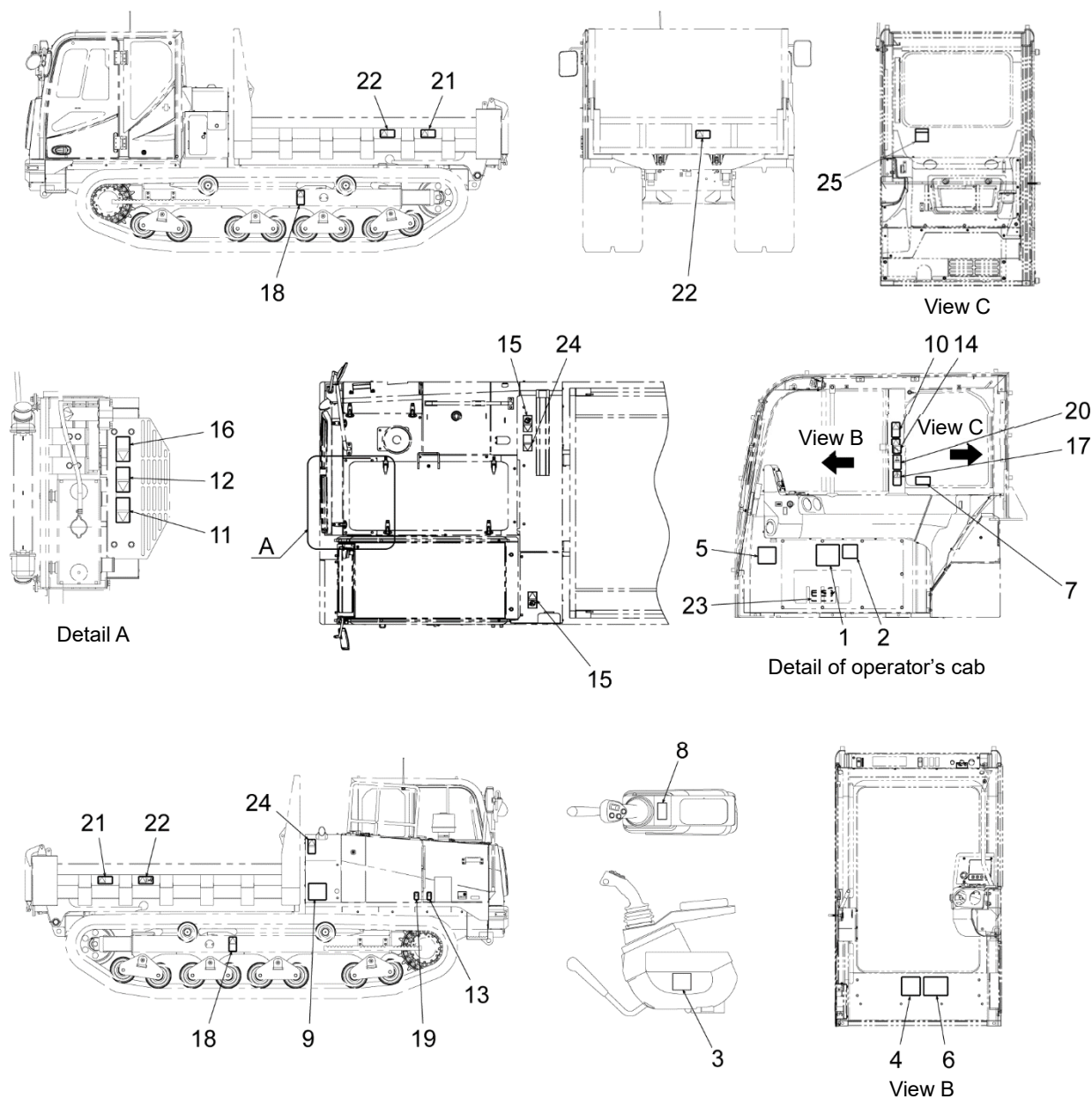
Keep the safety signs clean at all times so that they are clearly visible and easy to read.



CAUTION

- If a safety sign is dirty, use water or a neutral cleaner to remove the dirt. Do not use gasoline or organic solvents.
- If it is not possible to remove the dirt, or if a safety sign is damaged or peeling, replace the safety sign with new.
Refer to this section and parts list on the machine and order a new sign from your authorised KATO dealer to replace the safety sign.
- When you replace a safety sign, always check that it is identical to the original.

(01E0-0040-1E)



10988566-012-0E

1. For safe operation WARNING

1. Precautions on safety (D408 897 00)

 **CAUTION**

Precautions on safety

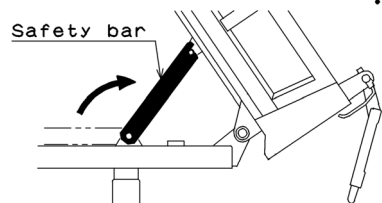
1. Read and understand the operation manual before operation to secure safe and correct operation and maintenance.
2. Observe instructions and warnings on the operation manual and warning labels when operating or servicing the machine.
3. Before starting the engine, make sure that there is no personnel on and around the machine. Always sit in the operator's seat before starting the engine.
4. Sound the horn to alert the people around the machine.
5. When you leave from the operator seat, turn on the parking switch and stop engine.
6. Conduct dumping work on a level ground.
7. Do not put any part of your body under the dump body. If you cannot avoid it, always use the safety bar.
8. Observe instructions on caution labels to travel up and down on a slope. If this is ignored, the machine may over turn.
9. Avoid parking the machine on a slope. If you cannot avoid it, be sure to lock the crawler shoe.
10. For transportation, be sure to put blocks at both sides of the crawler shoe and fix the machine with wire and chain.

D40889700

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

 **WARNING**

For working under the raised body, be sure to use the safety bar to prevent the body from falling.

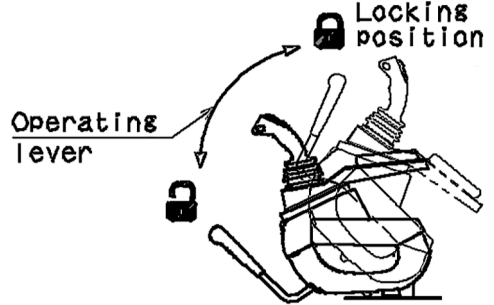


If you fail to use the safety bar to remove the dump cylinder, hose, and other devices, the raised body may fall and cause serious accident.

444881600

3. Setting the left lever unit in the lock position (D409 626 00)

 **WARNING**



Accidentally touching the operation lever without being locked can cause unexpected movement of the machine, which incurs danger. When getting off the operator seat, always be sure to move the operation lever to the locking position.

D40962600

4. Traveling on a slope (D406 188 00)

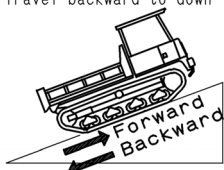
 **CAUTION**

Note when travelling steep
To prevent the machine from tipping over do not travel up or down the steep of more than 20 degree.

When traveling the steep of more than 9 degree keep the travel mode at "low" and engine revolution at a half. stay straight travel and do not stir.

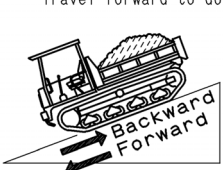
1. Travelling up/down the steep when unloaded

Travel forward for up
Travel backward to down



2. Travelling up/down the steep when fully loaded

Travel backward to up
Travel forward to down



D40618800

! WARNING 1. For safe operation

5. Loading and unloading the machine
(D405 618 00)

! CAUTION

Loading and unloading the machine

Be sure to apply the parking brake of a track.
Put blocks at tires.



15° or less

1. Set ramp angle 15° or less.
2. Securely attach ramps to the track.
3. Keep the same height of both ramps.
4. Fix the machine on the track with wire or chain.

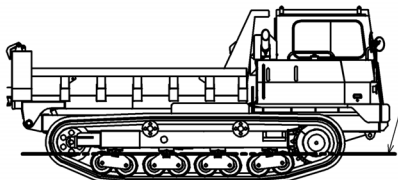
D40561800

6. Under-water works
(D406 189 00)

! CAUTION

Note when working in the water

Do not operate the machine where the water comes above the water allowing level



Water allowing level
upper end of lower roller

If water or mud enter the engine it will cause the engine trouble. Keep the water allowing level when travelling in the water and slow down to avoid the water from entering.

D40618900

7. Safety alarm
(D409 629 00)

! WARNING

Slope Alarm

- When going down a slope, when the front of the machine tilts by more than 9°, the slope indicator flashes, and the buzzer sounds for 5 seconds.

! The machine will start overrunning if you do not reduce travel speed.

Reduce the travel speed by the following operations.

1. Return the travel lever to the neutral position.
2. Change the 2-speed switch to the low speed.

(For details, read the operation manual.)

D40962900

8. Vessel operation warning
(D408 906 00)

Caution about dump bed operation

- ! Do not travel while the dump bed is in the air**
- ! When a load has been placed on the dump bed, take care so that the lowering is not intermittent.**

D40890600

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

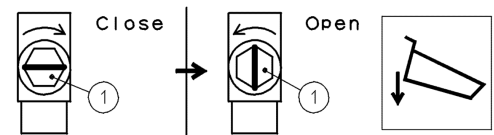
! CAUTION

If the raised body cannot be lowered due to a trouble of engine or pump, do the following item to lower the body.

1. Please slowly open the plug ① of the stop valve.
2. After the body was down, please return to its original state by close the plug.

※Fast and open the plug ①, the body rapidly down. It is dangerous. Please be careful.

※When you operate the machine with the plug ① is open, will lead to any accidents.

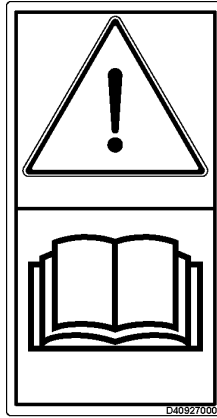


Close → Open (Emergency)

D40891100

10. Warning!

Read manual before operation, maintenance, disassembly, assembly and transportation.
(D409 270 00)



11. 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.
(D409 294 00)



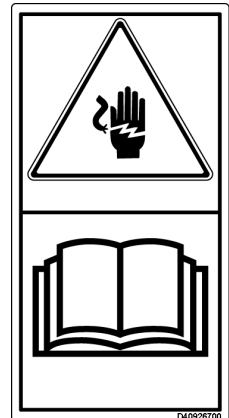
12. Sign indicates a burn hazard from touching heated parts, such as engine, motor, or muffler during or right after operation. Never touch when hot.

(D409 293 00)



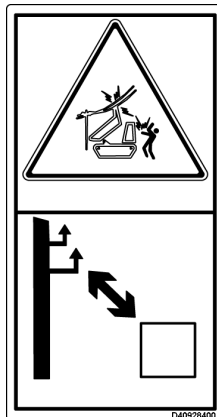
13. Sign indicates an electrical hazard from handling the cable. Read manual for safe and proper handling.

(D409 267 00)



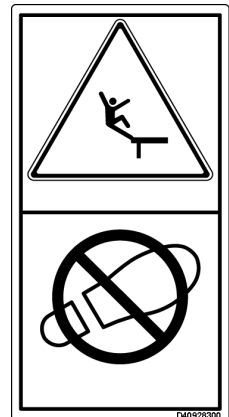
14. Sign indicates an electrocution hazard if machine is brought too near electric power lines. Keep a safe distance from electric power lines.

(D409 284 00)



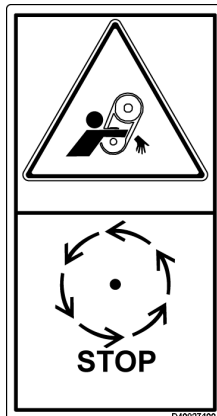
15. Sign indicates a hazard of falling.

Do not stand on this place.
(D409 283 00)



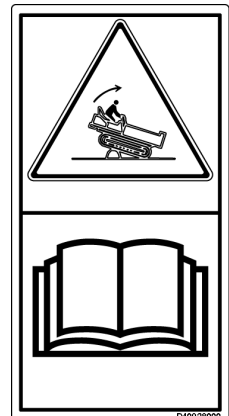
16. Sign indicates a hazard of rotating parts, such as belt.

Turn off before inspection and maintenance.
(D409 271 00)



17. Sign indicates a hazard of falling out when machine goes over an obstacle. Read manual and follow instructions for safe and proper operation.

(D409 280 00)

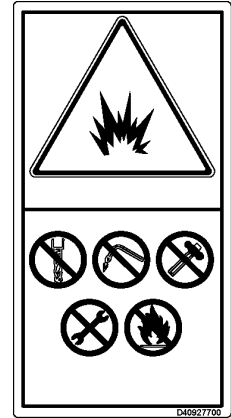


! WARNING 1. For safe operation

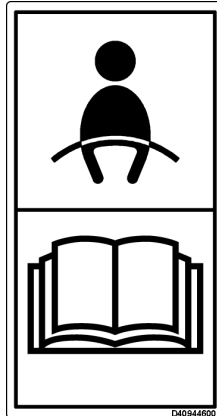
18. Sign indicates a hazard of a flying plug from track adjuster that could cause injury. Read manual before adjusting track for safe and proper handling. (D409 279 00)



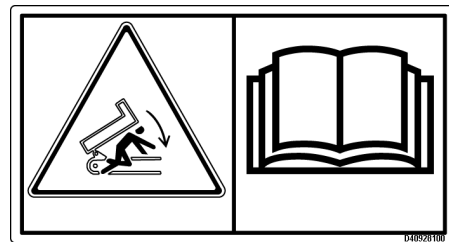
19. Sign indicates an explosion hazard. Never drill, cut with gas, hit or disassemble. Also, keep open flame away. (D409 277 00)



20. 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. (D409 446 00)

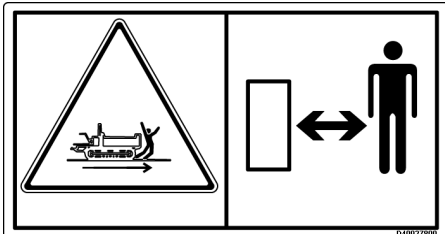


21. Sign indicates a crush hazard from falling vessel.



Read manual and follow safety instructions when holding the vessel in a raised position. (D409 281 00)

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



Keep away from equipment when it is moving. (D409 278 00)

- 23.



D40532300

24. Sign indicates a burn hazard from touching heated parts, such as engine, motor, or muffler during or right after operation. Never touch when hot. (D409 286 00)



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)

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

Contains Fluorinated Greenhouse Gases

Type of F-Gas	Charge weight[kg]
HFC-134a	0.7 ±0.05
GWP value	1430
CO ₂ equivalent[t]	1.0

In order to preserve the global environment
please follow carefully the followings points:

1. Don't release fluorinated Gas in the environment.
2. Collect the fluorinated Gas when you dispose this product.

D40900100 EN

! WARNING 1. For safe operation

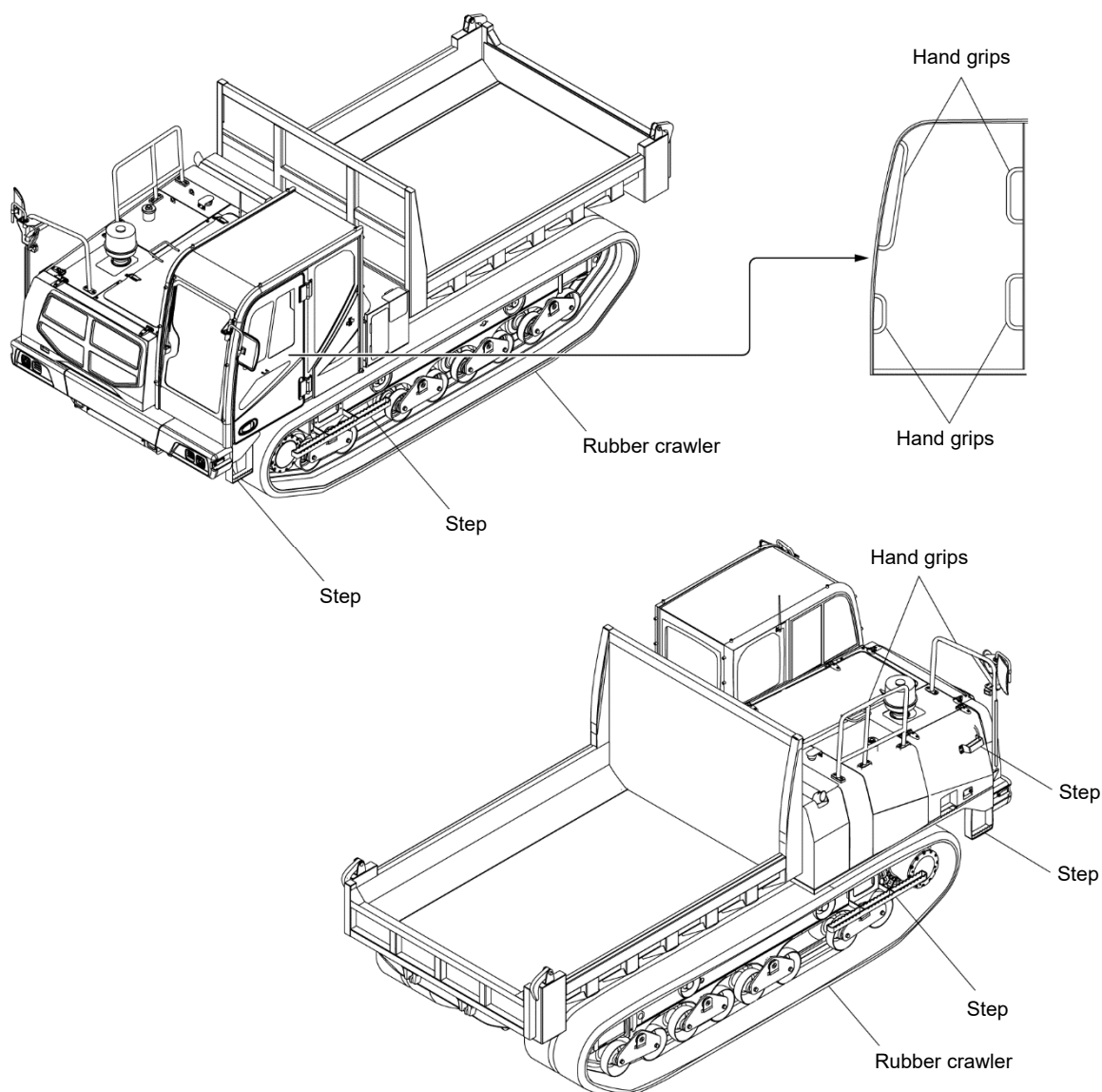
1-7 Precautions on getting on and off the machine (01E0-0041-0E)



CAUTION

- When you get on and off the machine, face toward it and use the hand grips and steps to support yourself. Keep at least three points of support at all times on the hand grips and steps.
Do not use any other than the hand grips to hold on to.
- Do not jump onto or off the machine.
Do not get on or off the machine while it is in motion.
- The floor, hand grips, steps, etc. are slippery when they have mud, oil or snow on them, so wipe them clean before you get on or off the machine.
- If the hand grips or steps are damaged, repair them. If the attachment bolts are loose, tighten them securely before you get on or off the machine.

(T0988566-182-0E)



10988566-013-0E

1-8 Precautions when filling with fuel (T0988566-015-0E)

Strictly observe the following precautions when filling with fuel.



CAUTION

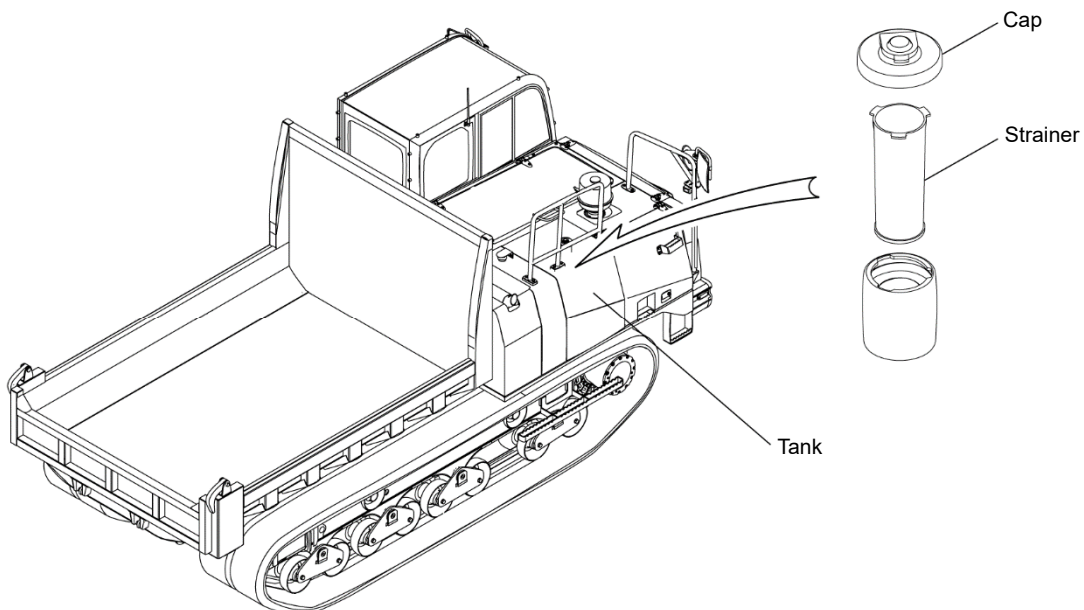
- Always fill with fuel of the designated type and grade. If you use a non-recommended fuel, performance will be impaired and a major accident could result.
- Stop the engine and turn the engine key switch to OFF before you start filling.
- Park the machine in a well-ventilated place and check that there is nobody inside before you start filling.
- Do not allow any fire or source of ignition nearby.
- Take care not to spill fuel on hot areas. If any fuel spills, wipe it up immediately.
- Take care to ensure that no dirt or water gets into the fuel tank when you fill with fuel.
- Watch the level gauge of the fuel tank while you fill with fuel so that the fuel does not pour out of the filler port on the fuel tank.
- Clean the cap strainer when you fill with fuel.
- After filling with oil, refasten the oil cap.
- Extra caution is required when inspecting or servicing the fuel system.
- Fuel leakage from fuel hoses, the injection pump, fuel filter, or connections can cause a fire. If any fuel leakage is discovered, repair it immediately.
- Do not use alternative fuels, which may reduce performance or cause a fire.

(01E0-0044-1E)

NOTE

Fuel for filling Diesel fuel

Fuel tank capacity 312 L



I0988566-014-0E

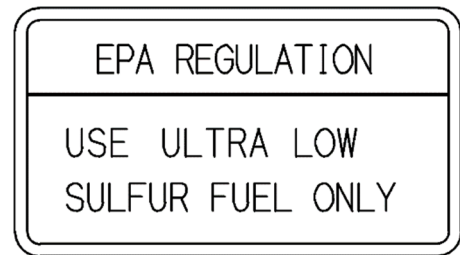
! WARNING 1. For safe operation

(1) Fuel

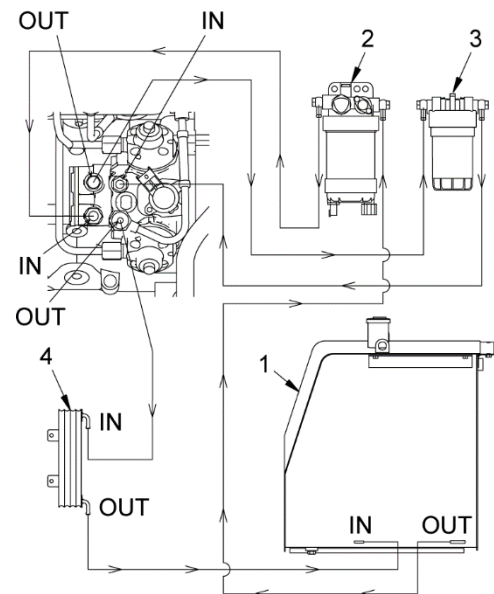
Diesel engine fuel should satisfy the following criteria.

- 1) Does not contain even fine dust
- 2) Has adequate viscosity
- 3) Has a high cetane number
- 4) Has good low-temperature flowability
- 5) Has low sulfur content
- 6) Has low carbon residue

Use standard automotive diesel fuels that meet the requirements above.



No.	Name
1	Fuel tank
2	Fuel pre-filter
3	Fuel filter
4	Fuel cooler
5	Fuel pump



Fuel piping system diagram

I098857500-004-0E

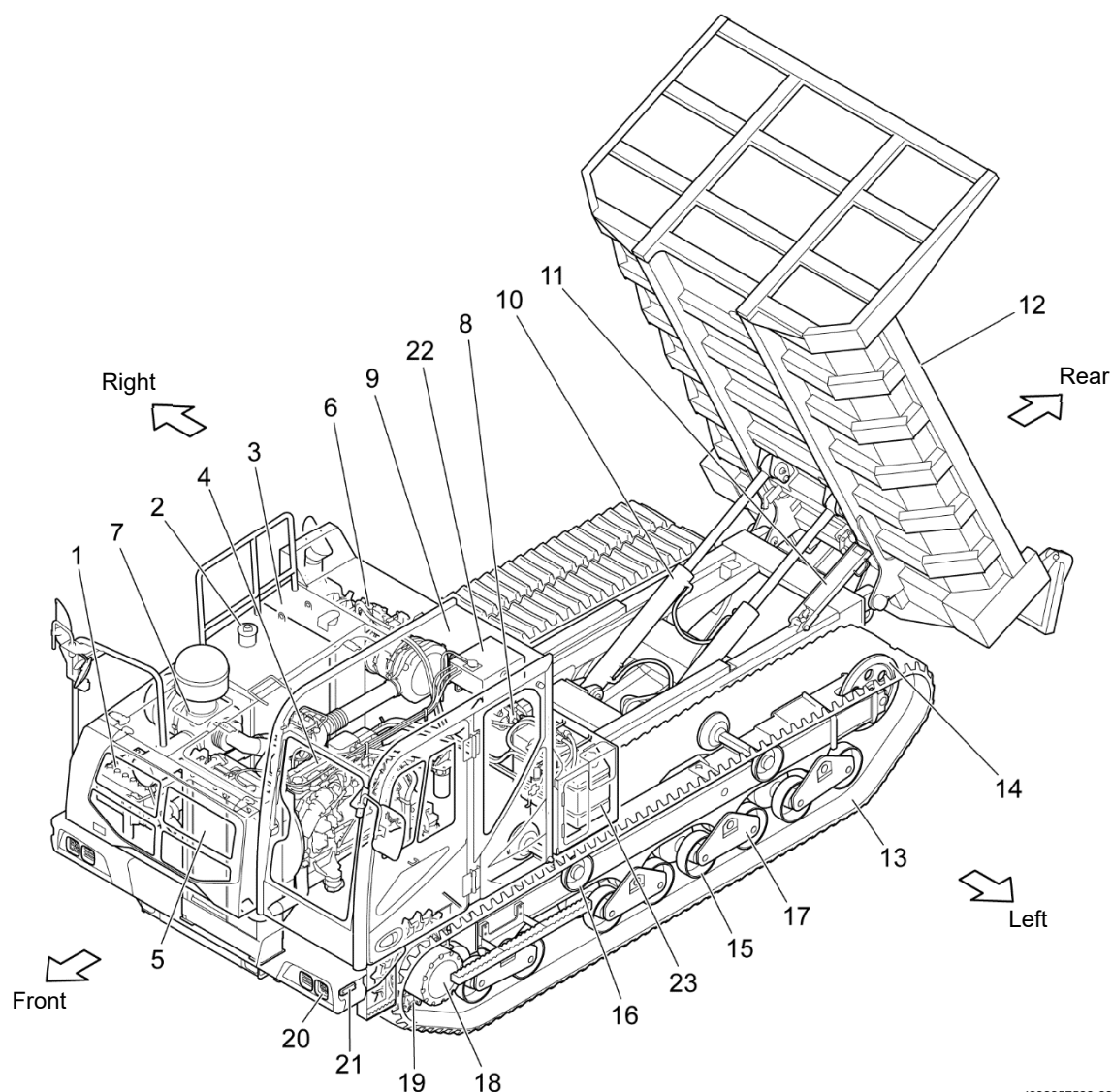
! WARNING

Never use diesel fuel that does not meet the requirements. Doing so may prevent maximizing the functionality and performance of the fuel injection system and the engine and may cause engine malfunction or failure.

Any malfunction or failure resulting from using non-specified fuel is not covered by the warranty.

(T0988566-015-0E)

2. Names of components (T0988566-016-0E)

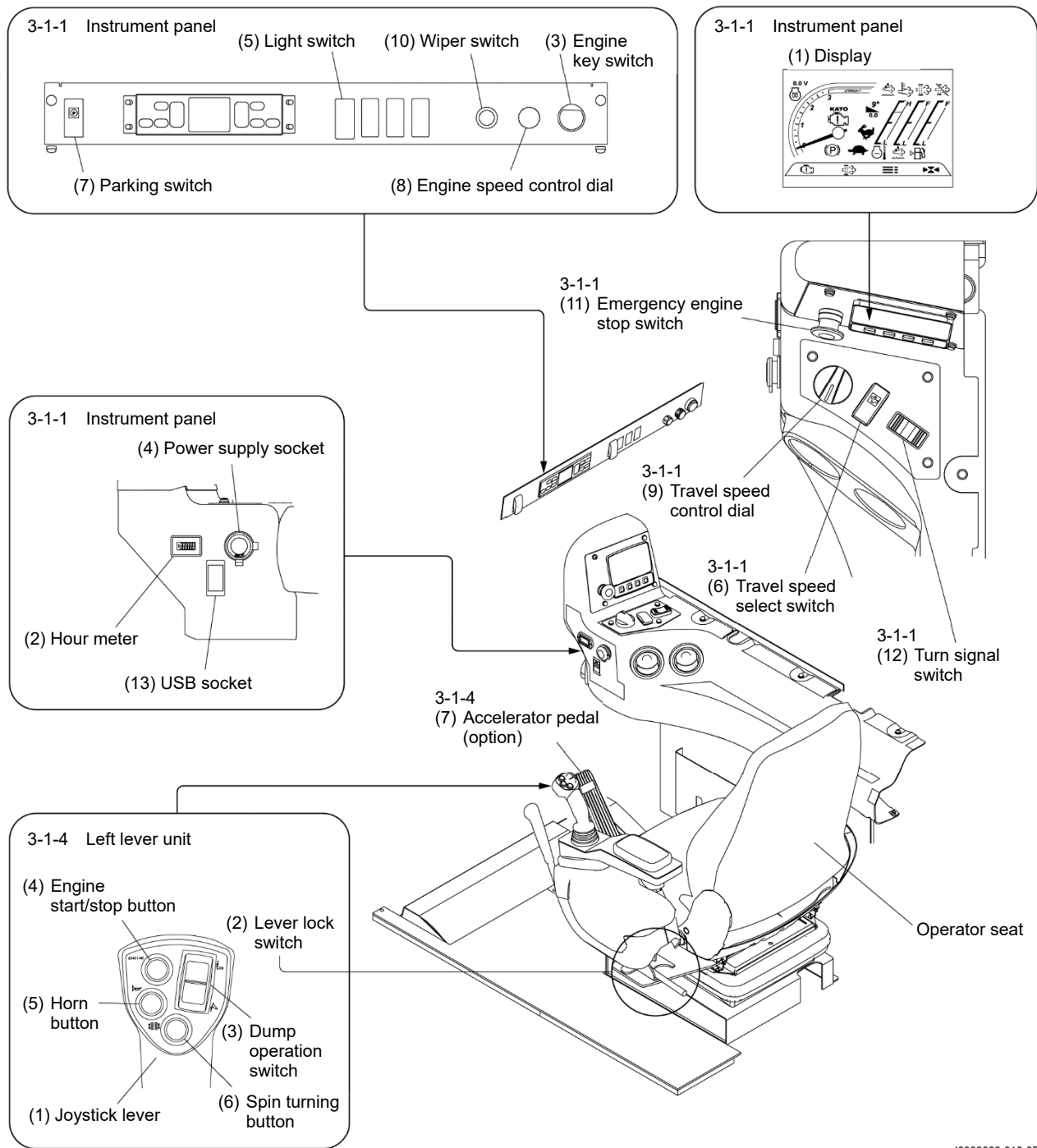


I098857500-005-0E

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

3. Explanation of the operation devices (01E0-0086-0E)

3-1 Inside the cab (T0988552-080-0E)

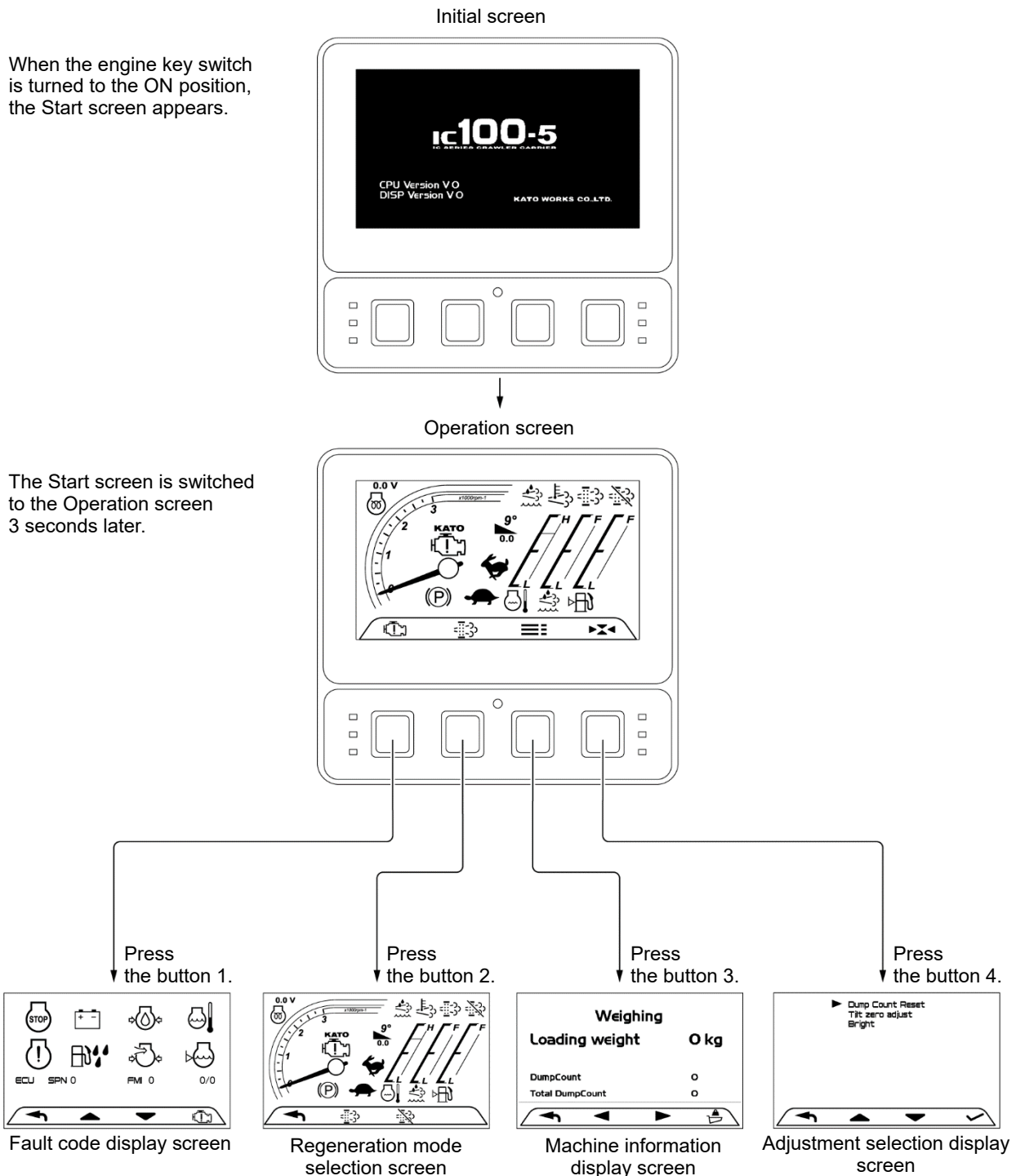


I0988566-018-0E

No.	Name	No.	Name
3-1-1	Instrument panel	3-1-4	Left lever unit
(1)	Display	(1)	Joystick lever
(2)	Hour meter	(2)	Lever lock switch
(3)	Engine key switch	(3)	Dump operation switch
(4)	Power supply socket (24 V)	(4)	Engine start/stop button
(5)	Light switch	(5)	Horn button
(6)	Travel speed select switch	(6)	Spin turn button
(7)	Parking switch	(7)	Accelerator pedal (option)
		(8)	Engine speed control dial
		(9)	Travel speed control dial
		(10)	Wiper switch
		(11)	Emergency engine stop switch
		(12)	Turn signal switch
		(13)	USB socket

3-1-1 Instrument panel (T0988566-017-0E)

(1) Display



I098857500-034-0E

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

The screen returns to the "Operation screen" when the key is pressed.

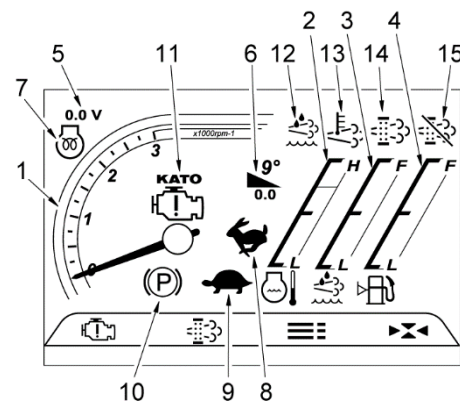
3. Explanation of the operation devices

Explanation of screen displays

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

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

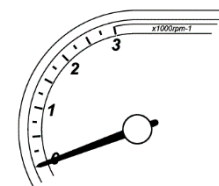
No.	Name
1	Engine tachometer
2	Coolant thermometer
3	DEF gauge
4	Fuel gauge
5	Battery voltage
6	Slope warning indicator
7	Preheat indicator
8	High speed
9	Low speed
10	Parking brake indicator
11	Engine error indicator
12	Diesel Exhaust Fluid (DEF) level warning indicator
13	DPF regeneration indicator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



I0988566-162-0

1) Engine tachometer

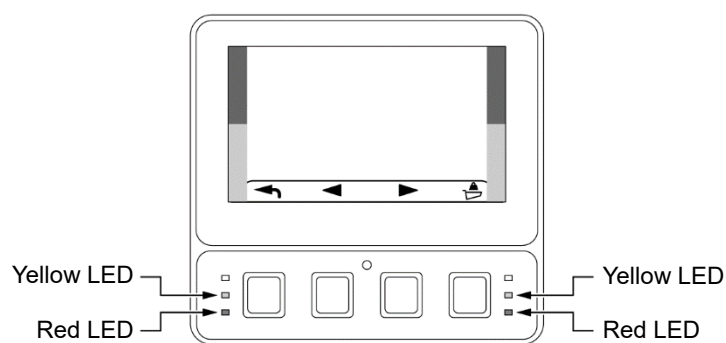
This meter indicates the number of engine revolutions.



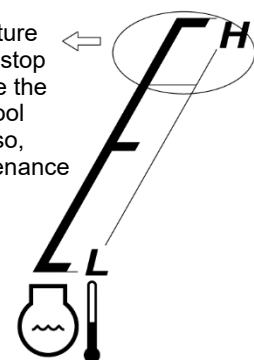
I0988566-163-0

2) Coolant thermometer

Indicates the coolant temperature.



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



I0988566-164-0E



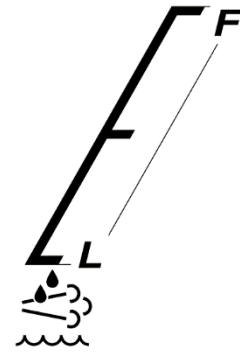
CAUTION

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

(T0988566-153-0E)

3) DEF gauge

Indicates the DEF (Diesel Exhaust Fluid) level.



10988566-165-0



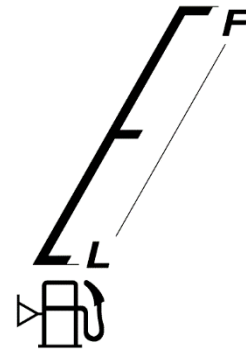
CAUTION

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

(T0988566-075-0E)

4) Fuel gauge

Indicates the fuel level.



10988566-166-0



CAUTION

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

(T0988566-076-0E)

5) Battery voltage

Indicates the current battery voltage.

0.0 V

FM-C300900

6) Slope warning indicator

Indicates the inclination angle of the machine.

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

Display when the inclination angle is less than 9°



-0.0

Current angle

FM-C300811

Display when the inclination angle is 9° or more



-0.0

Current angle

FM-C301070

3. Explanation of the operation devices

7) Preheat indicator

The preheat indicator comes on when the engine key switch is turned on.

The water temperature sensor senses the water temperature, the engine is preheated automatically, and the indicator lamp goes off when preheating is completed. Do not start the engine while the preheat indicator lamp is on.



FM-C300850

8) High speed

This is displayed when the high speed mode is selected.



CA-C201200

9) Low speed

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



CA-C201210

10) Parking brake indicator

This indicator comes on when the parking brake is activated. It flashes when the parking brake is activated while the parking brake switch is OFF.

For details, refer to P. 32.



FM-C300970

11) Engine error indicator

This indicator comes on when some kind of engine problem occurs.

When an engine error is indicated, immediately contact our sales service dealer.



CA-C201260

12) Diesel Exhaust Fluid (DEF) level warning indicator

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



CA-C201220

13) DPF regeneration indicator

This indicator comes on during post-processing unit regeneration or when the exhaust temperature is high.



CA-C201230

14) DPF warning indicator

This indicator comes on when regeneration of the post-processing unit is required.

When the engine is started, the post-processing unit is in the regeneration state.



CA-C201240

15) DPF regeneration stop indicator

This indicator comes on when regeneration of the post-processing unit has stopped.

For DPF handling, refer to the "DPF handling" section in the "Operation" chapter.

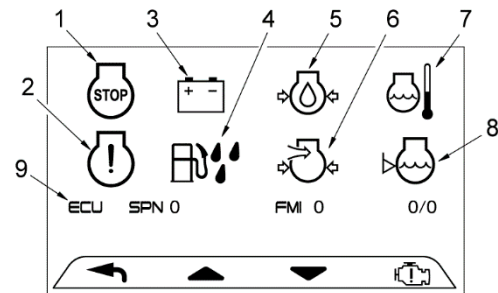
For manual regenerating of DPF, refer to the section "DPF manual regenerating" in the "Operation" chapter.



CA-C201250

Trouble code display screen

No.	Name
1	Engine stop indicator
2	Engine system warning indicator
3	Battery charge warning indicator
4	Fuel pre-filter warning indicator
5	Engine oil pressure warning indicator
6	Air cleaner clogging warning indicator
7	Coolant temperature warning indicator
8	Coolant level warning indicator
9	Trouble code display



1098857500-035-0

1) Engine stop indicator

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

When the engine stop indicator flashes comes on or flashes, move to a safe area and stop the engine immediately.

Repair is required once the engine is stopped. Please contact our sales service dealer.



10988566-206-0

2) Engine system warning indicator

This indicator comes on when an abnormality is detected in the post-processing unit or the engine when the engine is running. Stop the engine and inspect it.

Also, please report the contents of the trouble code display to our sales service dealer.



10988566-207-0

3) Battery charge warning indicator

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



10988566-208-0

3. Explanation of the operation devices

4) Fuel pre-filter warning indicator

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



10988566-209-0

5) Engine oil pressure warning indicator

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



FM-C300940

6) Air cleaner clogging warning indicator

This indicator comes on when the air cleaner is clogged while the engine is running. If this indicator comes on while the engine is running, stop the engine and clean or change the air cleaner elements.



CA-C201300

7) Coolant temperature warning indicator

This indicator comes on when the coolant's temperature rises abnormally. If this indicator turns on while the engine is running, stop traveling or other operations, operate the engine at the idling speed for at least 5 minutes to allow it to cool down gradually, and then stop the engine to check it.



CA-C201310

8) Coolant level warning indicator

This indicator comes on when the coolant level becomes too low. When this comes on, stop the engine and replenish the coolant tank with coolant.



CA-C201320

9) Trouble code display

The display shows the trouble code.

It indicates the contents of the engine trouble.

For details on the contents of the engine trouble that appears on the display, contact our sales service dealer.

ECU SPN 0 FMI 0 0/0

1098857500-036-0

Regeneration mode selection screen

This screen display is used to select the regeneration operation of the DPF.

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

1) DPF regeneration switch

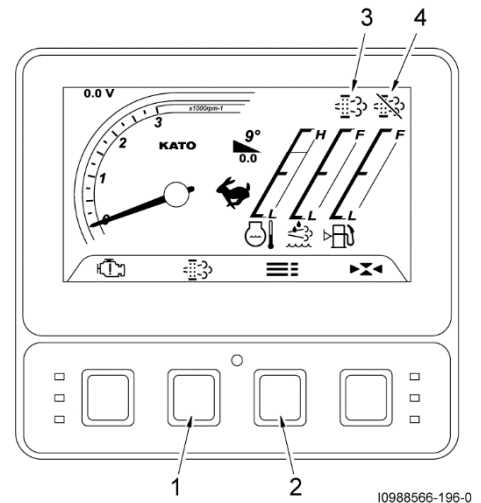
The post-processing unit is regenerated manually.

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

2) DPF regeneration disabled switch

The automatic regeneration function of the DPF is disabled. The automatic regeneration function is enabled by pressing this indicator again.

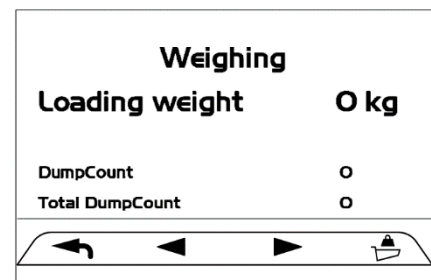
When the DPF regenerating is disabled, the DPF regenerating stop indicator lights up.



10988566-196-0

Machine information display screen

Weighing weight, number of dump counts, and total dump counts are displayed. The screen information can be switched by operating the buttons from the state shown on the right, and various machine information can be displayed.



10988566-210-0



CAUTION

The weighing weight is a reference value.

(T0988575-150-0E)

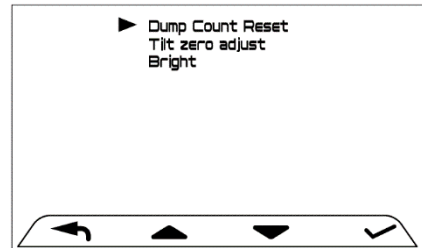
3. Explanation of the operation devices

Adjustment selection display screen

This screen is used to adjust the travel speed, the inclination angle of the machine, the brightness of screen display, etc.

Using [△] and [▽], select an item you want to adjust and confirm with [✓].

Dump Count Reset:	Resets the dump count.
Tilt zero adjust:	Do not change this item.
Bright:	Adjusts the brightness of the display.

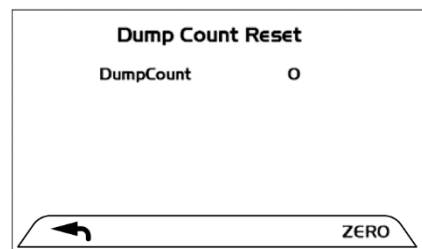


I0988566-213-0

Dump Count Reset (Dump count reset screen)

Dump Count: Current count

Pushing the "ZERO" key resets the count.

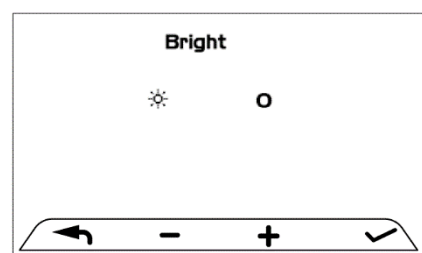


I0988566-211-0

Bright (Brightness adjustment screen)

Bright: Brightness

Pressing the [+] key makes the screen display brighter and pressing the [-] key makes it darker.

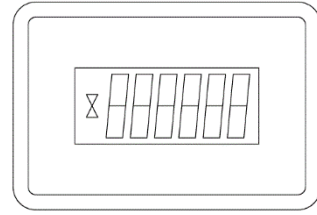


I0988566-212-0

(2) Hour meter

Hour meter

This meter indicates the accumulative running time in increments of 1/10 hours (6 minutes). The meter advances as long as the engine is running even if the machine does not move.



I0988535-043-0

(3) Engine key switch

Use this switch to start and stop the engine.

OFF (Stop)

The key can be inserted and removed. All power to the electrical system turns OFF and the running engine stops.

ACC

While the engine is stopped, the radio, USB socket and back monitor can be used.

ON (Run)

The power to the electrical system turns ON.

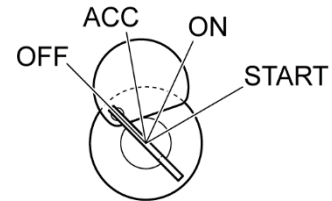
START

This is the engine start position.

After checking that the preheat indicator lamp on the display is off, turn the key to the start position.

When the engine starts, immediately release your hand from the key.

The key returns to the ON position automatically.



I098857500-047-0

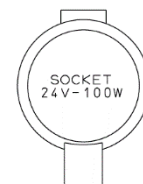
(4) Power outlet

This power outlet can be used when the engine key switch is turned on.

Use this power outlet as a spare power outlet within the following capacity.

When this power outlet is not used, be sure to close the cap.

Capacity: 24 V - 100 W



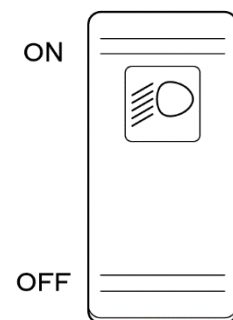
I0988566-019-0

(5) Headlight switch

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

This switch is used to turn on/off the headlights.

- Turning on: Press the ON side.
- Turning off: Press the OFF side.



IC55C200150

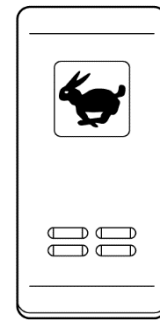
3. Explanation of the operation devices

(6) Travel speed select switch

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.



IC55C200180

(7) Parking switch

This switch activates/deactivates the parking brake.

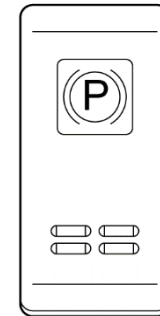
Brake ON: Press the P mark side. The mark indicator lamp goes on.

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.

When the key switch is turned on, the parking brake is always applied even if the parking switch is in the brake off position.

To release the parking brake in such a case, turn the parking switch to the brake on position, and then to the brake off position.



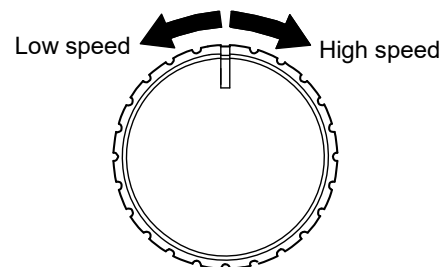
IC55C200190

(8) Engine speed control dial

Adjust the minimum engine speed.

High speed: Rotate the dial clockwise.

Low speed: Rotate the dial counterclockwise.



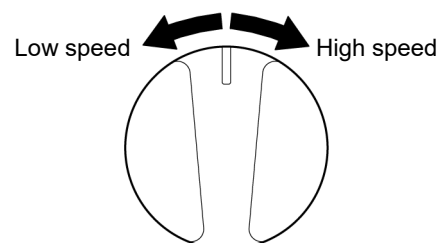
CA-C201040

(9) Travel speed control dial

This mode adjusts the travel speed of the machine.

High speed: Rotate the dial clockwise.

Low speed: Rotate the dial counterclockwise.



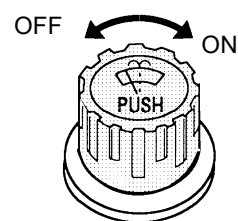
CA-C201050

(10) Wiper switch

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

- Wiper

Rotate the dial. — OFF: Stop
— ON: Operate



CA-C200230

- Washer fluid

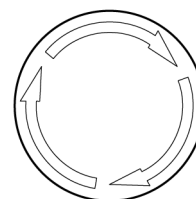
Pushing the dial sprays the washer fluid.

(11) Emergency engine stop switch

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.



CA-C201060

(12) Turn signal switch

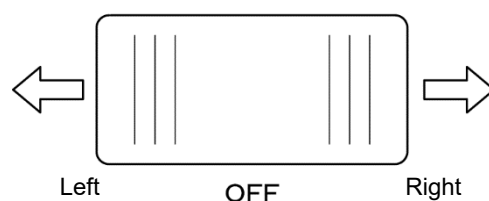
This switch can be used when the engine key switch is in the ON position.

Use the switch to operate the direction indicator lamps.

➡ : The right direction indicator lamp flashes.

OFF: The direction indicator lamps go OFF.

⬅ : The left direction indicator lamp flashes.

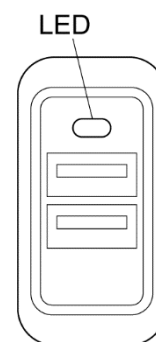


IC55C200160

(13) USB socket

These sockets supply 5 V USB power (1.2 A × 2 ports).

The power output is available when the LED is lit.



I0988566-205-0



CAUTION

- Only A-type USB terminals can be connected. Do not use other types.
- The allowable maximum current is 1.2 A for each port, 2.4 A in total. Check the power consumption in the instruction manual of the device to be used before use.
- No warranty repair will be provided for failure of the device connected or its data corruption or loss.

(T218081-148-0E)

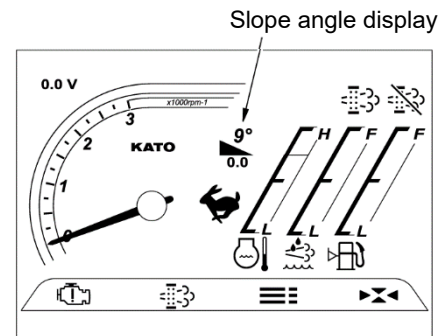
3. Explanation of the operation devices

Safety warning devices

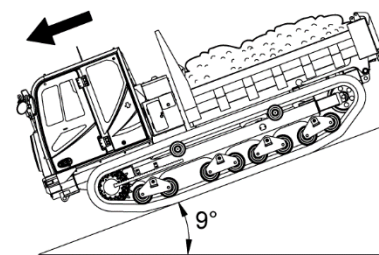
Slope warning indicator

The slope angle of the machine is indicated on the display.

When the machine travels on a slope of 9° or more, the alarm buzzer sounds for 5 seconds.



I0988566-200-0E



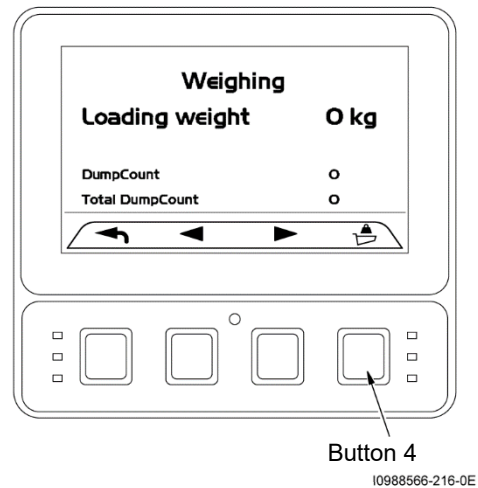
The posture at which the safety warning devices are activated

I0988566-201-0E

Load weighing function

This machine has a load weighing function.

When this load weighing function is enabled by operating the display button, you can perform loading while monitoring the loading weight.



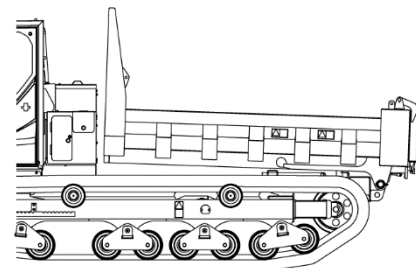
CAUTION

The weighing weight is a reference value.

(T0988575-150-0E)

Enabling the load weighing function

- (1) Press the button 4 of the load weighing function operation screen in the machine information display.
- (2) Automatically the vessel rises slightly and the load weighing is enabled.



Vessel position in load weighing

10988566-221-0E



CAUTION

The vessel moves. Be careful of the periphery of the machine.

(T0988566-210-0E)

- (3) When the measured loading weight reaches the rated value, the horn sounds, the vessel lowers automatically, and the load weighing finishes.

(When vessel operation or traveling operation is performed during load weighing, the vessel lowers automatically and the load weighing finishes.)

Dump counting function

This function counts the number of times earth and sand is discharged from the vessel.

DumpCount: Count value since the last reset

Total DumpCount: Cumulative total count value (unresettable)



CAUTION

- When loading with the vessel raised, do not drop earth and sand from a height or pound it in using a hydraulic shovel.
- Do not perform additional loading after the rated loading weight has been reached and the load weighing has finished, or overloading would be resulted, which impairs safety and causes reduction in function and life.

(T0988566-211-0E)

3. Explanation of the operation devices

3-1-2 Operator seat (T0988566-019-0E)

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

- Adjusting tilt

Move the seat back while pulling the lever (1) to adjust the angle of the seat back.

- Adjusting the back-and-forth position

Move the seat forward or backward while pulling the lever (2) to adjust the back-and-forth position.

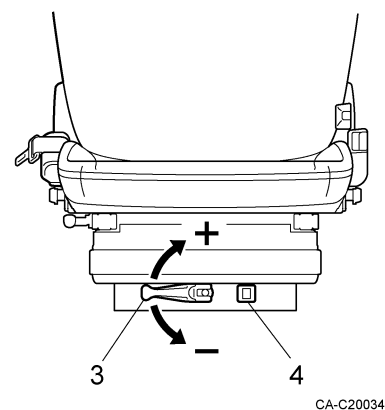
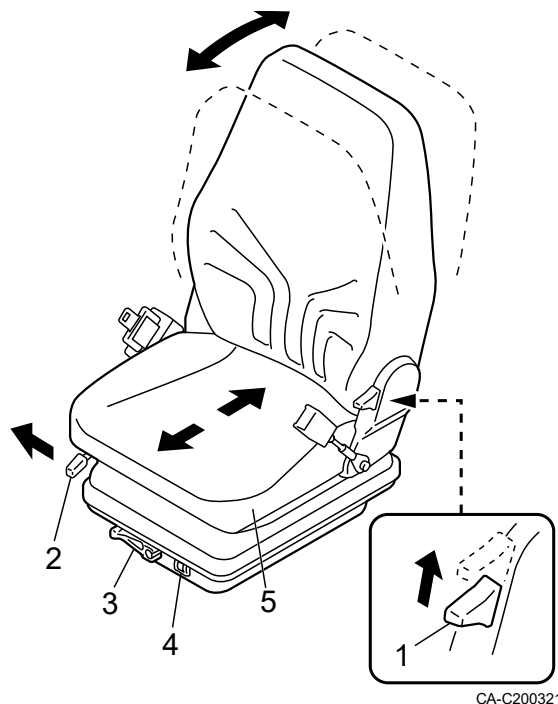
- Adjusting suspension

Raise the lever (3) and turn it to adjust suspension. The appropriate body weight is displayed on the display (4).

- Adjusting the seat height

When the seat is lifted from the bottom of the seat (5), the seat height is raised by 8 mm (a maximum of 30 mm).

To return the seat to the original height, lift the seat from the bottom of the seat to the maximum height, lift it again and then lower it.



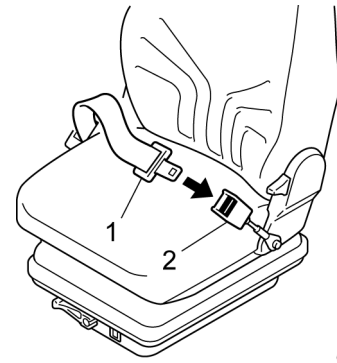
CAUTION

The operator seat should be adjusted with the engine stopped.

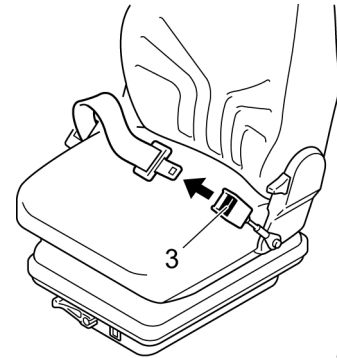
(T0988566-154-0E)

3-1-3 Seat belt (T0988566-020-0E)

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



CA-C200401



CA-C200411



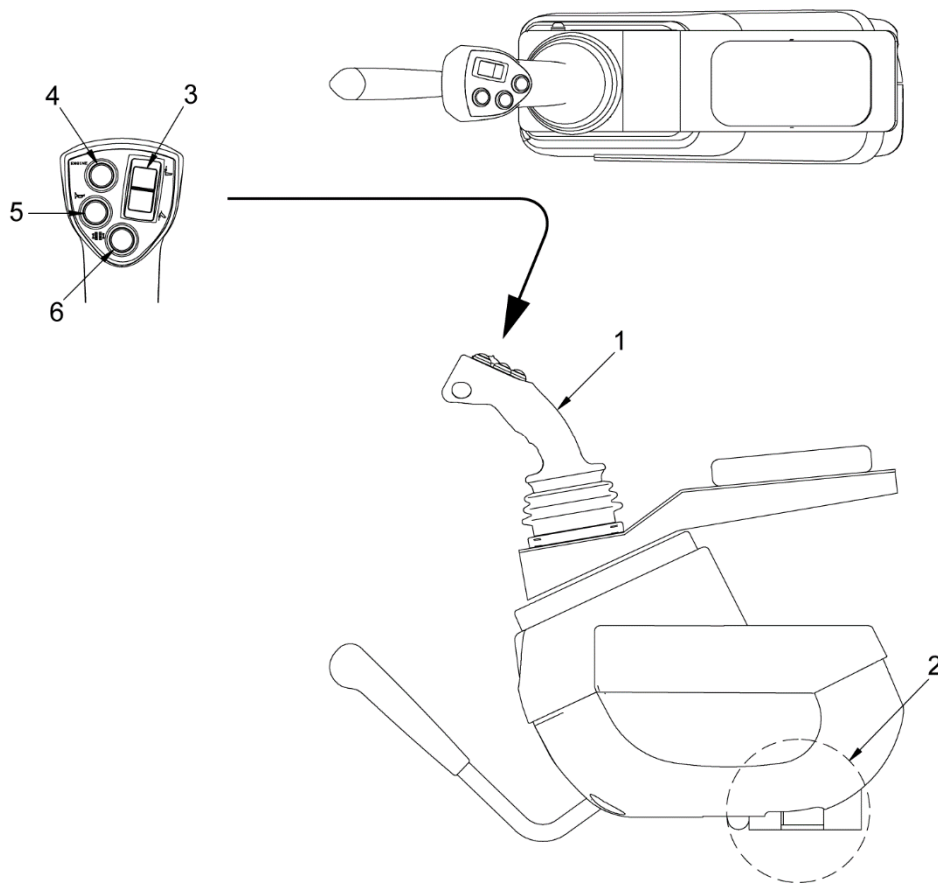
CAUTION

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

(T0988566-078-0E)

3. Explanation of the operation devices

3-1-4 Left lever unit (T0988566-021-0E)



I0988566-172-0

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

3. Explanation of the operation devices

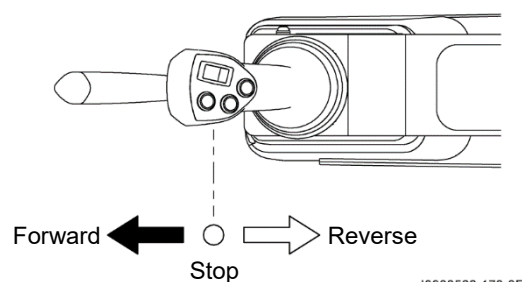
(1) Joystick lever

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

Forward: Push the lever forward.

Stop: Return the lever to the neutral position.

Backward: Pull the lever backward.



I0988566-173-0E

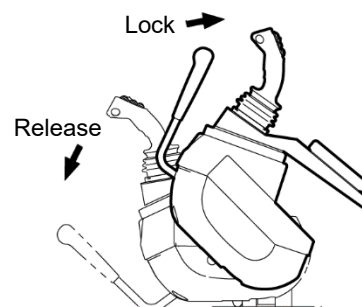
(2) Lever lock switch

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

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

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

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



I0988566-017-0E

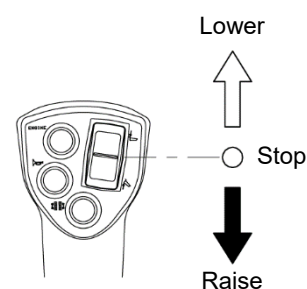
(3) Dump operation switch

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

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

Stop: Release the switch to stop the vessel.

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



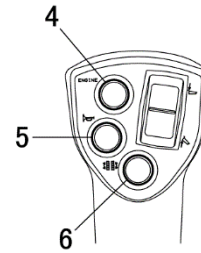
I0988566-174-0E

3. Explanation of the operation devices

(4) Engine start/stop button

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

The engine can be stopped by holding down this button while the engine is running.



I0988566-175-0

(5) Horn button

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

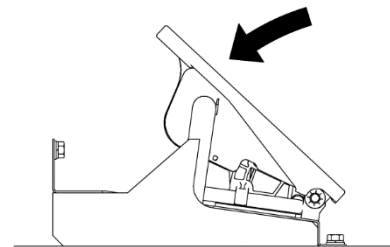
(6) Spin turn button

Spin turn operation can be performed by operating the joystick laterally while holding down the switch button (6).

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

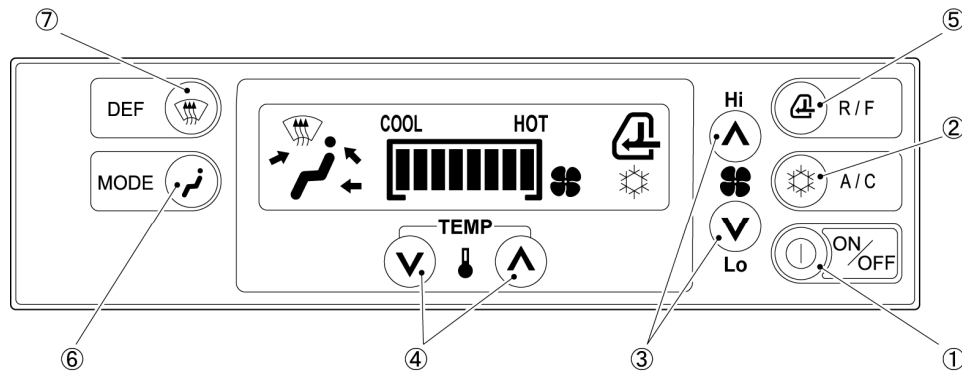
(7) Accelerator pedal (option)

This mode adjusts the travel speed of the machine.



I0988566-023-0

3-1-5 Air conditioner



CA-C201410

Names and functions of the operation panel components

① ON/OFF switch (power switch)

Use this switch to start and stop the air conditioner.

When this switch is pressed, the air conditioning operation starts with the settings used when the air conditioner was turned OFF previously.

When the ON/OFF switch is pressed for the first time, the operation starts with the factory settings.

② A/C switch (air conditioner switch)

Each time this switch is pressed, the compressor is switched ON and OFF. When ON,  lights up on the LCD unit.

③ FAN switches (airflow switches)

When one of these switch is pressed while the air conditioner is operating, the airflow changes and the newly set airflow status lights up on the LCD screen.

Pressing  increases the airflow.

Pressing  decreases the airflow.

LCD screen display				
Airflow	Weak	Medium	Strong	Super strong

CA-C201420

④ TEMP switches (temperature setting switches)

To set the temperature inside the cabin, press this switch while the air conditioner is operating.

Pressing  increases the temperature setting (spurting temperature).

Pressing  decreases the temperature setting (spurting temperature).

The newly set temperature state is displayed on the LCD screen.

⑤ R/F switch (REC/FRESH switch)

Each time this switch is pressed, the air circulation mode changes between recycle air and fresh air and either  or  is displayed on the LCD screen.

.....Recycle

.....Fresh air

⑥ MODE switch (air outlet switch)

Each time this switch is pressed, the air outlet changes in the order of Face → Vent → Bi-level → Foot → Face and so on, and the selected air outlet is displayed on the LCD screen.

				
Air outlet	Face	Face & vent	Face, vent & foot	Foot & Def (gentle breeze)
Air outlet direction	Front of upper body	Front and back of upper body	Front and back of upper body Underfoot	Underfoot Front glass

CA-C201430

⑦ DEF switch (defroster switch)

When this switch is pressed, the air outlet changes to the defroster and  is displayed on the LCD screen. Use this switch to clear condensation on the inside of the front glass and thaw frost from the outside of the front glass.

LCD screen display	
Air outlet	Def & foot (gentle breeze)
Air outlet direction	Front glass Underfoot

CA-C201440

3. Explanation of the operation devices

Operating procedure

To start and stop the air conditioner

Press the power switch.

To cool

- ① Press the A/C switch.
- ② Using the TEMP switches, set the temperature setting to  on the LCD screen.
- ③ Using the airflow switches, select the desired airflow.
- ④ Using the MODE switch, select Vent  as the air outlet position. (It is the recommended position, but you can change Vent as desired.)
- ⑤ Using the R/F switch, select Recycle  (recommended setting).

If it gets too cold, raise the temperature with the TEMP Up switch, decrease the airflow with the Lo airflow switch, or adjust to the desired temperature using both.



CAUTION

- When the A/C switch is not pressed, air conditioning does not take effect and the air ventilation mode is automatically set.
- When Vent is selected as the air outlet, air also blows out of the face vents.
- While clearing condensation on the front glass, do not set the temperature close to the maximum cooling temperature.
- If cool air blows onto the front glass, the outside of the front glass may condensate, interfering with visibility.

(T0988566-215-0E)

To heat

- ① Using the TEMP switches, set the temperature setting to  on the LCD screen.
- ② Using the airflow switches, select the desired airflow.
- ③ Using the MODE switch, select Foot  as the air outlet. (It is the recommended position, but you can change the foot position as desired.)
- ④ Using the R/F switch, select Recycle  (recommended setting).

If it gets too hot, lower the temperature with the TEMP Down switch, decrease the airflow with the Lo airflow switch, or adjust to the desired temperature using both.



CAUTION

- When the A/C switch is pressed, dehumidification heating takes effect.
- When Foot is selected as the air outlet, air also blows out of the defroster.

(T0988566-216-0E)

To thaw frost from the front glass

- ① Using the TEMP switches, set the temperature setting to  on the LCD screen.
- ② Using the airflow switches, select the desired airflow.
- ③ Using the DEF switch, set the air outlet as the defroster .
- ④ Using the R/F switch, select Recycle .



CAUTION

- By pressing the MODE switch, the setting before the DEF switch was pressed is restored.
- When DEF is selected as the air outlet, air also blows out of the foot vents.

(T0988566-216-0E)

To clear condensation on the front glass

- ① Using the airflow switches, select the desired airflow.
- ② Using the DEF switch, set the air outlet as the defroster .
- ③ Using the R/F switch, select Fresh Air .



CAUTION

- To quickly clear condensation, select the maximum airflow using the Hi airflow switch.
- By pressing the MODE switch, the setting before the DEF switch was pressed is restored.

(T0988566-217-0E)

3. Explanation of the operation devices

3-2 Outside the cab (T0988566-022-0E)

(1) Cover

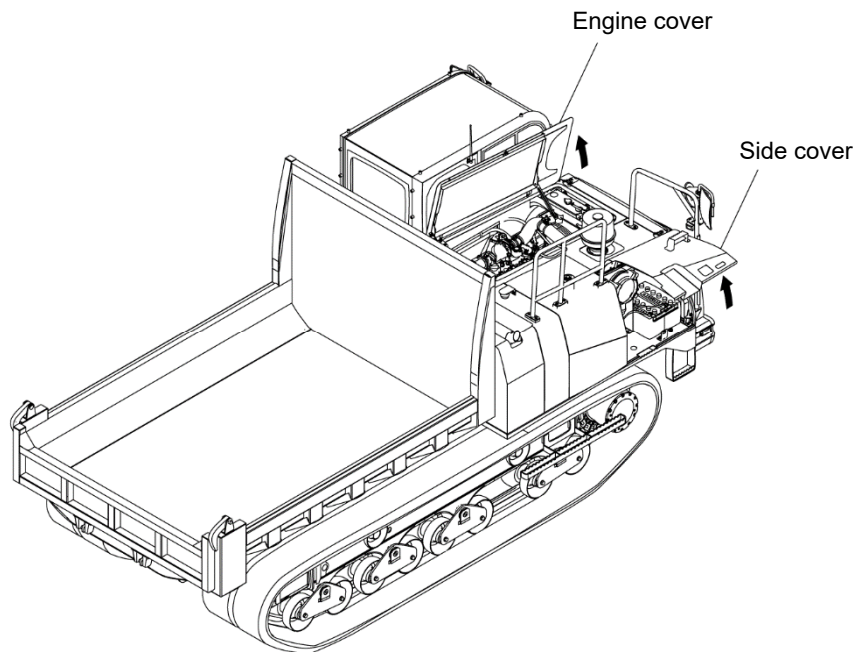
For inspection and servicing, park the machine on the level ground. Open each cover and engage the stopper securely.



CAUTION

- If you open the cover of the machine on a slope or in a strong wind, the cover could close unexpectedly, causing injury.
- Be sure to close all covers and lock them before you start to travel or operate the machine.
- Never travel or operate the machine with the cover open.

(T0988552-064-0E)

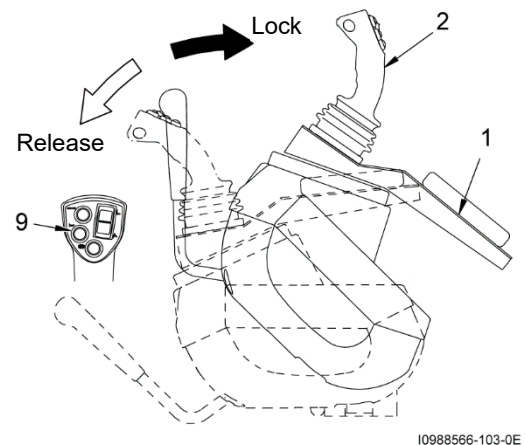


I0988566-102-0E

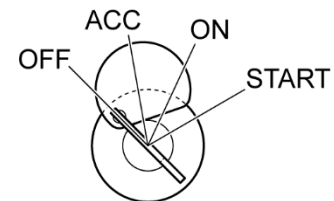
4. Explanation of operation (T0988566-023-0E)

4-1 Before starting the engine (T0988566-024-0E)

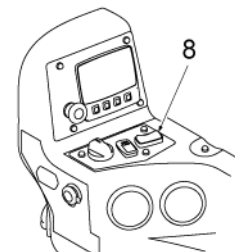
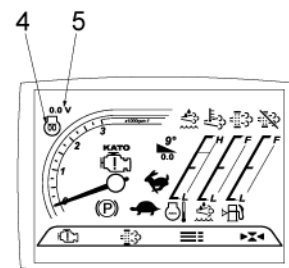
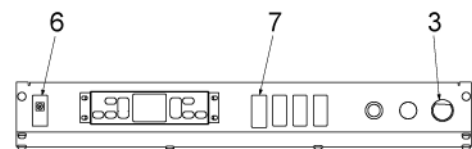
- (1) Sit on the seat, adjust it to allow free lever operations, and fasten the seat belt.
- (2) Make sure that the left lever unit (1) is set at the lock position.
- (3) Make sure that the joystick lever (2) is set at the neutral positions.
- (4) Insert the key into the engine key switch (3), turn it to the ON position, and check the following:



- 1) The display turns on. Make sure that the model name is correct.
- 2) Engine preheating starts automatically. Make sure that the preheat lamp (4) is lit and goes out then.
The lighting time of the preheat lamp varies with the water temperature.



- 3) Make sure that the battery voltage display (5) is normal (approximately 24 V).
- 4) Make sure that the mark lamp of the parking switch (6) is on.
- 5) Operate the headlight switch (7) and make sure that the headlights go on.
- 6) Operate the turn signal switch (8) and make sure that the turn signal lamps flashes.
- 7) Push down the horn button (9) of the joystick and make sure that the horn sounds.



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

I0988566-105-0

4. Explanation of operation

4-2 Engine starting (T0988566-025-0E)



CAUTION

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

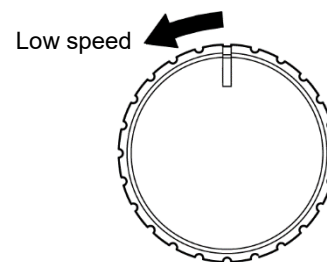
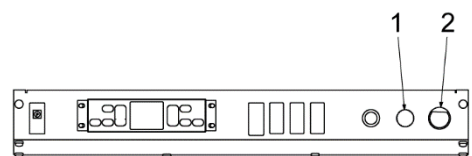
(T0988566-079-0E)

NOTICE

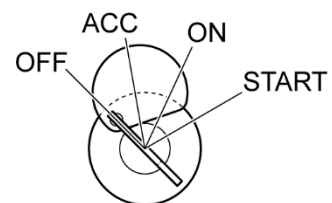
Do not turn on the starter motor for 30 seconds or more. If the engine does not start, return the key switch to OFF, wait for at least 2 minutes and restart the engine.

(T0988566-080-0E)

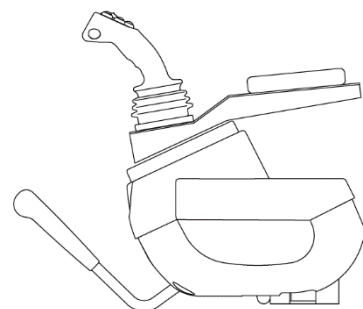
- (1) To provide against unexpected behavior of the machine, set the engine speed control dial (1) to the low position.
- (2) Make sure that the preheat lamp on the display is off. Turn the key (2) to the START position. The engine starts.
- (3) Release the hand from the key when the engine starts.
The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



I0988566-106-0E



I098857500-047-0



Operation position with the lever lock released

I0988566-217-0E

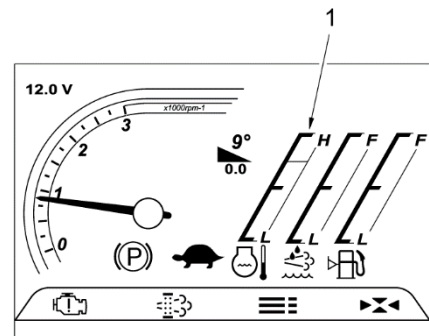
4-3 After starting the engine (T0988566-026-0E)

NOTICE

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

(T0988566-081-0E)

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



I0988566-107-0

4-4 Basic operation (T0988566-027-0E)

4-4-1 Start-travel-stop (T0988566-028-0E)

WARNING

- When traveling, lower the vessel completely.
If a travel operation is performed while the vessel is in a raised position, 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.

(T0988566-082-0E)

4. Explanation of operation

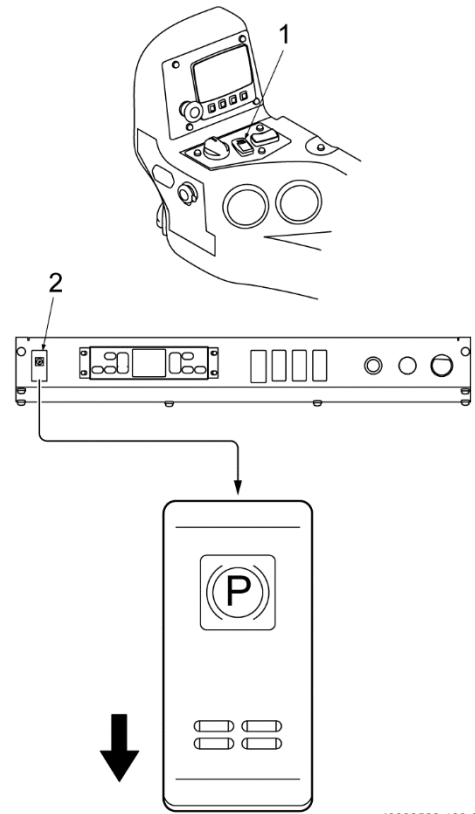
- (1) Adjust the traveling speed properly with the travel speed select switch (1).

- (2) Push down on the no-mark position of the parking switch (2) to deactivate the brake.

Make sure that the mark lamp is off.

The parking switch (2) is equipped with the parking brake safety function for preventing erroneous travel after turning ON the engine key switch.

After the engine key switch is turned ON, the machine cannot travel unless the parking switch (2) is turned ON once and then OFF.



I0988566-108-0

1) Joystick lever operation procedure

Use the joystick lever as shown below.

Forward: Push the joystick forward.

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

Backward: Pull the joystick lever backward.



I0988566-109-0



CAUTION

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

(T0988566-083-0E)

4-4-2 Steering control (T0988566-029-0E)

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.

(T0988566-151-0E)

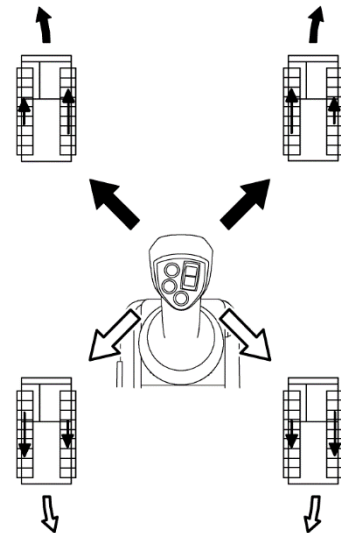
(1) Turn

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.



I0988566-110-0

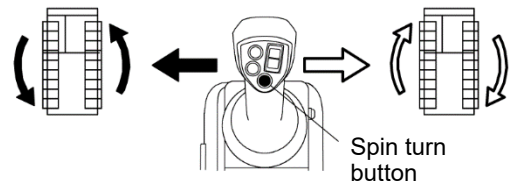
(2) Spin turn

Normal mode

Operate the joystick while holding down the spin turn button.

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

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



I0988566-111-0E

CAUTION

Pressing the spin turn button with the lever operated under light or no load should be avoided, or a risk of over-spin turn may be caused.

The spin turn button should be pressed with the joystick lever in the neutral position. Then operate the joystick lever.

(T0988566-152-0E)

Spin turn mode

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

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

When the key switch is turned off, the spin turn mode is canceled.

4. Explanation of operation

4-4-3 Dump operation (T0988566-030-0E)



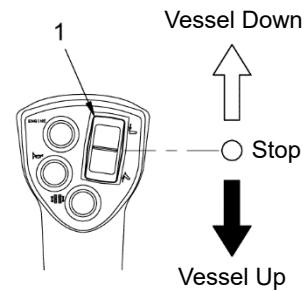
DANGER

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

(T0988566-086-0E)

(1) Procedure of dump operation

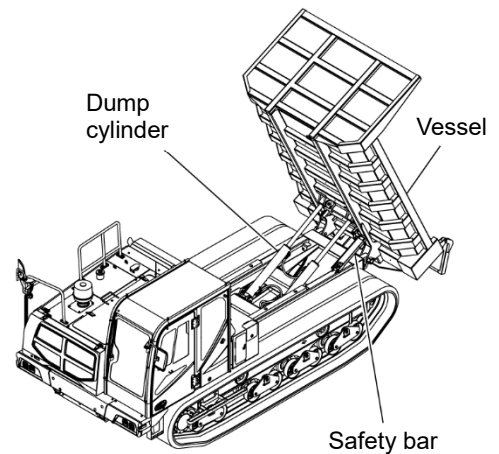
- 1) Stop the machine and confirm safety of a dumping place.
- 2) Raise or lower the vessel with the dump operation switch (1).
Vessel Up: Slide the switch backward.
Stop: Return the switch to the neutral position.
Vessel Down: Slide the switch forward.
- 3) Adjust the dumping speed by the engine revolution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



I0988566-112-0E

(2) Caution of dump operation

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



Dump at a level and stable place.

I0988566-113-0E

4-4-4 How to lower vessel in case of emergency (T0988566-031-0E)



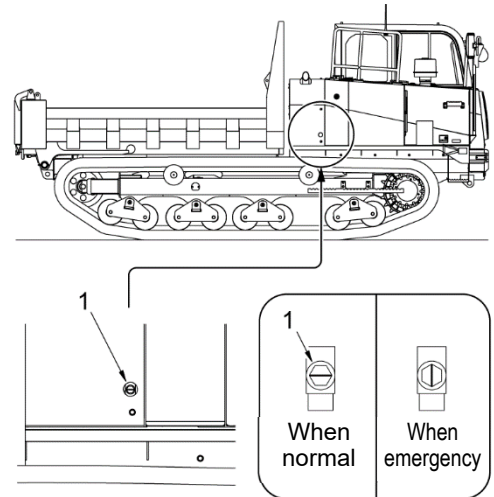
CAUTION

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

(T0988548-051-0E)

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

- (1) Make sure that there are no persons under or around the vessel.
- (2) Loosen the plug by using a socket wrench.
- (3) Turn the plug to the position for emergency vessel lowering. Then the vessel starts lowering.
- (4) Tighten the plug firmly after vessel has lowered completely.

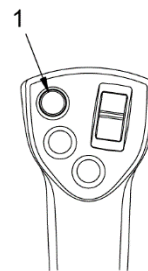


I0988566-114-0E

4-4-5 Engine start/stop button (T0988566-032-0E)

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

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



I0988535-018-0

The use of the engine start/stop button on the joystick lever is for temporary operation.

When the engine is stopped by this method, the engine key switch is in ON position and the battery is consumed. Therefore, when away from the machine for an extended period of time, be sure to stop the engine using the engine key switch (described later).

4. Explanation of operation

4-5 Warming up the machine (T0988566-033-0E)

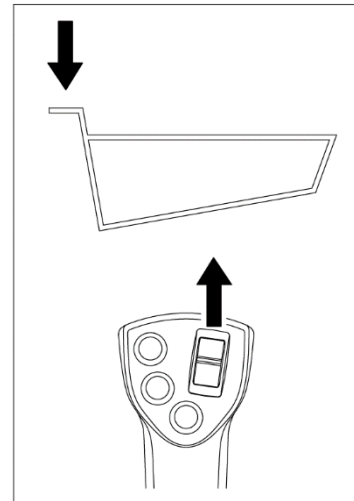
NOTICE

Do not increase the engine speed quickly when hydraulic oil is cool (below 20°).

The proper hydraulic oil temperature is approximately 50°C to 80°C. If you should carry out works at low temperature, warm up the engine until the hydraulic oil temperature rises to approximately 20°C before starting works.

(T0988566-088-0E)

- (1) When the temperature of the engine cooling water is low, the warm-up mode is activated. While in the warm-up mode, the idling engine speed increases; however, when the water temperature rises, the warm-up mode is automatically deactivated.
- (2) Idle the engine for approximately 5 minutes to warm it up after starting it.
- (3) If the hydraulic oil temperature is low, continue warming up for approximately 3 to 5 minutes with the dump lever to the "Lower" position to increase the hydraulic oil temperature, when it is low.



I0988566-220-0

- (4) Move the machine forward and backward and raise and lower the vessel several times to warm up the mechanisms.

4-6 "Break-in" operation (T0988566-034-0E)

NOTICE

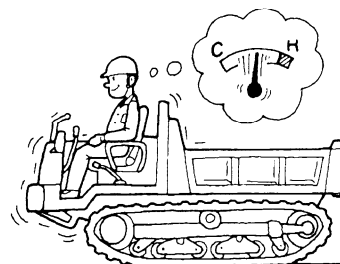
If a new machine is used in severe conditions, its performances are deteriorated early and the service life becomes shorter. Break in a new machine for about 100 hours first.

(T0988566-089-0E)

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

- Warm up the machine sufficiently.

Warm-up operation



CA-C300130

- Do not start or accelerate quickly or stop unnecessarily. Do not change the direction quickly.

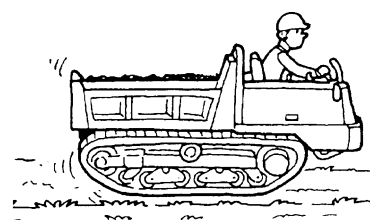


CA-C300150

- 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.

80 %

CA-C300140

4. Explanation of operation

4-7 Characteristics of travel operation (T0988566-035-0E)

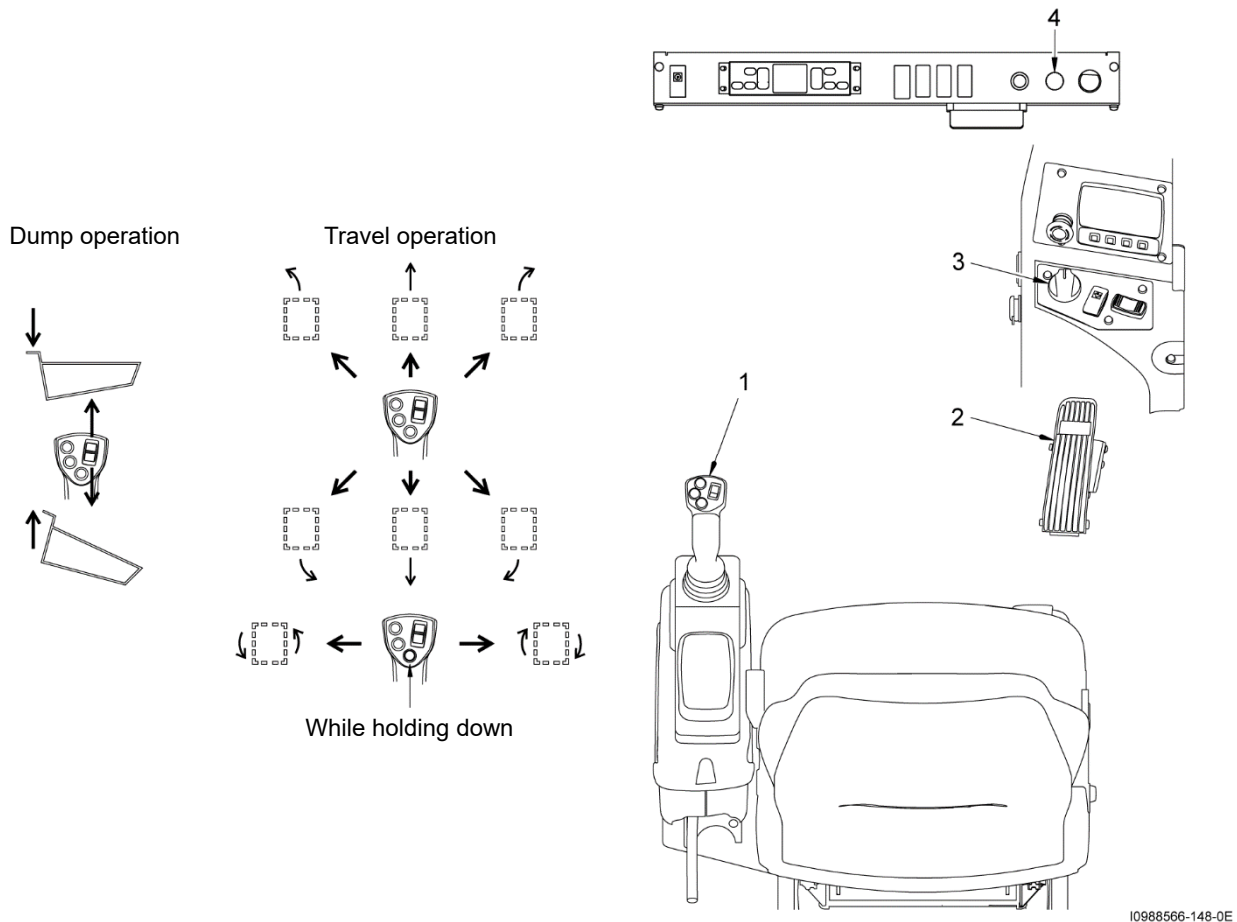
The operations of the joystick and the accelerator pedal (option) are linked with the engine revolutions and the hydraulic pump; thereby automatically controlling the oil pressure and the amount of discharge, stable travel speeds are achieved even with varied ground condition and loads.

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

(1) Joystick

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

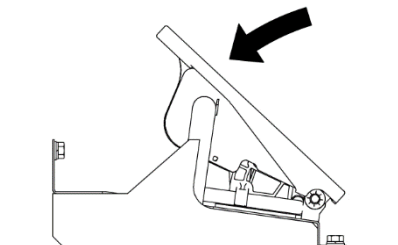
The engine revolutions are automatically linked according to the amount of each operation.



I0988566-148-0E

(2) Accelerator pedal

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



I0988566-023-0

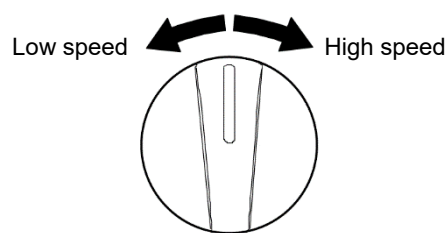
(3) Travel speed control dial

This adjusts the speed of travel operated with the joystick.

When this dial is set to the low speed side, the travel speed can be controlled by the joystick from 0 to very low speed.

When this dial is set to the high speed side, the travel speed can be controlled by the joystick from 0 to the maximum speed.

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

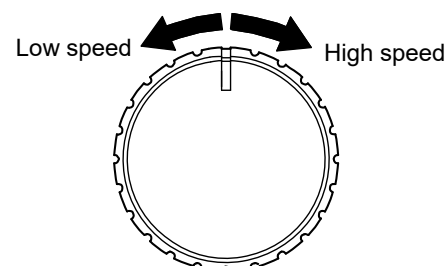


I0988566-118-0E

(4) Engine speed control dial

This dial is used to adjust the lowest engine speed.

The engine speed is controlled automatically according to lever operation, and usually the engine speed control dial is not used.



CA-C201040

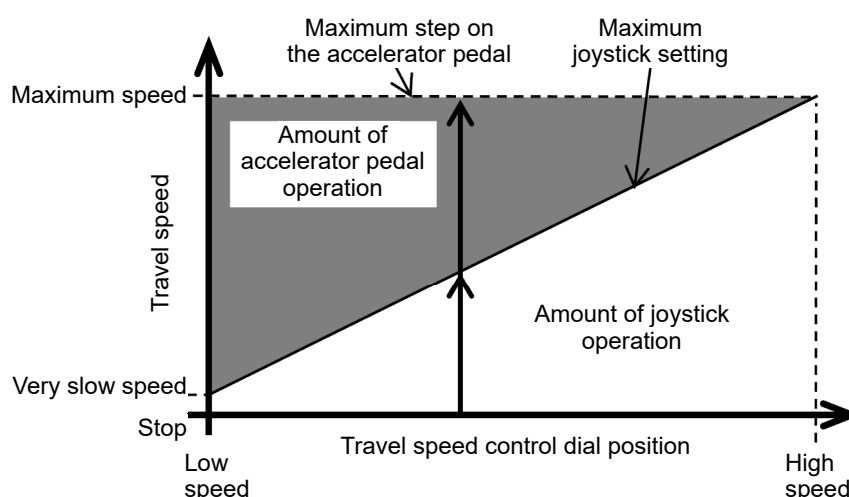
(5) Details of travel operation

The travel speed of the machine is determined by the engine revolutions and the hydraulic pump discharge amount (pump tilt angle), which is also affected by ground condition such as uphill and downhill, road surface conditions, load of travel such as the presence of loads on the vessel.

Stable travel speeds are achieved by linked control of the number of engine revolutions and the hydraulic pump according to the travel speed command entered using the joystick and also by changing them automatically according to travel load.

• Relationships between the joystick and the accelerator pedal (option)

The machine can be operated like an automobile by controlling the travel speed using the accelerator pedal with the joystick operated fully toward the traveling direction. (Refer to P. 54.)

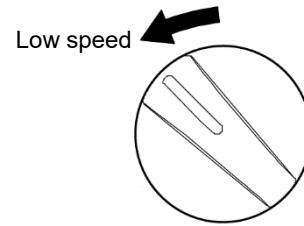


CA-C301390

4. Explanation of operation

(6) When the travel speed control dial is at the lowest speed position

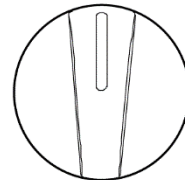
- Operating the joystick travels the machine at a speed range from stop to very slow.
- Operating the accelerator pedal (option) can adjust the speed of travel from very slow to the maximum.



I0988566-121-0E

(7) When the travel speed control dial is at the intermediate speed position

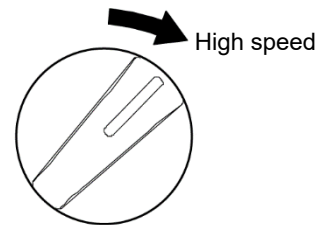
- In addition to the travel speed range that can be adjusted with the joystick, the accelerator pedal (option) can be used to adjust to the maximum speed.



I0988566-224-0

(8) When the travel speed control dial is at the highest speed position

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



I0988566-123-0E

4-8 Stopping the engine (T0988566-036-0E)

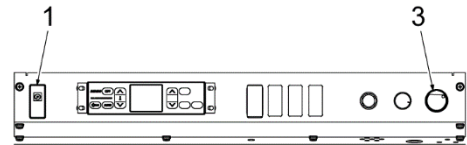
WARNING

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

(T0988566-090-0E)

(1) Stopping the machine

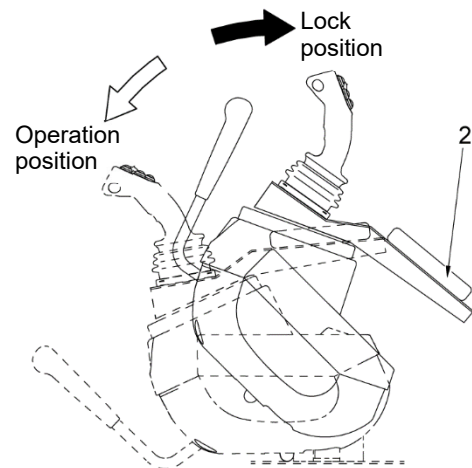
- 1) Stop the machine on a flat and rigid ground.
- 2) Set the parking switch (1) to the brake ON position.
- 3) Make sure that the vessel is lowered completely.
- 4) Check if the left lever unit (2) is set to the lock position.



I0988566-124-0

(2) Stopping the engine

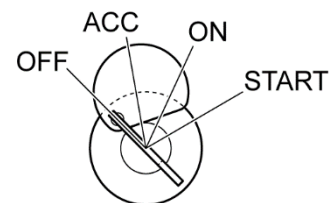
- 1) Keep the engine idling for approximately 5 minutes to lower the temperature of the engine.
- 2) Set the engine key switch (3) to the OFF position to stop the engine.
- 3) Pull out the key from the engine key switch.



I0988566-167-0E

(3) Inspection and locking after stopping the engine

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



I098857500-047-0

4. Explanation of operation

4-9 Stopping the engine (T0988566-037-0E)

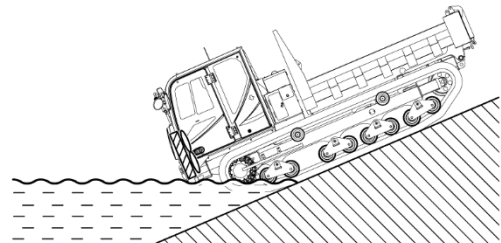
- (1) The acceptable water limit is up to the lower roller.

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.



CA-C100150

- (2) 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.



I0988566-126-0

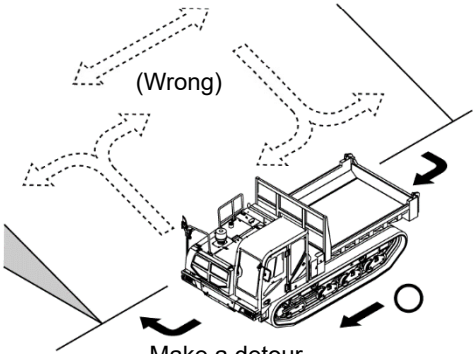
4-10 Caution of travel on a steep slope (T0988566-038-0E)


DANGER

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

Never change the travel direction on or cross a slope.

(Wrong)



Make a detour on a flat ground.

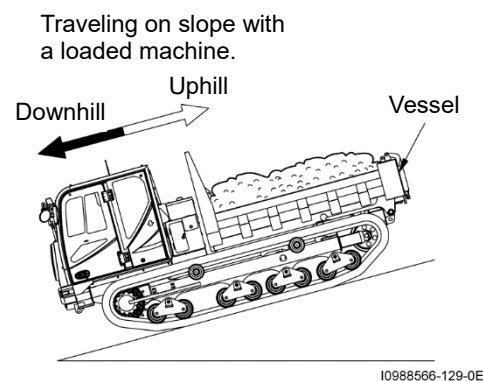
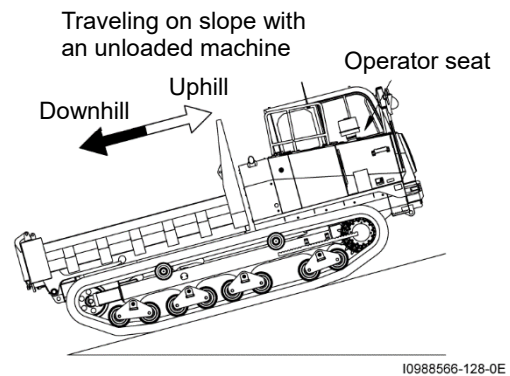
I0988566-127-0E

(T0988566-091-0E)

(1) Cautions

Travel in the proper postures shown below.

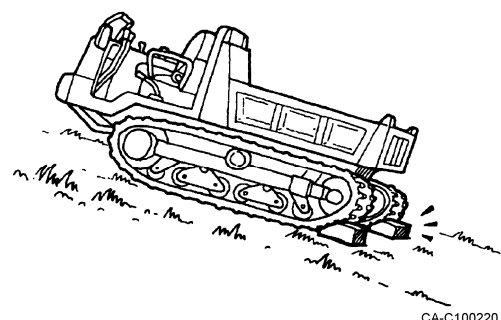
- Drive the machine with the cabin upper side of a slope when the vessel is empty. This posture ensures stable driving, since the center of gravity is located on the cabin side.
- Drive the machine with the vessel upper side of a slope when the vessel is full. This posture ensures stable driving, since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



(2) Do not park or stop the machine on a slope.

There is a danger of the machine running uncontrollably if stopped or parked on a slope.

When it is unavoidable to stop or park the machine on a slope, place stopper blocks under both crawlers at the lower end of the machine.

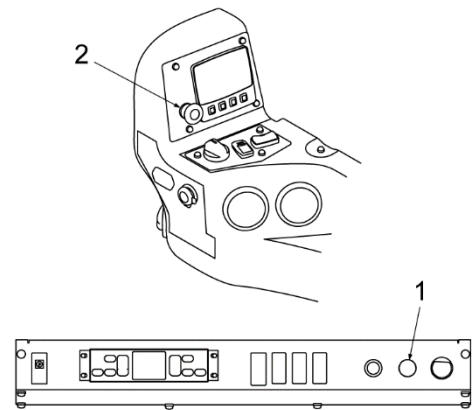


4. Explanation of operation

Overrun avoidance operation

Carry out the following operations immediately to reduce the speed:

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



I0988566-222-0

WARNING

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

(T0988566-209-0E)

Emergency engine stop switch

The engine can be stopped forcibly by pressing the emergency engine stop switch (2).

WARNING

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

(T0988566-210-0E)

4-11 Precaution on use of rubber crawler shoe (T0988566-039-0E)



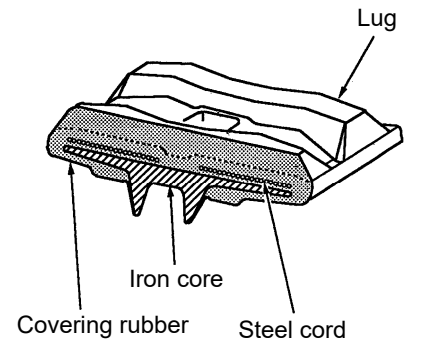
CAUTION

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.

(T0988566-092-0E)

4-11-1 Structure of rubber crawler shoe (T0988566-040-0E)

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



CJ-C300440

NOTICE

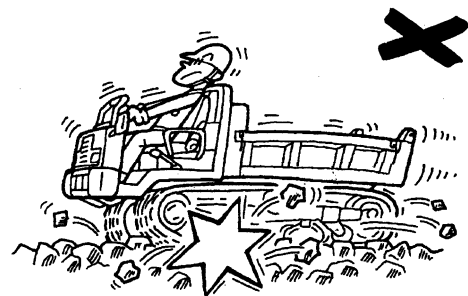
If a crack reaches the steel cord, it may be rusted and cut off by moisture. When any crack is detected, immediate repair is essential. Please contact our local dealer.

(T0988566-093-0E)

4-11-2 Prohibitions while working and traveling (T0988566-041-0E)

- (1) Do not travel or work on stone foundations or sharp rocks

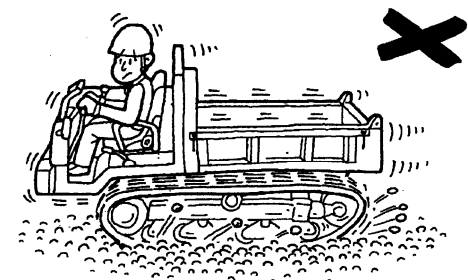
This wears down the lug and causes the steel cord to break.



CA-C300450

- (2) 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

4. Explanation of operation

(3) Do not travel or work on steel or scrap material

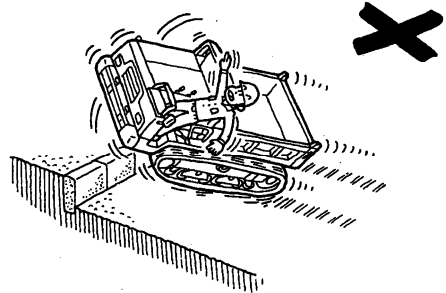
This wears down the lug and causes the steel cord to break.



CA-C300470

(4) Do not travel or work on large steps such as stone stairs

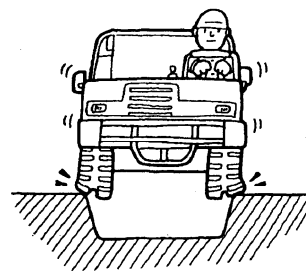
- Move slowly directly up steps.
- While moving up the steps, avoid places where the road surface changes.



CA-C300480

(5) Do not travel or work while spanning a ditch etc.

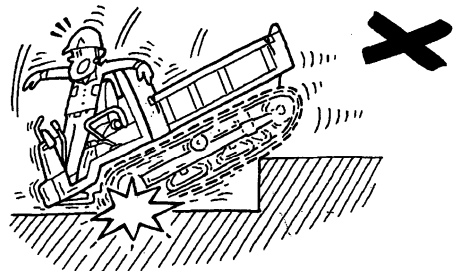
- This wears down the lug and breaks the iron core.
- The carrier might fall or topple over.



CA-C300490

(6) Avoid locations where the carrier might fall

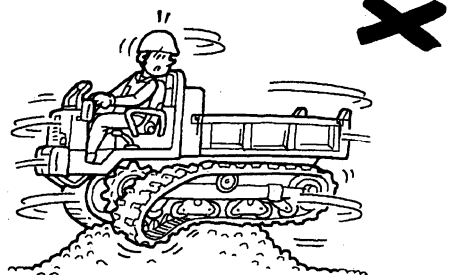
Do not let the carrier fall from locations like large stone steps.
This might damage or break the iron core.



CA-C300500

(7) Avoid traveling over large ruts or protrusions on the road

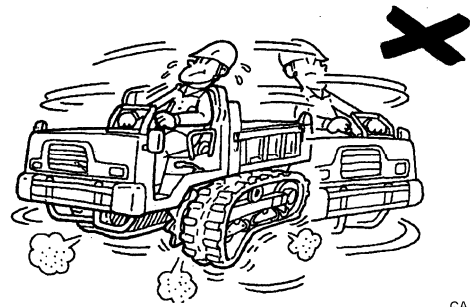
- Travel slowly and take care not to let the crawlers come off the rollers.
- Do not change directions when the crawlers may have lost tension at the high and low parts of ruts and protrusions. This may cause the crawlers to come off.



CA-C300510

(8) Avoid sudden changes in direction when steering

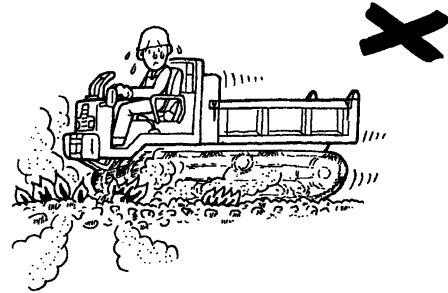
- Make direction changes in several smaller steering movements.
- Avoid sudden changes in direction.
This causes early wear on the lug and may cause the crawlers to slip off.



CA-C300520

(9) 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.

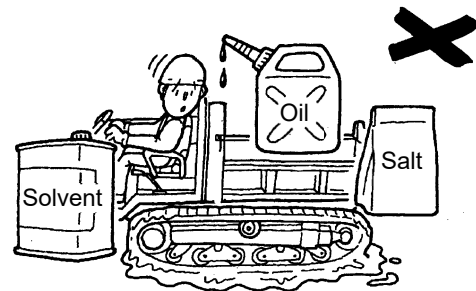


CA-C300530

4-11-3 Other items for caution (T0988566-042-0E)

(1) Do not let oil – solvents or salt adhere to the rubber crawlers

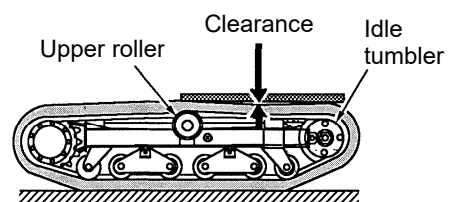
- If fuel, transmission fluid, DEF or paint should adhere to the rubber crawlers wipe it away quickly.
- Wash away with water after working in locations with a large salt content. Salt can cause the iron core to rust or peel.



CA-C300540

(2) 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-C300550

5. Operation (01E0-0155-0E)

5-1 Before starting operation (T0988566-040-0E)

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.

(1) Walk-around inspection

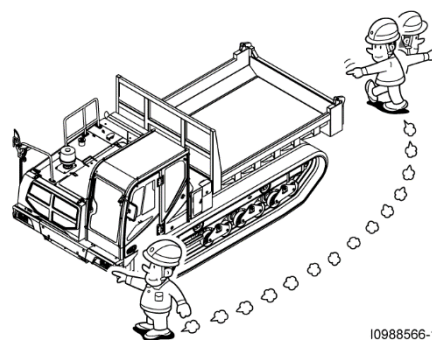
Look around and under the machine and check the items shown below.

Repair defective parts before starting operation.

- 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.
- Check oil leak and water leak from the engine.
- Remove dust and foreign matters from the engine, radiator and peripheral parts.
- Check for leaks from and damages to the intake and exhaust pipes around the air cleaner and the post-processing unit.

If flammable objects touch the exhaust pipe or the like, a fire may break out. Make sure that there is no withered grass, paper trash or other flammable objects near the exhaust pipe.

- Check loose terminals of the electrical cables.



I0988566-133-0

(2) Start-up inspection

Refer to [MAINTENANCE] for details.

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

For details of operation, refer to the sections 4-1 to 4-8 of "4. Explanation of operation".

6. Handling under special conditions (01E0-0247-0E)

6-1 Handling in cold conditions (01E0-0248-0E)

6-1-1 Preparations for low temperatures (T0988548-090-0E)

When the outside air temperature in winter drops to 0°C or below, the ability of the engine to start and the performance of lubrication in all parts deteriorates and falling air temperatures bring a variety of other ill effects, so adequate advance preparation is necessary.

Refer to the sections below and make adequate preparations for winter.

(1) Fuel

Use a diesel fuel with a fluidity point 5°C lower than the outside temperature. For example, if the outside air temperature falls to -15°C, use diesel fuel which remains fluid at -20°C.

WARNING

Using a non-specified fuel can not only adversely affect performance, but could also cause a serious accident. Such problems are not subject to guarantee.

(01E0-0251-1E)

(2) Engine oil

Use the engine oil recommended by KATO. Using an oil other than the type recommended by KATO could cause engine malfunction/failure.

Engine oil softens (lower viscosity) at higher temperatures and becomes thicker (higher viscosity) at lower temperatures. Therefore, use an oil with a viscosity appropriate for the given air temperature conditions. Contact your authorised KATO dealer before operating the engine at the outside air temperature below -20°C.

Grade	Temp. & application (°C)									Qty required
	-30	-20	-10	0	10	20	30	40		
API CJ-4, CK-4	*	SAE10W-30							Hi: 18.6 L Lo: 16.1 L	
		SAE15W-40								

* Factory default

(T0988575-002-0E)

NOTE

- Use engine oil classified to or API classification CJ-4 or CK-4 only.
- Use the appropriate engine oil according to the ambient temperature.

25°C or higher	10W-30 10W-40 15W-40
-10°C to 25°C	10W-30 10W-40 15W-40
-10°C or lower	10W-30 10W-40

(3) Lubricant

Replace the lubricant used in respective equipment with low viscosity lubricant.

Refer to "3-2 Recommended lubrication table" in the inspection and servicing section regarding specified viscosities.

6. Handling under special conditions

(4) Battery

Normally battery electrolyte does not freeze in cold weather, but if the battery charge is low, some freezing is possible. A battery which has frozen is permanently unusable, so take precautions to maintain the battery temperature.

6-1-2 Checking the coolant level and replenishing the coolant (T0988566-060-0E)

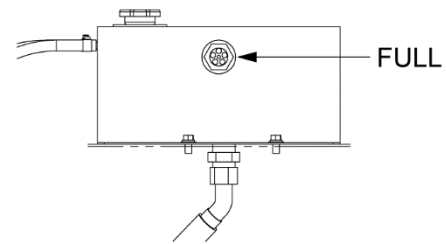


CAUTION

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

(T0988566-107-0E)

- (1) Open the right side cover of the machine. Check that the coolant level in the coolant tank is between the FULL line and the LOW line. Replenish the coolant to the FULL line if it is insufficient.



1098857500-007-0

- (2) When the coolant tank is empty, stop the engine, check for coolant leak, check the radiator coolant level, and replenish the coolant to the radiator and coolant tank.

6-1-3 Changing the coolant (T0988566-061-0E)



WARNING

- Immediately after the engine stops, coolant is hot. If coolant is discharged in this state, you may get burnt. Change coolant after the engine cools down.
- Do not remove the cap when the radiator coolant is hot. After the coolant temperature lowers, rotate the cap slowly to relief the pressure, and remove it.

(T0988566-108-0E)

(1) Coolant

- A new machine is filled with coolant containing long life coolant (LLC). This coolant has anti-freezing effect and corrosion resistant effect.

The long life coolant has long-term effects and may be used in all seasons.

- Replace coolant annually (every autumn).
- Be sure to use long life coolant when replacing coolant.



WARNING

- The long life coolant is toxic.
- If someone shallows it by mistake, make him/her vomit it immediately and consult a doctor.
- If long life coolant gets into eyes, immediately rinse with water sufficiently and consult a doctor.
- When storing long life coolant, use a container with an antifreeze solution label, cap the container and keep it out of the reach of children.

(T0988566-109-0E)

(2) Coolant mixing ratio

The freezing temperature of long life coolant depends on mixing ratio with water.

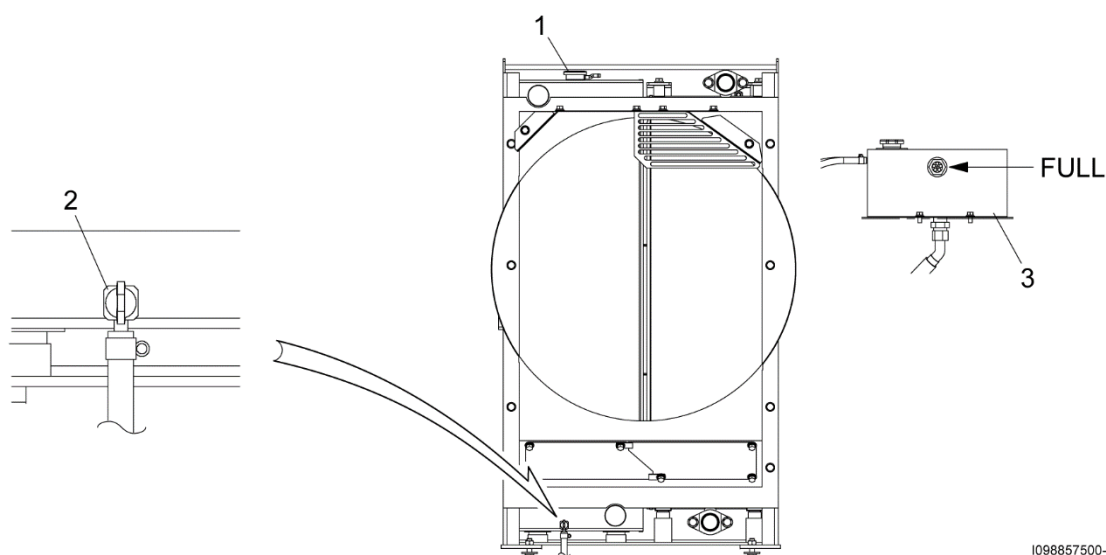
This machine is filled with 50% long life coolant at the time of shipment in order to protect the cooling system from rust regardless of the outside air temperature.

The mixing ratio of long life coolant should be 50% in all areas throughout the year.

Use tap water for mixing.

Lowest outside air temperature (°C)		-35
Mixing ratio (%)		50
Mixing volume (L)	LLC volume (L)	15.6
	Water volume (L)	15.6
Coolant 30.2 L in total		Engine: 11.7 L Radiator hoses: 8.0 L Coolant tank: 10.5 L

(3) Coolant change procedure



1098857500-008-0

- 1) Stop the engine.
- 2) After the engine has cooled down, remove the radiator cap (1).
- 3) Open the drain cock (2) at the bottom of the radiator to drain the coolant.
- 4) Close the drain cock. Pour tap water and cooling agent (radiator cleaner). Start the engine and keep it running at a speed slightly higher than the low idling speed for about 10 minutes.
- 5) Stop the engine. Open the drain cock to drain the content.
- 6) Rinse the inside with tap water until the water coming out becomes clean.
- 7) Close the drain cock. Pour mixture of tap water and long life coolant into the radiator until its level reaches just below the filling port.
- 8) Start the engine and keep it running at the low idling speed for 5 minutes. Then stop the engine.
This allows internal air to be released and the coolant level lowers. Replenish coolant to the level just below the filling port. Close the radiator cap.
- 9) Discharge the coolant in the coolant tank (3). Clean the inside of the tank. Pour coolant into the coolant tank until its level reaches the FULL mark.

6. Handling under special conditions

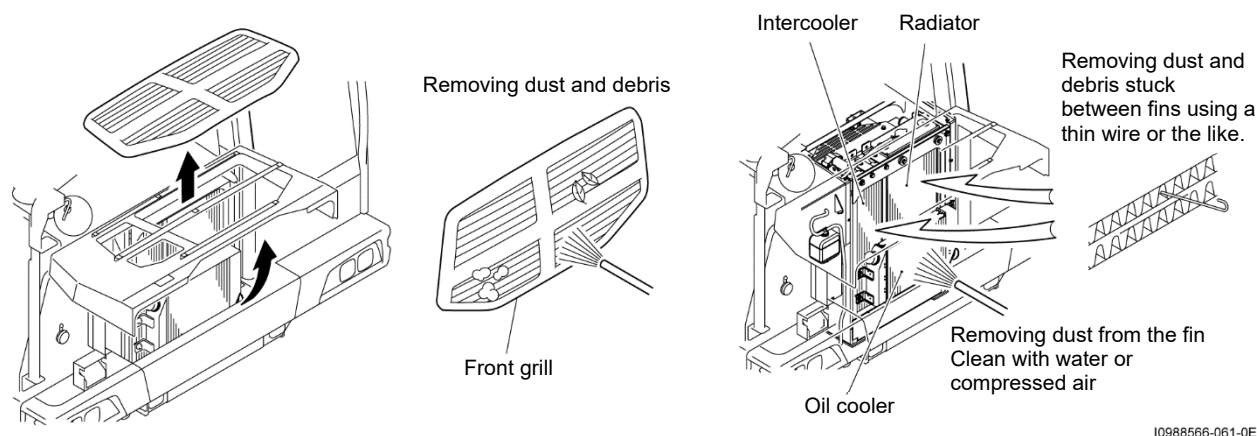
6-1-4 Precautions after operation (T0988552-067-0E)

- (1) Remove mud and water from the body and park the machine on concrete or hard dry ground. This is to avoid trouble the following day from the travel system such as the crawler shoes etc. freezing to the ground.
- (2) Thoroughly wipe away drops of water or mud from the piston rod surfaces of the hydraulic cylinders. Frozen water drops can damage the seals.
- (3) Open the drain cock of the fuel tank and drain plug of the water separator to drain out accumulated water from them. Water in fuel pipes can freeze and create blockages.
- (4) If use of tap water as the radiator coolant is unavoidable, drain completely the coolant from the engine and the radiator after the work. In such a case, attach a tag indicating "No coolant" in order to prevent a trouble in the next day.
- (5) Moisture at the key entry of the tool box etc. may freeze at night and make it impossible to turn the key. Wipe off the moisture well.

6-2 Handling under extreme heat (T0988548-093-1E)

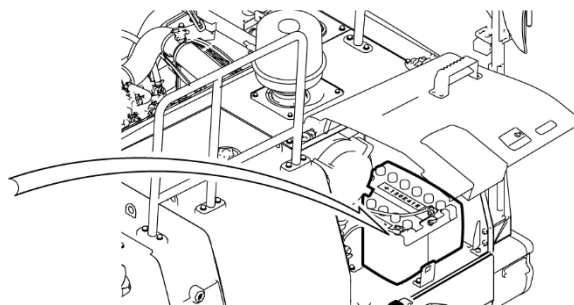
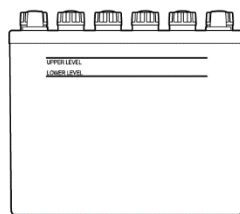
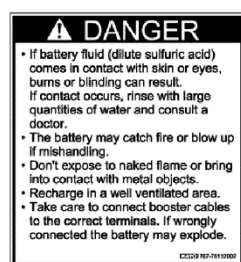
When using this machine under extreme heat, inspect and monitor the cooling system with great care to avoid any reduction of cooling efficiency.

- (1) Always keep the coolant up to the rated level and check that the cooling system is not leaking.
- (2) Check for blockages in the cooling fins of the oil cooler and the radiator.
 - 1) Check that nothing is clogging the cooling fins of the radiator and the intercooler.



- (3) Check the battery electrolyte level before you start the engine.

If the level is low, add it and measure the specific gravity. (Refer to P. 122.)



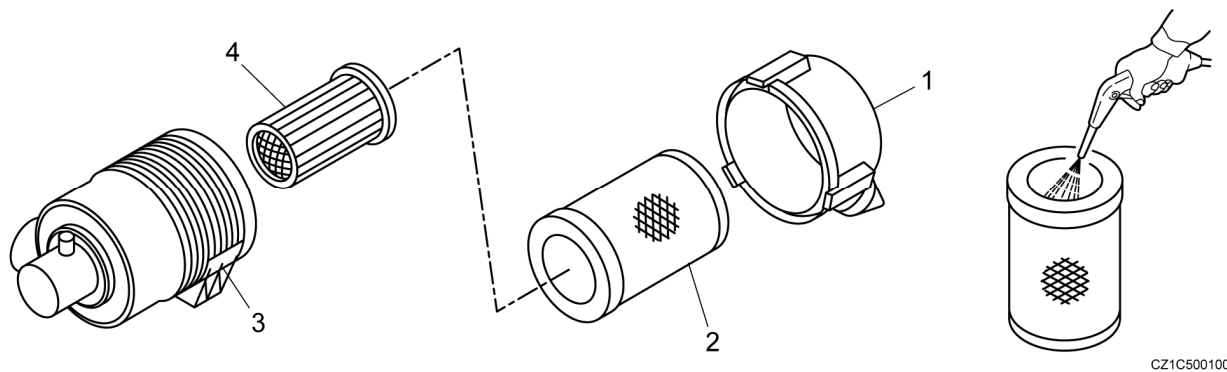
I0988566-070-0E

- (4) Watch the water temperature gauge while you work. If the coolant temperature warning indicator turns on, stop the work and inspect the cooling system.

6. Handling under special conditions

6-3 Handling under a dusty or sandy environment (T217451-022-0E)

(1) Inspect and clean air cleaner 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/cm²)) above and below along the crimp of the filter. Maintain an appropriate spacing (about 50 cm) between the tip of the nozzle and the filter.
- 5) Emit light (white light) from the inside of the element and inspect for damage to the filter.
Do not use the filter if the filter is damaged, or has pin holes, or has particularly thin portions, or if the seal portion is damaged.
- 6) After the cleaning is completed, affix the element again.
- 7) Attach with the arrow mark (↑) is towards the up direction, and fix with a fixing metal catch.

NOTICE

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

(T0988548-091-0E)

(2) 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.

(T0988548-092-0E)

6-4 Handling near the seashore (08E0-0041-0E)

(1) Preparations for operation

Check that all plugs, cocks, caps and bolts etc. are correctly tightened so that salt cannot enter.

(2) Treatment after operation

After work, wash the machine carefully to remove salt, paying particular attention to the care of electrical devices and hydraulic cylinders, to prevent corrosion. Also grease with care.

6-5 Handling in mud, rain, snow, zones of high humidity, on soft ground (01E0-0257-0E)

Humidity and mud attack paint, wiring and metal parts causing corrosion. When working under site conditions such as these, keep the machine as dry as possible and grease it thoroughly and carefully.

6-6 Handling in rocky ground (T0988548-094-1E)

(1) Be alert for cracks, wear, breakage and loose bolts in the travel system such as the crawler shoes etc. Adjust the crawler shoes to be slacker than usual.

(2) Since the rubber shoes are likely to be damaged, use them with care.

7. Long-term storage

7. Long-term storage (T0988566-155-0E)

(1) Before storage

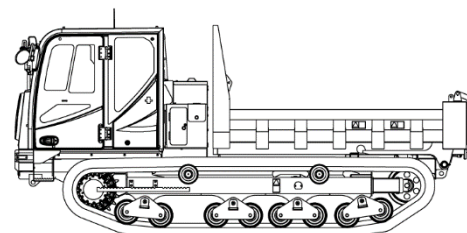
NOTICE

Move the vessel down to the lowest position before storing the machine as shown in the figure below in order to protect the cylinder rod from rust.

(T0988566-110-0E)

To store the machine for long periods of time, follow the next procedures.

- 1) Clean parts of the machine.
- 2) Lubricate parts of the machine.
- 3) Select a well-drained, dry and well-ventilated flat place, and put plates on the ground.
- 4) Disconnect the battery negative terminal connection and put a cover on the battery, or dismount the battery from the machine and store it separately.



Posture for long-term storage

I0988566-155-0E

DEF storage

1) Precautions for DEF storage

A DEF container should always be stored below 30°C (86°F).

At 40°C, DEF life is 4 months, and a rise in temperature will greatly reduce the life. DEF should be stored in a sealed container and in a well-ventilated place out of direct sunlight.

Since DEF crystallizes at -11°C, the liquid temperature in the container should be kept above -10°C.

(2) During storage



CAUTION

If you have to operate the machine indoors, keep good ventilation by opening windows or entrances to prevent gas poisoning.

(T0988566-111-0E)

- 1) During storage, operate the machine once a month to maintain oil films at the lubrication sections and charge the battery as well.
- 2) Before starting the engine, be sure to crank the engine with the starter and check that the engine oil pressure warning lamp goes out on the trouble code screen of the display.
- 3) After starting the engine, keep it running at the idling speed for about 5 minutes.

(3) After storage

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

8. Towing (T0988566-156-0E)

WARNING

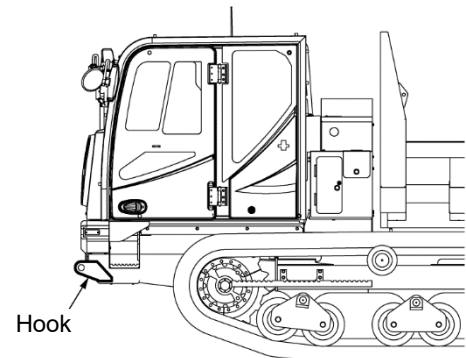
- Use wire ropes and shackles for towing that are strong enough for the towing weight.
- It is very dangerous if the wire rope is disentangled during towing. Do not stand between the towing machine and the towed machine.

(T0988566-112-0E)

(1) Towing the carrier

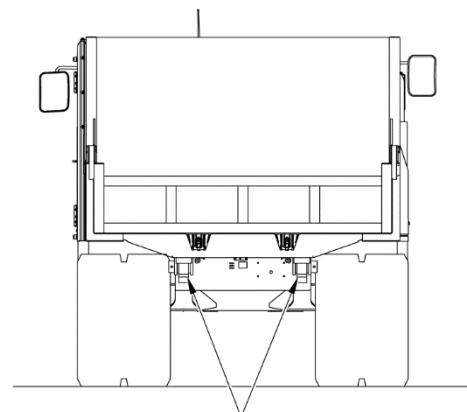
When the carrier gets stuck for instance in mud and cannot escape under its own power it must be towed by another machine. In such cases attach a shackle to a wire rope and attach this to the front or rear hook. The carrier can now be towed.

- 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.



Front towing hook

I098857500-037-0E

Hook
Rear towing hook

I0988566-157-0E

NOTICE

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

(T0988566-113-0E)

9. Transport^(T0988566-114-0E)

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

9-1 Loading and unloading the machine^(T0988566-115-0E)

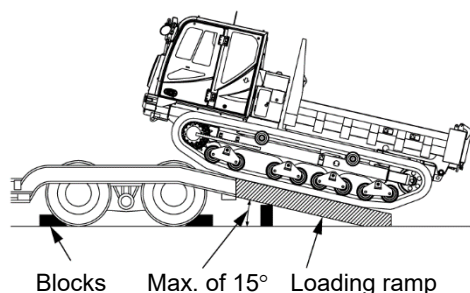


WARNING

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

(T0988548-102-0E)

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



10988566-158-0E

9-2 Fixation at transport (T0988566-116-0E)



CAUTION

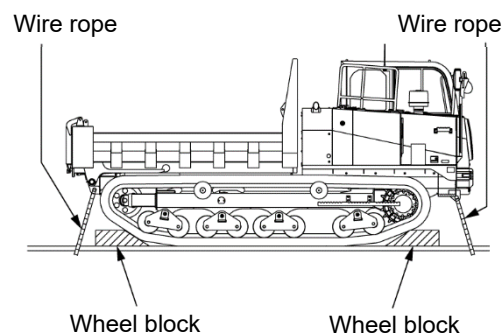
It is very dangerous if the machine moves during transportation.

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

(T0988566-117-0E)

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

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



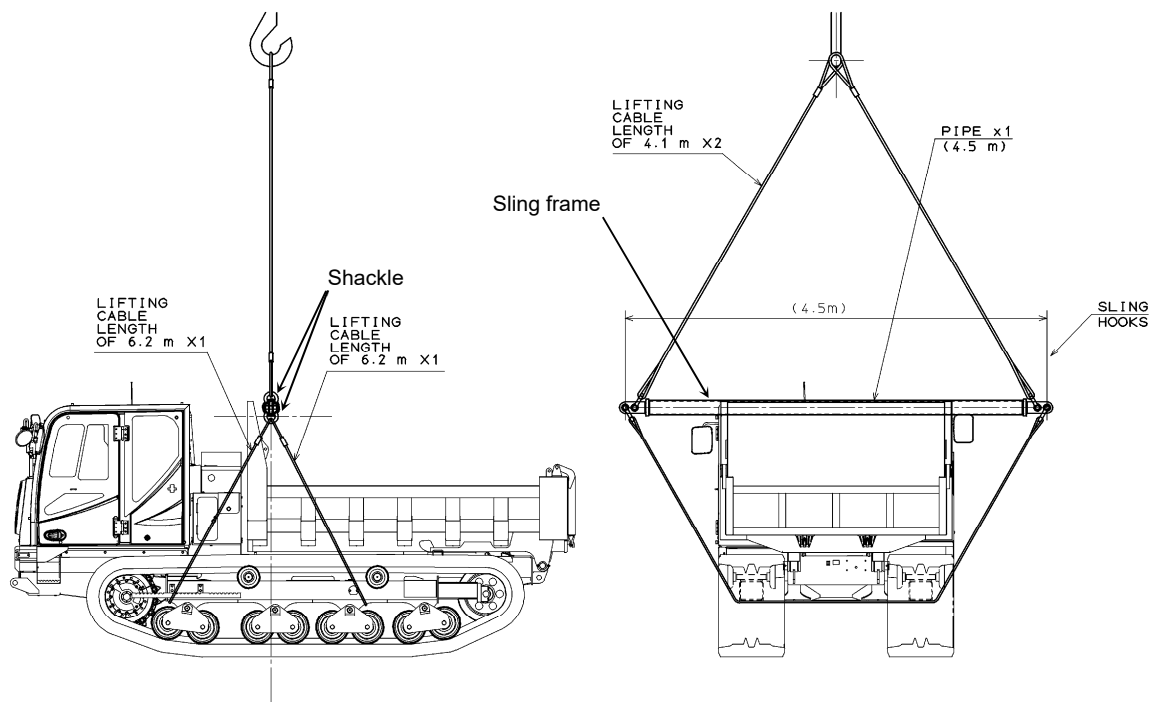
10988566-159-0E

10. 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.
- Do not perform crane operation including slinging work unless you are not qualified.

Weight on lifting the machine: 11,570 kg



1. Prepare strong enough wire ropes, shackles, sling frame.
2. Pass the wire ropes under the crawler frame as shown in the figure above. Use protection materials to avoid the wire ropes from contacting the machine directly.
3. Install the wire rope to the sling frame with the shackle.
4. Install the wire rope to the crane hooks and lift upward so the crawler is a little bit above the ground, then stop lifting.
5. If the balance is good continue slowing lifting the machine.

11. Handlings (T0988566-220-0E)

11-1 DPF handling (T0988566-187-0E)

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.

(T0988566-184-0E)

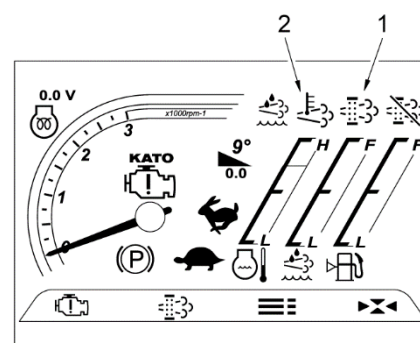
The DPF system collects soot (particulate matter) in exhaust gas on a filter in the muffler. When the soot collects more than a level, an automatic regenerating (removal by combustion) is performed (DPF automatic regenerating) during the machine is operating.

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.



I0988566-190-0

(1) When the DPF warning indicator is displayed

Perform the manual regenerating at your earliest convenience.

The engine warning indicator may turn on if you continue your work with the DPF warning indicator still on.



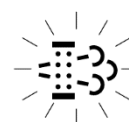
CA-C201240

(2) When the DPF warning indicator is blinking and the engine system warning indicator on the trouble code display screen is lit

Stop your work and immediately perform the manual regenerating.

If you still continue your work in this state, manual regeneration becomes impossible to perform.

If the DPF regenerating indication (2) does not appear even when the manual regenerating switch is pressed, contact our sales and service shop.



I0988566-219-0

When the engine stop indication appears on the trouble code display screen

The manual regenerating cannot be performed. Or you have some engine trouble not related to the DPF.

The engine stops.

The engine becomes impossible to be restarted.

Contact our sales and service shop.



I0988566-206-0

11. Handlings

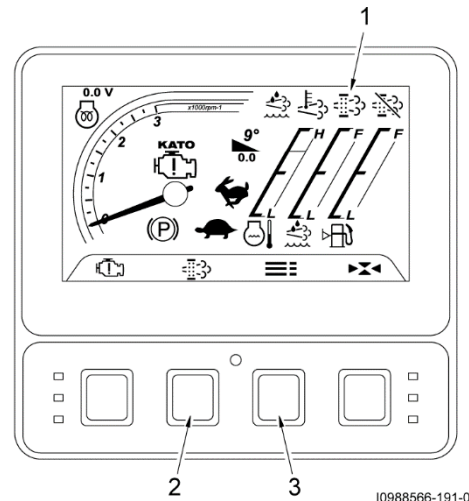
11-2 DPF manual regenerating (T0988566-188-0E)

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.

(T0988566-184-0E)

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



(1) Stopping the machine

Stop the machine at a safe place. Make sure no flammable material exists around the muffler, as the exhaust gas becomes hot during the regenerating.

(2) When the water temperature is low, perform the warming up operation till the water temperature gauge points around the middle position.

(3) Run the engine in the idling mode.

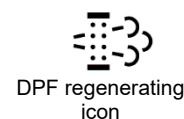
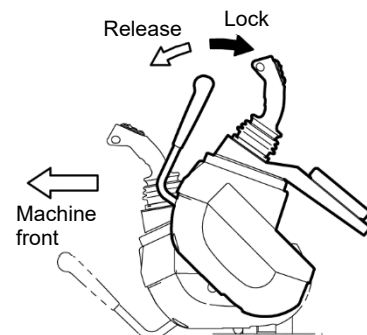
(4) Set the control lock lever to the lock position.

(5) Press the switch (2) on the display to call the regenerating mode selection screen, and press again the switch (2), on which the DPF regenerating icon appears.

(6) DPF regenerating starts and the DPF regenerating indication appears.

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.

(7) Do not stop the engine immediately after manual regenerating is completed. Keep the engine running at the idling speed for 10 minutes.



Appears on the regenerating mode select screen.

10988566-225-0E

• Stopping the manual regenerating halfway

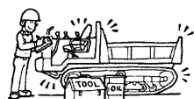
(1) The manual regenerating will stop when the engine is stopped, the switch (3) on the regenerating mode selection screen is pressed, or the lever lock is released and the lever is operated.

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

11-3 Starting with booster cables (T0988566-118-0E)

For details of starting with jumper cables, refer to "4-4-2 How to start the engine using the booster cables" in Inspection and servicing part.

MEMO



10988566-008-0

Inspection and servicing

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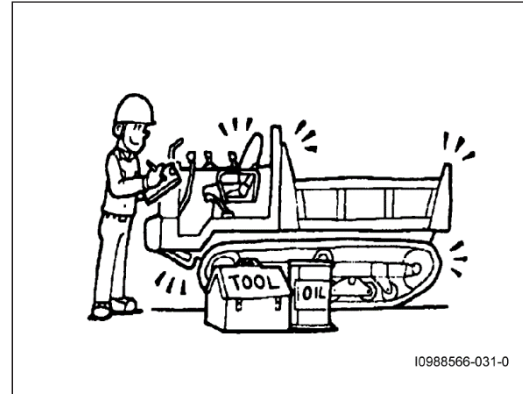
1. Precautions on inspection and servicing (T0988548-111-1E)

Inspection and servicing are as important as lubrication as they have a great influence on the lifespan of the machine and are highly significant in maintaining safety. Inspect and service the machine regularly to keep yourself aware of its condition and preserve its safety and economic performance.

Refer to the inspection and servicing points and methods described below and observe them correctly.

(1) Regular independent inspection

Draw up an inspection and servicing schedule and implement it.



(2) Keeping independent inspection records

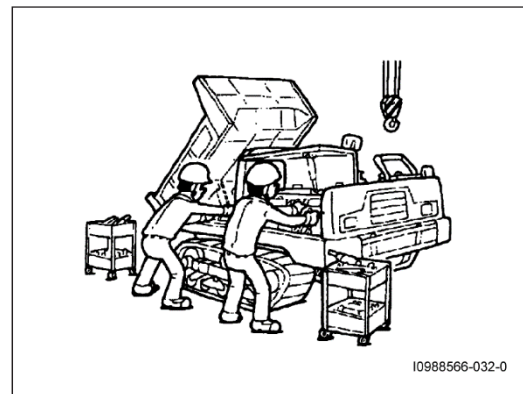
The regular independent inspection must be carried out, the results recorded and preserved.



(3) Repair of broken or malfunctioning parts

- If you discover a breakdown or malfunction during an independent inspection or preoperational check, it must be repaired immediately.
- Operation with such problems unrepaired is highly dangerous.

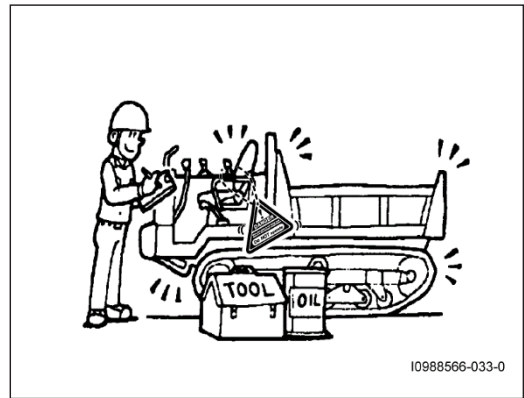
Never start work before all repairs are complete.



1. Precautions on inspection and servicing

(4) Park the machine on level ground for inspection and servicing

- Choose a work site which is firm, level and free of hazards.
- Always lower the vessel to rest on the ground.
- Stop the engine and remove the key.
- Put the warning tag.
- Place chocks to immobilize the crawler shoes.

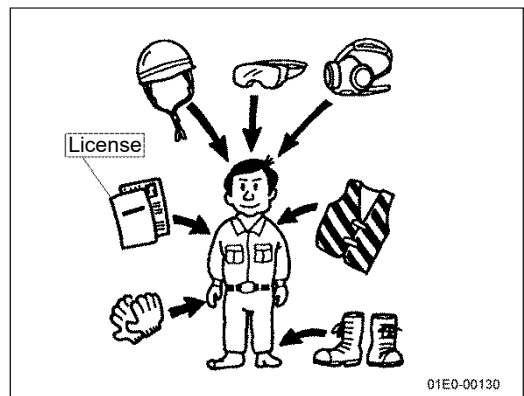


(5) Each piece of equipment is rigorously tested and tuned before shipping. Tuning outside your authorised KATO dealer is forbidden.



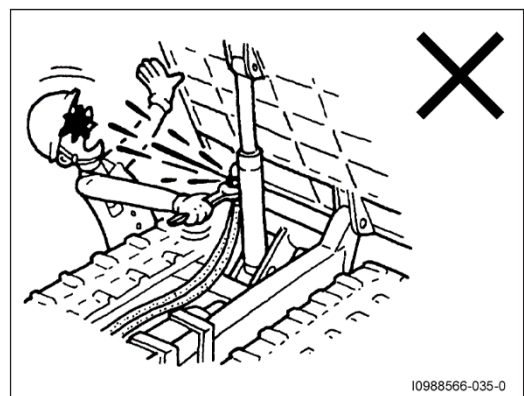
(6) Wear protective clothing and equipment

- Wear a helmet, protective goggles, safety boots, gloves etc. when inspecting and servicing the machine.
- Metal splinters can fly off when you are using a hammer or grinder, so always wear proper protective clothing and equipment when using these tools.



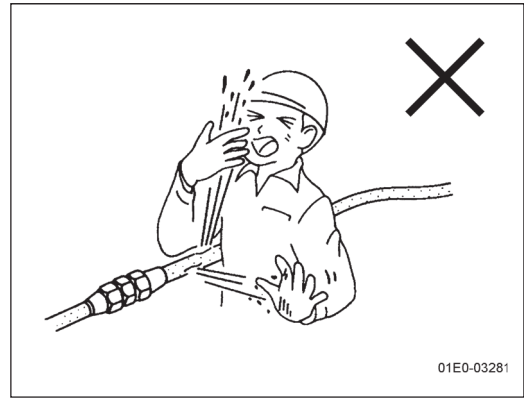
(7) Relieve hydraulic pressure

It is dangerous to replace or repair hydraulic hoses, joints and equipment without relieving pressure first.



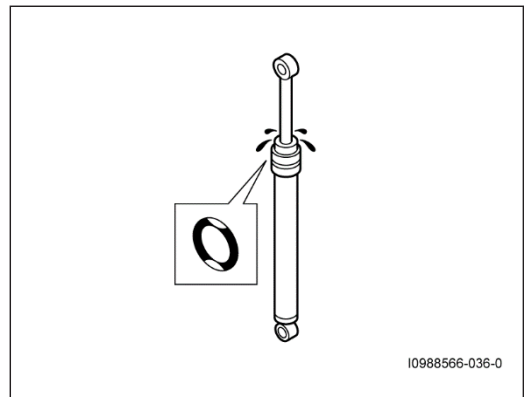
(8) Beware of highly pressurized oil

- Hydraulic oil or reduction gear oil at high pressure can cause serious skin and eye injuries.
Before cutting or opening a hydraulic pipe, always relieve the pressure inside it.
- Oil leakage may not be visible to the eye, so check with thick paper or wood-shavings. Do not detect oil leakage by naked hand or finger.
- Wear protective goggles to protect your eyes.
- If oil penetrates your skin, consult a doctor well experienced immediately.



(9) Precautions on replacing seals etc.

- After you remove an O-ring or other seal, wash the surfaces on which it was fitted before you fit the replacement.
- Before you fit an O-ring or other seal, check that it is undamaged and cover it with a film of oil. If you find a defective seal of any kind, do not use it because it could cause oil leakage.



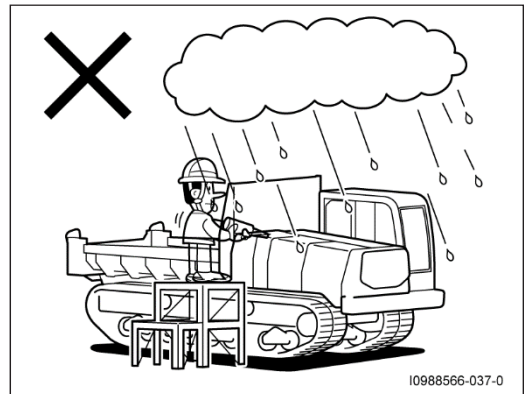
(10) Be careful when you open the radiator cap

- When the radiator coolant is hot, it could spray out dangerously when you take the radiator cap off, possibly causing burns.
- If you have to take the radiator cap off, wait until the coolant has had time to cool and slowly loosen the cap to allow pressure to dissipate before you remove it. Check the coolant level and top up with the coolant from the coolant tank.



(11) Do not allow water to enter when you top up with oil

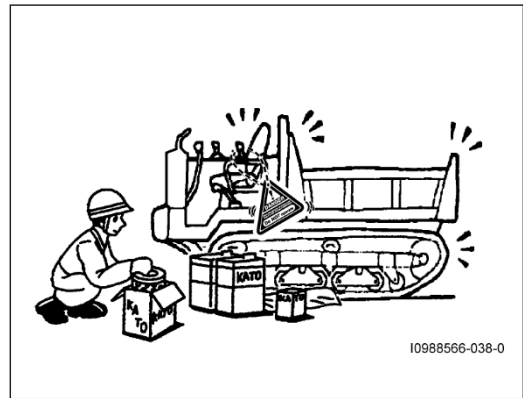
When you replenish fuel or DEF/AdBlue® or replenish or replace hydraulic oil or coolant, take care to avoid the entry of water or dust. If water gets in, it will cause corrosion and breakdowns.



1. Precautions on inspection and servicing

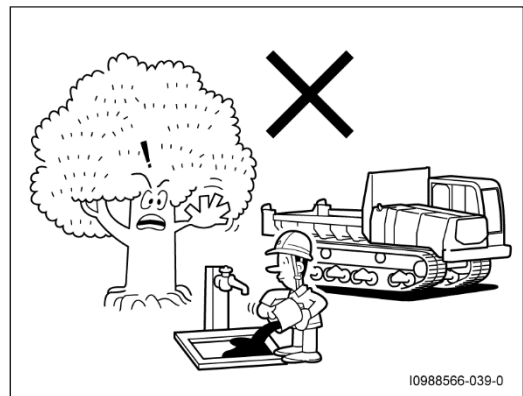
(12) Use genuine KATO or KATO-approved lubricants and filters

- When you add or replace lubricants or replace parts such as filters etc., always use genuine KATO or KATO-approved products.
- If you use any products which are not made or approved by KATO, we will not be in any way liable for resultant accidents or breakdowns.



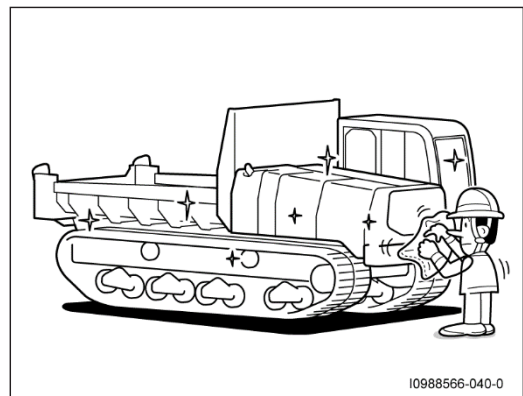
(13) Dispose of waste oil carefully

- If you dispose of waste oil, used filters and other waste products of the machine carelessly, you will cause environmental pollution.
- When you drain waste oil from the hydraulic equipment or oil reservoir, catch it in a proper container. Waste oil is environmentally harmful. Dispose of it thoughtfully.
- Never allow it to pour onto the ground or dump it in streams, rivers or wetlands.
- Follow the relevant regulations when you dispose of oil, fuel, DEF/AdBlue® , coolant, solvents, filters, batteries, or any other hazardous or potentially hazardous materials.



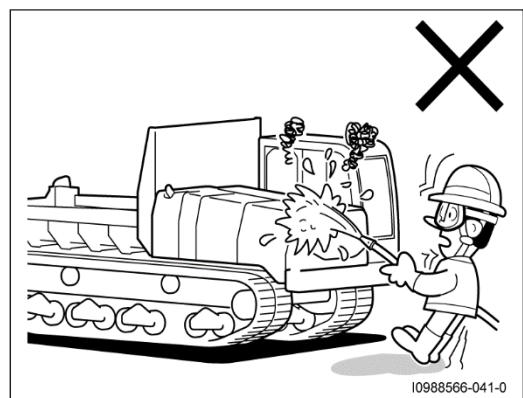
(14) Always keep cleanliness in mind when you handle the hydraulic equipment, engine or electrical parts.

The hydraulic equipment, engine and electrical parts are precisely adjusted. Always do your best to work cleanly.



(15) Precautions when washing the machine

- While washing the machine, you may lose your footing and fall down, so wear slip-resistant boots while washing the machine. If you are using high-pressure steam for cleaning, the jet can cut your skin and mud etc. can splash back into your eyes. Therefore, whenever washing the machine, with high-pressure steam or otherwise, always wear protective wear. Coming in contact with the steam or high pressure water could cause burns or other injury.
- If you spray water on electrical equipment during washing, it could break down or malfunction, so work carefully to avoid wetting the electrical equipment.

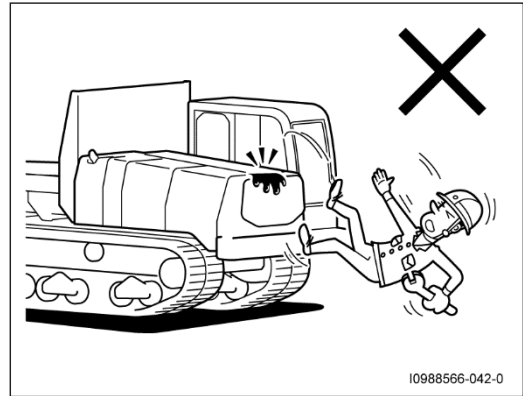


(16) Precautions when working in high places

- When you are working in high places, take precautions to avoid falling off.

Keep the area you are standing on tidy (no tools scattered around) and clean (wipe off any spilled oil or grease), and walk carefully to avoid slipping.

- When climbing and descending, use the hand grips and platforms and always keep yourself adequately supported on at least three points at any time. Wear a safety harness and other safety equipment as necessary.



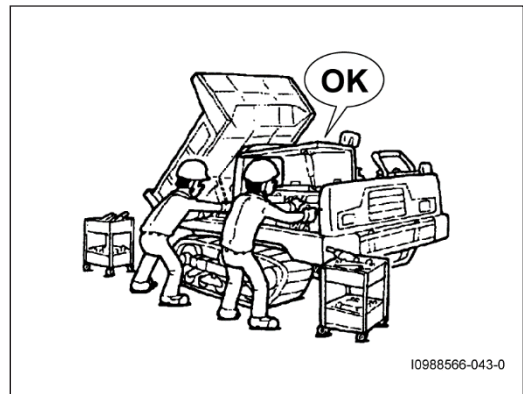
(17) Stop the engine before inspection and servicing

- It is dangerous to inspect and service the machine while it is moving.
- Always stop the engine before you start work unless the task you are about to perform needs the machine to be moving.



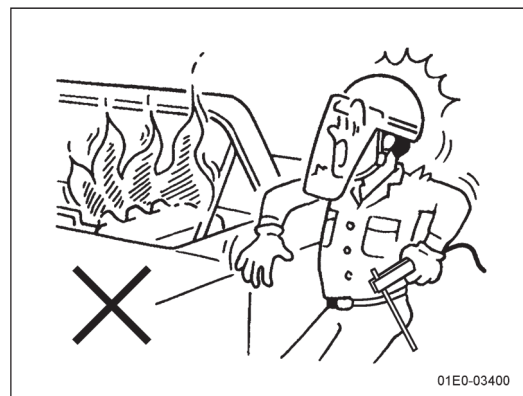
(18) Servicing with the engine running is a job for two people

- Avoid servicing the machine while it is working if at all possible.
- If it is unavoidable, work with at least two people. One of you must be in the operator's seat to be able to stop the engine at any time and all those involved must be in constant contact.
- If you work near rotating parts, take care not to be trapped or dragged in.



(19) Precautions when welding

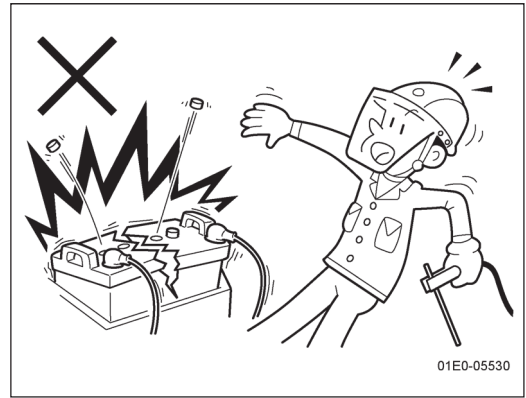
- There is a risk of fire when welding due to possible damage to electrical equipment or generation of gas from hot paint.
- Employ a qualified welder for the job and carry it out in a properly equipped place.



1. Precautions on inspection and servicing

(20) Basic precautions before welding

- Turn the starter switch to OFF.
- Then disconnect the battery cable from the negative terminal.
- Cut away the paint from the area to be welded so that it cannot produce gas.
- Attach an earth connection within one meter of the weld point with no O-rings or bearings between the weld and earth points.
- Always wear protective equipment and make sure the ventilation is adequate.
- Remove flammable materials and place a fire extinguisher nearby.
- If you don't turn the starter switch to OFF, turn the battery disconnect switch to OFF, and disconnect the battery cable from the negative terminal before welding, the electrical or electronic equipment could malfunction or the batteries could explode dangerously.



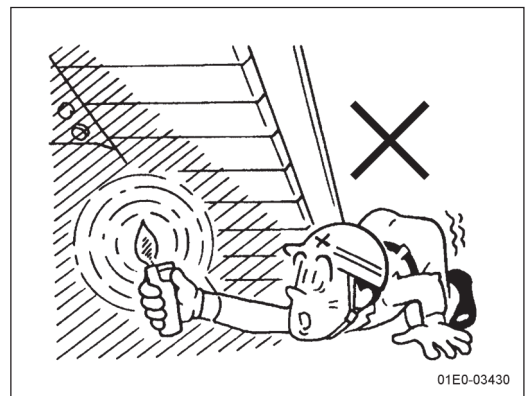
(21) The equipment are hot immediately after the engine stops

- The equipment are hot immediately after the engine stops, so you could be burned if you touch them. In particular the engine, silencer, oil reservoir, coolant, radiator, sliding parts, hydraulic equipment, pipes etc. will be very hot.
- Wait for all parts to cool before you begin inspection and servicing.



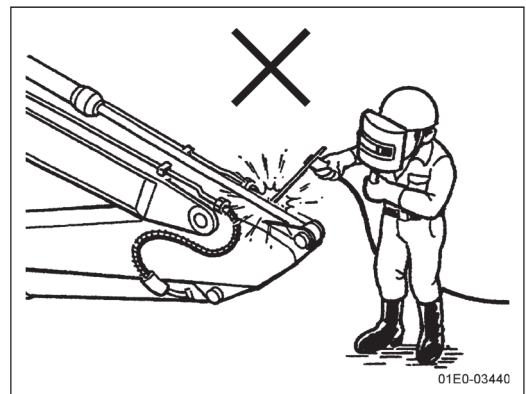
(22) Illumination

- If you are working in poor light, you cannot see well enough what you are doing, so you could injure yourself. Before operation, prepare illumination enough to light the working place.
- Do not use a lighter or other flame in place of a lamp to light dark places. You could start a fire or cause an explosion by igniting gas generated by the battery.
- Use an explosion-preventive type of lamp when looking at the battery or fuel.
- The power socket for the lighter on the dashboard in the cab can be used as the 24V power source for up to 100 W.



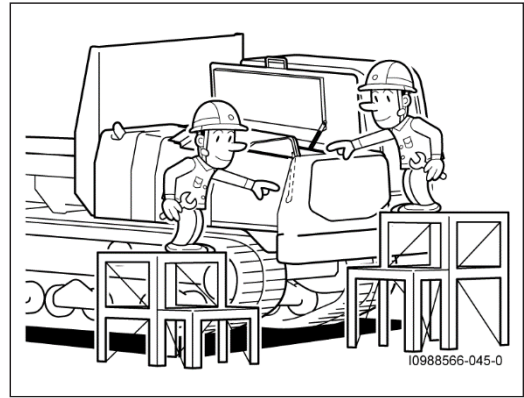
(23) Do not heat hydraulic equipment or pipes

- If you heat hydraulic equipment or pipes or areas near them, it could generate and ignite flammable vapour or smoke. Avoid welding, soldering or heating with a torch near hydraulic equipment or pipes.
- If you directly heat pressurized pipes or rubber hoses, they may rupture suddenly.



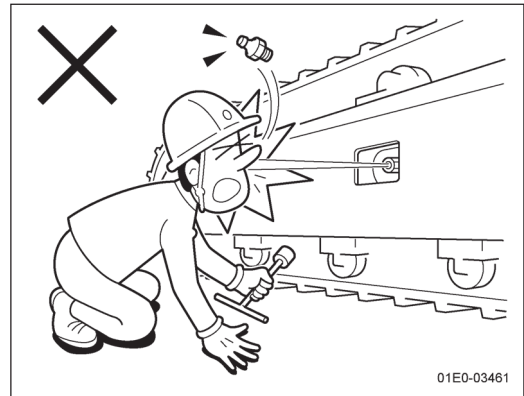
(24) Lock all inspection covers

- If you leave the inspection covers open, they can swing shut suddenly when the wind blows and trap fingers etc.
 - When you open an inspection cover or cab door, always use the stopper to lock it securely in the fully open position.
- When there is a strong wind, do not open the door or covers.



(25) Prevent flying parts

- The grease inside the adjuster cylinder is under high pressure. Ignoring the following precautions could cause serious injury or death.
- Do not remove the drain plug.
- Keep your face and other body parts away from the plug, which could be ejected.



2. Inspection and servicing table (T0988566-211-0E)

Follow the "Inspection and servicing table" to carry out the correct inspection and appropriate servicing necessary for safe and efficient work.



CAUTION

- The intervals stated in the inspection and servicing table are based on the elapsed time indicated by the hour meter.

Follow both the passage of dates and of hours of operation and carry out each inspection item when one of the times is reached, whichever occurs sooner.

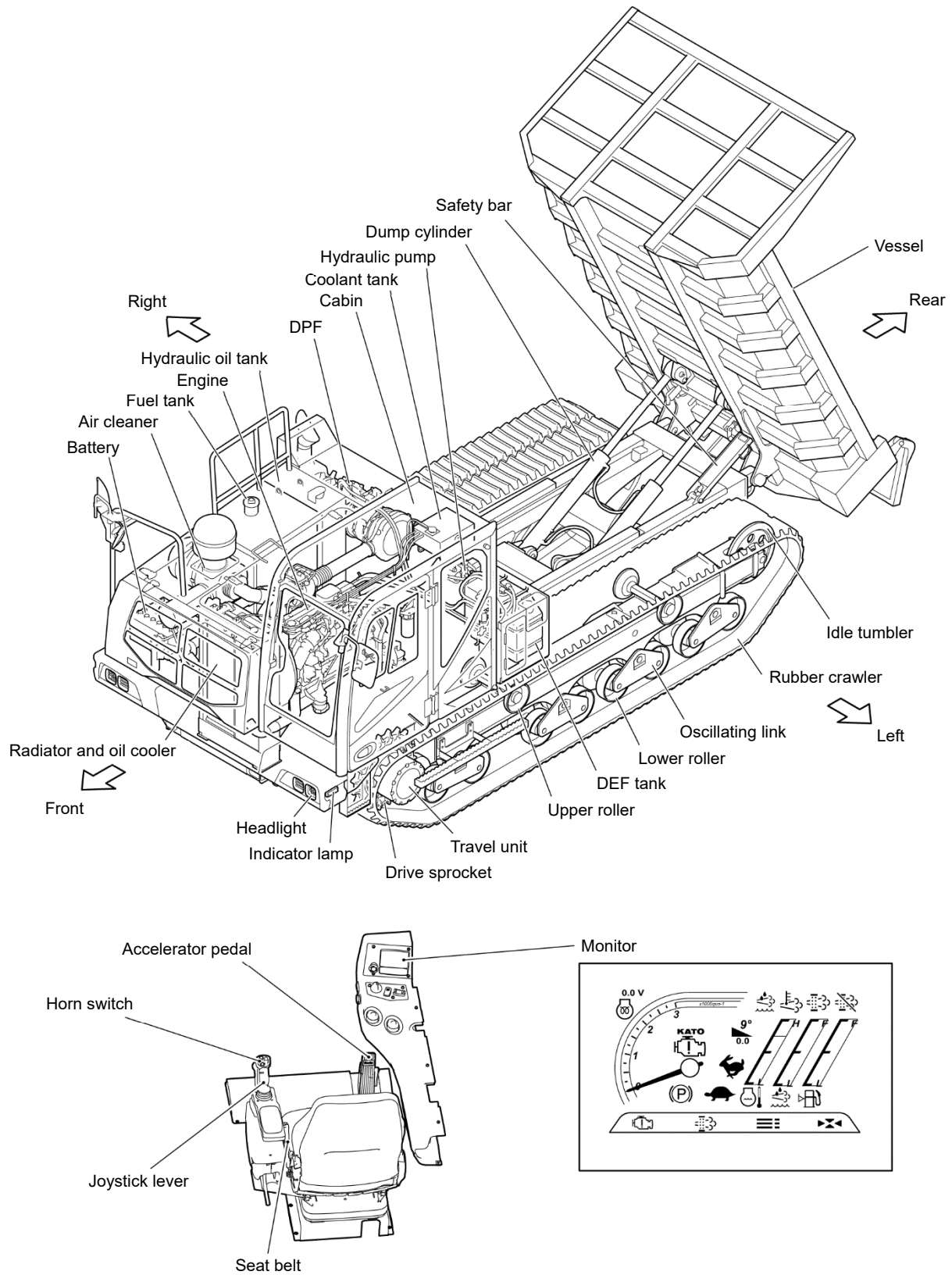
- If you discover any damage, breakdown or malfunction, repair it immediately. Do not leave it for later and do not start work before it is repaired.
- For the inspection and replacement methods for the engine, refer to the separate engine manual.
- The inspection intervals for this machine are based on standard operations and working conditions.

Under severe conditions, the inspection and replacement intervals should be shortened accordingly.

- If any method or interval of inspection and servicing is unclear, contact your authorised KATO dealer.

(T218081-152-0E)

(1) Part names for inspection and servicing



I098857500-006-0E

2. Inspection and servicing table

(2) Maintenance intervals

Inspection and maintenance location		Description of inspection and maintenance	Interval of inspection and maintenance									
			Daily	Every 50 hours	Every 150 hours	Every 250 hours	Every 500 hours	Every 1,000 hours	Every 2,000 hours	Every 3,000 hours	Every 4,500 hours	Irregular
Pins around vessel		Grease		○								
Oscillating link pins of lower rollers		Grease		○								
Rubber crawlers		Check for wear and cracks.	○									
		Inspect and adjust shoe tension.	○									
Bolt tightening locations		Inspect and tighten.		First time ○		○						
Travel reduction gear		Inspect lubricant level and replenish.						○				
		Change lubricant.			First time ○				○			
Hydraulic system	Hydraulic oil tank	Inspect hydraulic oil level and replenish.	○									
		Drain		○								
		Change hydraulic oil						○				
	Suction strainer	Clean						○				
	Return filter	Change cartridge		First time ○			○					
	Line filter	Change element		First time ○			○					
	Hoses, pipes	Inspect for leaks and damages.	○									
Engine oil system	Engine oil	Inspect engine oil level and replenish.	○									
		Change engine oil.		First time ○		○						
	Engine oil filter	Change cartridge		First time ○		○						
Cooling system	Coolant tank	Inspect coolant level and replenish.	○									
	Coolant	Change coolant.							○			
	Fan belt	Inspect tension and for scratches.					○					
	Fan	Inspect for cracks and deformation.	○									
	Radiator hose	Inspect for leaks and damages.	○									

2. Inspection and servicing table

Inspection and maintenance location		Description of inspection and maintenance	Interval of inspection and maintenance									
			Daily	Every 50 hours	Every 150 hours	Every 250 hours	Every 500 hours	Every 1,000 hours	Every 2,000 hours	Every 3,000 hours	Every 4,500 hours	Irregular
Fuel system	Fuel tank	Check fuel level and replenish.	○									
		Drain		○								
	Fuel pre-filter	Drain	○									
		Change cartridge					○					
	Fuel filter	Change cartridge					○					
	Fuel hose	Inspect for fuel leaks and damages.	○									
Air intake and exhaust system	Air cleaner	Inspect clogging warning lamp.	○									
		Clean element.			○							
		Change element				○						
	Air intake and exhaust (SCR) pipes	Inspect for leaks and damages.	○									
Electrical system	Battery	Inspect battery fluid and replenish.		○								
		Clean terminals.					○					
	Fuses	Change.										○
	Fusible link	Change.										○
Engine and others	DEF	Check DEF level and replenish.	○									
	DEF pump filter	Change.							○			

- For more information about the engine, also refer to the Engine Operation Manual.

(T0988575-003-0E)

3. Lubrication (01E0-0277-1E)

Lubrication is essential to ensure safety operation and to increase the lifespan of the machine.

Regular lubrication, done properly, preserves the safety and economic performance of hydraulic equipment, smooth operation of each part and reduces wear on rotating and sliding parts.

3-1 Precautions on lubrication (T0988548-280-0E)

The value of lubrication is greatly reduced if it is not applied correctly. Observe the following precautions strictly and use correct procedure.

- (1) Always follow KATO's instructions and specifications for lubrication. The interval for lubrication is based on the length of time the machine has been in use or the actual hours of operation as indicated by the hour meter inside the cab, whichever interval elapses sooner.

However, the lubrication interval specified by KATO is a guideline based on standard crawler carrier operating conditions. If the machine is used in harsh conditions, consult your authorised KATO dealer to determine a suitably-reduced lubrication interval.

- (2) Correct lubrication requires application of the right lubricant in the right quantity for each point that requires lubrication. Choose the lubricant you are going to use from among the types and brands recommended by KATO for each point and make sure the oil number you select agrees with our selection criteria for the outside temperatures common in the operating region.
- (3) Before filling/injecting with any lubricant, clean around the grease nipple, filler hole etc. to avoid the entry of dirt, moisture, etc. with the lubricant.
- (4) Work in a clean, dry workplace so that dirt, moisture, etc. do not enter the machine during the lubrication process.
- (5) Always add the same brand of lubricant. Mixing different brands could be detrimental, due to chemical reactions or other effects.

For various reasons, the recommended lubricants listed in this manual are subject to change without notice. Before using a product not listed in this manual, contact your authorised KATO dealer.

- (6) If you use lubricants which have not been recommended by KATO or which do not match the selection criteria, or if you do not observe the lubrication intervals, KATO will not bear any responsibility whatsoever for any resulting failures.

3-1-1 Precautions on greasing (T0988566-168-0E)

Greasing reduces wear to sliding and rotating parts, thus prolonging the lifespan of the machine, and it is also essential for their smooth action.

Correctly grease each point as necessary, following the precautions listed below.

Refer to the relevant instruction manuals for details of how to grease the engine-related and attachment-related parts.

- (1) When greasing bushes and bearings, expel the old grease and fill completely with new grease.
- (2) After greasing the pin sections, operate each part several times to spread the grease evenly over the entire surface of the pins.
- (3) Grease each part with the type of grease specified by KATO for that part.
- (4) The specified greasing intervals only apply where the grease types specified by KATO are applied in the appropriate locations correctly. If you have no choice but to use a non-recommended grease, consult your authorised KATO dealer to determine a suitably-reduced greasing interval.

3-1-2 Precautions on oiling (T0988566-169-0E)

Observe the following precautions when oiling.

- (1) Replace the oil in each device which requires oiling at the interval specified for each device.

The first oil replacement is particularly important when the machine is new and if this oil change is missed, the lifespan of the device will be drastically reduced. Even more serious consequences such as rapid breakdowns could also result.

- (2) Check the oil level in each device which requires oiling at the interval specified by KATO.

If any oil level is too low, top it up with oil of the same type as that currently in use.

- (3) When hydraulic oil has been replaced, extract the air from the pump and wait until all bubbles have disappeared from the oil reservoir then run the pump unladen at low speed to expel the air from inside the pipes. If there are air bubbles mixed with the hydraulic oil when you operate the machine, damage to the pump and various other problems will result.

- (4) Replace the cap with breather and clean the strainer of the suction strainer at the same time as you change the hydraulic oil. If the element or strainer is dirty, the hydraulic equipment will be damaged.

- (5) When you have changed or added oil, always wipe away any spilled oil or other residues, then test run the engine and look for any fresh oil leakage.

- (6) Order disposal of old oil from a reputable waste disposal company.

3-2 Lubricants added at the factory (T0988566-170-0E)

- (1) Recommended lubrication table

Lubrication points	Oil type	Grade	Temp. & application (°C)								Qty required	
			-30	-20	-10	0	10	20	30	40		
Engine oil pan	Engine oil	API-CJ-4		*	SAE10W-30							H: 18.6 L L: 16.1 L
					SAE15W-40							
Hydraulic oil tank	Hydraulic oil	Abrasion-resistant				*	ISO-VG46					System: 130 L Tank level: 100 L
							ISO-VG32					
Travel reduction gear	Gear oil	API GL-4		*	ISO-VG220							3.1 L
Fuel tank	Diesel fuel											System: 312 L
Cooling system	Coolant	LLC	Long-life coolant (LLC) 50% added								30.2 L	
DEF system	DEF	AdBlue®	Use DEF conforming to ISO standards only.								46.3 L	
Greasing	Grease	EP	EP2 lithium grease								Proper amount	

(T0988566-171-0E)

- The oil with the * marks is used for the machine before shipment.

3. Lubrication

(2) Grease types

Refill the grease nipples with grease using a grease gun.

Remove oozed old grease after refilling.

1) Pins around vessel

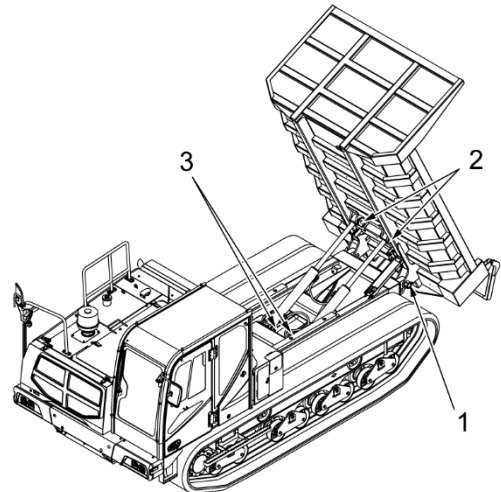


WARNING

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

(T0988566-157-0E)

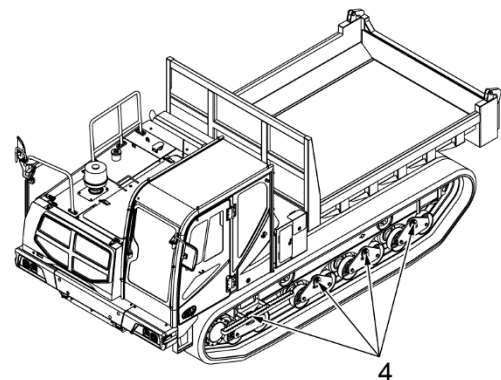
- Vessel joint pins (1) 2 positions
- Dump cylinder rod pins (2) 2 positions
- Dump cylinder foot pins (3) 2 positions



I0988566-047-0

2) Lower roller oscillating link

- Oscillating link pins (4) 8 positions



I0988566-048-0

NOTICE

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

(T0988566-158-0E)

4. Inspection and servicing of each part (T218971-043-0E)

Before starting the day's work, make a habit of looking all over the excavator to inspect the exterior.

Start the engine according to the correct procedure then make another exterior inspection to check for leaks of oil or water.

(1) Inspection of the exterior

- 1) Dents or damage of covers etc.
- 2) External damage of devices and equipment
- 3) Looseness of bolts and nuts
- 4) Looseness, short circuit, or damage of the wiring



I0988566-049-0



CAUTION

- If you notice abnormal noise or vibration from any covers etc., stop the engine immediately and investigate the cause.
- If you notice a smell of burning, scorching or fuel after starting the engine, stop the engine immediately and investigate the cause.

(T218081-154-0E)

4-1 Engine-related (01E0-0295-0E)

4-1-1 Engine inspection and servicing (01E0-0296-1E)

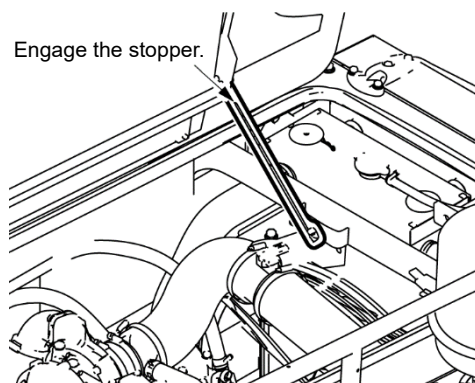
- (1) Take the engine inspection points from the "Inspection and servicing table".
- (2) Take the engine inspection methods from the separate engine manual.
- (3) Consumable part number

Refer to the "Data file, Parts list".



WARNING

- Always stop the engine before inspecting it.
If you inspect and service the engine while it is running, you risk severe injury by trapping your hands etc. in the cooling fan or fan belt.
- Always open the engine hood completely and engage the stopper when you open it.
- Immediately after the engine stops each part will be very hot and you risk burns if you touch it. If you are going to open the engine hood to inspect the engine, check that it has cooled sufficiently.



I0988566-050-0E

(T0988566-203-0E)

4. Inspection and servicing of each part

4-1-2 Engine oil (T0988566-172-0E)

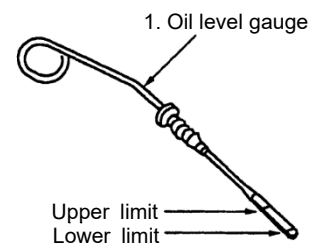
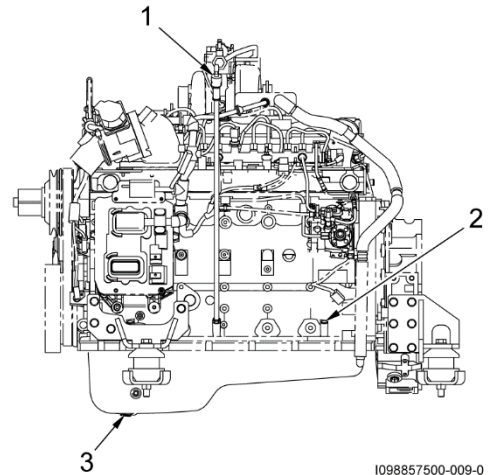
(1) Inspection and replacement of the engine oil

1) Inspection of the engine oil

Set the machine body on the level when checking the oil level.

2) Inspection procedure

- ① Pull out the oil level gauge and wipe off the oil by using a cloth.
- ② Reinsert the gauge all the way in and then gently pull it out.
- ③ If the oil level on the gauge is below the lower limit as in the figure refill the engine with engine oil through the oil filler port (2).
Be careful not to replenish oil exceeding the upper limit.
- ④ Discharge excess oil through the drain port (3) if the oil level is over the upper limit. Check the oil level again.
- ⑤ If the oil on the gauge is dirty, replace the engine oil.
- ⑥ Insert the oil level gauge securely after inspection.
- ⑦ If the machine is operated under the condition that the engine oil level is above the appropriate oil level, engine failure or engine stop may be caused.



The correct oil level is between the upper limit line and the lower limit line of the oil level gauge.

I0988548-175-0

WARNING

After the engine has been running for a long time, the engine oil will be extremely hot, so allow the engine to cool adequately.

(01E0-0299-1E)

CAUTION

- If the engine oil is extremely dirty or if the machine is working under severe conditions, shorten the oil replacement interval appropriately.
- The machine should be on level ground when you check the oil level.
- Clean around the oil filler port before you add oil so that no dirt etc. will enter with the oil.
- Choose the right engine oil for the outside air temperature in the region.
- After adding oil, wait for five or six minutes before checking the oil level. If you check the oil level immediately after adding, it may show a misleadingly low level, leading to overfilling.
- Spilled engine oil can cause fire, so wipe it away immediately.

(01E0-0300-0E)

3) Replenishment and replacement of the engine oil

Use a specified-grade of engine oil shown below. Using an oil other than the type specified could cause engine malfunction/failure.

Engine oil softens (lower viscosity) at higher temperatures and becomes thicker (higher viscosity) at lower temperatures. Therefore, use an oil with a viscosity appropriate for the given air temperature conditions. Contact your authorised KATO dealer before operating the engine at the outside air temperature below -20°C.

Engine oil

Standard/grade	Oil viscosity	Outside air temperature during startup
API CJ-4/CK-4	SAE 10W-30	-25°C to +35°C
	SAE 15W-40	-15°C to +40°C

(T0988566-124-0E)

4) Inspection and replacement intervals for the engine oil

Inspection interval:..... At the time of preoperational checks

Replacement interval:..... Every 250 hours of operation (50 hours at first time)

NOTE

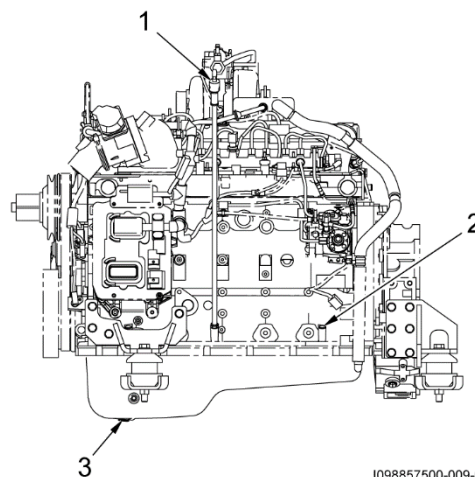
For oil replacement and replenishment procedures, refer to the separate engine manual.

NOTE

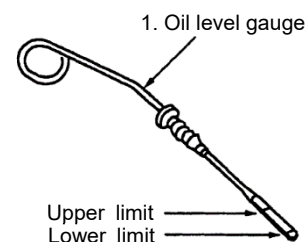
Engine oil capacity Hi: 18.6 L
Lo: 16.1 L
(including filter)

(2) Replace the Engine Oil and Engine Oil Filter

- 1) Place the container just under the drain port (3) of the engine.
- 2) Clean the oil filler cap (2) and around it in order not to let in foreign matters. Remove the oil filler cap.
- 3) Remove the drain plug (3) slowly so that oil will not splash on you. Discharge oil.
- 4) Check waste oil. If you find a lot of metallic powder, foreign matters, etc., contact our service office.
- 5) Attach the drain plug.
- 6) Fill the engine with engine oil until the oil level becomes between the upper limit and lower limit of the level gauge (1).
- 7) Idle the engine for several minutes, stop the engine, and check the level of engine oil 20 minutes later. Refill the engine with engine oil up to the specified level if the oil level is low.



I098857500-009-0



I0988548-176-0

4. Inspection and servicing of each part

4-1-3 Engine oil filter (T0988566-172-0E)

(1) Replacement procedure

WARNING

- Be sure to stop the engine before replacing the oil filter cartridge.
- Oil is hot and may cause burns. Start replacement work after the engine has cooled sufficiently.

(T0988566-173-0E)

CAUTION

- Do not replace the oil filter element immediately after operating the machine. Doing so when the engine oil is hot could cause a burn injury. Wait until the oil has cooled adequately before replacing the oil.
- Be careful not to spill any engine oil on the exhaust pipe or other potentially hot surfaces when replacing the engine oil filter. Doing so could cause a fire. If engine oil is spilled, wipe it up thoroughly.

(T218081-156-0E)

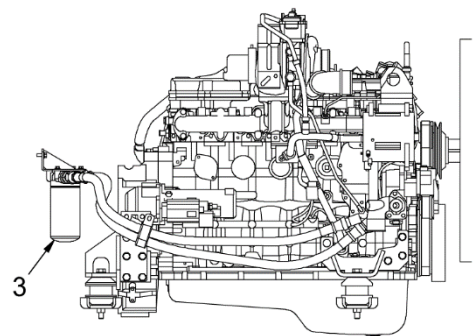
NOTICE

Before replacing the oil filter cartridge (2), stop the engine and loosen the cartridge bolt (1). This allows air to enter the cartridge and all oil flow out of the cartridge. As a result, oil dripping when removing the cartridge can be minimized.

1) Replace the oil filter cartridge (2).

The oil filter cartridge (2) should be replaced every 250 hours of operation.

- 2) Remove the old oil filter cartridge (2) by using a filter wrench.
- 3) Apply a thin layer of oil to the packing of the cartridge.
- 4) Screw in the cartridge by hand. When the packing contacts the sealing surface, tighten the cartridge sufficiently by hand, not by using a filter wrench. Use of a filter wrench results in over tightening.



I098857500-010-0

CAUTION

- Use the O-ring provided with the new element.
- Do not reuse the element.
- Be careful not to damage the O-ring by twisting it when installing the oil filter cap.
- Only replace the element with a new genuine part from KATO. Also, do not use the element beyond the specified replacement interval.
- When replacing the element, be careful not to let any foreign matter enter the oil.

(T218081-157-1E)

NOTE

Be sure to dispose of the element in accordance with local laws and regulation where the machine is used. If it cannot be disposed of properly on your own, consult a service provider for the engine manufacturer.

(2) Replacement interval

Every time the engine oil is replaced. (Every 250 hours of operation)

(3) Consumable part number

Refer to the "Data file, Parts list".

4. Inspection and servicing of each part

4-1-4 Fuel filter (T0988548-134-0E)

WARNING

Due to risk of fire, never smoke, use a cigarette lighter, or use any other ignition source while replacing the element. Always shut off the engine as well.

(T218081-163-0E)

CAUTION

- Do not replace the fuel filter immediately after stopping operation. The fuel is hot enough to cause burns, so perform work after the temperature has been allowed to drop.
- Be careful not to spill any fuel. If fuel is spilled, thoroughly wipe it up.

(T0988548-135-1E)

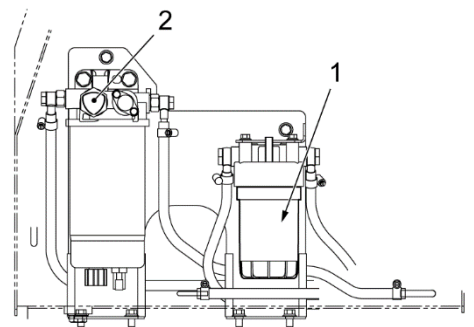
NOTE

- If water flows into the fuel pump, extensive damage will occur.
- Be sure to bleed the fuel system of air before operating the engine.

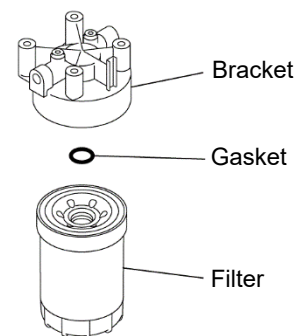
4-1-5 Replace fuel filter (T0988566-174-0E)

(1) Replacement procedure

- 1) Turn the filter (1) counterclockwise with the filter wrench to detach it.
- 2) Apply fuel slightly to the gasket of the new filter and tighten it thoroughly by hand, not by using a filter wrench.
- 3) Perform air bleeding. Push the manual pump (2) repeatedly until it can no longer be pushed in to discharge residual air.
- 4) When air bleeding is complete, start the engine and check for fuel leaks.



I098857500-011-0



Fuel filter

I098857500-012-0E

If the moisture sensor in the fuel does not fit or is disconnected, the engine system warning indicator will light up.

WARNING

Do not open the high-pressure fuel system while the engine is running, or high-pressure fuel could spurt out and cause serious personal injury or death.

(T0988566-185-0E)



CAUTION

- Do not reuse the element.
- Only replace each element with a new genuine part from KATO. Also, do not use the element beyond the specified replacement interval. Doing so could cause the fuel injection system to malfunction.
- When replacing the element, be careful not to let any foreign matter enter the fuel system. Doing so could cause the fuel injection system to malfunction.

(T0988566-175-0E)

NOTE

Always dispose of the filter in accordance with local laws and regulations.

(2) Replacement interval

- Element Every 500 hours

(3) Consumable part number

Refer to the "Data file, Parts list".



CAUTION

When fuel dirt is visible in the water separator, you should replace the filter even if it is not yet the scheduled time.

(T0988548-303-1E)

4-1-6 How to discharge air (T0988548-137-0E)

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. If it is left as is, it may cause a fire.

(T0988548-138-0E)

4. Inspection and servicing of each part

4-1-7 Check and clean fuel pre-filter and replace element (T0988566-176-0E)

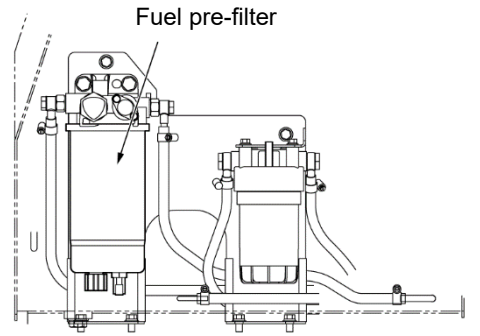
(1) Check, cleaning, and replacement

Check and discharging water

When the fuel pre-filter warning indicator on the display turns on, the fuel pre-filter contains more water than allowed.

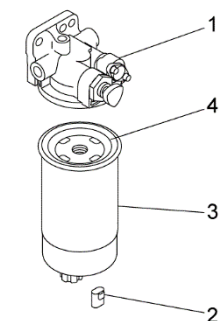
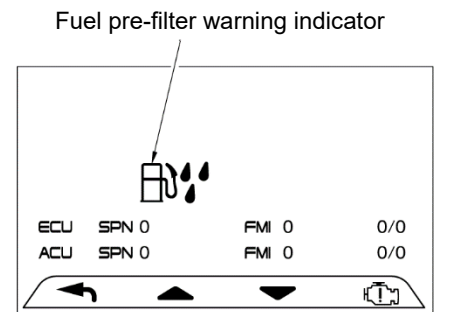
Discharge the water.

- 1) Clean the area around the filter head.
- 2) Disconnect the harness from the switch assy (2).
- 3) Loosen the switch assy by turning it counterclockwise to start draining.
- 4) Discharge water and sediment until clean fuel appears.
- 5) When clean fuel appears, tighten the switch assy.
- 6) Perform air bleeding and make sure that there is no fuel leak.
(Perform the same procedures as 4-1-6.)



Replacement

- 1) Clean the area around the filter head.
- 2) Disconnect the harness from the switch assy. Turn counterclockwise and remove the switch assy.
- 3) Turn the filter (3) counterclockwise to remove it using a filter wrench.
- 4) Apply fuel slightly to the gasket of a new filter.
- 5) Tighten the filter by hand, not by using a filter wrench.
- 6) Attach the switch assy to the filter. Then, connect the harness.
- 7) Perform air bleeding and make sure that there is no fuel leak.
(Perform the same procedures as 4-1-6.)



(2) Intervals for inspection and drainage of water and sediment

Inspection interval..... At the time of preoperational checks

Drainage interval Every 50 hours of operation



CAUTION

Some fuel will be drained along with the water or precipitate. To avoid the risk of fire, thoroughly wipe off any spilled fuel from surrounding surfaces.

(T218081-198-0E)



WARNING

Due to risk of fire, never smoke, use a cigarette lighter, or use any other ignition source while bleeding the fuel system of air. Always shut off the engine as well.

(T218081-169-0E)



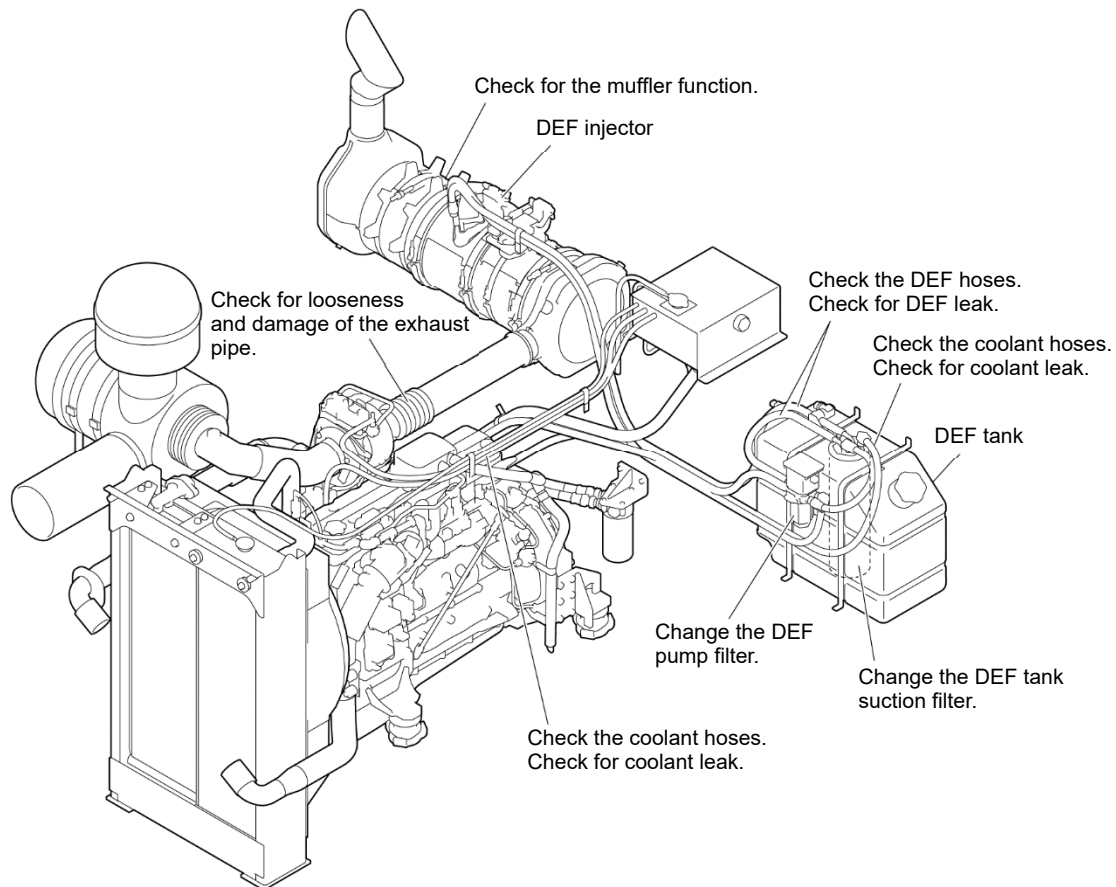
CAUTION

- Be careful not to spill any fuel. Doing so could cause a fire due to heat. If fuel is spilled, thoroughly wipe it up.
- Do not use a parts cleaner or alcohol-based water remover. If such agents contact plastic parts, they can cause cracking that could lead to fuel leakage.

(T0988566-204-0E)

4. Inspection and servicing of each part

4-1-8 Inspection of exhaust pipe, muffler, and urea SCR system (T218341-045-0E)



1098857500-015-0

(1) Inspection intervals for the exhaust pipe

- 1) Looseness or damages on the installation section At the time of preoperational checks
- 2) Color and status of exhaust At the time of preoperational checks
- 3) Function of the muffler Every 4,500 hours of operation or 3 years

NOTE

For the color and status of exhaust, refer to the separate engine instruction manual.

(2) Inspection of the urea SCR system

Check that the DEF hoses and coolant hoses are connected securely and that they are not damaged by cracking, bending, etc.

Check that there are no leaks of DEF (AdBlue®) and coolant from the DEF tank, the DEF pump, the DEF injector, the DEF hoses, and the coolant hoses.

- 1) Inspection of the DEF hoses and coolant hoses At the time of preoperational checks
- 2) Inspection of leaks of DEF (AdBlue®) and coolant At the time of preoperational checks

WARNING

Immediately after stopping operation, the exhaust pipe, muffler, and coolant are very hot. They can cause burns, so perform the inspection and servicing after the temperature has dropped.

(T218081-196-0E)

4-1-9 Inspection of DEF level and replenishment (T0988566-185-0E)

Regarding the urea SCR system

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

Regarding DEF

- The fluids that are effective in reducing NOx present inside the post-processing unit are collectively referred to as DEF (Diesel Exhaust Fluid).

- DEF is an aqueous urea and is commonly referred to as AdBlue® mainly in Europe.

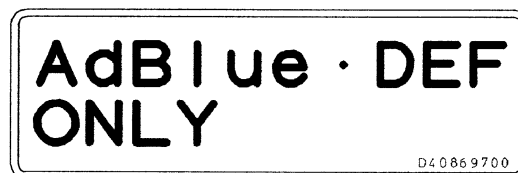
AdBlue® is a registered trade mark of the German Association of the Automotive Industry (VDA: Verband der Automobilindustrie).

Regarding specified DEF

- As for DEF, use the one that conforms to the International Organization for Standardization (ISO 22241-4).

Never replenish other fluids than the specified DEF. Also, never replenish DEF diluted with water.

(The new machine is shipped with about 10 liters of AdBlue® in its tank.)



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



CAUTION

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

(T218081-198-0E)

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



CAUTION

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

(T218081-198-0E)

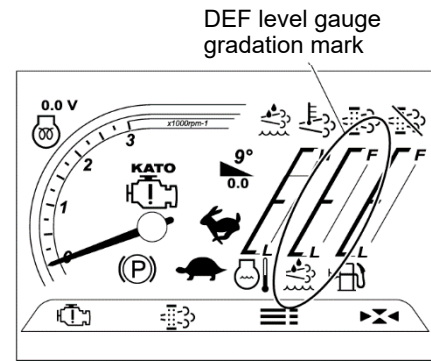
4. Inspection and servicing of each part

4-1-10 Replenishment of DEF (T0988566-186-0E)

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

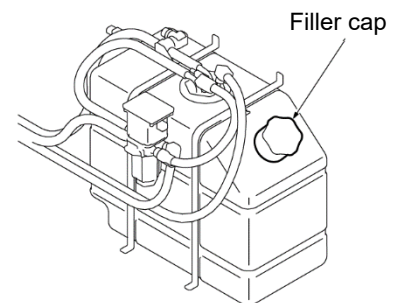
Replenish DEF with the key switch turned OFF.

- (1) Remove the filler cap.
- (2) Slowly replenish the specified DEF. (The tank capacity of this machine is 46.3 liters.)



I0988566-186-0E

- (3) Securely close the filler cap.



DEF tank

I098857500-038-0E



CAUTION

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

(T0988566-205-0E)

Changing the DEF pump filter

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

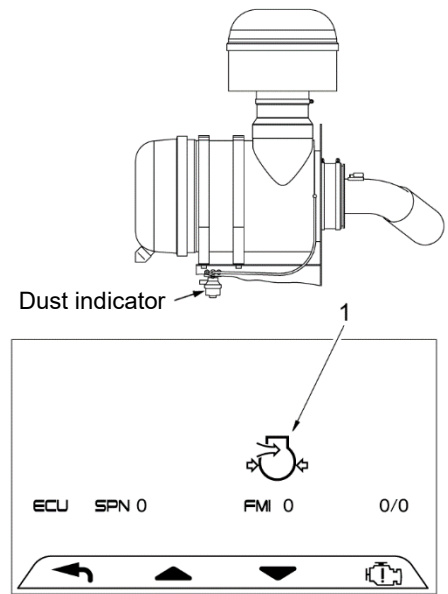
Regarding the above filter change, please refer to the Engine Operation Manual that comes with this machine and implement it as an inspection and maintenance item of specified period.

(Please refer to CUMMINS ENGINE MANUAL.)

4-1-11 Intake air system (T0988566-206-0E)

(1) Air cleaner clogging warning indicator

- 1) When the air cleaner is clogged, the dust indicator detects the clogging and the air cleaner clogging warning indicator (1) lights up.
- 2) When the air cleaner clogging warning indicator (1) lights up, clean or change the air cleaner.
- 3) After the clogging is eliminated, the air cleaner clogging warning indicator (1) goes out automatically.



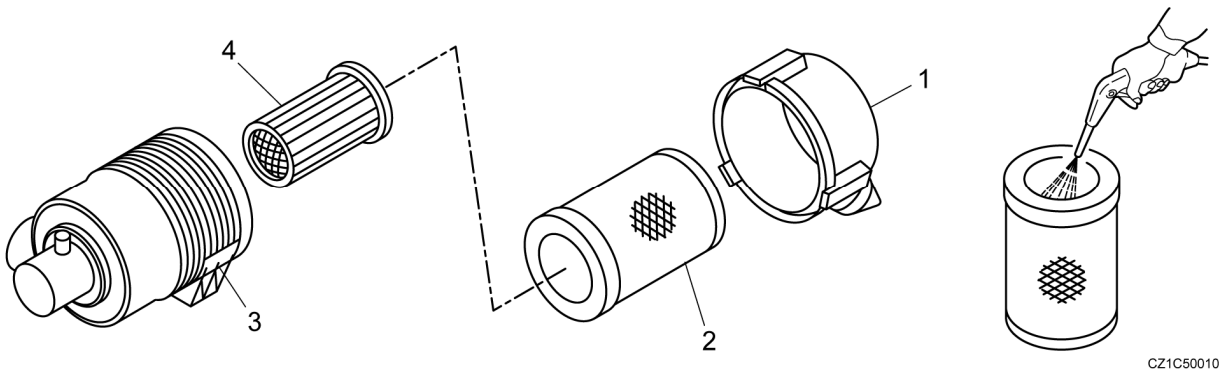
I098857500-026-0E

NOTICE

Clean or replace the element of the air cleaner if the red signal is found in daily inspection, regardless of the maintenance interval.

(T0988566-207-0E)

(2) Inspect and clean air cleaner element



CZ1C500100

- 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/cm²)) 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.

4. Inspection and servicing of each part

- 5) Emit light (white light) from the inside of the element and inspect for damage to the filter.

Do not use the filter if the filter is damaged, or has pin holes, or has particularly thin portions, or if the seal portion is damaged.

- 6) After the cleaning is completed, affix the element again.

- 7) Attach with the arrow mark (↑) is towards the up direction, and fix with a fixing metal catch.

NOTICE

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

(T0988548-142-0E)

- (3) 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.

(T0988548-143-0E)

- (4) Cleaning and replacement intervals

Cleaning intervalEvery 150 hours or when the air cleaner clogging warning indicator appears on the display.

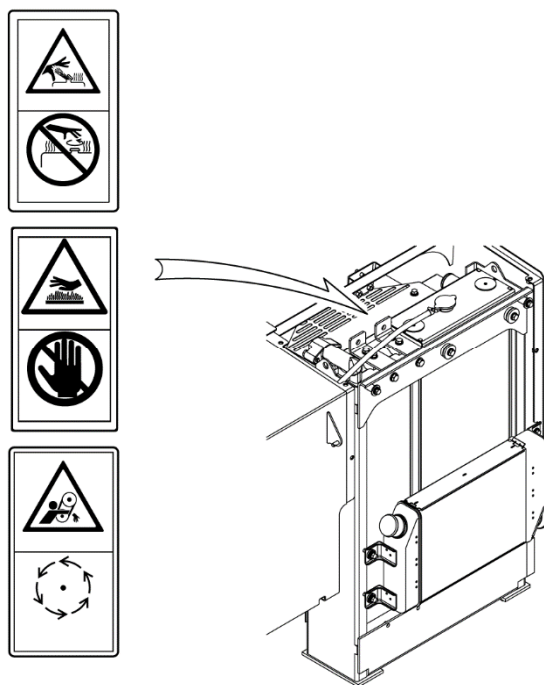
Replacement interval.....Every 250 hours of operation or yearly

- (5) Consumable part number

Refer to the "Data file, Parts list".

4-1-12 Cooling system (T0988566-177-0E)

As the engine runs, corrosion and water scale build up in the water jacket and the radiator, reducing their cooling efficiency and leading to overheating problems etc. It can also reduce the antifreeze effect of the Long Life Coolant added to the coolant, risking engine damage due to freezing. It is very important to regularly clean the cooling system and replace the coolant using the procedure described below.



I098857500-039-0E

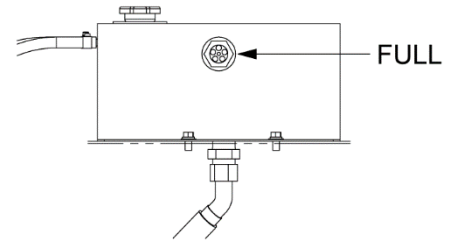
(1) Intervals for inspection and cleaning of the cooling system and replacement of the coolant

- 1) Water leakage, damage on the hoses, or looseness on the bands .. At the time of preoperational checks
- 2) Coolant level inspection.....At the time of preoperational checks
- 3) Coolant replacement.....Every 2 years
- 4) Cooling system cleaningEvery time the coolant is replaced.
- 5) Long Life Coolant (LLC).....Refer to the table "Addition of Long Life Coolant and calculation of its concentration" in 4-1-12 (3).
- 6) Coolant addingAdd the coolant through the cap on the top of the coolant tank.
- 7) Water for coolantUse tap water (soft water).
- 8) Radiator core cleaning.....Every 250 hours of operation or 6 months
- 9) Inspection of the Long Life Coolant concentration.....Every 500 hours of operation or 1 year

4. Inspection and servicing of each part

(2) Inspecting and replenishing the coolant

Set the machine body on the level when checking the coolant level. Always check the coolant level before starting the engine and check that the level is between the FULL line and the LOW line of the coolant tank. If the level is low, open the cap of the coolant tank and replenish coolant.



1098857500-007-0

WARNING

When you inspect or replenish the coolant, check that it has cooled sufficiently.

(T218081-174-0E)

CAUTION

Be sure to measure the Long Life Coolant concentration when replenishing the coolant after the level inspection or when repairing coolant leakage. An inappropriate concentration of Long Life Coolant could cause damage to the engine.

(T0988548-142-1E)

(3) Addition of Long Life Coolant and calculation of its concentration

Coolant freezing temperature against addition volume of the Long Life Coolant (LLC)

Minimum outside temperature (°C)		-35
Mixing rate (%)		50
Mixing volume (L)	LLC volume (L)	15.1
	Water volume (L)	15.1
Coolant Total volume: 30.2 L		Engine: 11.7 L Radiator, hose: 8.0 L Coolant tank: 10.5 L

(Using Long Life Coolant specified by the engine manufacturer)

(T0988566-178-0E)

Once you have finished adjusting the Long Life Coolant concentration, start the engine and allow it to mix the coolant fully, then use a hydrometer or concentration gauge to check the actual concentration.

(4) Precautions on handling Long Life Coolant

1) No fire near Long Life Coolant

Long Life Coolant is a hazardous substance and must not be handled near fire or other source of ignition.

CAUTION

Long Life Coolant is flammable, so beware of fire.

(T0988548-282-0E)

2) Do not drink Long Life Coolant

Long Life Coolant is poisonous. Never allow it into your mouth even when diluted. If you drink it by accident, make yourself vomit immediately and consult a doctor.

3) Never leave Long Life Coolant unattended or improperly stored

If you decant Long Life Coolant into smaller containers for storage, seal the container and clearly label the lid "COOLANT" respectively. Store them out of direct sunlight and out of the reach of children.

WARNING

- If you accidentally get Long Life Coolant in your eye, wash the affected area immediately in large amounts of clean water and consult a doctor.
- When you add or replace the coolant, check that it has cooled sufficiently.

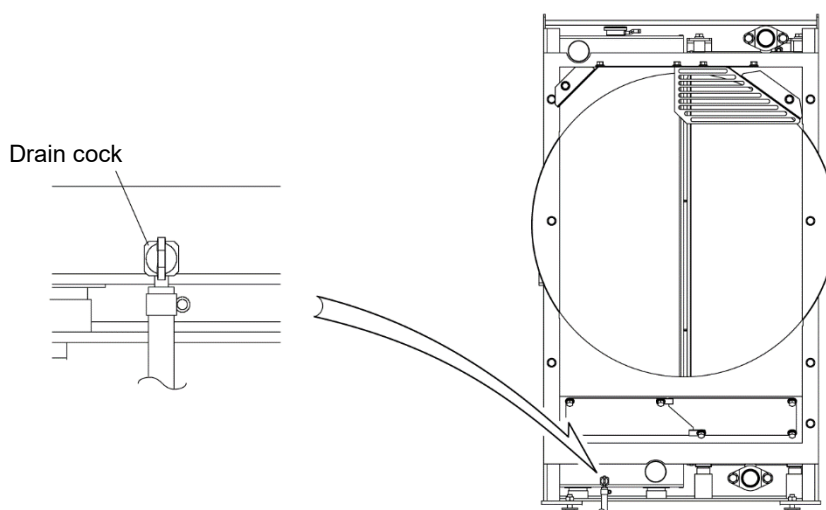
(T0988548-283-1E)

(5) Draining the coolant

WARNING

- When the radiator coolant is hot, it could spray out dangerously when you take the radiator cap off, possibly causing burns.
- If you have to take the radiator cap off, wait until the coolant has had time to cool and slowly loosen the cap to allow pressure to dissipate before you remove it.

(T218081-176-0E)



1098857500-040-0E

- 1) Place a container under the radiator drain cock to catch any coolant spillage.
- 2) Remove the radiator caps from the expansion tank and radiator.
- 3) Remove the cover from the bottom of the radiator.
- 4) Open the drain cock to drain the coolant from inside the radiator.
- 5) Once all coolant has drained out, tighten the drain cock to the regulation torque.
 - Tightening torque for the drain cock: 1.96 N·m

(6) Cleaning the coolant flow lines

- 1) Drain the coolant from inside the radiator.
- 2) Fill the radiator with tap water up to the specified level.
- 3) Inspect and clean the radiator cap. If there is any problem with the cap, replace it.
- 4) Tighten the radiator cap securely.
- 5) Start up the engine and let it idle for 20 minutes. Then shut off the engine and wait until the engine has cooled adequately before draining the water.
- 6) Repeat the above steps until the drained water becomes clean.

4. Inspection and servicing of each part

(7) Adding the coolant

- 1) Check that the radiator drain cock is securely tightened.
- 2) Fill the coolant tank with the coolant up to the specified level. At this time, the pressure cap of the coolant tank should be removed. After checking for being filled up, close the radiator cap.
 - Total coolant volume: About 30.2 L
- 3) Push on the upper radiator hose by hand several times to bleed the hose of air. If the coolant level decreases, add more coolant to raise the level. Repeat the above steps until the coolant level no longer decreases.
- 4) Tighten the radiator cap securely.
- 5) Start up the engine and let it idle for 5 minutes. Then shut off the engine.
- 6) Check that the coolant has cooled. If the coolant level has decreased, add coolant up to the specified level.
- 7) Run the engine at a slightly higher speed than the idling speed to bleed the cooling system of air.
- 8) If the water temperature indicator is stabilized, shut off the engine.
- 9) Check that the coolant has cooled. If the coolant level has decreased, add coolant up to the specified level by following the steps 2) to 8).
- 10) Tighten the radiator cap securely.
- 11) Start up the engine and check that there is no coolant leakage.

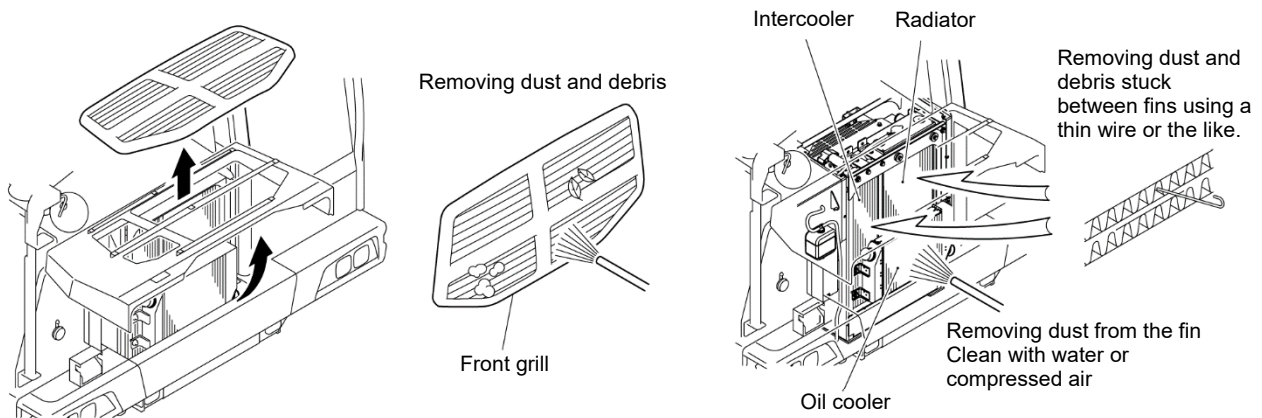
(8) Consumable part number

Refer to the "Data file, Parts list".

(9) Radiator core cleaning procedure

Dust and withered grass on the radiator core, oil cooler core, and intercooler core will impair the cooling effect and cause overheating.

- 1) To remove dust, remove the protector net and cover, and perform blowing against the core with 0.2 MPa (2 kgf/cm²) or less of water or compressed air from a distance of 20 to 30 mm from the front surface and perpendicularly to it as far as possible.
- 2) If withered grass or other debris is stuck between the fins of the core, use a thin wire to remove it so as not to damage the fins. Remove dust and debris also from the protector net.
- 3) Install the covers back in place.



10988566-061-0E



CAUTION

- Be sure to put on protective goggles when cleaning the radiator core.
- Using too-high pressure of water or compressed air may cause deformation of the radiator fins, which obstructs air flow and results in the opposite effect. Take care to keep a sufficient distance between the blow nozzle and the core.

(01E0-0311-0E)

4-2 Hydraulic system-related (01E0-0315-0E)

4-2-1 Maintenance of hydraulic devices (01E0-0316-0E)

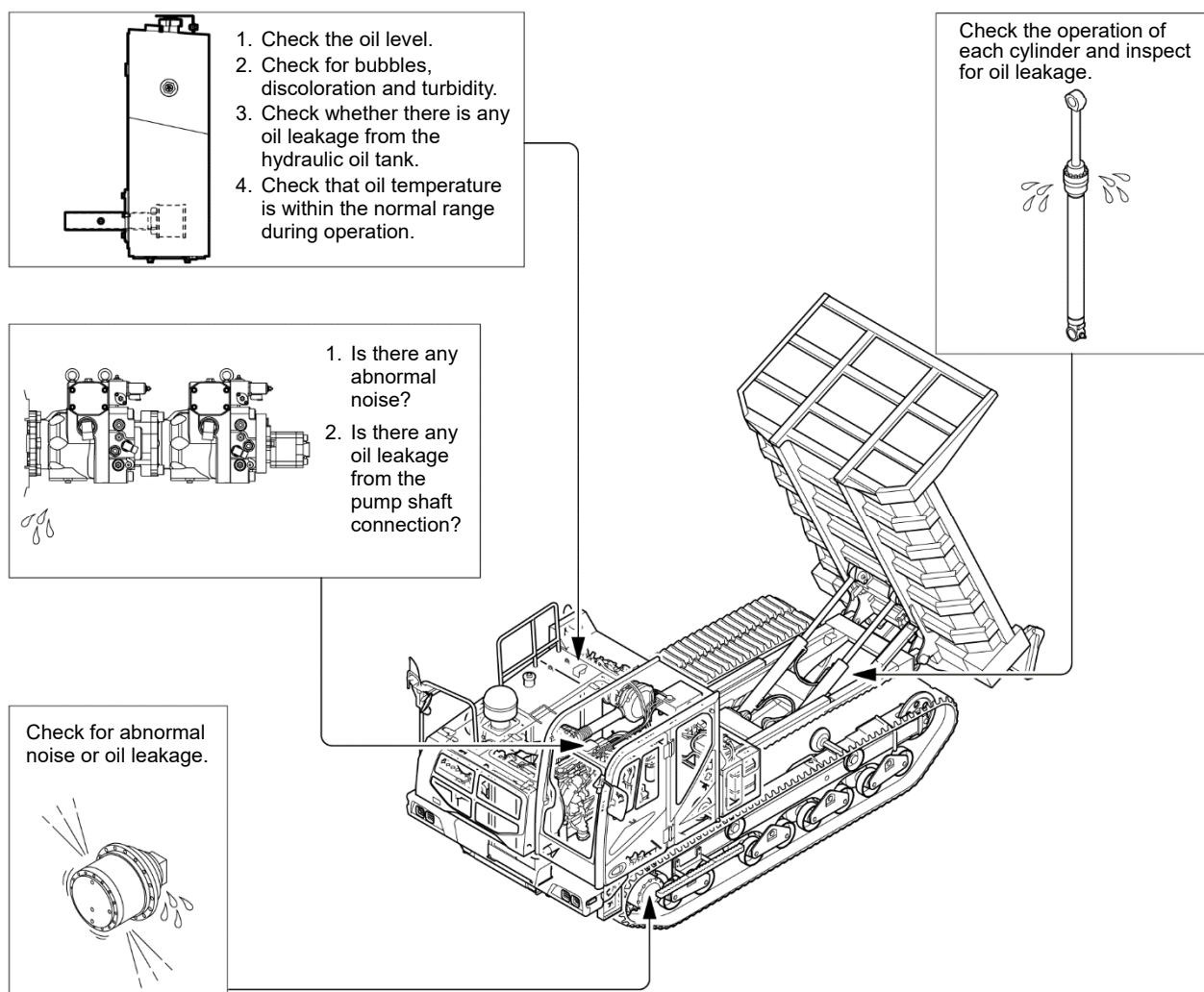
This machine is hydraulically powered and uses high-precision hydraulic equipment. Therefore if it is not operated and maintained correctly, its performance will be reduced and its lifespan shortened with an increased risk of malfunction. Always carry out the following daily inspections.

WARNING

- Always relieve pressure on the hydraulic oil tank before you inspect or service any hydraulic part or system.
- Never interfere with the pump regulator setting and relief settings of the control valve and brake valve.
- The bolts holding hydraulic equipment in place are under an extremely high force, so they are tightened to the right torque. In case of trouble, contact your authorised KATO dealer. Special bolts are used for attachment of hydraulic equipment, so you should not use normal commercially available ones which might cause breakdowns.
- If the hydraulic oil is hot, wait for it to cool before carrying out inspection and servicing. If you start work while the oil is hot, you may suffer severe burns.
- When you have replaced the hydraulic device, return filter or hydraulic oil, you should allow a running-in period of approximately 10 minutes at engine low speed with the control levers in their neutral positions (with no load applied).

(T0988548-286-0E)

(1) Daily inspection of hydraulic devices



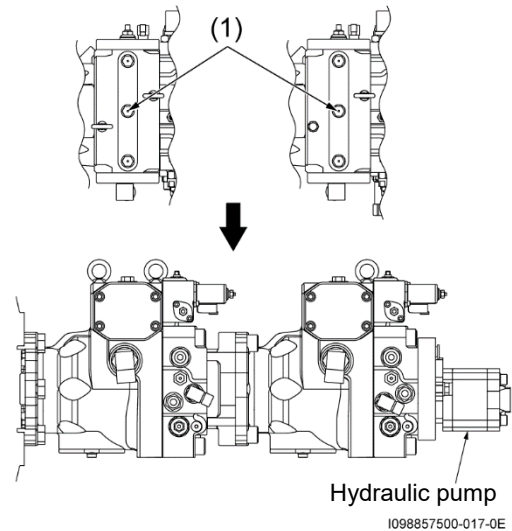
1098857500-041-0E

4. Inspection and servicing of each part

4-2-2 Extraction of air from the hydraulic pump (T0988548-155-0E)

- (1) Discharge air from the hydraulic pump.

Remove the air vent plug (1) and make sure that air is discharged and oil flows out through the plug hole.



NOTICE

The hydraulic pump may be broken unless air is discharged.

Be sure to discharge air from the hydraulic pump after changing hydraulic oil or replacing the hydraulic pump.

(T0988548-156-0E)

- (2) Idle the engine for approximately two to three minutes at low speed. Bring the machine into the level checking posture and check the oil level. Refill hydraulic oil if insufficient.

4-2-3 Hydraulic oil level and refilling (T0988566-125-0E)

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

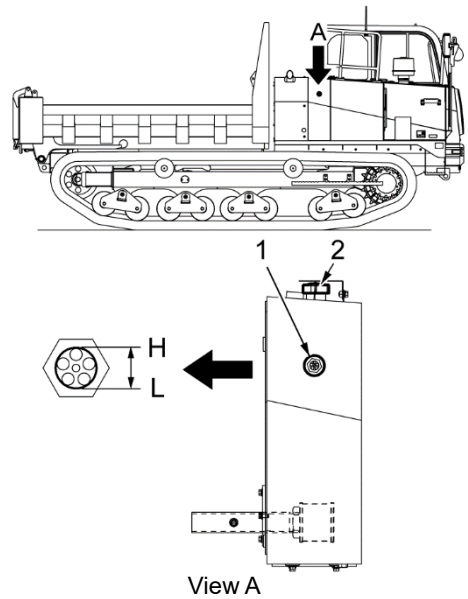
(2) Check the oil level gauge (1). If the oil level is between H and L, it is proper.

The oil level differs with the oil temperature. The following shows the standard.

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

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

Posture for checking the hydraulic oil



I0988566-064-0E

4-2-4 Drain the hydraulic oil tank (T0988566-126-0E)

WARNING

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

(T0988566-127-0E)

(1) Loosen the drain plug under the hydraulic oil tank to discharge water and sediment into a container.

(2) Close the drain plug when clean hydraulic oil is only discharged.

(3) Check the hydraulic oil level. Refill oil if insufficient.

4. Inspection and servicing of each part

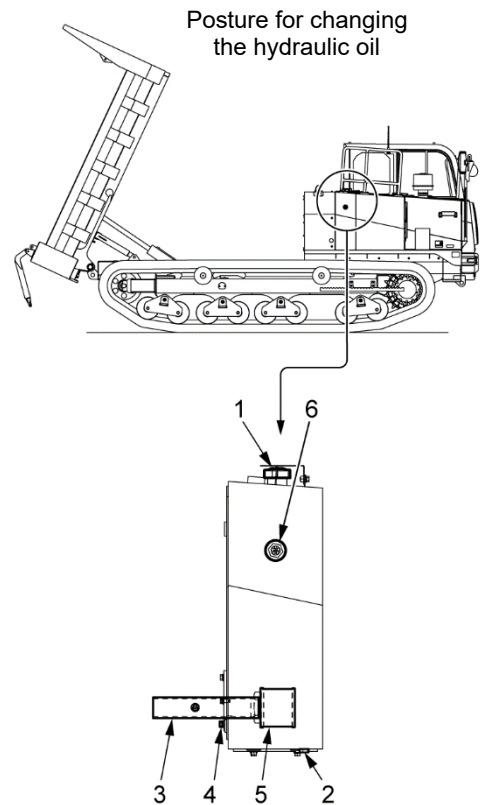
4-2-5 Change the hydraulic oil and clean the strainer (T0988566-128-0E)

WARNING

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

(T0988566-129-0E)

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



I0988566-065-0E

4-2-6 Replace the line filter cartridge and return filter cartridge (T0988566-130-0E)

⚠ WARNING

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

(T0988566-131-0E)

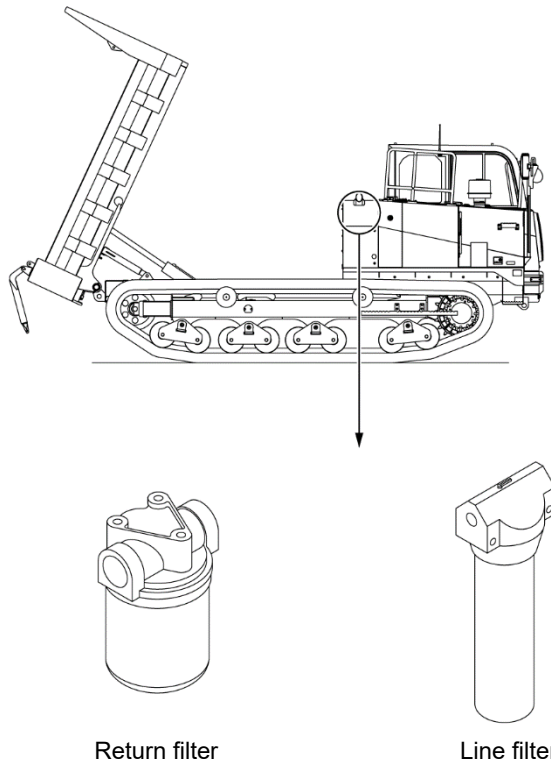
- (1) Remove the filter cartridge (1) with the filter wrench.
- (2) Clean the filter mounting position of the filter head (2). Apply hydraulic oil to the O ring (3) of a new filter cartridge.
- (3) Attach the filter cartridge and tighten it with the filter wrench.

Tighten it until the O ring is crushed and the top of the cartridge is brought into contact with the head.

- (4) Start the engine. Make sure that no oil leaks from the mounting position of the filter cartridge.
- (5) Store the safety bars, lower the vessel and check the oil level in the hydraulic oil tank.

It is OK if the oil level is between the H and L positions of the level gauge.

Refill hydraulic oil if insufficient.



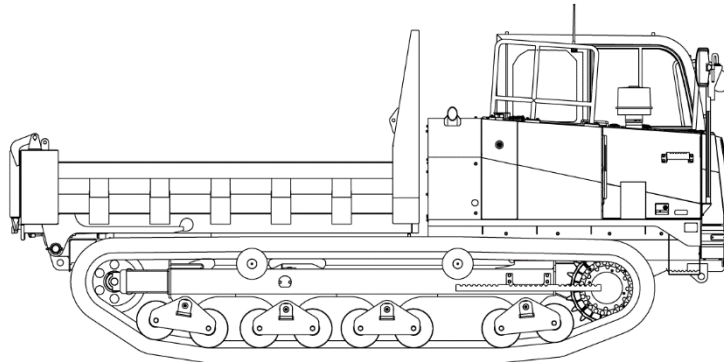
I098857500-042-0E

4. Inspection and servicing of each part

4-3 Travel-related (01E0-0344-0E)

WARNING

- After jacking up, always place a block or other secure support under the traveling frame for safety to support the machine.
- Place the front attachment in a stable position, stop the engine and move the control lock lever to the lock position.



I0988566-068-0

(T0988548-304-0E)

4-3-1 Oiling the idlers (T0988566-132-0E)

Check to make sure no oil is leaking from the plugs of the idlers. If any oil is leaking, have your authorised KATO dealer add oil. Operating the machine with oil leaking from the front idler could damage the travel system.

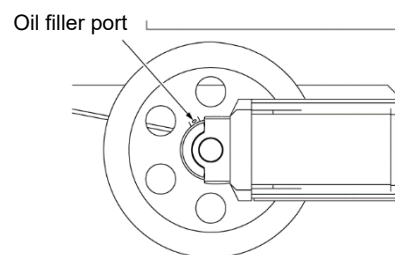
(1) Inspection and oiling intervals

Inspection interval..... At the time of preoperational checks

Oiling interval When defective

Oil volume (per front idler)..... 0.2 L

Oil for oiling..... Engine oil SAE#30 API-CD
or higher grade

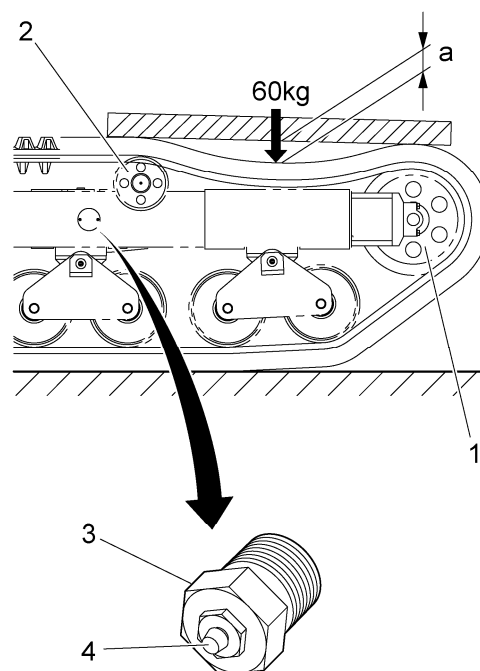


I0988566-069-0E

4-3-2 Inspection and adjustment of tension of rubber crawlers (T0988566-133-0E)

(1) Checking tension of the rubber crawlers

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



CA-C400440

NOTICE

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

(T0988566-134-0E)

(3) Loosening the rubber crawlers

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

NOTICE

Be careful not to over-tighten the check valve.

(T0988566-135-0E)

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

⚠ WARNING

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

(T0988566-136-0E)

4. Inspection and servicing of each part

4-3-3 Travel reduction gear (T0988566-137-0E)

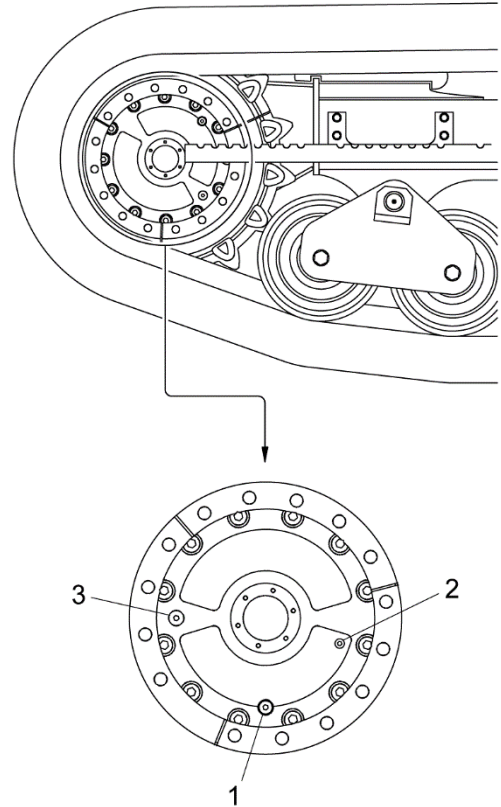
(1) Check the travel reduction oil level

WARNING

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

(T0988566-138-0E)

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



I098857500-043-0

(2) Change the travel reduction oil

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

4-4 Electrical system-related (01E0-0363-0E)

4-4-1 Battery handling (T0988566-179-0E)

This machine uses a 24 V (12 V+12 V) battery with a negative earth. Observe the following precautions when handling the battery.



WARNING

- 1) When handling the battery system, wear a protective eyewear, protective gloves, and long-sleeved working clothes.
- 2) The battery electrolyte used is dilute sulfuric acid, so keep it away from your eyes, skin, clothing and any metal components. If it comes into contact with any of them, wash it away with large amounts of water. (In case of personal contact, consult a doctor after washing.)
- 3) The batteries generate flammable hydrogen, so do not use flame or other source of ignition near the batteries.

In particular take care when welding.

- 4) Before inspecting/servicing the batteries or servicing the electric system, be sure to turn off the starter switch and disconnect the battery cable from the negative terminal for safety operation.
- 5) Before welding, be sure to turn off the starter switch and disconnect the battery cable from the negative terminal for safety operation. If you disconnect the battery cable from the negative terminal first, the electronic device could malfunction.
- 6) When detaching the battery cable, always begin with the negative terminal and when reattaching the battery cable, begin with the positive terminal. Take care to connect the terminals correctly.
- 7) Handle the batteries with care. In particular do not charge them near flame or a source of ignition and do not dispose of them in fire as an explosion could result.
- 8) Never take the batteries apart or make holes in the casing.
Any resulting leakage could cause dangerous corrosion and personal injury.
- 9) When recharging the batteries, dismount them from the machine, remove all bungs and place them in a well-ventilated area.

(T0988548-182-0E)

4. Inspection and servicing of each part

(1) Battery electrolyte level inspection



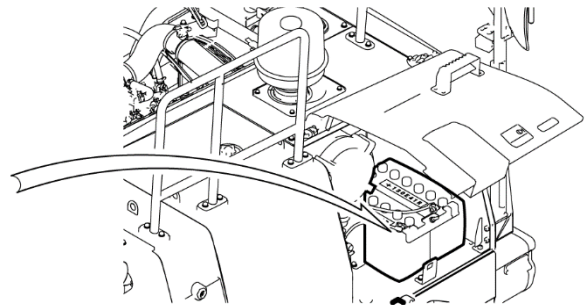
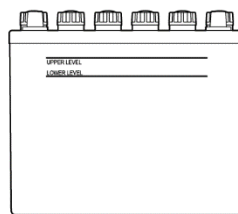
CAUTION

When performing the preoperational checks, be sure to check the batteries for the electrolyte level and refill if they are insufficient. If the electrolyte level is below "LOWER", the battery could explode when starting the engine.

(01E0-0366-0E)

The battery electrolyte level should be between the "UPPER" and "LOWER" level lines.

If it is below the "LOWER" level, top it up with battery electrolyte or distilled water to the "UPPER" level. Do not top up beyond the UPPER level.



10988566-070-0E

(2) Battery terminal inspection

Check for loose terminals and clean away dirt and corrosion.

- 1) If the terminals are covered with whitish powdery corrosion, wash it with away with boiling water.

If corrosion is severe, use a wire brush or sandpaper to scrape it away.

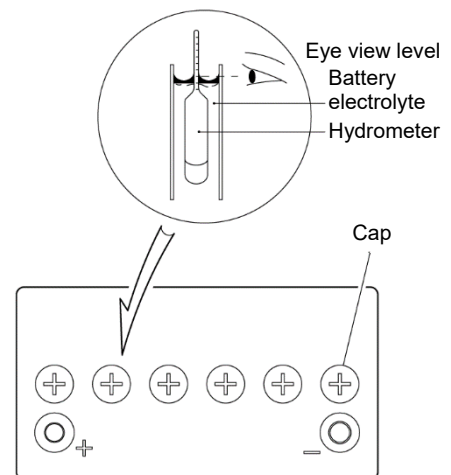
- 2) After cleaning the terminals, coat them in a thin layer of grease.

3) Specific gravity inspection

Full charge 1.28 (at 20°C)

Half charge 1.22

You must recharge the battery if the specific gravity is at or below 1.22.



10988552-079-0E

4-4-2 How to start the engine using the booster cables (T218081-084-0E)

WARNING

Precautions to observe when using the booster cables to start the engine

- When you are going to start the engine, refer to the section "Battery handling" in order to handle the battery correctly.
- Always wear protective goggles when you start the engine.
- Confirm the procedure for attaching the booster cables.
Incorrect booster cable attachment can cause accidents and breakdowns such as battery explosion or shorting in the electrical system.
- When you connect the booster cables, never connect the positive and negative terminals to each other.
- This machine uses 24 V battery capacity. The assisting machine should have the same specifications of the battery (voltage, capacity) as the broken-down machine has. Also use the right booster cables and clips for the battery capacity. If you use high-voltage sources such as those for welding equipment, or if you use a battery of a different voltage, you will damage the electrical equipment.
- When you are trying to start the engine, switch off all lights and accessories on the machine which has failed to start.
It is dangerous to operate any accessories while the outside power supply is connected.
- Park the assisting machine so it is not in contact with the broken-down machine. If they do touch, a short circuit will result, possibly damaging electrical equipment.
- In order to prevent the electrical components of the failed machine from getting damaged, turn the battery disconnect switch to the OFF position " - " before installing the booster cable.
- When you detach the booster cables, do not allow the clips to touch each other or the machine.

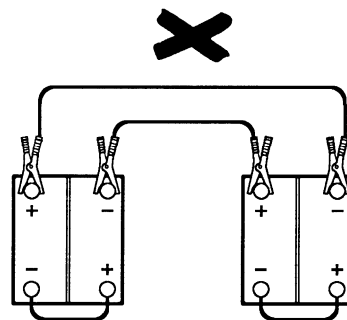
(T0988548-183-1E)

4. Inspection and servicing of each part

4-4-3 Starting engine with booster cables (T0988566-139-0E)

To start the engine using booster cables when the battery is dead, observe the following procedures.

Never connect the $\oplus$ and $\ominus$ terminals.



CA-C300100

WARNING

- If the booster cables are connected improperly, the battery will be shorted, resulting in a dangerous accident. Never connect the $\oplus$ and $\ominus$ terminals.
- The battery produces flammable hydrogen gas, which is explosive. Do not bring fire close to it or produce sparks near it.

(T0988548-185-0E)

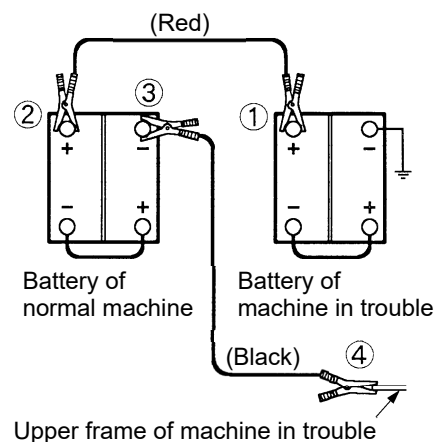
NOTICE

The electrical circuits of this machine run on 24 V. Use a 24 V auxiliary battery.

(T0988566-140-1E)

(1) Order of connecting booster cables

- 1) Set the engine key switches of the normal machine and machine in trouble to the OFF positions.
- 2) Connect the clip of the booster cable (red) to the $\oplus$ terminal of the machine in trouble. Connect the other clip to the $\oplus$ terminal of the normal machine.
- 3) Connect the clip of the booster cable (black) to the $\ominus$ terminal of the normal machine. Connect the other clip to the upper frame of the machine in trouble.



Order of connecting booster cables

① → ② → ③ → ④

CA-C300110

(2) Starting engine

- 1) Make sure that the cable clips are connected to the battery terminals and upper frame firmly.
- 2) Start the engine of the normal machine and keep the engine running at high revolution.
- 3) Start the engine of the machine in trouble.

(3) Disconnecting booster cables

- 1) First, disconnect the clip of the black booster cable (black) from the upper frame, and then disconnect the clip from the $\ominus$ terminal of the normal machine.
- 2) Disconnect the clip of the booster cable (red) from the $\oplus$ terminal of the normal machine, and then disconnect the clip from the machine in trouble.

Order of disconnecting booster cables

④ → ③ → ② → ①

CA-C300120

4-4-4 Replacement of bulbs (T0988548-187-0E)

Always switch the starter switch and lamp switches "OFF" before you start to replace the bulb.

Only use bulbs of the correct rated voltage and wattage.

**CAUTION**

Always replace the bulb with that of the specified capacity. If you use the bulb or LED light in excess of the rated capacity, the excess power consumption will cause accidents by blowing the fuse, burning to damage the relay or igniting electrical insulation.

(T0988552-051-0E)

(1) Consumable part number

Refer to the "Data file, Parts list".

4-4-5 Replace the fuses (T0988548-188-0E)**NOTICE**

- Be sure to set the engine key switch to the OFF position and remove the battery terminals before replacing the fuses.
- 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.

(T09885966-180-0E)

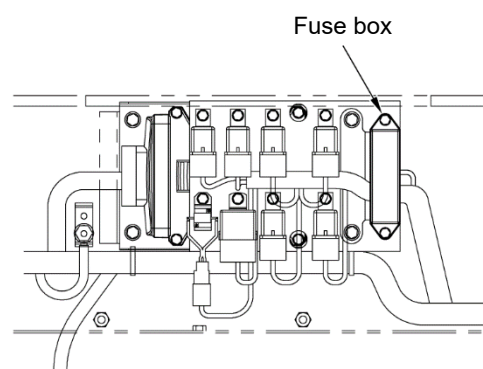
(1) Set the engine key switch key to the OFF position.

(2) Take off the fuse cover.

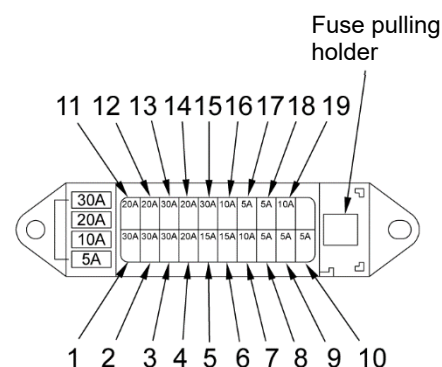
(3) Replace the blown fuse with a new fuse of the same capacity by using the fuse pulling holder installed in the fuse box.

	Fuse capacity	Circuit name
1	30 A	RESERVE
2	30 A	BACK UP
3	30 A	DEF HEATER
4	20 A	RESERVE
5	15 A	AFTER TREATMENT
6	15 A	DEF PUMP
7	10 A	SERVICE TOOL
8	5 A	RESERVE
9	5 A	ENGINE IGN
10	5 A	RESERVE
11	20 A	2SPEED PARKING LEVER LOCK etc.
12	20 A	A/C
13	30 A	LIGHT UNIT
14	20 A	ACCESSORY POWER SOCKET
15	30 A	WORKING LIGHT (OPT)
16	10 A	RESERVE
17	5 A	RESERVE
18	5 A	RESERVE
19	10 A	BACK MONITOR.RADIO.USB

(T0988566-181-0E)



I0988566-071-0E



I098857500-022-0E

4. Inspection and servicing of each part

4-4-6 Replace the fusible link (T0988548-190-0E)



CAUTION

- When the fuse has blown, investigate the cause carefully and repair the problem completely before attaching the fuse.
- Be sure to use the fuse with the designated ampere.

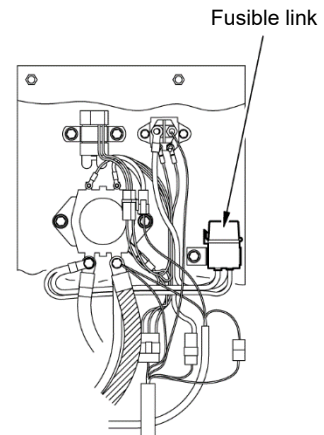
(T0988548-191-0E)

High current fuses are placed to blow and protect the circuit if a large current flows in the circuit between the batteries and the fuse box due to a short circuit or other problem.

If there is no abnormality in the fuses and a problem occurs in the electrical system, the fusible link has blown. Contact your authorised KATO dealer and replace the fusible link after the problem has been repaired.

(1) Consumable part number

Refer to the "Data file, Parts list".



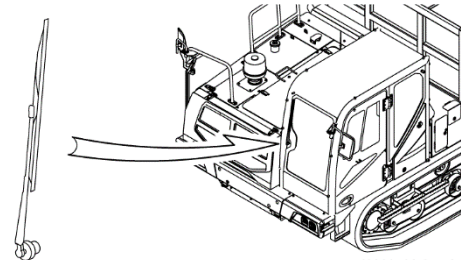
I098857500-044-0E

4-4-7 Inspection and replacement of the wiper blade (T218081-203-0E)

Work the windscreen wiper switch to check that the wiper works and that it switches normally between intermittent and continuous actions. Also check that the wiper blade is not damaged. Replace the wiper blade if it is worn or damaged.

(1) Consumable part number

Refer to the "Data file, Parts list".



I0988566-075-0

4-5 Air conditioner-related (01E0-0376-0E)

Have the air conditioner inspected and serviced regularly to maintain it at full performance.



CAUTION

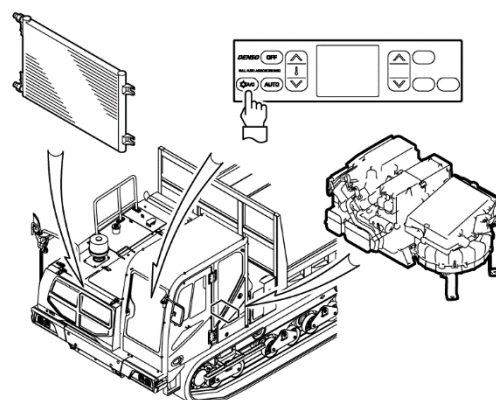
- If the air conditioner malfunctions, switch it OFF and contact your authorised KATO dealer.
- Filling with refrigerant (gas) and other service tasks require special tools and instruments and should only be attempted in a properly equipped KATO dealer.
- The refrigerant used for this air conditioner is HFC-134a. The classification number of the refrigerant (chlorofluorocarbon) and the amount of refrigerant filled in at the time of factory shipment are shown on the label attached on the cover behind the operator's seat.

Always have air conditioner repairs performed by your authorised KATO dealer. Always have it disposed of by a reputable waste disposal company.

(01E0-0377-1E)

NOTE

Even in seasons when the air conditioner is not used, run it with the automatic control switch turned OFF (manual control) and compressor switch turned ON for a few minutes two or three times per month to circulate oil to all parts of the compressor and maintain their oil coating.



10988566-076-0

4-5-1 Inspection and servicing list (T0988566-208-0E)

(1) Intervals for inspection, cleaning, and replacement

- 1) Inspection of the internal air filter and outside air filter At the time of preoperational checks
- 2) Replacement of the internal air filter and outside air filter Every 2,000 hours of operation or 2 years
- 3) Inspection of the condenser..... At the time of preoperational checks
- 4) Cleaning of the condenser..... Every 100 hours of operation or 1 month
- 5) Crack or damage on the compressor belt..... At the time of preoperational checks
- 6) Inspection of the refrigerant volume..... Every 500 hours of operation or 6 months
- 7) Looseness, damage, or gas leakage of the connection piping Every 500 hours of operation or 6 months
- 8) Replacement of the receiver drier Every 2,000 hours of operation or 2 years
- 9) Replacement of the air conditioner compressor belt Every 3,000 hours



CAUTION

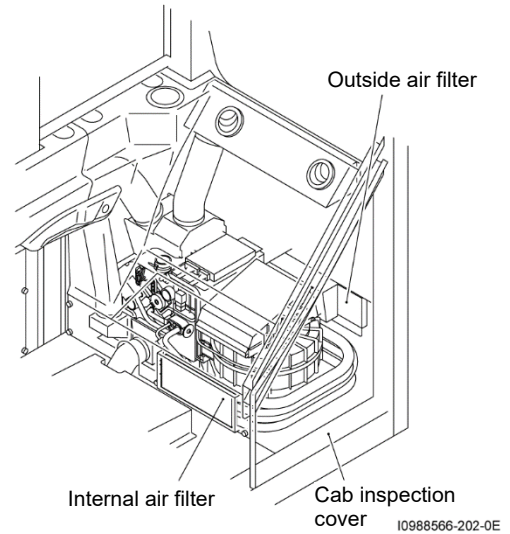
For refilling the refrigerant, refer to a separate servicing manual to check for refilling the volume and method.

(01E0-0380-0E)

4. Inspection and servicing of each part

4-5-2 Filter inspection, cleaning, and replacement (T0988566-182-0E)

The air conditioner unit includes filters to prevent dust, debris, or other matter from accumulating on the evaporator or heater core. Periodically remove the filters to inspect them and clean them by lightly hitting them, to the extent it does not damage the plastic frame. If filter blockage is not resolved by cleaning or there is significant deterioration or damage, install a new replacement filter.



(1) Removing and installing filters

1) Internal air filter (location: seat opposite side)

Removal: Pull the filter out from the above.

Installation: Install the filter by reversing the removal steps.

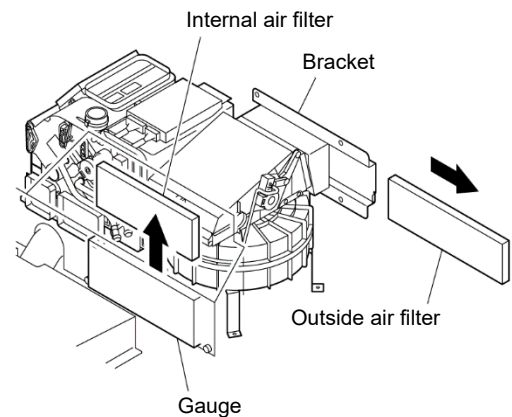
Make sure that the filter is held by the bracket claws.

2) Outside air filter (location: cab rear side)

Removal: Open the cab inspection cover and pull the filter out.

Installation: Install the filter by reversing the removal steps.

Make sure that the filter is held by the bracket claws.



(2) Consumable part number

Refer to the "Data file, Parts list".

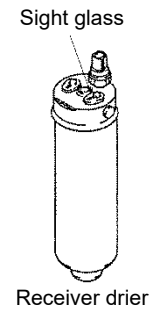
4-5-3 Inspection of refrigerant (gas) volume (T218081-204-0E)

The refrigerant for this air conditioner is HFC-134a. Never fill the air conditioner with any other refrigerant.

1) Conditions for evaluating refrigerant volume

Engine speed: Low idling
 Air volume switch: Strong
 Temperature setting switch: Maximum cooling
 Pressure on high-pressure side: 1.41 to 1.61 MPa
 (14.4 to 16.4 kgf/cm²)
 (Block the front of the condenser by the right amount to produce a pressure in this range.)

Door: Fully open
 Windows: Fully open



01E0-04170

2) Evaluation guidelines

Compare the state of bubbling visible through the sight glass with the diagrams below.

Refrigerant volume	Status seen from the sight glass	Action
○ Correct	After the air conditioner is turned on, a very small amount of bubble is visible, becoming transparent. 	
✕ Incorrect	After the air conditioner is turned on, bubbles are continuously visible. 	Have your authorized KATO dealer check and refill with refrigerant.

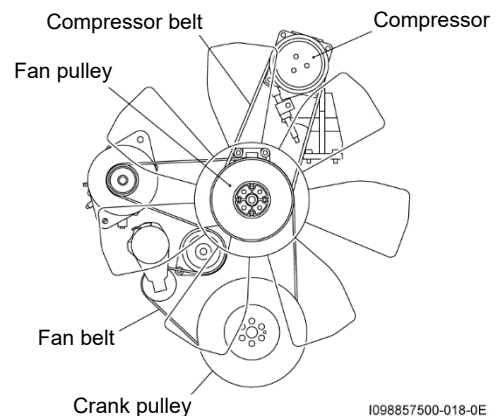
(Explanation of refrigerant flow illustrations)

-  Bubbling: Refrigerant is liquid with extensive mixing of vapour and liquid phases.
-  Bubbles have disappeared: As all the refrigerant becomes liquid, it turns transparent.

1218081-435-0E

4-5-4 Belt inspection (01E0-0383-0E)

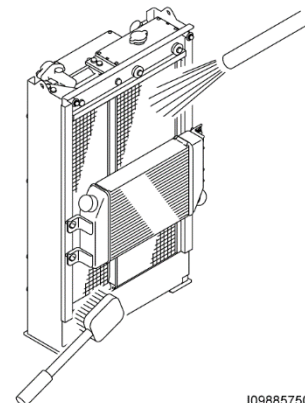
Check that the compressor belt and fan belt are not loose or worn. A loose compressor belt may slip and reduce the cooling effect. A loose fan belt may cause overheating and a dead battery.



1098857500-018-0E

4-5-5 Inspection for blockage in the radiator and condenser (T218341-116-0E)

If the radiator and condenser are clogged with mud, insects etc., the passage of air will be obstructed, causing overheating and reduced cooling performance. Clean them regularly according to the section "4-1-12 Cooling system, (9) Radiator core cleaning procedure".



1098857500-019-0

4. Inspection and servicing of each part

4-6 Travel-related (T0988548-192-0E)

4-6-1 Rubber shoe maintenance (T0988548-193-0E)

Rubber shoe should be repaired or exchanged if goes into any of the conditions described below.

If it is necessary to repair or replace it, contact our dealer.

(1) Height of lug

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

(2) Exposure of steel cord

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

(3) Cutting of steel cord

Replace immediately if more than half of the steel cord layer on one side has been cut.

If this is left as it is, the rubber shoes breaks suddenly during operation, thereby leading to a serious accident.

(4) Crack of covering rubber

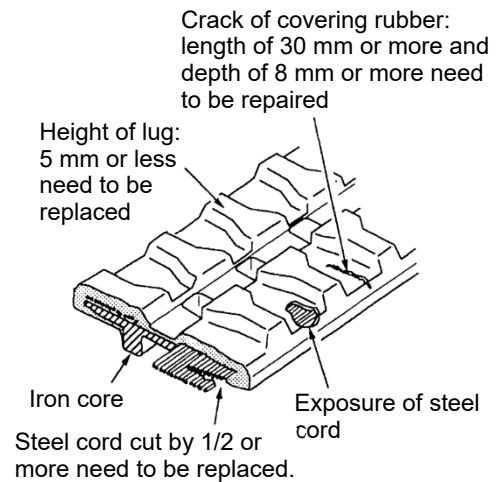
If a crack is 30 mm or more long and 8 mm or more deep, repair the covering rubber immediately. If steel cord appears even if a crack is small, repair it immediately. Otherwise, water may come into a crack, which rusts steel cords and cuts off the rubber shoe.

(5) Dislocation of the iron core

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

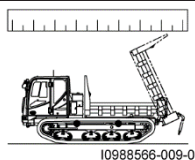
(6) Adjustment procedure

Refer to the "4-3-2 Inspection and adjustment of tension of rubber crawlers".



Damages of rubber shoe

WC-C300630J



Data file

1. Tighten bolts	131
1-1 Special tightening positions.....	131
1-2 Standard tightening torques (10T bolts)	133
2. Parts list.....	134

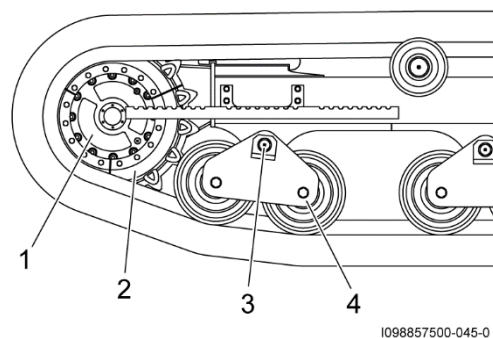
1. Tighten bolts (T0988566-144-0E)

Retighten loose bolts in daily inspection. Be sure to make up for lacking bolts. Check and retighten the bolts after the first 50 hours if a new machine is used.

1-1 Special tightening positions (T0988566-145-0E)

The bolts shown below bear large forces. Tighten them at the torque shown in the table below.

When these bolts and nuts are replaced, apply the Loctite to the threads and tighten them at the specified torques.



(1) Travel unit

No.	Tightening position	Bolt size	Wrench size (mm)	Tightening torque	
				(N·m)	(kgf·m)
1	Travel reduction gear	M20	30	476	48.5
2	Drive sprocket	M20	30	476	48.5
3	Oscillating link	M30 Castle nut	46	476	48.6
4	Lower roller	M24	36	850	86.7

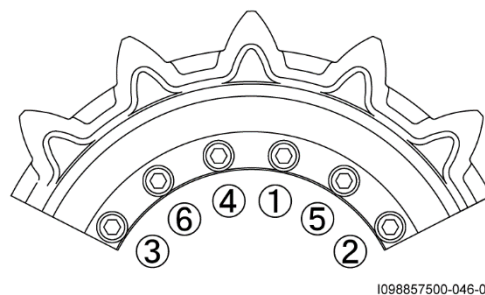
(T0988575-004-0E)

- Precautions in attaching the drive sprocket.

Observe the following procedures when attaching the drive sprocket.

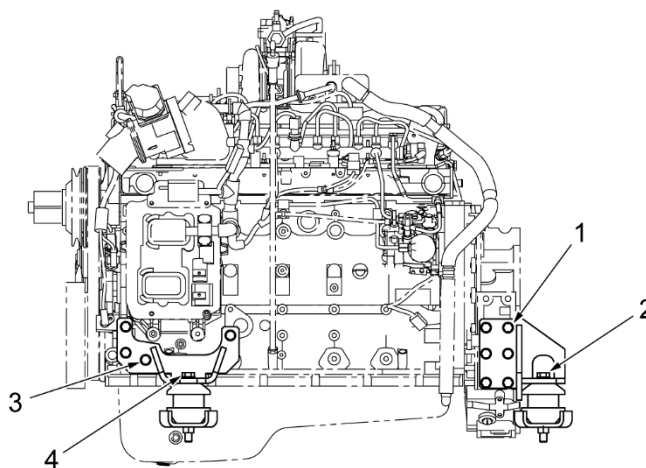
- 1) Bring the inner surface of the sprocket into close contact with the motor spigot when attaching the sprocket.
- 2) Tighten all of six bolts with the Loctite applied at a torque of 245 to 295 N·m first.
- 3) Then, tighten the bolts in the order shown in the figure at the specified torque of 476 N·m.

Tighten the bolts quickly since Loctite is applied to them.



1. Tighten bolts

(2) Engine

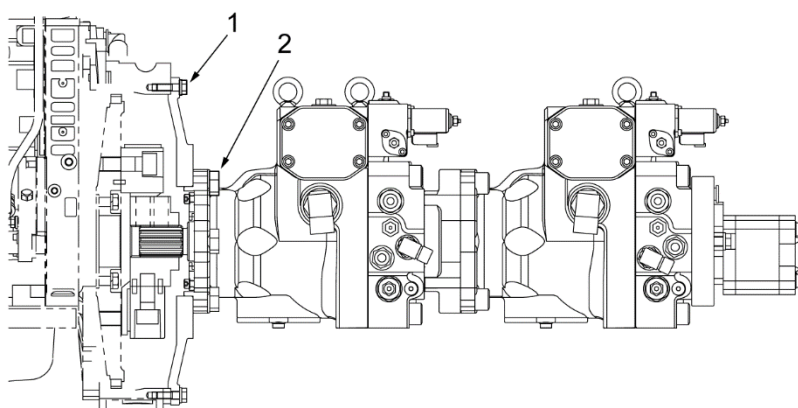


I098857500-020-0

No.	Tightening position	Bolt size	Wrench size (mm)	Tightening torque	
				(N·m)	(kgf·m)
1	Engine and bracket (rear)	M16	24	256	26.1
2	Bracket and frame (rear)	M16	24	241	24.6
3	Engine and bracket (front)	M16	24	256	26.1
4	Bracket and frame (front)	M16	24	241	24.6

(T0988566-146-0E)

(3) Hydraulic pump



I098857500-021-0J

No.	Tightening position	Bolt size	Wrench size (mm)	Tightening torque	
				(N·m)	(kgf·m)
1	Engine and pump housing	M10	17	47	4.8
2	Pump housing and hydraulic pump	M20	30	476	48.5

(T0988575-005-0E)

1-2 Standard tightening torques (10T bolts) (T0988566-148-0E)

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

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

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

2. Parts list

2. Parts list (T0988566-149-0E)

This parts list contains the consumable parts of the main vessel and engine of the machine.

Regarding parts not listed in this parts list, please contact our sales service dealer.

When ordering any of the parts listed below, please notify the model, serial number, part name and quantity.

(1) Consumable parts list

Part Name	Part No.	Quantity/Unit	Remarks
Fuel filter cartridge	FF63054NN	1	Cummins
Water separator cartridge	FS20121	1	Cummins
Engine oil filter cartridge	LF3970	1	Cummins
Air cleaner filter (outer)	AF26124	1	Cummins
Air cleaner filter (inner)	AF26125	1	Cummins
Hydraulic oil return filter cartridge	0759116 03	1	
Hydraulic oil line filter element	0787401 03	1	
Fuse 5 A	0830 107 01	5	
Fuse 10 A	0830 243 01	3	
Fuse 15 A	0830 000 01	2	
Fuse 20 A	0830 243 02	4	
Fuse 30 A	0830 243 05	5	
Direction indicator lamp bulb	0854 565 UA	2	
Fan belt	3289492	1	
Air compressor belt	091010116	1	
DEF pump filter ASSY	4387114	1	Cummins
Wiper blade	085020310	1	
Air conditioner filter	0745144UA	1	

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