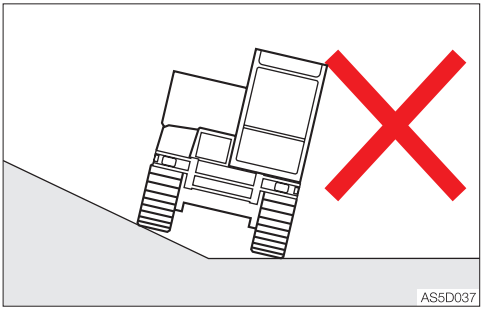
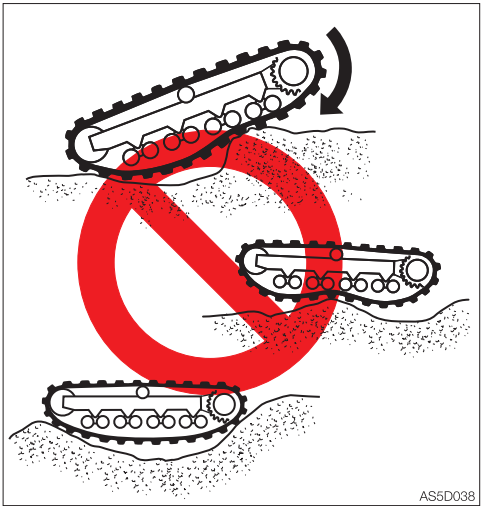
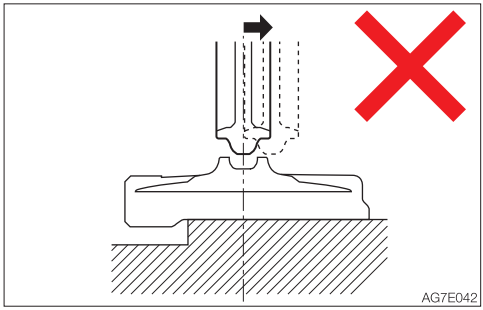


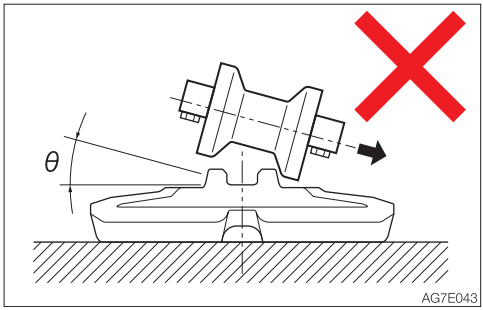
• Avoid traveling by setting one track on a slope or projecting portion and the other track on a flat surface (with the machine at a tilt of 10° or more). Travel with both tracks set on flat surfaces.



• Do not change directions when the tracks are slack as shown in the figure.



• The rubber track will come off if the machine travels backward in this condition.



• The rubber track will come off if the machine changes directions in this condition.

HANDLING THE ENGINE

PROHIBITIONS

Do not modify the exhaust gas control system. Any usages other than described in this manual are prohibited.

CAUTIONS

- To maintain the engine's exhaust performance, operate or use the machine and perform inspection and maintenance by following this manual.
  Incorrectly operating or using the machine or performing inspection and maintenance could cause machine failure.
- If the exhaust gas control system is not properly functioning, the ECM error warning lamp turns on or flashes and an error code appears.
  If an error code appears, immediately repair the fault detected, or consult your sales or service dealer for help. Refer to "Exhaust gas control system error" on page 6-36.
- If the ECM error warning is ignored, the operator inducement system activates. Since the system limits the engine output, there is a possibility that machine becomes unable to move.

DIESEL FUEL

The diesel fuel used must meet the requirements specified in the region where the machine is operated.
Refer to "Service data" on page 5-4.

TRANSPORT



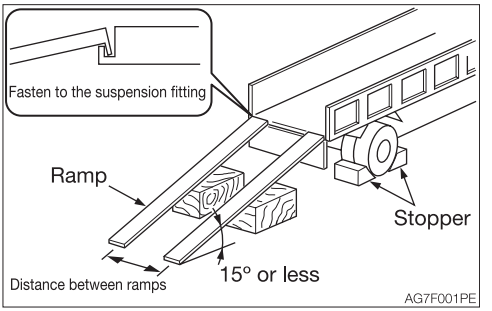
LOADING AND UNLOADING

⚠ WARNING

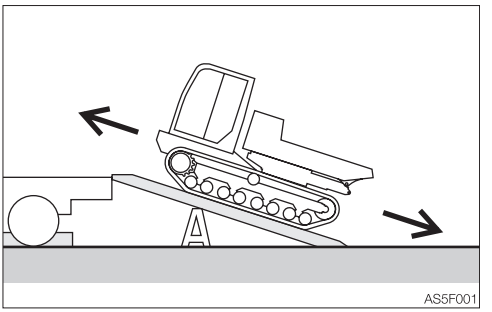
The machine may roll or tip over or fall while being loaded or unloaded. Take the following precautions:

- **Select a firm, level surface and keep sufficient distance from road shoulders.**
- **Secure the ramps of adequate strength and size to the truck bed. The slope of the ramps must not exceed 15°. If the rumps are bowed down too low, support them with poles or blocks.**
- **Keep the truck bed and loading ramps clean of oil, soil, ice, snow, and other materials to prevent the machine from sliding sideways. Clean the tracks.**
- **Chock the transporter wheels to prevent movement.**
- **When being loaded or unloaded, travel slowly in 1st (low) gear by following the signal from the signal person.**
- **Never change courses on the ramp. If it is necessary, move down from the ramps, change the course and then get on the ramps again.**
- **Do not swing or raise the dump body on the ramps. The machine may tip over.**
- **When raising the dump body on the truck bed, do it slowly as the footing should be unstable.**
- **Lock the cab door after being loaded, if applicable. Otherwise, the door may open during transport.**
- **Chock the tracks and secure the machine to the truck bed with wire rope or chain.**

When loading or unloading the machine, be sure to use ramps or a platform and follow the procedure below.



1. Set the parking brake on the transporter and chock the wheels.
2. Fix the ramps securely to the truck bed. The slope of the ramps must not exceed 15°.
3. Align the center of the truck bed with the center of the machine, and of the ramp with the center of the track.
4. Fully lower the dump body and make it parallel to the main frame.
5. Set the travel speed to the 1st (low) and slow down the engine speed.



6. When getting on or down the ramps, the dump body (without load) must be pointing down the slope.
7. Drive the machine straight toward the ramps and slowly travel up or down the ramps, by following the signal from the signal person.
8. Load the machine at the specified position on the transporter.
   Refer to “Transporting posture” on page 4-5.

HOISTING THE MACHINE

⚠ WARNING

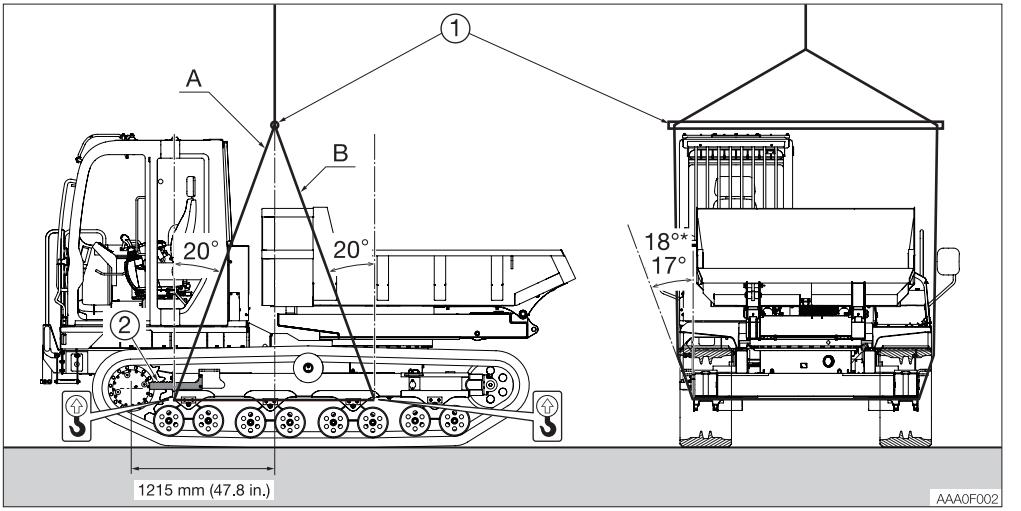
- **Know and use the correct crane signals.**
- **Check the hoisting point for damage or deformation on a daily basis and replace the parts if damage or deformation is found.**
- **Check the hoisting equipment for damaged or missing parts on a daily basis and replace as necessary.**
- **When hoisting, use a wire rope capable of lifting the machine mass.**
- **Hoist the machine in only as manner described in the procedure below. Do not do it in any other manner. Doing so is dangerous as it may result in the machine losing its balance.**
- **Do not hoist the machine with an operator on it.**
- **When hoisting, hoist slowly so that the machine does not tip.**
- **Keep everyone out of the area when hoisting. Do not move the machine over the heads of the persons.**

IMPORTANT: This hoisting method applies to machines with standard specifications. This method is not applicable for the machines with non-standard attachments and/or optional products, because the center of gravity differs according to the attachments and optional products installed. Contact your Takeuchi service agent for details.

Hoisting

1. Fully lower the dump body and make it parallel to the main frame.
2. Raise the safety lock lever to the lock position.
3. Stop the engine, remove the ignition key and get off the machine.
4. Remove the step (2).
5. Install the wire ropes as shown on the figure below. Install the wire ropes and hoisting attachment without letting them touch the machine body.
6. Put a pad on the contacting part of the wire rope and rubber crawler to prevent damage on the rubber crawler.
7. Hoist the machine slowly until it leaves the ground.
8. Stop hoisting until the machine becomes stable, and then start hoisting the machine slowly again.

Hoisting posture



*:Front
(1):Lifting tool
(2):Step

	A	B
Wire rope	7080 (278.7)	7110 (279.9)

Unit: mm (inch)

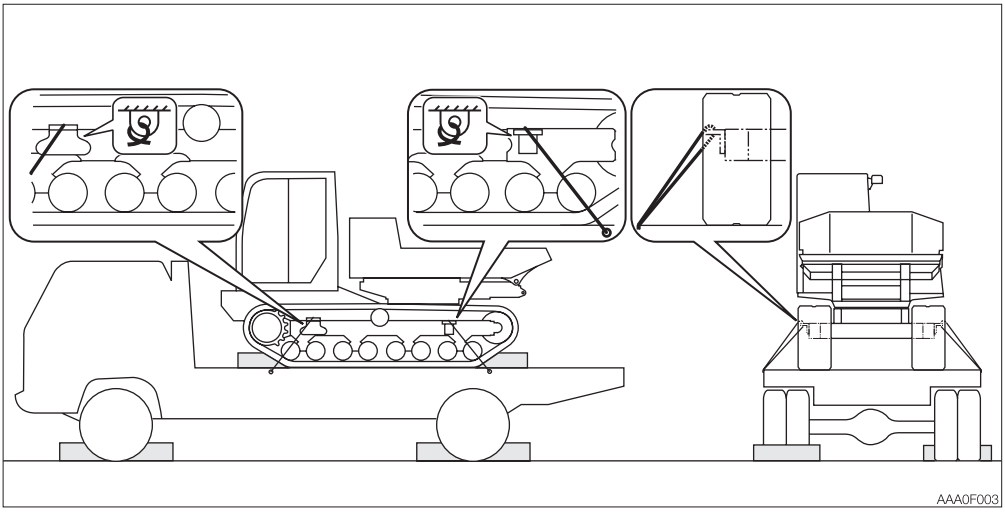
SECURING THE MACHINE

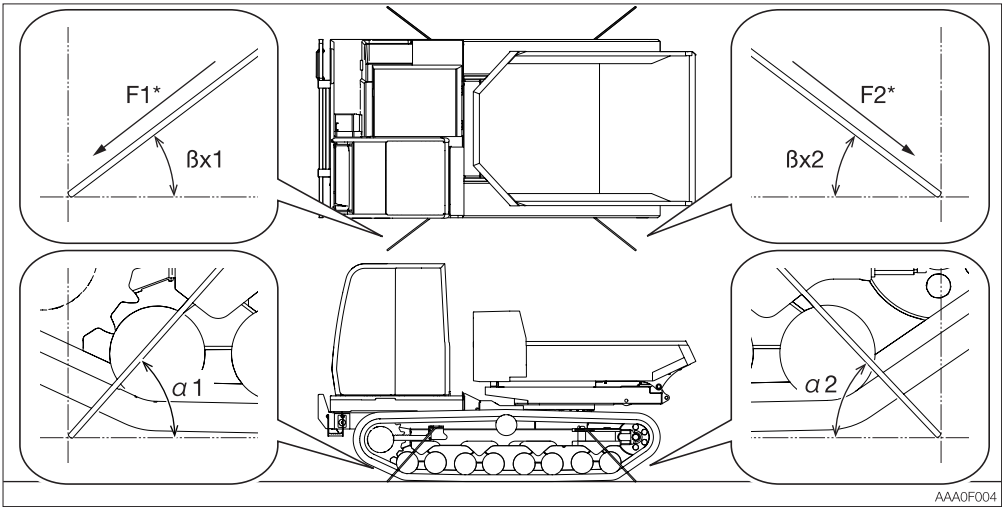
⚠ WARNING

Check the tie down point for damage or deformation on a daily basis and replace the parts if damage or deformation is found.

After loading the machine at the specified position, secure it as described below.

Transporting posture





α1	48°
α2	47°
βx1	37°
βx2	38°
F1*	35.2 kN
F2*	35.0 kN

*: Distributed tying-down force

1. Raise the safety lock lever to the lock position.
2. Stop the engine, remove the ignition key and lock all locks.
3. Place the stoppers (chocks) in front and behind the tracks.
4. Install a chain or wire rope over the lower frame of the machine and fasten it securely to prevent the machine from slipping sideways.

Precautions to be taken during transportation

⚠ WARNING

- **Know and follow the applicable safety rules, vehicle code and traffic laws when transporting the machine.**
- **Select the best transport route by considering the length, width, height and weight of the truck with the machine loaded on it.**
- **Never abruptly start or stop or run at a high speed at the sharp curves during transport. Doing so will move or lose the balance of the loaded machine.**

MAINTENANCE



GENERAL

MAINTENANCE OVERVIEW

To keep the machine in good condition and use if for a long period, perform the inspection and maintenance properly and safely following the procedures recommended by this manual.

The inspection and maintenance items are divided into groups according to the machine's total operating time: every 10 hours (walk-around and daily inspection), every 50 hours, every 250 hours, etc. Refer to the hour meter readings to determine when to schedule an inspection and maintenance. Items for which it is not possible to determine the inspection and maintenance interval are included under "When Required".

When operating the machine in extremely harsh environments (with high dust levels or high temperatures), inspection and maintenance should be performed earlier than the times specified on the Maintenance List.

CAUTIONS ON MAINTENANCE

Do not perform any other inspection and maintenance works than those listed in this manual.
For works not listed in this manual, ask your sales or a service dealer for help.

Keep the machine clean
- Clean the machine before performing inspection and maintenance and try to keep it clean.
- Stop the engine before washing the machine. Cover the electrical parts so that water cannot enter. Water on electrical parts could cause short-circuits or malfunctions. Do not use water or steam to wash the battery, electronic control components, sensors, connectors or the operator's compartment.

Fuel, lubricant, grease and DEF/AdBlue®
- Choose fuel, lubricant, grease and DEF/AdBlue® by referring to the "Fuel and lubricant table".
- Use clean fuels, lubricants, greases and DEF/AdBlue® which do not contain water, and take care not to allow any dirt to enter the tank when replacing or refilling.
- Store fuels, lubricants, greases and DEF/AdBlue® in the prescribed places and in such a way that no water or dirt can get in them.

Cautions on refueling
- If the port includes a strainer, do not remove the strainer when fueling.
- After fueling, be sure to securely tighten the fuel filler cap.
- Do not add more than the specified amount of fuel.

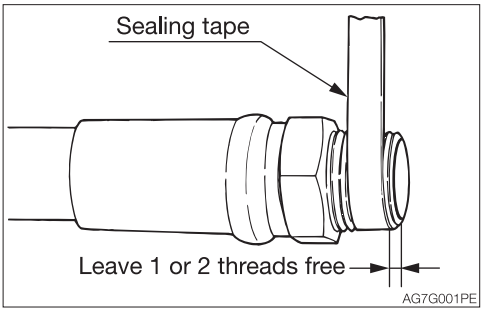
Do not use fuel to clean parts
Do not use fuel to clean parts. Use a non-combustible cleaning agent.

Keep dirt out
When mounting and removing parts, do so in a place where there is no dust, clean the working area and the part, and keep dirt out.

Clean the installation surfaces
When installing and removing parts, be sure that the surfaces of contact of the parts are clean. If the sealing grooves of the surface of contact are damaged, consult your sales or service dealer for repair or release.

Seals and split pins
- Be sure to replace all seals and cotter pins with new ones.
- When installing, be careful not to damage or twist the seal.

Sealing tape



- When wrapping the plug with sealing tape, remove any old sealing tape from the threads and clean the threads.
- Wrap the thread tight with seal tape starting 1 or 2 threads away from the thread end.

Disposing of wastes
- Always collect oil that is drained from the machine in containers. Improperly disposed waste oil can cause environmental harm.
- Follow appropriate laws and regulations when disposing of harmful objects such as oil, fuel, cooling water, coolant, filters, batteries and DEF/AdBlue®.

Check after maintenance
- Gradually increase the engine speed from a low idle to maximum speed and check that there is no oil or water leaking from serviced parts.
- Operate each control lever and check that the machine is operating properly.

Cautions on handling of battery wiring
- Disconnect the wiring from the both terminals (+ and –) on the battery before working on the electrical system or doing electric welding.
  Always disconnect it from the earth side (–). When connecting, connect the earth side last.
- Do not disconnect the battery wiring while the engine is moving. Otherwise, the electric circuits of the rotary converter or others may be damaged.
- The SCR system operates for up to 10 minutes after the ignition switch is turned to the OFF position.
  When removing the batteries or electrical connectors for inspection or maintenance, wait for at least 10 minutes after the ignition switch is turned to the OFF position. Otherwise, the system could fail.

SERVICE DATA

FUEL AND LUBRICANT TABLE

Select the appropriate fuel, lubricant and grease according to the temperature by referring to the table below.

- Regardless of the specified time, change the oil if it becomes too dirty or degraded.
- When refilling, never mix oils of different brands. If a brand is to be changed, replace the whole fuel/oil.

Fuel

Diesel fuel specifications

Diesel fuel should comply with the following specifications. The table lists several worldwide specifications for diesel fuels.

Diesel fuel specification	Area	Diesel fuel specification	Area
ASTM D975 No.1-D S15 No.2-D S15	USA Canada	ISO 8217DMX	International
Bio-diesel fuel Biodiesel blends up to B7 ASTM D6751			
EN590: 2009	European union	BS2869-A1 or A2	United kingdom
Bio-diesel fuel Biodiesel blends up to B7 EN14214, EN590			

Fuel tank	**Diesel fuel**	To maintain the performance and service life of the engine, always use clean and high-quality fuel. • To avoid freezing in cold climates, use a diesel fuel that still functions when the temperature is at least 12°C (21.6°F) below the lowest expected ambient temperature. • Use a diesel fuel that has a cetane number of 45 or higher. When operating at a very low temperature or at a high altitude, a higher cetane number fuel will be required. • Use fuel with sulfur content of less than 15 ppm by volume. Especially in the U.S.A. and Canada, ultra-low sulfur fuel should be used. A higher sulfur content fuel may cause sulfuric acid corrosion in the cylinders of the engines. • Never mix kerosene, used engine oil, or residual fuel with the diesel fuel. Use of kerosene is prohibited. • Poor quality fuel can reduce engine performance and / or cause engine damage. • Fuel additives are not recommended. Some fuel additives may cause poor engine performance. • Use zinc- and sodium-free fuel. • Do not use the fuel that has been in storage for a long time. • Do not use the fuel purchased from a non-authorized dealer. • In the EU, use fuel that satisfies the following conditions · Sulfur content is 10 mg/kg (10 ppm) or less, and 15 mg/kg (15 ppm) or less at the final distribution point. · Cetane number is 45% or more. · Fatty acid methyl ester (FAME) content is 7% v/v or less.
		Precautions when using bio-diesel fuel The warranty of the engine manufacturer may be voided by using a bio-diesel fuel that does not meet the standard or that is deteriorated.

Lubricant

Location	Type	Type by air temperature -4 14 32 50 68 86 104°F -20 -10 0 10 20 30 40°C	When to replace
Engine oil pan	Diesel engine oil API: CJ-4 class ACEA: E6 class	SAE 10W-30	Every 500 hrs. or once a year (whichever comes first)
Hydraulic oil tank	Anti-wear hydraulic oil	ISO VG46	Every 1000 hrs.
Engine cooling system	Cooling water (water + coolant)** SAE: J814C, J1941, J1034 or J2036 ASTM: D6210 or D4985 (USA) JIS: K-2234 (Japan)	Mixture of 50% coolant Mixture of 30% coolant	Every 2000 hrs. or every two years (whichever comes first)
Travel reduction gear	Gear oil API: GL-4	SAE 90	Every 1000 hrs after the initial 250 hrs*.
Swing bearing	Lithium based grease EP-2 NLGI No.2	—	Every 250 hrs.
Dump body			Daily or every 10 hrs.
Track roller			
Levers			When required

* : If the ratio of traveling time to total operating time is high, replace the gear oil earlier than the specified time.

** : For water, use tap water (soft). Do not use well or river water. When the ambient temperature drops below 0°C, add coolant (antifreeze). Follow the coolant manufacturer's instructions to determine the mixture ratio.

API standard: American Petroleum Institute
ACEA standard: Association des Constructeurs Européens d'Automobiles
SAE standard: Society of Automotive Engineers

Volume

Engine oil pan	Engine cooling system	Hydraulic oil tank	Fuel tank	Travel reduction gear
Upper limit 10.5 L (11.1 US qt.) Lower limit 6 L (6.3 US qt.)	18.5 L (19.5 US qt.)	System 84 L (22.2 US gal.) Tank 44 L (11.5 US gal.)	Level capacity 127 L (33.6 US gal.) Effective capacity 121 L (32 US gal.)	2.6 L X 2 (2.7 US qt.) X 2

Note: On the DPF-equipped engines, part of the fuel may get mixed with engine oil during the regenerating process. This may dilute the oil and increase its quantity. If the oil rises above the upper limit of the oil level gauge, it means the oil has been diluted too much, resulting in a trouble. In such case, immediately replace the oil with new one.
Note: After flushing or changing hydraulic oil, the cleanliness of hydraulic oil before the operation shall be ISO CODE 20/17/14 or better as specified in ISO.

Hydraulic system specifications

Working pressure range	P1, P2 MAIN (Travel) : 34.5MPa (5003.8 psi) P3 Pilot : 2.0MPa (290.1 psi) P4 MAIN (Attachment) : 20.6MPa (2987.8 psi) P5 Pilot : 4.9MPa (710.7 psi) See workshop manual for detail. “Service data - Specification table”
Working temperature range	-40 - 100°C
Type of fluid being used	ISO VG32 - 68 or equivalent oil. See workshop manual for detail. “Service data - Table of fuel and lubricant”
Working flow-rate range	P1, P2 MAIN (Travel) : 122.5L/min (32.4 US gal/min) P3 Pilot : 69.5L/min (18.4 US gal/min) P4 MAIN (Attachment) : 34.3L/min (9.1 US gal/min) P5 Pilot : 12.8L/min (3.4 US gal/min) See workshop manual for detail. “Service data - Specification table”
Lifting provisions	Refer to “Hoisting the machine” on page 4-3.
Emergency, safety and energy isolation requirements	Refer to “Lowering the dump body” on page 6-34.
Painting or protective coating	Painted or plated(each hydraulic components)

HANDLING OF DEF/ADBLUE®

The standard for DEF/AdBlue®
The DEF/AdBlue® used must be compliant with ISO 22241.

Quantity of DEF/AdBlue® to add

DEF/AdBlue® tank
Tank capacity 13.8 L (3.6 US gal.)

Storing DEF/AdBlue®

- Store the DEF/AdBlue® solution in a sealed container to prevent it from vaporizing.
- Store the solution in an indoor place, away from the direct sunlight, well vented and at the temperature lower than 25°C (77°F). Do not store it in a place where the temperature falls below –5°C (23°F).
- The life of DEF/AdBlue® is dependent on the temperature of the room it is stored.
- The quality of DEF/AdBlue® is maintained even after it is frozen and thawed. It is useable without doing anything.
- When storing or carrying the DEF/AdBlue® solution, use the container in which it was contained when purchased.
  If you must use the other container made out of polyethylene or stainless steel, choose a clean one without any water or dirt adherent to it and clean it with the DEF/AdBlue® solution before use.
- Do not store the DEF/AdBlue® solution in a place where the temperature may become extremely high.
  There is a risk that ammonia gas may be released if the DEF/AdBlue® solution heats up to high temperature.
  Seal the container before storing, and open the seal in an open outdoor area.
  If there is a pungent odor, do not get near it unless necessary.
- Do not use expired DEF/AdBlue® solution (including solution left in the tank) stored for a long period. Doing so could cause ammonia slip, degraded NOx conversion efficiency or device damage. For the life of DEF/AdBlue®, refer to the table below.

Effective storage period in accordance with JIS K2247-3/ISO 22241-3

Storage temperature	Expected DEF/AdBlue® life
≦ 10°C (40°F)	36 months
10°C (40°F)<T ≦ 25°C (77°F)	18 months
25°C (77°F)<T ≦ 30°C (86°F)	12 months
30°C (86°F)<T ≦ 35°C (95°F)	6 months

LIST OF CONSUMABLES

Periodically replace consumables such as filters and elements according to the table below.

System	Item	Part name	Part No.	When to replace
Hydraulic system	Hydraulic oil return filter	Cartridge	15510-00320	Every 1000 hrs after the initial 50 hrs.
	Pilot line filter	Element	15511-02802	Every 500 hrs after the initial 50 hrs.
Engine lubrication system	Engine oil filter	Cartridge	Y119005-35151	Every 500 hrs. or once a year (whichever comes first)
Fuel system	Fuel filter	Cartridge	Y129A00-55800	Every 500 hrs.
	Water separator filter	Element	Y129A00-55730	
Air cleaner system	Air cleaner	Primary (Outer) element	Y129979-12560	Every 1000 hrs. or after 6 cleanings (whichever comes first)
		Secondary (Inner) element	Y129979-12550	When the primary elements are replaced.
AC system	Receiver dryer		19115-05511	Every 2 years
	Ventilation filter	Element	08714-61536	Once a year or if clogging remains after cleaning
	Circulation filter	Element	19115-06736	

LIST OF TOOLS (IF EQUIPPED)

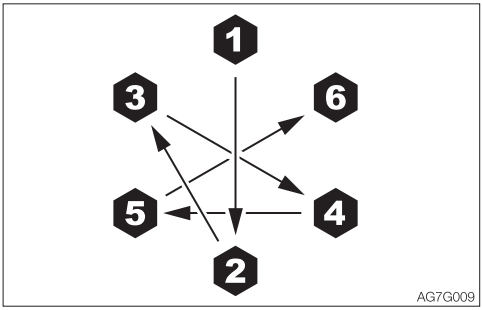
Code	Part name	Part No.	Remarks
1	Spanner	19100-47081	10-12
2	Spanner	19100-47082	14-17
3	Spanner	16900-01922	19-22
4	Spanner	16900-02427	24-27
5	Spanner	16900-02730	27-30
6	Spanner	16900-03236	32-36
7	Spanner	16901-00013	13
8	Spanner	16901-00041	41
9	Spanner	16909-00019	19
10	Screwdriver	19100-06112	(+) (–) replaceable shank
11	Filter wrench	19103-47081	
12	Hammer	16903-00330	3/4
13	Monkey wrench	16904-00250	250 mm
14	Pliers	16905-00200	200 mm
15	Hex.wrench	16906-00250	2.5 mm
16	Hex.wrench	16906-00500	5 mm
17	Hex.wrench	16906-00600	6 mm
18	Hex.wrench	16906-00800	8 mm
19	Hex.wrench	16906-01000	10 mm
20	Hex.wrench	16906-01200	12 mm
21	Tool case	16914-00005	
22	Grease gun	16910-60600	500 cc
23	Drain connector	15545-12601	

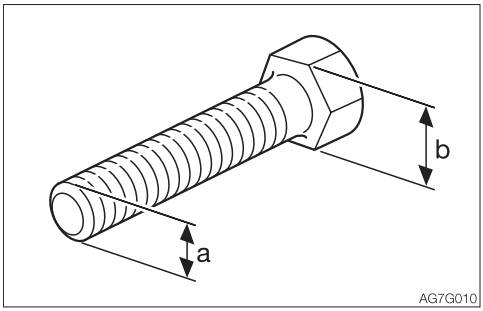
LIST OF TIGHTENING TORQUES

Nuts and Bolts (for ISO strength category 10.9)

Tighten nuts and bolts at the torques shown on the table below, unless otherwise specified.

- The tightening torques used for the mounted plastic covers are not listed in the table below. Consult your sales or service dealer for details. They will be damaged if over tightened.
- When replacing nuts and bolts, replace them with nuts and bolts of the same size and standards.
- Tighten nuts and bolts alternately (top, bottom, left then right) or in 2 or 3 times so that they are evenly tightened.





Classification	Head width (b)	Size (a) x pitch	Tightening torque	
			General connection points	
	mm	mm	N·m	ft-lb.
Coarse	10	M6 x 1.0	9.8±0.8	7.2±0.6
	12, 13	M8 x 1.25	23±1.8	17±1.4
	14, 17	M10 x 1.5	47±3.8	35±2.8
	17, 19	M12 x 1.75	83±6.6	62±5
	19, 22	M14 x 2.0	134±10.7	99±7.9
	22, 24	M16 x 2.0	208±16.6	153±12.2
	27, 30	M20 x 2.5	411±32.9	303±24.2
Fine	12, 13	M8 x 1.0	25±2	18±1.4
	14, 17	M10 x 1.25	50±4	37±3
	17, 19	M12 x 1.5	87±7	64±5.1
	19, 22	M14 x 1.5	135±10.8	100±8
	22, 24	M16 x 1.5	221±17.7	163±13
	27, 30	M20 x 1.5	452±36.2	333±26.6

SAFETY-CRITICAL PARTS

To use the machine safely, periodically perform inspection and maintenance. The safety-critical parts listed below must be periodically replaced for an increased safety.
Serious injury or a fire could result if they are worn or damaged.

List of safety-critical parts

Unit		Safety-critical parts to be replaced periodically	When to replace
Fuel system		Fuel hoses	Every 2000 hrs. or every two years (whichever comes first)
		Packing on fuel filler cap	
Cooling system		Rubber hoses	Every 2 years
Heater & AC systems		Heater hoses	
		Air conditioner hoses	
Hydraulic system	Main body	Hydraulic hoses (pump - delivery)	
		Hydraulic hoses (pump - suction)	
		Hydraulic hoses (travel motor)	
	Working equipment	Hydraulic hoses (swing motor)	
		Hydraulic hoses (dump cylinder piping)	
		Hydraulic hoses (tension cylinder piping)	
		Hydraulic hoses (pilot valve)	
		Seat belt	Every 3 years
		Non-slip sheet	

The material of the safety-critical part listed above tends to change over time and cause wear or deterioration. It is difficult to determine the degree of deterioration at the periodic inspection, and thus they need to be replaced with new ones after a certain time to maintain their proper performance even if they appear in good condition. Note that regardless of the replacement schedule, replacement must be performed immediately if a symptom of wear is found. If a hose clamp is deformed or cracked, replace it together with the hose immediately. When replacing the safety-critical parts, ask your sales or service dealer.
In addition to the safety-critical parts, inspect the hydraulic hoses and retighten or replace as necessary. When replacing the hydraulic hoses, replace the O-rings and seals at the same time.
Check the fuel and hydraulic hoses according to the periodic schedule described below. Refer to “Maintenance”.

Type of inspection	Inspection item
Daily inspection	Leakage from the connecting parts of hydraulic or fuel hoses Damage to cab - replace*
Monthly inspection	Leakage from the connecting parts of hydraulic or fuel hoses Damaged hydraulic or fuel hoses (cracks, wear and tear)
Annual inspection	Leakage from the connecting parts of hydraulic or fuel hoses Deteriorated, twisted, damaged hydraulic or fuel hoses (cracks, wear and tear) or hoses in contact with other parts of the machine

*: Cab parts No. 07186-00010

MAINTENANCE LIST

Inspection and maintenance item	Page
Walk-around inspection	
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*: If the percentage of the traveling time within the total operating time is high, replace the gear oil earlier than the specified time.

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*: If the percentage of the traveling time within the total operating time is high, replace the gear oil earlier than the specified time.

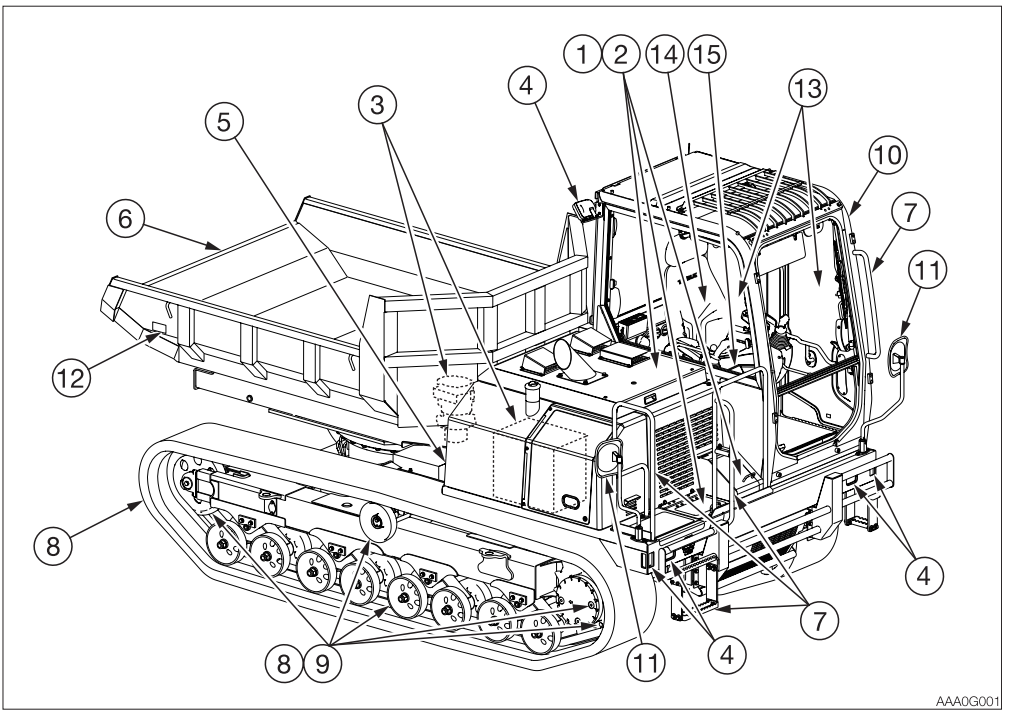
WALK-AROUND INSPECTION

Perform the following inspections every day before starting the engine for the first time.

⚠ WARNING

- **Before operating, perform the walk-around inspections and make repairs immediately where necessary.**
- **Be sure to secure the engine hood or covers when they are left open. Do not leave the engine hood or covers open on a windy day or if the machine is parked on a slope.**

Before starting the engine, look around the machine and clean any combustibles from the surroundings of the engine. Also, inspect if oil or water is leaking and any nuts, bolts or electric wiring are loosened or damaged.



INSPECTING BY OPENING THE ENGINE HOOD AND COVERS

1. Check for any twigs, leaves, oil or other combustible materials around the engine and battery.
2. Check for leakage of oil, fuel, DEF/AdBlue® or engine coolant around the engine.

INSPECTING BY WALKING AROUND THE MACHINE

3. Check for oil leakage from the hydraulic oil tank, hydraulic devices, hoses or connections.
4. Check lights for dirt, damage and burnt out bulbs.
5. Check the hoses for damage.
6. Check the dump body, cylinders and pins for wear, damage and looseness
7. Check the handrail, the steps and the slip-resistant surfaces for damage and loose bolts.
8. Check the tracks, carrier rollers, track rollers, idlers and sprockets for damage, wear and loose bolts.
9. Check for oil leakage from the travel motor, carrier rollers, track rollers and idlers.
10. Check the cab and the guard for damage and the bolts and the nuts for looseness or damage.
11. Check the rear view mirrors and room mirror for dirt, damage and angle adjustment.
12. Check the labels for dirt and damage.

INSPECTING WHILE SITTING IN THE OPERATOR'S SEAT

13. Check the windshield for dirt or damage.
14. Check the seat and seat belt for dirt or damage.
    Check the operator's seat for dirt, oil or other combustible materials.
15. Check the monitor, instruments and switches for dirt or damage.

DAILY INSPECTION (EVERY 10 HOURS)

Perform the following inspections every day before starting the engine for the first time.

⚠ WARNING

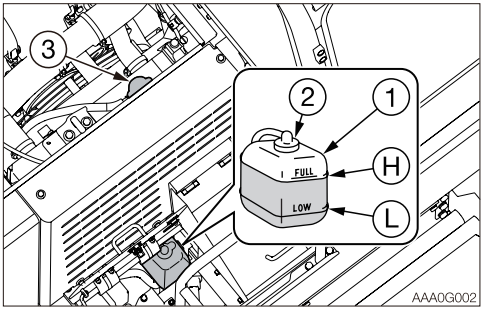
- **Before operating, perform the daily inspections and make repairs immediately where necessary.**
- **Be sure to secure the engine hood or cover before working the inside. Do not keep the hood or cover open on a windy day or if the machine is parked on a slope.**

INSPECTING AND REPLENISHING THE COOLANT

⚠ WARNING

- **Do not remove the radiator cap or the drain plug when the cooling water is hot. Stop the engine and wait until the engine and the radiator cool before slowly loosening the radiator cap and the drain plug to remove them.**
- **Always wear the protective goggle and gloves when handling coolant (antifreeze). If any coolant (antifreeze) comes in contact with eyes or skin, wash it off with clean water. Otherwise, it could result in injures.**
- **Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.**
  - **Do not spill oil or grease.**
  - **Do not leave tools scattered around.**
  - **Watch your step when walking.**
- **Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.**
- **Be sure to secure the engine hood or covers when they are left open. Do not leave the engine hood or covers open on a windy day or if the machine is parked on a slope.**

Inspection



1. Open the engine hood and the battery cover.
2. Inspect the cooling water level in the reserve tank (1).
   The level should be between the upper limit (H) and the lower limit (L).
   If it is below the lower limit (L), replenish.

Replenishing

1. Remove the cap (2) of the reserve tank (1).
2. Add cooling water up to the upper limit (H) of the reserve tank (1).
   If the reserve tank (1) is found empty at the inspection, check for water leakage and then the water level in the radiator (3). Add water to the radiator (3) as required, and then to the reserve tank (1).
3. Install the cap (2).

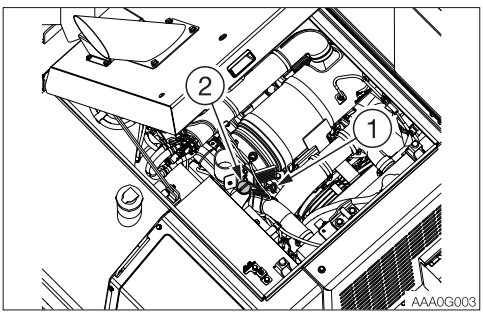
Note: Use only clean water (soft water) to replenish the cooling water loss due to evaporation. Use coolant (antifreeze) and clean water (soft water) of the specified mixing ratio to replenish the cooling water loss due to leaking.

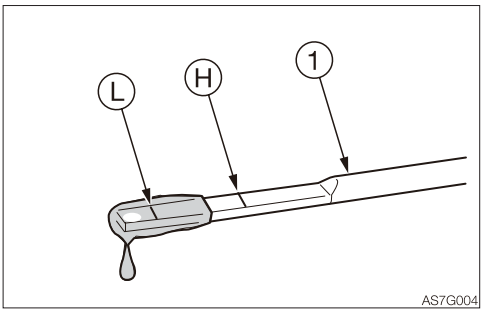
INSPECTING AND REPLENISHING THE ENGINE OIL

⚠ WARNING

- **Stop the engine and allow each part of the machine to cool down before performing maintenance.**
- **Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.**
  - **Do not spill oil or grease.**
  - **Do not leave tools scattered around.**
  - **Watch your step when walking.**
- **Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.**
- **Be sure to secure the engine hood or covers when they are left open. Do not leave the engine hood or covers open on a windy day or if the machine is parked on a slope.**

Inspection





1. Open the engine hood.
2. Take out the dipstick (1) and wipe the oil off with a rag.
3. Fully reinsert the dipstick (1), and then pull it back out.
4. Check the oil on the dipstick (1).
   The level should be between the upper limit (H) and the lower limit (L).
   If it is below the lower limit (L), replenish.

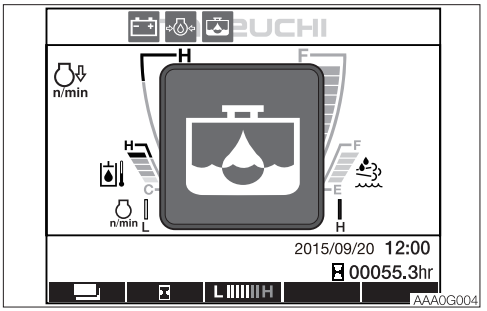
Replenishing

1. Remove the oil filler cap (2).
2. Add oil up to between the upper limit (H) and the lower limit (L) of the dipstick (1).
   Problems could arise if the oil level is either too low or too high.
3. Tighten the oil filler cap (2).
4. Start the engine, run it at low idle for about 5 minutes, then stop it.
5. After about 15 minutes, inspect the oil level.

INSPECTING THE WATER SEPARATOR

⚠ WARNING

- Do not smoke or permit open flames while handling fuel or working on the fuel system.
- Stop the engine in a well-ventilated place and allow it to cool down before performing maintenance.
- Clean up spilled fuel immediately.

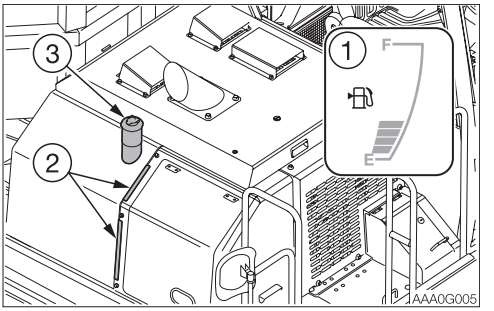


1. Turn the ignition switch to the ON position.
2. Inspect the water separator warning lamp.
3. If the warning lamp is flashing, drain the water.
   Refer to “Draining the water from the water separator” on page 5-60.

INSPECTING THE FUEL LEVEL

⚠ WARNING

- Do not smoke or permit open flames while handling fuel or working on the fuel system.
- Never remove the fuel cap or add fuel when the engine is running or still hot. Do not spill fuel on the hot surface of the machine.
- Fill the fuel tank in a well ventilated place.
- Clean up spilled fuel immediately.
- Do not fill the fuel tank to capacity. Allow room for oil expansion.
- Securely tighten the fuel filler cap.
- Use the correct grade of fuel for the operating season.
- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
  - Do not spill oil or grease.
  - Do not leave tools scattered around.
  - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.



1. Check the fuel level using the fuel gauge (1).
   F: Tank is full.
   E: Tank is empty.
2. If the level is low, add fuel from the fuel filler port (3) while watching the sight gauge (2).
   Refer to “Fuel filler port” on page 2-4.

INSPECTING THE HYDRAULIC OIL TANK LEVEL AND REPLENISHING

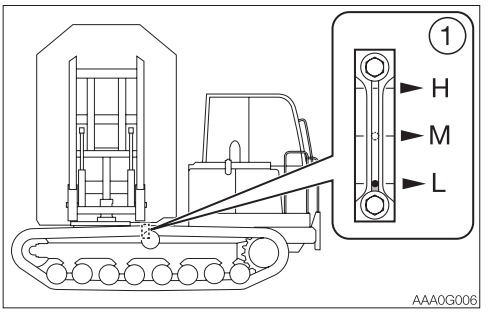
⚠ WARNING

- **Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.**
  - **· When removing plugs or screws, or when disconnecting hoses, stand to the side and loosen them slowly to gradually release the internal pressure before removing.**
- **If you must work under the raised dump body, be sure to engage the dump body prop to prevent the dump body from dropping. Never position yourself under the dump body without making sure that it is securely supported.**

Inspection

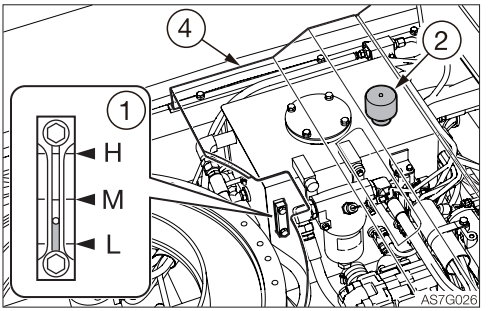
The oil level changes with the oil temperature. Inspect the oil by maintaining the machine at posture shown in the figure at the next.

- Machine configuration for inspecting the hydraulic oil level



1. Start the engine and run it at low speed.
2. Swing the dump body to the right by 90°.
3. Fully raise the dump body.
4. Raise the safety lock lever to the lock position and stop the engine.
5. Engage the dump body prop to the dump body.
6. Inspect the oil level using the sight gauge (1).
   - · When the oil temperature is about 20°C (68°F):
     The level should be between the middle (M) and the lower limit (L).
     (When the dump body is lowered, the oil level rises to the “M”.)
     If it is below the lower limit (L), replenish.
   - · When the oil temperature is about 50 to 80°C (122 to 176°F):
     The level should be around the middle (M).
     (When the dump body is lowered, the oil level rises to the middle point between the “M” and “H”.)

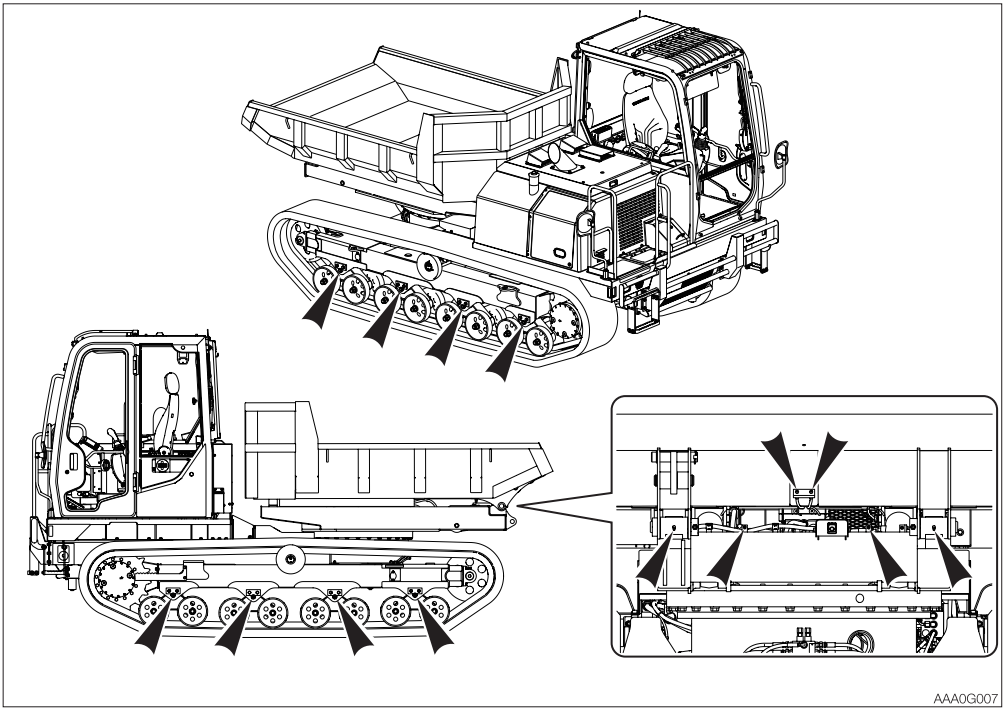
Replenishing



IMPORTANT: Do not fill up to the level higher than the middle point between the middle (M) and the lower limit (L). Doing so will damage the hydraulic circuits or result in oil spurting. If excessively added, stop the engine, wait for the hydraulic oil to cool and let the excessive oil drain from the drain plug.

7. Loosen the bolts and remove the cover (4).
8. Remove the air breather (2).
9. Add the hydraulic oil up to the middle point between the middle (M) and the lower limit (L) of the sight gauge (1) through the hole in the air breather (2).
10. Tighten the air breather (2).
11. Install the cover (4).

LUBRICATING THE DUMP BODY AND TRACK ROLLERS



1. Set the machine configuration for lubrication as shown in the diagram above, and then stop the engine.
2. Use the grease gun to lubricate the grease fitting.
3. Wipe off the excess grease.

CHECKING THE DEF/ADBLUE® LEVEL AND REFILLING

⚠ WARNING

- When removing the cap from the DEF/AdBlue® tank, take care not to inhale steam.
- Do not put anything else other than DEF/AdBlue® solution in the DEF/AdBlue® tank. Putting liquids, particularly light oil or gasoline, in the tank could cause a fire or damage the SCR system. If this is accidentally done, contact a Takeuchi service dealer.

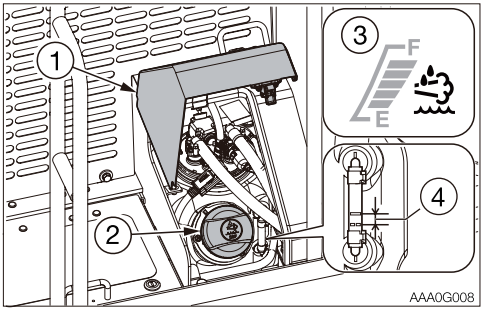
⚠ CAUTION

- DEF/AdBlue® is a colorless, transparent, odorless and non-hazardous aqueous solution (32.5% urea, 67.5% water, freezes at –11°C), and is harmless to the human body. In very rare cases, however, inflammation could occur in some people, and thus proper actions should be taken as follows.
- If skin contact occurs, flush with water. If there are changes in the skin condition or if there is pain, immediately seek medical attention.
- If accidentally swallowed, drink one or two glasses of water or milk and immediately seek medical attention.
- If eye contact occurs, immediately flush with a large amount of clean water and seek medical attention.

IMPORTANT:

- Do not use expired DEF/AdBlue® solution (including solution left in the tank) stored for a long period. Doing so could cause ammonia slip, degraded NOx conversion efficiency or device damage.
- When handling DEF/AdBlue®, do not use anything such as cotton work-gloves whose fibers could get into the solution. Doing so could cause clogging of the DEF/AdBlue® filter or urea deposit at the DM injection port.
- When refilling, be sure to use DEF/AdBlue® conforming to ISO 22241. Do not dilute it or mix it with other chemicals.
- When removing the cap from the DEF/AdBlue® tank, take care not to allow any soil or dirt to enter the tank. Otherwise, the SCR system could fail.
- Do not overfill the tank with DEF/AdBlue® or top off the tank while the engine is running. Doing so could cause the solution to leak from the breather and to freeze. The frozen solution could damage the sensor.
- Do not stand on top of the DEF/AdBlue® tank or piping, and do not put things on them. Doing so could damage them.
- Wipe off any spill of DEF/AdBlue® and rinse it off with water.
- A dry white powder of DEF/AdBlue® may be deposited around the refill port. Wipe it off so that the powder does not enter the tank.
- If DEF/AdBlue® is added while the engine is running or the ignition switch is ON, it takes a long time for the level of the DEF/AdBlue® solution to reach the correct level.

Checking the level



Use the DEF/AdBlue® level indicator (3) to check the amount of the DEF/AdBlue® solution remaining.

F: Tank is full.
E: Tank is empty.

Refilling

1. Turn the ignition key to the OFF position to stop the engine.
2. Open the DEF/AdBlue® tank cover (1).
3. Turn the DEF/AdBlue® tank cap (2) counterclockwise and remove it.
4. Add DEF/AdBlue® until its level can be seen in the gauge (4).
5. Install the DEF/AdBlue® tank cap (2) on the filler port, and then turn the cap clockwise to close.
6. Close the DEF/AdBlue® tank cover (1).

Notes:
- If any solution other than DEF/AdBlue® is used, the warning lamp lights up and the buzzer sounds. Refer to “9.SCR system/ NCD warning lamp” on page 2-18.
- The engine speed is limited if the DEF/ AdBlue® solution is insufficient. Running the engine with insufficient DEF/AdBlue® causes the engine to idle.
- If the tank is faulty, please contact a Takeuchi service dealer for advice.

When DEF/AdBlue® is low or the tank is empty:
Corresponding to the DEF/AdBlue® level in the tank, the warning lamp lights up or flashes. Also, the engine output and RPM are limited.
To refill the tank under these conditions, refer to “Restarting when the DEF/AdBlue® level is low or the tank is empty” on page 6-13.

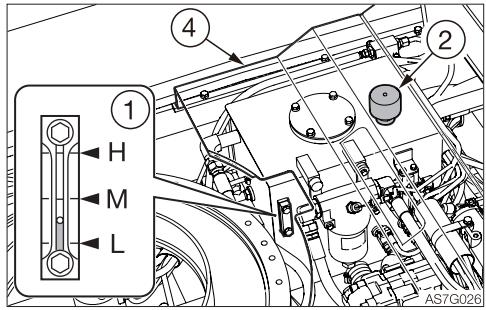
AFTER THE INITIAL 50 HOURS (ONLY FOR NEW MACHINES)

REPLACING THE HYDRAULIC OIL RETURN FILTER

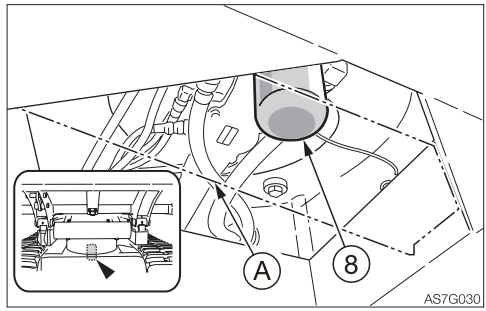
⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The engine and the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.**
  - **The hydraulic oil is also hot and under high pressure. Be careful not to touch the hydraulic oil when loosening the cap or plug. Working on the machine under these conditions could result in burns or injuries due to the hot oil spurting out.**
- **Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.**
  - **When removing plugs or screws, or when disconnecting hoses, stand to the side and loosen them slowly to gradually release the internal pressure before removing.**
- **If you must work under the raised dump body, be sure to engage the dump body prop to prevent the dump body from dropping. Never position yourself under the dump body without making sure that it is securely supported.**

1. Start the engine and run it at low speed.
2. Fully raise the dump body.
3. Raise the safety lock lever to the lock position and stop the engine.
4. Engage the dump body prop to the dump body.



5. Loosen the bolts and remove the cover (4).
6. Remove the air breather (2).



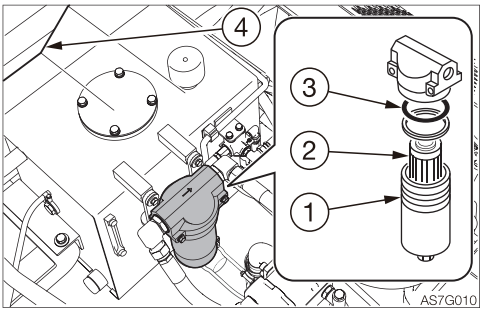
7. Loosen the bolts and remove the cover (A).
8. Turn the filter (8) counterclockwise with the filter wrench and remove it.
9. Clean the surface to install the filter stand.
10. Apply a thin layer of oil on the packing of the new filter.
11. Install the new filter by hand.
12. Tighten 3/4 more turn after the filter packing comes in contact with the surface of installation.
13. Inspect the oil level with the sight gauge (1), and replenish if the level is too low. Refer to “Inspecting the hydraulic oil tank level and replenishing” on page 5-21.
14. Install the air breather (2).

REPLACING THE PILOT LINE FILTER

⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The engine and the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.**
  - **The hydraulic oil is also hot and under high pressure. Be careful not to touch the hydraulic oil when loosening the cap or plug. Working on the machine under these conditions could result in burns or injuries due to the hot oil spurting out.**
- **Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.**
  - **When removing plugs or screws, or when disconnecting hoses, stand to the side and loosen them slowly to gradually release the internal pressure before removing.**
- **If you must work under the raised dump body, be sure to engage the dump body prop to prevent the dump body from dropping. Never position yourself under the dump body without making sure that it is securely supported.**

1. Start the engine and run it at low speed.
2. Fully raise the dump body.
3. Raise the safety lock lever to the lock position and stop the engine.
4. Engage the dump body prop to the dump body.



5. Loosen the bolts and remove the cover (4).
6. Turn the case (1) counterclockwise and remove it.
7. Remove the element (2) and O-ring (3).
8. Clean the inside of the case (1).
9. Coat the O-ring receiving groove on the new filter with a thin layer of oil.
10. Install the new element on the filter stand.
11. Coat the new O-ring (3) with a thin layer of oil.
12. Set the new O-ring (3), and then tighten the case (1) to the filter stand.
    Tightening torque: 45 ± 5 N·m (33.2 ± 3.7 ft-lb.)
13. Inspect the level with the sight gauge and replenish if the level is low.
    Refer to “Inspecting the hydraulic oil tank level and replenishing” on page 5-21.

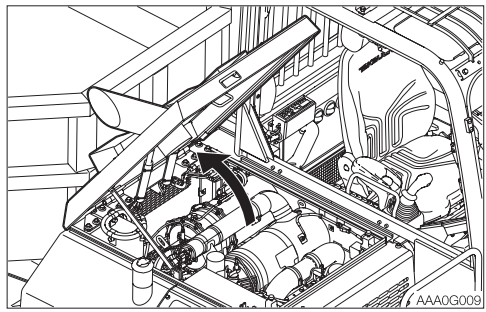
INSPECTING AND ADJUSTING THE FAN BELT

⚠ WARNING

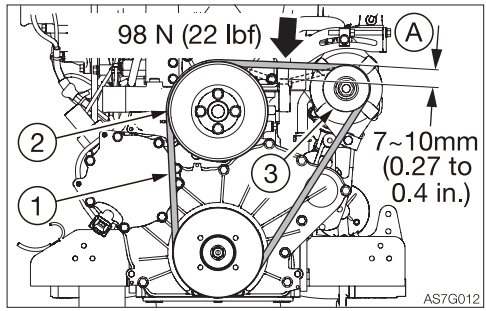
- Stop the engine and allow the machine to cool down before performing maintenance.
  - The engine, muffler, radiator, hydraulic lines, sliding parts and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
  - Do not spill oil or grease.
  - Do not leave tools scattered around.
  - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- Be sure to secure the engine hood or covers when they are left open. Do not leave the engine hood or covers open on a windy day or if the machine is parked on a slope.

IMPORTANT: The loose belts could result in bad battery charge, overheat of engine or early wear of belt. Too tight belts could damage the water pump or bearing and belt used to drive the alternator.
IMPORTANT: Do not let any oil or grease get on the belt.

Inspection

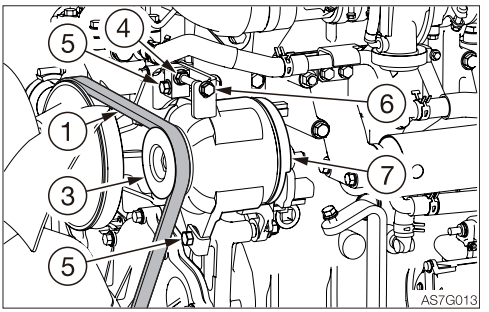


1. Open the engine hood.



2. Press the fan belt (1) at the midpoint between the fan pulley (2) and alternator pulley (3) to check the tension (approx. 98 N or 22 lbf).
   The slack (A) should be 7 to 10 mm (0.27 to 0.4 in.).
3. Inspect the fan belt (1) and replace if it is as follows.
   - There are cuts or cracks.
   - The belt is worn and touches the bottom of the V groove in the pulley.
   - The belt stretched too loose to be adjusted.

Adjustment



1. Loosen the bolts (5) and locking nuts (4).
2. Turn the adjustment bolt (6) to move the alternator (7) and to adjust the tension of the fan belt (1).
   - Tighten: Clockwise
   - Loosen: Counterclockwise
3. Tighten the bolts (5) and locking nuts (4).

Note: When replacing with a new belt, run the engine at low idle speed for about 3 to 5 minutes to break in the new belt, before adjusting the tension.

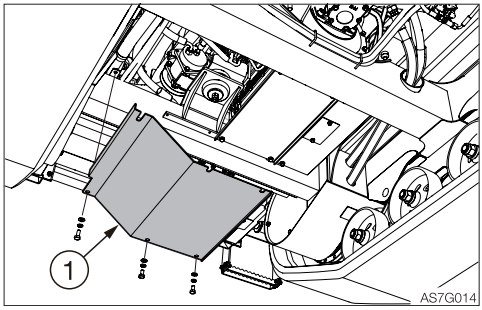
INSPECTING AND ADJUSTING THE COMPRESSOR BELT (AIR CONDITIONER)

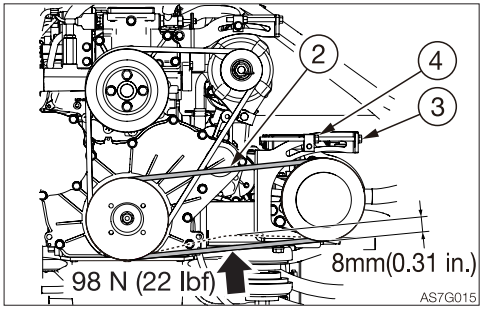
⚠ WARNING

- Stop the engine and allow the machine to cool down before performing maintenance.
  - The engine, muffler, radiator, hydraulic lines, sliding parts and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
- The high-pressure pipes of the air conditioner can be very hot (80 to 120°C or 176 to 248°F). Be careful not to burn yourself.

IMPORTANT: Do not let any oil or grease get on the belt. It will cause the belt to slip, decrease the cooling capacity or shorten the service life of the air conditioner.

If the belt is too slack, it will slip and vibrate, resulting in decreased cooling capacity. The service life of the air conditioner also will be shortened. Adjust the belt tension to the standard value (approximately 8 mm or 0.3 in).





Inspection

1. Loosen the bolts and remove the inspection cover (1).
2. Press on the center of the belt (2) with a finger. The belt tension is normal if the slack in the belt is 8 mm (0.31 in.) when pressed with a force of 98 N (22 lbf).

Adjustment

If the belt tension is not normal, adjust it with the adjuster bolt (3).

1. Loosen the locking nut (4).
2. Turn the adjuster bolt (3) as follows.
   - Tighten: Clockwise
   - Loosen: Counterclockwise
3. Tighten the locking nut (4) after adjustment.

Note: When replacing with a new belt, run the engine at low idle speed for about 3 to 5 minutes to break in the new belt, before adjusting the tension again.

Replacing

Replace the belt in the following cases:

- There are cuts or cracks.
- The belt is worn and touches the bottom of the V groove in the pulley.
- The belt stretched too loose to be adjusted.

EVERY 50 HOURS

INSPECTING THE TRACK TENSION

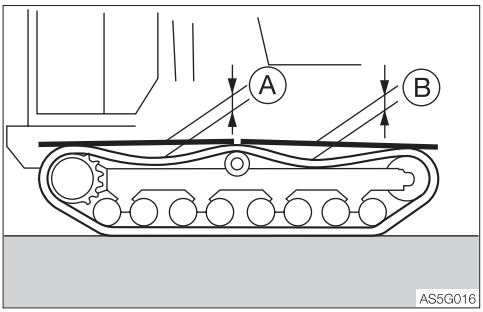
⚠ WARNING

If maintenance must be performed with the engine running, always work as a two person team communicating each other.

- **One person must sit in the operator's seat so that he/she can immediately stop the engine when necessary. He/she must take care not to touch the lever or pedal unless necessary.**
- **The one who performs maintenance must make sure to keep his/her body or clothing away from the moving part of the machine.**

This machine uses a hydraulic cylinder to adjust the tension of the tracks. It is not necessary to regularly perform adjustments of the tension of the track.
If the tension is too loose and the track comes off after the engine start-up, the hydraulic cylinder is likely faulty. Ask your sales or service dealer for repairs.

Inspection



1. Move the machine to a flat, rigid and safe ground.
2. Move the machine forward and backward two or three times.
3. Travel in reverse so that the slack in the track is on the upper side.
4. Place straight bars on the track on the sprocket side and idler side with the carrier roller at the center.

· Each slack of (A) and (B) should be 5 to 15 mm (0.2 to 0.6 in.).

Adjustment

If the amount of slack is too large, contact a Takeuchi sales or service outlet for repairs.

INSPECTING THE BATTERY FLUID LEVEL AND REPLENISHING

⚠ DANGER

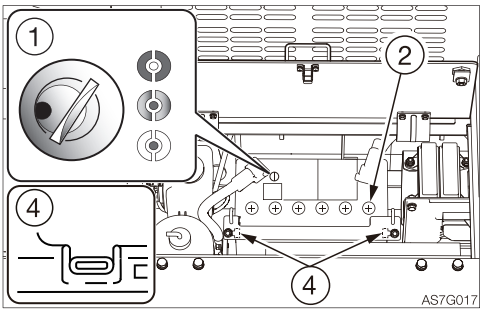
- Do not use the battery when the fluid level is below the lower level limit. Doing so will hasten the deterioration of the internal portions of the battery and shorten the battery life. It also can cause rupturing (explosion).
- Batteries generate flammable hydrogen gas which may explode. Keep away from flame, sparks, fire or lighted cigarettes.
- Use a dampened cloth to clean above the fluid level line and check the fluid level. Do not clean with a dry cloth; otherwise it can cause static electricity to build up, resulting in ignition or explosion.
- Do not use the cable if it's connecting terminal is loose or corroded. If used, ignition or explosion may occur.
- Do not block the exhaust hole of the battery. An explosion could result, if blocked.

⚠ WARNING

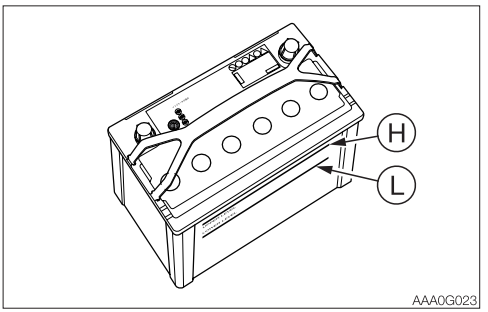
- Wear protective goggle and clothing when working with batteries.
- Do not add the distilled water above the upper level limit. Doing so could cause the fluid to leak. This fluid can cause skin damage if contacted, or can cause the machine components to corrode.
- Batteries contain sulfuric acid which will damage eyes or skin if contacted.
  - If eye contact occurs, flush immediately with clean water and get prompt medical attention.
  - If accidentally swallowed, drink large quantities of water or milk and call a physician immediately.
  - If acid contacts skin or clothing, wash off immediately with a lot of water.
- Before performing maintenance on top of the work bench, clean the footing and observe the following precautions to prevent falling.
  - Do not spill oil or grease.
  - Do not leave tools scattered around.
  - Watch your step when walking.
- Never jump down from the machine or the work bench. When getting on or off the machine or work bench, use the steps, handrails or work bench to support your body. Your weight should be evenly distributed among the three contact points (one hand and two feet or two hands and one foot).

Inspection

IMPORTANT: Check the fluid level of all cells following the steps below, even when the fluid level can be checked using the indicator.
IMPORTANT: The SCR system operates for up to 10 minutes after the ignition switch is turned to the OFF position. When removing the batteries or electrical connectors for inspection or maintenance, wait for at least 10 minutes after the ignition switch is turned to the OFF position. Otherwise, the system could fail.



1. Open the battery cover.
2. Inspect the indicator (1).
   - Blue: Good
   - White: Charging needed
   - Red: Insufficient battery fluid



3. Inspect the fluid level.
   The fluid level must be between the upper level (H) line and lower level (L) line. If not, add distilled water up to the line (H).
4. Check the battery terminal for looseness, dirt and corrosion.
5. Check the exhaust holes (4) for dirt.
6. Turn the ignition switch to ON and check the battery voltage on the display. The battery is normal if the voltage is 12 V or more.
   Refer to “(4) Data display” on page 2-28.

Replenishing

When adding distilled water, do so before starting operations in order to prevent freezing.

1. Remove the sealing plugs (2), and then add distilled water up to the highest level line (H).
2. Check that the indicator (1) turns blue.
3. Securely tighten the sealing plugs (2).

Note: For the replacement battery, a semi-sealed type is recommended.

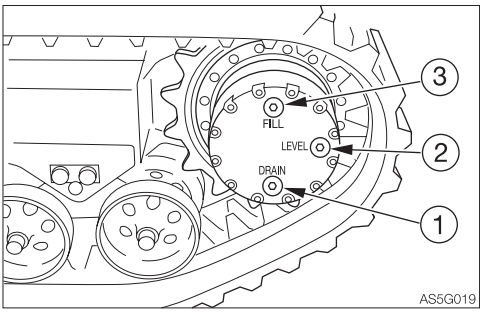
AFTER THE INITIAL 250 HOURS (ONLY FOR NEW MACHINES)

REPLACING THE TRAVEL MOTOR GEAR OIL

⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The travel motor is hot immediately after the engine is stopped. Touching it will cause burns.**
  - **The gear oil is also hot and under high pressure immediately after the engine is stopped.**
    Be careful when loosening the plugs. Working on the machine under these conditions could result in burns or injuries.
- **The pressure in the reduction gear case of travel motor may cause oil or the plug to fly out. Loosen the plug slowly to release the pressure.**

IMPORTANT: If the percentage of the traveling time within the total operating time is high, replace the gear oil earlier than the specified time.



1. Set the travel motor so that plug (1) is at the very bottom.
2. Place a pan under the plug (1).
3. Remove the plugs (1), (2) and (3), and drain the oil.
4. Rewrap the plugs with new sealing tape.
5. Tighten the plug (1).
   - Tightening torque: 157±8 N·m (115.7±5.8 ft-lb.)
6. Add oil through the hole of the plug (3) until oil flows out of the hole of the plug (2).
7. Tighten the plugs (2) and (3).
   - Tightening torque: 157±8 N·m (115.7±5.8 ft-lb.)

EVERY 250 HOURS

INSPECTING AND ADJUSTING THE FAN BELT

Refer to “Inspecting and adjusting the fan belt” on page 5-29.

INSPECTING AND ADJUSTING THE COMPRESSOR BELT (AIR CONDITIONER)

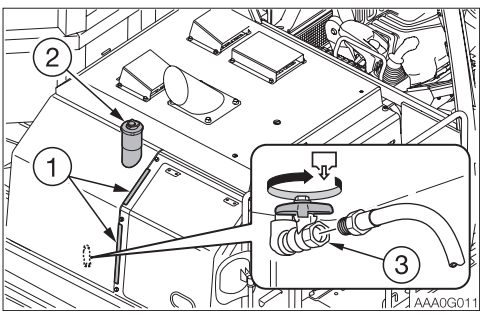
Refer to “Inspecting and adjusting the compressor belt (Air conditioner)” on page 5-31.

DRAINING THE WATER FROM THE FUEL TANK

⚠ WARNING

- **Do not smoke or permit open flames while handling fuel or working on the fuel system.**
- **Never remove the fuel cap or add fuel when the engine is running or still hot. Do not spill fuel on the hot surface of the machine.**
- **Fill the fuel tank in a well ventilated place.**
- **Do not fill the fuel tank to capacity. Allow room for oil expansion.**
- **Clean up spilled fuel immediately.**
- **Securely tighten the fuel filler cap.**
- **Use the correct grade of fuel for the operating season.**
- **Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.**
  - **Do not spill oil or grease.**
  - **Do not leave tools scattered around.**
  - **Watch your step when walking.**
- **Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.**

Do the draining operation before starting the machine.



1. Remove the fuel filler cap (2).
2. Connect the hose to the drain valve (3).
3. Place a pan under the end of the hose just connected.
4. Open the drain valve (3) and drain the water and sediment buildup in the bottom of the tank
5. Close the drain valve (3) and disconnect the hose.
6. Add fuel while watching the sight gauge (1).
7. Tighten the fuel filler cap (2) and lock it with the key.
8. Bleed air.

Bleeding air from the fuel system

Refer to “Bleeding air from the fuel system” on page 6-12.

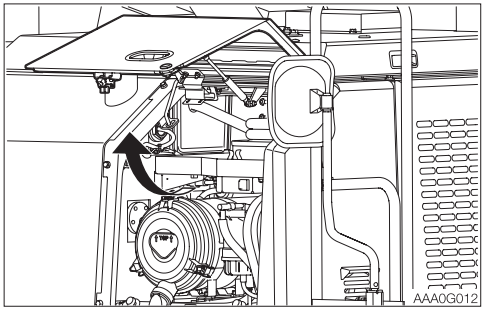
Note: Air in the fuel system causes the engine to fail to start or to have problems. Bleed air when the fuel tank is emptied, using the same procedure above.

CLEANING THE AIR CLEANER

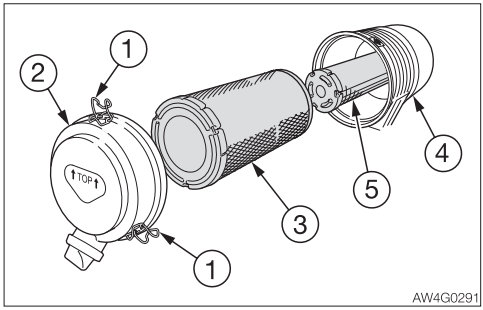
⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The engine, muffler, radiator and many other parts of the machine are hot immediately after the engine is stopped. Touching it will cause burns.**
- **Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.**

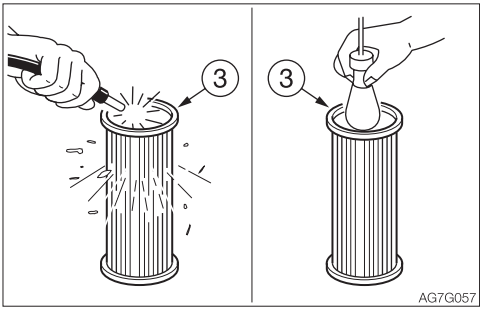
IMPORTANT: Be careful not to scratch the element. Do not use an element if it is damaged.
IMPORTANT: When operating the machine in very dusty places, perform inspection and maintenance operations every day.
IMPORTANT: Be sure to install the element and dust cap securely. If not, dust could be drawn into the cylinder, damaging the engine.



1. Open the side cover.



2. Loosen the clamps (1) and remove the dust cup (2).
3. Clean the inside of the dust cup (2).
4. Remove the primary element (3).
   To prevent dirt from getting inside the engine, do not remove or clean the secondary element (5) except for replacing.
5. Clean the inside of the body (4).



6. Clean the primary element (3) with dried compressed air (294 to 490 kPa or 43 to 71 psi).
   First blow the air from the inside of the element along the pleats. Then blow the air from the outside and finally from the inside again.
7. Light up the inside of the primary element (3) with a light bulb, inspect it, and replace it if there are small holes or thin spots.
8. Install the primary element (3).
9. Install the dust cup (2) with its "⬆ TOP ⬆" mark facing up, and then fasten it with the clamps (1).

CLEANING THE RADIATOR FINS AND THE OIL COOLER FINS

⚠ WARNING

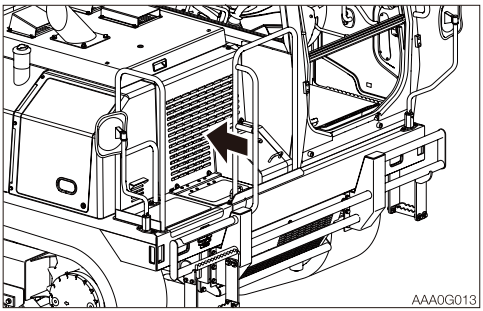
Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.

IMPORTANT: Be careful not to damage the fins when cleaning.

- **When using compressed air or pressurized water, make sure the pressure is no higher than 200 kPa (28 psi) and hold the nozzle sufficiently away from the fins.**

IMPORTANT: When using water, cover the electrical system to prevent water from getting in.

IMPORTANT: When operating the machine in very dusty places, perform inspection and maintenance operations every day.



1. Blow compressed air on the fins to remove mud and dirt stuck on them.

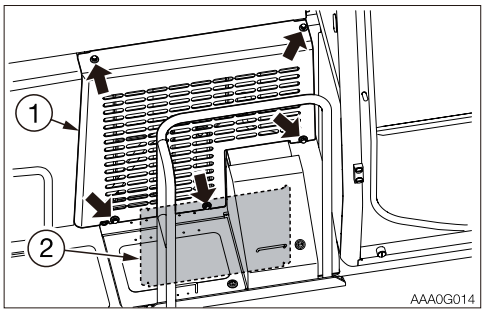
CLEANING THE CONDENSER (AIR CONDITIONER)

⚠ WARNING

Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.

IMPORTANT: Be careful not to damage the fins when cleaning.

- **When using compressed air or pressurized water, make sure the pressure is no higher than 200 kPa (28 psi) and hold the nozzle sufficiently away from the fins.**



1. Loosen the bolts and remove the under cover (1).
2. Clean the condenser (2).

Note: If the condenser is dirty, heat will not discharge properly and the air conditioner will not work efficiently.

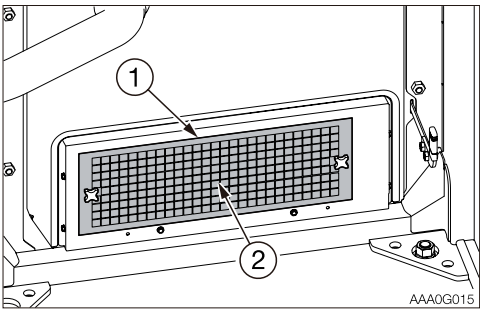
CLEANING THE AIR FILTERS (AIR CONDITIONER/HEATER)

⚠ WARNING

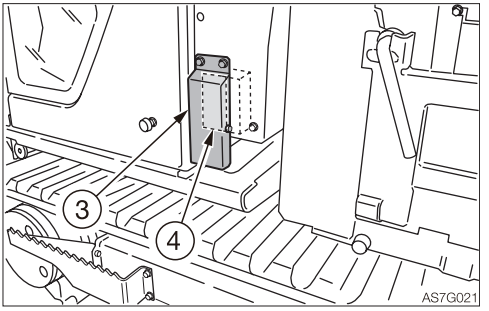
Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.

Clean the filters immediately after operating in dusty places.
If the filters are clogged, the air flow is reduced and a booming sound is heard from the air conditioner unit.

Removing the filters



1. Slide the seat fully forward, and then fold the backrest forward.
2. Loosen the knobs and remove the cover (1).
3. Remove the circulation filter (2).
   Circulation filter (2): Part No. 19115-06736



4. Loosen the bolts and remove the cover (3).
5. Remove the ventilation filter (4).
   Ventilation filter (4): Part No. 08714-61536

Cleaning

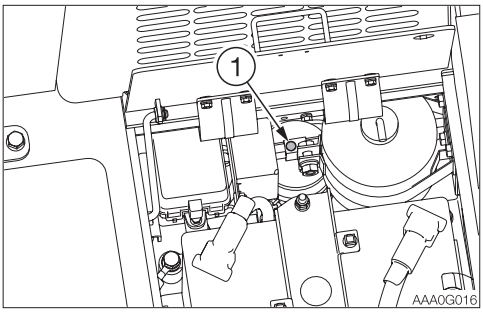
1. Blow dry, compressed air (138 kPa or 20 psi or less) directly on the filters from the inside, moving up and down along the pleats.
   Be sure to keep the nozzle at an adequate distance from the filters.
2. Wash the filter with neutral detergent if it is very dirty. Dry the filter completely after washing it.

INSPECTING THE REFRIGERANT (GAS) LEVEL (AIR CONDITIONER)

⚠ WARNING

- **Exposure of the eyes or hands to the cooler's refrigerant could result in blindness or frostbite.**
  Never touch the refrigerant or loosen the parts of the cooling circuit.
- **Keep flames away if the refrigerant gas is leaking.**
- **The high-pressure pipes of the air conditioner can be very hot (80 to 120°C or 176 to 248°F). Be careful not to burn yourself.**
- **Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.**
  - **Do not spill oil or grease.**
  - **Do not leave tools scattered around.**
  - **Watch your step when walking.**
- **Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.**

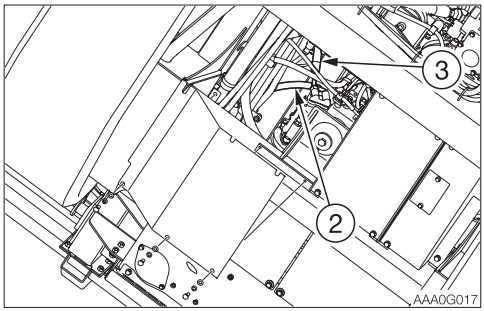
The cooling capacity decreases if the amount of refrigerant is insufficient. Inspect the refrigerant level using the sight glass (1) on the top of the receiver drier.



1. Inspect the places for the conditions below.

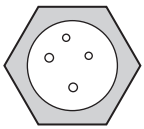
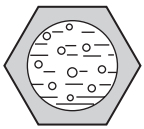
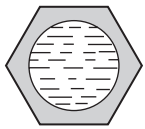
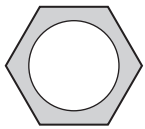
Places for inspection	Conditions
Cab door	Fully open
Temperature control dial	Set fully to the COOL side
Fan speed	High
Engine speed	Maximum speed
Air conditioner switch	ON

2. Open the battery cover.
3. Inspect the refrigerant by watching the flow of air bubbles through the sight glass (1)
   Refer to "Check list for refrigerant volume" on page 5-44.



4. Open the inspection cover.
5. Check the temperature of the compressor's high pressure pipe (2) and low pressure pipe (3).
   Refer to "Check list for refrigerant volume" on page 5-44.

Check list for refrigerant volume

Air conditioner	Normal	Abnormal		
High/low pressure pipe temperature	High pressure pipe is hot (80 to 120°C or 176 to 248°F), low pressure pipe is cold (8 to 15°C or 46 to 59°F). Clear difference in temperature between the pipes.	High pressure pipe is warm, low pressure pipe is slightly cool. No significant difference in temperature between the pipes.	Little difference in temperature between the high-pressure pipe and the low-pressure pipe.	High pressure pipe is hot, low pressure pipe is slightly cool. A significant difference in temperature between the pipes.
Pipe connection	Normal	Some places are dirty with oil.	Some places are extremely dirty with oil.	Normal
Sight glass	 AG7G064	 AG7G065	 AG7G066	 AG7G067
	Almost transparent with some bubbles. Fully transparent when the engine speed is increased or decreased.	Flow of bubbles can be seen constantly. Sometimes transparent or white with bubbles.	Mist-like flow is faintly visible.	No bubbles are visible, even when the fan is set to High and the engine is idling.
Refrigerant level	Proper level	Refrigerant may be leaking.	Refrigerant has leaked; little is left.	Refrigerant level too high

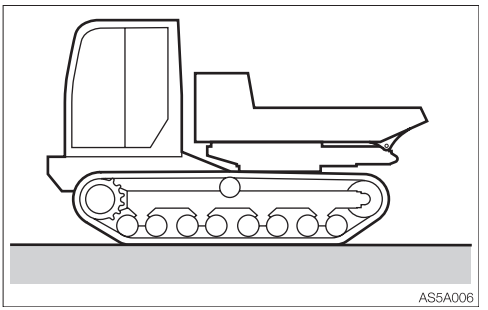
If the air conditioner is not working
If the air conditioner does not work well, set the fan switch to OFF and contact your sales or service dealer for inspection and/or repairs.

IMPORTANT: Continued use of the air conditioner when it is not working properly will damage its various parts.
IMPORTANT: Using the air conditioner when there is no refrigerant will damage the compressor.
IMPORTANT: Always consult your sales or service dealer for replacing the refrigerant. Be sure to use R134a refrigerant (1720 g or 3.8 lb).

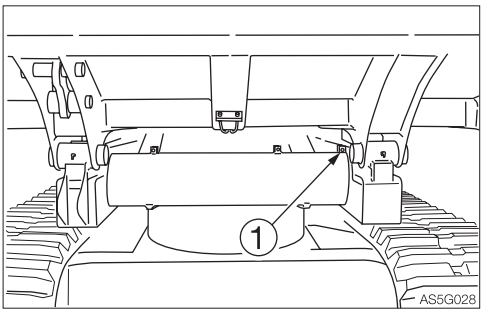
LUBRICATING THE SWING BEARING

⚠ WARNING

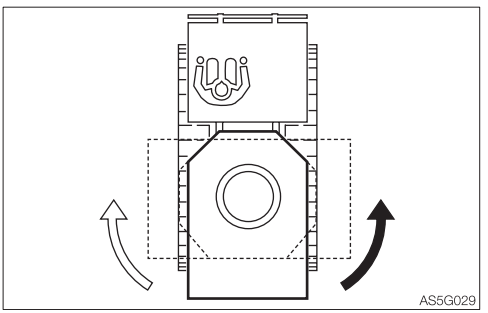
Do not swing while lubricating. Doing so is dangerous, as you may get caught in the machine.



1. Stop the engine with the machine set as shown on the figure above.



2. Use the grease gun to lubricate the grease fitting (1).



3. Start the engine, swing the dump body 90° clockwise.
4. Stop the engine.
5. Repeat the step 2 above.
6. Start the engine, swing the dump body 180° counterclockwise.
7. Stop the engine.
8. Repeat the step 2 above.
9. Wipe off the excess grease expelled from the swing bearing and grease fitting.

EVERY 500 HOURS

REPLACING THE PILOT LINE FILTER

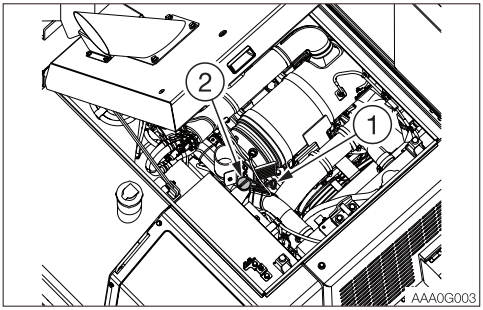
Refer to “Replacing the pilot line filter” on page 5-28.

REPLACING THE ENGINE OIL AND THE OIL FILTER

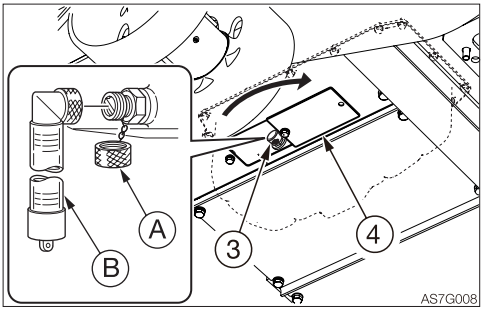
⚠ WARNING

- Stop the engine and allow the machine to cool down before performing maintenance.
  - The engine, muffler, radiator, hydraulic lines, sliding parts and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
  - The engine oil is also hot. Be careful not to touch the hydraulic oil when loosening the cap or plug. Working on the machine under these conditions could result in burns or injuries.
- Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.
  - Do not spill oil or grease.
  - Do not leave tools scattered around.
  - Watch your step when walking.
- Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.
- Be sure to secure the engine hood or covers when they are left open. Do not leave the engine hood or covers open on a windy day or if the machine is parked on a slope.

Engine oil



1. Open the engine hood.
2. Remove the oil filler cap (2).

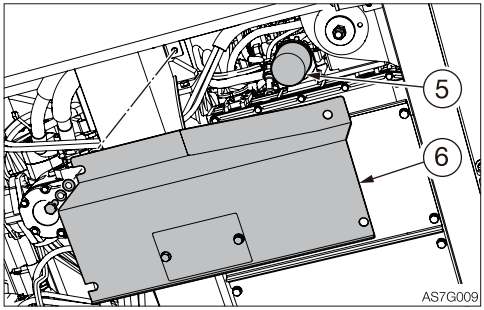


3. Loosen the bolts and remove the under cover (4).
4. Place a pan for catching the waste oil under the drain plug (3).
5. Remove the cap (A), install connector (B) and drain the oil. (The oil comes out when the screw is tightened.)
6. Remove the connector (B) and install the cap (A).

IMPORTANT: Check the waste oil for metal powder. If it contains large amounts of metal powder, consult your sales or service dealer.

7. Install the under cover (4).

Engine oil filter



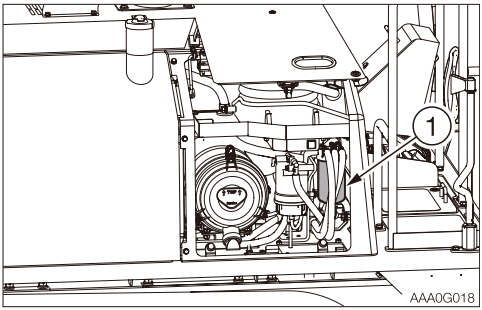
8. Loosen the bolts and remove the under cover (6).
9. Turn the filter (5) counterclockwise with the filter wrench and remove it.
10. Clean the surface of installation of the filter stand.
11. Apply a thin layer of oil on the packing of the new filter.
12. Install the new filter by hand.
13. Tighten one more turn (with the filter wrench) after the filter packing comes in contact with the surface of installation. (Torque when tightening with filter wrench: 19.6 to 23.5 N·m or14 to 17 ft-lb.)
14. Add oil up to between the upper limit (H) and the lower limit (L) of the dipstick (1). Problems could arise if the oil level is either too low or too high. It takes around 10 to 20 minutes for all of the added oil to go down to the oil pan.
15. Tighten the oil filler cap (2).
16. Start the engine, run it at low idle for about 5 minutes, then stop it.
17. After about 10 minutes, inspect the oil level.

Note: Change the engine oil and oil filter even if the running time is less than 500 hours after a year's time of operation. Or, change the engine oil and oil filter if the running time reaches 500 hours within a year's time of operation.

REPLACING THE FUEL FILTER

⚠ WARNING

- **Do not smoke or permit open flames while handling fuel or working on the fuel system.**
- **Stop the engine in a well-ventilated place and allow it to cool down before performing maintenance.**
- **Clean up spilled fuel immediately.**

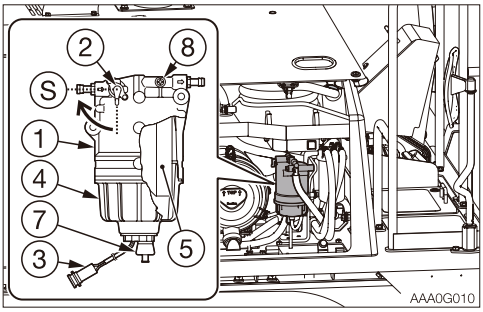


1. Open the side cover.
2. Turn the filter (1) counterclockwise with the filter wrench and remove it.
3. Clean the surface of installation of the filter stand.
4. Apply a thin layer of oil on the packing of the new filter.
5. Install the new filter by hand.
6. Tighten one more turn after the filter packing comes in contact with the surface of installation. (Torque when tightening with filter wrench: 19.6 to 23.5 N·m or 14 to 17ft-lb.)
7. Bleed the air.
   Refer to “Bleeding air from the fuel system” on page 6-12.

REPLACING THE WATER SEPARATOR FILTER

⚠ WARNING

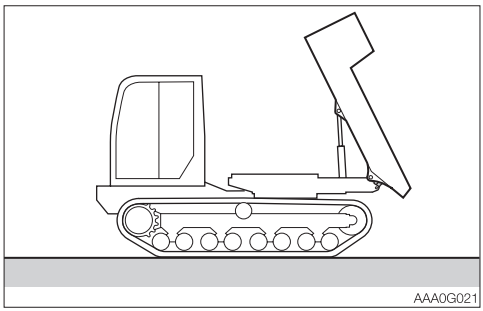
- **Do not smoke or permit open flames while handling fuel or working on the fuel system.**
- **Stop the engine in a well-ventilated place and allow it to cool down before performing maintenance.**
- **Clean up spilled fuel immediately.**



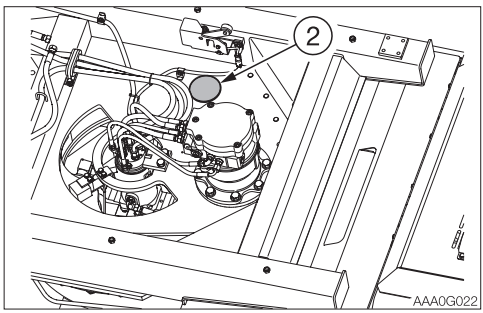
(S): Close

1. Open the side cover.
2. Close the valve (2) of the water separator (1).
3. Place a pan for catching fuel under the drain hose.
4. Loose the air-bleeding plug (8) and the drain plug (7) to discharge fuel from inside.
5. Remove the sensor wiring coupler (3).
6. Remove the case (4) with the filter wrench.
7. Remove the element (5), and then clean the case. When doing the above, be careful not to damage the sensor.
8. Replace the packing with a new one and lubricate it with diesel fuel.
9. Install the new element (5) on the filter stand.
10. Tighten the case (4) by hand. Be sure to do it by hand.
    Tightening torque: 23 to 29 N·m (17 to 21.4 ft-lb)
11. Install the sensor wiring coupler (3).
12. Tighten the drain plug (7).
13. Bleed air.
    Refer to “Bleeding air from the fuel system” on page 6-12.

INSPECTING THE SLEW PINION GEAR



1. Fully raise the dump body.



2. Remove the cap (2).
3. Make sure that the gear tooth surface of the slew bearing is well greased.
   If the surface is not adequately greased, add grease.
   If the grease has turned white due to water or mud entered it, replace the whole grease. Consult your sales or service dealer for help.
   Grease full capacity: 10 L (2.6 US gal) or 9.0 kg (20 lbs.)
4. Install the cap (2).

REPLACING THE AIR CLEANER ELEMENT

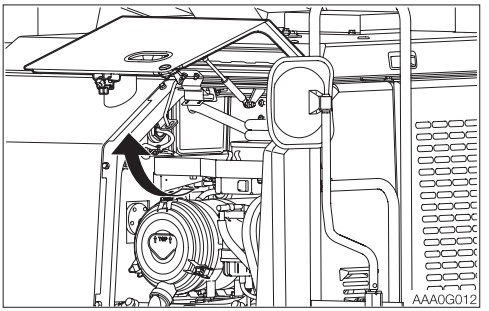
⚠ WARNING

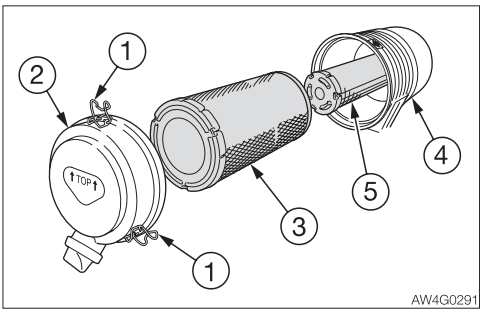
Stop the engine and allow the machine to cool down before performing maintenance.

- **The engine, muffler, radiator and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.**

IMPORTANT: Do not use an element if its pleats, gaskets or seals are damaged.
IMPORTANT: Be sure to install the element and dust cap securely. If not, dust could be drain into the cylinder, damaging the engine.

1. Open the side cover.





2. Loosen the clamps (1) and remove the dust cup (2).
3. Clean the inside of the dust cup (2).
4. Remove the primary element (3).
5. Clean the inside of the body (4).
6. Remove the secondary element (5).
7. Install the new elements.
8. Install the dust cup (2) with its "⬆ TOP ⬆" mark facing up, and then fasten it with the clamps (1).

EVERY 1000 HOURS

REPLACING THE HYDRAULIC OIL RETURN FILTER

Refer to “Replacing the hydraulic oil return filter” on page 5-27.

REPLACING THE TRAVEL MOTOR GEAR OIL

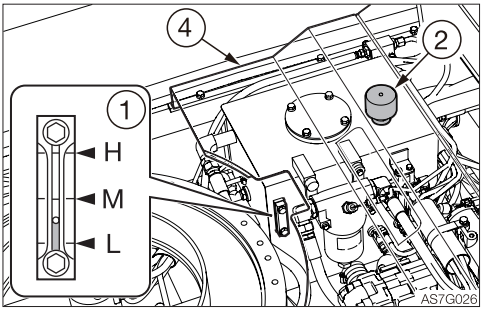
Refer to “Replacing the travel motor gear oil” on page 5-36.

REPLACING THE HYDRAULIC OIL AND CLEANING THE SUCTION STRAINER

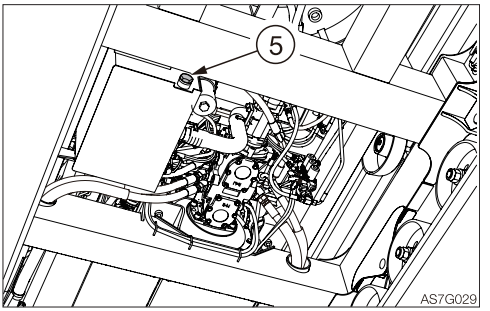
⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The engine and the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.**
  - **The hydraulic oil is also hot and under high pressure immediately after the engine is stopped. Be careful when loosening the caps or plugs. Working on the machine under these conditions could result in burns or injuries due to the hot oil spurting out.**
- **Oil may spurt out if caps or filters are removed or pipes are disconnected before releasing the pressure in the hydraulic system.**
  - **When removing plugs or screws, or when disconnecting hoses, stand to the side and loosen them slowly to gradually release the internal pressure before removing.**
- **If you must work under the raised dump body, be sure to engage the dump body prop to prevent the dump body from dropping. Never position yourself under the dump body without making sure that it is securely supported.**

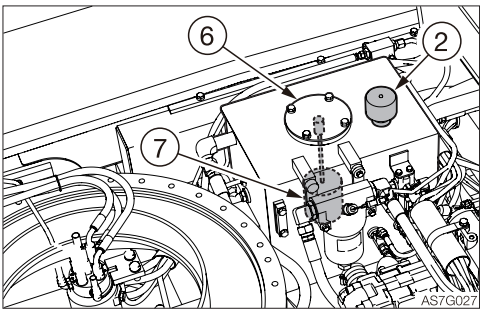
1. Start the engine and run it at low speed.
2. Fully raise the dump body.
3. Raise the safety lock lever to the lock position and stop the engine.
4. Engage the dump body prop to the dump body.



5. Loosen the bolts and remove the cover (4).
6. Remove the air breather (2).



7. Place a pan for catching the waste oil under the drain plug (5).
8. Loosen the drain plug (5) and drain the hydraulic oil.

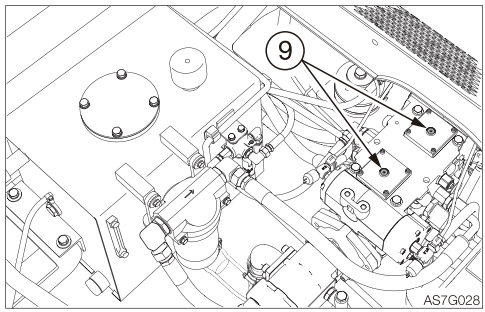


9. Loosen the bolts and remove the flange (6).

10. Remove the suction strainer (7) and clean it.
11. Clean the inside of the hydraulic oil tank.
12. Install the suction strainer (7) and the flange (6).
13. Tighten the drain plug (5).
14. Replace the pilot line filter.
    Refer to “Replacing the pilot line filter” on page 5-28.
15. Replace the hydraulic oil return filter.
    Refer to “Replacing the hydraulic oil return filter” on page 5-27.
16. Add hydraulic oil from the hole of air breather (2) up to the level between the middle (M) and the lower limit (L) in the sight gauge (1).
17. Tighten the air breather (2).
18. Bleed air from the hydraulic oil circuit by following “Bleeding air” below.
19. Install the cover (4).
20. Set the machine configuration for inspecting the hydraulic oil level and inspect the oil level after the oil cools.
    Refer to “Inspecting the hydraulic oil tank level and replenishing” on page 5-21.

Bleeding the air
IMPORTANT: After replacing the hydraulic oil or hydraulic devices, or after performing maintenance of the hydraulic devices, bleed air from the hydraulic circuits and hydraulic devices. Failure to do so may damage the hydraulic devices.

• Hydraulic pump



1. Loosen the vent plugs (9) on the hydraulic pump.
2. Tighten the plugs (9) once the hydraulic oil overflows from the hole of the vent plugs (9).

• Cylinders

3. Disengage the dump body prop on the dump body.
   Refer to “Dump body prop” on page 2-8.
4. Start the engine and let it run at a low-idling speed for 10 minutes.
5. Maintain the engine at low idle, and then extend and retract the dump cylinders 4 or 5 times, without letting them reach the stroke end.
6. Run the engine at high speed, and then extend and retract the dump cylinders 4 or 5 times, without let them reach the stroke end.
7. Return the engine speed to low idle, and then extend and retract the dump cylinders 4 or 5 times to the stroke end.

INSPECTING AND ADJUSTING THE ENGINE VALVE CLEARANCE

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING THE RADIATOR CAP

This operation requires experience. Ask your sales or service dealer for it.

EVERY 1500 HOURS

INSPECTING THE CRANKCASE BREATHER SYSTEM

This operation requires experience. Ask your sales or service dealer for it.

EVERY 2000 HOURS

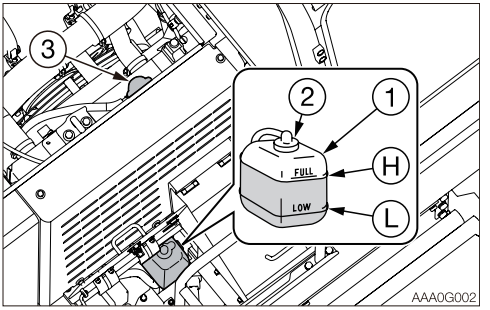
CLEANING THE ENGINE COOLING SYSTEM

Replace the coolant after the two-year operation even if the running time is less than 2000 hours.

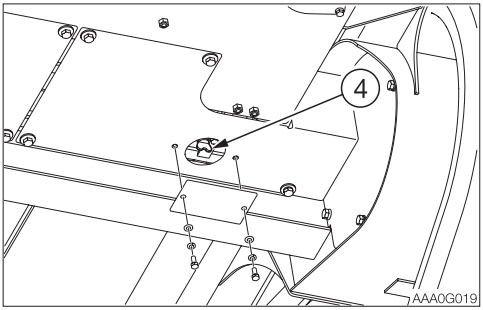
⚠ WARNING

- **Stop the engine and allow the machine to cool down before performing maintenance.**
  - **The engine, muffler, radiator and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.**
  - **The engine coolant is also hot and under high pressure immediately after the engine is stopped. Be careful when loosening the caps or plugs. Working on the machine under these conditions could result in burns or injuries due to the hot coolant spurting out.**
- **If maintenance must be performed with the engine running, always work as a two person team communicating each other.**
  - **One person must sit in the operator's seat so that he/she can immediately stop the engine when necessary. He/she must take care not to touch the lever or pedal unless necessary.**
  - **The one who performs maintenance must make sure to keep his/her body or clothing away from the moving part of the machine.**
- **Standing at the back of the machine while the engine is running is extremely dangerous, as the machine could move suddenly. Never stand at the back of the machine while the engine is running.**
- **Do not remove the radiator cap or the drain plug when the cooling water is hot. Stop the engine and wait until the engine and the cooling water cool. Then, slowly loosen the radiator cap and the drain plug to remove them.**
- **Before performing maintenance on the top of the machine, clean the place you will work on and observe the following to prevent falling.**
  - **Do not spill oil or grease.**
  - **Do not leave tools scattered around.**
  - **Watch your step when walking.**
- **Never jump down from the machine. Use the steps and handrails when climbing up and down the machine, and always support your body at three points with your hands and feet.**

When cleaning, if the temperature of the coolant is low, the thermostat will be closed and the coolant will not circulate in the radiator. Heat the coolant water to at least 90°C (194°F) before cleaning.



1. Open the engine hood and the battery cover.
2. Gradually loosen the radiator cap (3) to release the internal pressure, and then remove the cap.



3. Loosen the bolts and remove the cover.
4. Place a pan for catching the waste coolant under the drain plug (4), and then loosen the drain plug (4) to drain the coolant.
5. Tighten the drain plug (4).
6. Add tap water to the radiator through the coolant fill port up to the top of the port. Take time and slowly add water, so that no air enters the radiator.
7. Close the radiator cap (3).
8. Start the engine and run it at a speed slightly above low idling. Raise the water temperature to at least 90°C (194°F), and then run the engine for about 10 minutes with the thermostat open.
9. Stop the engine, wait until the cooling water temperature becomes lower, and then remove the drain plug (4) to drain the water.
10. After draining, clean the cooling system using a cleaning agent. When using the cleaning agent, follow the instructions included with the agent.
11. Repeat the steps 3 to 8 to rinse the cooling system.
12. Tighten the drain plug (4).
13. Tighten the bolts and install the cover.
14. Take time and slowly add the new coolant (mixture of antifreeze and tap water) to the radiator through the fill port until it is full.
15. Close the radiator cap (3).
16. Warm up the engine. Use the meters to check that there are no irregularities in the cooling system at this time.
17. Increase the water temperature to at least 90°C (194°F). Then, run the engine for about 10 minutes with the thermostat open.
18. Stop the engine, wait until the cooling water temperature becomes lower, and then check the level of coolant in the radiator.
    If necessary, add cooling water until the radiator is full.
19. Close the radiator cap (3).
20. Clean the interior of the reserve tank (1), and then add coolant to the upper limit (H).
21. When the coolant has been replaced, inspect the coolant level once again after operating the machine.
    When the machine is operated, the coolant is distributed throughout the entire system, resulting in the lower coolant level.
    Add coolant up to the full level.

EVERY 3000 HOURS

INSPECTING THE ECU AND RELATED SENSORS AND ACTUATORS

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING THE TURBOCHARGER (BLOW WASH AS NECESSARY)

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING THE DPF AND DOC

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING THE OPERATION OF THE AIR INTAKE THROTTLE VALVE

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING THE SCR CATALYST AND RELATED SENSORS AND ACTUATORS

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING AND REPLACING THE SUPPLY MODULE MAIN FILTER

This operation requires experience. Ask your sales or service dealer for it.

INSPECTING AND CLEANING THE FUEL INJECTOR

This operation requires experience. Ask your sales or service dealer for it.

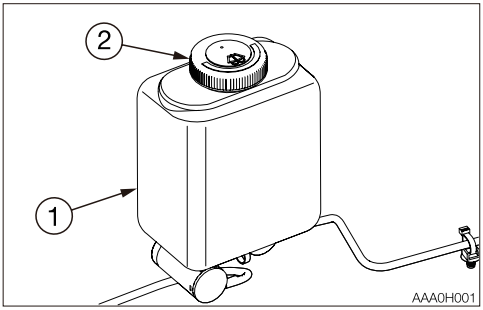
WHEN REQUIRED

INSPECTING AND REPLENISHING THE WINDSHIELD WASHER FLUID

⚠ WARNING

Choose ethyl alcohol as washer solution. Do not use methyl alcohol as washer solution. It could damage the eyes.

Use a windshield washer fluid designed specifically for motor vehicles. Follow the instructions included with the washer fluid.



Inspection

1. Open the cab door.
2. Inspect the washer tank (1) and add washer fluid if the level is low.

Replenishing

1. Mix the washer fluid to the prescribed concentration.
2. Remove the cap (2) and add washer fluid. Keep the dust away while replenishing the washer fluid.
3. Install the cap (2).

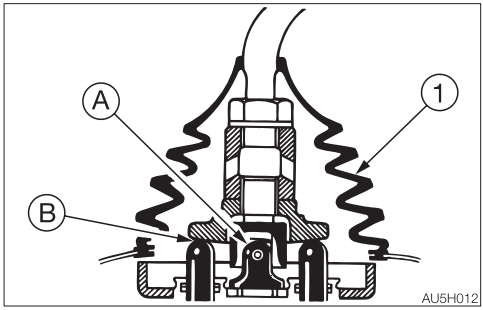
LUBRICATING THE LEVERS

⚠ WARNING

Set the machine to the parking posture, stop the engine, remove the ignition key and store it. Failure to do so may result in the machine moving abruptly, leading to serious injury or death.

If the levers no longer move smoothly, grease them.

Control levers

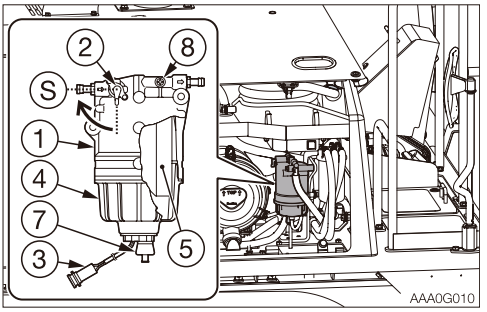


1. Remove the lower mount section of the boot (1) and turn it upward.
2. Wipe off the old grease.
3. Apply grease to points (A) and (B).
4. Set the boot (1) back as it was.

DRAINING THE WATER FROM THE WATER SEPARATOR

⚠ WARNING

- **Do not smoke or permit open flames while handling fuel or working on the fuel system.**
- **Stop the engine in a well-ventilated place and allow it to cool down before performing maintenance.**
- **Clean up spilled fuel immediately.**



(S): Close

1. Open the side cover.
2. Place a pan under the drain valve (7) to catch fuel.
3. Open the drain valve (7) and drain the water.
   If the water does not drain easily, loosen the plug (8).
4. Close the drain valve (7) and tighten the plug (8).
   Refer to “Bleeding air from the fuel system” on page 6-12.

INSPECTING AND CLEANING THE DPF SOOT FILTER

For the inspection and maintenance of the DPF soot filter or oxidation catalyst, follow the procedure below.
This operation requires experience. Ask your sales or service dealer for it.

- Do not modify the DPF without permission. If modified, it may be damaged or malfunction may occur. As a result, an expensive repair work may be required.
- Do not reuse the DPF that has been dropped to the ground. There is catalyst fitted inside the DPF. It can be damaged if strong shocks are applied to it.

• Soot filter

Cleaning:
The soot filter must be cleaned if any of the error codes listed below appears. When cleaning becomes necessary, the ECM error warning lamp or the vehicle and engine emergency lamp starts flashing and an alarm is sounded.
Display the engine error code screen to check the SPN and FMI numbers.

Error code		Classi-fication	Description
SPN	FMI		
3719	7	Warning	DPF recovery regeneration inhibit
3719	9	Warning	DPF recovery regeneration failure
3720	0	Warning	DPF ash cleaning request 2
3720	16	Caution	DPF ash cleaning request 1
522573	0	Caution	DPF over accumulation
522574	0	Caution	DPF over accumulation

Replacement:
Replace every 9000 hours.

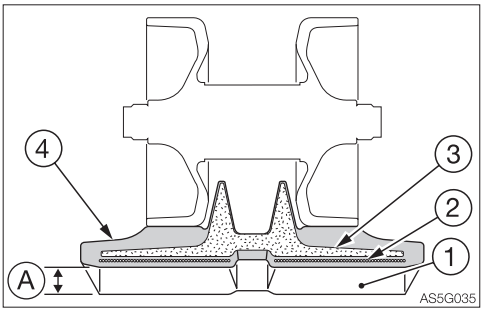
• Oxidation catalyst
Replacement:
Replace every 9000 hours.

INSPECTING THE RUBBER TRACKS

Repair or replace the rubber tracks if their condition becomes as described below. Consult your sales or service dealer for repair or replacement.

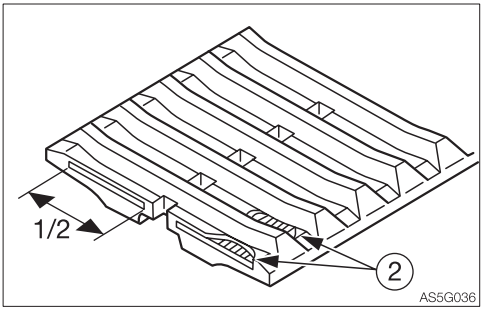
Rubber track
Replace the track if the entire track is stretched and cannot be adjusted.

(1) Lug



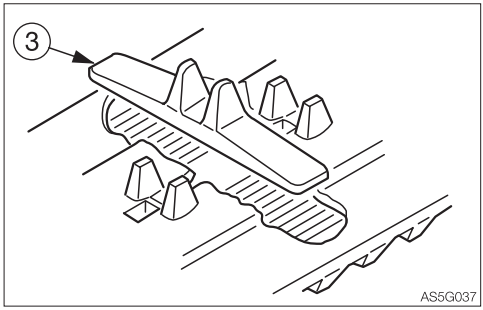
Replace if the height of (A) is 5 mm (0.2 in.) or below.

(2) Steel cord



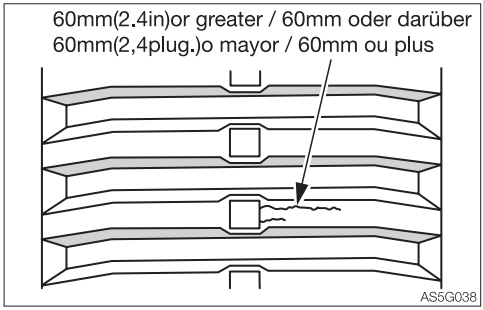
Replace if the steel cord is exposed for two links or more.
Replace if the half or more of the steel cords on one side are cut.

(3) Metal core



Replace if even one metal core is off.

(4) Rubber



Repair if there are cracks of 60 mm (2.4 in.) or greater in length.
If the steel cord is visible, repair as soon as possible, regardless of the length of the crack.

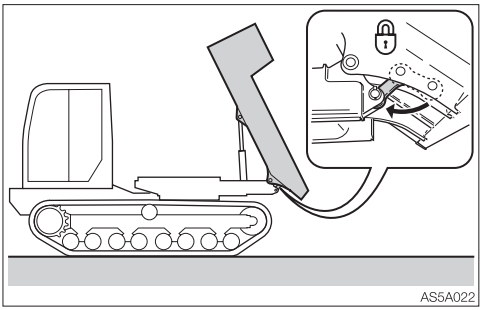
REPLACING THE RUBBER TRACKS

⚠ WARNING

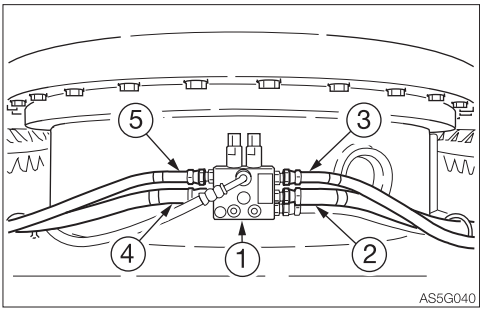
- If you must work under the raised machine or its components, always use the dump body prop, wood blocks, jack-stands or other rigid and stable supports to keep the machine or its components raised. Never get under the machine or its components if they are not sufficiently supported. This procedure is especially important when working on hydraulic cylinders.
- Stop the engine and allow each part of the machine to cool before performing maintenance.
- If maintenance must be performed with the engine running, always work as a two person team communicating each other.
  - One person must sit in the operator's seat so that he/she can immediately stop the engine when necessary. He/she must take care not to touch the lever or pedal unless necessary.
  - The one who performs maintenance must make sure to keep his/her body or clothing away from the moving part of the machine.
- When disconnecting hoses, stand to the side and loosen them slowly to gradually release the internal pressure before removing.
- It is extremely dangerous to remove the tracks by not following the procedure below. If the tension of the rubber track cannot be loosened, Contact a Takeuchi service agent for advice.
- Take great care in handling rubber tracks, because they are very heavy.
- If you must work under the raised dump body, be sure to engage the dump body prop to prevent the dump body from dropping. Never position yourself under the dump body without making sure that it is securely supported.

IMPORTANT: Prepare two wrenches for removal and installation of hydraulic hoses. Use one of the wrenches for holding the hydraulic hose to prevent it from twisting.

Removing



1. Start the engine and run it at low speed.
2. Fully raise the dump body.
3. Raise the safety lock lever to the lock position and stop the engine.
4. Engage the dump body prop to the dump body.



5. Change the connecting locations of the hydraulic hoses connected to the auto-tension valve (1).
   Changing the connecting locations of the hydraulic hoses allows the tension cylinder to be retracted and extended.
   - Right rubber track:
     Change the connecting locations between the hydraulic hoses (2) and (3).
   - Left rubber track:
     Change the connecting locations between the hydraulic hoses (4) and (5).

6. Start the engine, fully retract the tension cylinder and then stop the engine.
7. Jack up the machine so that a clearance can be created between the metal core protrusion of the rubber track and the track rollers, and then put wood bases or the like between the track frame on its lower side and ground.
8. Remove the rubber track from the idler side first, and then from the sprocket.

Installing

1. Engage one side the rubber track with the sprocket, and place the side of the rubber track onto the idler.
2. Start the engine and turn the rubber track slowly while using a lever to install the rubber track onto the idler.
3. Stop the engine and confirm that the rubber track is fully engaged with the sprocket, the rollers and idler.
4. Referring to the step (5) on the previous page, change the connecting locations of the hydraulic hoses connected to the auto-tension valve (1), to return those to the original state before the removal of the rubber track.
5. Start the engine and check that the rubber track tension is sufficient.
6. Lower the machine to the ground.
7. Check the hydraulic hoses for oil leakage.

EVERY 2 YEARS

REPLACING THE RECEIVER DRYER

This operation requires experience. Ask your sales or service dealer for it.

MAINTENANCE DURING EXTENDED STORAGE PERIOD

Storage procedures

If the machine is to be stored for 30 days or more, store it indoors. If it must be stored outdoors, park the machine on a surface laid with lumber on a flat ground, and place a waterproof cover over it so that it stays dry.

1. Clean the machine.
2. Inspect for oil leakage, water leakage, cracks and loose nuts and bolts.
3. Add fuel and replace the hydraulic oil and oil.
4. To prevent rusting and freezing, replace the engine coolant with long-life coolant (LLC).
   Refer to “Cleaning the engine cooling system” on page 5-56.
5. Use the grease gun to lubricate the grease fittings.
6. Fully retract the dump cylinders to lower the dump body completely.
7. Apply rust-inhibiting oil to the hydraulic cylinder rods.
8. Disconnect the negative cable from the battery and cover the battery to prevent freezing.

IMPORTANT: The SCR system operates for up to 10 minutes after the ignition switch is turned to the OFF position. When removing the batteries or electrical connectors for inspection or maintenance, wait for at least 10 minutes after the ignition switch is turned to the OFF position. Otherwise, the system could fail.

During storage

⚠ WARNING

- **Do not operate the machine in an enclosed area without adequate ventilation.**
- **If natural ventilation is not possible, install ventilators, fans, exhaust extension pipes or other venting devices.**

1. To prevent rusting, operate the machine once a month so that the oil can be circulated throughout the system.
2. Inspect the battery and recharge it as necessary.
   Ask your sales or service dealer for recharging.

Starting the machine after storage

IMPORTANT: If the above “Storage procedures” have not been followed during the extended storage periods, consult your sales or service dealer before starting the machine again.

1. Wipe off the rust-inhibiting oil that was applied on the piston rods of the hydraulic oil cylinders.
2. Add oil or grease as necessary.

Returning the engine to service

1. Perform the daily checks.
2. The engine should be pre-oiled before startup.
   a. Crank the engine, leaving the fuel system shut off so the engine will not start, for 15 seconds.
   b. Then pause for 30 seconds.
   c. Repeat the procedure until you have cranked the engine for a total of one minute. This will circulate the oil in the engine’s lubrication system.
3. Prime the fuel system.
4. Start the engine. Allow the engine to idle for approximately 15 minutes while you check for:
   · Proper oil pressure
   · Fuel, engine oil or coolant leaks
   · Proper operation of the indicators and/or gauges
5. Avoid prolonged operation at minimum or maximum engine speeds and loads for the remainder of the first hour of operation.

TROUBLESHOOTING



SYMPTOMS THAT ARE NOT MALFUNCTIONS

The symptoms listed below are not malfunctions.

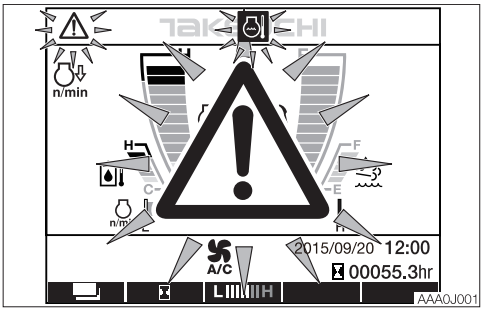
- The swing motor produces noise at the beginning and end of the swing operation.
- The travel motor produces noise when suddenly stopped from its high speed traveling.
- The control valve produces noise if excessive force is applied to the dump body or when it moved to the stroke end.
- In some cases smoke may be emitted from the tail pipe while the DPF regeneration is being performed. This is not a failure; it is due to burning of the particulate matter (PM).
- In some cases the noise associated with the DPF regeneration operation or cancel operation may change; this is not a failure.

IF THE ENGINE OVERHEATS

⚠ WARNING

- **Do not open the engine hood when steam is coming from it. The steam or hot water may spurt out and cause burns.**
- **Do not try to remove the radiator cap or the drain plug when the cooling water is hot. Stop the engine, wait until the engine and the radiator cool, and then slowly loosen the radiator cap to release the internal pressure.**
- **Before performing maintenance, stop the engine and allow the machine to cool down.**

The symptoms listed below indicate overheating.



- An alarm is sounded and the vehicle and engine emergency lamp and the coolant temperature warning lamp start flashing.
- The water temperature gauge level is in the red zone.
- Steam comes from the engine room.

Remedy procedure

1. Park the machine in a safe place.
2. Check if steam is coming out of the closed engine hood.
3. If there is steam, stop the engine immediately and contact your sales or service dealer for repair. If steam, is not coming out run the engine at low idle and let the water temperature cool down.
4. When the water temperature gauge level drops in the green zone, stop the engine.
5. Perform the inspections and the remedies listed below once the engine cools down.
   - Fan belt slack..... Adjust ..... Refer to page 5-29.
   - Coolant level ..... Add Refer to page 5-18.
   - Water leakage..... Repair
   - Radiator fins..... Clean Refer to page 5-41.
   - Sediment in cooling system ..... Clean Refer to page 5-56.

If the problem persists after the above remedies, contact your sales or service dealer for repair.

IF THE BATTERY GOES DEAD

The symptoms below indicate that the battery is dead.
- The starter motor does not turn or fails to start the engine.
- The horn is too weak.

Remedy procedure

Start the engine using the booster battery on the other vehicle (booster vehicle) and the jumper cables.

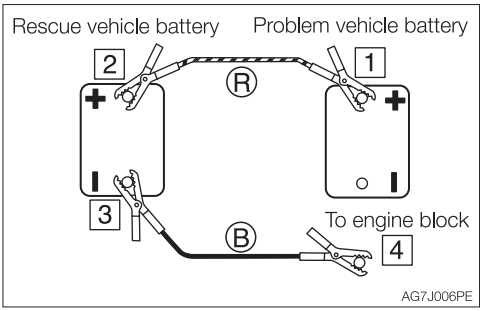
⚠ WARNING

- **When starting the engine using the jumper cables, be sure to connect the cables by following the proper steps. Improper use of jumper cables can result in battery explosion or unexpected machine motion.**
  - **Do not allow the booster vehicle and the machine with a dead battery (dead machine) to touch each other.**
  - **Do not allow the positive (+) and the negative (–) clips of the jumper cables to touch each other.**
  - **When connecting, attach the jumper cable to the positive (+) terminals first. When disconnecting, remove the cable from the negative (–) terminal (ground) first.**
  - **Connect the last clip of the jumper cable to a point as far away from the battery as possible.**
- **Always wear the protective goggle when jump starting the engine by using the jumper cables.**

IMPORTANT: Use the jumper cables and clips of a size suited to the capacity of battery. Do not use damaged or corroded jumper cables and clips.
IMPORTANT: Be sure that the battery of the booster vehicle has the same capacity as the battery of the dead machine.
IMPORTANT: Be sure to connect the clips securely.

Connecting the jumper cables

IMPORTANT: Set the ignition keys of the booster vehicle and the dead machine to the OFF position.



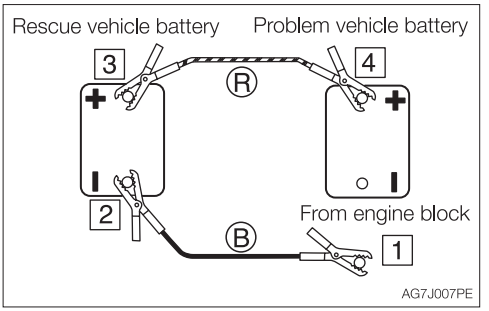
1. Connect the clip of jumper cable (R) to the positive (+) battery terminal of the dead machine.
2. Connect the other clip of jumper cable (R) to the positive (+) battery terminal of the booster vehicle.
3. Connect the clip of jumper cable (B) to the negative (–) battery terminal of the booster vehicle.
4. Connect the other clip of jumper cable (B) to the engine block of the dead machine. Connect the clip to a place as far from the battery as possible.

Starting the engine

1. Check that the clips are securely connected to the terminals.
2. Start the engine of the booster vehicle and run it at high speed.
3. Start the engine of the dead machine.

Disconnecting the jumper cables

Once the dead machine is successfully running, remove the jumper cables by following the same steps as for connection in the reverse order.



1. Disconnect the clip of jumper cable (B) from the engine block of the dead machine.
2. Disconnect the other clip of jumper cable (B) from the negative (–) battery terminal of the booster vehicle.
3. Disconnect the clip of jumper cable (R) from the positive (+) battery terminal of the booster vehicle.
4. Disconnect the clip of jumper cable (R) from the positive (+) battery terminal of the dead machine.

Recharging

Ask your sales or service dealer for recharging the dead battery.

IF A FUSE BLOWS

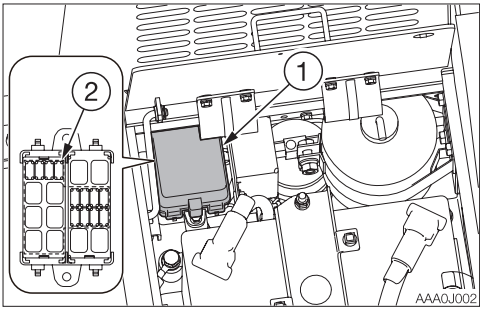
If a light does not come on or the electrical system does not work, a fuse may be blown. Inspect the fuses.

INSPECTING AND REPLACING THE FUSE

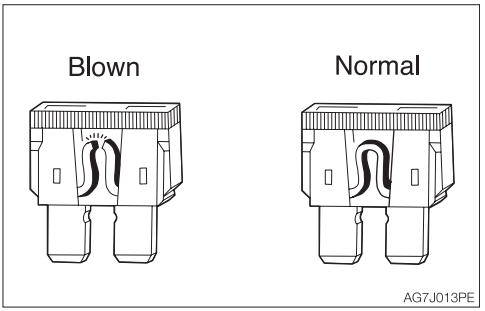
⚠ WARNING

If the fuse blows again soon after replacement, then the electric system is likely faulty. It may pose a fire hazard if not properly repaired. Contact your sales or service dealer for advice.

1. Turn the ignition key to the OFF position to stop the engine.



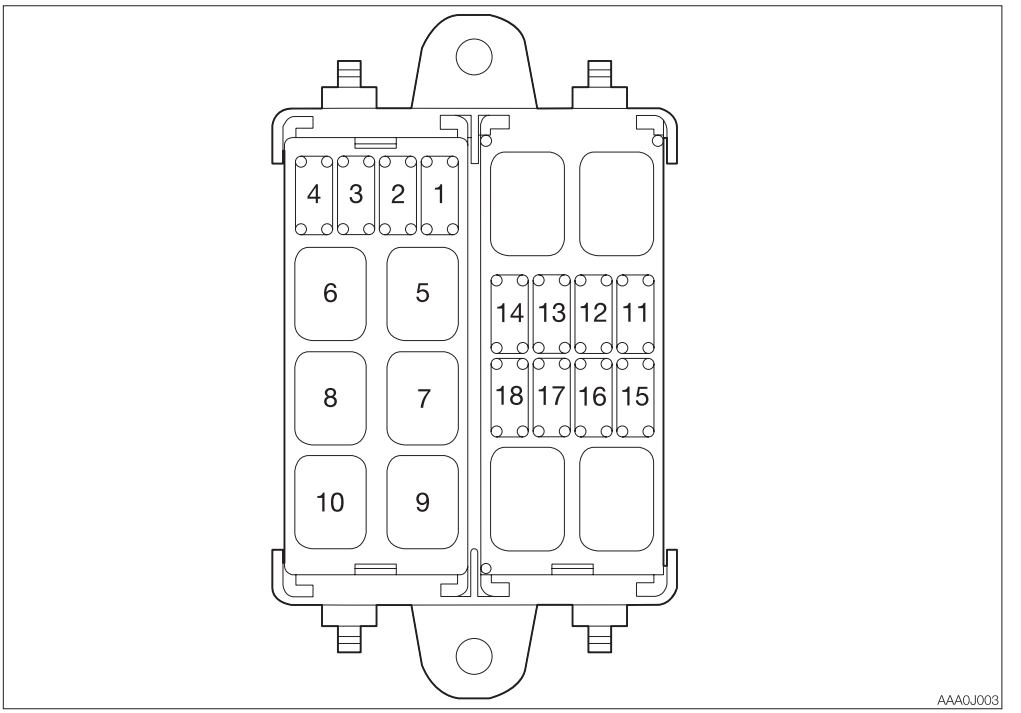
2. Open the battery cover.
3. Open the fuse box cover (1).
4. Check for any blown fuses (2).



5. If a fuse is blown, replace it with a spare fuse of the same capacity.

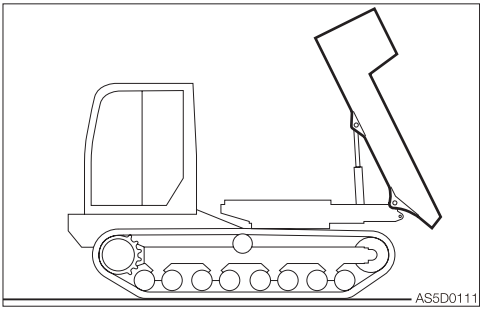
MEMO

Fuse layout and circuits protected (1)

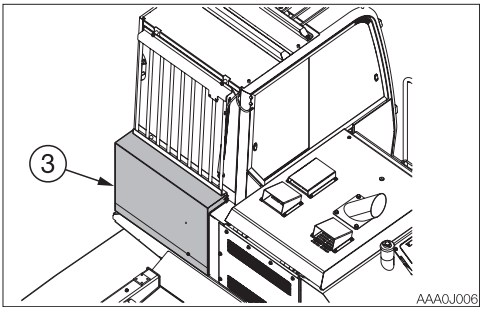


IF A FUSE BLOWS

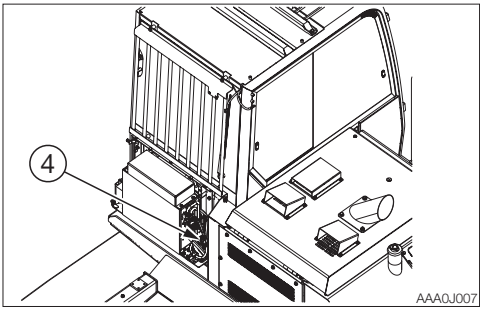
No.	Capacity	Symbol	Protected circuit	Fuse No.
1	25A		Lights	F1
2	15A		Cab interior power supply	F2
3	15A		Safety lock lever	F3
4	15A		Travel alarm	F4
5	60A	S.B.F.1	Fusible link (1)	-
6	40A	S.B.F.2	Fusible link (2)	-
7	30A	S.B.F.3	Fusible link (3)	-
8	60A	S.B.F.4	Fusible link (4)	-
9	40A	S.B.F.5	Fusible link (5)	-
10	40A	S.B.F.6	Fusible link (6)	-
11	20A	OPT	Option	F5
12	5A		Switch lighting	F6
13	10A		Horn	F7
14	15A		Ignition switch	F8
15	25A		ECU	F9
16	25A		SCR system	F10
17	25A	DEF HEATER	DEF heater	F11
18	15A		NOx sensor	F12



6. Fully raise the dump body.
7. Raise the safety lock lever to the lock position and stop the engine.
8. Engage the dump body prop to the dump body.

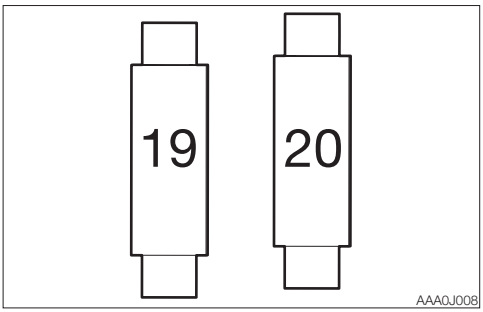


9. Loosen the bolts and remove the cover (3).

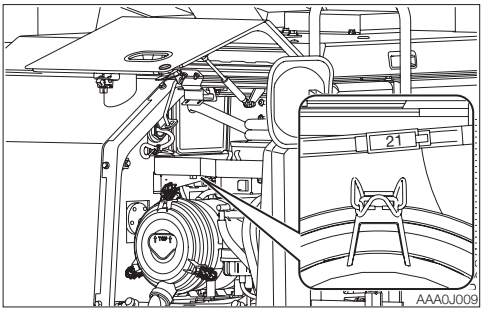


10. Check for any blown fuses (4).

Fuse layout and circuits protected (2)



No.	Capacity	Symbol	Protected circuit	Fuse No.
19	10A	-	Air conditioner	F13
20	10A	-	Air conditioner	F16



11. Open the side cover until it stops.
12. Check for any blown fuses.

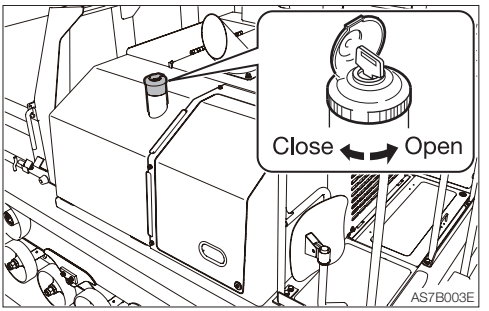
Fuse layout and circuits protected (3)

No.	Capacity	Symbol	Protected circuit	Fuse No.
21	25A	-	Fuel supply pump	F14

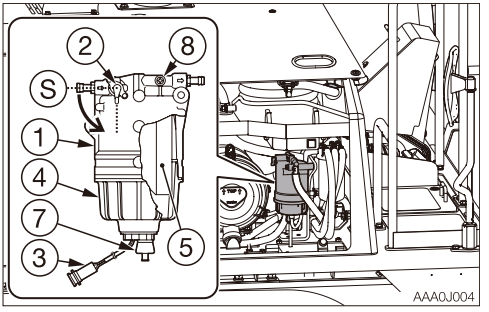
RESTARTING AFTER ADDING FUEL

BLEEDING AIR FROM THE FUEL SYSTEM

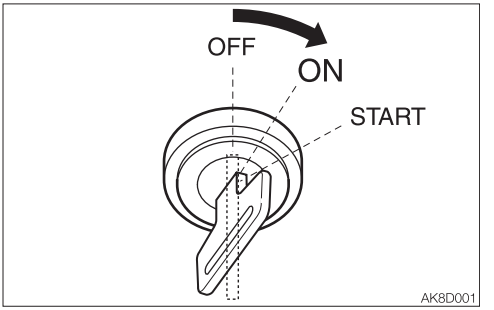
IMPORTANT: NEVER use the starter motor to crank the engine in order to prime the fuel system. This may cause the starter motor to overheat and damage the coils, pinion gear and/or ring gear.
IMPORTANT: If the engine stalls due to fuel shortage, add fuel, turn the key to the ON position for 60 seconds, and then turn it to the START position. Running the starter for a long time before there is enough fuel is going through can cause the starter to fail.



1. Add fuel.



(S): Close
2. Open the side cover.
3. Open the valve (2) of the water separator.



4. Turn the ignition key to the ON position and hold it for about 60 seconds.
   The automatic air bleeder bleeds air from the fuel system.
5. Start the engine and check for fuel leakage.

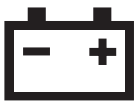
Note: Air in the fuel system causes the engine to fail to start or to have other problems. Always bleed air when the fuel tank is emptied or when there is air in the fuel system.

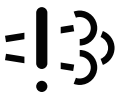
RESTARTING WHEN THE DEF/ ADBLUE® LEVEL IS LOW OR THE TANK IS EMPTY

1. Turn the ignition switch to the OFF position.
2. Add at least 5 liters (1.3 US gal.) of DEF/ AdBlue®.
3. Turn the ignition switch to the ON position and wait for the warning lamp to go out.
4. Start the engine when the warning lamp goes out.
5. If the warning lamp does not go out, turn the ignition switch to the OFF position.

IF A WARNING LAMP FLASHES

If an alarm is sounded or a warning lamp starts flashing during operation, park the machine in a safe place and perform the remedy procedures described below.

Warning lamp	Lamp name	Causes and remedies
 AW4J007	**Vehicle and engine emergency lamp**	There is a problem in the machine. Refer to the respective warning lamp below. Get the vehicle or engine error code number from the multi-information display, and then consult your sales or service dealer referring to the “Vehicle error code list” or “Engine error code list”. Refer to “Multi-information display” on page 2-16. Refer to “Vehicle error code list” on pages 6-16 and 6-17. Refer to “Engine error code list” on pages 6-18 to 6-29.
 AW4J0041	**ECU error warning lamp**	There is a problem in the engine. If an error code is displayed on the multi-information display, inform your sales or service dealer of the code and ask for help. Refer to “Multi-information display” on page 2-16. Refer to “Engine error code list” on pages 6-18 to 6-29.
 AN4J005	**Engine stop request warning lamp**	
 AG7J019	**Battery charge warning lamp**	There is a problem with the fan belt or charger. Check the fan belt for slack or breakage and adjust as necessary. If the lamp continues flashing after maintenance, there is likely a problem with the charger. Consult your sales or service dealer for help. Refer to “Inspecting and adjusting the fan belt” on page 5-29.
 AG7J017	**Engine oil pressure warning lamp**	There is a problem in the engine lubrication system. Check the engine oil level. If the lamp is flashing when the level is normal or even after replenishment of oil or coolant, consult your sales or service dealer. Refer to “Inspecting and replenishing the engine oil” on page 5-19.

Warning lamp	Lamp name	Causes and remedies
 AW4J009	**Water separator warning lamp**	Water is in the water separator. Drain water. Refer to “Draining the water from the water separator” on page 5-60.
 AG7J018	**Coolant temperature warning lamp**	The coolant temperature is too high and the engine is overheating. Refer to “If the engine overheats” on page 6-3.
 AG7J020	**Air cleaner warning lamp**	The air cleaner is clogged. Clean it. Refer to “Cleaning the air cleaner” on page 5-39.
 AW4J010	**Fuel level warning lamp**	The fuel level is too low. Add fuel. Refer to “Inspecting the fuel level” on page 5-20.
 AR0J004	**SCR system warning lamp**	There is a problem in the SCR system. Contact a Takeuchi service dealer for advice. Refer to “Output limitation performed by inducement due to an abnormality detected in the SCR system” on page 6-41.
	NCD warning lamp **NCD: NOx Control Diagnostic system**	A problem is detected in the exhaust system. Get the engine error code number from the multi-information display and consult your sales or service dealer referring to the “Engine error code list”. Refer to “Multi-information display” on page 2-16. Refer to “Engine error code list” on page 6-18.
 AU5J003	**Pilot line filter warning lamp**	The hydraulic oil pilot line filter is clogged. Stop the engine and replace the filter immediately. Continuing to operate the machine while the lamp is flashing could damage the line filter and hydraulic equipment. Refer to “Replacing the pilot line filter” on page 5-28. Cold climate operation: Hydraulic oil is not warmed up. Refer to “Warming up the machine (hydraulic oil)” on page 3-8.
 AN4J008	**DEF/AdBlue® level warning lamp**	The DEF/AdBlue® level is low. Make sure that there is no leakage, and then add the DEF/AdBlue® solution. Refer to “Checking the DEF/AdBlue® level and refilling” on page 5-24. Refer to “Output limitation performed by inducement due to decreased DEF/Adblue® tank level” on page 6-44.

VEHICLE ERROR CODE LIST

If an error code appears on the display, consult your sales or service dealer.

Error code	Error details
9	Impossible to sense ACC key
402	CAN 0 communication error
502	CAN communication error (EECU)
512	CAN communication error (DEF tank)
602	CAN communication error (cluster gauge)
612	CAN communication error (sub-controller)
712	CAN communication error (DCU)
822	CAN communication error (immobilizer)
1703	Main power supply voltage error (too high)
1704	Main power supply voltage error (too low)
1713	Sub-controller power supply voltage error (too high)
1714	Sub-controller power supply voltage error (too low)
2503	Sensor voltage error (too high) MMC
2504	Sensor voltage error (too low) MMC
2513	IOX sensor voltage error (too high) MMC
2514	IOX sensor voltage error (too low) MMC

Error code	Error details
3300	Alternator charge faulty
3370	Engine overspeeding
3401	Engine oil pressure error
3500	Overheat
3600	Air cleaner clogged
3700	Water separator alarm
3810	Line filter clogged
3820	Hydraulic oil temp. sensor error (too high)
3825	Hydraulic oil temp. sensor error (cable break)
5303	Accelerator sensor error (too high)
5304	Accelerator sensor error (too low)
5323	Foot accelerator sensor error (voltage high)
5324	Foot accelerator sensor error (voltage low)
5505	Fuel gauge resistance value error (cable break)
5913	RL pressure sensor error (too high)
5914	RL pressure sensor error (too low)
5923	RR pressure sensor error (too high)
5924	RR pressure sensor error (too low)
5933	FL pressure sensor error (too high)
5934	FL pressure sensor error (too low)
5943	FR pressure sensor error (too high)
5944	FR pressure sensor error (too low)
8095	Lever lock PWM output current error (low current)
8096	Lever lock PWM output current error (high current)
9900	Options settings change (TFM)

PWM = Pulse width modulation

ENGINE ERROR CODE LIST

If an error code appears on the display, consult your sales or service dealer.

Error code		Error details	DTC
SPN	FMI		
29	3	Accelerator sensor 3 error (voltage high)	P0228
	4	Accelerator sensor 3 error (voltage low)	P0227
51	3	Intake throttle position sensor error (voltage high)	P02E9
	4	Intake throttle position sensor error (voltage low)	P02E8
91	3	Accelerator sensor 1 error (voltage high)	P0123
	4	Accelerator sensor 1 error (voltage low)	P0122
100	1	Low oil pressure alarm	P1198
	4	Oil pressure switch disconnection	P1192
102	3	EGR low pressure side pressure sensor error (voltage high)	P0238
	4	EGR low pressure side pressure sensor error (voltage low)	P0237
	10	EGR low pressure side pressure sensor error (detected value error)	P1673
	13	EGR low pressure side pressure sensor error (abnormal learning value)	P0236
105	3	Intake manifold temperature sensor error (voltage high)	P040D
	4	Intake manifold temperature sensor error (voltage low)	P040C
	10	Intake manifold temperature sensor error (detected value error)	P1676
108	3	Atmospheric pressure sensor error (voltage high)	P2229
	4	Atmospheric pressure sensor error (voltage low)	P2228
	10	Atmospheric pressure sensor error (characteristic error)	P1231
110	0	Engine coolant temperature high (Overheat)	P0217
	3	Engine coolant temperature sensor error (voltage high)	P0118
	4	Engine coolant temperature sensor error (voltage low)	P0117
	10	Engine coolant temperature sensor error (detected value error)	P1674

Error code		Error details	DTC
SPN	FMI		
157	0	Rail pressure too high	P0088
	3	Rail pressure sensor error (voltage high)	P0193
	4	Rail pressure sensor error (voltage low)	P0192
	18	Rail pressure devitation error (low rail pressure)	P0094
167	1	Charge alarm	P1568
	5	Charge switch disconnection	P1562
172	3	Ambient air temperature sensor error (voltage high)	P0113
	4	Ambient air temperature sensor error (voltage low)	P0112
	10	Ambient air temperature sensor error (detected value error)	P1678
	19	ECU system error (invalid ambient air temperature value is received)	P1555
173	3	Exhaust manifold temperature sensor error (voltage high)	P0546
	4	Exhaust manifold temperature sensor error (voltage low)	P0545
	10	Exhaust manifold temperature sensor error (detected value error)	P1677
174	0	Fuel temperature high	P0168
	3	Fuel temperature sensor error (voltage high)	P0183
	4	Fuel temperature sensor error (voltage low)	P0182
190	0	Overspeed	P0219
237	13	VI reception data error	U3002
	31	VI reception timeout	U0168
412	3	EGR gas temperature sensor error (voltage high)	P041D
	4	EGR gas temperature sensor error (voltage low)	P041C
	10	EGR gas temperature sensor error (detected value error)	P1675
587	2	Data verification error between ECU and DCU (engine model unmatched)	P1672
588	2	Data verification error between ECU and DCU (serial No. unmatched)	P264F
630	2	EEPROM error	P1601

Error code		Error details	DTC
SPN	FMI		
633	3	SCV (MPROP) H/L side VB short circuit	P0629
	5	SCV (MPROP) H side GND short circuit/disconnection	P0627
	7	Drive circuit error (SCV sticking)	P2635
651	5	Injector (No. 1 cylinder) disconnection (injector-specific)	P0201
652	5	Injector (No. 2 cylinder) disconnection (injector-specific)	P0202
653	5	Injector (No. 3 cylinder) disconnection (injector-specific)	P0203
654	5	Injector (No. 4 cylinder) disconnection (injector-specific)	P0204
1202	2	Immobilizer error (system)	U0426
1209	3	EGR high pressure side pressure sensor error (voltage high)	P0473
	4	EGR high pressure side pressure sensor error (voltage low)	P0472
	13	EGR high pressure side pressure sensor error (abnormal learning value)	P0471
1347	0	Pump protection failure	P1235
	15	Pump replacement failure	P1236
1485	2	Power is turned off without self-hold	P068A
1761	1	Low aqueous urea tank level (Inducement 2)	P154A
	3	Aqueous urea tank level sensor (AT1T1I) internal circuit disconnection	P203D
	4	Aqueous urea tank level sensor (AT1T1I) internal circuit short circuit	P203C
	13	Aqueous urea tank level sensor (AT1T1I) controller internal failure	P155A
	15	Aqueous urea tank level sensor detected value error	P155B
	18	Low aqueous urea tank level (Inducement 1)	P1549
2791	0	EGR overvoltage error	P0404
	1	EGR low voltage error	P1404
	7	EGR feedback error	P1409
	9	EGR ECM data error	U0401
	12	Disconnection in EGR motor coils	P0403

Error code		Error details	DTC
SPN	FMI		
2797	3	Injector bank 1 +B short circuit	P2148
	5	Injector bank 1 disconnection	P2146
	6	Injector bank 1 GND short circuit	P2147
2798	3	Injector bank 2 +B short circuit	P2151
	5	Injector bank 2 disconnection	P2149
	6	Injector bank 2 GND short circuit	P2150
2950	3	Intake throttle drive circuit VB/GND short circuit	P1658
	5	Intake throttle drive circuit disconnection	P0660
	7	Intake throttle drive circuit devitation error	P1655
	8	Intake throttle drive circuit drive duty error	P1656
3031	0	Aqueous urea tank temperature rise error	P205B
	2	Aqueous urea tank temperature sensor/Aqueous urea tank level sensor (AT1T1I) controller temperature rise error	P1557
	3	Aqueous urea tank temperature sensor (AT1T1I) internal circuit disconnection	P205D
	4	Aqueous urea tank temperature sensor (AT1T1I) internal circuit short circuit	P205C
	13	Aqueous urea tank temperature sensor (AT1T1I) controller internal failure	P1556
	15	Aqueous urea tank temperature sensor detected value error (upper limit error)	P1539
	17	Aqueous urea tank temperature sensor detected value error (lower limit error)	P153A
3216	15	SCR upstream NOx sensor detected value error (upper limit error)	P1525
	17	SCR upstream NOx sensor detected value error (lower limit error)	P1526
3242	0	DPF inlet temperature sensor error (high temperature)	P1436
	3	DPF inlet temperature sensor error (voltage high)	P1428
	4	DPF inlet temperature sensor error (voltage low)	P1427

Error code		Error details	DTC
SPN	FMI		
3250	0	DPF intermediate temperature sensor temperature rise error (post-injection failure)	P1426
	1	DPF intermediate temperature sensor temperature too low	P0420
	3	DPF intermediate temperature sensor error (voltage high)	P1434
	4	DPF intermediate temperature sensor error (voltage low)	P1435
3251	0	DPF differential pressure sensor differential pressure rise error	P2452
	3	DPF differential pressure sensor error (voltage high)	P2455
	4	DPF differential pressure sensor error (voltage low)	P2454
	13	DPF differential pressure sensor error (abnormal learning value)	P2453
3515	2	Aqueous urea quality sensor/Aqueous urea tank temperature sensor (A1DEFI) controller temperature rise error	P1559
	3	Aqueous urea tank temperature sensor (A1DEFI) internal circuit disconnection	P1551
	4	Aqueous urea tank temperature sensor (A1DEFI) internal circuit short circuit	P1552
	13	Aqueous urea tank temperature sensor (A1DEFI) controller internal failure	P1550
3516	0	Aqueous urea quality sensor concentration error (large deviation)	P154D
	1	Aqueous urea quality sensor concentration error (small deviation)	P154E
	3	Aqueous urea quality sensor (A1DEFI) internal circuit disconnection	P206D
	4	Aqueous urea quality sensor (A1DEFI) internal circuit short circuit	P206C
	13	Aqueous urea quality sensor (A1DEFI) controller internal failure	P154F
3521	13	Aqueous urea quality sensor contamination error in aqueous urea tank	P1558
3609	3	DPF high pressure side pressure sensor error (voltage high)	P1455
	4	DPF high pressure side pressure sensor error (voltage low)	P1454
3719	0	Backup mode	P1424
	7	Recovery regeneration is inhibited	P1446
	9	Regeneration failure (recovery regeneration failure)	P1445
	16	Stationary regeneration standby	P1421

Error code		Error details	DTC
SPN	FMI		
3720	0	Ash cleaning request 2	P1420
	16	Ash cleaning request 1	P242F
4334	3	Supply module pump pressure sensor error (voltage high)	P204D
	4	Supply module pump pressure sensor error (voltage low)	P204C
	15	Supply module pump pressure sensor detected value error (upper limit error)	P153C
	17	Supply module pump pressure sensor detected value error (lower limit error)	P153D
4341	0	Aqueous urea hose heater (pressure) power stage temperature rise error	P1508
	3	Aqueous urea hose heater (pressure) L side VB short circuit	P20C0
	5	Aqueous urea hose heater (pressure) disconnection	P20BD
4343	0	Aqueous urea hose heater (back flow) power stage temperature rise error	P1507
	3	Aqueous urea hose heater (back flow) L side VB short circuit	P20BC
	5	Aqueous urea hose heater (back flow) disconnection	P20B9
4345	0	Aqueous urea hose heater (suction) power stage temperature rise error	P150A
	3	Aqueous urea hose heater (suction) L side VB short circuit	P20C4
	5	Aqueous urea hose heater (suction) disconnection	P20C1
4360	0	SCR catalyst upstream temperature sensor temperature rise error	P0426
	3	SCR catalyst upstream temperature sensor error (voltage high)	P0428
	4	SCR catalyst upstream temperature sensor error (voltage low)	P0427
	10	SCR catalyst upstream temperature sensor detected value error (at cold start check)	P1542
	15	SCR catalyst upstream temperature sensor detected value error (upper limit error)	P153B
	17	SCR catalyst upstream temperature sensor detected value error (lower limit error)	P1541

Error code		Error details	DTC
SPN	FMI		
4375	0	Supply module (pump motor) power stage temperature rise error	P150D
	3	Supply module (pump motor) PWM signal wire VB short circuit	P208D
	4	Supply module (pump motor) PWM signal wire GND short circuit	P208C
	5	Supply module (pump motor) PWM signal wire disconnection	P208A
	7	Supply module (pump motor) pump motor drive error 2	P208B
	10	Supply module (pump motor) pump motor drive error 1	P151F
5137	0	Tank heating valve power stage temperature rise error	P150C
	4	Tank heating valve L side GND short circuit	P202B
	5	Tank heating valve disconnection	P202A
522243	5	Starting aid relay disconnection/VB short circuit	P0543
	6	Starting aid relay GND short circuit	P0541
522323	0	Air cleaner clogged alarm	P1101
522329	0	Water separator alarm	P1151
522400	2	Crankshaft signal error	P0336
	5	No signal from crankshaft	P0337
522401	2	Camshaft signal error	P0341
	5	No signal from camshaft	P0342
522573	0	Excessive PM accumulation (Method C)	P2463
522574	0	Excessive PM accumulation (Method P)	P1463
522575	7	Regeneration failure (stationary regeneration failure)	P2458
522577	11	Regeneration failure (stationary regeneration not performed)	P2459
522579	12	Short circuit in EGR motor coils	P1405
522580	12	EGR position sensor error	P0488
522581	7	EGR valve sticking error	P148A
522582	7	EGR initialization error	P049D

Error code		Error details	DTC
SPN	FMI		
522583	1	EGR high temperature thermistor error	P1410
522584	1	EGR low temperature thermistor error	P1411
522596	9	TSC1 reception timeout (SA1)	U0292
522597	9	TSC1 reception timeout (SA2)	U1301
522599	9	Y_ECR1 reception timeout	U1292
522600	9	Y_EC reception timeout	U1293
522610	9	CAN reception timeout from the EGR valve	U010B
522617	12	Out of EGR target range	U1401
522618	9	EBC1 reception timeout	U1302
522619	9	Y_DPFIF reception timeout	U1303
522730	12	Immobilizer error (CAN communication)	U0167
522803	13	Pump learning not performed alarm	P1237
522993	12	CPU monitoring IC error	P0607
522994	12	CPU error	P0606
522995	12	QR data correction input error	P1630
522996	4	Low charge error	P0611
522997	3	Overcharge error	P0200
522998	12	Flash ROM error (checksum error)	P1602
523074	0	Sensor 5V circuit 1 error (voltage high)	P0653
	1	Sensor 5V circuit 1 error (voltage low)	P0652
523075	0	Sensor 5V circuit 2 error (voltage high)	P0699
	1	Sensor 5V circuit 2 error (voltage low)	P0698
523221	12	QR data not written	P1631
	13	QR data error	P1632
523249	5	Crankshaft/camshaft speed sensor non-input (simultaneous)	P0008
523513	9	CAN reception timeout DCU	U1501

Error code		Error details	DTC
SPN	FMI		
523554	3	Supply module (reverting valve) H side VB short circuit	P2671
	4	Supply module (reverting valve) H side GND short circuit	P2670
523555	3	Hose heater relay/tank heating valve H side VB short circuit	P2686
	4	Hose heater relay/tank heating valve H side GND short circuit	P2685
523556	3	Supply module (supply module heater) H side VB short circuit	P26E9
	4	Supply module (supply module heater) H side GND short circuit	P26E8
	5	Supply module (supply module heater) disconnection	P20C5
	10	Supply module (supply module heater) detected value error	P20B6
523557	3	Aqueous urea hose heater (back flow, pressure, suction) H side VB short circuit/L side VB short circuit	P1510
	7	SCR system forced termination	P1506
523558	3	DCU supply voltage error (Voltage high 1)	P1512
	4	DCU supply voltage error (Voltage low 2)	P1513
523559	3	DCU supply voltage error (Voltage high 2)	P1514
	4	DCU supply voltage error (Voltage low 1)	P1511
523560	2	Main relay opens early	P20EA
	7	Main relay sticking	P20EB
523562	9	CAN reception timeout from SCR upstream NOx sensor	U029D
523563	9	CAN reception timeout from SCR downstream NOx sensor	U029E
523570	9	CAN reception timeout from ECU	U1607
523574	3	Supply 1 overvoltage error	P21CC
	4	Supply 1 low voltage error	P21CB
523576	12	Sensor supply votage error	P1516
523577	12	SPI communication error 1	P1500
523578	12	SPI communication error 2	P1501
523579	12	AD converter error 1	P1502
523580	12	AD converter error 2	P1503

Error code		Error details	DTC
SPN	FMI		
523581	0	DCU internal temperature rise error	P1504
523582	3	DCU internal temperature sensor error (voltage high)	P1517
	4	DCU internal temperature sensor error (voltage low)	P1519
523584	0	Dosing module power stage temperature rise error	P1505
523585	3	Dosing module L side VB short circuit	P151B
523586	3	Dosing module H side VB short circuit/disconnection	P2049
	4	Dosing module L side GND short circuit	P2048
	5	Dosing module H side GND short circuit	P2047
523588	7	Dosing module valve sticking	P208E
523589	12	EEPROM memory deletion error	P1600
523590	12	EEPROM memory reading error	P160E
523591	12	EEPROM memory writing error	P160F
523592	0	Hose heater relay power stage temperature rise error	P1509
	3	Hose heater relay L side VB short circuit	P21C4
	4	Hose heater relay L side GND short circuit	P21C3
	5	Hose heater relay disconnection	P21C2
523593	3	Supply module (supply module heater) L side VB short circuit	P20C8
523594	3	Tank heating valve L side VB short circuit	P202C
523595	0	SCR upstream NOx value rise error	P1545
	3	SCR upstream NOx sensor internal circuit short circuit	P2203
	5	SCR upstream NOx sensor internal circuit disconnection	P151C
523596	0	SCR downstream NOx value rise error	P1546
	3	SCR downstream NOx sensor internal circuit short circuit	P2216
	5	SCR downstream NOx sensor internal circuit disconnection	P151D
523597	7	SCR upstream NOx sensor incomplete heating error	P2209
523598	7	SCR downstream NOx sensor incomplete heating error	P2222

Error code		Error details	DTC
SPN	FMI		
523599	0	Supply module (reverting valve) power stage temperature rise error	P150E
523600	3	Supply module (reverting valve) L side VB short circuit	P20A3
	4	Supply module (reverting valve) L side GND short circuit	P20A2
	5	Supply module (reverting valve) disconnection	P20A0
523601	1	Inefficient NOx cleaning	P1520
523606	10	SCR downstream NOx sensor detected value error	P1524
523610	0	Supply module (supply module heater) power stage temperature rise error	P150B
	1	Supply module (supply module heater temperature sensor) detected value error	P152A
	10	Supply module (supply module heater temperature sensor) detected value error (at cold start check)	P1543
523611	1	Supply module (supply module temperature sensor) detected value error	P152B
	10	Supply module (supply module temperature sensor) detected value error (at cold start check)	P1544
523612	2	Supply module (supply module heater temperature sensor) fault value for temperature information duty value received	P152C
523613	2	Supply module (supply module heater temperature sensor) invalid value for temperature information duty value received	P152D
523614	8	Supply module temperature information PWM cycle error	P152F
523615	8	Supply module temperature information PWM signal error	P152E
523616	2	Supply module (supply module temperature sensor) fault value for temperature information duty value received	P1530
523617	2	Supply module (supply module temperature sensor) invalid value for temperature information duty value received	P1531
523618	7	Supply module (pump motor) not starting to measure temperature	P20AD
523619	0	Supply module (pump motor) pressure rise error 1	P20E9
523620	7	Supply module (pump motor) pressure reduction failure	P1532

Error code		Error details	DTC
SPN	FMI		
523621	0	Aqueous urea hose (back flow side) pressure rise error	P1533
523622	7	Aqueous urea hose (pressure side) pressure rise error	P1534
523623	2	Supply module (pump motor) pressure stability error	P150F
523624	7	Supply module (reverting valve) failure	P1535
523625	0	Supply module aqueous urea sucking back failure	P204F
523626	0	Supply module (pump motor) pressure rise error 2	P1536
523627	1	Supply module pressure drop error	P1537
523628	10	Supply module aqueous urea pressure rise failure	P1538
523630	2	Aqueous urea tank temperature rise error	P154B
523634	9	A1DEFI reception timeout	U1610
523635	9	AT1T1I reception timeout	U1611
523636	0	SCR system error (Inducement2)	P1554
	16	SCR system error (Inducement1)	P1553
523637	0	ECU system error (FS action instruction 1 from ECU)	P155C
523640	5	Key switch disconnection	P1561
523643	9	Data verification error between ECU and DCU (verification timeout)	U1502

OTHER SYMPTOMS

For symptoms not included in the table below or if the problem persists after the proper remedies have been taken, consult your sales or service dealer.

Symptoms	Major causes	Remedies
Left and right control levers do not move smoothly	• Insufficient grease on the left and right control levers	• Grease the levers. Refer to page 5-59.
Dumping, swinging or traveling operation not possible	• Safety lock lever is raised (locked)	• Lower the safety lock lever (release). Refer to page 2-39.
	• Fuse is blown	• Replace the fuse. Refer to page 6-6.
Dumping or swinging force is insufficient	• Hydraulic oil level too low	• Add to the specified level. Refer to page 5-21.
	• Hydraulic oil is not warm enough	• Perform the warm-up. Refer to page 3-8.
	• Air cleaner is clogged	• Clean the air cleaner. Refer to page 5-39.
	• Hydraulic oil is not of suitable type	• Replace the hydraulic oil. Refer to page 5-52.
Traveling is not possible or not smooth	• Stones or foreign objects are stuck	• Remove the foreign object.
Machine veers to the right/left	• Stones or foreign objects are stuck	• Remove the foreign object.
Switches are not functioning	• Fuse is blown	• Replace the fuse. Refer to page 6-6.
Travel speed cannot be changed	• Fuse is blown	• Replace the fuse. Refer to page 6-6.
Swinging is not possible or not smooth	• Insufficient grease on the swing bearing	• Grease the swing bearing. Refer to page 5-45.
Hydraulic oil temperature is too high	• Hydraulic oil level too low	• Add up to the specified level. Refer to page 5-21.

Symptoms	Major causes	Remedies
Starter motor turns but engine does not start	• Insufficient fuel	• Add fuel. Refer to page 5-20.
	• Air in fuel system	• Bleed air. Refer to page 6-12.
	• Water in fuel system	• Drain water. Refer to page 5-38.
	• Fuel is frozen.	• Warm the fuel pipe with hot water or wait until the ambient temperature becomes high.
	• Engine control system is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Fuel line is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Preheating device is faulty.	• Adjust or repair (ask your sales or service dealer).
Tracks come off	• Tracks too loose	• Consult your sales or service dealer. Refer to page 5-33.
Engine exhaust is white or bluish	• Excessive engine oil	• Adjust to the specified level. Refer to page 5-19.
	• Insufficient engine warm-up.	• Perform the warm-up operation. Refer to page 3-5.
	• Engine control system is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Fuel line is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Prolonged idling (approx. two hours or more)	• Increase the engine RPM and check for smoke.
	• Poor fuel	• Replace the fuel.

Symptoms	Major causes	Remedies
Engine exhaust is occasionally black	• Air cleaner is clogged	• Clean the air cleaner. Refer to page 5-39.
	• Engine control system is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Fuel line is faulty.	• Adjust or repair (ask your sales or service dealer).
	• Clogging in the exhaust line.	• Adjust or repair (ask your sales or service dealer).
	• DPF is faulty.	• Adjust or repair (ask your sales or service dealer).
Irregular noise is produced from the engine (combustion or mechanical noise)	• Low quality fuel is being used	• Replace the fuel.
	• Engine is overheating	• Refer to “If the engine overheats” on page 6-3.
	• Damage inside the muffler	• Replace the muffler. For replacement, ask your sales or service dealer.
Headlights do not come on.	• The switch located on the light is off.	• Turn on the switch located on the light.

TOWING

⚠ WARNING

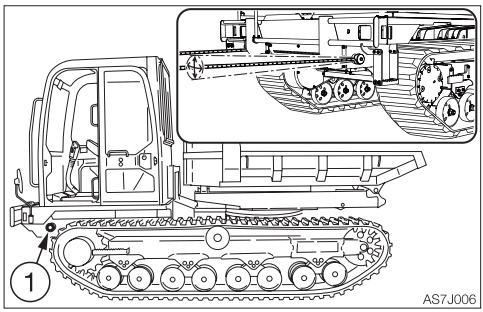
When towing, serious injury or death could result, if performed incorrectly or the wire rope being used is inappropriate or not properly inspected.

- **It becomes dangerous if the wire rope breaks or becomes disengaged. Use a wire rope appropriate for the required tractive force.**
- **Do not use a wire rope that is kinked, twisted or otherwise damaged.**
- **Do not apply heavy loads abruptly to the wire rope.**
- **Wear safety gloves when handling the wire rope.**
- **Make sure there is an operator on the machine being towed as well as on the machine that is towing.**
- **Never tow on slopes.**
- **Do not let anyone come near to the wire rope while towing.**

IMPORTANT: Do not tow a machine if its engine does not start or if the machine does not run. Doing so could damage the machine being towed.
When recovering the machine gets stuck in the mud, lift the machine, or contact a Takeuchi sales or service dealer.
IMPORTANT: Be sure to follow the steps below closely when towing. Failure to heed even one of the steps may cause damage to the hooks (1).

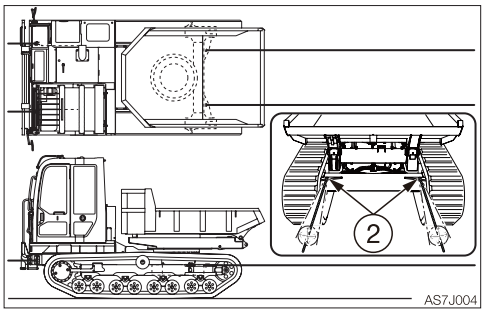
Towing the machine (if engine can be started and travel motor runs normally)
Use the procedure described below to tow heavy objects or the machine itself if it should get stuck in the mud and not be able to get out on its own.

<Front>



1. Attach the wire rope to the hooks (1).

<Rear>



- Permissible forces: 75.4 kN (16947 lbf)

1. Attach the wire rope to the shackle.
2. Fasten the shackle to the towing holes (2).
3. Make sure that the wire rope is horizontal and is lined up straight with the travel frame. (Cone angle of 20° or less)
4. Move the machine to tension the wire rope.
5. Move the machine at a low speed of 2 km/h (1.24 mph) or less to a place (convenient location for repair) a short distance from the site.

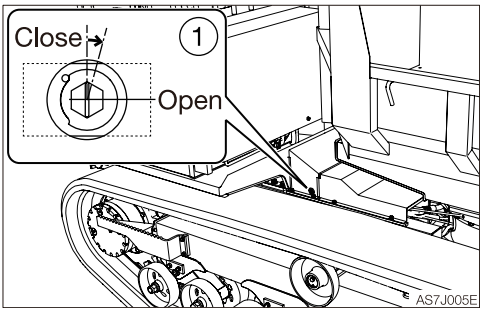
Note: Do not tow using only a towing hook or hole on one side.

LOWERING THE DUMP BODY

⚠ WARNING

- **Stop the engine and allow each part of the machine to cool down before performing maintenance.**
  - **The engine, the hydraulic system and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.**
  - **The hydraulic oil is also hot and under high pressure immediately after the engine is stopped. Be careful not to touch the hydraulic oil when loosening the cap or plug. Working on the machine under these conditions could result in burns or injuries due to the hot oil spurting out.**
- **Keep away from the working area when the dump body is lowered. You may be hit by the dump body or the material falling out of it.**
- **Slowly turn the valve nut and lower the dump body at a slow pace.**
- **Do not loosen or remove the hoses not located in the specified places. Doing so could cause the oil to spurt out.**

If the dump body must be fully lowered while the engine is stopped, use the following procedure.



IMPORTANT: After lowering the dump body, be sure to close the stop valve (1). If not closed, the dump body cannot be raised.

1. Slightly turn the stop valve (1) clockwise. (The dump body starts moving down.)
2. Slowly lower the dump body.
3. After the dump body is fully lowered, check the safety and stability of the machine.
4. Close the stop valve (1) by turning it counterclockwise.

IF THE CAB IS DAMAGED

⚠ WARNING

Immediately replace the damaged cab. Serious injury or death may occur if the machine is operated with damaged cab. Do not operate the machine until the replacement is complete. Do not try to repair the damaged cab by welding. Doing so could endanger the safety of the cab.

Cab part number: 07186-00010

EXHAUST GAS CONTROL SYSTEM ERROR

ERROR CODE LIST

If the exhaust gas control system detects an error, the ECM error warning lamp turns on or flashes and the following error codes are displayed.
If an error code appears, immediately repair the fault part detected, or consult your sales or service dealer for help.

Error code		Error description		DTC	NCD or PCD Error*	Limited engine
SPN	FMI	Fault location	Cause			Level
102	3	EGR Differential Pressure Sensor	1. Wiring Bypass	P0238	N	2
102	4	EGR Differential Pressure Sensor	1. Wiring Disconnection 2. Sensor Removal	P0237	N	2
102	10	EGR Differential Pressure Sensor	1. Pressure Hose Removal 2. Sensor Leave in Atmosphere 3. Dummy Registance	P1673	N	6
110	4	Coolant Temperature Sensor	1. Wiring Disconnection 2. Sensor Removal	P0117	N	4
3251	3	DPF Differential Pressure Sensor	1. Wiring Bypass	P2455	N	2
3251	4	DPF Differential Pressure Sensor	1. Wiring Disconnection 2. Sensor Removal	P2454	N	2
4795	31	DPF Differential Pressure Sensor	1. Pressure Hose Removal 2. SF Removal 3. Sensor Leave in Atmosphere 4. Dummy Registance	P226D	P	6
3242	3	DPF Inlet Temperature Sensor	1. Wiring Bypass	P1428	P	2
3242	4	DPF Inlet Temperature Sensor	1. Wiring Disconnection 2. Sensor Removal	P1427	P	2
3250	3	DPF Intermediate Temperature Sensor	1. Wiring Bypass	P1434	P	2
3250	4	DPF Intermediate Temperature Sensor	1. Wiring Disconnection 2. Sensor Removal	P1435	P	2
412	3	EGR Gas Temperature Sensor	1. Wiring Bypass	P041D	N	3
412	4	EGR Gas Temperature Sensor	1. Wiring Disconnection 2. Sensor Removal	P041C	N	3
105	3	Intake Manifold Temperature Sensor	1. Wiring Bypass	P040D	N	2
105	4	Intake Manifold Temperature Sensor	1. Wiring Disconnection 2. Sensor Removal	P040C	N	2
173	3	Exhaust Manifold Temperature Sensor	1. Wiring Bypass	P0546	N	3
173	4	Exhaust Manifold Temperature Sensor	1. Wiring Disconnection 2. Sensor Removal	P0545	N	3
2791	12	EGR Valve	1. Wiring Disconnection	P0403	N	4

*:
N: NCD (NOx Control Diagnostic system)
P: PCD (Particulate Control Diagnostic system)

NOX CONTROL DIAGNOSTIC SYSTEM (NCD)

The NCD system warns the operator of any error detected by turning on the warning lamp and displaying an engine error code. The engine output is limited depending on the type of fault.

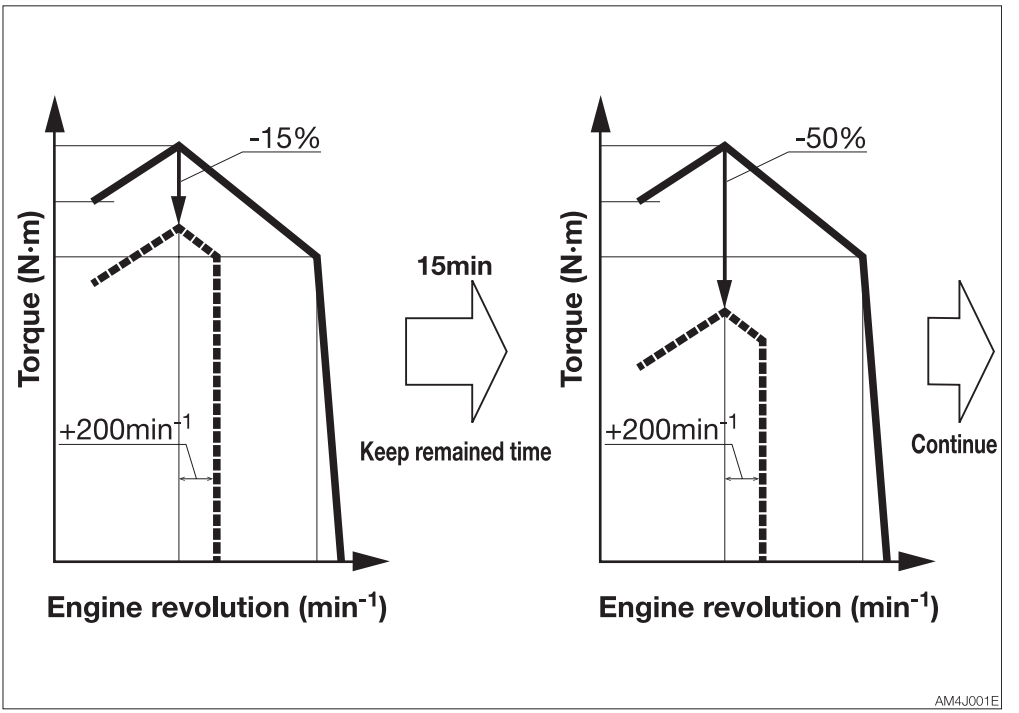
PARTICULATE CONTROL DIAGNOSTIC SYSTEM (PCD)

The PCD system warns the operator of any error detected in the particulate after-treatment system such as the DPF, by using the warning lamp and displaying an engine error code. The engine output is limited depending on the type of fault.

LIMITING THE ENGINE OUTPUT

If the exhaust gas control system detects an error, the engine output is limited depending on the type of fault.
There are three types of engine output limitation, each corresponding to the fault level determined.
Note: If the time interval between the fault repairing and error detecting is short, the regular operation may be executed with a shorter pre operation.

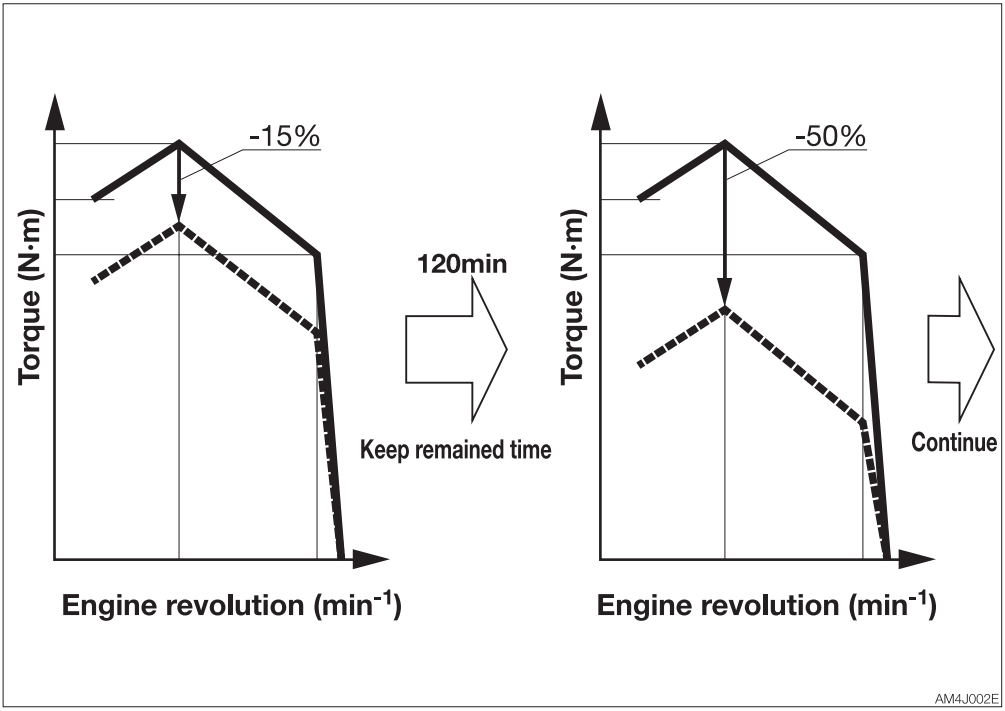
Level 2



: Normal
: Limited output

Pre operation: when the error is detected, the engine torque is reduced by 85%, compared to the normal operation.
The engine revolution becomes +200 min^{-1}, compared to the maximum torque.
Regular operation: after 15-minute pre operation, the regular operation starts. The engine torque is reduced by 50%, compared to the normal operation. The engine revolution becomes +200 min^{-1}, compared to the maximum torque. The regular operation continues until the error is resolved.

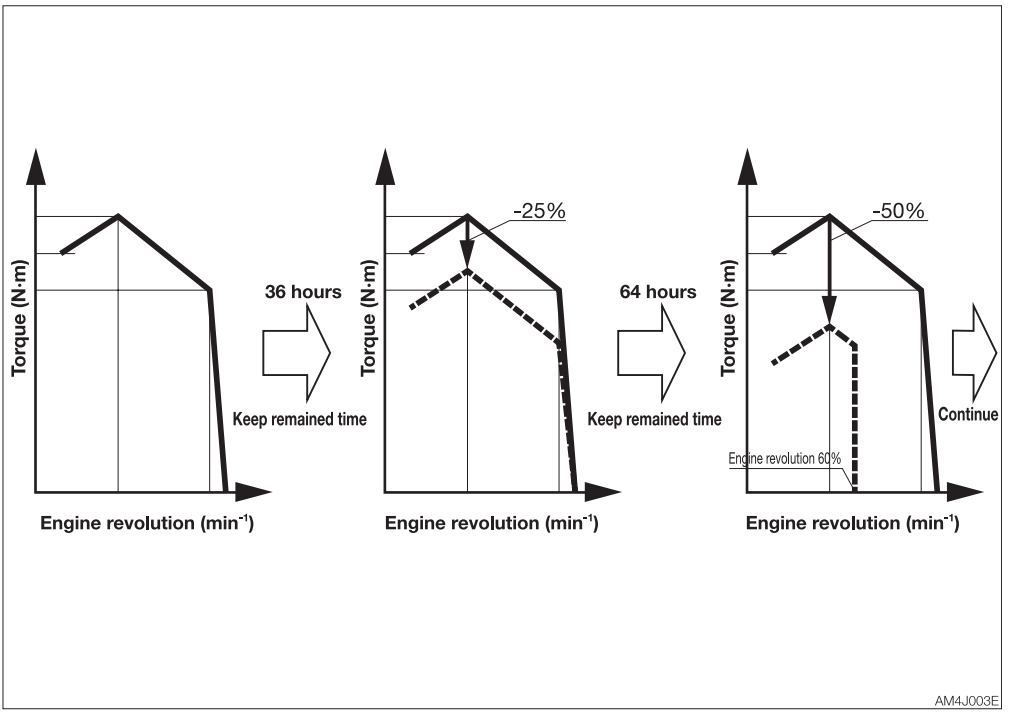
Level 3 or 4



: Normal
: Limited output

Pre operation: when the error is detected, the engine torque is reduced by 85%, compared to the normal operation.
Regular operation: after 120-minute pre operation, the regular operation starts. The engine torque is reduced by 50%, compared to the normal operation. The regular operation continues until the error is resolved.

Level 6 (only NCD)



: Normal
: Limited output

Pre operation 1: If an error is detected, the warning lamp turns on or starts flashing; the engine output is not limited.
Pre operation 2: Pre operation 2 starts after pre operation 1 continues 36 hours. The engine torque is reduced by 75%, compared to the normal operation.
Regular operation: Regular operation starts after the pre operation 2 continues 64 hours. The engine torque is reduced by 50%, compared to the normal operation. The regular operation continues until the error is resolved.

OUTPUT LIMITATION PERFORMED BY INDUCEMENT DUE TO AN ABNORMALITY DETECTED IN THE SCR SYSTEM

The term “inducement” used here refers to the action of limiting the engine RPM or fuel injection amount if the DEF/AdBlue® injection fails due to an abnormality.
If an abnormality is detected in the SCR system (including a decrease in the quality of DEF/AdBlue®), the inducement is activated to prevent the engine from running with a failure in the injection of DEF/AdBlue®. If the engine continues to operate in the inducement status, the engine RPM and fuel injection amount are limited so strictly that operation will eventually become impossible. If this happens, immediately correct the abnormality.
According to the engine running time since the abnormality, the following three levels of inducement are provided in the SCR system.

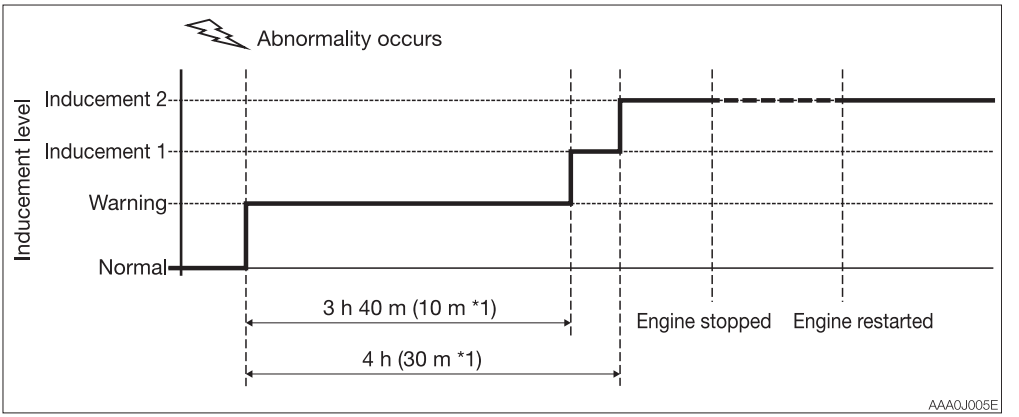
a. Warning
The SCR system warning lamp lights up.
The system enters the warning level if an abnormality occurs, and remains at this level until the engine running time reaches 3 hours and 40 minutes (or 10 minutes in the case of *1) unless the abnormality is corrected. Whether there is a limitation on the engine RPM or the fuel injection amount depends on the error type.

b. Inducement 1
The SCR system warning lamp flashes.
The system enters the inducement level 1 if the duration of the warning level exceeds 3 hours and 40 minutes (or 10 minutes in the case of *1), and remains at this level until the engine running time reaches 4 hours (or 30 minutes in the case of *1). At this time, the engine RPM is limited to the maximum torque rotation speed + 200 min^{-1} (or to low idle, depending on the error type) and the maximum fuel injection amount is limited to 50%.

c. Inducement 2
The system enters the inducement level 2 if the duration of inducement level 1 exceeds 4 hours (or 30 minutes in the case of *1). The engine RPM is limited to low idle and the maximum fuel injection amount is limited to 50%.

The relation between the engine running time and the inducement is shown in the figure below. Once an abnormality occurs, the inducement status cannot be canceled even if the engine is stopped and restarted, and the level at the time of engine stopping will be continued.

The relation between the engine running time and the inducement if an abnormality occurs



*1: If another inducement-related abnormality occurs within 40 hours of engine running time after the last abnormality is corrected.

If the inducement status occurs due to the abnormality in the SCR system, errors by each level are detected. Please contact your local sales or service dealer.

Table 1-1 Relation between inducement level and errors detected

Location of abnormality	Inducement level	DTC code			Error
		P code	SPN	FMI	
Engine system	Warning	P155C	523637	0	ECU system error FS action request 1 from ECU
	Inducement 1	P1553	523636	16	SCR system error Inducement 1
		P155C	523637	0	ECU system error FS action request 1 from ECU
	Inducement 2	P1554	523636	0	SCR system error Inducement 2
		P155C	523637	0	ECU system error FS action request 1 from ECU
SCR system	Inducement 1	P1553	523636	16	SCR system error Inducement 1
	Inducement 2	P1554	523636	0	SCR system error Inducement 2

OUTPUT LIMITATION PERFORMED BY INDUCEMENT DUE TO DECREASED DEF/ADBLUE® TANK LEVEL

By detecting a decrease in the level of DEF/AdBlue® left in the tank, the inducement is activated to prevent the engine from running with an empty DEF/AdBlue® tank. If the engine continues to operate in the inducement status, the engine RPM and fuel injection amount are limited so strictly that operation will eventually become impossible. If the inducement is activated, immediately add DEF/AdBlue® to cancel the inducement.
According to the DEF/AdBlue® level detected, the following three levels of inducement are provided due to the decrease in the DEF/AdBlue® tank level.

a. Warning
The DEF/AdBlue® level warning lamp lights up.
The system enters the warning level if the level of the DEF/AdBlue® level meter decreases to 10% or less. The engine RPM and fuel injection amount are not limited.

b. Inducement 1
The DEF/AdBlue® level warning lamp flashes.
The system enters the inducement level 1 if the level of the DEF/AdBlue® level meter decreases to 0% or less. The maximum fuel injection amount is limited to 75%.

c. Inducement 2
The system enters the inducement level 2 if the DEF/AdBlue® level in the fuel tank is zero (unable to draw up DEF/AdBlue®). The engine RPM is limited to low idle and the maximum fuel injection amount is limited to 50%.

If the inducement status occurs due to a decrease in the DEF/AdBlue® level in the tank, errors by each level are detected. If this happens, immediately add DEF/AdBlue®.

Relation between inducement level and errors detected

Location of abnormality	Inducement level	DTC code			Error
		P code	SPN	FMI	
DEF/AdBlue® tank level	Inducement 1	P1549	1761	18	DEF/AdBlue® tank level decreased. Inducement 1
	Inducement 2	P154A	1761	1	DEF/AdBlue® tank level decreased. Inducement 2

SPECIFICATIONS



BASIC SPECIFICATIONS

Type			Cab
MASS			
Operating mass	kg (lb)		6550 (14440)
PERFORMANCE			
Dump body capacity (Standard dump body)	m^3 (cu.ft.)	Heaped	2.055 (72.57)
		Struck	1.15 (40.61)
Maximum loading mass	kg (lb)		3700 (8160)
Travel speed	km/h (mph)	1st	7.0 (4.35)
		2nd	9.5 (5.90)
Gradeability	degrees		30
Ground pressure (ISO 16754: 2008)	kPa (psi)	With dump body full	42 (6.09)
		With dump body empty	27 (3.92)
ENGINE			
Manufacturer and model			Yanmar 4TNV94FHT-NTBC
Rated output	Net (ISO 14396)	kW/min^{-1} (hp/rpm)	88.4/2500 (118.5/2500)
	Net (ISO 9249/ SAE J1349)	kW/min^{-1} (hp/rpm)	83.2/2500 (111.6/2500)
Displacement		ml (cu.in.)	3053 (186.3)
Amount of CO_2 emission*		g/kWh	732
Starter		V-kW	12-3
Alternator		V-kW	12-0.96
Battery (IEC 60095-1)		V-A·h	12-90
CCA		A	795

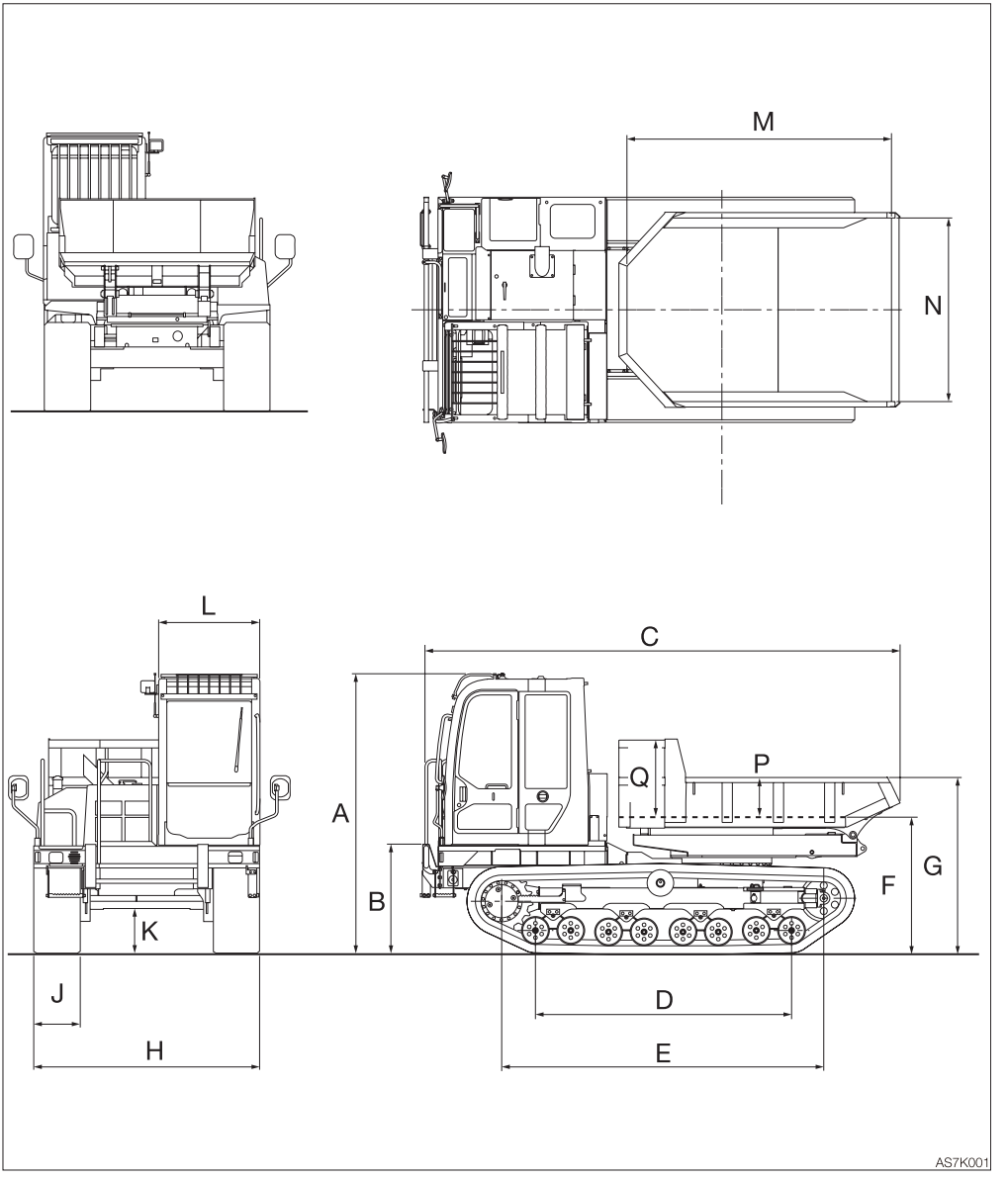
*: The amount of CO_2 emission refers to the value obtained by testing the parent engine representing the engine type (engine family member) being used; it shall not guarantee the performance of the machine.

Unit:dB (A)

NOISE EMISSION		
DECLARED SINGLE-NUMBER NOISE EMISSION VALUES in accordance with ISO 4871*		
Sound power level (2000/14/EC)	Guaranteed sound power level	102
Emission sound pressure level at the operator's position**	Emission sound pressure level	82
Measured values and Uncertainties		
Sound power level (2000/14/EC)	Measured sound power level	101
	uncertainty	1
Emission sound pressure level at the operator's position**	Measured emission sound pressure level	79
	uncertainty	3

* : Declared single-number noise emission values are the sum of measured values and the associated uncertainty.
** : Values determined according to noise test code given in ISO 6396.

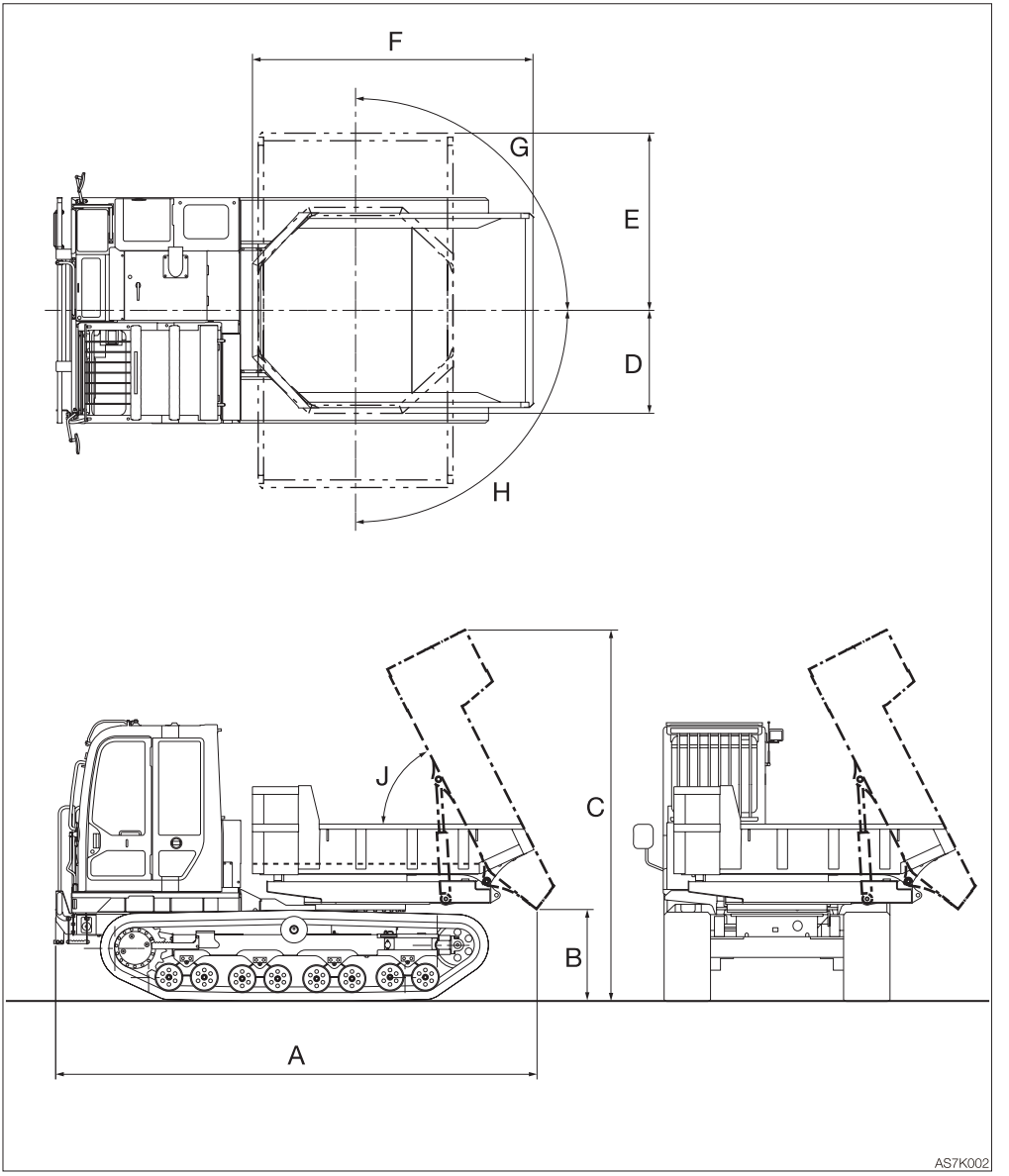
MACHINE DIMENSIONS



Unit: mm (inch)

	Item	Standard dump body
A	Overall height	2725 (107.3)
B	Height of bumper	1040 (40.9)
C	Overall length	4660 (183.5)
D	Length of track ground	2500 (98.4)
E	Track base	3145 (123.8)
F	Dump body floor height	1330 (52.4)
G	Dump body flap height from the ground	1715 (67.5)
H	Overall width	2200 (86.6)
J	Track shoe width	450 (17.7)
K	Ground clearance of undercarriage	435 (17.1)
L	Cab width	990 (39.0)
M	Dump body length (inside)	2615 (103.0)
N	Dump body width	1795 (70.7)
P	Height of dump body gate	385 (15.2)
Q	Height of dump body front gate	750 (29.5)

OPERATING RANGES



Unit: mm (inch)

	Standard dump body
A	4680 (184.3)
B	885 (34.8)
C	3610 (142.1)
D	1005 (39.6)
E	1730 (68.1)
F	2735 (107.7)
G	90°
H	90°
J	65°

OPTIONS

GENERAL PRECAUTIONS

SAFETY PRECAUTIONS

⚠ WARNING

When removing or installing an attachment or optional part, take the following precautions.

- **Consult with Takeuchi before installing an optional attachment.**
- **Do not use any attachments not approved by Takeuchi. Doing so may cause safety problems. Or, it may adversely affect the machine's operation or service life.**
- **We will not be held responsible for any injuries, accidents or damage to its products caused by the use by a non-approved attachment.**
- **Select a firm, level work area. Also, be sure to park in a well ventilated place.**
- **Clear obstacles and dangerous objects, and clean up spilled fuel immediately.**
- **When it is necessary to temporally place a heavy object or an attachment on the ground during removal or installation, be sure to place it in a stable position.**
- **Use the proper procedure when mounting an attachment; otherwise serious damage could result. Consult your sales or service dealer for help.**
- **When hoisting, be sure to designate a person to act as a signalman. Follow the instructions of the signalman regarding the procedure and measures.**
- **Keep everyone out of the area when hoisting. There is a hazard of objects falling or contacting with people in the area.**
- **Use a crane to move heavy objects (25 kg (55 lb.) or greater).**
- **Before removing a heavy object, be sure to put a support to it. When lifting with a crane, pay attention to the center of gravity of the load to keep the machine in balance.**
- **Do not operate the machine while the load is lifted by a crane stand.**

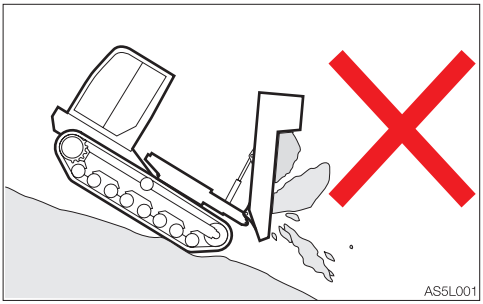
CAUTIONS WHEN INSTALLING ATTACHMENTS

Be sure to perform a test operation after an optional or other special attachment has been replaced. Inspect the hydraulic oil level and recharge it as necessary. Consult your sales or service dealer for detailed procedures on installing/removing attachments.

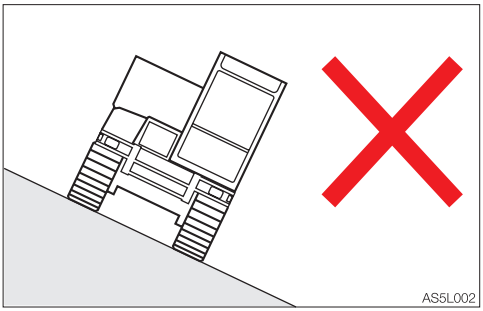
PRECAUTIONS WHEN OPERATING ATTACHMENTS

⚠ WARNING

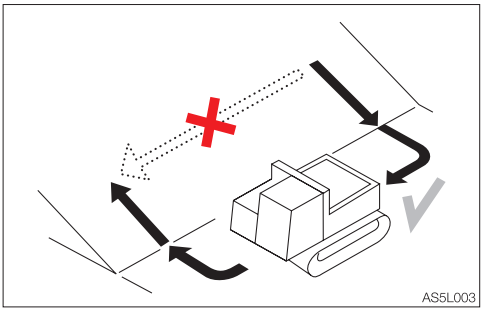
Long or large attachments reduce stability of the machine. The machine may tip over if it loses the balance when traveling or slewing on slopes.
Never perform the operations listed below as they are extremely dangerous.



- Traveling down the slopes with the dump body raised



- Traveling across slopes



- Turning on slopes
- If there is a heavy attachment is installed, the machine takes larger operating range than usual to swing. Carefully judge the distance so as not to bump into an object around the machine. Keep a safe distance from surrounding obstacles to the attachment.
  Also, be aware that the spontaneous drop (the gradual dropping of the attachment under its own weight when it is stopped in midair) gets larger as the attachment gets heavier.
- The machine can tip over more easily in the lateral direction than in the longitudinal direction.
  · Do not swing sideways when the dump body is heavily loaded. In particular, do not swing sideways on slopes.

OPTIONAL EQUIPMENT MASS

OPTION	
Heater	-20(-44)

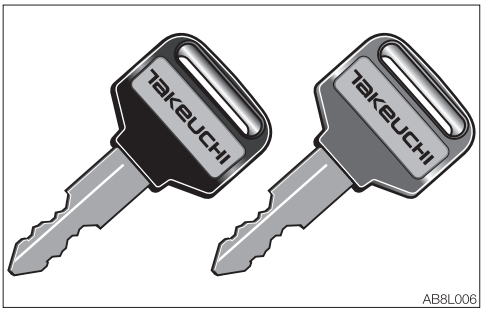
Units: kg (lb)

*: Mass of optional equipment is added to the standard machine mass.
*: This table only contains the optional equipment of 10 kg (20 lb) or more in mass.

TAKEUCHI SECURITY SYSTEM

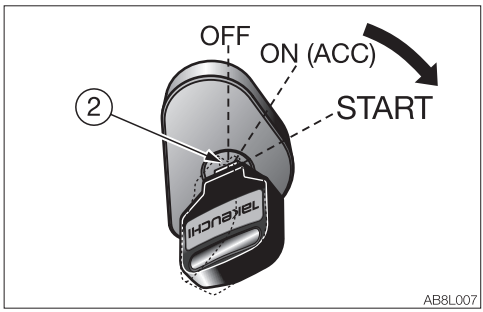
The Takeuchi Security System is a system that allows only registered ignition keys to be used for starting the engine.
The engine cannot be started with any unregistered or counterfeit ignition keys. If a registered ignition key is lost or stolen, you can set the system to delete the registered key information, so that the lost or stolen key cannot be used to start the engine. Although machine theft cannot be completely prevented, the system certainly helps reduce the risk of theft.

IGNITION KEY



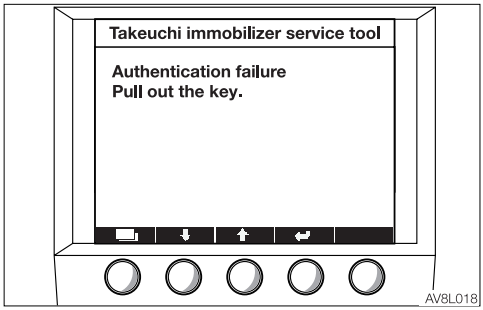
There are two types of ignition key, red and black, which can be registered in the Takeuchi Security System.
The red key is the master key. The black key is the starting key.

STARTING THE ENGINE



The engine can be started using the normal method with a registered BLACK key.
The engine cannot be started using the RED master key.
Refer to Chapter 3, “Starting and stopping the engine”.

If an attempt is made to start the engine with an unregistered key:



If an unregistered ignition key is turned from the OFF to the ON (ACC) position, the message “Authentication failure” appears and the alarm starts sounding.
If this attempt is repeated five times in a row, the horn sounds for two minutes, and the engine cannot be started. The horn stops when the key is turned to the OFF position.

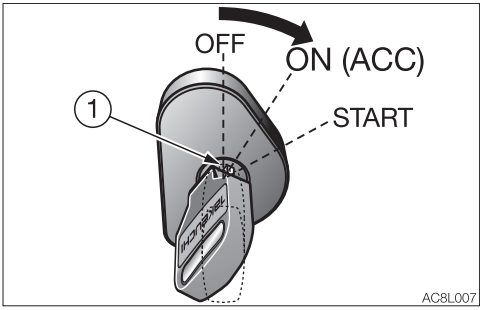
REGISTERING AND DELETING THE IGNITION KEY

⚠ WARNING

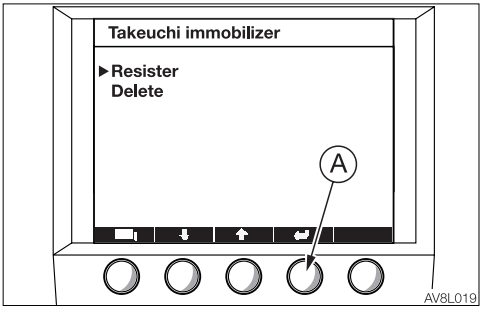
- **Sit on the operator's seat.**
- **Raise the safety lock lever to the locked position.**
- **Clear all people from the machine and the area.**
- **Sound the horn to warn people around the machine.**

Registration may fail if the ignition key is on a keyring or keychain; remove it before starting registration.
A malfunction could occur if multiple ignition keys are brought near to the key cylinder. Be sure that no ignition keys other than the correct key are near the key cylinder during registration.

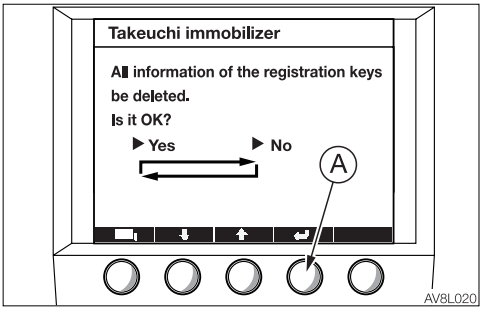
Ignition key registration procedure
For Steps 1 to 6 below, complete each step and proceed to the next one within five minutes. If no operation is performed for five minutes during this procedure, the system returns to the initial state.
From Step 7 onward, the system automatically ends the operation if no operation is performed for five minutes.



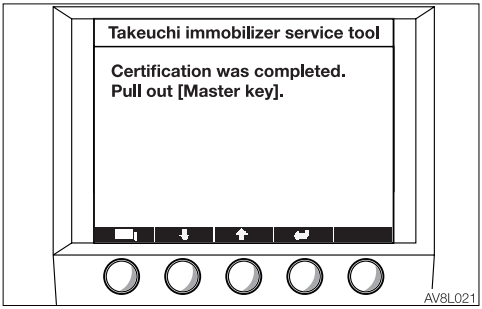
1. Insert the master key (1) into the ignition switch and turn the key from the OFF to the ON (ACC) position.

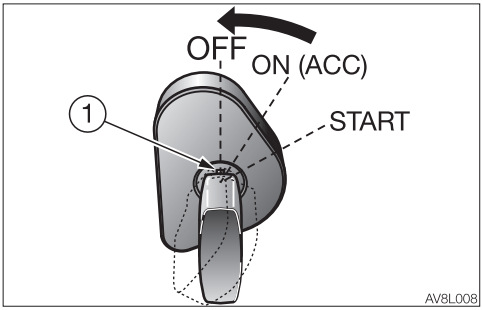


2. On the LCD, select “REGISTER” and press (A).

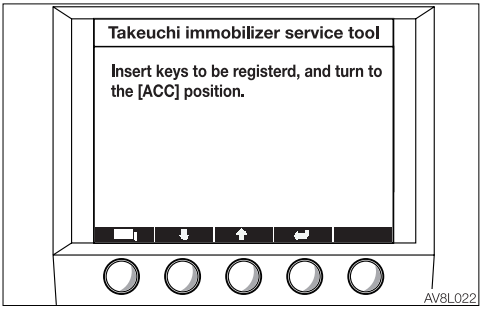


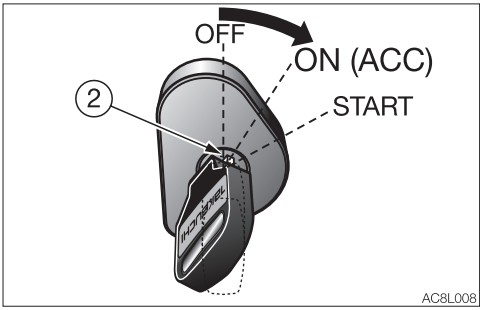
3. Select whether to delete all of the existing registration information.
   On the LCD, select “YES” and press (A): All registration information will be deleted; register a new key.
   On the LCD, select “NO” and press (A): A new ignition key will be added to the existing registration information.



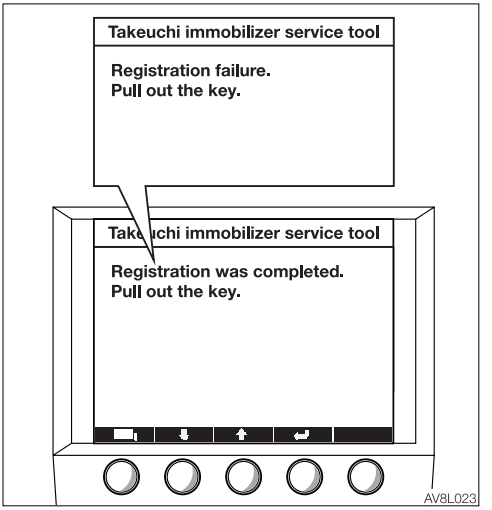


4. When the message “Certification was completed” appears on the LCD, turn the master key (1) from the ON (ACC) to the OFF position, and then remove it from the ignition switch.
   The number (3) in the lower left indicates the number of ignition keys currently registered (only for canopy). Up to 13 ignition keys can be registered.

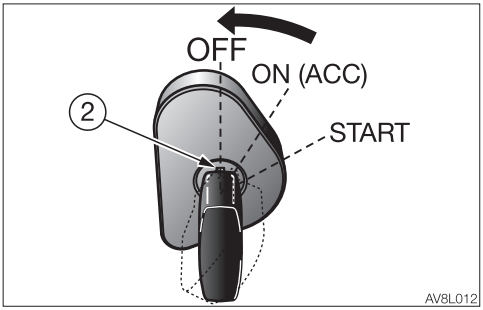


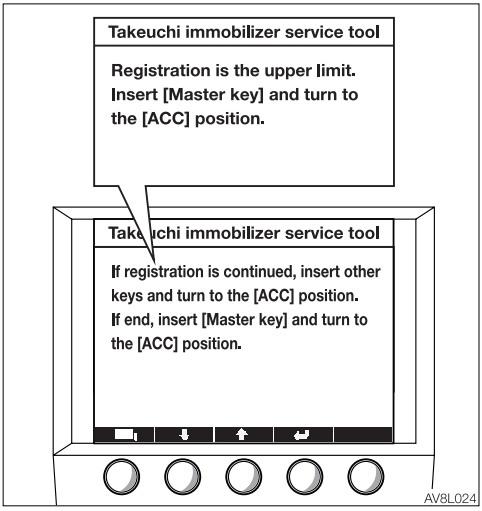


5. Insert the ignition key (2) to be registered into the ignition switch and turn the key from the OFF to the ON (ACC) position.

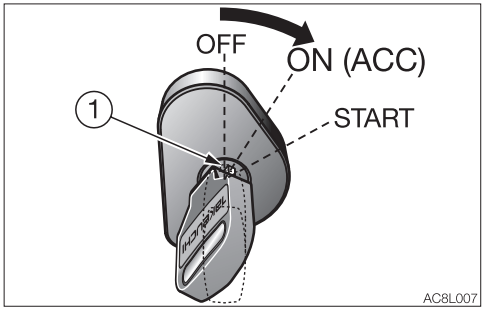


6. If the registration was successfully completed, the message “Registration was completed” appears. This means that the ignition key (2) currently inserted has been registered.
   If the registration fails, the message “Registration failure” appears.

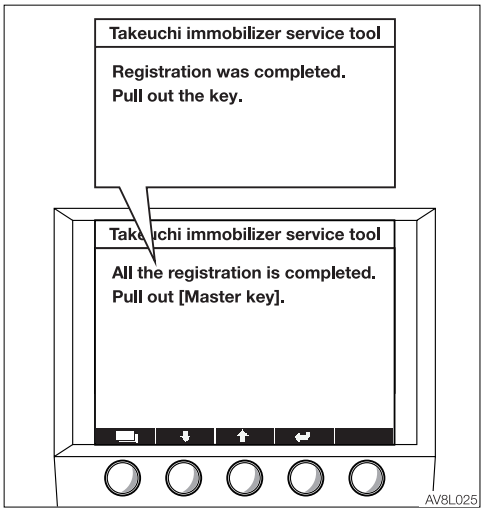




7. Turn the ignition key (2) from the ON (ACC) to the OFF position, and then remove it from the ignition switch.
   To continue registration, repeat the steps from Step 5.
   To end registration, proceed to Step 8.

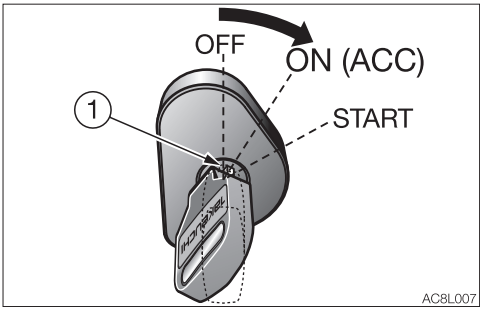


8. Insert the master key (1) into the ignition switch and turn the key from the OFF to the ON (ACC) position. Or, wait for five minutes or more.

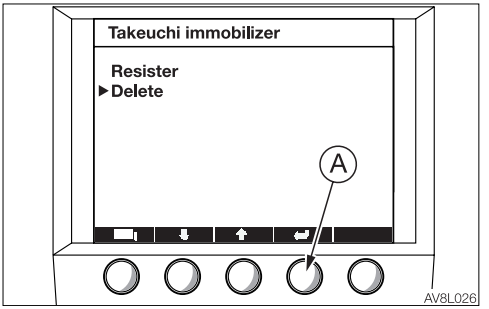


9. If any ignition key has been registered, the message “All the registration is completed” appears. Turn the master key (1) from the ON (ACC) to the OFF position, and then remove it from the ignition switch to complete the registration.
   If no ignition key has been registered, the message “Registration failure” appears, and the registration information is returned to the initial state.

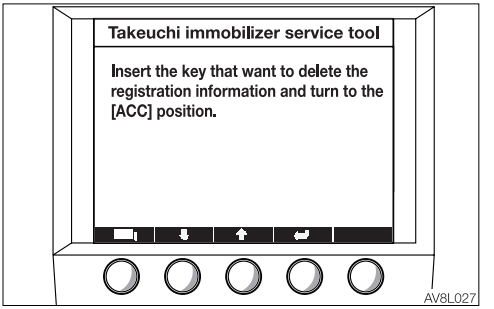
Deleting a registered ignition key
The information of each registered ignition key can be deleted to cancel its ability to start the engine.

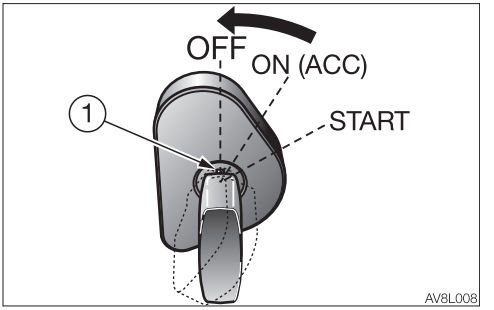


1. Insert the master key (1) into the ignition switch and turn the key from the OFF to the ON (ACC) position.

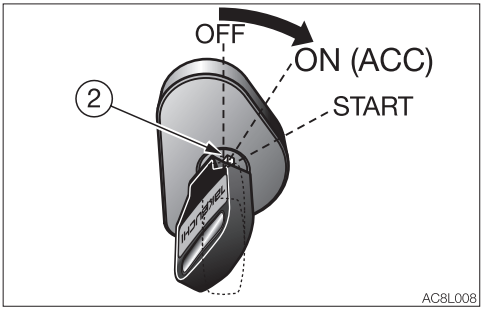


2. On the LCD, select “DELETE” and press (A).

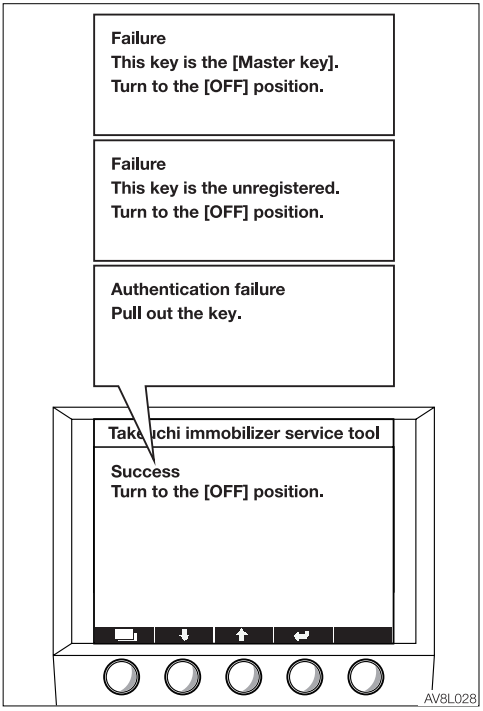




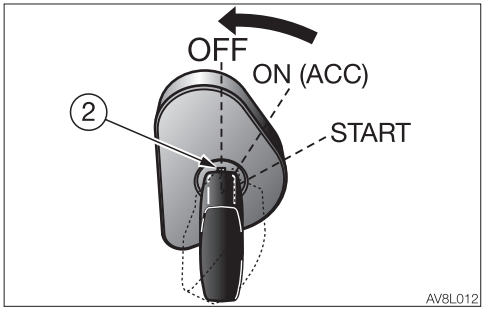
3. When the display shown as the illustration appears on the LCD, turn the master key (1) from the ON (ACC) to the OFF position, and then remove it from the ignition switch.
Note: If the registered key is lost and you want to delete all registration information, please refer to STEP 3 (A) on page 8-7.



4. Insert the ignition key (2) to be deleted into the ignition switch and turn the key from the OFF to the ON (ACC) position.



5. If the deletion is successful, the message “Success” appears. This means that the information registered for the ignition key (2) currently inserted has been deleted. If the deletion fails, the message “Failure” or “Authentication failure” appears on the LCD. Remove the ignition key, and then repeat the steps from Step 1 again.



6. Turn the ignition key (2) from the ON (ACC) to the OFF position, and then remove it from the ignition switch.
To continue deletion, repeat the steps from Step 1.

IF THE MASTER KEY IS LOST

If you lose your master key, contact your service or sales dealer for assistance.

COUNTRIES WHERE THE SYSTEM CAN BE USED

To use the Takeuchi Security System, “radio wave authentication” must be obtained in the country where the system is to be used. The system can be used in the countries listed below, as of January 2017. Do not use the system in other countries. For details on how to disable the system, please contact your service or sales dealer for assistance.

Countries where the system can be used:
Ireland, Italy, UK, Estonia, Austria, Holland, Cyprus, Greece, Croatia, Sweden, Spain, Slovakia, Slovenia, Czech, Denmark, Germany, Hungary, Finland, France, Bulgaria, Belgium, Poland, Portugal, Malta, Latvia, Lithuania, Rumania, Luxemburg, Iceland, Norway, Liechtenstein, Switzerland, Turkey

MEMO

TAKEUCHI FLEET MANAGEMENT (TFM)

⚠ CAUTION

- **Never disassemble the TFM. It may cause injury or failure.**
- **Any damage to the TFM device or wire harness may cause damage to the device and surrounding equipment.**



- Takeuchi Fleet Management (TFM) is a system that manages machine position information, operation information, and machine status using a communication device installed in the machine.
- Machines that support TFM are equipped with communication devices and are labeled as above.
- A communication contract is required to use TFM. Please contact our sales service for information regarding the contract.

IMPORTANT:

- **The TFM equipment has been tested and found to comply with the limits for a Class A and Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against signal interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can emit radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause signal interference to radio communications.**
- **Operation of this equipment in a residential area may cause signal interference in which the user may be required to take additional steps to correct the interference. To correct any interference issue, move the TFM equipped machine away from the affected device, or, if possible; relocate the affected device away from the TFM equipped machine.**
- **The TFM device uses mobile communication. Therefore, it may not function properly in places where the signal is weak (buildings, tunnels, underground, etc.).**
- **The TFM device complies with the RF radiation exposure limits of the FCC Rules. The product is tested for a separation distance of 0 mm from human bodies. It is advised for those with specific sensitive conditions to avoid close device-body exposure.**
- **Please be aware that storing a machine long-term may result in the loss of communication from the TFM device if its internal battery is drained.**
- **The TFM device consumes a small amount of machine battery power even when the key is in the OFF position. For extended storage, see “Maintenance during extended storage period” on page 5-65.**

Specification

M7H (For Europe)

Frequency	Power
UMTS/HSPA:	
900 MHz	0.25 W
2100 MHz	0.25 W
GSM/GPRS:	
900 MHz	2 W
1800 MHz	1 W
GSM/EDGE:	
900 MHz	0.5 W
1800 MHz	0.4 W

M7L (For North America)

Frequency	Power
LTE Band:	
700 MHz	0.2 W
850 MHz	0.2 W
1700 MHz (AWS)	0.2 W
1900 MHz	0.2 W
UMTS Band:	
850 MHz	0.25 W
1900 MHz	0.25 W

M7MG

Frequency	Power
LTE Band:	
700 MHz	0.2 W
850 MHz	0.2 W
1700 MHz (AWS)	0.2 W
1900 MHz	0.2 W
UMTS Band:	
850 MHz	0.25 W
1900 MHz	0.25 W

First Published November 2019
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AAA0EN013

OPERATOR'S MANUAL

TCR50-2 Crawler Dumper

Edited and issued by TAKEUCHI MFG. CO., LTD.

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info@ztr.com

April 5, 2019

RE: M7H

To whom it may concern,

This letter is to confirm that ZTR product **M7H** sufficiently demonstrate compliance to CE and the Radio Equipment Directives (RED). The M7H satisfies all the technical regulations applicable to the product within the scope of Council Directives 2014/53/EU, 2015/35/EU and 2014/30/EU. The following tests were completed successfully.

EN 60950-1: 2006+A11: 2009+A1: 2010+A12: 2011+A2: 2013
EN62311:2008
ETSI EN 300 328 V2.1.1 (2016-05)
ETSI EN 303 413 V1.1.1 (2017-06)
Draft ETSI EN 301 489-52 V1.1.0 (2016-11)
Draft ETSI EN 301 489-17 V3.2.0 (2017-03)
Draft ETSI EN 301 489-1 V2.2.0 (2017-03)
Draft ETSI EN 301 489-19 V2.1.0 (2017-03)
EN 55032: 2015
ETSI EN 301 511 V12.5.1 (2017-03)
ETSI EN 301 908-1 V11.1.1 (2016-07)
ETSI EN 301 908-2 V11.1.2 (2017-08)

(Title(s) of regulations, standards, etc.)

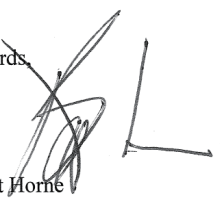
All essential radio test suites have been carried out.

The tests were carried out by a notarized 3rd party certification lab MiCOM Labs inc.

This Declaration of Conformity is issued under the sole responsibility of ZTR Control Systems (or the manufacturer).

Please direct any test results questions or concern to ZTR's Engineering Group for clarification.

Regards,



Brent Horne
Director of Product Development
ZTR Control Systems

Trackunit Aps
Gasvaerksvej 24 4.sal, 9000 Aalborg, Denmark
www.trackunit.com

EU declaration of conformity

Hereby, Trackunit Aps declares that the radio equipment type **Trackunit M7MG** complies with the essential requirements of Directive 2014/53/EU.

3.1 (a) protection of health and safety of persons and of domestic animals and the protection of property, including the objectives with respect to safety requirements set out in Directive 2014/35/EU

Standard used: EN 62368-1:2020+A11:2020
EN 62311:2020
EN 62133-2:2012

3.1 (b) adequate level of electromagnetic compatibility as set out in Directive 2014/30/EU

Standard used: EN 301 489-1 V2.2.3
EN 301 489-17 V3.2.4
EN 301 489-19 V2.2.0
EN 301 489-52 V1.2.1

3.2 the equipment is so constructed that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.

Spectrum used:	Bluetooth:	2,402 – 2,480 GHz,	Max. 10 dBm EIRP
	Positioning:	1,559 – 1,610 GHz,	Receive only
	Cellular 4G:	B1, B3, B5, B8, B20, B28,	Max. 27 dBm EIRP
	Cellular 2G:	GSM/GPRS/EDGE; 900 / 1800	Max. 33 dBm EIRP

Standard used: EN 300 328 V2.2.2
EN 303 413 V1.2.1
EN 301 511 V12.5.1
EN 301 908-1 V13.1.1
EN 301 908-13 V13.1.1

Complies with the essential requirements of Directive 2011/65/EU and Directive 2015/863/EU on the Restriction of use of certain Hazardous Substances (RoHS 3).

Complies with the essential requirements of the Regulation 1907/2006/EC regarding Registration, Evaluation, Authorization and Restriction of Chemicals (REACh).

Complies with Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE).

Signed for and on behalf of Trackunit Aps
Aalborg, 01 December 2022

DocuSigned by:
Søren Brogaard
DBFCD953D519425...

Søren Brogaard, CEO

Declaration of Conformity

We herewith declare that the following named machine, based on its conception and design, and in the form brought into service is in accordance with the relevant, basic safety and health requirements of the following EU directives. In case of any alteration of the machine not coordinated with us, this certificate loses its validity.

Designation of the machine	Crawler Dumper
Manufacturer	TAKEUCHI MFG. CO., LTD 205 Uwadaira, Sakaki-machi, Hanishina-gun, Nagano 389-0605, Japan

Model	TCR50-2
Engine type	4TNV94FHT-N (e13*2016/1628*2021/1068EV5/D*0200*Δ)
Engine performance	88.4kW @ 2500 rpm

The machine is in accordance with the requirements of EU directives:

1) Machinery Directive: 2006/42/EC and appendix
2) Electromagnetic Compatibility-Regulation: 2014/30/EU and appendix.
3) Noise Directive: 2000/14/EC (Evaluation procedure according to appendix VI), 2005/88/EC and appendices.
4) Regulations on engine emissions: Regulation (EU) 2016/1628, as last amended by Regulation 2016/1628.

Harmonized norms: EN474-1:2022, EN474-6:2022

Compiler of the technical files:
Romain Loffredi
Takeuchi France S.A.S.
Parc d'Activités des Béthunes
3, avenue de la Mare 95310 SAINT OUEN L'AUMONE,
CS 29258 – SOA

Issued in Sakaki, Japan
Toshiya Takeuchi, President

Declaration of Conformity

We herewith declare that we take full responsibility that the following named machine, based on its conception and design, and in the form brought into service is compliant with the relevant, basic safety and health requirements of the following (UK) enactments. In case of any alteration of the machine not coordinated with us, this certificate loses its validity.

Designation of the machine	Crawler Dumper
Manufacturer	TAKEUCHI MFG. CO., LTD 205 Uwadaira, Sakaki-machi, Hanishina-gun, Nagano 389-0605, Japan

Model	TCR50-2
Engine type	4TNV94FHT-N (e13*2016/1628*2021/1068EV5/D*0200*Δ)
Engine performance	88.4kW @ 2500 rpm

The machine is compliant with the following UK enactments:

1) Supply of Machinery (Safety) Regulations 2008 (S.I. 2008/1597)
2) Electromagnetic Compatibility Regulations 2016 (S.I. 2016/1091)
3) Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001 (S.I. 2001/1701)

And the Designated Standards referred to and adopted therein and particularly EN474-1:2022, EN474-6:2022

Compiler of the technical files:
Daniel Bryning (Product Manager)
TAKEUCHI MFG. (UK) Ltd.
Unit E2B, John Boyd Dunlop Drive
Kingsway Business Park Rochdale OL16 4NG

Issued in Sakaki, Japan
Toshiya Takeuchi, President

 **WARNING:** Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.



WARNING:

Cancer and Reproductive Harm –
www.P65Warnings.ca.gov

