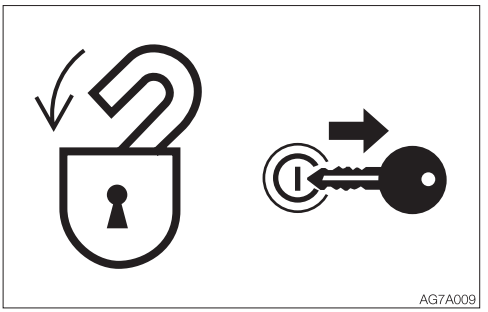
INSPECTION AND CHECKS AFTER STOPPING THE ENGINE

1. Check for oil or water leak and inspect the working equipment, covers and undercarriage. If any irregularities are found, repair.
2. Fill up the fuel tank.
   Refer to “Inspecting the fuel level” on page 5-19.
3. Remove any paper scraps or dirt from the engine room.
4. Remove any mud from the undercarriage.

Locking
Be sure to lock the following places:



- Fuel filler cap
- Cab door
- Engine hood
- Side cover
- Battery cover

HANDLING IN COLD CLIMATES

PREPARING FOR COLD CLIMATES

Starting engine in cold climates is not easy, and it becomes more difficult if the coolant freezes. Prepare for cold-climate problems as follows.

Replacing the fuel and lubricant
Replace the hydraulic oil, engine oil and fuel with those intended for cold climates.
Refer to “Fuel and lubricant table” on page 5-4.

Engine coolant

⚠ WARNING

The engine coolant is combustible. Keep away from flame.
Use long-life coolant (antifreeze) and tap water for the engine coolant.

Note: New machines are delivered with JIS Type 2 long-life coolant (antifreeze) at a concentration of 50%.
Refer to “Fuel and lubricant table” on page 5-4.

Battery
As the temperature drops, the battery performance decreases.
Inspect the battery. If it is discharging, contact a Takeuchi service agent to have the battery recharged.
Refer to “Inspecting the battery fluid level and replenishing” on page 5-30.

CAUTIONS AFTER OPERATIONS

Observe the following cautions to prevent mud, water, or the undercarriage from freezing and making it impossible for the machine to move.

- Remove all mud and water from the machine body. In particular, wipe the hydraulic cylinder rod clean to prevent damage to the seal caused by mud or dirt on the rod surface getting inside the seal together with drops of water.
- Park the machine on hard and dry ground. If this is impossible, park the machine on a wooden board placed on ground.
- Drain any water in the fuel tank to prevent it from freezing.
  Refer to “Draining the water from the fuel tank” on page 5-29.
- As the battery capacity drops markedly in low temperatures, cover the battery or remove it from the machine and keep it in a warm place.
  If the electrolyte level is low, add distilled water in the morning before beginning work. To prevent the battery electrolyte from freezing in the night, do not add water after the day’s work.

AFTER THE COLD CLIMATE

When the climate becomes warmer, do as follows:

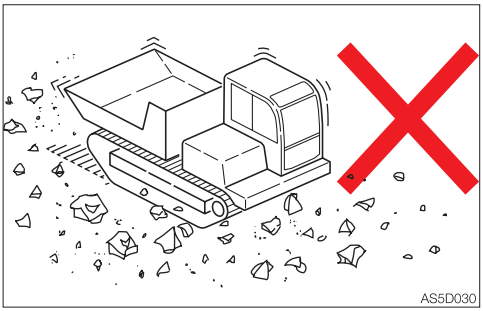
- Replace the fuel and oil for all parts with those specified in the “Fuel and lubricant table”.
  Refer to “Fuel and lubricant table” on page 5-4.
- If a coolant of “one season type” is used, drain the cooling system completely, clean out the inside of the cooling system thoroughly, and fill with tap water.
  Refer to “Cleaning the engine cooling system” on page 5-52.

HANDLING RUBBER TRACKS

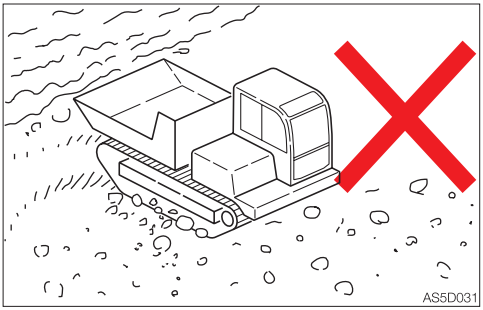
Rubber tracks have an inherent weakness, lack of strength, due to their use of rubber. Be sure to observe the prohibitions and cautions below to prevent the tracks from being damaged or coming off.

PROHIBITIONS

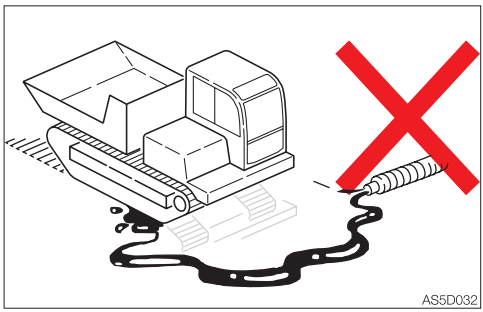
Do not travel or operate the machine in the following places:



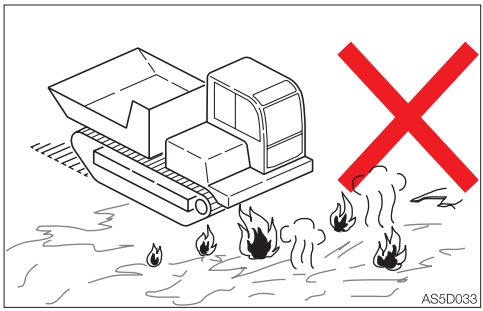
- Traveling and slewing on crushed rock, extremely rough hard rock, steel beams, scrap iron, or near the edges of steel plates will cause damage to the rubber tracks.



- Traveling on riverbeds or places where there are large numbers of boulders may cause the stones to get caught and damage the tracks or make the tracks come off.
- Do not use the machine on the seashore. The salt may corrode the steel core.



- Do not let fuel, oil, salt or chemical solvents get on the tracks. These substances may corrode the bonding of the steel cores on the tracks, resulting in rust or peeling. If any of these substances gets on the tracks, immediately clean it off with water.

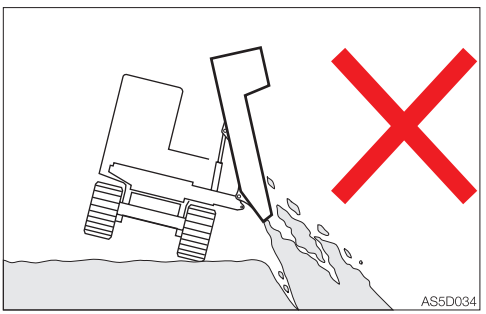


- It will cause an irregular wear or damage to the lugs, if the machine travels on irregular surfaces such as recently paved with asphalt, exposed to a bonfire or of hot iron sheets under the blazing sun.
- Do not move earth in places where the rubber tracks may slip. Doing so may speed up lug wear.

CAUTIONS

Observe the following cautions when operating the machine:

- Avoid changing course abruptly or spin-turning on concrete surfaces whenever possible. Doing so may wear or damage the rubber tracks.
- Avoid drops that may expose the rubber tracks to strong shocks.
- Salt, potassium chloride, ammonium sulfate, potassium sulfate, and triple superphosphate of lime can damage the tracks. If any of these substances gets on the tracks, wash if off thoroughly with water.
- Do not let the sides of the rubber tracks rub against concrete or walls.
- Be especially careful on snowy or frozen surfaces in winter, as the tracks tend to slip in such conditions.
- Use rubber tracks at temperatures between –25°C to +55°C (–14°F to 131°F).
- When storing the rubber tracks for long periods of time (three months or more), do so indoors in a place not exposed to direct sunlight or rain.

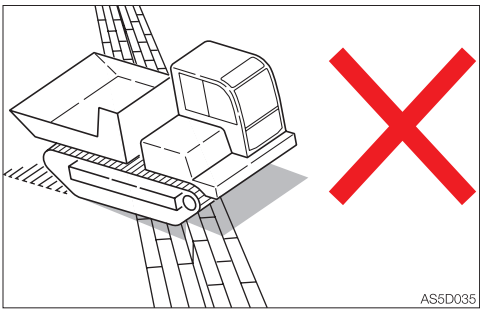


- Rubber tracks are not very stable because the entire lugs are made of rubber. Be very careful when swinging sideways.

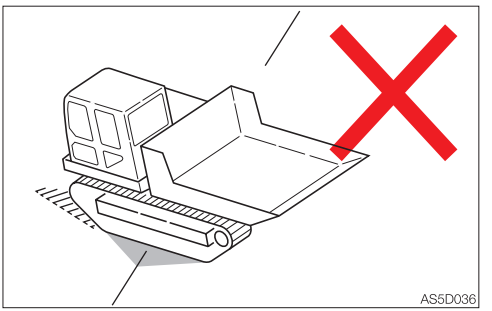
PREVENTING THE RUBBER TRACKS FROM COMING OFF

Observe the following cautions to prevent the track from coming off:

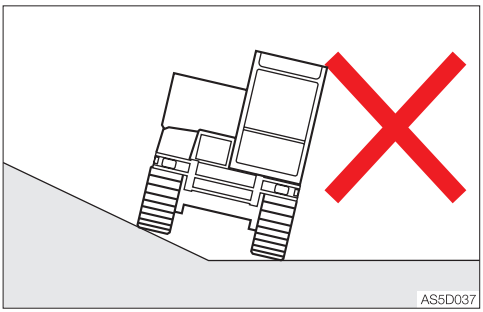
- Always keep the tracks at the proper tension.



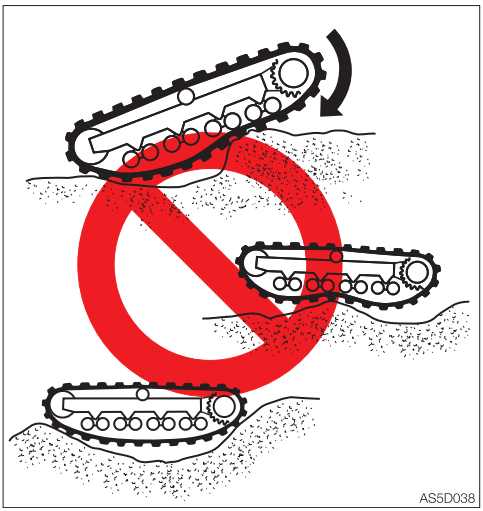
- When traveling over a large step such as a cobblestone or rock (20 cm (8 in.) or deeper), climb up the step at the right angle and do not change courses on top of the step.



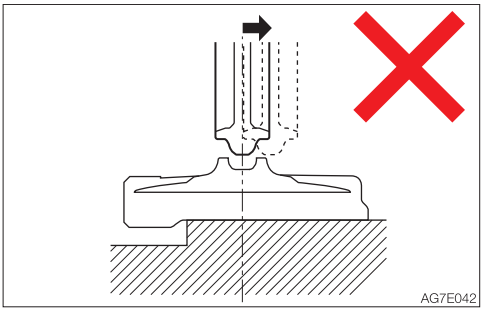
- When climbing in reverse, do not change directions at the point where the slope starts.



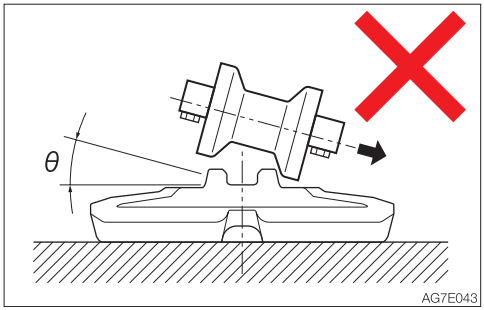
- Avoid traveling by setting one track on a slope or projecting portion and the other track on a flat surface (with the machine at a tilt of 10° or more). Travel with both tracks set on flat surfaces.



- 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.

TRANSPORT



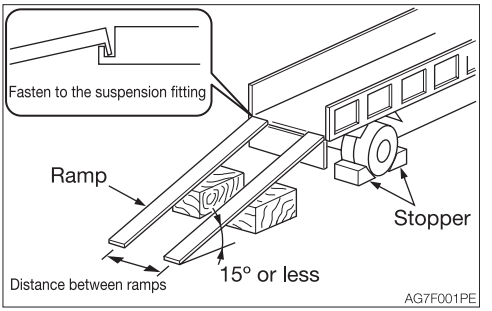
LOADING AND UNLOADING

⚠ WARNING

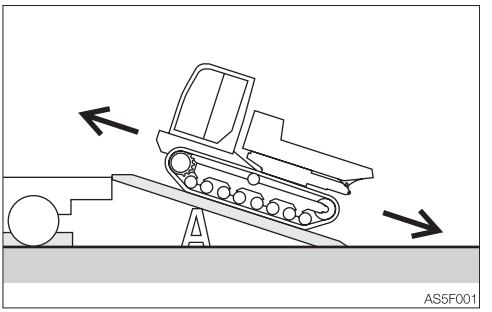
The machine may roll or tip over or fall while being loaded or unloaded. Take the following precautions:

- **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 4-4.

HOISTING THE MACHINE

⚠ WARNING

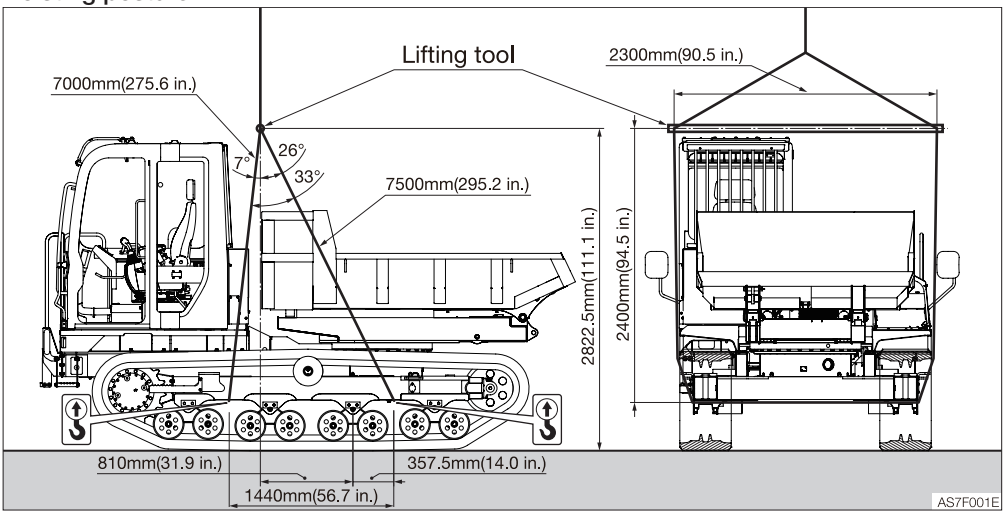
- Know and use the correct crane signals.
- Check the hoisting equipment for damaged or missing parts on a daily basis and replace as necessary.
- When hoisting, use a wire rope capable of lifting the machine mass.
- Hoist the machine in such a manner described in the procedure below. Do not do it in 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. Install the wire ropes as shown on the figure below. Install the wire ropes and hoisting attachment without letting them touch the machine body.
5. Hoist the machine slowly until it leaves the ground.
6. Stop hoisting until the machine becomes stable, and then start hoisting the machine slowly again.

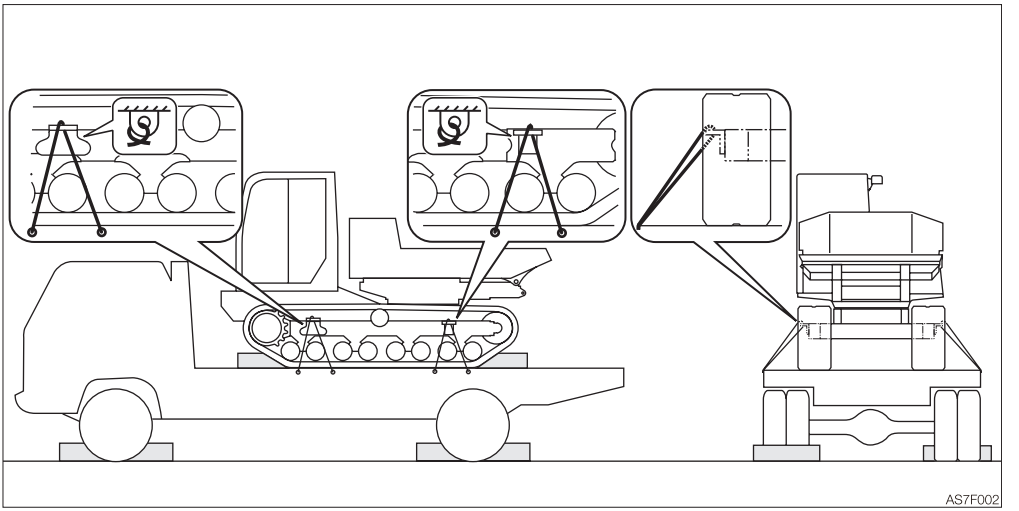
Hoisting posture



SECURING THE MACHINE

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

Transporting posture



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 and grease
- Choose fuel, lubricant and grease by following to the "Fuel and lubricant table".
- Use fuels, lubricants and greases which do not contain water, and be careful to keep dirt out when changing or replenishing fuel, lubricant or grease.
- Store fuels, lubricants and greases 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.

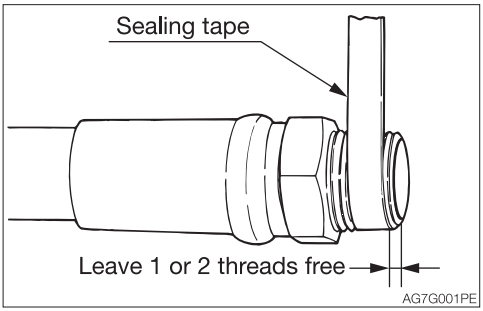
Clean the installation surfaces

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 and batteries.

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.

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 B5 ASTM D6751, D7467			
EN590: 2009	European union	BS2869-A1 or A2	United kingdom
Bio-diesel fuel Biodiesel blends up to B5 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 (53.6°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.
		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 or higher 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 or J1034 ASTM: D6210 or D4985 (USA)	Mixture of 50% coolant Mixture of 30% coolant	Every 2000 hrs.
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.

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.)	17.5 L (18.5 US qt.)	System 75 L (19.8 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.

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)

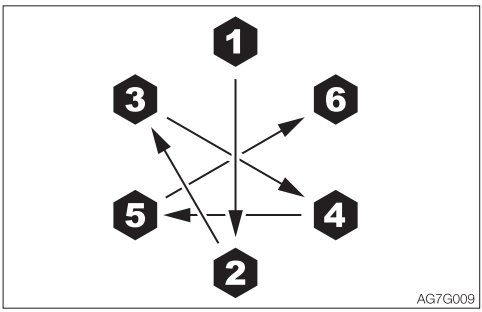
Code	Part name	Part No.	Remarks
1	Spanner	19100-47081	10-12
2	Spanner	19100-47082	14-17
3	Spanner	16900-01922	19-22
4	Spanner	16900-02427	24-27
5	Spanner	16900-02730	27-30
6	Spanner	16900-03236	32-36
7	Spanner	16901-00013	13
8	Spanner	16901-00041	41
9	Spanner	16909-00019	19
10	Screwdriver	19100-06112	(+) (–) 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	Case	16919-00001	
23	Grease gun	16910-60600	600 cc
24	Drain connector	15545-12601	

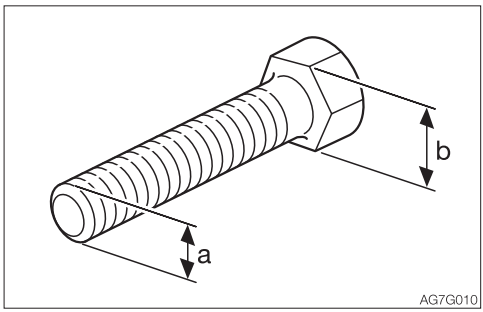
LIST OF TIGHTENING TORQUES

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±0.5	7.2±0.4
	12, 13	M8 x 1.25	22.6±1.1	16.6±0.8
	14, 17	M10 x 1.5	47.1±2.4	34.7±1.7
	17, 19	M12 x 1.75	83.4±4.1	61.5±3.0
	19, 22	M14 x 2.0	134.4±6.7	99.1±4.9
	22, 24	M16 x 2.0	207.9±10.4	153.3±7.7
	27, 30	M20 x 2.5	410.9±20.5	303.1±15.1
Fine	12, 13	M8 x 1.0	24.5±1.2	18.1±0.9
	14, 17	M10 x 1.25	50±2.5	36.9±1.8
	17, 19	M12 x 1.5	87.3±4.3	64.4±3.2
	19, 22	M14 x 1.5	135.3±6.8	99.8±5.0
	22, 24	M16 x 1.5	220.6±11	162.7±8.1
	27, 30	M20 x 1.5	452.1±22.6	333.4±16.6

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 2 years
		Packing on fuel filler cap	
Cooling system		Rubber hoses	
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

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. 07186-00005

MAINTENANCE LIST

Inspection and maintenance item	Page
Walk-around inspection	
Inspecting by opening the engine hood and covers	5-14
Inspecting by walking around the machine	5-15
Inspecting while sitting in the operator's seat	5-15
Daily inspection (every 10 hours)	
Inspecting and replenishing the coolant	5-16
Inspecting and replenishing the engine oil	5-17
Inspecting the water separator	5-18
Inspecting the fuel level	5-19
Inspecting the hydraulic oil tank level and replenishing	5-20
Lubricating the dump body and track rollers	5-21
After the initial 50 hours (only for new machines)	
Replacing the hydraulic oil return filter	5-22
Replacing the pilot line filter	5-23
Inspecting and adjusting the fan belt	5-24
Inspecting and adjusting the compressor belt (Air conditioner)	5-26
Every 50 hours	
Inspecting the track tension	5-28
Draining the water from the fuel tank	5-29
Inspecting the battery fluid level and replenishing	5-30
After the initial 250 hours (only for new machines)	
Replacing the travel motor gear oil*	5-32
Every 250 hours	
Inspecting and adjusting the fan belt	5-33
Inspecting and adjusting the compressor belt (Air conditioner)	5-33
Cleaning the air cleaner	5-34
Cleaning the radiator fins and the oil cooler fins	5-36
Cleaning the condenser (Air conditioner)	5-36
Cleaning the air filters (Air conditioner)	5-37
Inspecting the refrigerant (gas) level (Air conditioner)	5-38
Lubricating the swing bearing	5-40

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

Inspection and maintenance item	Page
Every 500 hours	
Replacing the pilot line filter	5-42
Replacing the engine oil and the oil filter	5-42
Replacing the fuel filter	5-44
Replacing the water separator filter	5-45
Every 1000 hours	
Replacing the hydraulic oil return filter	5-46
Replacing the travel motor gear oil*	5-46
Replacing the air cleaner element	5-46
Replacing the hydraulic oil and cleaning the suction strainer	5-48
Inspecting and adjusting the engine valve clearance	5-50
Inspecting the radiator cap	5-50
Every 1500 hours	
Inspecting the crankcase breather system	5-51
Every 2000 hours	
Cleaning the engine cooling system	5-52
Every 3000 hours	
Inspecting the turbocharger (blow wash as necessary)	5-54
Inspecting, cleaning and checking operation of the EGR valve	5-54
Cleaning the EGR lead valve	5-54
Cleaning the EGR cooler (cleaning the water side and exhaust air passage blower)	5-54
Inspecting the operation of the air intake throttle valve	5-54
Inspecting and cleaning the fuel injector	5-54
When required	
Inspecting and replenishing the windshield washer fluid	5-55
Lubricating the levers	5-55
Draining the water from the water separator	5-56
Inspecting and cleaning the DPF soot filter	5-56
Inspecting the rubber tracks	5-57
Replacing the rubber tracks	5-58
Every 2 years	
Replacing the receiver dryer	5-60

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

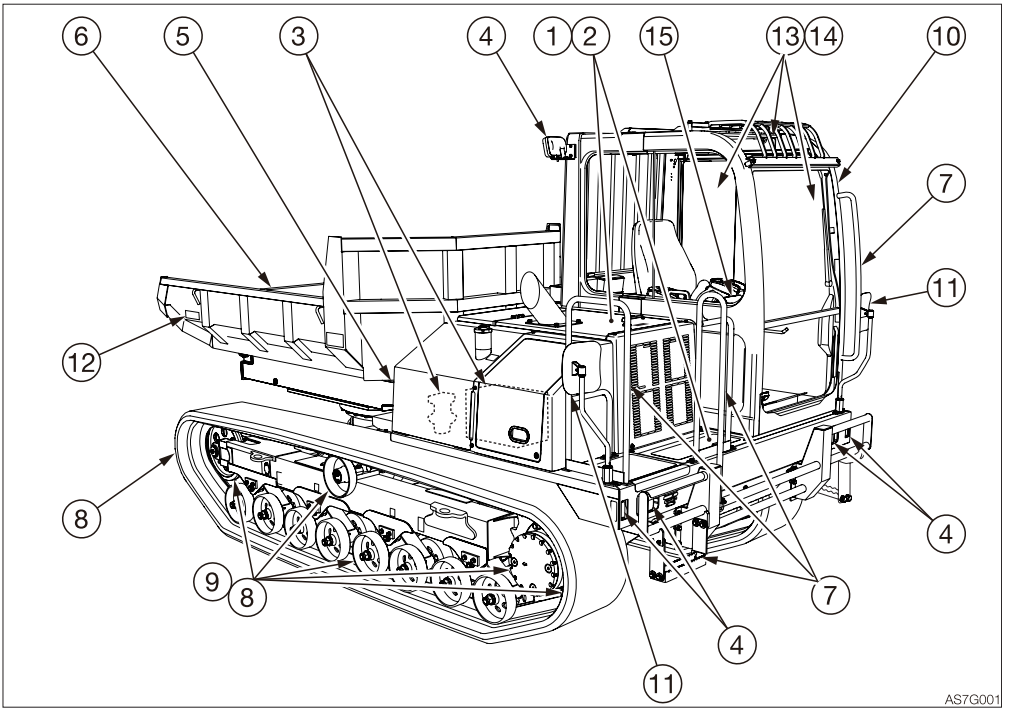
WALK-AROUND INSPECTION

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 oil, fuel or engine coolant leakage 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

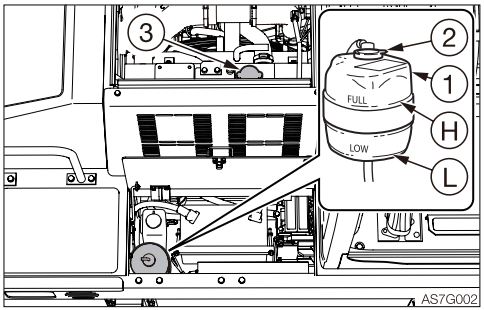
- **Before operating, perform the daily inspections and make repairs immediately where necessary.**
- **Be sure to secure the engine hood or cover before working the inside. Do not keep the hood or cover open on a windy day or if the machine is parked on a slope.**

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).

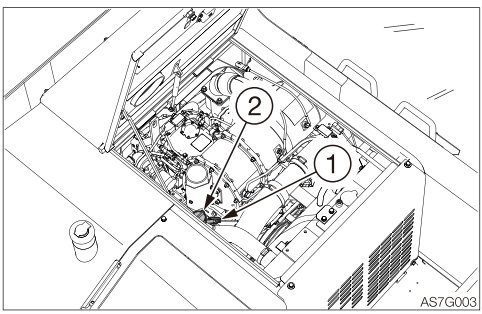
Note: Use only clean water (soft water) to replenish the cooling water loss due to evaporation. Use coolant (antifreeze) and clean water (soft water) of the specified mixing ratio to replenish the cooling water loss due to leaking.

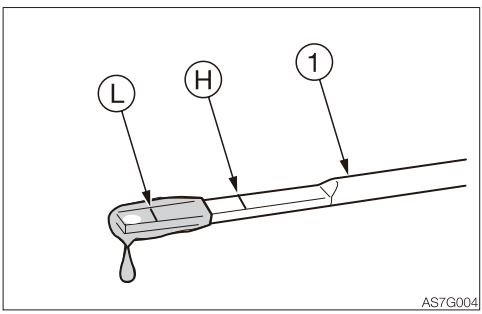
INSPECTING AND REPLENISHING THE ENGINE OIL

⚠ 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.

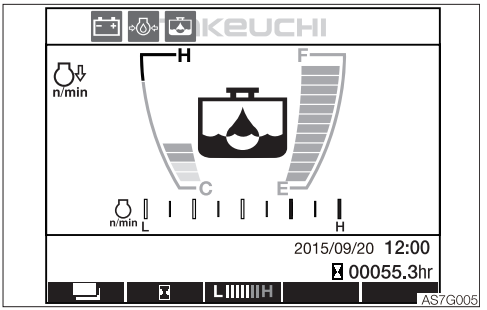
Replenishing

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.**



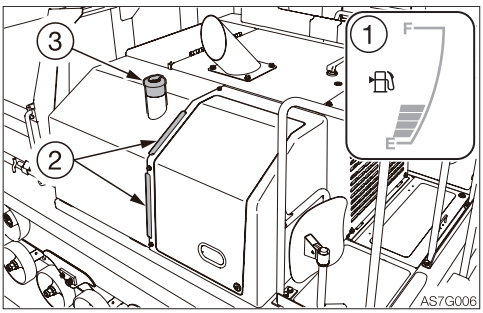
1. Turn the ignition switch to the ON position.
2. Inspect the water separator warning lamp.
3. If the warning lamp is flashing, drain the water.
   Refer to “Draining the water from the water separator” on page 5-56.

INSPECTING THE FUEL LEVEL

Refer to “Fuel filler port” on page 2-4.

⚠ 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).

INSPECTING THE HYDRAULIC OIL TANK LEVEL AND REPLENISHING

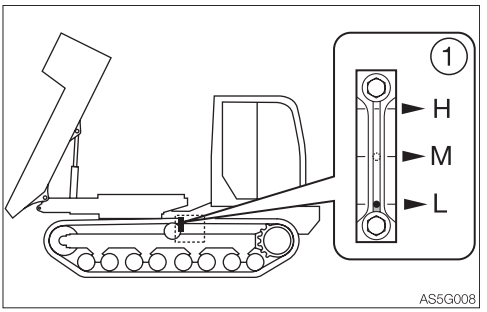
⚠ WARNING

- **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

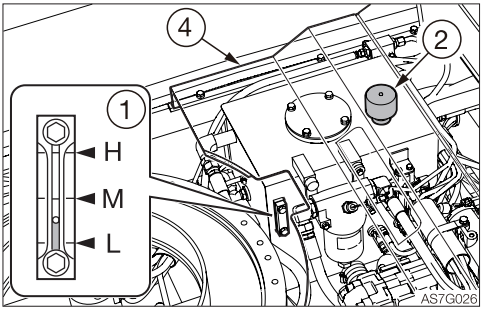
The oil level changes with the oil temperature. Inspect the oil by maintaining the machine at posture shown in the figure at the next.

- Machine configuration for inspecting the hydraulic oil level



1. Start the engine and run it at low speed.
2. 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. 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”.)

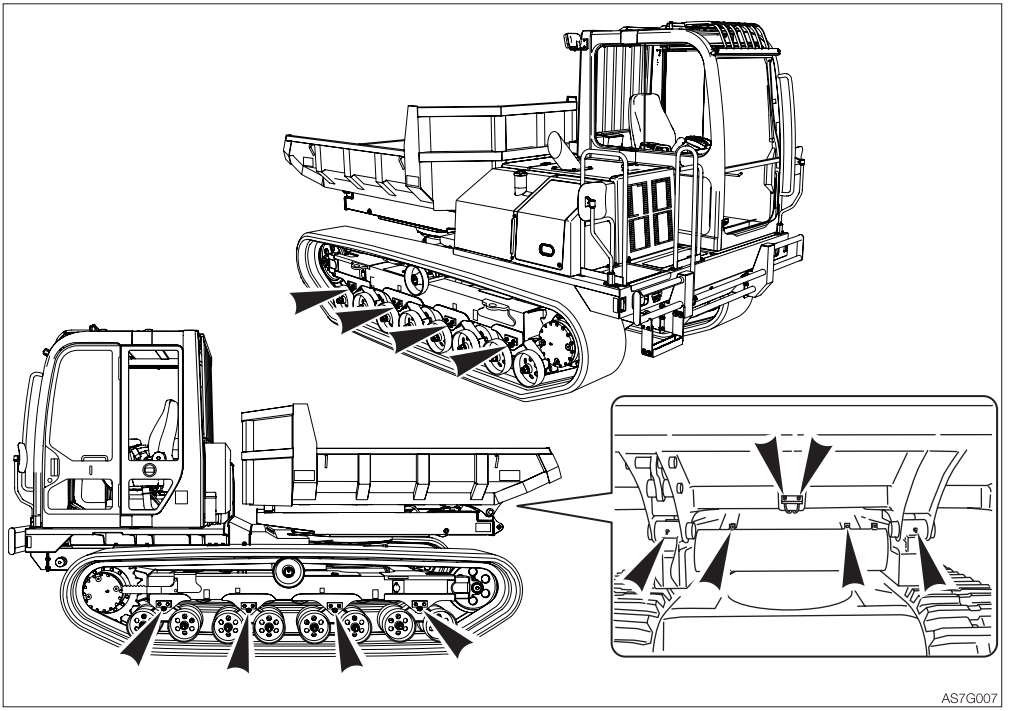
Replenishing



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.

6. Loosen the bolts and remove the cover (4).
7. Remove the air breather (2).
8. 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).
9. Tighten the air breather (2).
10. 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.

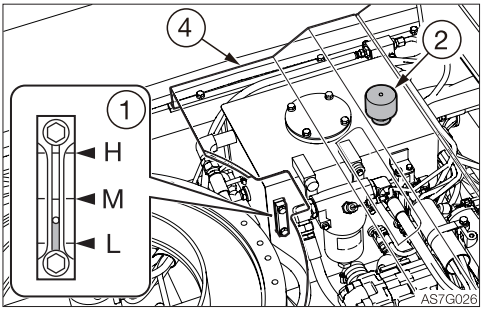
AFTER THE INITIAL 50 HOURS (ONLY FOR NEW MACHINES)

REPLACING THE HYDRAULIC OIL RETURN FILTER

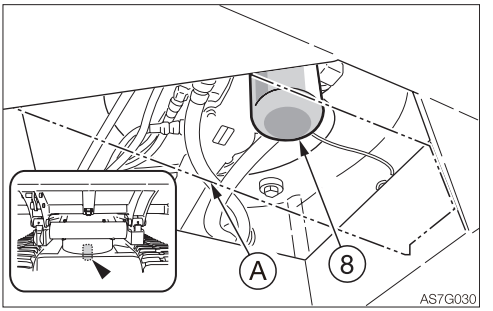
⚠ WARNING

- **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).



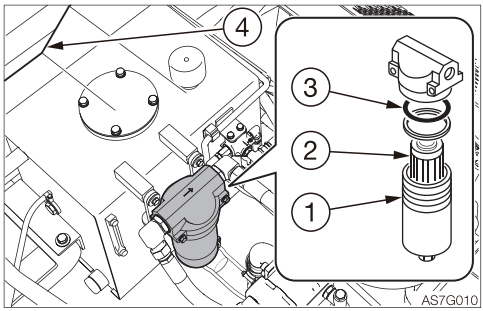
7. Loosen the bolts and remove the cover (A).
8. Turn the filter (8) counterclockwise with the filter wrench and remove it.
9. Clean the surface to install the filter stand.
10. Apply a thin layer of oil on the packing of the new filter.
11. Install the new filter by hand.
12. Tighten 3/4 more turn after 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 5-20.
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.
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 5-20.

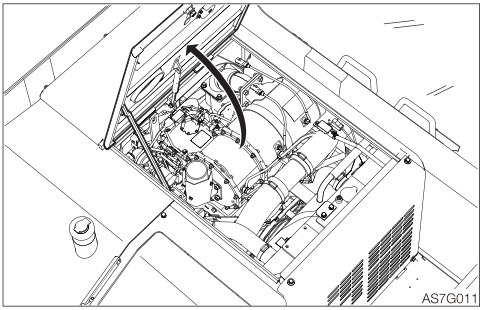
INSPECTING AND ADJUSTING THE FAN BELT

⚠ WARNING

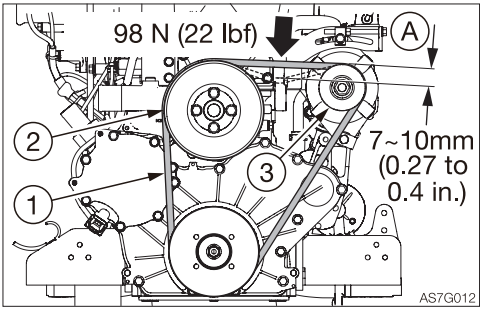
- Stop the engine and allow the machine to cool down before performing maintenance.
  - The engine, muffler, radiator, hydraulic lines, sliding parts and many other parts of the machine are hot immediately after the engine is stopped. Touching these parts will cause burns.
- Before performing maintenance 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

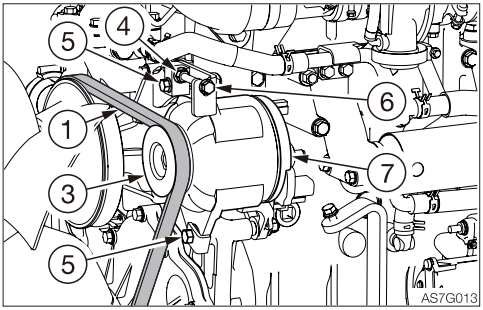


1. Open the engine hood.



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.

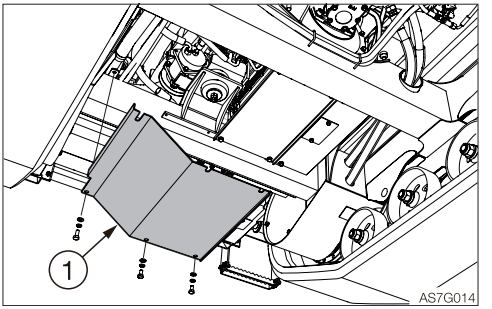
INSPECTING AND ADJUSTING THE COMPRESSOR BELT (AIR CONDITIONER)

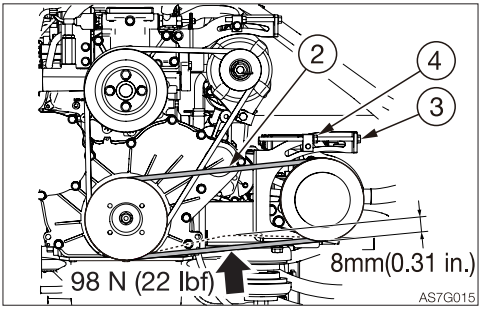
⚠ WARNING

- 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

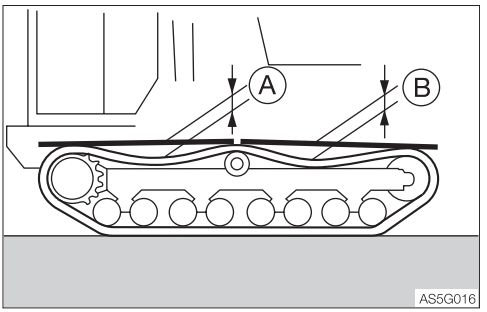
⚠ WARNING

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

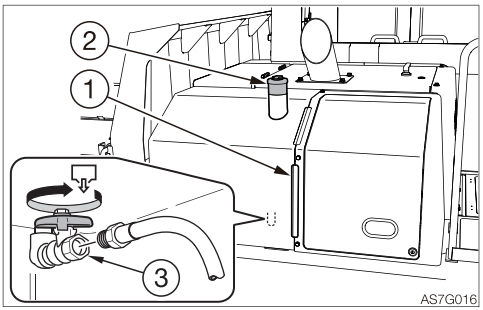
If the amount of slack is too large, contact a Takeuchi sales or service outlet for repairs.

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 6-8.

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.

INSPECTING THE BATTERY FLUID LEVEL AND REPLENISHING

⚠ DANGER

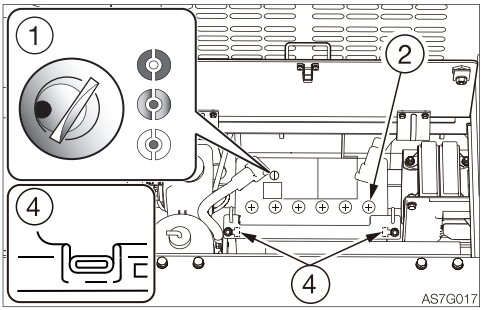
- Do not use the battery when the fluid level is below the lower level limit. Doing so will hasten the deterioration of the internal portions of the battery and shorten the battery life. It also can cause rupturing (explosion).
- Batteries generate flammable hydrogen gas which may explode. Keep away 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).

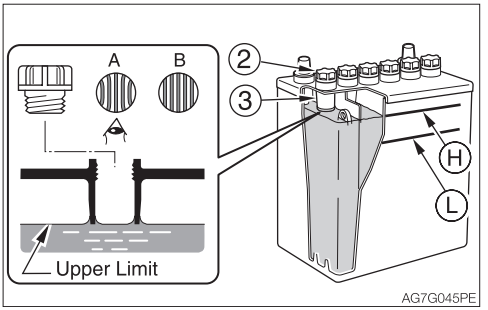
Inspection

IMPORTANT: Check the fluid level of all cells following the steps below, even when the fluid level can be checked using the indicator.



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).

• If the fluid level cannot be checked by fluid level lines:



Remove the caps (2) and look into the fluid filler holes to check the fluid level. If the fluid is below the sleeve (3), be sure to add distilled water up to the bottom edge of the sleeve (3).

Proper level (A)
If the fluid reaches up to the bottom edge of the sleeve (3), the surface tension causes the fluid to swell and the plate appears as if it is distorted.

Level too low (B)
If fluid does not reach up to the bottom edge of the sleeve (3), the plate looks laminar, not distorted.

4. Check the battery terminal for looseness, dirt and corrosion.
5. Check the exhaust holes (4) for dirt.

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.

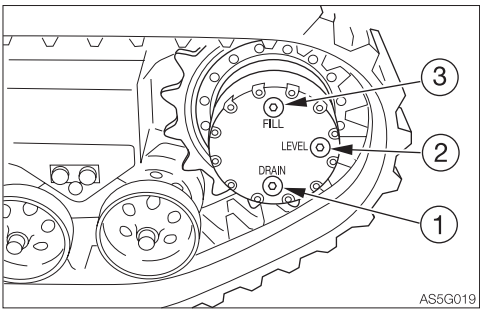
AFTER THE INITIAL 250 HOURS (ONLY FOR NEW MACHINES)

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 5-24.

INSPECTING AND ADJUSTING THE COMPRESSOR BELT (AIR CONDITIONER)

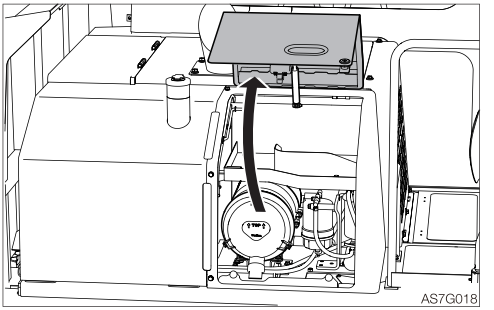
Refer to “Inspecting and adjusting the compressor belt (Air conditioner)” on page 5-26.

CLEANING THE AIR CLEANER

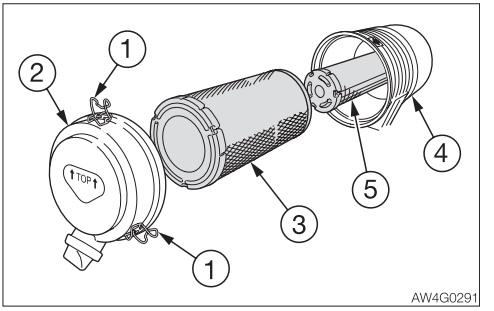
⚠ WARNING

- 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.

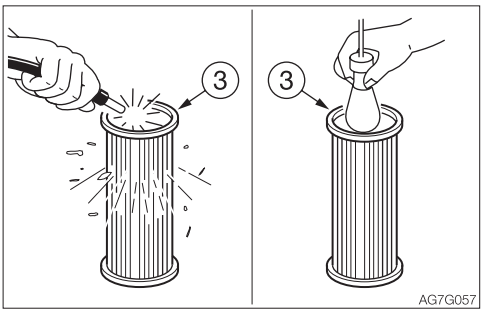
IMPORTANT: Be careful not to scratch the element. Do not use an element if it is damaged.
IMPORTANT: When operating the machine in very dusty places, perform inspection and maintenance operations every day.
IMPORTANT: Be sure to install the element and dust cap securely. If not, dust could be drawn into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

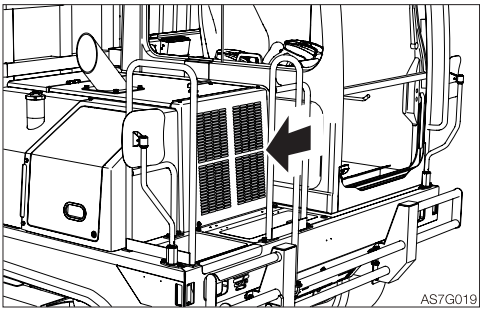
CLEANING THE RADIATOR FINS AND THE OIL COOLER FINS

⚠ 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.



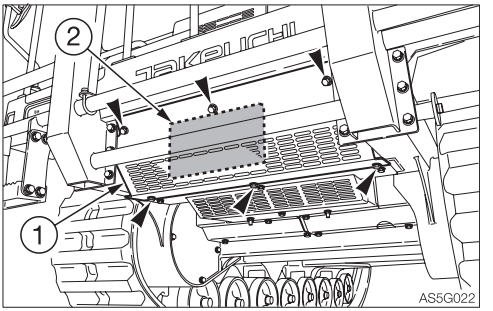
1. Blow compressed air on the fins to remove mud and dirt stuck on them.

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.

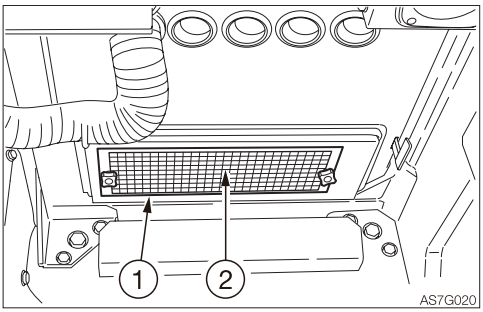
CLEANING THE AIR FILTERS (AIR CONDITIONER)

⚠ WARNING

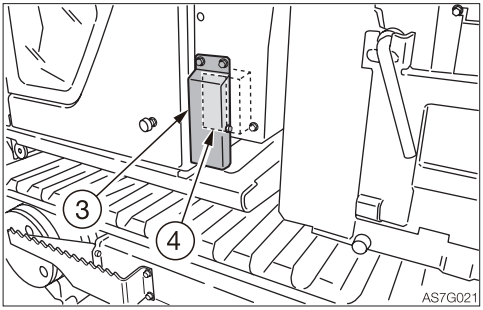
Wear required appropriate equipment such as protective goggle and filter mask when using compressed air, as metal fragments or other objects can fly and cause serious injury.

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

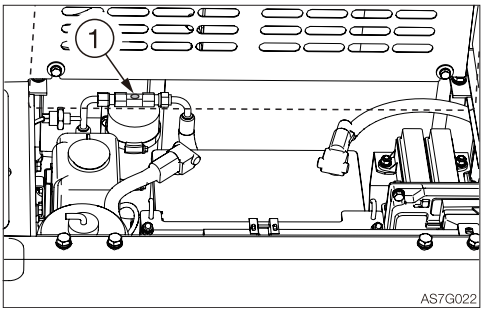
1. Blow dry, compressed air (138 kPa or 20 psi or less) directly on the filters from the inside, moving up and down along the pleats.
   Be sure to keep the nozzle at an adequate distance from the filters.
2. Wash the filter with neutral detergent if it is very dirty. Dry the filter completely after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

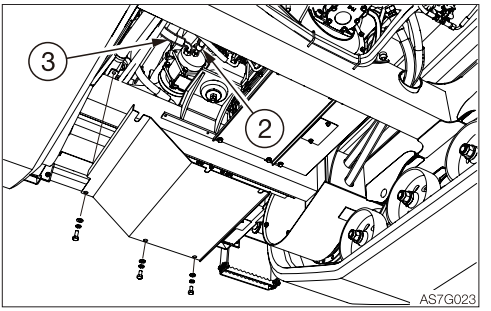
The cooling capacity decreases if the amount of refrigerant is insufficient. Inspect the refrigerant level using the sight glass (1) on the top of the receiver drier.



1. Inspect the places for the conditions below.

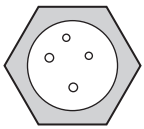
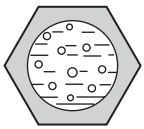
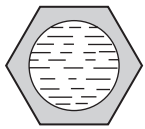
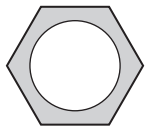
Places for inspection	Conditions
Cab door	Fully open
Temperature control dial	Set fully to the COOL side
Fan speed	High
Engine speed	Maximum speed
Air conditioner switch	ON

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 5-39.



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 5-39.

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 Almost transparent with some bubbles. Fully transparent when the engine speed is increased or decreased.	 AG7G065 Flow of bubbles can be seen constantly. Sometimes transparent or white with bubbles.	 AG7G066 Mist-like flow is faintly visible.	 AG7G067 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

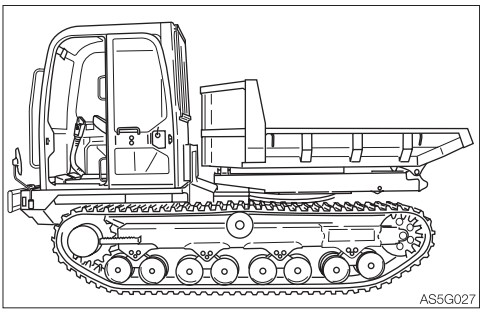
If the air conditioner is not working
If the air conditioner does not work well, set the fan switch to OFF and contact your sales or service dealer for inspection and/or repairs.

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 (1800 g or 4.0 lb).

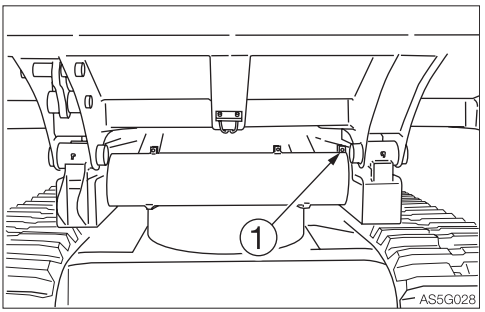
LUBRICATING THE SWING BEARING

⚠ WARNING

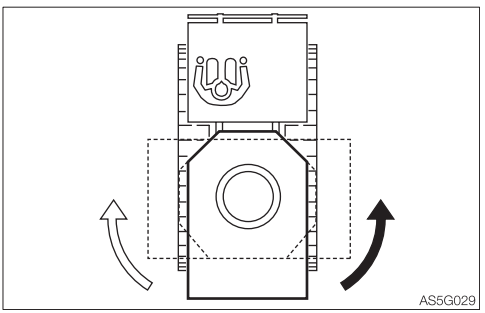
Do not swing while lubricating. Doing so is dangerous, as you may get caught in the machine.



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.

MEMO

EVERY 500 HOURS

REPLACING THE PILOT LINE FILTER

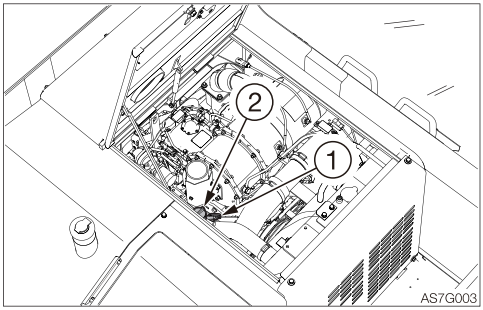
Refer to “Replacing the pilot line filter” on page 5-23.

REPLACING THE ENGINE OIL AND THE OIL FILTER

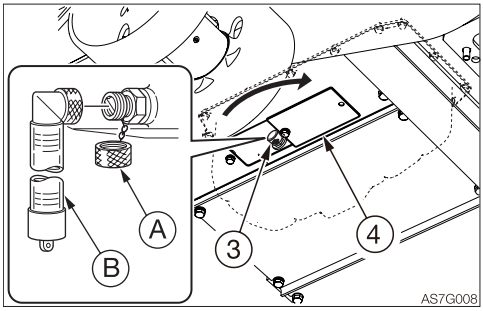
⚠ WARNING

- 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).

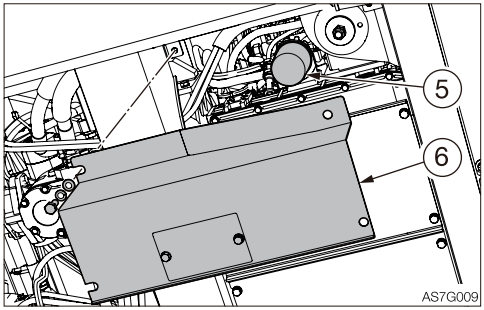


3. Loosen the bolts and remove the under cover (4).
4. Place a pan for catching the waste oil under the drain plug (3).
5. Remove the cap (A), install connector (B) and drain the oil. (The oil comes out when the screw is tightened.)
6. Remove the connector (B) and install the cap (A).

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



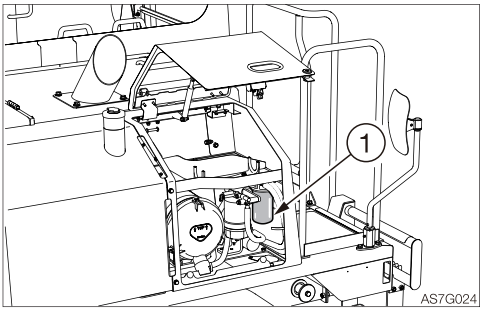
8. Loosen the bolts and remove the under cover (6).
9. Turn the filter (5) counterclockwise with the filter wrench and remove it.
10. Clean the surface of installation of the filter stand.
11. Apply a thin layer of oil on the packing of the new filter.
12. Install the new filter by hand.
13. Tighten 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.**

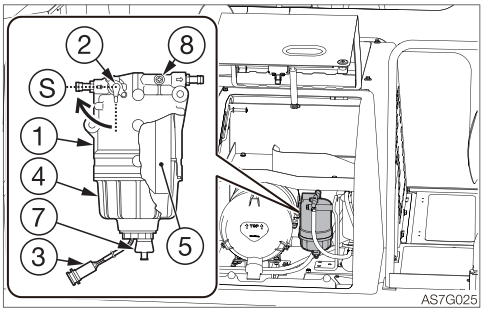


1. Open the side cover.
2. Turn the filter (1) counterclockwise with the filter wrench and remove it.
3. Clean the surface of installation of the filter stand.
4. Apply a thin layer of oil on the packing of the new filter.
5. Install the new filter by hand.
6. Tighten one more turn after the filter packing 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 6-8.

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: 27 to 33 N·m (20 to 24.6 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 6-8.

EVERY 1000 HOURS

REPLACING THE HYDRAULIC OIL RETURN FILTER

Refer to “Replacing the hydraulic oil return filter” on page 5-22.

REPLACING THE TRAVEL MOTOR GEAR OIL

Refer to “Replacing the travel motor gear oil” on page 5-32.

REPLACING THE AIR CLEANER ELEMENT

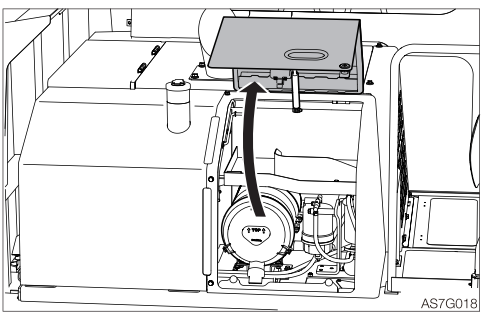
⚠ WARNING

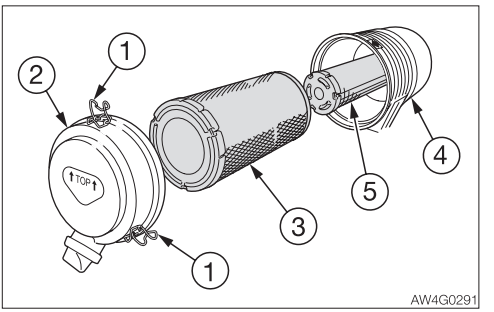
Stop the engine and allow the machine to cool down before performing maintenance.

- **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).

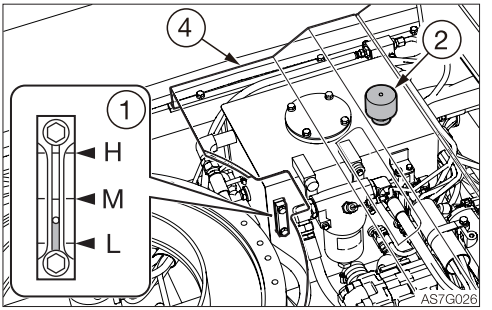
MEMO

REPLACING THE HYDRAULIC OIL AND CLEANING THE SUCTION STRAINER

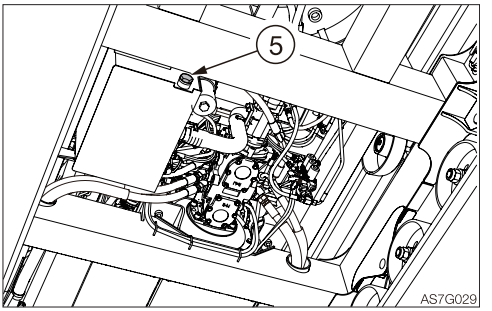
⚠ WARNING

- **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.**

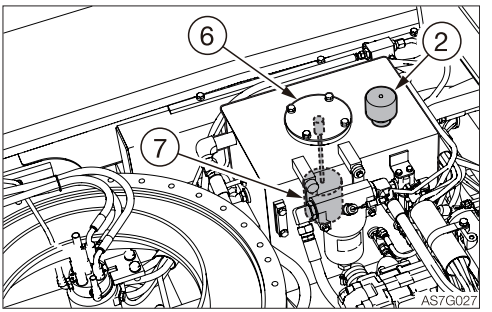
1. Start the engine and run it at low speed.
2. Fully raise the dump body.
3. Raise the safety lock lever to the lock position and stop the engine.
4. Engage the dump body prop to the dump body.



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.

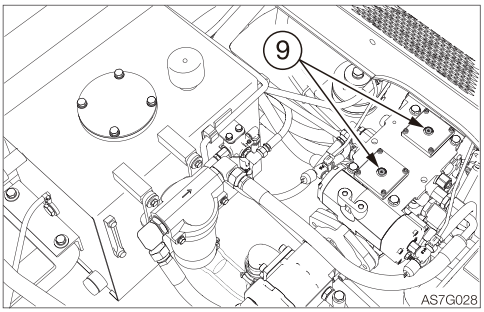


9. Loosen the bolts and remove the flange (6).

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 5-23.
15. Replace the hydraulic oil return filter.
    Refer to “Replacing the hydraulic oil return filter” on page 5-22.
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 5-20.

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 2-7.
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.

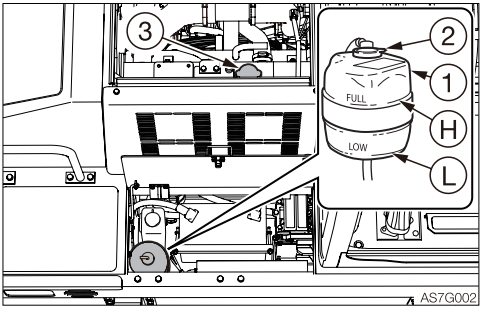
EVERY 2000 HOURS

CLEANING THE ENGINE COOLING SYSTEM

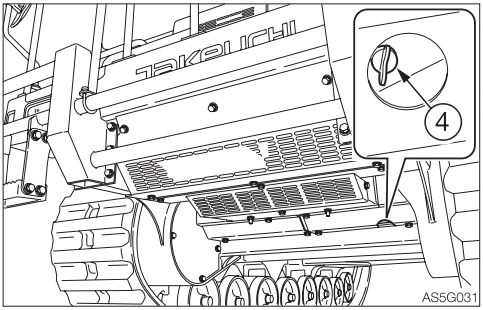
⚠ WARNING

- 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. Place a pan for catching the waste coolant under the drain plug (4), and then loosen the drain plug (4) to drain the coolant.
4. Tighten the drain plug (4).
5. 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.
6. Close the radiator cap (3).
7. 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.
8. Stop the engine, wait until the cooling water temperature becomes lower, and then remove the drain plug (4) to drain the water.
9. After draining, clean the cooling system using a cleaning agent. When using the cleaning agent, follow the instructions included with the agent.
10. Repeat the steps 3 to 8 to rinse the cooling system.
11. Tighten the drain plug (4).
12. 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.
13. Close the radiator cap (3).
14. Warm up the engine. Use the meters to check that there are no irregularities in the cooling system at this time.
15. Increase the water temperature to at least 90°C (194°F). Then, run the engine for about 10 minutes with the thermostat open.
16. 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.
17. Close the radiator cap (3).
18. Clean the interior of the reserve tank (1), and then add coolant to the upper limit (H).
19. When the coolant has been replaced, inspect the coolant level once again after operating the machine.
    Once the machine is operated, the coolant is distributed throughout the entire system, resulting in the lower coolant level.
    Replenish the cooling water that has been used.

EVERY 3000 HOURS

INSPECTING THE TURBOCHARGER (BLOW WASH AS NECESSARY)

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

INSPECTING, CLEANING AND CHECKING OPERATION OF THE EGR VALVE

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

CLEANING THE EGR LEAD VALVE

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

CLEANING THE EGR COOLER (CLEANING THE WATER SIDE AND EXHAUST AIR PASSAGE BLOWER)

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 AND CLEANING THE FUEL INJECTOR

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

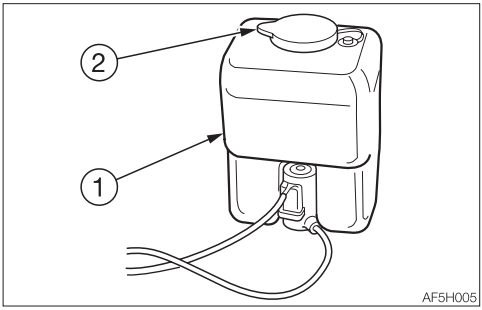
WHEN REQUIRED

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 battery cover.
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).

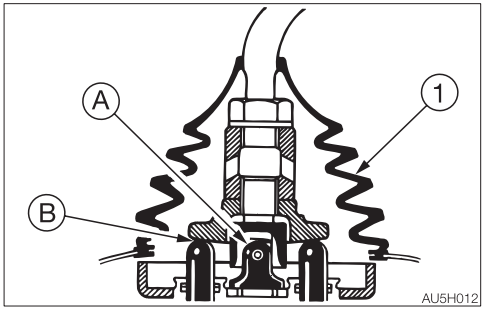
LUBRICATING THE LEVERS

⚠ 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

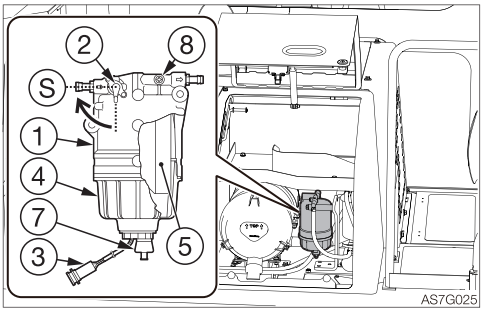


1. Remove the lower mount section of the boot (1) and turn it upward.
2. Wipe off the old grease.
3. Apply grease to points (A) and (B).
4. Set the boot (1) back as it was.

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 engine hood.
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 6-8.

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.

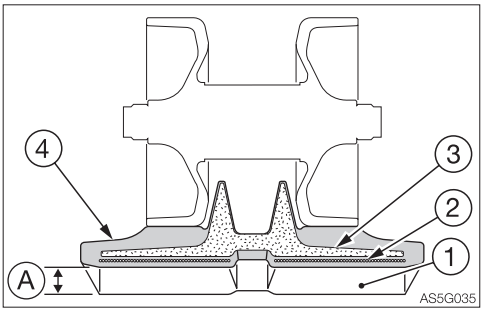
• Oxidation catalyst
Replacement:
Replace every 9000 hours.

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.

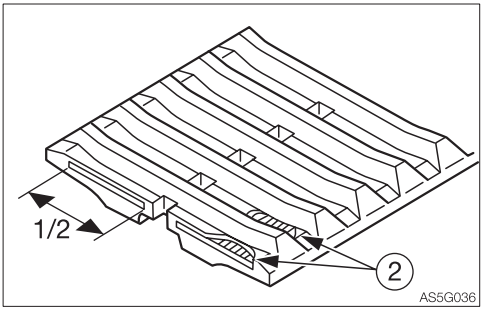
Rubber track
Replace the track if the entire track is stretched and cannot be adjusted.

(1) Lug



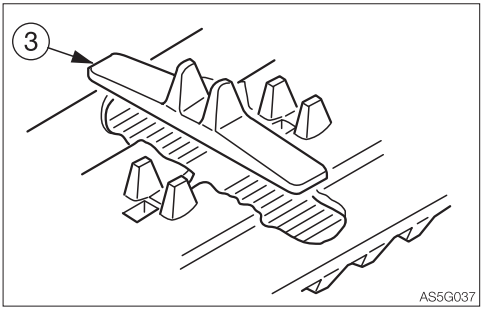
Replace if the height of (A) is 5 mm (0.2 in.) or below.

(2) Steel cord



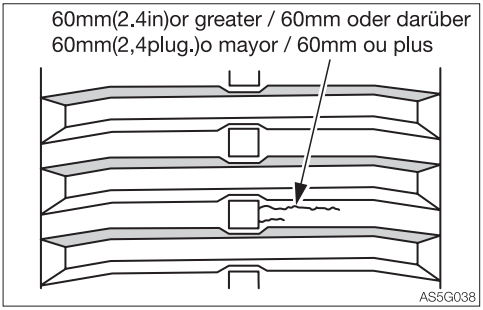
Replace if the steel cord is exposed for two links or more.
Replace if the half or more of the steel cords on one side are cut.

(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.

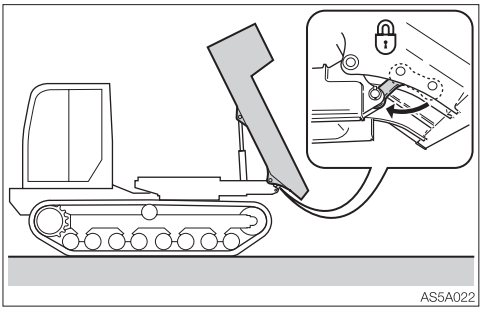
REPLACING THE RUBBER TRACKS

⚠ WARNING

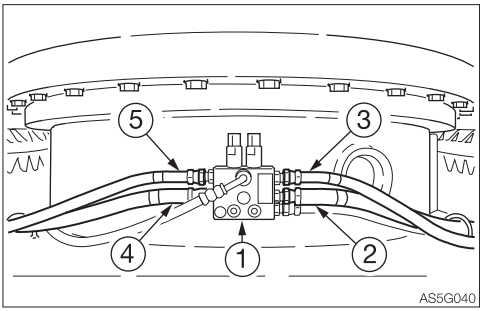
- If you must work under the raised machine or its components, always use the dump body prop, wood blocks, jack-stands or other rigid and stable supports to keep the machine or its components raised. Never get under the machine or its components if they are not sufficiently supported. This procedure 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 5-52.
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.

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.

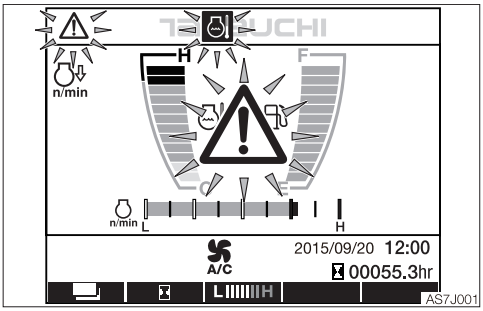
- The swing motor produces noise at the beginning and end of the swing operation.
- The travel motor produces noise when suddenly stopped from its high speed traveling.
- The control valve produces noise if excessive force is applied to the dump body or when it moved to the stroke end.
- In some cases 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 5-24.
   - Coolant level ..... Add Refer to page 5-16.
   - Water leakage..... Repair
   - Radiator fins..... Clean Refer to page 5-36.
   - Sediment in cooling system ..... Clean Refer to page 5-52.

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.

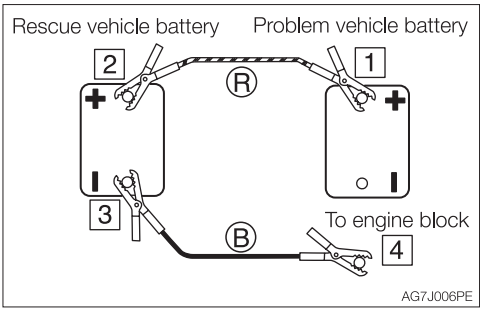
⚠ WARNING

- **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.



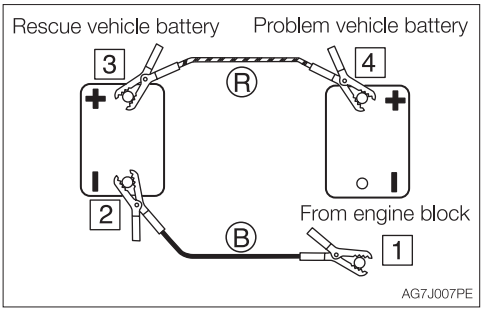
1. Connect the clip of jumper cable (R) to the positive (+) battery terminal of the dead machine.
2. Connect the other clip of jumper cable (R) to the positive (+) battery terminal of the booster vehicle.
3. Connect the clip of jumper cable (B) to the negative (–) battery terminal of the booster vehicle.
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

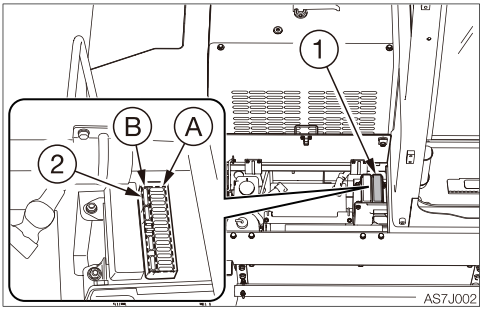
If a light does not come on or the electrical system does not work, a fuse may be blown. Inspect the fuses.

INSPECTING AND REPLACING THE FUSE

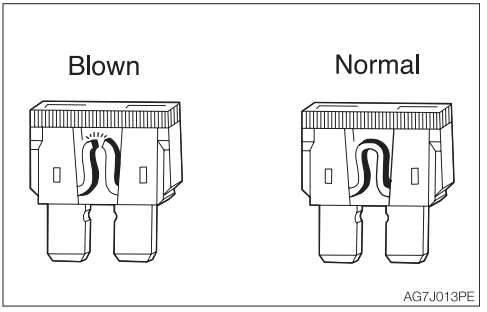
⚠ WARNING

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 starter 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.

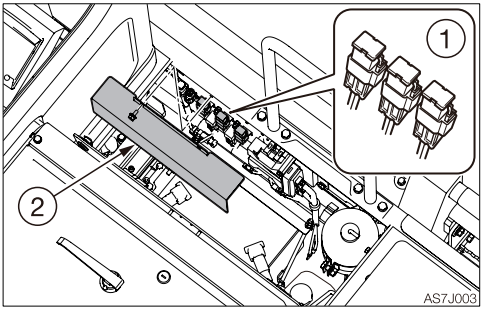
Fuse layout and circuits protected
(A) side

Capacity	Symbol	Protected circuit
25A		Light
25A	CAB	Cab interior power supply
5A		Lever lock
15A	CTL(1)	Controller power supply (1)
5A		Travel alarm
5A		Switch lighting
15A	OPT(1)	Option (1)
10A	OPT(2)	Option (2)
20A		Air conditioner compressor
30A		Air conditioner blower motor
25A	CAB	Cab light
15A		Horn

(B) side

Capacity	Symbol	Protected circuit
5A		Ignition switch
15A	CTL(2)	Controller power supply (2)
25A		Feed pump
20A	ECU	ECU power source

INSPECTING THE FUSIBLE LINK



If the machine is not turned on after turning the ignition switch to the ON position, there is likely a break in the cartridge type fusible link (1).

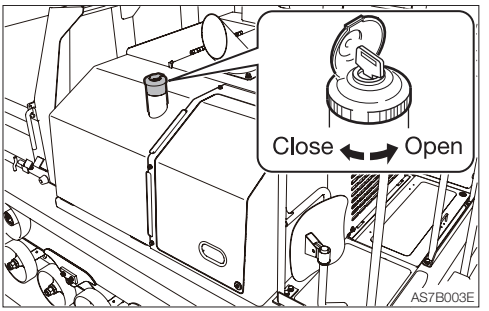
1. Open the battery cover.
2. Loosen the bolts and remove the cover (2).
3. Inspect the fusible links (1).
4. If there is a break, please contact your sales or service dealer.

Note: Fusible links are large type fuses used in high current applications. Like a regular fuse, they act as fuses by protecting the electric components and wirings from damage caused by excessive current draw.

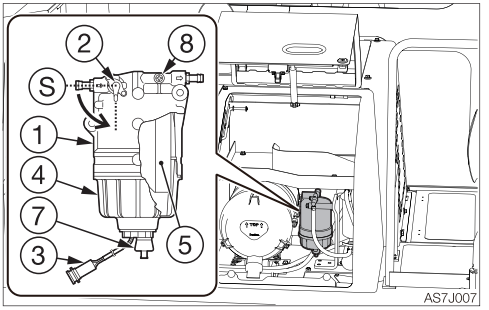
RESTARTING AFTER ADDING FUEL

BLEEDING AIR FROM THE FUEL SYSTEM

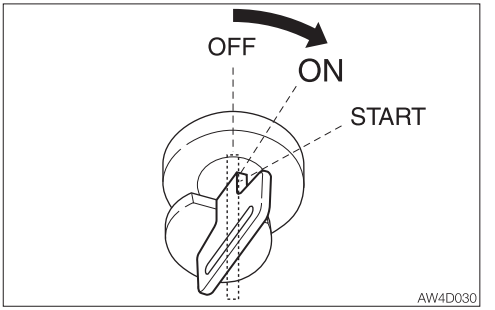
IMPORTANT: NEVER use the starter motor to crank the engine in order to prime the fuel system. This may cause the starter motor to overheat and damage the coils, pinion gear and/or ring gear.
IMPORTANT: If the engine stalls due to fuel shortage, add fuel, turn the key to the ON position for 60 seconds, 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.



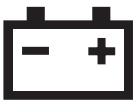
4. Turn the ignition key to the ON position and hold it for about 60 seconds.
   The automatic air bleeder bleeds air from the fuel system.
5. Start the engine and check for fuel leakage.

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.

MEMO

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 2-14. Refer to “Vehicle error code list” on pages 6-12 and 6-13. Refer to “Engine error code list” on pages 6-14 to 6-19.
 AW4J0041	**ECU error warning lamp**	An engine problem is detected. 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 2-14. Refer to “Engine error code list” on pages 6-14 to 6-19.
 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 5-24.
 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 5-17.
 AW4J009	**Water separator warning lamp**	Water is in the water separator. Drain water. Refer to “Draining the water from the water separator” on page 5-56.

Warning lamp	Lamp name	Causes and remedies
 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 5-34.
 AW4J010	**Fuel level warning lamp**	The fuel level is too low. Add fuel. Refer to “Inspecting the fuel level” on page 5-19.
 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 5-23. Cold climate operation: Hydraulic oil is not warmed up. Refer to “Warming up the machine (hydraulic oil)” on page 3-8.

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)
602	CAN communication error (cluster gauge)
612	CAN communication error (IOX024)
1703	Main power supply voltage error (too high)
1704	Main power supply voltage error (too low)
1713	IOX024 power supply voltage error (too high)
1714	IOX024 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
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 (too high pressure)
5324	Foot accelerator sensor error (too low pressure)
5505	Fuel gauge resistance value error (cable break)
8095	Lever lock PWM output current error (low current)
8096	Lever lock PWM output current error (high current)

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		
522400	2	Crank speed sensor (Crank signal malfunction)	P0336
	5	Crank speed sensor (No crank signal)	P0337
522401	2	Cam speed sensor (Cam signal malfunction)	P0341
	5	Cam speed sensor (No cam signal)	P0342
	7	Cam speed sensor (Angle offset failure)	P1341
523249	5	No signal on both crank and cam speed sensor	P0008
91	3	Accelerator sensor 1 (Excessive sensor output)	P0123
	4	Accelerator sensor 1 (Insufficient sensor output)	P0122
28	3	Accelerator sensor 2 (Excessive sensor output)	P0223
	4	Accelerator sensor 2 (Insufficient sensor output)	P0222
29	3	Accelerator sensor 3 (Excessive sensor output)	P0228
	4	Accelerator sensor 3 (Insufficient sensor output)	P0227
	8	Pulse sensor failure (Pulse communication)	P1227
51	3	Intake throttle opening sensor fault (High voltage)	P02E9
	4	Intake throttle opening sensor fault (Low voltage)	P02E8
102	3	EGR low pressure side sensor fault (High voltage)	P0238
	4	EGR low pressure side sensor fault (Low voltage)	P0237
	13	EGR low pressure side sensor fault (Abnormal learning value)	P0236
1209	3	EGR high pressure side sensor fault (High voltage)	P0473
	4	EGR high pressure side sensor fault (Low voltage)	P0472
	13	EGR high pressure side sensor (Abnormal learning value)	P0471
110	3	Cooling water temperature sensor fault (High voltage)	P0118
	4	Cooling water temperature sensor fault (Low voltage)	P0117
	0	Cooling water temperature sensor temperature abnormal high (Overheat)	P0217

Error code		Error details	DTC
SPN	FMI		
172	3	New air temperature sensor fault (High voltage)	P0113
	4	New air temperature sensor fault (Low voltage)	P0112
174	3	Fuel temperature sensor fault (High voltage)	P0183
	4	Fuel temperature sensor fault (Low voltage)	P0182
	0	Fuel temperature sensor temperature abnormal high	P0168
157	3	Rail pressure sensor fault (High voltage)	P0193
	4	Rail pressure sensor fault (Low voltage)	P0192
3251	3	DPF differential pressure sensor fault (High voltage)	P2455
	4	DPF differential pressure sensor fault (Low voltage)	P2454
	0	DPF differential pressure sensor differential pressure abnormal high	P2452
	13	DPF differential pressure sensor (Abnormal learning value)	P2453
3609	3	DPF high pressure side sensor fault (High voltage)	P1455
	4	DPF high pressure side sensor fault (Low voltage)	P1454
3242	3	DPF inlet temperature sensor fault (High voltage)	P1428
	4	DPF inlet temperature sensor fault (Low voltage)	P1427
	0	DPF inlet temperature sensor temperature abnormal high	P1436
3250	3	DPF intermediate temperature sensor fault (High voltage)	P1434
	4	DPF intermediate temperature sensor fault (Low voltage)	P1435
	1	DPF intermediate temperature sensor temperature abnormal low temperature	P0420
	0	DPF intermediate temperature sensor temperature abnormal high (Post-injection failure)	P1426

Error code		Error details	DTC
SPN	FMI		
108	3	Atmospheric pressure sensor fault (High voltage)	P2229
	4	Atmospheric pressure sensor fault (Low voltage)	P2228
	10	Atmospheric pressure sensor characteristic fault	P1231
412	3	EGR gas temperature sensor fault (High voltage)	P041D
	4	EGR gas temperature sensor fault (Low voltage)	P041C
105	3	Intake manifold temperature sensor fault (High voltage)	P040D
	4	Intake manifold temperature sensor fault (Low voltage)	P040C
173	3	Exhaust manifold temperature sensor fault (High voltage)	P0546
	4	Exhaust manifold temperature sensor fault (Low voltage)	P0545
1485	2	Main relay early opening	P068A
522243	5	Startup assist relay interrupted	P0543
	6	Startup assist relay GND interrupted	P0541
651	5	Injector 1 open circuit (Inherent location of the injector)	P0201
652	5	Injector 2 open circuit (Inherent location of the injector)	P0202
653	5	Injector 3 open circuit (Inherent location of the injector)	P0203
654	5	Injector 4 open circuit (Inherent location of the injector)	P0204
2797	3	Injector bank 1 +B short circuit	P2148
	6	Injector bank 1 GND short circuit	P2147
	5	Injector bank 1 cable break	P2146
2798	3	Injector bank 2 +B short circuit	P2151
	6	Injector bank 2 GND short circuit	P2150
	5	Injector bank 2 cable break	P2149
522996	4	Injector drive circuit undercharge error	P0611
522997	3	Injector drive circuit overcharge error	P0200

Error code		Error details	DTC
SPN	FMI		
633	3	High-pressure pump drive circuit high-side VB short circuit	P0629
	5	High-pressure pump drive circuit high-side GND short circuit, cable break	P0627
	7	High-pressure pump drive circuit error	P2635
1347	0	High-pressure pump protection fail	P1235
	15	High-pressure pump replacement fail	P1236
522803	13	High-pressure pump learning not yet implemented alarm	P1237
157	0	Actual rail pressure rise error	P0088
	18	Rail pressure deviation error during the actual rail pressure drop	P0094
190	0	Overspeed	P0219
523221	12	QR data not yet written	P1631
	13	QR data error	P1632
522995	12	QR data correction input error	P1630
2950	5	No-load of throttle valve drive H bridge circuit	P0660
	3	Power short circuit of throttle valve drive H bridge output 1	P1658
522596	9	TSC1 (CAN message) reception time out (SA1)	U0292
522597	9	TSC1 (CAN message) reception time out (SA2)	U1301
522599	9	Y_ECR1 (CAN message) reception time out	U1292
522600	9	Y_EC (CAN message) reception time out	U1293
237	31	VI (CAN message) reception time out	U0168
	13	VI (CAN message) reception data fault	U3002
522618	9	EBC1 (CAN message) reception time out	U1302
522619	9	Y_DPFIF (CAN message) reception time out	U1303
522610	9	CAN1 (for EGR): Reception time out	U010B

Error code		Error details	DTC
SPN	FMI		
2791	0	EGR over-voltage fault	P0404
	1	EGR under-voltage fault	P1404
	7	EGR feedback malfunction	P1409
	9	EGR ECM data fault	U0401
	12	Open circuit between the EGR motor coils	P0403
522579	12	Short circuit between the EGR motor coils	P1405
522580	12	EGR position sensor malfunction	P0488
522581	7	EGR stuck open valve malfunction	P148A
522582	7	EGR initialization malfunction	P049D
522583	1	High temp. thermistor error	P1410
522584	1	Low temp. thermistor error	P1411
522617	12	EGR target value out of range	U1401
630	2	EEPROM error	P1601
523074	1	ECU internal sensor 5V circuit 1 error (low voltage)	P0652
	0	ECU internal sensor 5V circuit 1 error (high voltage)	P0653
523075	1	ECU internal sensor 5V circuit 2 error (low voltage)	P0698
	0	ECU internal sensor 5V circuit 2 error (high voltage)	P0699
522993	12	ECU IC for monitoring internal CPU error	P0607
522994	12	ECU internal CPU error	P0606
522998	12	Flash ROM corruption error (checksum)	P1602
522323	0	Air cleaner clogged alarm	P1101
522329	0	Oil/water separator alarm	P1151

Error code		Error details	DTC
SPN	FMI		
167	5	Charge switch (Charge switch open circuit)	P1562
	1	Charge switch (Charge alarm)	P1568
100	4	Oil pressure switch (Oil pressure switch open circuit)	P1192
	1	Oil pressure switch (Low oil pressure fault alarm)	P1198
522573	0	DPF overaccumulation (Method C)	P2463
522574	0	DPF overaccumulation (Method P)	P1463
522575	7	DPF regeneration defect (Stationary regeneration failure)	P2458
522577	11	DPF regeneration defect (Stationary regeneration not-performed)	P2459
3720	16	DPF OP interface (Ash cleaning request 1)	P242F
	0	DPF OP interface (Ash cleaning request 2)	P1420
3719	16	DPF OP interface (Stationary regeneration standby)	P1421
	0	DPF OP interface (Backup mode)	P1424
	9	DPF OP interface (Recovery regeneration failure)	P1445
	7	DPF OP interface (Recovery regeneration prohibition)	P1446

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 5-55.
Dumping, swinging or traveling operation not possible	• Safety lock lever is raised (locked)	• Lower the safety lock lever (release). Refer to page 2-34.
	• 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 5-20.
	• 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 5-34.
	• Hydraulic oil is not of suitable type	• Replace the hydraulic oil. Refer to page 5-48.
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 5-40.
Hydraulic oil temperature is too high	• Hydraulic oil level too low	• Add up to the specified level. Refer to page 5-20.

Symptoms	Major causes	Remedies
Starter motor turns but engine does not start	• Insufficient fuel	• Add fuel. Refer to page 5-19.
	• Air in fuel system	• Bleed air. Refer to page 6-8.
	• Water in fuel system	• Drain water. Refer to page 5-29.
	• 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 5-28.
Engine exhaust is white or bluish	• Excessive engine oil	• Adjust to the specified level. Refer to page 5-17.
	• 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 5-34.
	• 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.

MEMO

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.

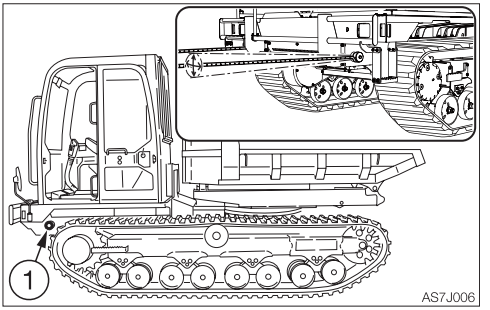
- **It becomes dangerous if the wire rope breaks or becomes disengaged. Use a wire rope appropriate for the required tractive force.**
- **Do not use a wire rope that is kinked, twisted or otherwise damaged.**
- **Do not apply heavy loads abruptly to the wire rope.**
- **Wear safety gloves when handling 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.
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

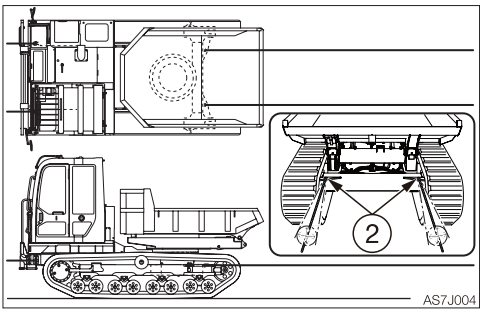
Use the procedure described below to tow heavy objects or the machine itself if it should get stuck in the mud and not be able to get out on its own.

<Front>



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

<Rear>



- Permissible forces: 74.4 kN (16726 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.

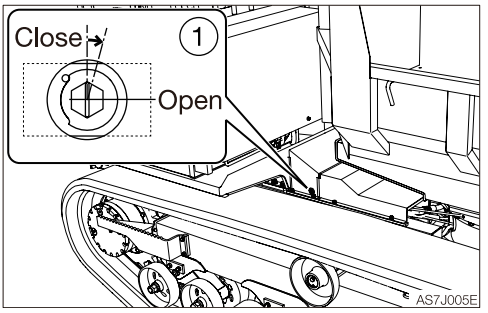
Note: Do not tow using only a towing hook or hole on one side.

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: 07186-00005

SPECIFICATIONS

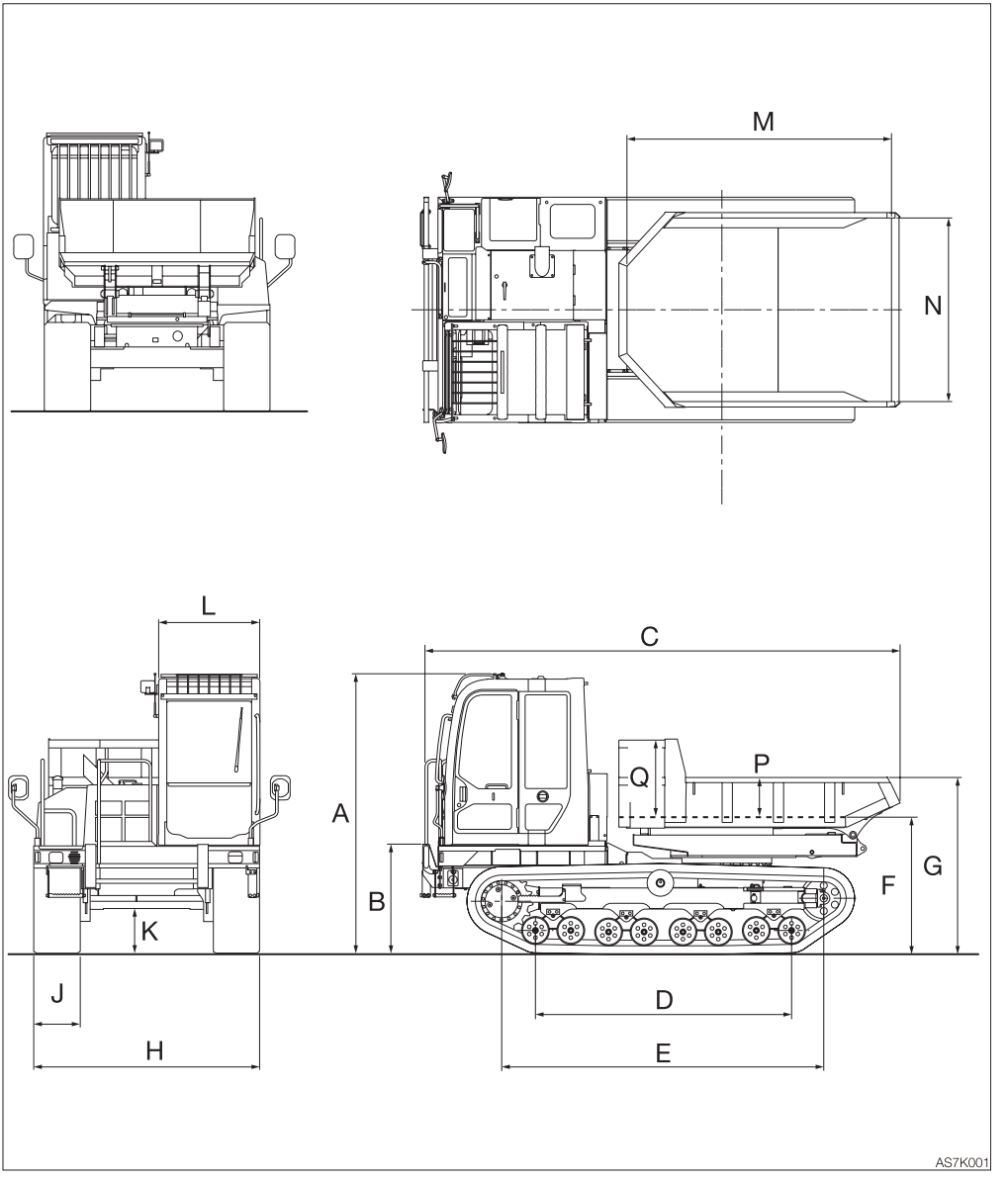


BASIC SPECIFICATIONS

Type			Cab
MASS			
Operating mass	kg (lb)		6410 (14130)
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)		0~9.2 (5.72)
Gradeability	degrees		30
Ground pressure (ISO 16754: 2008)	kPa (psi)	With dump body full	41.5 (6.02)
		With dump body empty	26.3 (3.81)
Noise level dB (A)	Sound power level		L_{WA} 103
	Emission sound pressure level at the operator's position (ISO 6396,2008:)		L_{pA} 82
ENGINE			
Manufacturer and model			Yanmar 4TNV94CHT-NTBC
Rated output	Net (ISO 14396)	kW/min^{-1} (hp/rpm)	88.4/2500 (118.5/2500)
	Net (ISO 9249/ SAEJ1349)	kW/min^{-1} (hp/rpm)	83.2/2500 (111.6/2500)
Displacement		ml (cu.in.)	3053 (186.3)
Starter		V-kW	12-3
Alternator		V-kW	12-0.96
Battery		V-A·h	12-72

MEMO

MACHINE DIMENSIONS

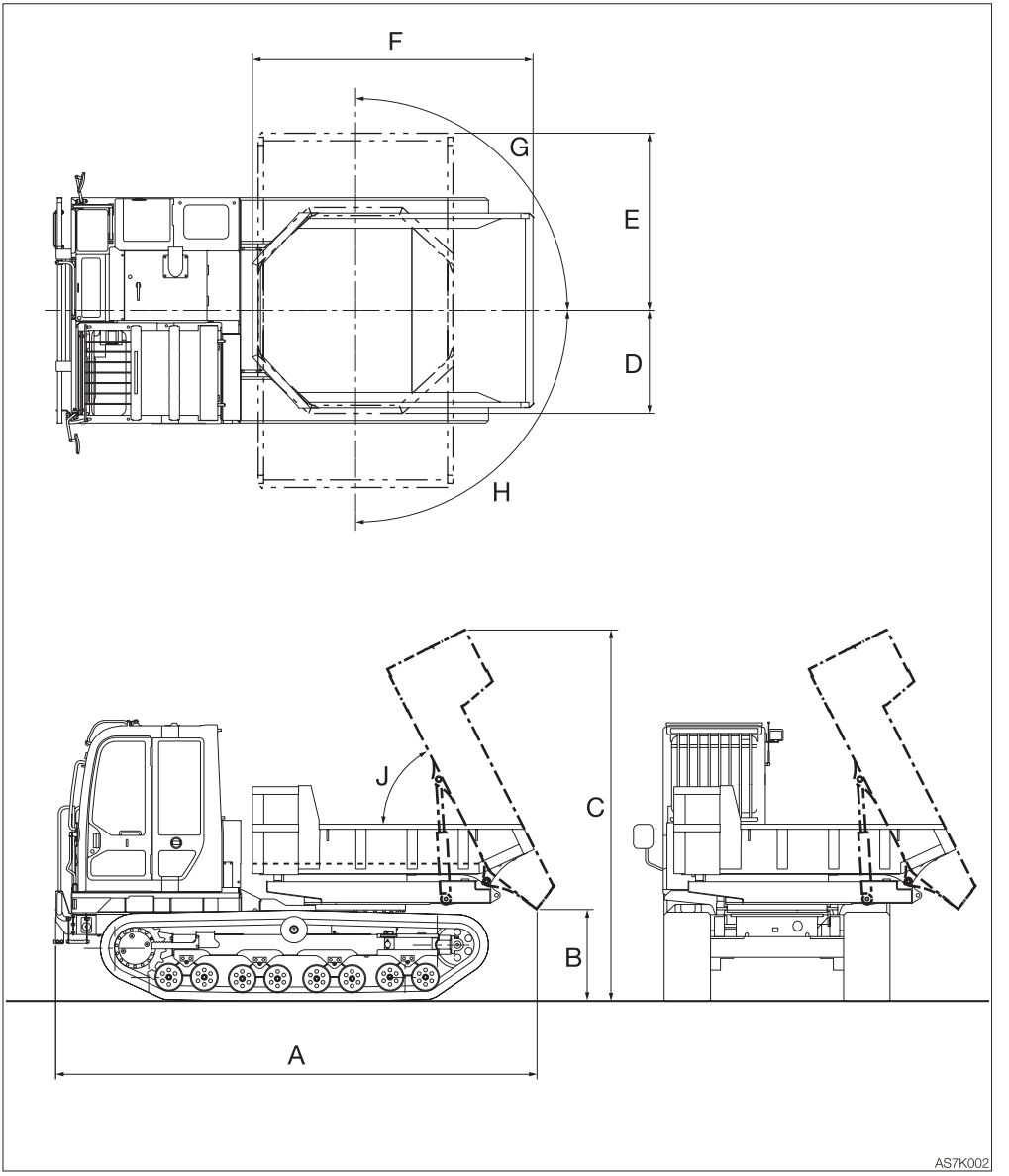


MACHINE DIMENSIONS

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	980 (38.6)
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 (142.0)
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.**

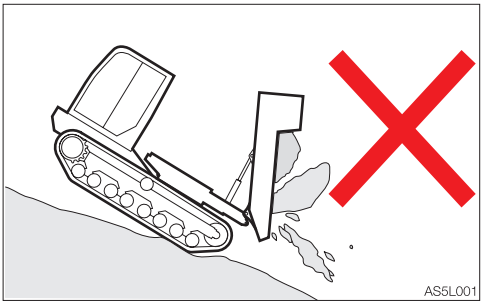
CAUTIONS WHEN INSTALLING ATTACHMENTS

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.

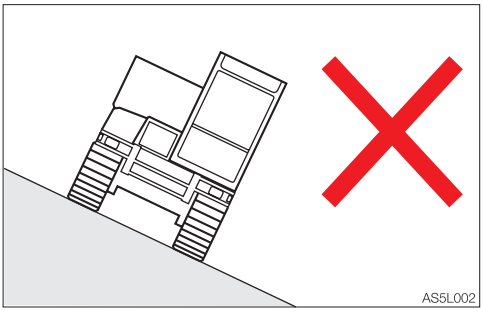
PRECAUTIONS WHEN OPERATING ATTACHMENTS

⚠ WARNING

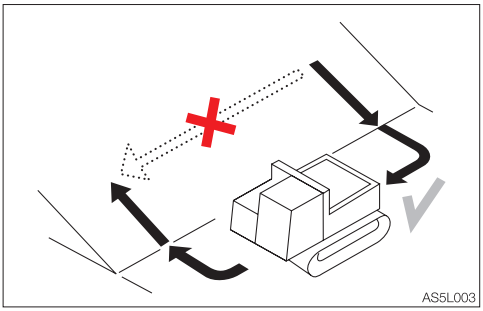
Long or large attachments reduce stability of the machine. The machine may tip over if it loses the balance when traveling or slewing on slopes.
Never perform the operations listed below as they are extremely dangerous.



- 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

Standard machine mass (Not including operator)	Cab
	6330 (13960)
OPTION	
Air conditioner	61 (135)

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.

First Published August 2015
Third Published December 2016

OPERATOR'S MANUAL

TCR50 Crawler Dumper

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

Printed in Japan by STATION M Co., Ltd.

CALIFORNIA

PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.
Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling battery.

Declaration of Conformity

We herewith declare that 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
Engine type	4TNV94CHT-NTBC
Engine power	88.4kW @ 2500 rpm

The machine is in accordance with the requirements of EU directives:
1) Machine 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: 97/68/EC as last amended by Directive 2011/88/EU.

Harmonized norms: EN474-1:2006+A4:2013, EN474-6:2006+A1:2009.

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