SEAM034300

Operation & Maintenance Manual

WA30-5
WA50-3

WHEEL LOADER

SERIAL NUMBERS **WA30-5 -22005** and up
WA50-3 -21450

It is our policy to improve our products whenever it is possible and practical to do so. We reserve the right to make changes or add improvements at any time without incurring any obligation to install such changes on products sold previously.

Due to this continuous program of research and development, periodic revisions may be made to this publication. It is recommended that customers contact their distributor for information on the latest revision.

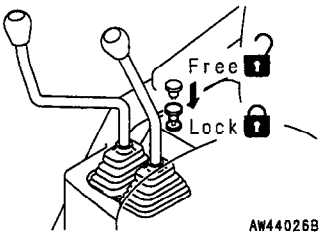
July 1999

UNAUTHORIZED MODIFICATION

- Any modification made without authorization from Komatsu can create hazards.
- Before making a modification, consult your Komatsu distributor. Komatsu will not be responsible for any injury or damage caused by any unauthorized modification.

ALWAYS APPLY LOCK WHEN LEAVING OPERATOR'S SEAT

- When standing up from the operator's seat, always place the safety lock lever securely in the LOCK position. If you accidentally touch the travel or swing lever when they are not locked, the work equipment may suddenly move and cause serious injury or damage.
- When leaving the machine, lower the work equipment completely to the ground, set the safety lock lever to the LOCK position, then stop the engine and use the key to lock all the equipment. Always take the key with you.
  Work equipment posture → See "12.12 PARKING MACHINE".
  Locks → See "12.16 LOCKING".



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MOUNTING AND DISMOUNTING

- NEVER jump on or off the machine. NEVER get on or off a moving machine.
- When getting on or off the machine, face the machine and use the handhold and steps.
- Never hold any control levers when getting on or off the machine.
- Maintain three-point contact (both feet and one hand or one foot and both hands), and be sure that you are supported securely by the handrail and steps.
- If there is any oil, grease, or mud on the handholds or steps, wipe it off immediately. Always keep these parts clean. Repair any damage and tighten any loose bolts.


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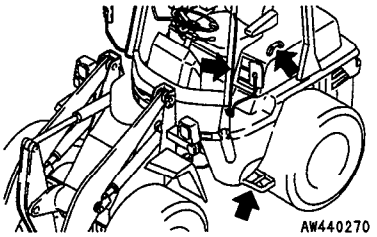
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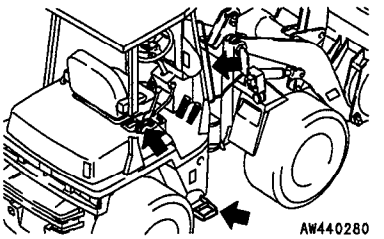
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PARKING THE MACHINE

- When parking the machine, stop on a flat firm road surface where there is no danger of falling rocks, landslides, or floods, and lower the work equipment to the ground. If the machine must be stopped on a slope, block the wheels to prevent the machine from moving.

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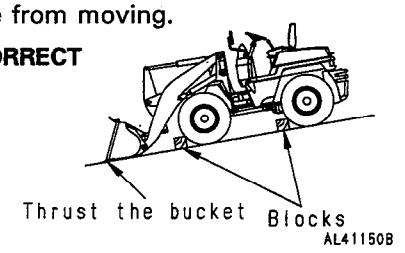

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- When parking on public roads, park the machine so that the machine, flags, and fences do not obstruct traffic, and provide fences, signs, flags, or lights, and put up any other necessary signs to ensure that passing traffic can see the machine clearly.
  Parking procedure → See "12.12 PARKING MACHINE".

- When leaving the machine, lower the work equipment completely to the ground, set the safety lock lever to the LOCK position, then stop the engine and use the key to lock all the equipment. Always take the key with you.
  Work equipment posture → See "12.12 PARKING MACHINE".
  Places to lock → See "12.16 LOCKING".

PRECAUTIONS WHEN CARRYING OUT MAINTENANCE AT HIGH TEMPERATURE OR HIGH PRESSURE

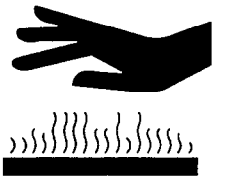
- Immediately after stopping operations, the engine cooling water and oil at all parts is at high temperature and under high pressure.
  In this condition, if the cap is removed, or the oil or water are drained, or the filters are replaced, this may result in burns or other injury. Wait for the temperature to go down, then carry out the inspection and maintenance in accordance with the procedures given in this manual.

Clean inside or cooling system, check lubricating oil level, add oil → see "24.2 WHEN REQUIRED".

Check cooling water level, engine oil pan, oil level, brake oil level, add oil or water → see "24.3 CHECK BEFORE STARTING".

Checking hydraulic oil level, adding oil → see "24.5 PERIODIC MAINTENANCE".

Changing oil, replacing filters → see "24.6 – 8 PERIODIC MAINTENANCE".



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ROTATING FAN AND BELT

- Keep away from rotating parts and be careful not to let anything get caught in them.
- If your body or tools touch the fan blades or fan belt, they may be cut off or sent flying, so never touch any rotating parts.

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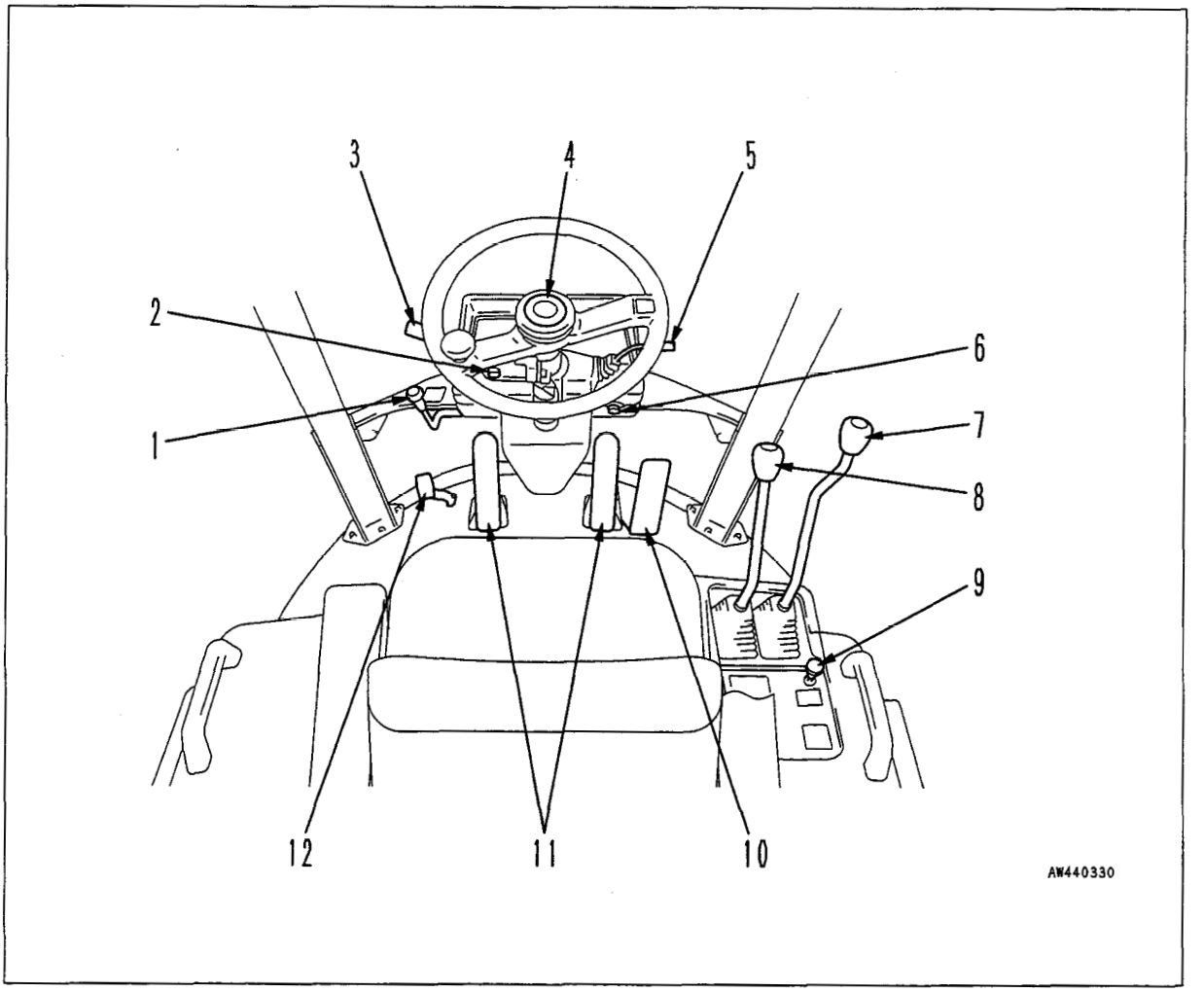
WHEN OPERATING WITH CHASSIS RAISED

- When carrying out operations with the work equipment or chassis raised, lock the front and rear frames with the safety lock, always place the control levers in the HOLD position, then lock the control levers with the safety lock, and block the work equipment and chassis.
- Always fit blocks under the wheels on the opposite side when jacking up the machine. After jacking up the machine, set blocks under it to hold it in position.

TIRE MAINTENANCE

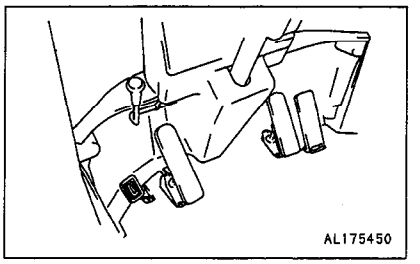
Disassembly, repair, and assembly of tires requires specialist equipment and skill, so please ask your specialist tire repair shop to carry out repairs.

10.2 GENERAL VIEW OF CONTROLS AND GAUGES



1. Parking brake release lever
2. Safety lock (for directional lever)
3. Directional lever
4. Horn button
5. Lamp switch
   Turn signal lever
6. Starting switch
7. Front attachment control lever
8. Work equipment control lever
9. Safety lock (for work equipment control lever)
10. Accelerator pedal
11. Brake pedal
12. Parking brake pedal

7. PARKING BRAKE PEDAL



⚠ WARNING

Always apply the parking brake when leaving the machine or parking it.

This lever operates the parking brake.

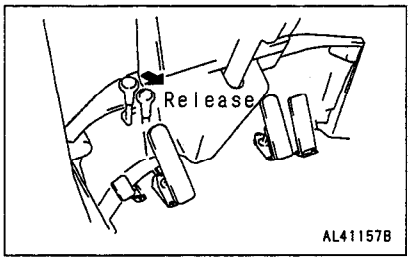
The brake is applied by depressing this pedal, and the parking brake pilot lamp lights up.

The machine does not start when the directional lever is operated with parking brake applied.

NOTICE

Never use the parking brake lever to apply the brakes when traveling, except in an emergency. Apply the parking brake only after the machine has stopped.

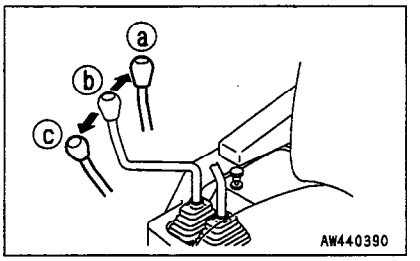
8. PARKING BRAKE RELEASE LEVER



This is used to release the parking brake. Pull the lever back to release the parking brake.

When the parking brake pedal returns to its original position, the parking brake is released.

9. FRONT ATTACHMENT CONTROL LEVER



This lever operates the service hydraulic circuit for the front work equipment.

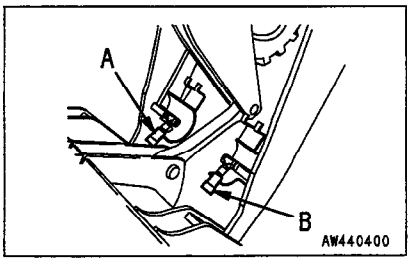
Position ⓐ : Oil is discharged from A and sucked in from B

Position ⓑ : HOLD (the flow of hydraulic oil stops and the attachment is held in the same position)

Position ⓒ : Oil is discharged from B and sucked in from A

NOTICE

Do not operate the lever if the service circuit is not being used.



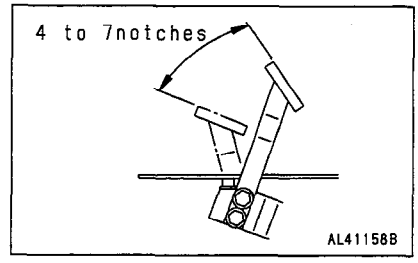
CHECK PARKING BRAKE ALARM BUZZER

Check that the alarm buzzer sounds when the engine is stopped with the parking brake not applied.

CHECK EFFECT OF PARKING BRAKE AND PEDAL STROKE

Depress the parking brake pedal and check that the parking brake pilot lamp lights up after 1 – 2 notches and that the parking brake pedal moves 4 – 7 notches when depressed fully.

If the above value is not correct, or if the braking effect is poor, see "24.2 WHEN REQUIRED".

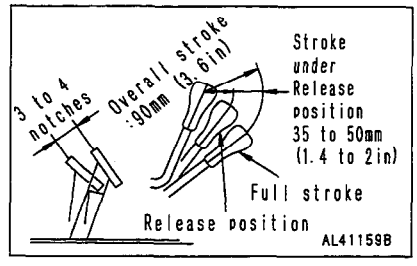


CHECK TRAVEL OF PARKING BRAKE RELEASE LEVER

Depress the parking brake pedal 3 – 4 notches, then pull the release lever and check that the parking brake pedal returns to its original position.

The travel of the lever after the brake is released should be 35 – 50 mm (1.4 – 2 in).

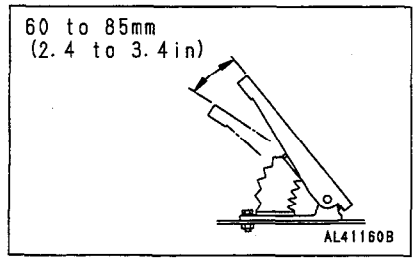
If the above value is not correct, see "24.2 WHEN REQUIRED".



CHECK EFFECT OF BRAKE AND PEDAL STROKE

The travel at the tip of the pedal should be 60 – 85 mm (2.4 – 3.4 in).

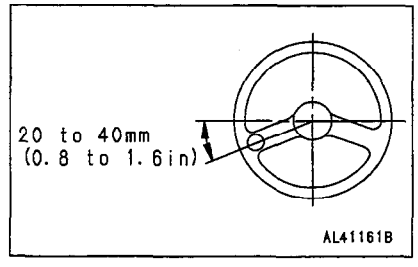
If the travel is not within the standard range, or the braking effect is poor, see "24.2 WHEN REQUIRED".



CHECK STEERING WHEEL PLAY AND OPERATION OF STEERING

The play at the outside circumference of the steering wheel should be 20 – 40 mm (0.8 – 1.6 in).

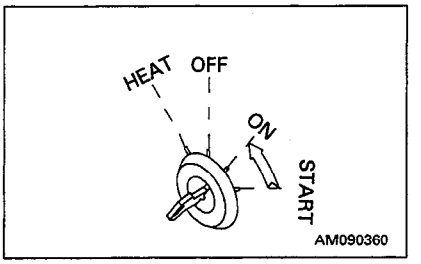
If it is more than 40 mm (1.6 in) or the operation of the steering is not smooth, please contact your Komatsu distributor for inspection.

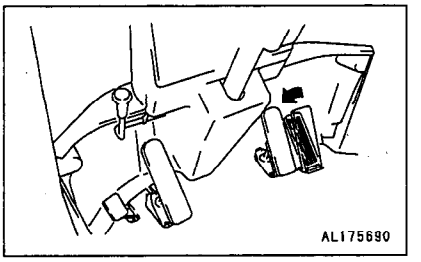


4. When engine starts, release the key of starting switch ①. The key will return automatically to the ON position.

5. When the engine speed rises, depress accelerator pedal ③ lightly and hold it in position.

If the engine does not start, wait for 2 minutes, then repeat Steps 1, 2, and 3.





12.10 WORK POSSIBLE USING WHEEL LOADER

In addition to the following, it is possible to further increase the range of applications by using various attachments.

12.10.1 DIGGING OPERATIONS

⚠ WARNING

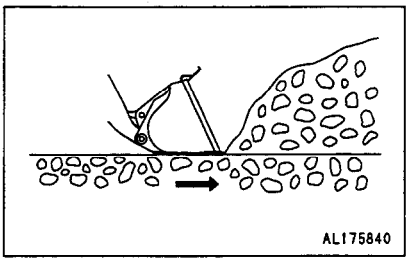
Always set the machine facing directly to the front when carrying out digging or scooping operations. Never carry out these operations with the machine articulated.

NOTICE

If the tires slip, the tire life will be reduced, so do not allow the tires to slip during operation.

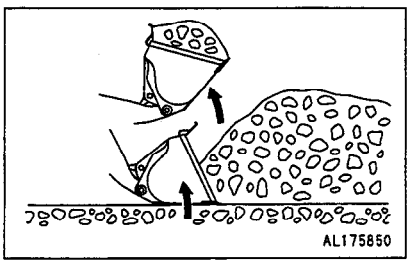
- Scoop up the piled soil by moving the machine forward as shown below. If the tires begin slipping under heavy load, raise the bucket slightly to reduce the load.

1. Force the bucket into the pile of soil while moving the machine forward.

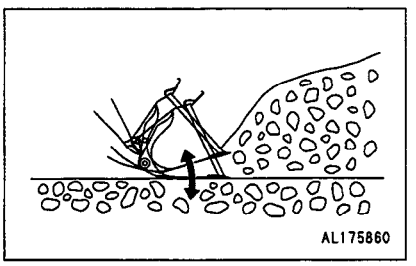


2. After the bucket has fully penetrated into the soil, place the work equipment control lever in raise position while moving the machine forward. Move the work equipment control lever to tilt position from time to time until the bucket is filled with soil.

Try to keep the load in the center of the bucket; if the load is on one side of the bucket, the load will be unbalanced.

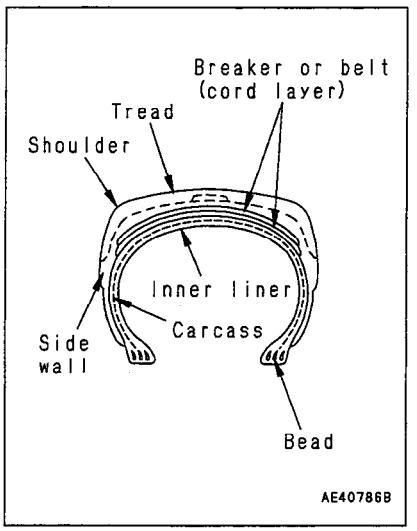


3. When it is difficult for the bucket to penetrate into the piled soil, move the work equipment control lever left and right to move the bucket teeth up and down.



12.18 HANDLING THE TIRES

12.18.1 PRECAUTIONS WHEN HANDLING TIRES



⚠ CAUTION

If a tire has reached any of the following service limits, there is danger that the tire may burst or cause an accident, so to ensure safety, replace it with a new tire.

- **Service limits for wear**
  - **When the remaining depth of the groove on construction equipment tires (at a point approx. 1/4 of the tread width) is 15% of the groove depth on a new tire.**
  - **When the tire shows marked uneven wear, stepped wear or other abnormal wear, or when the cord layer is exposed.**
- **Service limits for damage**
  - **When there is external damage extending to the cord or when the cord is broken**
  - **When the cord is cut or there is dragging**
  - **When the tire is peeling (there is separation)**
  - **When the bead is damaged**
  - **For tubeless tires, when there is air leakage or improper repair**

Please contact your Komatsu distributor when replacing the tires. It is dangerous to jack up the machine without taking due care.

12.18.2 TIRE PRESSURE

Measure the tire pressure before starting operations, when the tires are cool.

If the tire inflation pressure is too low, there will be overload; if it is too high, it will cause tire cuts and shock burst. To prevent these problems, adjust the tire inflation pressure according to the table below.

	WA30	WA50
Air pressure MPa (kgf/cm^2)	0.2 (2.0)	0.18 (1.8)

If the deflection of the tire is excessive, raise the inflation pressure within the limits given in the table below to give a suitable deflection.

	WA30	WA50
Air pressure MPa (kgf/cm^2)	0.22 – 0.24 (2.2 – 2.4)	0.20 – 0.22 (2.0 – 2.2)

14.2 PRECAUTIONS AFTER COMPLETION OF WORK

To prevent mud, water, or the undercarriage from freezing and making it impossible for the machine to move on the following morning, always observe the following precautions.

- Mud and water on the machine body should be completely removed.
  This is to prevent damage to the seal caused by water in mud or dirt getting inside the seal and freezing.

- Park the machine on hard, dry ground.
  If this is impossible, park the machine on wooden boards.
  The boards help protect the tracks from being frozen in the soil and the machine can start next morning.

- Open the drain valve and drain any water collected in the fuel system to prevent it from freezing.

- As the battery capacity drops markedly in low temperatures, cover the battery or remove it from the machine, keep it in a warm place, and install it again the next morning.

14.3 AFTER COLD WEATHER

When season changes and the weather becomes warmer, do as follows.

- Replace the fuel and oil for all parts with oil of the viscosity specified.
  For details, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".

- If for any reason permanent antifreeze cannot be used, and an ethyl glycol base antifreeze (winter, one season type) is used instead, or if no antifreeze is used, drain the cooling system completely, then clean out the inside of the cooling system thoroughly, and fill with fresh water.

16.4 OTHER TROUBLE

16.4.1 ELECTRICAL SYSTEM

- ( ): Always contact your Komatsu distributor when dealing with these items.
- In cases of abnormalities or causes which are not listed below, please contact your Komatsu distributor for repairs.

Problem	Main causes	Remedy
Lamp does not glow brightly even when the engine runs at hight speed	• Defective wiring • Defective adjustment of fan belt tension	(• Check, repair loose terminals, disconnections) • Adjust fan belt tension For details, see EVERY 250 HOURS SERVICE
Lamp flickers while engine is running		
Abnormal noise is generated from alternator	• Defective alternator	(• Replace)
Starting motor does not turn when starting switch is turned to ON	• Defective wiring • Insufficient battery charge	(• Check, repair) • Charge
Pinion of starting motor keeps going in and out	• Insufficient battery charge	• Charge
Starting motor turns engine sluggishly	• Insufficient battery charge • Defective starting motor	• Charge (• Replace)
Starting motor disengages before engine starts	• Defective wiring • Insufficient battery charge	(• Check, repair) • Charge
Preheating pilot lamp does not light up	• Defective wiring • Defective heater timer • Defective preheating pilot lamp	(• Check, repair) (• Replace) (• Replace)
Even when engine is stopped, engine oil pressure caution pilot lamp does not light up (starting switch at ON position)	• Defective caution pilot lamp • Defective caution pilot lamp switch	(• Replace) (• Replace)

18.1.3 COOLANT

- River water contains large amounts of calcium and other impurities, so if it is used, scale will stick to the engine and radiator, and this will cause defective heat exchange and overheating.
  Do not use water that is not suitable for drinking.

- When using anti-freeze, always observe the precautions given in the Operation and Maintenance Manual.

- Komatsu machines are supplied with Komatsu original anti-freeze in the coolant when the machine is shipped.
  This anti-freeze is effective in preventing corrosion of the cooling system.
  The anti-freeze can be used continuously for two years or 4000 hours. Therefore, it can be used as it is even in hot areas.

- Anti-freeze is flammable, so be extremely careful not to expose it to flame or fire.

- The proportion of anti-freeze to water differs according to the ambient temperature.
  For details of the mixing proportions, see "24.2.2 CLEAN INSIDE OF COOLING SYSTEM".

- If the engine overheats, wait for the engine to cool before adding coolant.

- If the coolant level is low, it will cause overheating and will also cause problems with corrosion from the air in the coolant.

18.1.4 GREASE

- Grease is used to prevent twisting and noise at the joints.

- The nipples not included in the maintenance section are nipples for overhaul, so they do not need grease.
  If any part becomes stiff after being used for long time, add grease.

- Always wipe off all of the old grease that is pushed out when greasing. Be particularly careful to wipe off the old grease in places where sand or dirt sticking in the grease would cause wear of the rotating parts.

18.1.5 STORING OIL AND FUEL

- Keep indoors to prevent any water, dirt, or other impurities from getting in.

- When keeping drum cans for a long period, put the drum on its side so that the filler port of the drum can is at the side. (To prevent moisture from being sucked in)
  If drum cans have to be stored outside, cover them with a waterproof sheet or take other measures to protect them.

- To prevent any change in quality during long-term storage, be sure to use in the order of first in - first out (use the oldest oil or fuel first).

22. PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS

To ensure safety at all times when operating or driving the machine, the user of the machine must always carry out periodic maintenance. In addition, to further improve safety, the user should also carry out periodic replacement of the parts given in the table. These parts are particularly closely connected to safety and fire prevention.

With these parts, the material changes as time passed, or they easily wear or deteriorate. However, it is difficult to judge the condition of the parts simply by periodic maintenance, so they should always be replaced after a fixed time has passed, regardless of their condition. This is necessary to ensure that they always maintain their function completely.

However, if these parts show any abnormality before the replacement interval has passed, they should be repaired or replaced immediately.

If the hose clamps show any deterioration, such as deformation or cracking, replace the clamps at the same as the hoses.

When replacing the hoses, always replace the O-rings, gaskets, and other such parts at the same time.

Ask your Komatsu distributor to replace the safety critical parts.

SAFETY CRITICAL PARTS

No.	Safety critical parts for periodic replacement	Q'ty	Replacement interval
1	Fuel hose (fuel tank - feed pump pre-filter)	1	Every 2 years or every 4000 hours, whichever comes first
2	Fuel hose (feed pump pre-filter - feed pump)	1	
3	Fuel hose (feed pump - fuel filter)	1	
4	Fuel hose (fuel filter - injection pump)	1	
5	Fuel return hose (injection pump - fuel filter)	1	
6	Fuel return hose (fuel filter - fuel tank)	2	
7	Fuel return hose (nozzle - injection pump)	1	
8	Fuel hose (between nozzle)	2	
9	Steering hose (pump - priority valve)	1	
10	Steering hose (orbitrol valve - steering cylinder)	3	
11	Steering cylinder packing, seal, O-ring	1	
12	Seat belt	1	Every 3 years

24.2.5 CHECK AXLE OIL LEVEL, ADD OIL

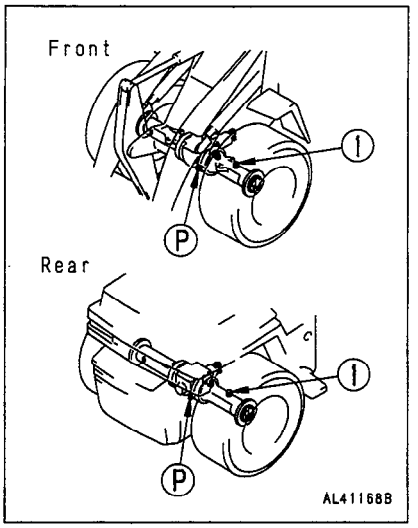
⚠ WARNING

- **When checking the oil level, apply the parking brake, and lock the front and rear frames with the safety bar and pin.**
- **The oil is at high temperature after the machine has been operated. Always wait for the temperature to go down before starting this operation.**

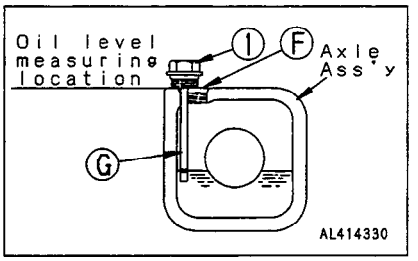
Carry out this procedure if there is any sign of oil on the axle case.

Carry out the inspection with the machine on a horizontal road surface.
(If the road surface is at an angle, the oil level cannot be checked correctly.)

1. Stop the engine and remove oil level plug ①.
2. Wipe off any oil adhering to the oil level gauge Ⓖ attached to plug ① with waste cloth.



3. Set the oil level gauge Ⓖ as shown in the right diagram.
4. The oil level is correct when it is between the two lines provided on the oil level gauge. If the oil level does not reach the lower line, add axle oil through filler port Ⓕ.

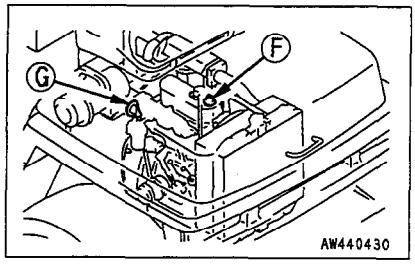


For details of the oil to use, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE."

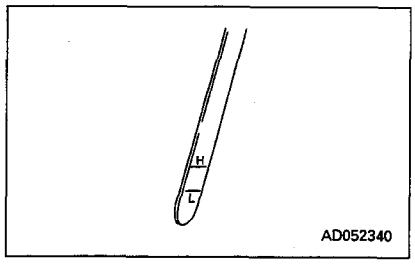
5. If the oil level is above the upper line, drain off the excess oil through drain plug Ⓟ and check the oil level again.
6. If the oil level is correct, install plug ①.

Tightening torque: 69 ± 10 N•m (7 ± 1 kgf•m, 27 ± 8 lbft)

24.3.4 CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL

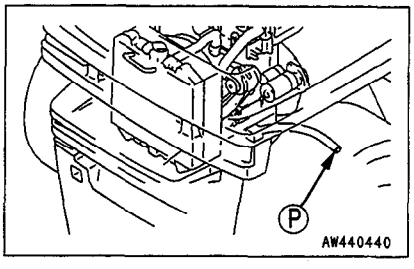


1. Open the tilt hood at the rear of the machine.
2. Remove dipstick Ⓖ and wipe the oil off with a cloth.
3. Insert dipstick Ⓖ fully in the oil filler pipe, then take it out again.
4. The oil level should be between the H and L marks on dipstick Ⓖ.
   If the oil level is below the L mark, add engine oil through oil filler Ⓕ.



For details of the oil to use, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".

5. If the oil is above the H mark, drain the excess engine oil from drain plug Ⓟ, and check the oil level again.
6. If oil level is correct, tighten the oil filler cap securely, then tighten the tilt hood.



REMARK

When checking the oil level after the engine has been operated, wait for at least 15 minutes after stopping the engine before checking.

If the machine is at an angle, make it horizontal before checking.

24.6 EVERY 500 HOURS SERVICE

Maintenance for every 50 and 250 hours should be carried out at the same time.

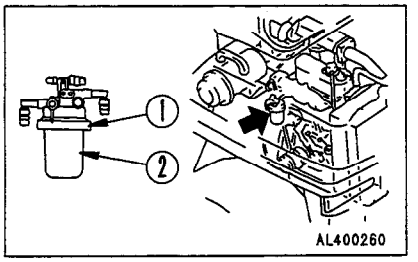
24.6.1 REPLACE FUEL FILTER ELEMENT

⚠WARNING

- **Engine is at high temperature immediately after the machine has been operated. Wait for engine to cool down before replacing the filter.**
- **Do not bring fire or sparks near the fuel.**

Prepare the following.
- Container to catch the oil

1. Set a container under the filter element cup to catch the oil.
2. Loosen ring ①, remove element cup ②, then take out element.
3. Wash element cup ② in diesel oil or flushing oil, then install a new element. When replacing the element, replace the O-ring at the same time.
4. Fill with fuel, then turn the starting switch to the START position without depressing the accelerator pedal, and run the starting motor for 15 – 20 seconds to crank the engine and bleed the air from the system.
   Do not run the starting motor continuously for more than 20 seconds. Wait for 2 minutes before turning the starting motor running it again.



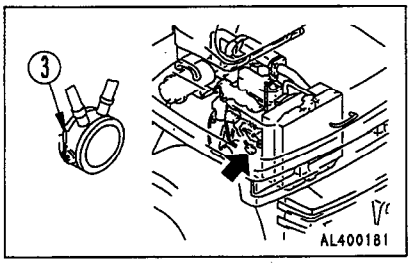
⚠WARNING

When cranking the engine, confirm the safety around the engine, as the engine may start.

Use the same method when the engine has run out of fuel. Crank the engine 3 – 4 times for 15 – 20 seconds to bleed the air.

If the fuel tank is completely filled, the time taken to bleed the air can be reduced.

It is also possible to bleed the air manually by operating lever ③ of the feed pump up and down.



5. After replacing the filter element, start up the engine and check the filter seal face for possible oil leakage.