SEAM021400

Operation & Maintenance Manual

GD825A-2

MOTOR GRADER

SERIAL NUMBERS GD825A-12051 and up

⚠ WARNING

Unsafe use of this machine may cause serious injury or death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept near the machine for reference and periodically reviewed by all personnel who will come into contact with it.

NOTICE

Komatsu has Operation & Maintenance Manuals written in some other languages. If a foreign language manual is necessary, contact your local distributor for availability.

KOMATSU

6. GENERAL PRECAUTIONS

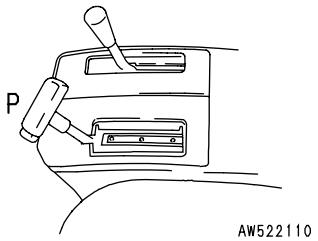
⚠ WARNING: For reasons of safety, always follow these safety precautions.

SAFETY RULES

- Only trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
- Do not operate the machine if you are feeling unwell, if you are taking medication that makes you feel sleepy, if you have been drinking, or if you are suffering from emotional problems. These problems will interfere with your sense of judgement in emergencies and may cause accidents.
- When working with another operator or with a person on worksite traffic duty, be sure that all personnel know the nature of the work and understand all hand signals that are to be used.
- Always observe strictly any other rules related to safety.

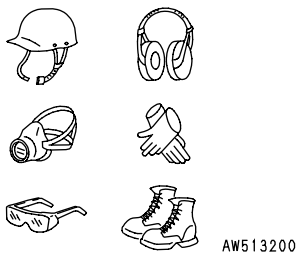
SAFETY FEATURES

- Be sure that all guards and covers are installed in their proper position. Have guards and covers repaired immediately if damaged.
- Be sure that you understand the method of use of safety features such as safety parking brake and the seat belt, and use them properly.
- Never remove any safety features. Always keep them in good operating condition.
  Parking brake → See "12.14 PARKING MACHINE".
  Seat belt (if equipped) → See "12.1.4 USING SEAT BELT".
- Failure to use safety features according to the instructions in the Operation and Maintenance Manual could result in serious bodily injury.



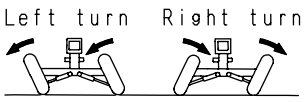
CLOTHING AND PERSONAL PROTECTIVE ITEMS

- Avoid loose clothing and jewelry. They can catch on controls or in protruding parts and cause serious injury or death.
- Do not wear oily clothes. They are highly flammable.
- Wear a hard hat, safety glasses, safety shoes, mask, or gloves when operating or maintaining the machine.
  Always wear safety goggles, hard hat, gloves, and other protective equipment if your job involves scattering metal chips or minute materials - particularly when driving in pins with a hammer and when cleaning the air cleaner element with compressed air.
  Check also that there is no one near the machine.
- Check that all protective equipment works properly before using it.



PRECAUTIONS WHEN TRAVELING

- Set the machine in the travel posture and travel on a flat road.
  Travel posture → See "12.4 TRAVEL POSTURE FOR MACHINE".
- It is dangerous to look around you when operating. Always concentrate on your work.
- It is dangerous to drive too fast, or to start suddenly, stop suddenly, turn sharply, or zigzag.
- If you find any abnormality in the machine during operation (noise, vibration, smell, incorrect gauges, air leakage, oil leakage, etc.), move the machine immediately to a safe place and look for the cause.
- Do not steer the machine sharply. If steered sharply, the work equipment may touch the ground and the machine may be unbalanced or the machine and structures around it may be broken.
- When traveling on rough ground, travel at low speed and avoid turning sharply when changing direction.
- If the engine stops when the machine is traveling, the steering cannot be operated, so operation is dangerous. Apply the brake immediately and stop the machine.
- Operate carefully when the wheels are leaning. It is prohibited to travel on roads with the wheels leaning.
- Travel at a maximum speed of 10 km/h (6.2 MPH) when using the articulation. If the articulation is used when traveling at a speed of over 10 km/h (6.2 MPH), there is danger that the machine may overturn. Never use the articulation at speeds of over 10 km/h (6.2 MPH).
- Keep the machine at a sufficient distance from the other machines during travel and work to avoid contact with those machines.
- When crossing a private bridge or structure, first check that it can stand the weight of the machine. When traveling along public roads, ask the governmental offices for instructions.
- When traveling along public roads, observe traffic regulations. Since the machine travels slower than the general automobiles, take the slower lane of the road and make way for the other automobiles.
- If the machine travels at high speed for several hours, the tires will become overheated and the pressure in them rises abnormally to cause serious injury.
- When traveling continuously, observe the following items.
  - Ask your Komatsu distributor or the tire shop about the speed limit and necessity of adjustment of tire inflation pressure.
  - Stop the machine for 30 minutes to cool the tires after traveling 1 hour.
  - Do not lower the tire inflation pressure.



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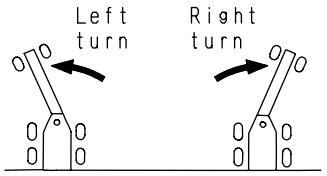

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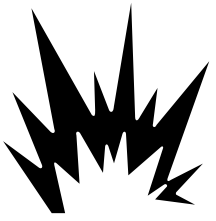
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NEAT CLEAN WORK PLACE

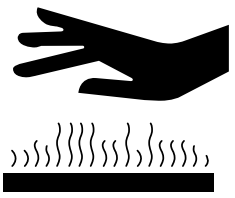
Tidy any tools or hammers that are lying in the work place, wipe up any grease or oil or any other slippery substances, and clean the area to make it possible to carry out the operation in safety.
If the work place is left untidy, you may trip or slip and suffer injury.

FOLLOW LEADER IN OPERATIONS WITH OTHER WORKERS

When carrying out repairs of the machine or removal and installation of components, decide a leader and follow the instructions of the leader.
There is danger that differences of opinion between workers when working together may lead to misunderstandings and cause an expected accident.

RADIATOR WATER LEVEL

- When checking the radiator water level, stop the engine, let the engine and radiator cool down, then check the sub tank. If the water level in the sub tank is near the upper limit, there is enough water in the radiator.
- If there is no sub tank, or if it is necessary to remove the radiator cap, do as follows.
- Wait for the radiator water temperature to go down, then check the water level.
  (When checking how much the water temperature has gone down, bring your hand close to the surface of the engine or radiator without touching it, and check the temperature of the air at the engine or radiator surface.)
- Loosen the radiator cap gradually to release the internal pressure before removing the radiator cap.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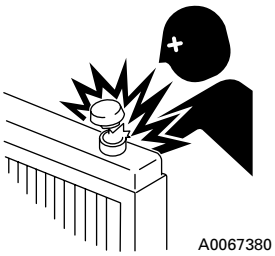
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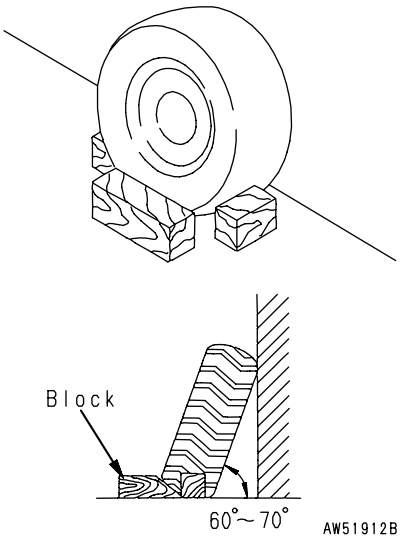
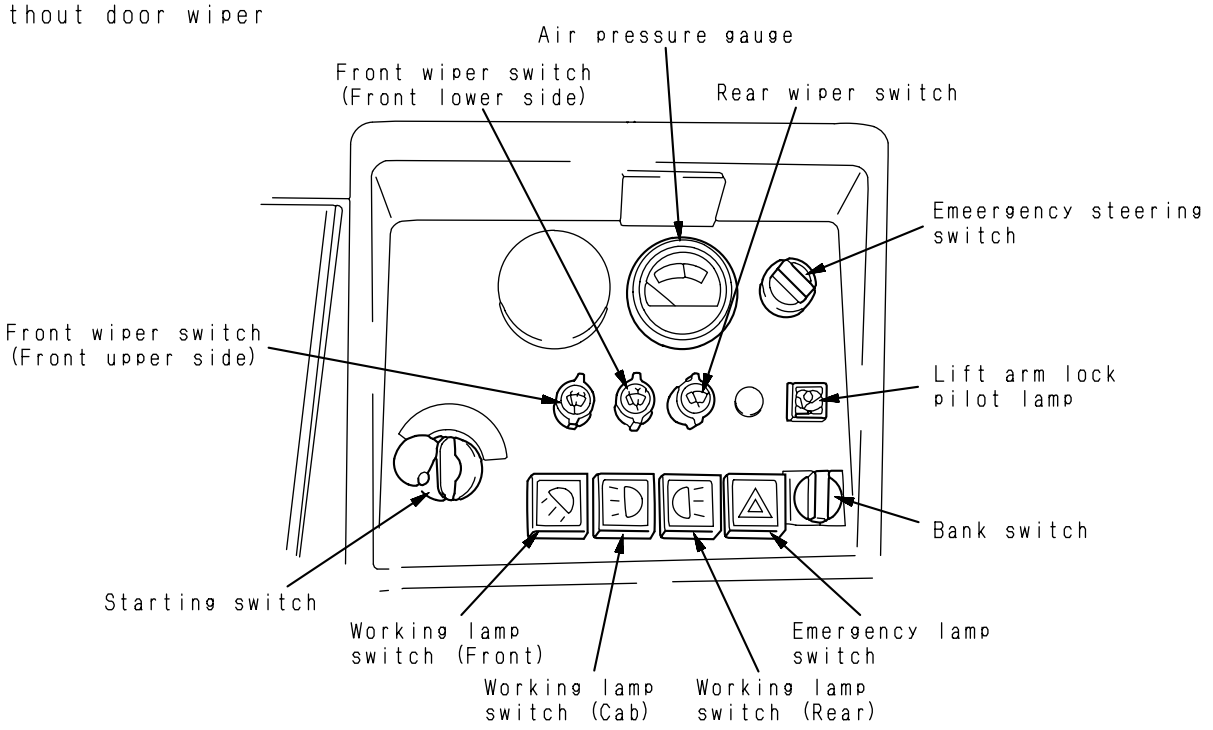
PRECAUTIONS FOR STORAGE OF TIRES

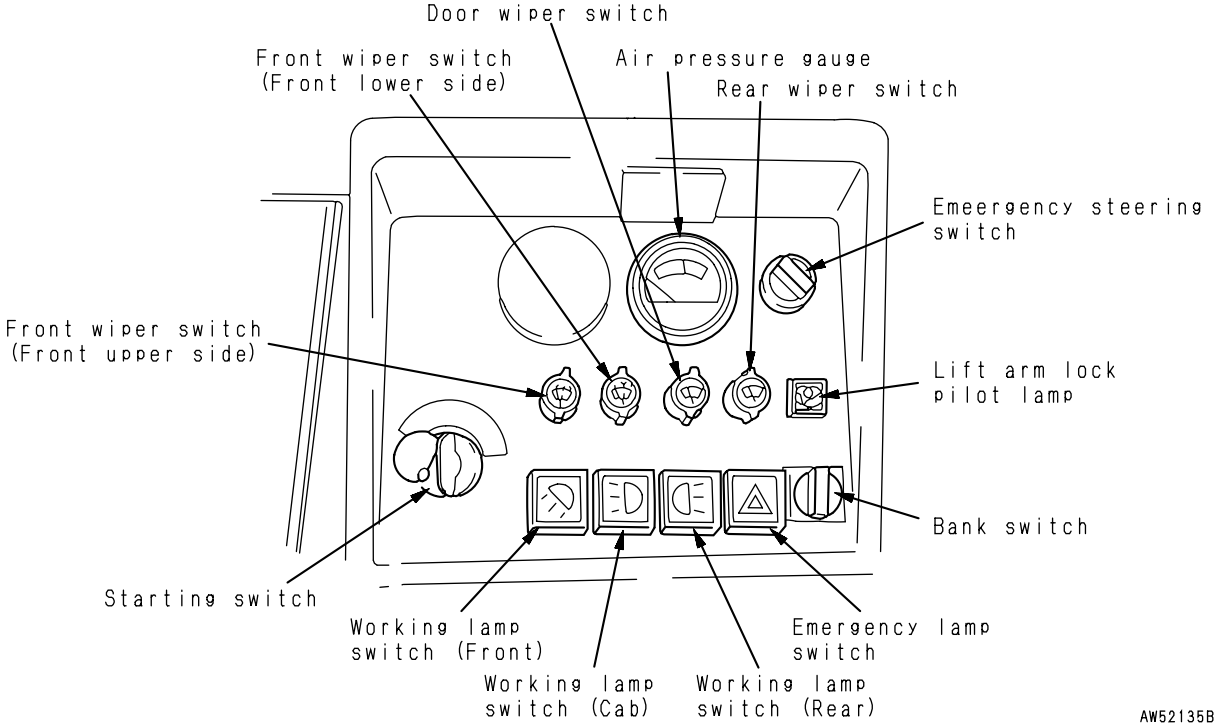
- As a basic rule, store the tires in a warehouse which unauthorized persons cannot enter. If you must store the tires outside, always erect a fence around the tires and put up a “No Entry” sign.
- Stand the tire on level ground, and block it securely so that it will not roll or fall over even if an unauthorized person touches it. If the tire is placed on its side, it will be flattened and will deteriorate.
- If the tire should fall over, get out of the way quickly. Tires for construction equipment are extremely heavy, so trying to hold the tire may lead to serious injury.



Without door wiper

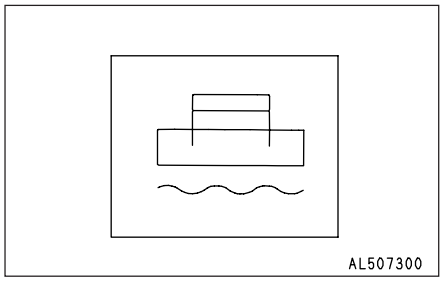


With door wiper (If equipped)



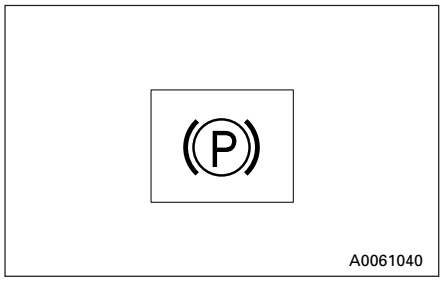
3. BLADE FLOAT

This lights up when the blade float switch is set to the ON position.



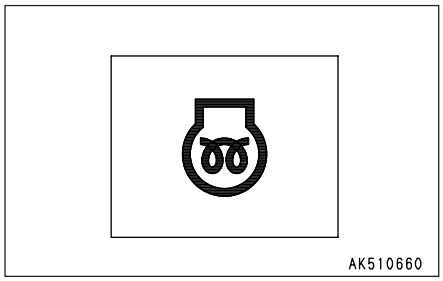
4. PARKING

This lights up when the parking brake is actuated.

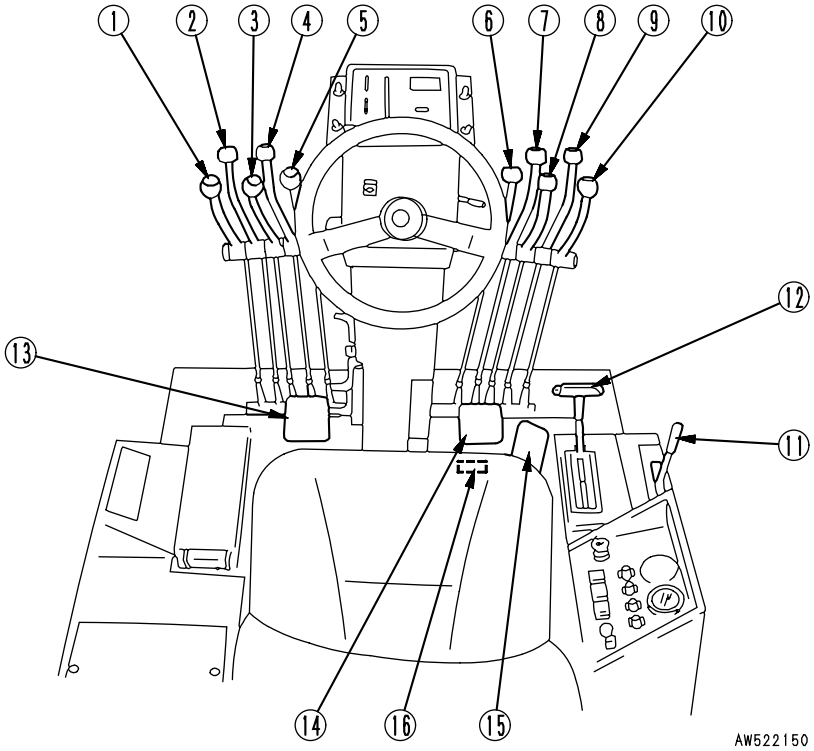


5. ENGINE PREHEATING MONITOR

This shows the preheating time when starting the engine in temperatures of below 5°C.
It lights up for about 36 seconds when the starting switch is turned to HEAT, then flashes for about 16 seconds.
Finally, it goes out, indicating that the preheating is completed.

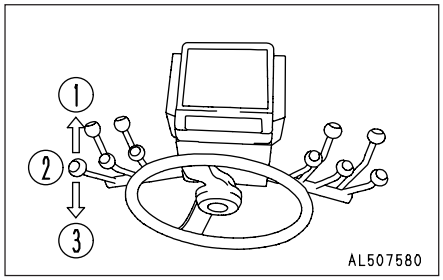


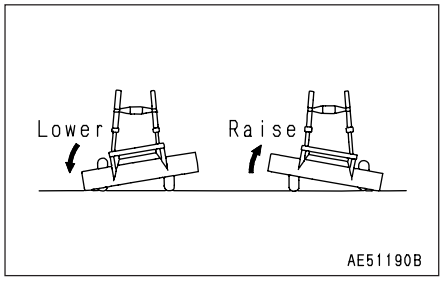
11.4 CONTROL LEVERS AND PEDALS



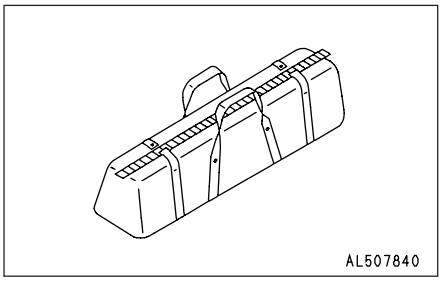
1. LEFT BLADE LIFT CYLINDER CONTROL LEVER
This lever operates the left blade lift cylinder.

① LOWER : The left side of the blade goes down.
② HOLD : The blade stops and is held in the same position.
③ RAISE : The left side of the blade goes up.





11.11 TOOL BAG



⚠ WARNING

Do not leave the tool bag on the floor by your feet.
It will get in the way during operations.

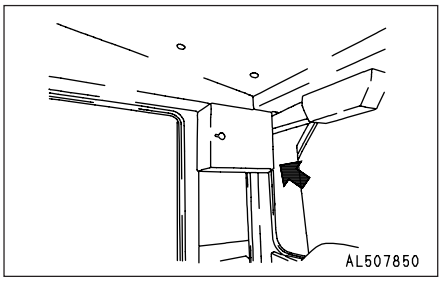
A bag is provided to hold the tools supplied with the machine.
When not using the tools, put them in the tool bag and put the tool bag behind the operator's seat.

REMARK

- A tool box for holding the tool supplied with the machine is also available as an option. This tool box can be installed to the drawbar.
- The tool box already installed to the drawbar contains the tools used when lifting the cab.

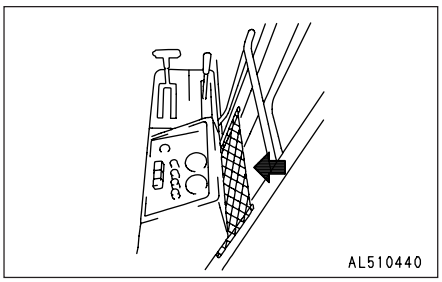
11.12 STORAGE BOX

There is a box for storing small articles at the top right of the cab.



11.13 STORAGE NET

Use this storage space to keep the Operation and Maintenance Manual.



11.14 QUICK-FILL FUEL FILLER

A commercially available mount and relief valve can be installed for use when filling quickly with fuel from a fuel tanker.

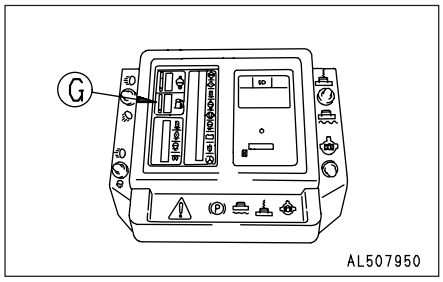
For details of the method of installing and handling, please see the instruction manual provided with the quick tanker fill device.

CHECK FUEL LEVEL, ADD FUEL

⚠ WARNING

When adding fuel, never let the fuel overflow. This may cause a fire. If you spill any fuel, thoroughly clean up all the spillage.

1. Turn the engine starting switch to the ON position and check the fuel level with fuel level gauge Ⓖ.
   After checking, turn the switch back to the OFF position.

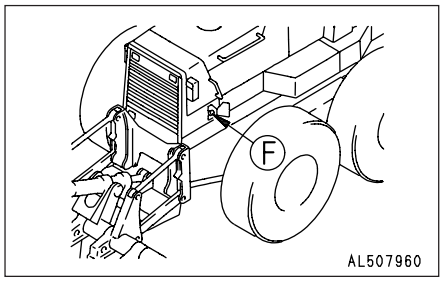


2. After completing work, fill the fuel tank through oil filler port Ⓕ.

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

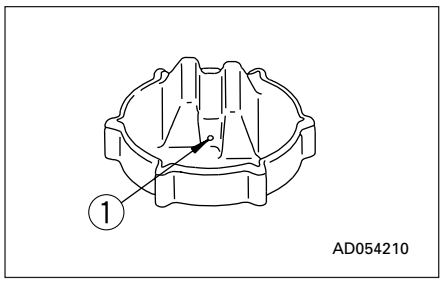
3. After adding fuel, tighten the cap securely.

   Fuel capacity: 500 ℓ



NOTICE

If breather hole ① in the cap becomes clogged, the pressure inside the tank will go down and the fuel may not flow, so clean the breather hole from time to time.

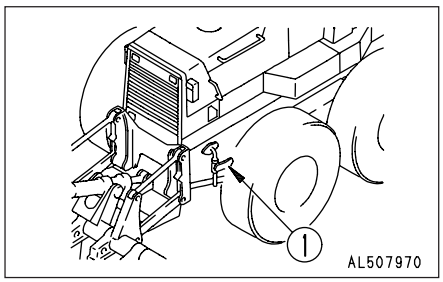


DRAIN WATER AND SEDIMENT IN FUEL TANK

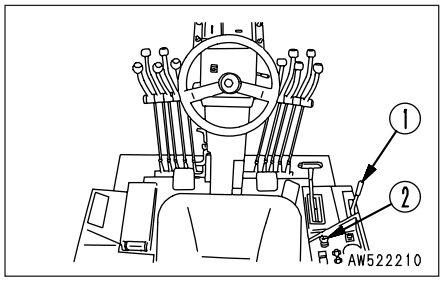
Loosen fuel tank drain valve ① and drain the sediment and water, accumulated at the bottom, together with fuel.

REMARK

The fuel will not be drained if it is not above the installation position of drain valve ① on the tank.



12.2 STARTING ENGINE
12.2.1 NORMAL STARTING



⚠ WARNING

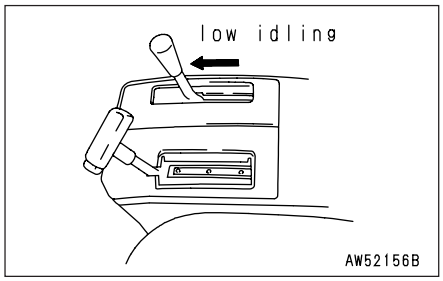
Check that there are no persons or obstacles in the surrounding area, then sound the horn and start the engine.

NOTICE

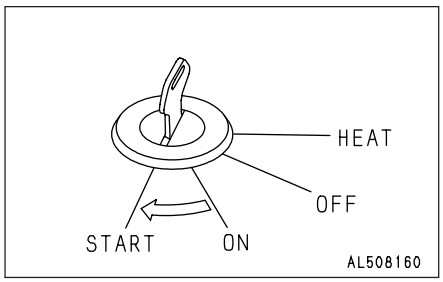
Do not keep the starting motor rotating continuously for more than 20 seconds.

If the engine will not start, wait for at least 2 minutes before trying to start the engine again.

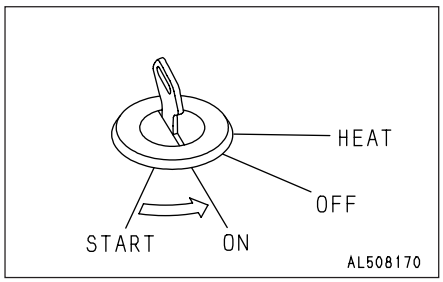
1. Set fuel control lever ① at the LOW IDLING position.



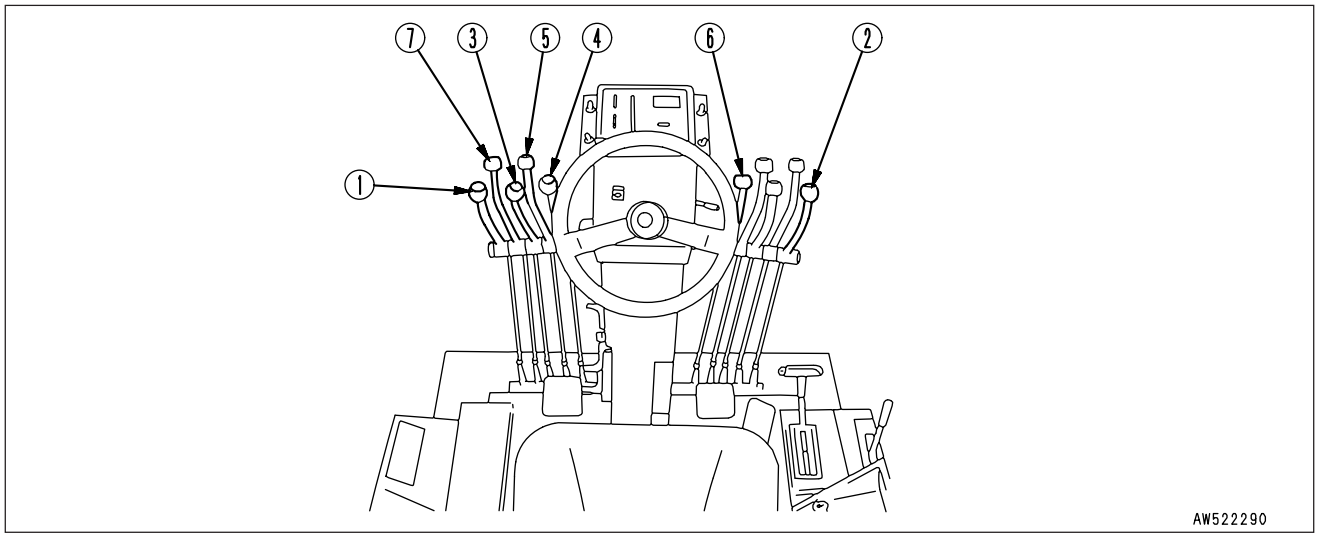
2. Insert the key into starting switch ② and turn the key to the START position. The engine will start.



3. When the engine starts, release the key in starting switch ②. The key will return automatically to the ON position.



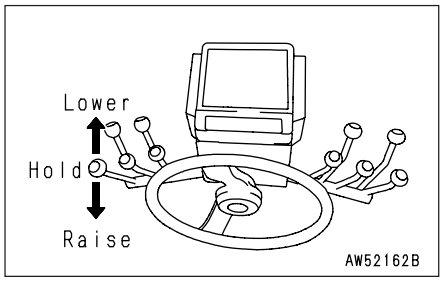
12.10 OPERATING WORK EQUIPMENT

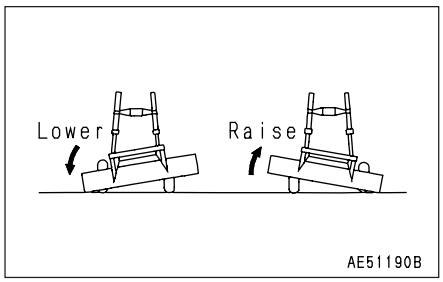


12.10.1 OPERATING BLADE

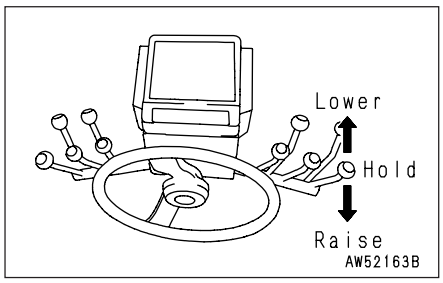
BLADE LIFT OPERATION

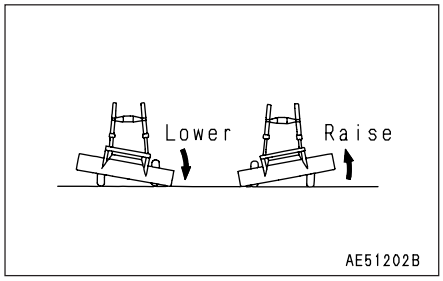
Operate left blade control lever ① as follows.
Pull BACK to RAISE left end of blade
Push FORWARD to LOWER left end of blade





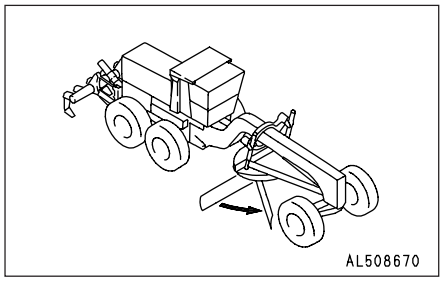
Operate right blade control lever ② as follows.
Pull BACK to RAISE right end of blade
Push FORWARD to LOWER right end of blade



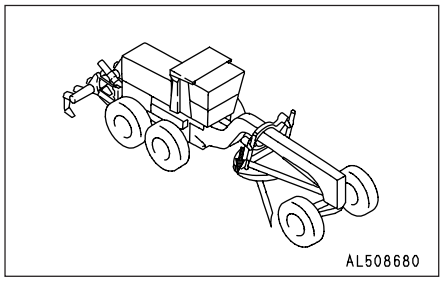


12.11.5 RIGHT DITCH FINISHING

1. Set the right side of the blade behind the front right wheel.

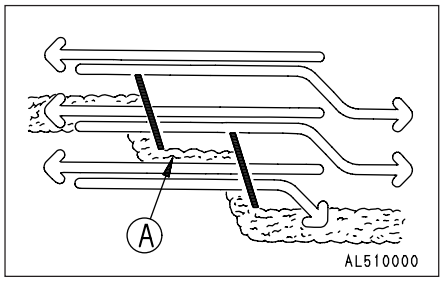


2. Operate the right blade lift cylinder and set the blade to the depth of the ditch.

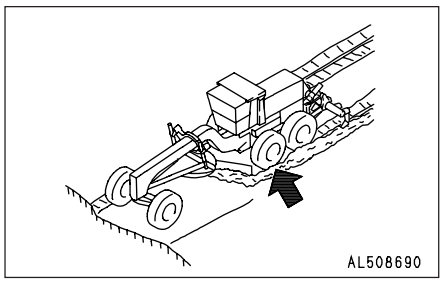


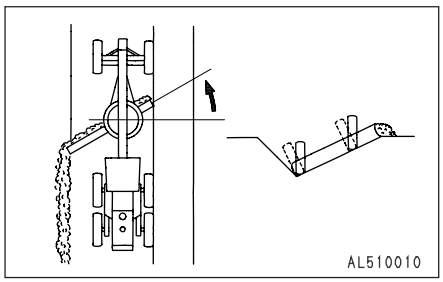
3. Be careful not to let the rear left wheel run over windrow Ⓐ formed by the blade.
   Operate the blade lift cylinder and blade rotation to set so that the windrow is pushed to the outside of the rear left wheel.

4. Lean the front wheels slightly to the left.



5. Move the earth piled up on the road shoulder away from the ditch and spread it.

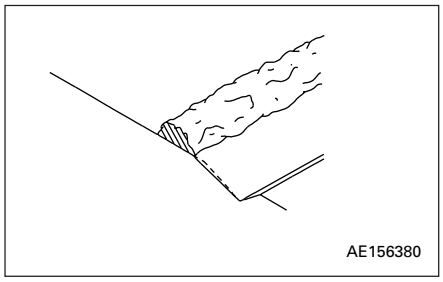




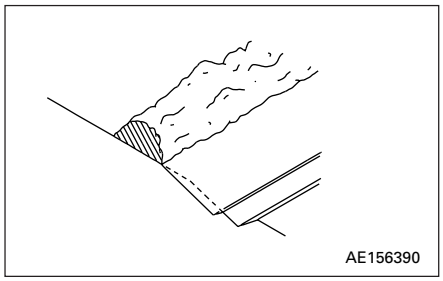
12.11.11 CONSTRUCTING ROAD - METHOD FOR MAKING FLAT-BOTTOMED DITCH

The procedure shown in the diagrams is for one side of the road. Repeat the same operation on the opposite side of the road.

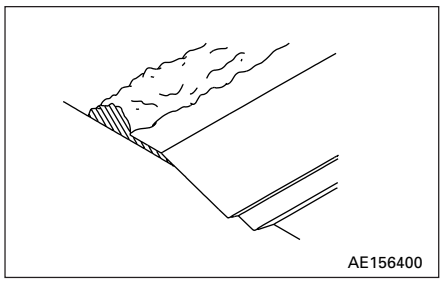
1. Make the slope face on the inside flat.



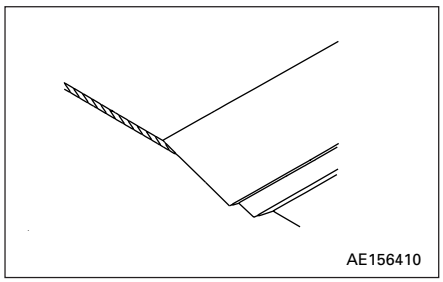
2. Dig the width and depth of the bottom of the ditch with the left ditching method.



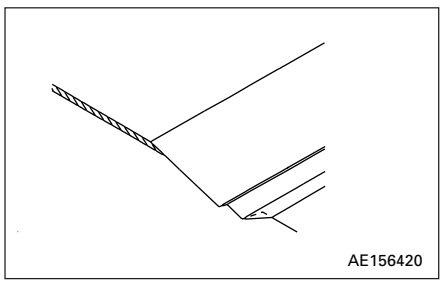
3. Finish the road shoulder.



4. Spread the soil to the center.



5. Finish the slope face on the bank.

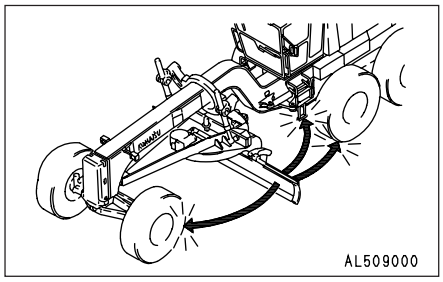


12.12.3 CAUTIONS IN OPERATION OF WORK EQUIPMENT

When operating the work equipment control lever, always pay careful attention to the movement of the work equipment and do not move it more than necessary as the work equipment or the hydraulic cylinder may hit and damage other parts.

When the work equipment is operated, special attention should be given to avoiding contact between the following parts.

- Front wheel and blade
- Rear wheel and blade
- Blade and step

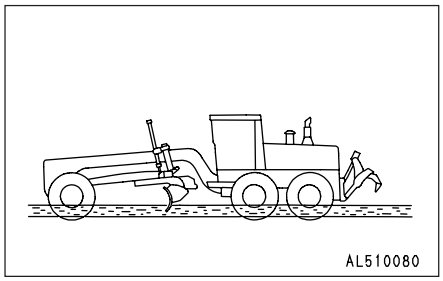


12.12.4 PERMISSIBLE WATER DEPTH

When crossing rivers, do not operate the machine in places where the water is above the permissible depth (up to the bottom face of the tandem case).

Raise the work equipment (blade, ripper) to the maximum height. After crossing the river, check the effect of the brakes, and if necessary clean or dry them.

Wash the work equipment carefully and carry out greasing thoroughly for greasing points that went under water.



12.21.2 FEATURES OF BLADE FLOAT

Ease of operation

- Unnecessary to operate blade
- Operating skill not needed (need is reduced)

Safety, protection

- Shock reduced
- Buried object protected)blade moves away when mounting projecting objects)
- The work equipment is protected (the impact load is reduced).

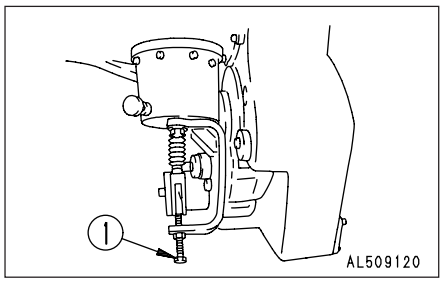
Improvement in ease of steering

- Easy steering when operating on curves
- Reduced side slippage when operating on curves
- Easy steering when using leaning
- Reduced side slippage when using leaning
- No loss of control of front wheels (front wheels floating, safety)

Improvement in ease operation

- Good blade pushing
- Good blade escape
- Priority system for lever control

16.3.3 RELEASING PARKING BRAKE



⚠ WARNING

Stop the machine on a flat surface when releasing the parking brake, and check that the surroundings are safe. In emergencies or when the parking brake must be released on a hill, block the tires carefully before releasing the brake.

If the pressure in the air tank drops below 2.4 kg/cm^2, the parking brake is applied automatically. Therefore, when towing the machine, release the parking brake as follows.

- Turn bolt ① and the parking brake will be released.

Towing machine without emergency steering

⚠ WARNING

When the engine is stopped, it is impossible to steer the machine, and this may lead to personal injury. If the engine should stop during operations, immediately apply the service brake and stop the machine.

The standard steering works only when the engine is running.

Towing machines with emergency steering

⚠ WARNING

Never operate the electrical motor for the emergency steering for more than 30 seconds.
If the machine battery cells are not functioning, the emergency steering cannot display its capacity.

This mechanism works to prevent steering failure caused by a breakdown of the engine or hydraulic pump while the machine is being operated.

If the oil pressure in the steering hydraulic circuit drops below (0.69 MPa (7 kgf/cm^2, 99.4 PSI), the hydraulic switch is turned on, and the electrical motor is actuated to turn the hydraulic pump and enable steering to be carried out.

If the machine is traveling at a speed of less than 1 km/h, or if the machine is stopped, the emergency steering device automatically stops.

ENGINE continued (16.5.3)

Problem	Main causes	Remedy
Exhaust gas is white or blue	● Too much oil in oil pan ● Lack of fuel ● Improper fuel	● Add oil to specified level. For details, see CHECK BEFORE STARTING. ● Add fuel. For details, see CHECK BEFORE STARTING. ● Change to specified fuel.
Exhaust gas occasionally turns black	● Clogged air cleaner element ● Defective nozzle ● Defective compression ● Defective turbocharger	● Clean or replace. For details, see WHEN REQUIRED. (● Replace nozzle) (● Adjust valve clearance) (● Clean or replace the turbocharger)
Combustion noise occasionally makes breathing sound	● Defective nozzle	(● Replace nozzle)
Abnormal noise generated (combustion or mechanical)	● Low grade fuel being used ● Overheating ● Damage inside muffler ● Excessive valve clearance	● Change to specified fuel. ● See item “Machine monitor, engine oil pressure lamp flash when engine is running”. (● Replace muffler) (● Adjust valve clearance)

REMARK

- When fuel sulphur content is less than 0.5%, change oil in the oil pan every periodic maintenance hours described in this manual.
  Change oil according to the following table if fuel sulphur content is above 0.5%.

Fuel sulphur content	Change interval of oil in engine oil pan
0.5 to 1.0%	1/2 of regular interval
Above 1.0%	1/4 of regular interval

- When starting the engine in an atmospheric temperature of lower than 0˚C, be sure to use engine oil of SAE10W, SAE10W-30 and SAE15W-40, even though an atmospheric temperature goes up to 10°C more or less in the day time.

- Use API classification CD as engine oil and if API classification CC, reduce the engine oil change interval to half.

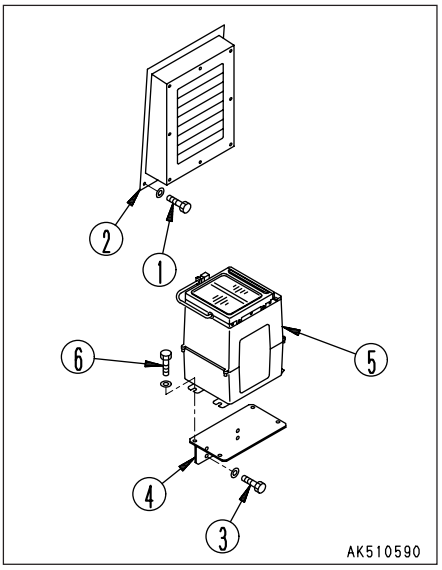
- There is no problem if single grade oil is mixed with multigrade oil (SAE10W-30, 15W-40), but be sure to add single grade oil that matches the temperature in the table.

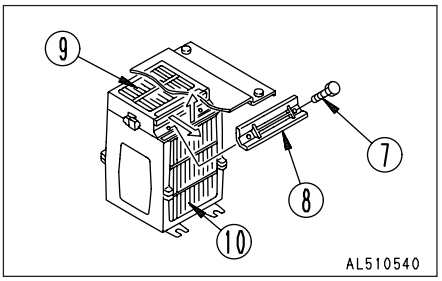
- We recommend Komatsu genuine oil which has been specifically formulated and approved for use in engine and hydraulic work equipment applications.

Specified capacity: Total amount of oil including oil for components and oil in piping.
Refill capacity: Amount of oil needed to refill system during normal inspection and maintenance.

ASTM: American Society of Testing and Material
SAE: Society of Automotive Engineers
API: American Petroleum Institute

24.2.5 CLEAN ELEMENT OF AIR CONDITIONER RECIRCULATION AIR FILTER





⚠ WARNING

When using pressure air to clean the element wear safety glasses or goggles to protect your eyes.

NOTICE

When bracket ④ is removed using bolt ③, the balance of unit ⑤ will be lost. Be careful not to let unit ⑤ fall off or cause damage to the wiring.

1. Loosen bolt ① and remove cover ②.
2. Loosen bolt ③ and pull out bracket ④.
3. Loosen bolt ⑥ and remove air conditioner unit ⑤.
4. Loosen bolt ⑦ and remove cover ⑧.
5. Pull filter ⑨ out to the side and filter ⑩ out to the top.
6. Clean the filter with compressed air in the same way as the fresh air filter.
   If the filter is extremely dirty, rinse it in water. After rinsing it in water, dry it thoroughly before assembling again.

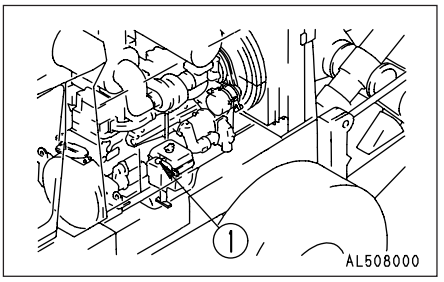
Method of cleaning filter

Direct dry compressed air (less than 0.69 MPa (7 kgf/cm^2, 99.4 PSI)) to the element from inside along its folds, then direct it from outside along its folds and again from inside.

24.3.7 HAVE ANY DEFECTS WHICH WERE FOUND DURING THE PREVIOUS DAY'S OPERATION BEEN CORRECTED?

24.3.8 CHECK AND REFILL WITH WINDOW WASHING FLUID

If the washer fluid level is low, and fluid through cap ①.

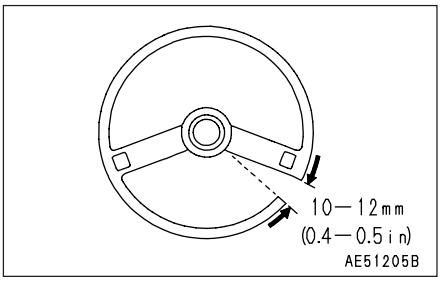


24.3.9 CHECK AND ADJUST STEERING WHEEL

Start the engine and check the steering wheel play.

Standard: 10 – 12 mm (0.4 – 0.5 in) maximum

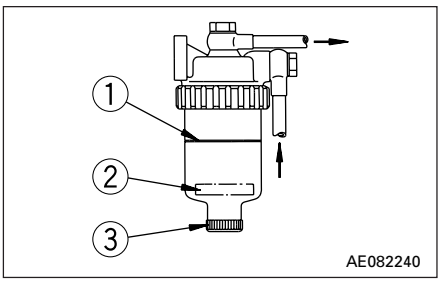
If the steering wheel play is out of the standard range or the steering wheel waves normally or is abnormally heavy, ask your Komatsu distributor for repairs.



24.3.10 CHECK FOR WATER AND SEDIMENT IN WATER SEPARATOR, DRAIN WATER

The water separator separates water mixed in the fuel. If float ② is at or above red line ①, drain the water according to the following procedure:

1. Loosen drain plug ③ and drain the accumulated water until the float reaches the bottom.
2. Tighten drain plug ③.
3. If the air is sucked into fuel line when draining the water, be sure to bleed air in the same manner as for the fuel filter. See "24.6 EVERY 500 HOURS SERVICE".



24.5.7 CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE

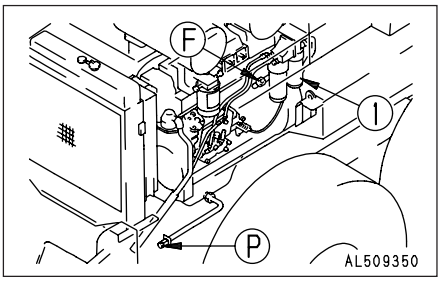
⚠ WARNING

The oil is at high temperature after the engine has been operated, so never change the oil immediately after finishing operations. Wait for the oil to cool down before changing it.

Prepare the followings.
- Container to catch drained oil: Min 34ℓ capacity
- Refill capacity: 34 ℓ (8.98 US gal, 7.48 UK gal)
- Filter wrench

1. Open the engine side cover on the right side of the chassis.

2. Open oil filler Ⓕ.



3. Set a container to catch the oil directly under drain plug Ⓟ under the chassis.

4. Loosen drain plug Ⓟ, and drain the oil.

5. Check the drained oil, and if there are excessive metal particles or foreign material, please contact your Komatsu distributor.

6. Install drain plug Ⓟ.

7. Using a filter wrench, turn filter cartridge ① counterclockwise to remove it.
   In particular, if this operation is carried out immediately after stopping the engine, a large amount of oil will come out, so wait for 10 minutes before starting the operation.

8. Clean the filter holder, coat the packing surface of a new filter cartridge with engine oil (or coat it thinly with grease), then install it to the filter holder.

9. When installing, tighten until the packing surface contacts the seal surface of the filter holder, then tighten it up 3/4 to 1 of a turn.

24.6.2 CLEAN, CHECK RADIATOR FINS

⚠ WARNING

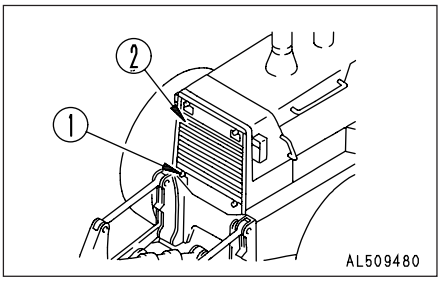
If compressed air, steam, or water hit your body directly, there is danger of injury. Always wear protective glasses, mask, and safety shoes.
When cleaning, use a maximum pressure of less than 0.2 MPa (2.0 kgf/cm², 28.4 PSI).

Clean the radiator fins if any mud or dirt is stuck to the radiator.

1. Remove bolts ① and panel ②.

2. Clean the radiator fins clogged with mud, dust and leaves with compressed air. Steam or water may be used instead of compressed air.

3. Check the rubber hoses. If the hose is found to have cracks to be hardened by ageing, replace such hoses with new ones.



24.7.4 CHANGE OIL IN FINAL DRIVE CASE, CLEAN STRAINER

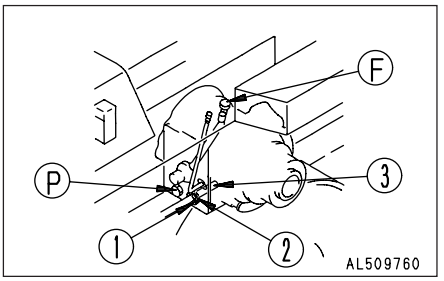
⚠ WARNING

The oil is at high temperature immediately after the machine has been operated. Wait for the oil to cool down before starting the operation.

Prepare the following.
- Container to catch drained oil: Min. 57 ℓ (15.05 US gal, 12.54 UK gal) capacity
- Refill capacity: 57 ℓ (15.05 US gal, 12.54 UK gal)

1. Remove the under cover and set a container under the final drive case to catch the oil.

2. To prevent getting oil on yourself, loosen drain plug Ⓟ and drain the oil.
   To prevent the oil from spurting out, loosen drain plug Ⓟ, then gradually remove it.



3. After draining the oil, tighten drain plug Ⓟ.
   Tightening torque: 58.8 – 78.5 N·m
   (6 – 8 kgf·m, 43.4 – 57.9 lbft)

4. Remove 4 bolts ①, then remove cover ② and take out strainer ③.

5. Remove all the dirt stuck to strainer ③, then wash it in clean diesel oil or flushing oil. If strainer ③ is damaged, replace it with a new part.

6. After washing strainer ③, install it, then install cover ② with bolts ①.

7. Refill the specified quantity of engine oil through oil filler Ⓕ.

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

8. After refilling, check that the oil is at the specified level. For details, see “24.5 EVERY 250 HOURS SERVICE”.

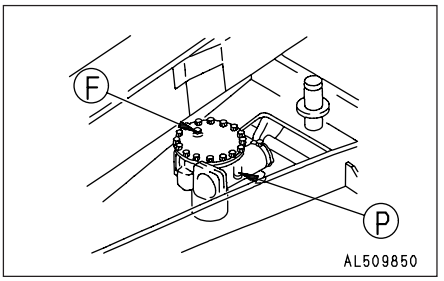
9. Check for oil leakage from the final drive case.

24.8.3 CHANGE OIL IN CIRCLE REVERSE GEAR CASE

⚠ WARNING

The oil is at high temperature immediately after the machine has been operated. Wait for the oil to cool down before starting the operation.

For gear case
Prepare the following.
- Container to catch drained oil: Min. 8 ℓ (2.11 US gal, 1.76 UK gal) capacity
- Refill capacity: 8 ℓ (2.11 US gal, 1.76 UK gal)



1. Set the container under drain plug Ⓟ to catch the oil.
2. Remove drain plug Ⓟ and drain the oil.
3. After draining the oil, clean drain plug Ⓟ and install it again.
4. Remove oil filler plug Ⓕ and add gear oil to the specified level.

   For details of the oil to use, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
5. Check that the oil is at the specified level.

   For details, see "24.5 EVERY 250 HOURS SERVICE".
6. Install oil filler plug Ⓟ.

NOTICE
There may be wear particles in the oil, but there is no problem using the oil as it is.