Operation & Maintenance Manual

SEAM034800

PC28UU-2

HYDRAULIC EXCAVATOR

SERIAL NUMBERS PC28UU-11295 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

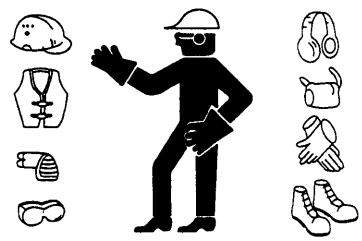
- ONLY trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
- When working with another operator or a person on worksite traffic duty, be sure all personnel understand all hand signals that are to be used.

SAFETY FEATURES

- Be sure all guards and covers are in their proper position. Have guards and covers repaired if damaged.
- Use safety features such as safety lock properly.
- NEVER remove any safety features. ALWAYS keep them in good operating condition.
  Safety lever → See "12.12 PARKING MACHINE".
- Improper use of safety features could result in serious bodily injury or death.

CLOTHING AND PERSONAL PROTECTIVE ITEMS

- Avoid loose clothing, jewelry, and loose long hair. They can catch on controls or in moving parts and cause serious injury or death. Also, do not wear oily clothes because they are flammable.
- Wear a hard hat, safety glasses, safety shoes, mask or gloves when operating or maintaining the machine. Always wear safety goggles, hard hat and heavy gloves if your job involves scattering metal chips or minute materials - this is so particularly when driving pins with a hammer and when cleaning the air cleaner element with compressed air.
  Check also that there is no one near the machine.
  Driving in pins → See "12.18 REPLACEMENT OF BUCKET".
  Cleaning of air cleaner element → See "24.2 WHEN REQUIRED" in service procedure.



DO NOT HIT WORK EQUIPMENT

- When working in places where there are height limits, such as in tunnels, under bridges, under electric cables, or in garages, be extremely careful not to hit the boom or arm.

ENSURE GOOD VISIBILITY

- When working in dark places, install working lamps and head lamps, and set up lighting in the work area if necessary.
- Stop operations if the visibility is poor, such as in mist, snow, or rain, and wait for the weather to improve to a condition that allows the operation to be carried out safely.

OPERATE CAREFULLY ON SNOW

- When working on snow or icy roads, even a slight slope may cause the machine to slip to the side, so always travel at low speed and avoid sudden starting, stopping, or turning.
- When there has been heavy snow, the road shoulder and objects placed beside the road are buried in the snow and cannot be seen, so always carry out snow-clearing operations carefully.

WORKING ON LOOSE GROUND

- Avoid operating your machine too close to the edge of cliffs, overhangs, and deep ditches. If these areas collapse, your machine could fall or tip over and result in serious injury or death. Remember that the soil after heavy rain or blasting is weakened in these areas.
- Earth laid on the ground and the soil near ditches are loose. They can collapse under the weight or vibration of your machine.
- Install the HEAD GUARD if working in areas where there is danger of falling rocks and dirt.

PRECAUTIONS WHEN CARRYING OUT MAINTENANCE AT HIGH TEMPERATURE OR HIGH PRESSURE

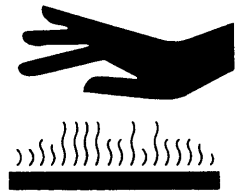
- Immediately after stopping operations, the engine cooling water and oil at all parts is at high temperature and under high pressure.
  In this condition, if the cap is removed, or the oil or water are drained, or the filters are replaced, this may result in burns or other injury. Wait for the temperature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

  Cleaning inside or cooling system → see "24.2 WHEN REQUIRED".

  Checking cooling water level, oil level in hydraulic tank → see "24.3 CHECK BEFORE STARTING".

  Checking lubricating oil level → see "24.3 CHECK BEFORE STARTING".

  Changing oil, replacing filters → see "24.5 - 8 PERIODIC MAINTENANCE".



PRECAUTIONS WHEN USING HIGH PRESSURE GREASE TO ADJUST TRACK TENSION

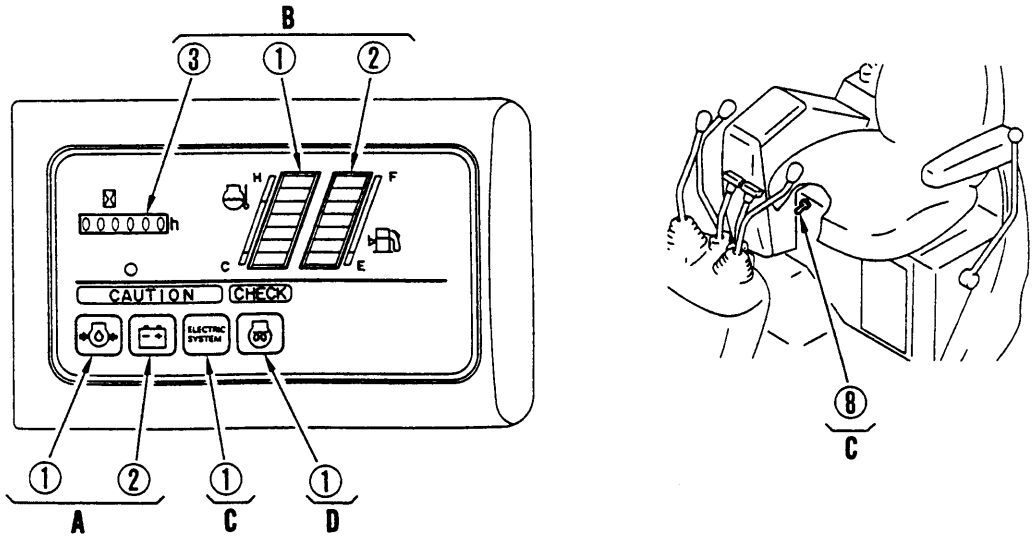
Grease is pumped into the track tension adjustment system under high pressure.
If the specified procedure for maintenance is not followed when making adjustments, the plug or grease fitting may fly out and cause damage or personal injury.

- When loosening the grease drain plug, never loosen it more than one turn.
- Never put your face, hands, feet, or any other part of your body directly in front of any grease drain plug or valve.

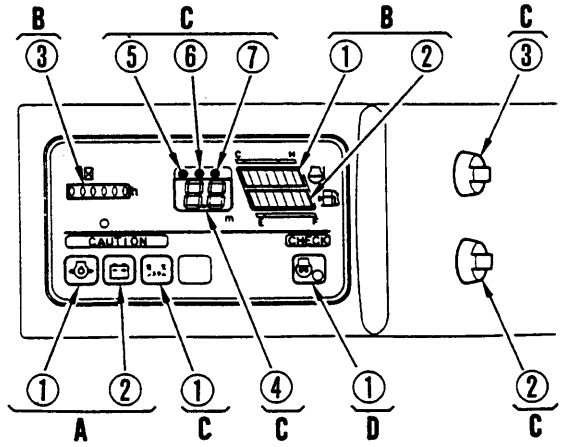
  Adjusting track tension → see "24.2 WHEN REQUIRED".

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.



(Panel with automatic control system for work equipment (if equipped))



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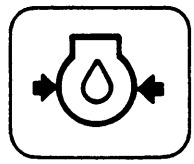
11.1.1 A EMERGENCY STOP ITEM

⚠ CAUTION

If the monitor flashes, stop the engine immediately and carry out the following action.



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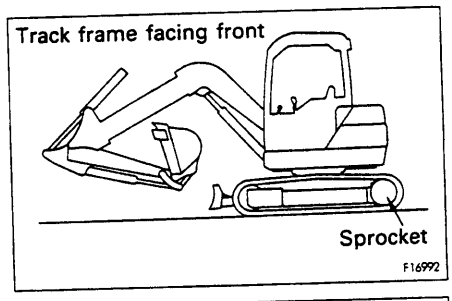
1. ENGINE OIL PRESSURE

This lamp flashes if the engine lubricating oil pressure drops below the normal value. If it flashes, stop the engine and check the condition. For details, see "16.5 OTHER TROUBLE".

REMARK

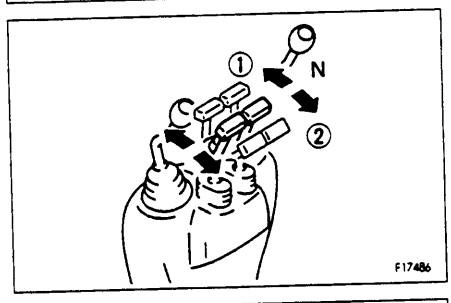
When the engine is stopped, and the starting switch is turned to the ON position, this lamp lights up, but it does not indicate an abnormality.

7. TRAVEL LEVERS



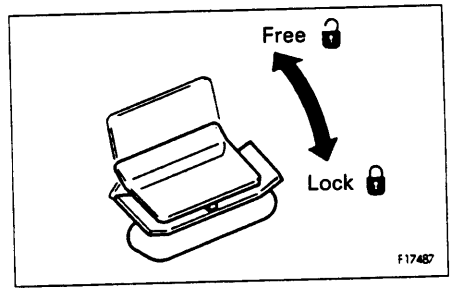
⚠ WARNING

When the track frame is facing the rear, the direction of the travel operation is reversed.
Before operating the travel lever, check if the track frame is facing the front or the rear.
(The track frame is facing the front if the sprocket is at the rear.)



① FORWARD:
The lever is pushed forward
② REVERSE:
The lever is pulled back
N (Neutral): The machine stops

8. PEDAL LOCK (FOR BOOM OFFSET CONTROL PEDAL)



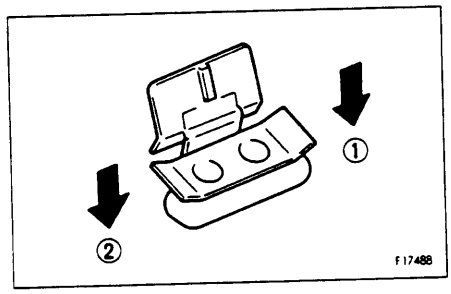
⚠ WARNING

When not operating the boom offset, always keep it locked with the pedal lock.
If the control pedal is not locked and it is touched by mistake, it may lead to a serious accident.

This locks the boom offset control pedal.
The pedal is locked by fitting the plate over the pedal.

9. BOOM OFFSET CONTROL PEDAL

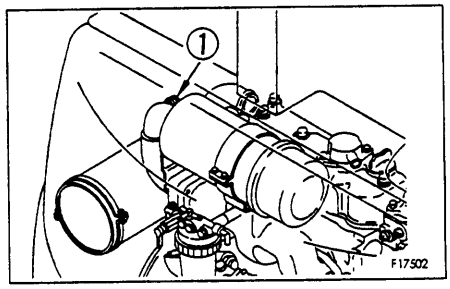
This pedal offsets the boom to the left or right.



① Right offset
② Left offset

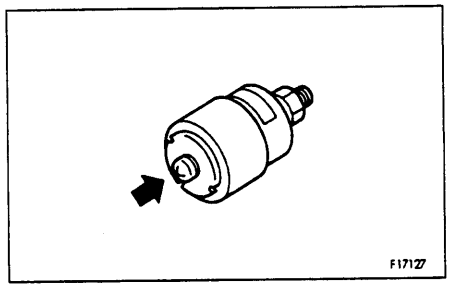
CHECK DUST INDICATOR

1. Open the engine hood and check that the red piston is not showing in dust indicator ①.



2. If the red piston has appeared, clean or replace the element immediately.
   For details of the method of cleaning the element, see "24.2.1 CHECK, CLEAN AND REPLACE AIR CLEANER ELEMENT".

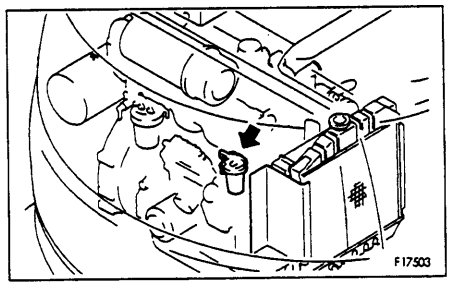
3. After checking, cleaning, and replacing, press the knob of dust indicator ① to return the red piston to its original position.



CHECK WATER SEPARATOR

If red ring ① of the water separator is at the bottom of case ②, there is no water.

If red ring ① is floating, there is water up to the bottom of the ring, so drain the water as follows.



- Use a water separator filter wrench.

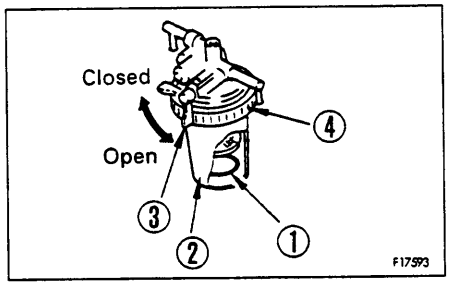
1. Open the engine hood, and set handle ③ to the CLOSED position.

2. Using the filter wrench, loosen ring ④, then remove case ② and throw out the water inside it.

3. Set case ② in position, then tighten ring ④ to install it.

4. Set handle ③ to the OPEN position.

5. Install grease gun holder ④ and fit grease gun ③ to it.



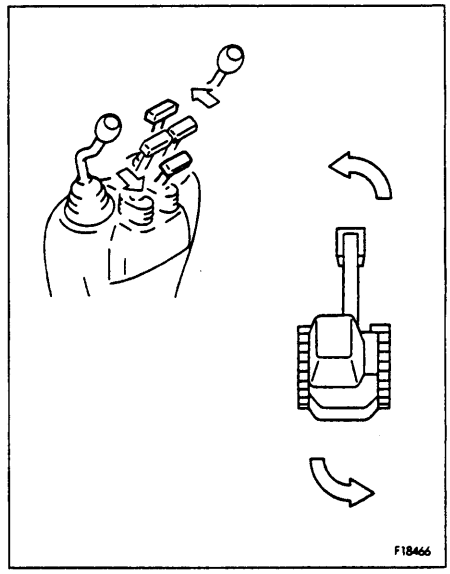
6. Drain any water or sediment from the fuel tank. For details, see "24.2 WHEN REQUIRED".

When making counter-rotation turn (spin turn)

When turning left using counter-rotation, pull the left travel lever back and push the right travel lever forward.

REMARK

When turning right using counter-rotation, pull the right travel lever back and push the left travel lever forward.



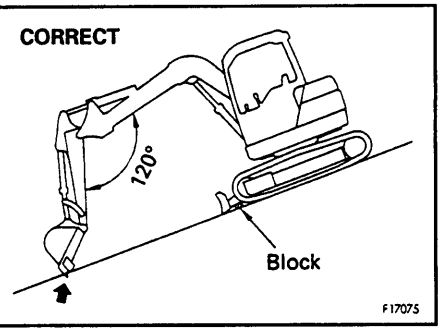
12.12 PARKING MACHINE

⚠ CAUTION

Avoid stopping suddenly. Give yourself ample room when stopping.

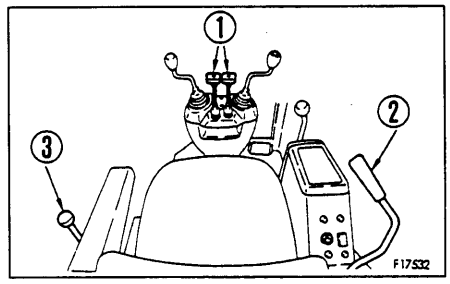
⚠ WARNING

When stopping the machine, select flat hard ground and avoid dangerous places. If it is unavoidably necessary to park the machine on a slope, insert blocks underneath the track shoes. As an additional safety measure, thrust the bucket into the ground.

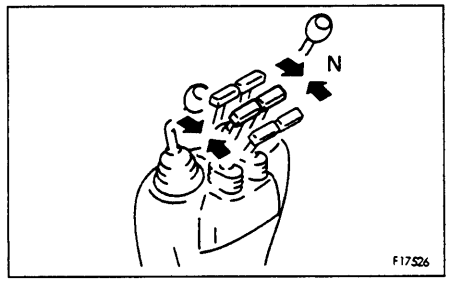


⚠ WARNING

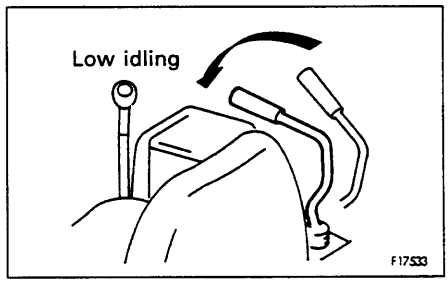
If the control lever is touched by accident, the work equipment or the machine may move suddenly, and this may lead to a serious accident. Before leaving the operator's compartment, always apply the lock securely.



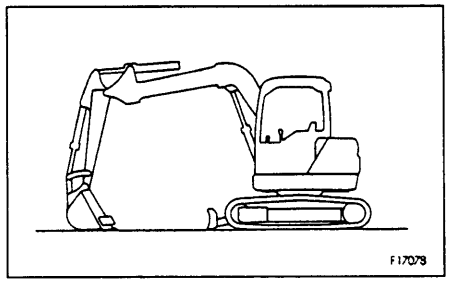
1. Put left and right travel levers ① in the neutral position.



2. Lower the engine speed to low idling by fuel control lever ②.

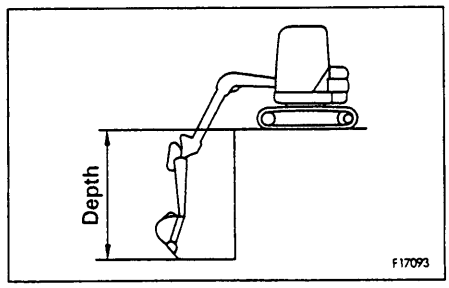


3. Lower the bucket horizontally until the bottom touches the ground.
4. Lower the blade to the ground.

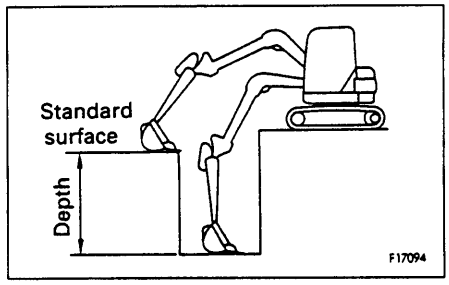


12.19.2 HANDLING AUTOMATIC CONTROL DEVICE

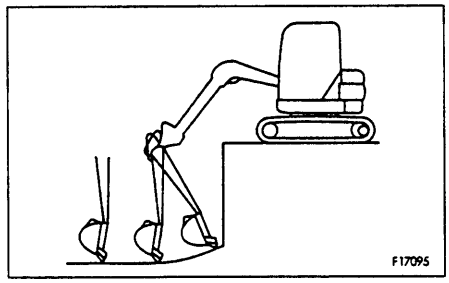
Depth display: This displays the depth from the ground surface.



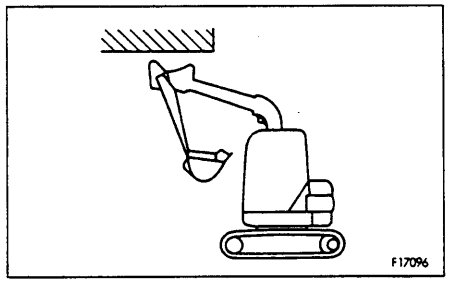
Depth display 0 set mode: This displays the depth from the standard surface.



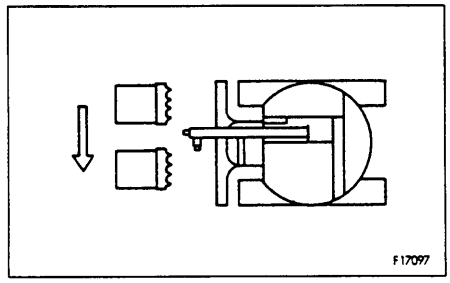
Depth mode: This sets the amount the boom can be lowered.



Height mode: This sets the amount the boom can be raised.



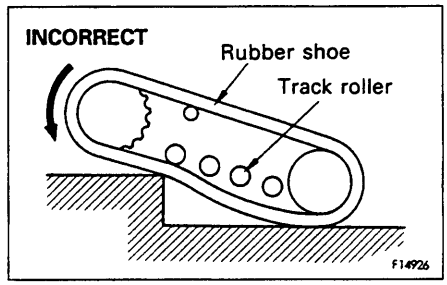
Offset mode: This determines the left offset position for operations such as ditch digging.



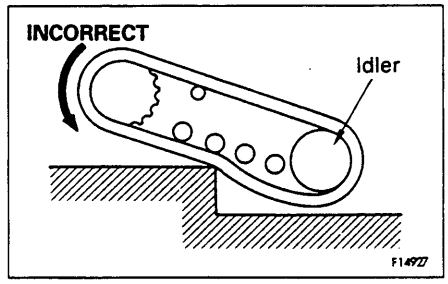
It is possible to set either the depth display or depth display 0 set mode together with the other three modes, so use these settings to match the operation.

(Mechanism of rubber shoe coming off track)

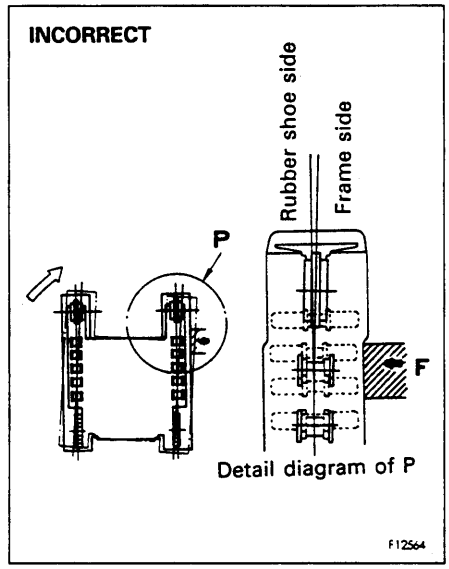
1) When traveling over an obstacle, a gap is formed between the track roller and the rubber shoe.
   In this condition, the rubber shoe may come off.



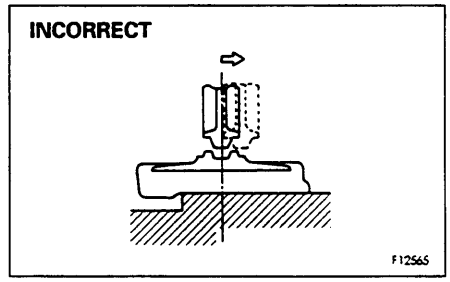
2) If the machine travels further in reverse, a gap is formed among the track roller, idler and the rubber shoe.



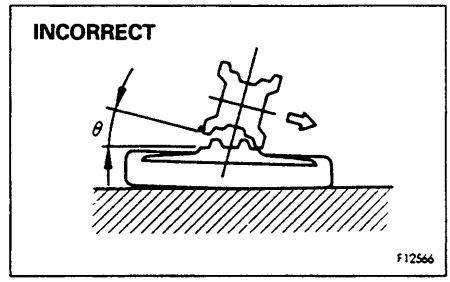
- When turning in a condition where the rubber shoe cannot move to the side because of the object it is passing over, or because of some other object.
- When the idler or track roller are out of alignment with the core because of movement of the rubber shoe out of alignment.



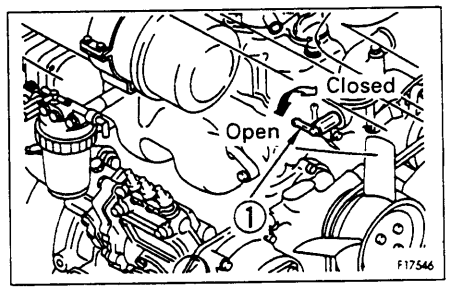
- If the machine travels in reverse in this condition, the rubber shoe will come off.



- If the machine is turned in this condition, the rubber shoe will come off.



14.3 PREPARING THE CAB HEATER (if equipped)



If the ambient temperature drops, use the cab heater.

- When using the cab heater, turn valve ① on the water manifold counterclockwise to open it.
- When leaving the cab heater unused for a long time, turn valve ① clockwise to close it.

14.4 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.

16.5 OTHER TROUBLE

16.5.1 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 high 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		
Charge lamp does not go out even when engine is running	• Blown fuse • Defective alternator • Defective wiring	• Replace (• Replace) (• Check, repair)
Abnormal noise is generated from alternator	• Defective alternator	(• Replace)
Starting motor does not turn when starting switch is turned to ON	• Blown fuse • Defective wiring • Insufficient battery charge	• Replace (• 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
Pre-heating monitor does not light	• Defective wiring • Defective monitor	(• Check, repair) (• Replace)
Oil pressure monitor does not light up when engine is stopped (starting switch at ON position)	• Defective monitor • Defective oil pressure switch	(• Replace) (• Replace)

18.1.2 FUEL

- The fuel pump is a precision instrument, and if fuel containing water or dirt is used, it cannot work properly.
- Be extremely careful not to let impurities get in when storing or adding fuel.
- Always use the fuel specified in the Operation and Maintenance Manual.
  Fuel may congeal depending on the temperature when it is used (particularly in low temperature below –15°C (5°F)), so it is necessary to change to a fuel that matches the temperature.
- To prevent the moisture in the air from condensing and forming water inside the fuel tank, always fill the fuel tank after completing the day's work.
- Before starting the engine, or when 10 minutes have passed after adding fuel, drain the sediment and water from the fuel tank.
- If the engine runs out of fuel, or if the filters have been replaced, it is necessary to bleed the air from the circuit.

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 inflammable, 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 WHEN REQUIRED".
- 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.

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 critical parts.

- Use a permanent type of antifreeze.
  If, for some reason, it is impossible to use permanent type antifreeze, use an antifreeze containing ethylene glycol.

- Stop the machine on level ground when cleaning or changing the coolant.

- To restrict the formation of rust and scale in hard water areas, add Komatsu genuine corrosion resistant KI (powder) to the cooling water.
  Never use commercial available anti-corrosive agents (made by Fleetguard, etc.).

- When deciding the ratio of antifreeze to water, check the lowest temperature in the past, and decide from the mixing rate table given below.
  It is actually better to estimate a temperature about 10°C lower when deciding the mixing rate.

Mixing rate of water and antifreeze

Min. atmospheric temperature	°C	–10	–15	–20	–25
	°F	14	5	–4	–13
Amount of antifreeze	ℓ	1.16	1.39	1.58	1.77
	US gal	0.31	0.37	0.42	0.47
	UK gal	0.26	0.31	0.35	0.39
Amount of water	ℓ	2.69	2.46	2.27	2.08
	US gal	0.71	0.65	0.60	0.55
	UK gal	0.59	0.54	0.50	0.46

⚠ WARNING

Anfifreeze is flammable, so keep it away from any flame.

- We recommend use of an antifreeze density gauge to control the mixing proportions.

- Use city water for the cooling water.
  If river water, well water or other such water supply must be used, contact your Komatsu distributor.

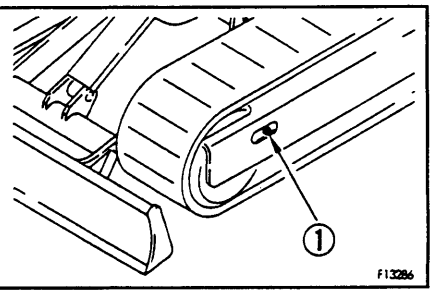
⚠ WARNING

When removing drain plug, avoid pouring coolant on yourself.

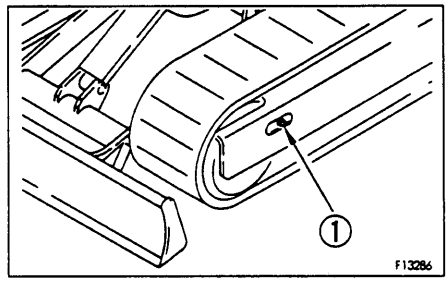
Adjustment

⚠ WARNING

Grease inside the adjusting mechanism is under high pressure. Grease coming from lubricator ① under pressure can penetrate the body causing injury or death. For this reason, do not loosen lubricator ① more than one turn. Do not loosen any part other than lubricator ①.
If the track tension is not relieved by this procedure, please contact your Komatsu distributor.

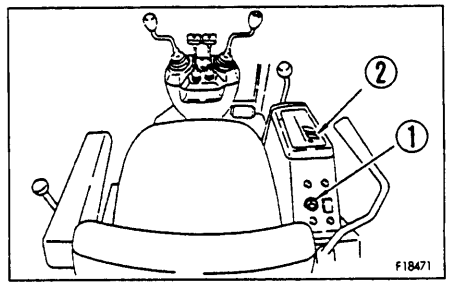


- **When increasing tension**
- Prepare a grease gun



1. Pump in grease through lubricator ① with a grease gun.
2. To check that the correct tension has been achieved, move the machine backwards and forwards.
3. Check the track tension again, and if the tension is not correct, adjust it again.
4. If the tension is yet loose after applying pressurized injection of grease, it is necessary to replace the rubber shoes or seal inside of cylinder. Consult your Komatsu distributor for repair.

24.3.3 CHECK FUEL LEVEL



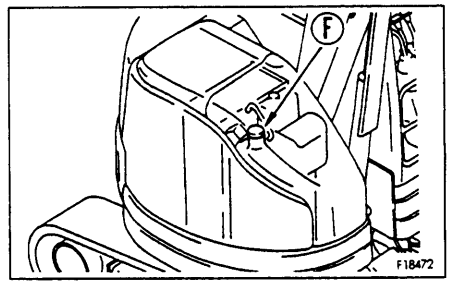
⚠ WARNING

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

1. Insert the key in starting switch ①, and turn it to the ON position to light up the monitor.
2. Check the fuel level on fuel gauge ②. If the fuel level is low, add fuel through fuel filler port Ⓕ.

   Fuel capacity: 35 ℓ (9.42 US gal, 7.70 UK gal)

   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.



24.6 EVERY 500 HOURS SERVICE

Maintenance for every 100 and 250 hours should be carried out at the same time.

24.6.1 REPLACE FUEL FILTER CARTRIDGE

⚠ WARNING

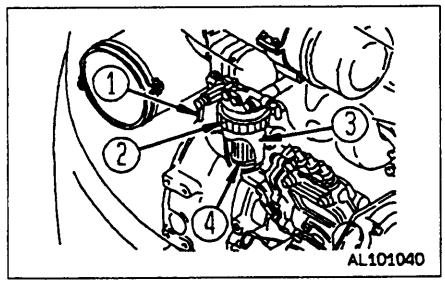
- **Engine is at high temperature immediately after the machine has been operated. Wait for engine to cool down before replacing the filter.**
- **Do not bring fire or sparks near the fuel.**

Prepare the following.
- Filter wrench for fuel filter element
- Container to catch drained oil

1. Set the container to catch the fuel under the filter element.

2. Close valve ① at the top of the filter.

3. Using the filter wrench, loosen ring ②, then remove element cup ③ and take out element ④.



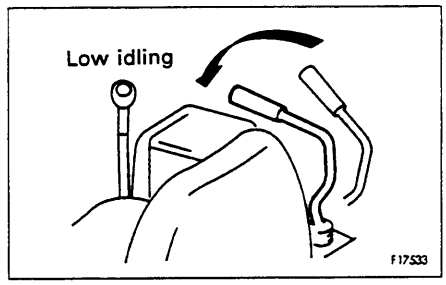
4. Wash element cup ③ in light oil or in a cleaning oil and install a new element.

REMARK

When replacing a fuel filter element, replace the filter O-ring at the same time.

4. Set the fuel control lever to the low idling position.

5. After replacing the fuel filter element bleed the air.



- Cab, rubber shoe specification machine
- Cab, steel shoe specification machine

The values without parenthese are the values for the rubber shoe specification machine.
The values inside parenthese are the values for the steel shoe specification machine.
If only one value is given, the value is the same for both the rubber shoe specification and steel shoe specification machines.