Operation & Maintenance Manual

SEAM009502T

PC40-7

HYDRAULIC EXCAVATOR

SERIAL NUMBERS PC40-24995 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

SAFETY

⚠ WARNING

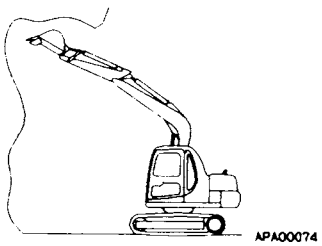
Read and follow all safety precautions. Failure to do so may result in serious injury or death.

This safety section also contains precautions for optional equipment and attachments.

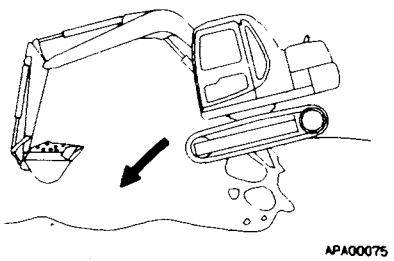
PROHIBITED OPERATIONS

- Do not dig the work face under an overhang. This may cause the overhang to collapse and fall on top of the machine.
- Do not carry out deep digging under the front of the machine. The ground under the machine may collapse and cause the machine to fall.

INCORRECT

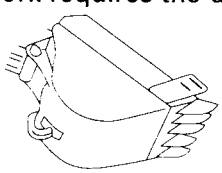


INCORRECT



IT IS PROHIBITED TO LIFT LOADS

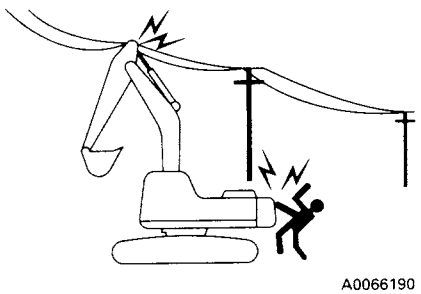
- It is prohibited to use this machine for lifting loads.
- It is permitted to use this machine only for pulling out steel plates, but this work requires the use of a special device.
  Lifting loads → See "12.9 PROHIBITIONS FOR OPERATION".



DO NOT GO CLOSE TO HIGH-VOLTAGE CABLES

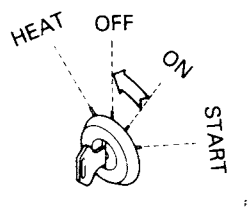
- Going close to high-voltage cables can cause electric shock. Always maintain the safe distance given below between the machine and the electric cable.
- The following actions are effective in preventing accidents.
  1) Wear shoes with rubber or leather soles.
  2) Use a signalman to give warning if the machine approaches too close to the electric cable.
- If the work equipment should touch the electric cable, the operator should not leave the operator's compartment.
- When carrying out operations near high voltage cables, do not let anyone come close to the machine.
- Check with the electricity company about the voltage of the cables before starting operations.

Voltage	Min. safety distance	
6.6 kV	3 m	10ft
33.0 kV	4 m	14ft
66.0 kV	5 m	17ft
154.0 kV	8 m	27ft
275.0 kV	10 m	33ft



STOP THE ENGINE BEFORE CARRYING OUT INSPECTION AND MAINTENANCE

- Always stop the machine on firm flat ground and stop the engine before carrying out inspection and maintenance.
- If it is necessary to run the engine when carrying out maintenance, such as when cleaning the inside of the radiator, place the safety lock lever at the LOCK position and carry out the operation with two workers.
- One worker should sit in the operator's seat so that he can stop the engine immediately if necessary. He should also be extremely careful not to touch any lever by mistake. Touch the levers only when they have to be operated.
- The worker carrying out the maintenance should be extremely careful not to touch or get caught in the moving parts.



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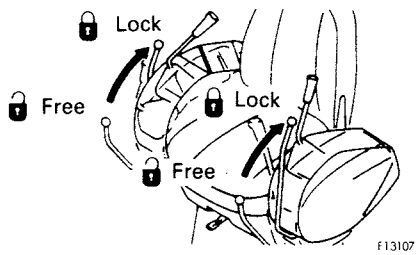

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RULES TO FOLLOW WHEN ADDING FUEL OR OIL

- Keep away from flame when filling with fuel or oil.
- Spilled fuel and oil may cause you to slip, so always wipe it up immediately.
- Always tighten the cap of the fuel and oil fillers securely.
- Never use fuel for washing any parts.
- Always add fuel and oil in a well-ventilated place.


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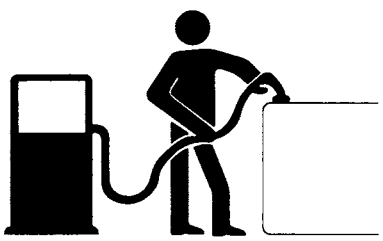
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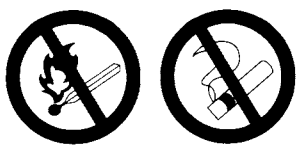
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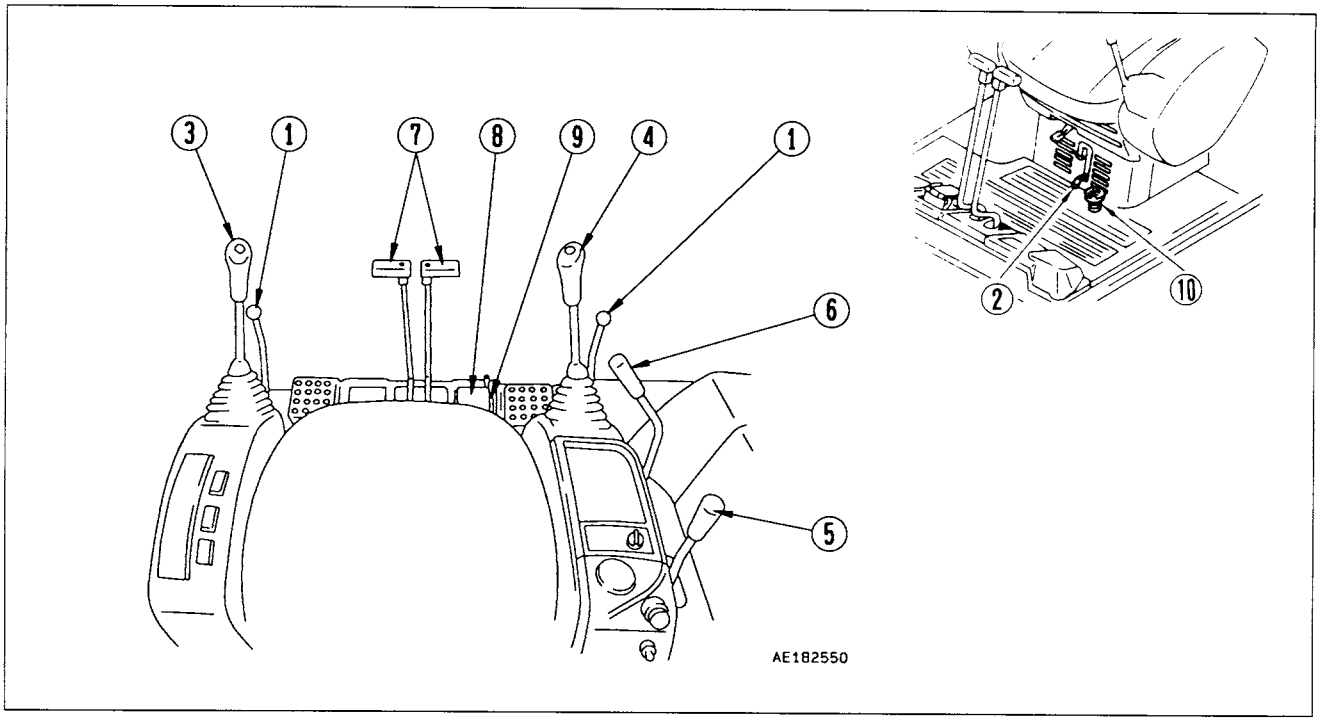
OPERATION

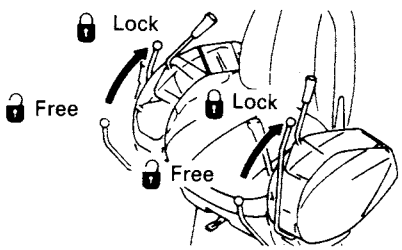
11.3 CONTROL LEVERS AND PEDALS



1. LOCK LEVER (FOR LEFT AND RIGHT WORK EQUIPMENT LEVERS AND TRAVEL LEVERS)

⚠ WARNING

- **When leaving the operator's compartment, set the safety lever securely to the LOCK position. If the gear shift lever is not locked, and it is touched by mistake, this may lead to a serious accident.**
- **If the safety lever is not placed securely in the LOCK position, the control lever may not be properly locked. Check that the situation is as shown in the diagram.**

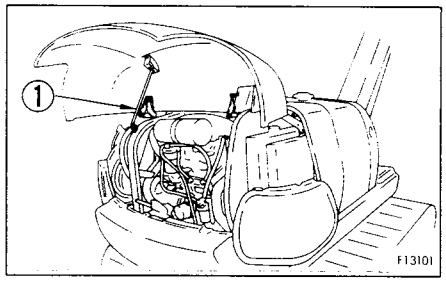


⚠ WARNING

- **Even when the lock lever is in the lock position, it does not lock the blade and boom swing.**
- **When pulling the lock lever up, be careful not to touch the work equipment control lever. If the lock lever is not pulled up fully, there is danger that the work equipment or swing may move.**

12. OPERATION

12.1 CHECK BEFORE STARTING ENGINE



12.1.1 WALK-AROUND CHECK

⚠ WARNING

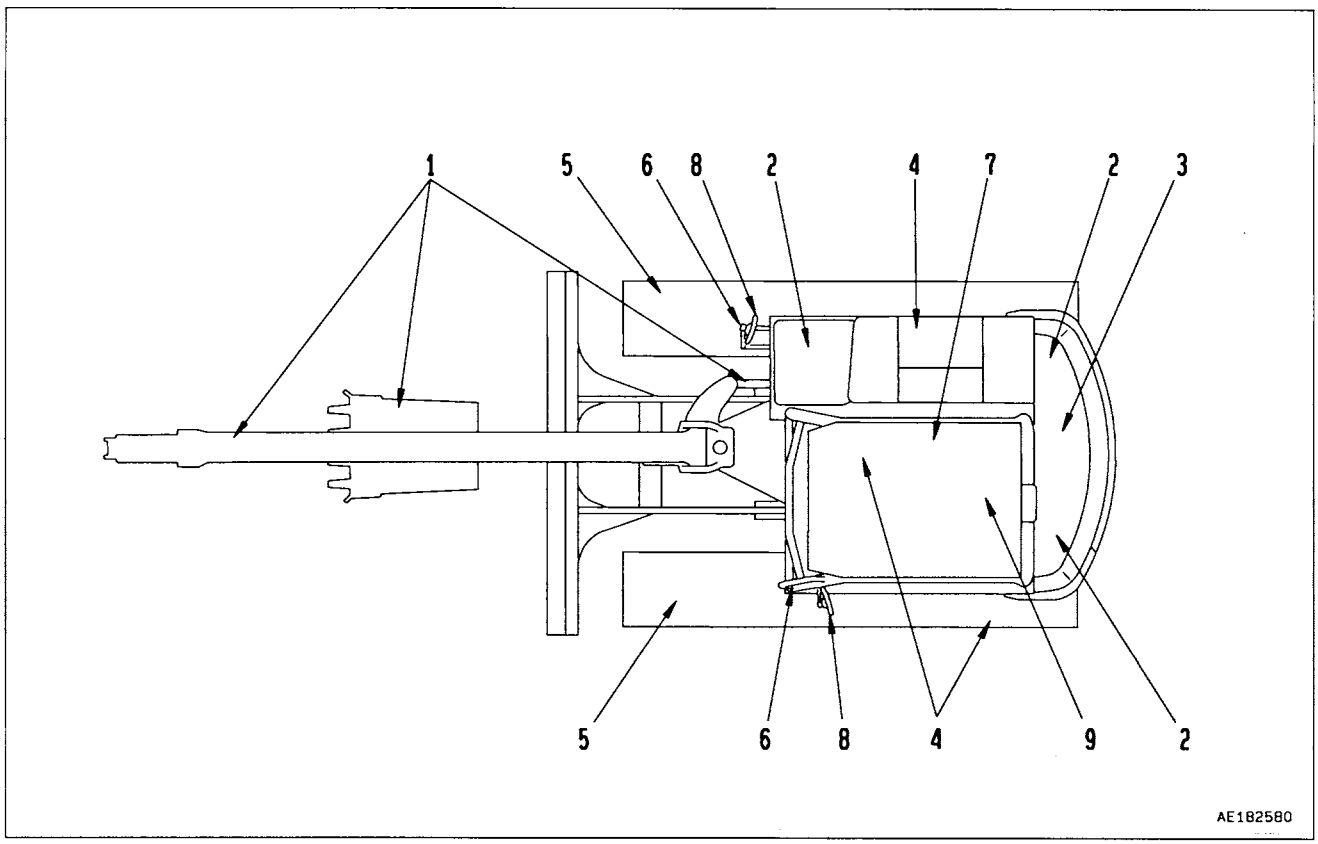
If you open the engine hood, always lock the hood in position securely with hood support lever ①.

⚠ WARNING

Leakage of oil or fuel, or accumulation of flammable material around high temperature parts, such as the engine muffler may cause fire.
Check carefully, and if any abnormality is found, repair it or contact your Komatsu distributor.

Before starting the engine, look around the machine and under the machine to check for loose nut or bolts, or leakage of oil, fuel, or coolant, and check the condition of the work equipment and hydraulic system. Check also for loose wiring, play, and collection of dust at places which reach high temperatures.

Always carry out the items in this section before starting the engine each day.



12.3 OPERATIONS AND CHECKS AFTER STARTING ENGINE

⚠ WARNING

- **Emergency stop**
  If there has been any abnormal actuation or trouble, turn the starting switch key to the OFF position. The electrical system and engine will stop. Then contact your Komatsu distributor for inspection.

- **If the work equipment is operated without warming the machine up sufficiently, the response of the work equipment to the movement of the control lever will be slow, and the work equipment may not move as the operator desires, so always carry out the warming-up operation. Particularly in cold areas, be sure to carry out the warming-up operation fully.**

NOTICE

The most suitable temperature for the hydraulic oil is 50 – 80°C, but in order to extend the life of the machine, the temperature must be raised to at least 20°C before starting work.

NOTICE

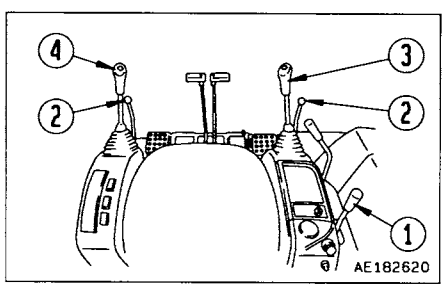
Do not suddenly operate the levers when the hydraulic oil temperature is below 20°C.

NOTICE

Do not suddenly accelerate the engine before the warming-up operation is completed.

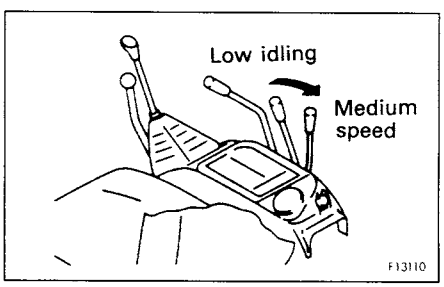
Do not run the engine at low idling or high idling continuously for more than 20 minutes.

If it is necessary to run the engine at idling, apply a load from time to time or run the engine at a mid-range speed.



After starting the engine, do not immediately start operations. First, carry out the following operations and checks.

1. Pull fuel control lever ① to the center position between LOW IDLING and HIGH IDLING and run the engine at medium speed for about 5 minutes with no load.



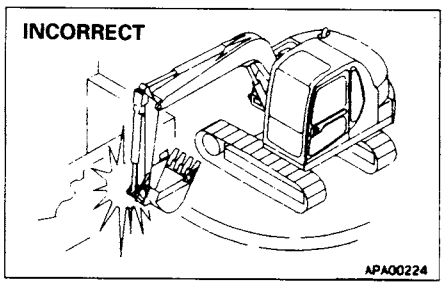
12.9 PROHIBITIONS FOR OPERATION

⚠ WARNING

- **If it is necessary to operate the work equipment control lever when the machine is traveling, stop the machine before operating the work equipment control lever.**
- **Never operate the machine on a rock bed (hard or soft rock).**

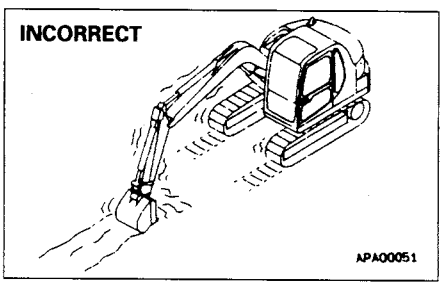
Prohibited operations using swing force

Do not use the swing force to compact soil or break earth mounds or walls.
When swinging, do not dig the bucket teeth into the soil.
These operations will damage the work equipment.



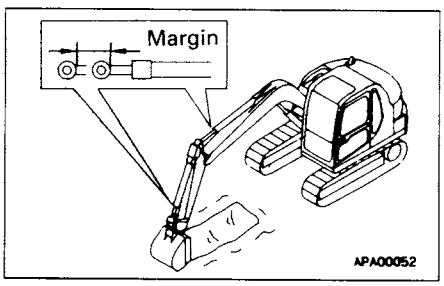
Prohibited operations using travel force

Do not leave the bucket dug into the ground and use the travel force to excavate. This will bring excessive force to bear on the rear of the machine.



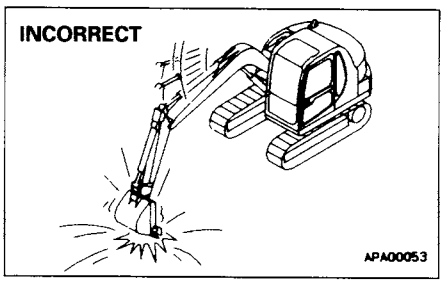
Precautions when operating hydraulic cylinders to end of stroke

If the cylinder is operated to the end of its stroke during operations, force will be brought to bear on the stopper inside the cylinder, and this will reduce the life of the machine. To prevent this, always leave a small safety margin when operating the cylinders.



Prohibited operations using dropping force of bucket

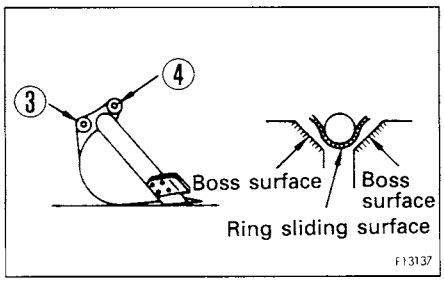
Do not use the dropping force of the bucket as a pickaxe, breaker, or pile driver. This will bring excessive force to bear on the rear of the machine, and will not only damage the machine, but is also dangerous.



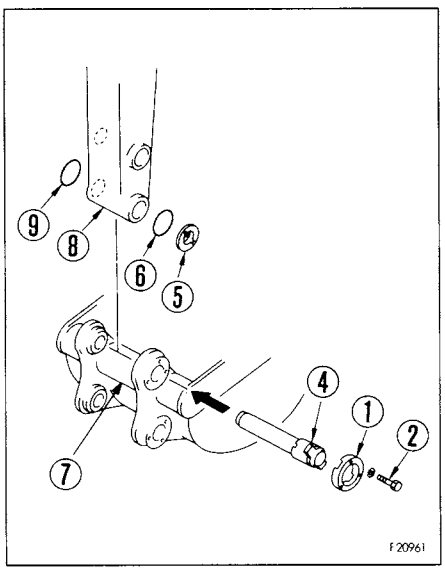
12.14.2 INSTALLATION OF BUCKET

When installing the bucket, apply molybdenum disulfide lubricant (NLGI No. 1 or equivalent) to the sliding surfaces of the pin and ring.

1. Wipe off any mud from the ring boss and sliding surfaces.
2. Lower the bucket to the ground with the bucket back down. Align the holes for arm pin ④.

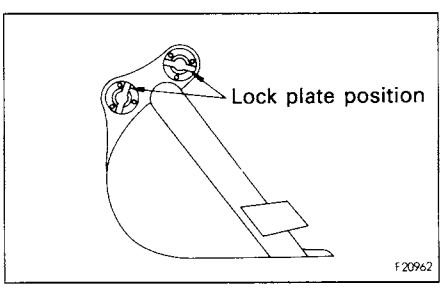


3. Insert pin ④ in bucket boss ⑦, spacer ⑤, play preventive ring ⑥, arm boss ⑧ and play preventive ring ⑨ in order in the arrow direction.
4. When inserting pin ④, align the dent of pin ④ with the projection of spacer ⑤, the groove of retainer ① with the lock plate of pin ④, and the bolt of retainer ① with the tap hole of the bucket. Tighten bolts ② temporarily.

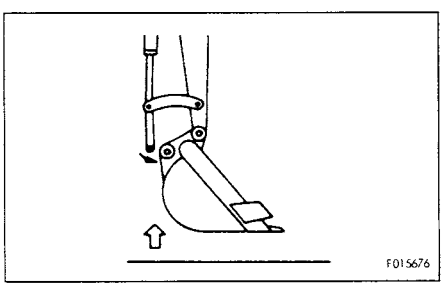


NOTICE

Set the lock plates of pins ③ and ④ as shown at right.



5. Lift the work equipment to free the bucket.
6. Extract the bucket cylinder and align link mounting pin ③. (Do not fit play preventive rings ⑥ and ⑨ at this time.)



13. TRANSPORTATION

When transporting the machine, observe all related laws and regulations, and be careful to assure safety.

13.1 LOADING, UNLOADING WORK

⚠ WARNING

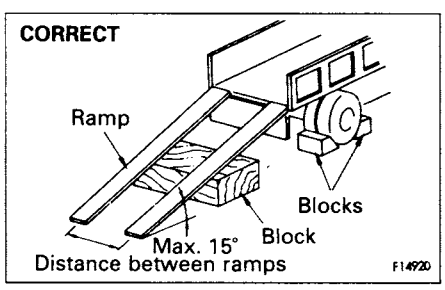
- **Loading or unloading the machine can be a dangerous operation, so be particularly careful.**
  When loading or unloading the machine, run the engine at low idling and travel at low speed.
- **Make sure the ramp has sufficient width, length and thickness to enable the machine to be safely loaded and unloaded. If the ramp sags appreciably, reinforce it with blocks, etc.**
- **When loading and unloading the machine, park the trailer on a flat firm roadbed. Keep a fairly long distance between the road shoulder and the machine.**
- **Remove the mud from the undercarriage to prevent the machine from slipping to the side on slopes.**
  Be sure the ramp surface is clean and free of grease, oil, ice and loose materials.
- **Never change the direction of travel when on the ramps. If it is necessary to change direction, drive off the ramps and correct the direction, then drive on to the ramps again.**
- **When turning the machine on the trailer, the machine's footing is unstable, so carry out the operation slowly.**

When loading or unloading, always use ramps or a platform and carry out the operations as follows.

1. Properly apply the brakes on the trailer and insert blocks beneath the tires to ensure that it does not move. Then fix the ramps in line with the centers of the trailer and the machine. Be sure that the two sides are at the same level as one another.

   Make the angle of the ramps a maximum of 15°.
   Set the distance between the ramps to match the center of the tracks.

2. Lower the engine speed using the fuel control lever.



15.2 DURING STORAGE

⚠ WARNING

If it is unavoidably necessary to carry out the rustpreventive operation while the machine is indoors, open the doors and windows to improve ventilation and prevent gas poisoning.

Operate the engine and move the machine for a short distance once a month so that a new film of oil will be coated over movable parts and component surfaces. At the same time, also charge the battery.

When operating the work equipment, wipe off the grease applied to the hydraulic cylinder rod.

After operating the work equipment, apply grease again.

15.3 AFTER STORAGE

NOTICE

If the machine is stored without carrying out the monthly rust prevention operation, request your Komatsu distributor for service.

Carry out the following procedure when taking the machine out of long-term storage.

- Wipe off the grease from the hydraulic cylinder rods.
- Add oil and grease to all places.

ENGINE (cont'd) (16. 5. 3)

Problem	Main causes	Remedy
Exhaust gas is white or blue	• Too much oil in oil pan	• Add oil to specified level, see CHECK BEFORE STARTING
	• Improper fuel	• Change to specified fuel
Exhaust gas occasionally turns black	• Clogged air cleaner element	• Clean or replace, see WHEN REQUIRED
	• Defective nozzle	(• Replace nozzle)
	• Defective compression	(• See defective compression above)
Combustion noise occasionally makes breathing sound	• Defective nozzle	(• Replace nozzle)
Abnormal noise generated (combustion or mechanical)	• Low grade fuel being used	• Change to specified fuel
	• Overheating	• Red range of engine water temperature gauge lights up as above
	• Damage inside muffler	(• Replace muffler)
	• Excessive valve clearance	(• Adjust valve clearance)

20.USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE

PROPER SELECTION OF FUEL, COOLANT AND LUBRICANTS

RESERVOIR	KIND OF FLUID	AMBIENT TEMPERATURE	CAPACITY	
		−22 −4 14 32 50 68 86 104°F −30 −20 −10 0 10 20 30 40°C	Specified	Refill
Engine oil pan	Engine oil	SAE 30 SAE 10W SAE 10W-30 SAE 15W-40	9.1 ℓ 2.40 US gal 2.00 UK gal	8.5 ℓ 2.24 US gal 1.87 UK gal
Swing machinery case	Engine oil	SAE 30	1.0 ℓ 0.26 US gal 0.22 UK gal	1.0 ℓ 0.26 US gal 0.22 UK gal
Final drive case (each)			1.4 ℓ 0.37 US gal 0.31 UK gal	1.4 ℓ 0.37 US gal 0.31 UK gal
Hydraulic system	Engine oil	SAE 10W SAE 10W-30 SAE 15W-40	78 ℓ 20.6 US gal 17.2 UK gal	45 ℓ 11.9 US gal 9.9 UK gal
Fuel tank	Diesel fuel	ASTM D975 No.2 ※1	50 ℓ 13.2 US gal 11.0 UK gal	—
Cooling system	Water	Add antifreeze	8.0 ℓ 2.11 US gal 1.76 UK gal	—

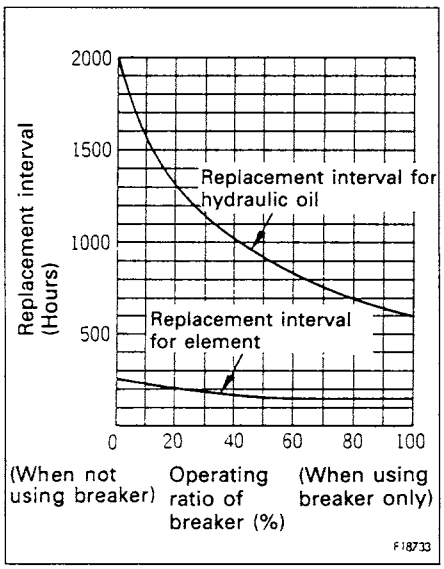
※1: ASTM D975 No. 1

23.2 MAINTENANCE INTERVAL WHEN USING HYDRAULIC BREAKER

For machines equipped with a hydraulic breaker, the hydraulic oil deteriorates faster than for normal bucket digging operations, so set the maintenance intervals as follows.

- **Replacing hydraulic filter element**
  On new machines, replace the element after the first 100 to 150 hours, then carry out further replacement of the element according to the table on the right.

- **Changing oil in hydraulic tank**
  Change the oil according to the table on the right.



24.2.5 CHECK ELECTRIC WIRINGS

⚠WARNING

If fuses are frequently blown or if there are traces of short circuit on the electrical wiring, locate the cause and carry out repair.

Check for damage of the fuse and any sign of disconnection or short circuit in the electric wiring. Check also for loose terminals and tighten any loose parts. Check the following points carefully.

- Battery
- Starting motor
- Alternator

Please contact your Komatsu distributor for investigation and correction of the cause.

⚠WARNING

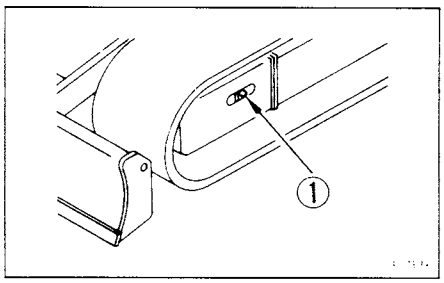
Accumulation of flammable material (dead leaves, twigs, grass, etc.) around the battery may cause fire, so always check and remove such material.

When carrying out walk-around checks or checks before starting, always check if there is any accumulation of flammable material around the battery, and remove such flammable material.

- **When loosening tension**

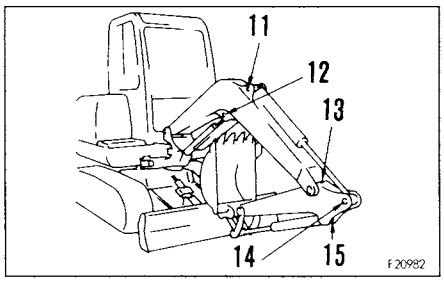
⚠ WARNING

It is extremely dangerous to release the grease by any method except the procedure given below. If the track tension is not relieved by this procedure, please contact your Komatsu distributor.

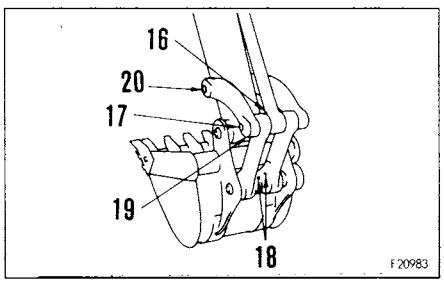


1. Loosen lubricator ① gradually to release the grease.
2. Turn lubricator ① a maximum of one turn.
3. If the grease does not come out smoothly, move the machine backwards and forwards a short distance.
4. Tighten lubricator ①.
5. To check that the correct tension has been achieved, move the machine backwards and forwards.
6. Check the track tension again, and if the tension is not correct, adjust it again.

11. Arm cylinder foot pin (1 point)
12. Boom cylinder rod end (1 point)
13. Boom – Arm coupling pin (1 point)
14. Arm cylinder rod end (1 point)
15. Bucket cylinder foot pin (1 point)



16. Bucket cylinder rod end (1 point)
17. Link coupling pin (1 point)
18. Bucket – Link coupling pin (2 points)
19. Arm – Bucket coupling pin (1 point)
20. Arm – Link coupling pin (1 point)



24.7 EVERY 1000 HOURS SERVICE

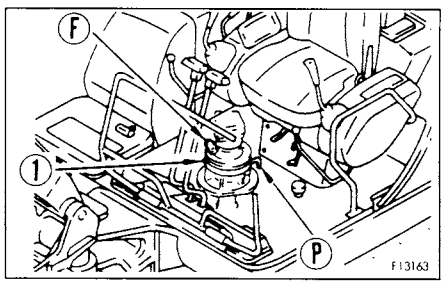
Maintenance for every 100, 250 and 500 hours should be carried out at the same time.

24.7.1 CHANGE OIL IN SWING MACHINERY 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.

Prepare the following.
- Container to catch drained oil: Min. 1.0 ℓ capacity
- Refill capacity: 1.0 ℓ (0.26 US gal, 0.22 UK gal)



1. Set a container to catch the oil under drain plug Ⓟ at the bottom of the machine.
2. Remove drain plug Ⓟ under the chassis, drain the oil, then tighten the plug again.

   Tightening torque of drain plug Ⓟ: 29.4 ± 9.8 Nm (3 ± 1 kgm, 21.7 ± 7.2 lbft)
3. Remove the cover under the right console box, then remove the cap of oil filler port Ⓕ and level plug ①. Add engine oil through oil filler port Ⓕ to the specified level.

   For details of the oil to use, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
4. Add oil until the oil flows out from the hole for level plug ①, then install level plug ①.

   Tightening torque of level plug ①: 14.7 ± 4.9 Nm (1.5 ± 0.5 kgm, 10.9 ± 3.6 lbft)
5. Install cap of oil filler Ⓕ.