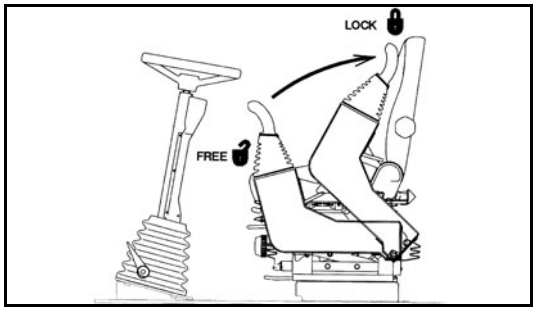
⚠ WARNING: Failure to follow these safety precautions may lead to a serious accident.

ALWAYS APPLY LOCK WHEN LEAVING OPERATOR'S SEAT

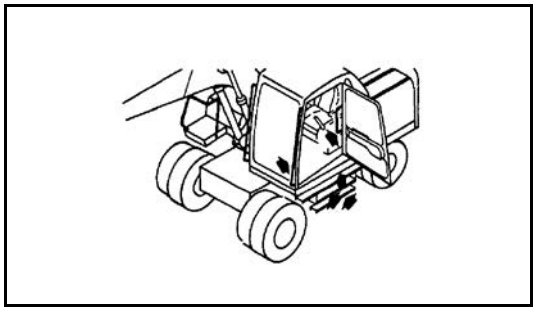
- When standing up from the operator's seat, always raise the control lever Pad Safety lock to the LOCK position. If you accidentally touch the travel or swing lever when they are not locked, the work equipment may suddenly move and cause serious injury or damage.
- When leaving the machine, lower the work equipment completely to the ground, set the control lever Pad 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 "PARKING MACHINE" on page 139.

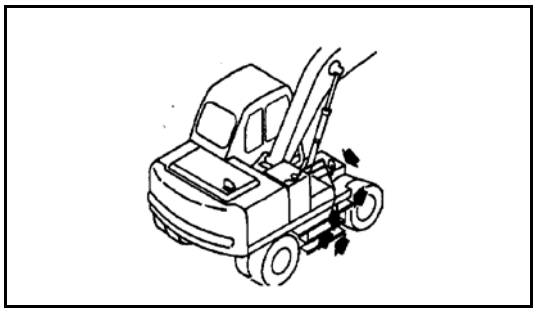


MOUNTING AND DISMOUNTING

- NEVER jump on or off the machine. NEVER get on or off a moving machine.
- When mounting or dismounting, always face the machine and use the handrails, machine or chassis steps.
- Do not hold any control levers when getting on or off the machine.
- Ensure safety by always maintaining at least three-point contact of hands and feet with the handrails, steps or wheels.



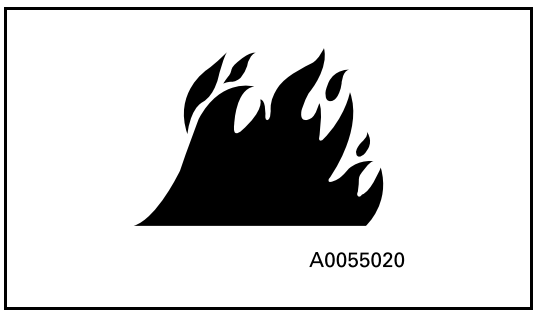
- Always remove any oil or mud from the handrails, steps and track shoes. If they are damaged, repair them and tighten any loose bolts.
- If grasping the door handrail when mounting or dismounting or moving on the chassis steps, open and lock the door securely in the open position. Otherwise, the door may move suddenly, causing you to lose balance and fall.



FIRE PREVENTION FOR FUEL AND OIL

Fuel, oil, and antifreeze can be ignited by a flame. Fuel is particularly FLAMMABLE and can be HAZARDOUS.

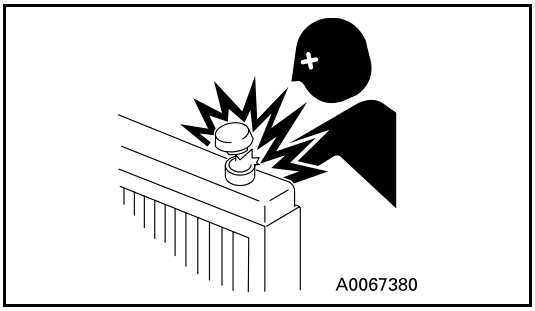
- Keep flames away from flammable fluids.
- Stop the engine and do not smoke when refuelling.



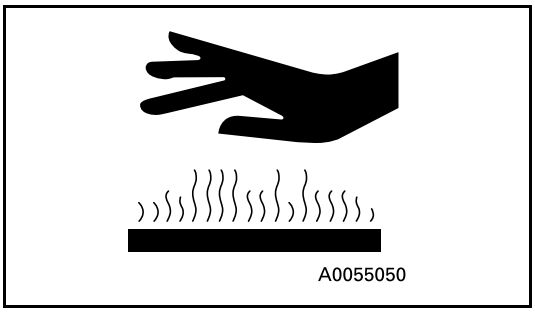
⚠ WARNING: For reasons of safety, always follow these safety precautions..

RADIATOR WATER LEVEL

- If it is necessary to add water to the radiator, stop the engine and allow the engine and radiator to cool down before adding the water.

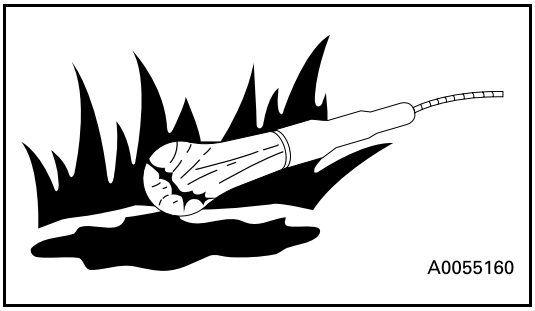


- Slowly loosen the caps to relieve pressure before removing the caps.



USE OF LIGHTING

- When checking fuel, oil, coolant, or battery electrolyte, always use lighting with anti-explosion specifications.
  If such lighting equipment is not used, there is danger of explosion.



DURING MAINTENANCE

PERSONNEL

- Only authorised personnel can service and repair the machine. Extra precaution should be used when grinding, welding, and using a sledge-hammer.

under-carriage	B	A	Max		7,5 m		6,0 m		4,5 m		3,0 m		1,5 m	
			OF	OS	OF	OS	OF	OS	OF	OS	OF	OS	OF	OS
Blade+ rear outrigger	7.5 m	kg	* 2800	* 2800										
	6.0 m	kg	* 2300	* 2300					* 3450	* 3450				
	4.5 m	kg	* 2150	* 2150			* 3550	2950	* 3800	* 3800				
	3.0 m	kg	* 2200	* 2200			* 3850	2900	* 4700	* 4700	* 6750	* 6750		
	1.5 m	kg	* 2350	2150			* 4000	2800	*5850	4450	* 7400	* 7400		
	0.0 m	kg	* 2700	2250			3950	2700	* 6150	4250	* 7550	* 7550		
	-1.5 m	kg	* 3400	2600			3900	2700	* 6000	4200	* 8950	8650	* 5800	* 5800
	-3.0 m	kg	* 3850	3550					* 4800	4300	* 7200	* 7200		
Rear outrigger	7.5 m	kg	* 2800	* 2800										
	6.0 m	kg	* 2300	* 2300					* 3450	* 3450				
	4.5 m	kg	* 2150	* 2150			* 3550	2450	* 3800	* 3800				
	3.0 m	kg	* 2200	1850			* 3700	2400	* 4700	3900	* 6750	* 6750		
	1.5 m	kg	* 2350	1750			3600	2300	* 5650	3650	* 7400	7050		
	0.0 m	kg	* 2700	1850			3550	2550	5700	3500	* 7550	6800		
	-1.5 m	kg	3350	2150			3500	2250	5650	3450	* 8950	6800	* 5800	* 5800
	-3.0 m	kg	* 3850	2900					* 4800	3550	* 7200	6950		
Without stabilizer	7.5 m	kg	* 2800	* 2800										
	6.0 m	kg	* 2300	1800					* 3450	2750				
	4.5 m	kg	* 2150	1350			3050	1600	* 3800	2700				
	3.0 m	kg	* 2200	1150			3000	1550	* 4700	2700	* 6750	4750		
	1.5 m	kg	2200	1100			2900	1450	4650	2300	* 7400	4200		
	0.0 m	kg	2300	1100			2800	1400	4500	2150	* 7550	3950		
	-1.5 m	kg	2650	1300			2800	1350	4550	2100	* 8950	3950	* 5800	* 5800
	-3.0 m	kg	3700	1850					4550	2200	* 7200	4100		

.Note for lift capacity tables:
1. Ratings are based on ISO 10567
2. Lifting capacities are given for:
   a) 75% of tipping load
   b) rated hydraulic lift capacity 87% of max.
3. Capacities marked with an asterisk (*) are limited by hydraulic capacities

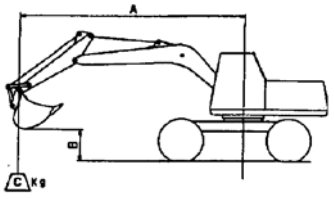
ONE PIECE BOOM Arm length 2,50 m

When removing bucket, linkage or cylinder, lifting capacities can be increased by their respective weights.

A - Reach from swing center

B - Bucket hook height

C - Lifting capacities, including bucket (462 kg), linkage (84 kg) and bucket cylinder (92 kg)



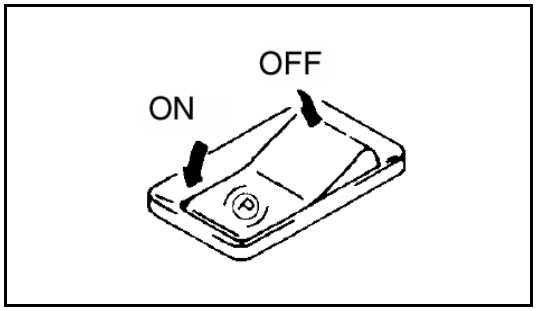
OF: Lifting capacity (rating overfront)
OS: Lifting capacity (Rating overside)

- Rating over rear

- Rating over side or 360 degrees

the swing brake electrical system (swing brake system error). The abnormality must be repaired immediately.

16. PARK BRAKE SWITCH



This switch is used to apply and release park brake.

OFF: Park brake released (warning light not illuminated)
ON: Park brake applied (warning light illuminated)

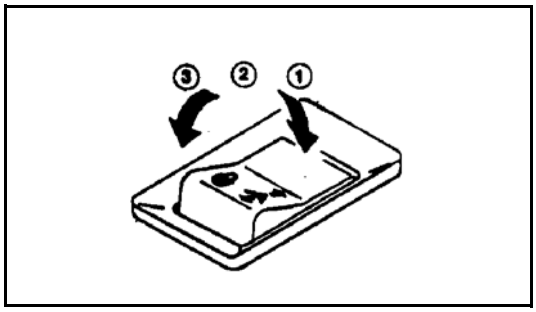
Note1: When moving off from a standstill up an incline it will be necessary to depress the travel pedal slightly before releasing park brake to build pressure to the travel hydraulics and prevent initial rearwards movement

16. CONT.

Note 2: A warning buzzer will sound if the travel pedal is depressed and the park brake is applied.

Do not apply the park brake while the machine is in motion or the park brake may be damaged.

17. SUSPENSION LOCK SWITCH



Release the front axle suspension lock, using switch).

Position (1): Front axle suspension travels freely.

Position (2): Front axle suspension is in ‘auto’ mode i.e. when travel pedal is depressed, front axle suspension travels freely and when travel pedal is not depressed, front axle suspension is locked.

Position (3): Front axle is locked.

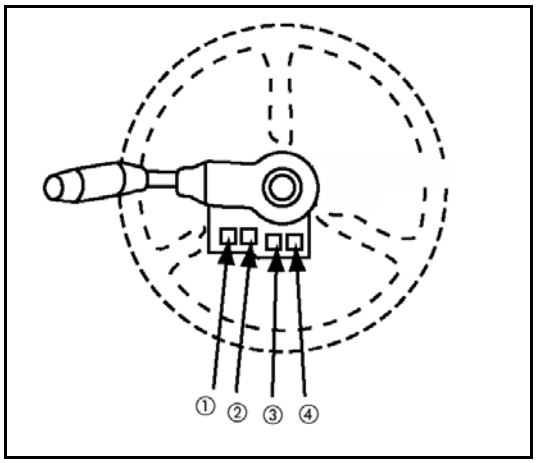
The lamp within the switch will illuminate when the front axle is locked, and will not be illuminated when the front axle is unlocked.

⚠ WARNING

Take care when using undercarriage attachments to stabilize the machine, and suspension lock simultaneously, as locked front axle may suddenly become free.

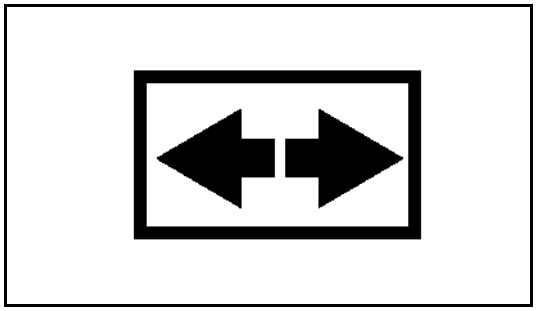
When machine is fitted with blade and outriggers it is necessary to Position outrigger switch (20) in its central (R.H. Attachment) Position in order to disengage suspension lock during dozer operations.

WARNING LAMPS



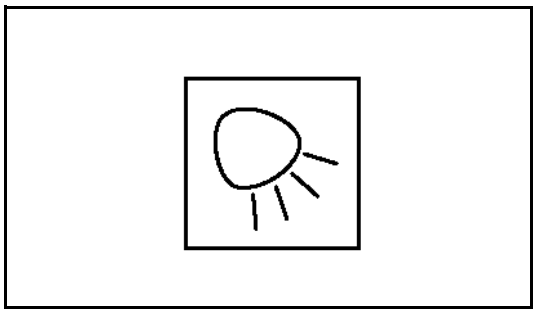
1. INDICATOR WARNING LAMP

This lamp will flash (and buzzer will sound) when indicator lever is not in neutral.



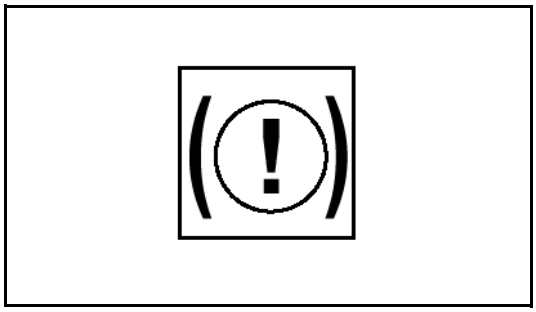
2. WORKLIGHTS WARNING LAMP

This lamp will illuminate when work lamps are switched on.



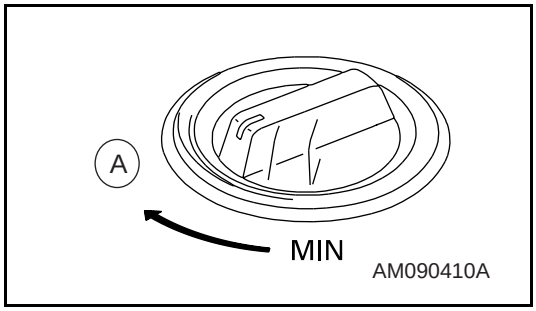
3. LOW BRAKE PRESSURE LAMP

When engine is running and brake system hydraulic pressure is abnormal, this lamp will illuminate.

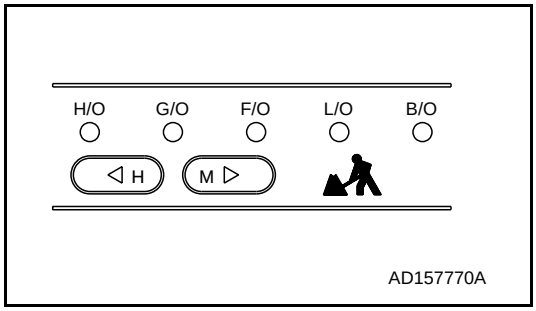


After starting the engine, do not immediately start operations. First, carry out the following operations and checks.

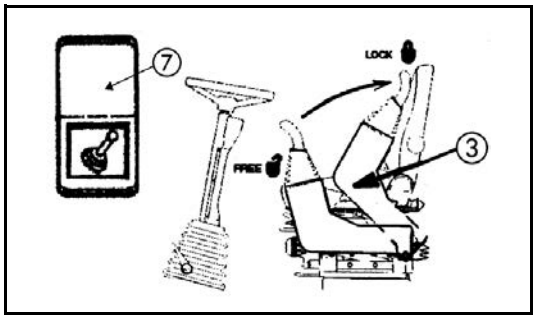
1. Turn fuel control dial (1) to the center position between LOW IDLING (MIN) and HIGH IDLING (MAX) and run the engine at medium speed for about 5 minutes with no load.



2. While running the engine at medium speed, press working mode switch (2) until the heavy-duty operation mode lamp is turned on.

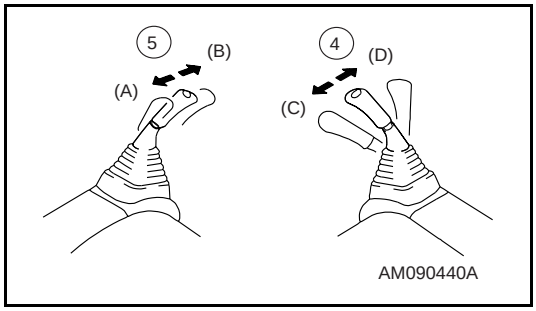


3. Lower the control lever pad (3) to the FREE position, put PPC lock switch (7) to on position and raise the bucket from the ground.

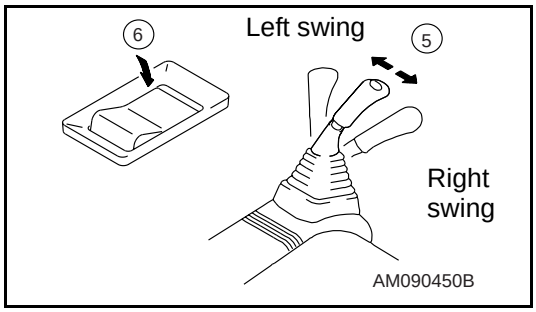


4. Operate bucket control lever (4) and arm control lever (5) slowly to move the bucket cylinder and arm cylinder to the end of the stroke.

(A) IN	(C) CURL
(B) OUT	(D) DUMP



5. Carry out bucket and arm operation for 5 minutes at full stroke, alternating between bucket operation and arm operation at 30 second intervals.
   If the swing lock switch (6) is set to the ON (actuated) position and swing control lever (5) is operated at full stroke, oil temperature rise can be increased earlier.



NOTICE

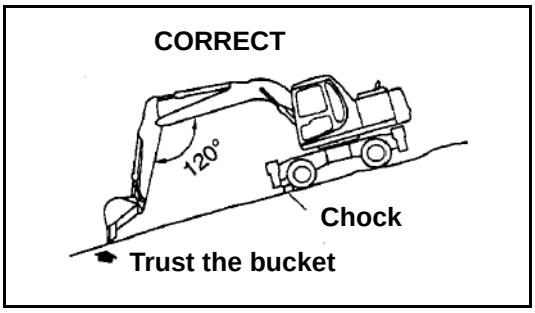
When the work equipment is retracted, take care that it does not interfere with the machine body or ground.

STOPPING

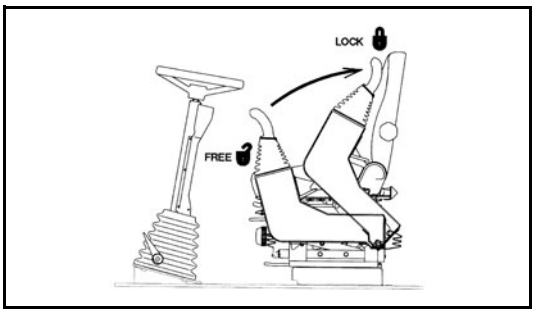
STOPPING MACHINE (NORMAL)

⚠ WARNING

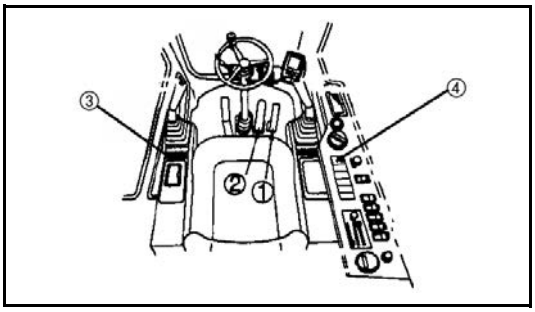
- **Avoid stopping suddenly. Give yourself ample room when stopping.**
- **When stopping the machine, select flat hard ground and avoid dangerous places. If it is unavoidably necessary to park the machine on a slope, insert chocks underneath the wheels. As an additional safety measure, thrust the bucket into the ground.**



- **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 set the control lever pad safety lock securely to the LOCK position.**



1. Release the travel pedal (1) and depress the service brake pedal (2) to stop the machine. (The service brakes may be locked by fully de-pressing the service brake pedal until it 'latches')
2. Lower the work equipment until it touches the ground
3. Raise the control lever pad safety lock to lock the work equipment controls (3)



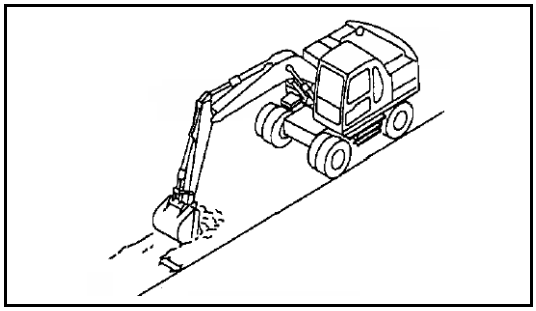
STOPPING MACHINE (EMERGENCY)

The park brake on this machine is a hydraulic-mechanical device which can be used to stop the machine if the service brakes do not work.

In the event of service brake failure;

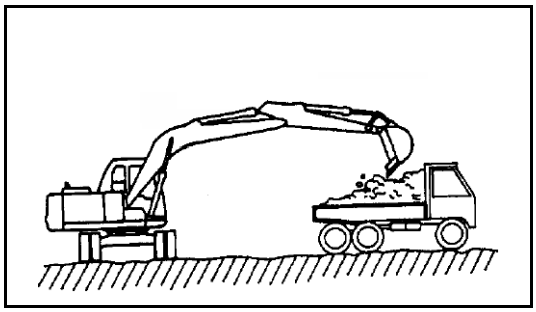
1. Release travel pedal (1)
2. Depress service brake pedal (2) (to confirm no braking)
3. Brace yourself before engaging emergency brake (A seatbelt is fitted for your safety and comfort. Please wear this at all times.)
4. Press park break switch (4) to 'on' position, machine will very quickly come to a halt.

DITCHING WORK



Ditching work can be performed efficiently by attaching a bucket to match the width of the ditch and then setting the wheels parallel to the line of the ditch to be excavated.
To excavate a wide ditch, first dig out both sides and then finally remove the center portion.

LOADING WORK



In places where the swing angle is small, work efficiency can be enhanced by locating the dump truck in a place easily visible to the operator.
Loading is easier and capacity greater if you begin from the front of the dump truck body than if loading is done from the side.

REPLACEMENT AND INVERSION OF BUCKET

⚠ WARNING

- **When knocking the pin in with a hammer, metal particles may fly and cause serious injury, particularly if they get into your eyes. When carrying out this operation, always wear goggles, helmet, gloves, and other protective equipment.**
- **When the bucket is removed, place it in a stable condition.**

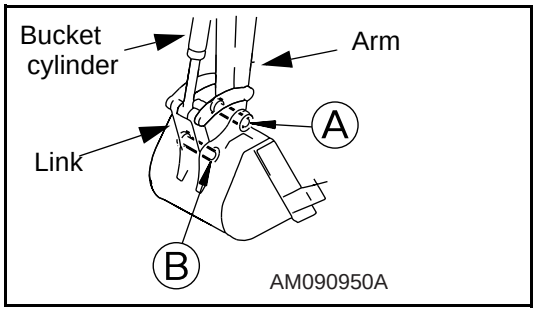
Stop the machine on a firm, flat surface. When performing joint work, make clear signals to each other and work carefully for safety's sake.

REPLACEMENT

1. Place the bucket in contact with a flat surface.

REMARK

When removing the pins, place the bucket so that it is in light contact with the ground.



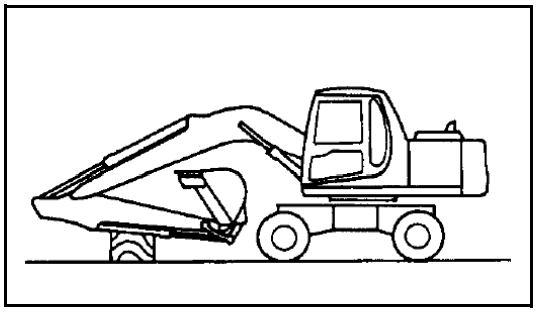
PRECAUTIONS FOR LOADING

⚠ WARNING

When loading the machine, park the trailer on a flat firm roadbed. Keep a fairly long distance between the road shoulder and the machine.

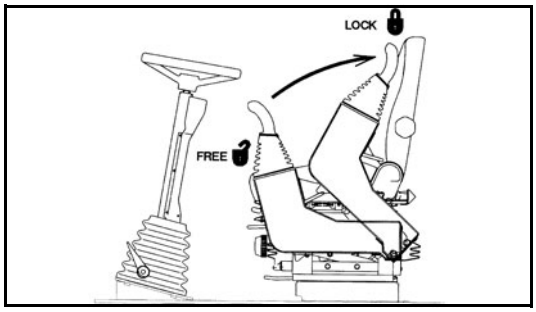
After loading to the specified position, secure the machine as follows.

1. Fully extend the bucket and arm cylinders, then slowly lower the boom.

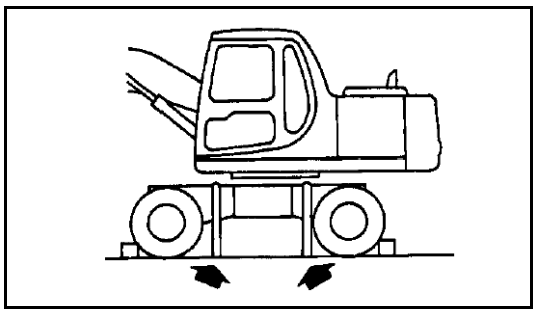


2. Stop the engine and remove the key from the starting switch.

3. Lock all the control levers securely with the control lever pad safety lock.



4. When transporting the machine, place rectangular timber underneath the front and rear wheels to prevent the machine from moving about. Also, hold it down with chains or rope. Be particularly careful to ensure that the machine does not slip sideways.



NOTICE

When transporting the machine, place rectangular timber under one end of the bucket cylinder to prevent it touching the ground, thereby saving it from possible damage.

ENGINE

- ( ): 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
Engine oil pressure monitor lights up	● Engine oil pan oil level is low (sucking in air) ● Clogged oil filter cartridge ● Defective tightening of oil pipe joint, oil leakage from damaged part ● Defective engine oil pressure sensor	● Add oil to specified level, see CHECK BEFORE STARTING ● Replace cartridge, see EVERY 250 HOURS SERVICE ● (Check, repair) ● (Replace sensor)
Steam is emitted from top part of radiator (pressure valve) Radiator water level monitor lights up	● Cooling water level low, water leakage ● Loosen fan belt ● Dirt or scale accumulated in cooling system ● Clogged radiator fin or dam-aged fin ● Defective thermostat ● Loose radiator filler cap (high altitude operation) ● Defective water level sensor	● Add cooling water, repair, see CHECK BEFORE STARTING ● Adjust fan belt tension, see EVERY 250 HOURS SERVICE ● Change cooling water, clean inside of cooling system, see WHEN REQUIRED ● Clean or repair, see EVERY 500 HOURS SERVICE ● (Replace thermostat) ● Tighten cap or replace packing ● (Replace sensor)
Engine does not start when starting motor is turned.	● Lack of fuel ● Air in fuel system ● Defective fuel injection pump or nozzle ● Starting motor cranks engine sluggishly ● Preheating monitor does not light up ● Defective compression ● Defective valve clearance	● Add fuel, see CHECK BEFORE STARTING ● Repair place where air is sucked in, see EVERY 500 HOURS SERVICE ● (Replace pump or nozzle) ● See ELECTRICAL SYSTEM ● (Adjust valve clearance)
Exhaust gas is white or blue	● Too much oil in oil pan ● Improper fuel	● Add oil to specified level, 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, see WHEN REOUIRED ● (Replace nozzle) ● (See defective compression above) ● Clean or replace turbo-charger
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 ● Refer to “Radiator water level monitor lights up” as above ● (Replace muffler) ● (Adjust valve clearance)

USE FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE

PROPER SELECTION OF FUEL, COOLANT AND LUBRICANTS

Reservoir		Kind of fluid	AMBIENT TEMPERATURE		Type OF OIL	CAPACITY	
			Min.	Max		Specified	Refill
Engine oil pan		Engine oil (API CE or CF-4)	0°C -20° C -15°C -30° C	30°C 10° C 50° C 30° C	SAE 30 SAE 10W SAE 15W-40 SAE 10W-30	16 liter	16 liter
Swing machinery case		Engine oil	-20° C	30° C	SAE 30	2.5 liter	2.5 liter
PTO gear case						0.75 liter	0.75 liter
Hydraulic system		Bio-oil	-20° C	30° C	SAE 10W	190 liter	135 liter
		Hydr-oil API-CD	-20° C	30° C	SAE 10W-30		
		Engine oil API-CD	-20° C	50° C	SAE 15W-40		
Fuel tank		Diesel fuel	-10° C -30° C	40° C -10° C	ASTM D975 No. 2 ASTM D975 No 1 (for winter use)	250 liter	
Cooling system		Water	Add antifreeze			20 liter	
Axles	Front	Multi oil	-30° C	40° C	SAE 20W-30	15 liter	
	Rear					20 liter	
Transmission						1.1 liter	
Transmission clutch						0.5 liter	
Hubs	Front		-20° C	40° C	SAE 80W-90	2.5 liter	
	Rear					2.7 liter	

REMARK

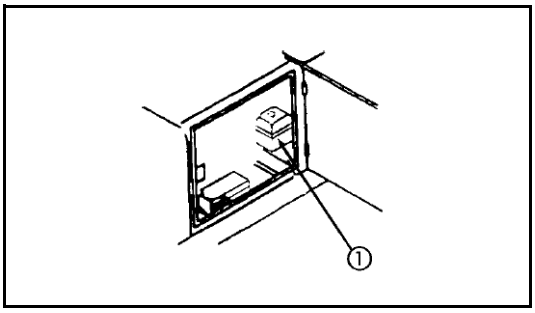
- We recommend Komatsu genuine oil which has been specifically formulated and approved for use in engine and hydraulic work equipment applications.
- Only use high quality oils which meet internationally recognized specifications.
- When starting the engine in an atmospheric temperature of lower than 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.

CHECK BEFORE STARTING

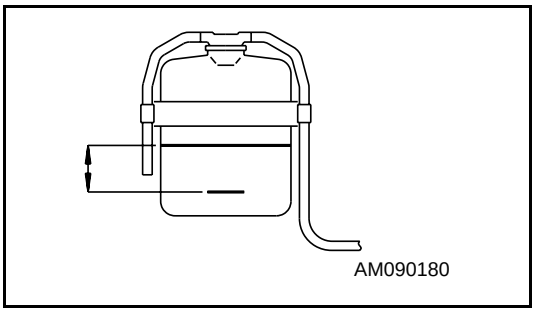
CHECK COOLANT LEVEL, ADD WATER

⚠ WARNING

Do not open the radiator cap unless necessary. When checking the coolant, always check the radiator reserve tank when the engine is cold.



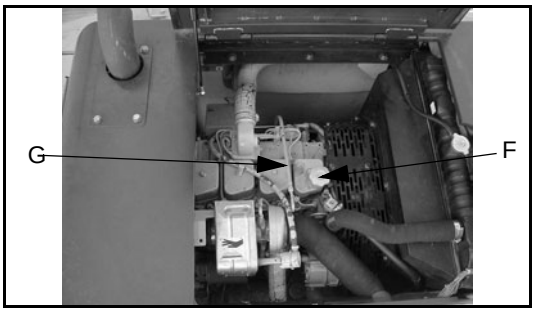
1. Open the rear door on the left side of the machine and check that the cooling water level is between the FULL and LOW marks on radiator reserve tank (1) (shown in the diagram on the right).
   If the water level is low, add water through the water filler of reserve tank (1) to the FULL level.
2. After adding water, tighten the cap securely.
3. If the reserve becomes empty, first inspect for water leaks and then fill the radiator and the reserve tank with water.



CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL

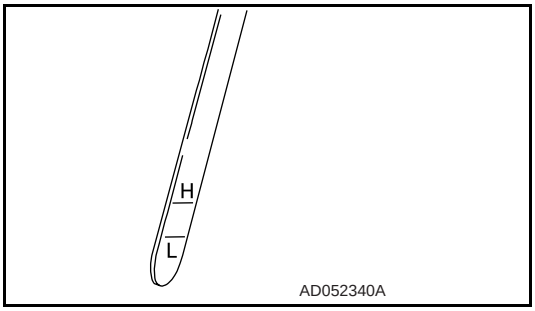
1. Open the engine hood.
2. Remove dipstick (G) and wipe the oil off with a cloth.
3. Insert dipstick (G) fully in the oil gauge pipe, then take it out again.
4. The oil level should be between the H and L marks on dipstick (G). If the oil level is below the L mark, add engine oil through oil filler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

   For details of the oil to use, “USE FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE” on page 177
5. If the oil is above the H mark, drain the excess engine oil from drain valve (P), and check the oil level again.
6. If the oil level is correct, tighten the oil filler cap securely and close the engine hood.



REMARK

Ensure that the machine is level when checking oil level.



4. After refilling, install bleeding plug (1).
5. Wipe off oil on the dipstick with a cloth.
6. Insert dipstick (G) into the gauge pipe thoroughly and then pull out it again.
7. When the oil level is between the H and L marks, on dipstick (G), it is normal. If the oil does not reach the L mark, add more oil through oil filler (F).
8. If the oil level exceeds the H mark, drain the excess engine oil from drain plug (P), and check the oil level again.

CHECK ALL TIGHTENING PARTS OF TURBO-CHARGER

Contact your Komatsu distributor to have the tightening portions checked.

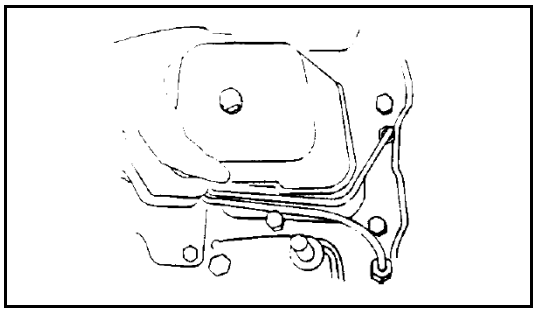
CHECK PLAY OF TURBOCHARGER ROTOR.

Ask Komatsu distributor to check the play of the turbocharger rotor.

CHECK & ADJUST VALVE CLEARANCE

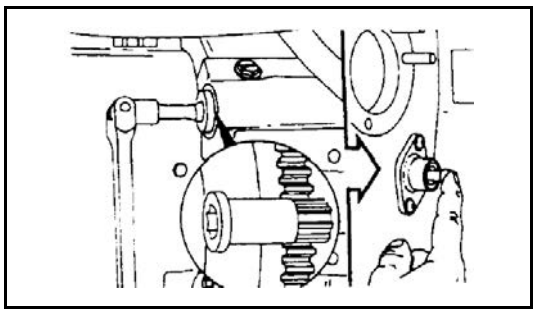
FIRST 1000 HOURS ONLY

1. Adjusting the valves



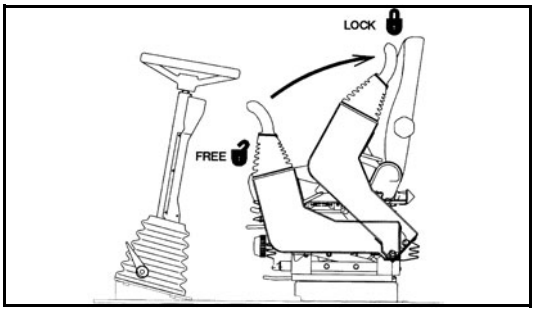
Remove the valve covers.

2. Locate Top Dead Centre (TDC) for Cylinder Number 1 by rotating the crankshaft slowly while pressing on the engine timing pin
3. When the pin engages the hole in the camshaft gear, Cylinder Number 1 is at TDC on the compression stroke.



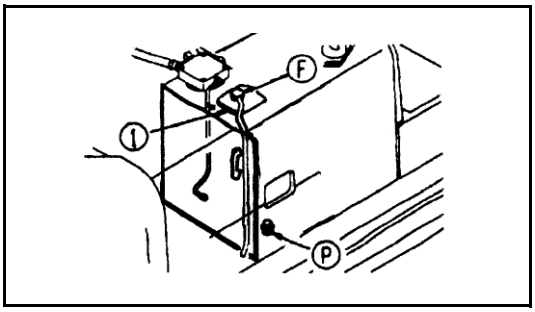
2. Retract the arm and bucket cylinders to the stroke end, then lower the boom and put the bucket teeth in contact with the ground.

3. Lock the control lever pad safety lock lever and stop the engine.



4. Remove the cover over the hydraulic tank and remove the cap of oil filler (F).

5. Set the oil container under the drain plug under the machine. Using the handle, remove drain plug (P) and drain the oil. Check the O-ring installed to plug (P), and if it is.damaged, replace the O-ring. After draining the oil, tighten drain plug (P). Tightening torque: 69 ± 10 Nm (7 ± 1 kgm).



When removing drain plug (P), be careful not to get oil on yourself.

6. Add the specified amount of engine oil through oil filler port (F) Check that the oil level is between H and L on the sight gauge.

   For type of oil to be used, see “USE FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE” on page 177.

NOTICE

When the hydraulic breaker is installed, the hydraulic oil deteriorates earlier than in normal bucket digging work. Therefore replace the hydraulic oil according to the table at the right.

7. After replacing hydraulic oil or replacing filter element and strainer, bleed air from the circuit according to the following procedure.