CEAMW25010

OPERATION & MAINTENANCE MANUAL

KOMATSU

WA500-1L

WHEEL LOADER

SERIAL NUMBERS
WA500-1L A20854 and up

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

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

SEP 93

NEVER allow anyone near the center articulation pivot. If the machine turned, they could be crushed.

NEVER allow anyone to stand on the ladder when the bucket is raised or the machine is moving or turning to prevent injury from falling, crushing or falling material.

NEVER get on or off the machine while it is moving because serious injury or death could result.

After starting and while operating, observe instruments and warning lights frequently. Investigate any unusual indications or noises in the machine.

If the engine has a tendency to stall, investigate immediately. Do not operate the machine until the cause has been corrected.

If noise exposure exceeds 90 dBA for eight hours, wear ear protective equipment.

DRIVING THE MACHINE

Carry the bucket low for maximum visibility and stability when traveling.

Before operating in areas with overhead obstructions, carefully check overhead clearance. Obstructions, such as guy wires, power lines, tree branches, bridges and building doors could cause a rollover accident.

Drive slowly enough to insure complete control. Slow down when traveling in congested areas or on mud, ice or other slippery surfaces. Keep a safe distance away from other vehicles, according to the load and ground conditions.

Avoid crossing obstacles, such as ridges, curbs, logs and rocks. If you cannot avoid them, reduce speed and cross at an angle. Ease up to the breakover point, pass the balance point slowly and ease down on the other side.

Cross ditches and gullies slowly and at an angle after checking that the ground will safely support the machine.

Avoid sidehill travel whenever possible. Drive straight up and down the hill. If the machine starts slipping sideways, turn downhill immediately.

When traveling on hills with a loaded bucket, travel forward up the hill and in reverse down the hill.

Stop, look and listen before entering a highway. Stay on the right side of the road. Slow down and signal when turning off.

When roading the machine, engage the hydraulic control lever lock to guard against accidental actuation of the levers. Personal injury could result if the bucket catches on a ledge in the road.

Do not use the transmission disconnect brake pedal when traveling fast or going downhill because this shifts the transmission into neutral. Loss of control or damage to the power train could result when the pedal is released and the transmission is re-engaged.

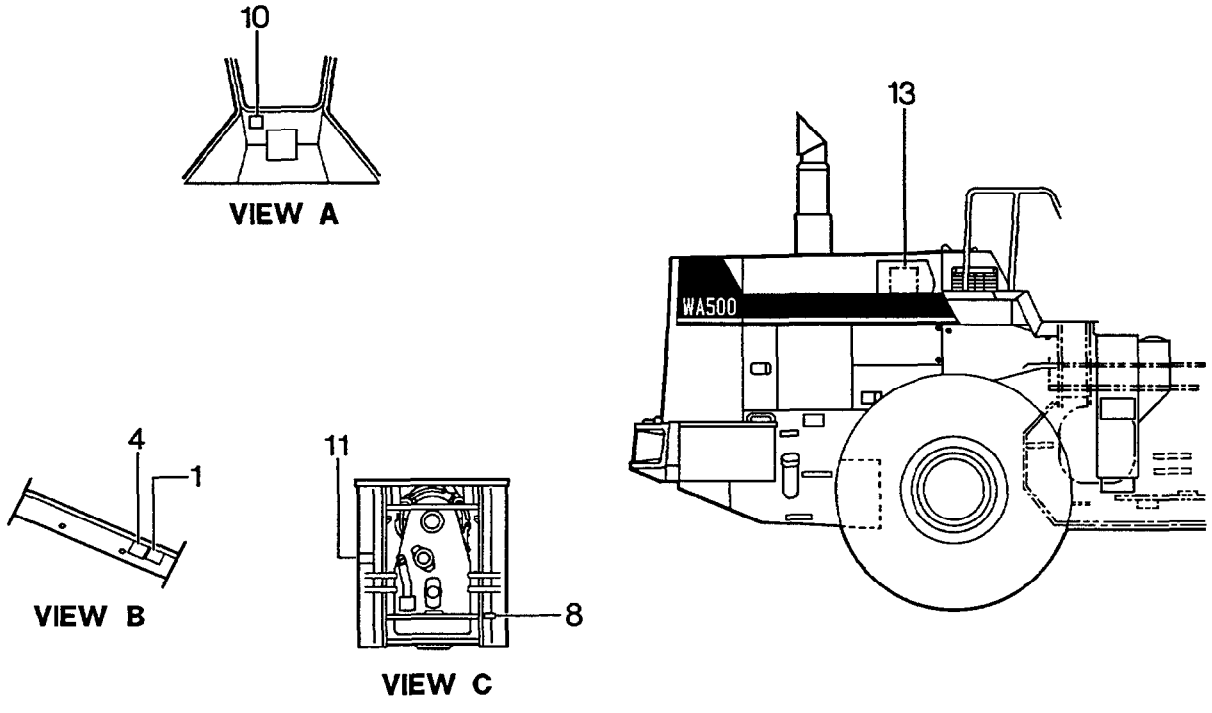
Never shift the transmission into neutral (N) when traveling downhill. The machine could go out of control or the power train could be damaged when the transmission is shifted into gear again.

Do not overspeed the engine. Excessive speeds can be hazardous and harmful to the power train. Select the proper gear before starting downhill. Control speed with the brakes.

Never use the bucket as a brake except in an emergency. It might catch on the ground and result in personal injury.

If the main steering light comes on, IMMEDIATELY stop the machine in a safe place. Shut off the engine and apply the parking brake. Correct the cause before operating again.

If the brake system warning light or buzzer comes on during operation, IMMEDIATELY stop the machine in a safe place. Apply the parking brake. Correct the cause before operating again.



L02AD070

Always keep these product graphics clean. If they are missing or damaged, replace them with a new product graphic. Replacement product graphics can be ordered from your distributor.

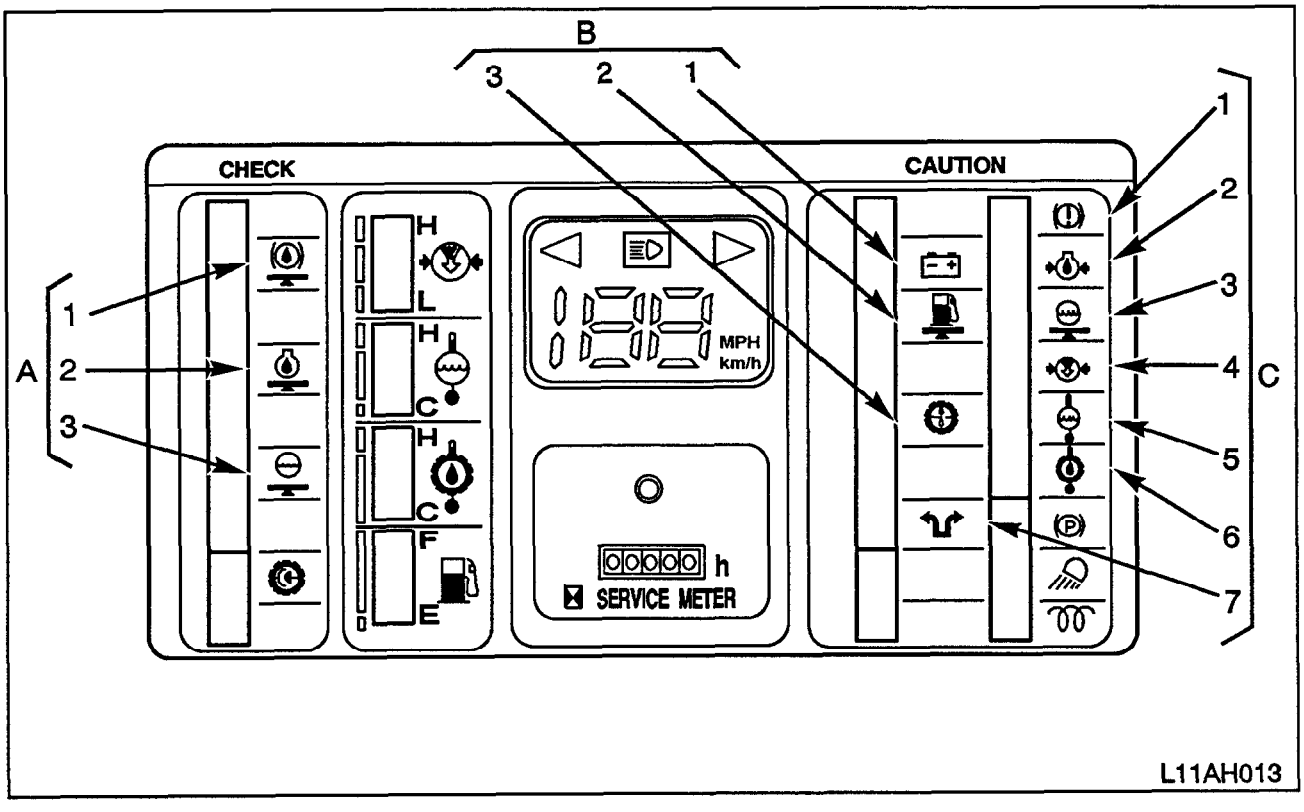
In addition to safety product graphics, the machine has instructional and identification product graphics, which should be treated in the same manner as described above.

Safety product graphics may be available in languages other than English. To find out more information about foreign language product graphics, contact your distributor.

A. CHECK MONITOR LAMP GROUP
(Check items before starting)

★ When the engine is started, these monitor lamps will go off even if there are abnormalities.

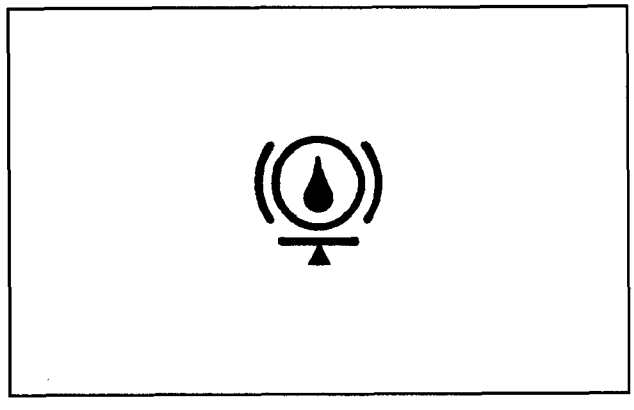
★ Do not rely on the "CHECK MONITOR LAMP GROUP (Check items before starting)" only for the check before starting. Always make the checks by referring to the section on "CHECKS BEFORE STARTING".



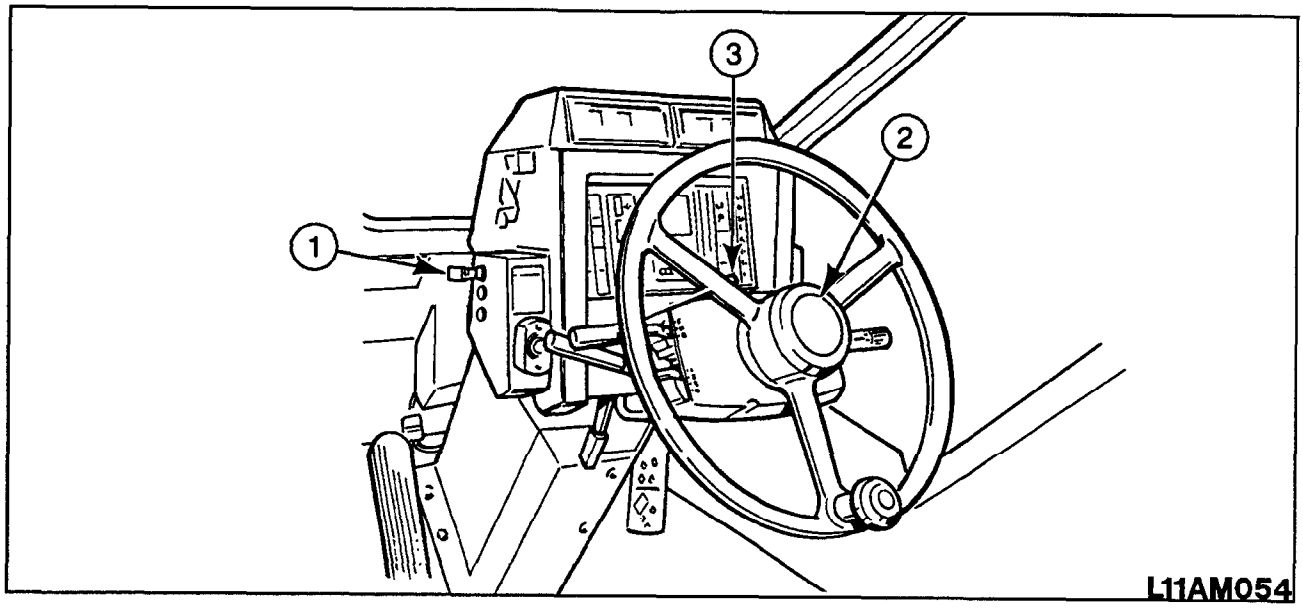
1. Brake Oil Level Monitor

This monitor indicates a low brake oil level.

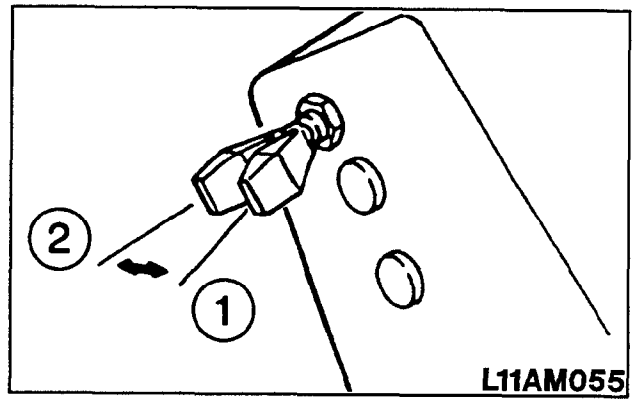
If the monitor lamp flashes, check the oil level in the brake oil tank and add oil as required.



SWITCHES



1. TRANSMISSION CUT-OFF SELECTOR SWITCH



This switch selects the operation of the left brake pedal. Normally, put this switch in ON position.

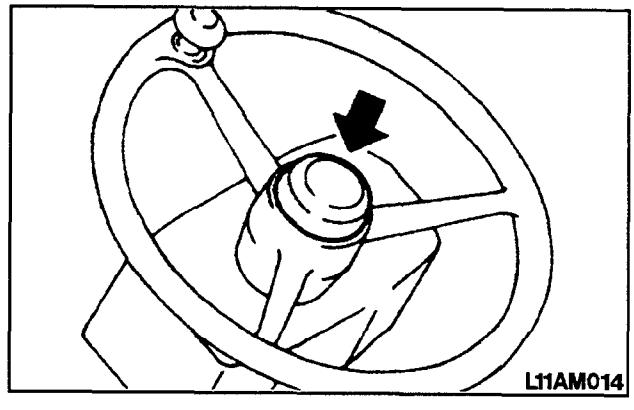
1. OFF POSITION:
   Depressing the left brake pedal operates the wheel brakes only, like the right brake pedal.
2. ON POSITION:
   Depressing the left brake pedal operates the wheel brakes and also returns the transmission to NEUTRAL.

★ If the switch is in the ON position, the transmission cut-off selector pilot lamp will light up.

If the machine has to be started on a slope, always turn the transmission cut-off selector switch to OFF and depress the left brake pedal. Then depress the accelerator pedal while releasing the left brake pedal to start the machine off slowly.

2. HORN BUTTON

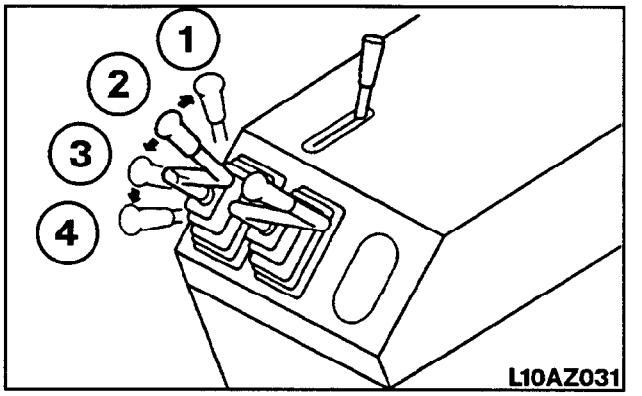
When the button in the center of the steering wheel is pressed, the horn will sound.



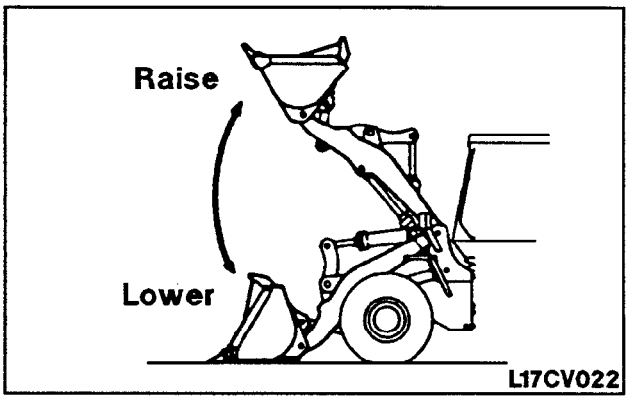
7. LIFT ARM CONTROL LEVER

This lever is used to operate the lift arm.

1 Raise
2 Hold: The lift arm is kept in the same position.
3 Lower
4 Float: The lift arm moves freely under external force.



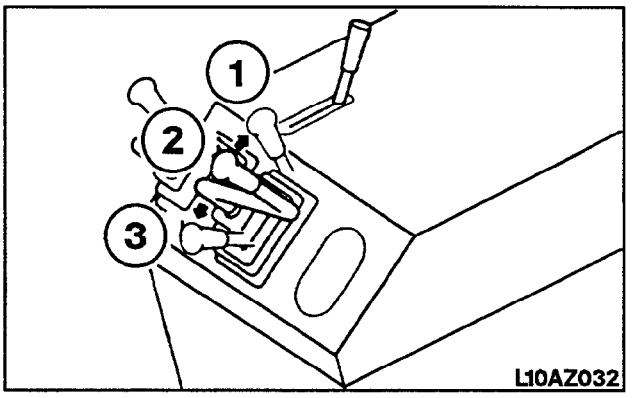
When the lift arm control lever is pulled further from 1 position, the lever is stopped in this position until lift arm reaches the preset position of kick-out, and the lever is returned to the hold position.



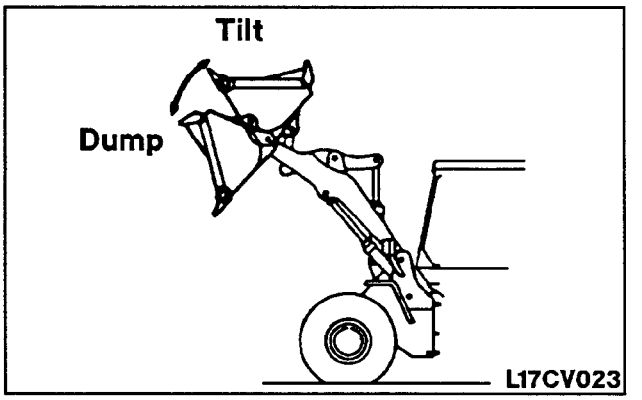
8. BUCKET CONTROL LEVER

This lever operates the bucket.

1 Tilt
2 Hold: The bucket is kept in the same position.
3 Dump



When the bucket control lever is pulled further from 1 position, the lever is stopped in this position until bucket reaches the preset position of positioner, and the lever is returned to the hold position.



METHOD OF OPERATION

OPERATION OF CONTROL PANEL

PURPOSE		SWITCH AND LEVER POSITIONS			
		Fan Speed Switch	Air Conditioner Switch	Temperature Control Lever	Air Intake Selector Lever
Cooling	Quick	HI	ON	Full left	Left
	Normal	HI - LO	ON	Full left to near center	Right
Dehumidfying and heating		HI - LO	ON	Center to near right	Right
Heating	Quick	HI	OFF	Full to near right	Left
	Normal	HI - LO	OFF	Center to near right	Right
Defrosting		HI	ON	Center to near right - Full right when carrying out quick defrosting or demisting	Right
Ventilation or Pressurizing		HI - LO	OFF	Full left	Right

AIR VENT SELECTION

PURPOSE	VENT POSITION		
	Face (1)	Foot (2)	Defrost (3)
Cooling	Open	Open or closed	Closed
Heating	Open or closed	Open	Open or closed
Defrosting	Closed	Open or closed	Open
Ventilation	Open	Open	Open

★ The effectiveness of the heating air conditioning system can be increased by selecting the most suitable vent.

★ Do not turn the fan speed switch on when all the vents are closed.

★ Run the engine with the throttle at the 1/3 position or below.

5) Raise the bucket 10 - 30 cm (3.7 - 11.8 in) from the ground, operate the bucket control lever to the tilt position, relieve the circuit for approximately 5 seconds, then return the lever to the neutral position and hold it for approximately 2 seconds. Repeat this operation to warm up the work equipment circuit.

★ Raise the engine speed gradually from the idling speed.

3. Warm up the steering circuit as follows.

WARNING! If this operation is carried out when the oil temperature is still low, even when the steering wheel is turned and stopped, there may be a time lag before the chassis turns or stops. In such cases, carry out the warming-up operation in a large open area. In addition, use the safety bar to ensure safety. In this case, do not relieve the circuit for more than 5 seconds.

4. Turn the steering wheel slowly to the left and right to warm up the oil inside the steering valve. Repeat this operation about 10 times.

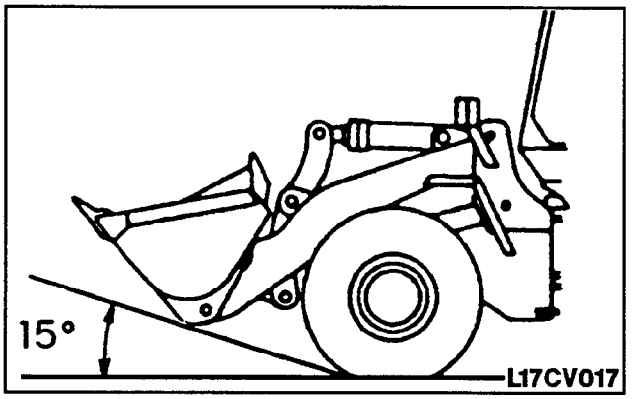
★ Turn the steering wheel a short distance, then stop it, and check that the chassis stops according to the amount the steering wheel is turned.

★ The recommended oil for the work equipment hydraulic system depends on the ambient temperature. Select oil according to the table under "LUBRICANTS, FUEL AND COOLANT" in Section 3.

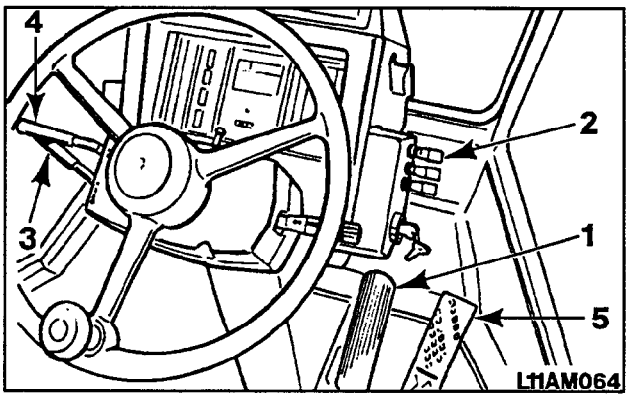
MOVING MACHINE OFF

1. Check that a warning item is not displayed on the monitor panel.

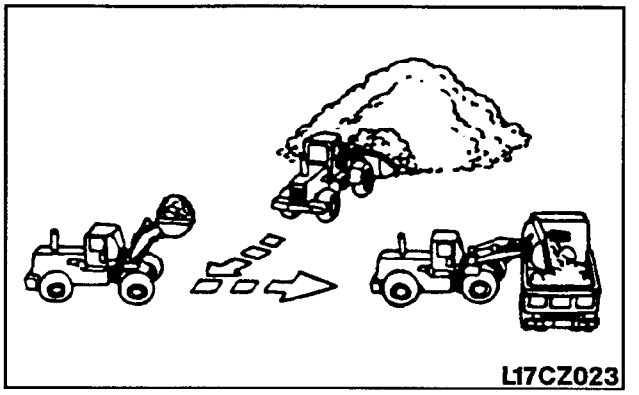
2. Free the work equipment control lever lock for the equipment control levers. Place the work equipment in the traveling position.



3. Depress right brake pedal (1), and turn parking brake switch (2) to OFF to release the parking brake.



PARKING MACHINE


L17CZ023

WARNING! Never leave the machine with the engine running or the bucket raised. When parking the machine, stop the engine, lower the bucket to the ground, place the transmission in neutral (N), apply the parking brake, turn off the electrical starting switch, and remove the key.

WARNING! Park the machine in a non-traffic area. If parking in traffic lanes cannot be avoided, provide appropriate flags, barriers, flares and warning signals. Also provide advance warning signals in the traffic lane for approaching traffic.

WARNING! Avoid parking on a slop because unexpected machine movement may occur. If necessary to park on a slope, park at a right angle to the slope and block the tires.

WARNING! Before starting the engine or when the machine is standing with the engine running: Place the transmission in neutral (N), apply the parking brake, and lower all raised work equipment.

Park machine in an area free of grease and fuel puddles which cause tire deterioration.

Lower hydraulically supported equipment to the ground to avoid unexpected movement and damage possibilities.

Park on level ground to obtain accurate coolant, lubricant and fuel level checks.

WARNING! Always lock up the machine, including any anti-vandalism attachment, when leaving it unattended.

COLD WEATHER OPERATION

PREPARATION FOR LOW TEMPERATURE

If the temperature becomes low, it may be difficult to start the engine, so do as follows.

FUEL AND LUBRICANTS

Change to fuel and oil with low viscosity for all components. For details of the specified viscosity, see "LUBRICANTS, FUEL AND COOLANT" in Section 3.

COOLANT

- In climates where the temperature is above -37°C (-34°F), use a coolant mixture that contains 50 percent antifreeze. **Antifreeze is essential in any climate.** It broadens the operating temperature range by lowering the coolant freezing point and by raising its boiling point. Do **not** use more than 50 percent antifreeze in the mixture unless additional freeze protection is required. **Never** use more than 68 percent antifreeze under any condition.

WARNING! Antifreeze is flammable, so keep it away from any flame.

Care in using antifreeze

Use a Permanent Antifreeze (ethylene glycol mixed with corrosion inhibitor, antifoam agent, etc.) meeting the standard requirements as shown below. With permanent antifreeze, no change of coolant is required for a year. If it is doubtful that an available antifreeze meets the standard requirements, ask the supplier of that antifreeze for information.

Standard requirements for permanent antifreeze:

- SAE J1034
- FEDERAL STANDARD O-A-548D

★ Never use methanol, ethanol or propanol based antifreeze.

★ Where no permanent antifreeze is available, an ethylene glycol antifreeze without corrosion inhibitor may be used only for the cold season. In this case, clean the cooling system twice a year (in spring and autumn). When refilling the cooling system, add antifreeze in autumn, but do not add any in spring.

★ Absolutely avoid using any water leak preventing agent irrespective of whether it is used independently or mixed with an antifreeze.

★ Do not mix one antifreeze with a different brand.

★ For details of changing the coolant, refer to "COOLING SYSTEM" in Section 3.

BATTERY

- As ambient temperature drops, battery capacity will drop, and electrolyte may sometimes freeze if battery charge is low. Maintain battery at a charge level of approximately 100% and insulate it against cold temperature so that machine can be easily started.

Fire prevention:
Use a nonflammable cleaner or light oil for cleaning parts. Keep flame or cigarette light away from cleaning fluid.

Clamping faces:
When O-rings or gaskets are removed, clean the clamping faces and replace the O-rings and gaskets with new ones. Be sure to properly fit the O-rings and gaskets when assembling.

Objects in your pockets:
Keep your pockets free of loose objects which can fall out and drop into the machinery; especially when you work on the machinery while bending over it.

Cleaning machine:
- Do not direct a high-pressure jet directly at the radiator.
- Do not splash water on the electrical components.

Pre- and post-work checks:
Before starting work in mud, rain, snow or at the seashore, check plugs and drain valves for tightness. Wash the machine immediately after the work to protect components from rusting. Lubricate components more frequently than usual. Be sure to lubricate work equipment pins daily if they are submerged in water.

Dusty worksites:
When working at dusty worksites, do as follows:
- Check the air cleaner for clogging more frequently. Clean the air cleaner at shorter intervals than specified.
- Clean the radiator core frequently to avoid clogging.
- Replace the fuel filter(s) frequently.
- Clean electrical components, especially the cranking motor and alternator, to avoid accumulation of dust.

Avoid mixing oils:
Never mix oils of different brands. If you have only oil which is a different brand from the one that is used in the machine, do not add it but replace all the oil.

4. AXLE OIL

For axle oil, use only the recommended oil as follows:

SHELL:	DONAX TT or TD
CALTEX:	RPM TRACTOR HYDRAULIC FLUID
CHEVRON:	TRACTOR HYDRAULIC FLUID
TEXACO:	TDH OIL
MOBIL:	MOBIL AND SUPER UNIVERSAL

★ It is possible to substitute engine oil SAE 30W API classification CD for axle oil. Although increased brake noise may result, durability should not be affected.

5. GREASE

The recommended lubricating grease is No. 2 multi-purpose lithium grease with 3% molybdenum disulfide.

6. DIESEL FUEL

WARNING! Do not mix gasoline or alcohol with diesel fuel. This mixture can cause an explosion.

IMPORTANT: Due to the precise tolerances of diesel injection systems, it is extremely important that the fuel be kept clean and free of dirt or water. Dirt or water in the system can cause severe damage to both the injection pump and nozzles.

For normal service above -12°C (+10°F), the use of ASTM Grade No. 2-D diesel fuel with a minimum Cetane number of 40 is recommended. The use of No. 2-D diesel fuel will result in optimum engine performance under most operating conditions. Fuels with Cetane numbers higher than 40 may be needed in high altitudes or extremely low ambient temperatures to prevent misfires and excessive smoke.

At operating temperatures below -12°C (+10°F), use ASTM Grade No. 1-D diesel fuel. The use of lighter fuels can reduce fuel economy.

Where a winterized blend of Grade No. 2-D and No. 1-D fuels is available, it may be substituted for Grade No. 1-D fuel. However, it is the supplier's responsibilty to provide the fuel for the anticipated ambient temperature.

Use a low sulfur content fuel having a cloud point that is at least 10 degrees below the lowest expected fuel temperature. Cloud point is the temperature at which crystals begin to form in the fuel.

The viscosity of the fuel **must** be kept above 1.3 cSt to provide adequate fuel system lubrication.

7. COOLANT

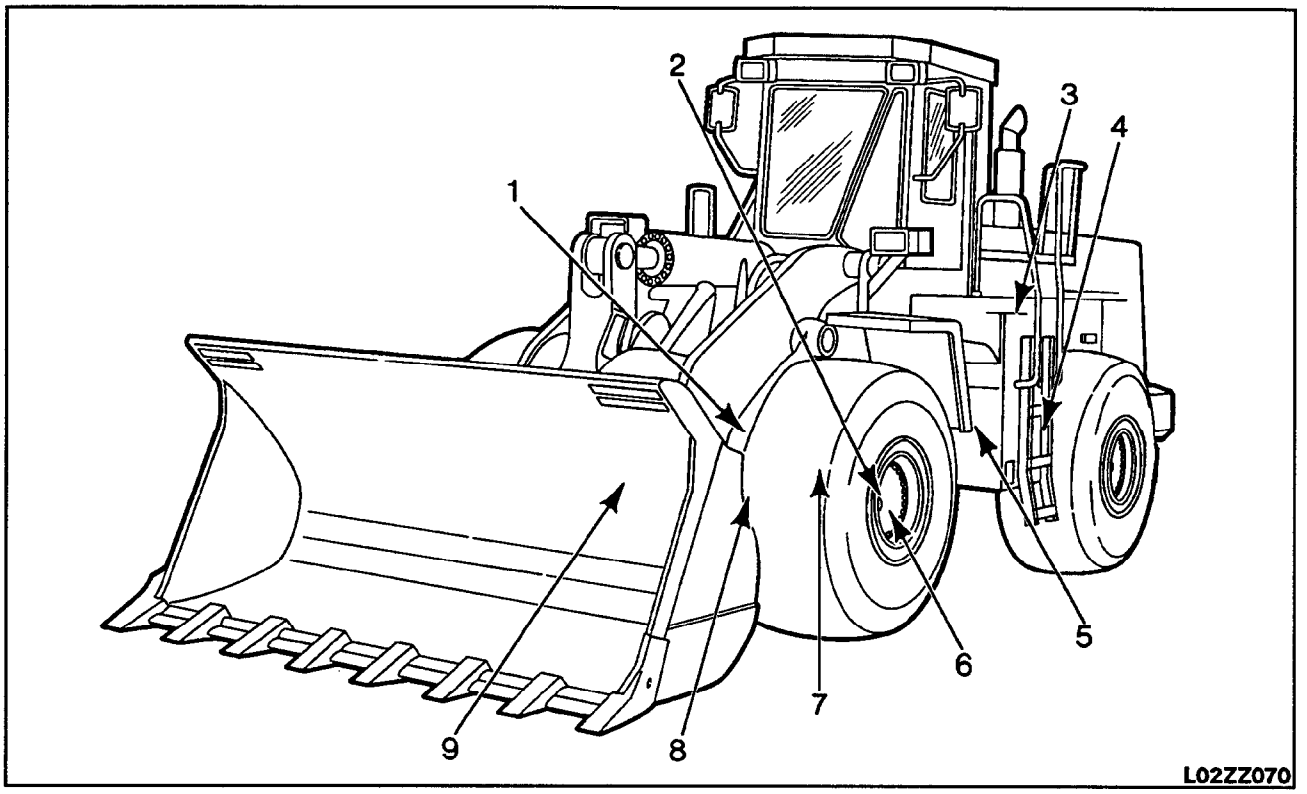
General

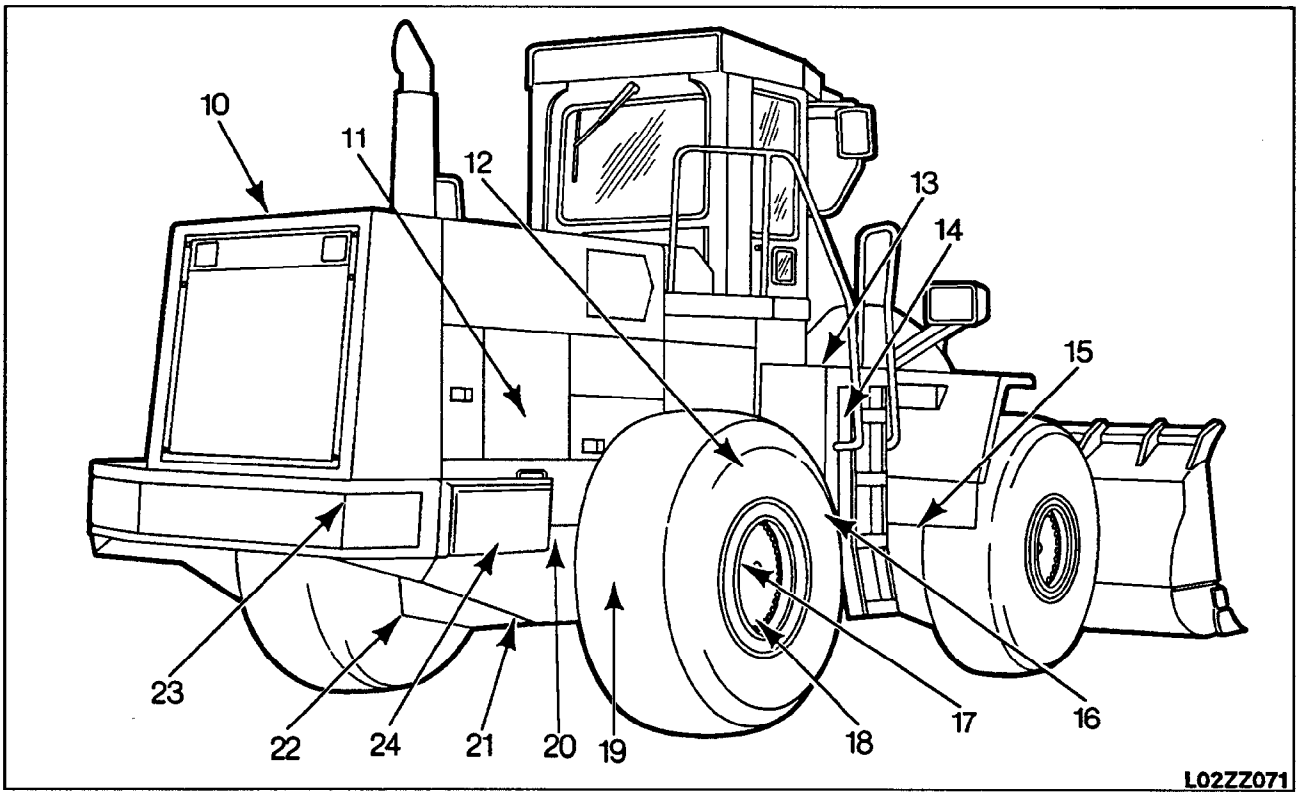
Selection and maintenance of the engine coolant is important to long engine life. The following information provides recommendations for selecting the engine coolant and maintaining the coolant inhibitors.

Heavy duty diesel engines require a balanced coolant mixture of water, antifreeze, and supplemental coolant additives. Supplemental coolant additive recommendations are included in the section entitled "Inhibitors/Conditioners". The coolant mixture **must** be drained and replaced at the specified service interval shown in the "SCHEDULED MAINTENANCE GUIDE" or every two years of operation, whichever comes first.

Water

Use water which has a low mineral content. Water used in conjunction with antifreeze, coolant filters and inhibited water must meet the following standards:


1
2
3
4
5
6
7
8
9
L02ZZ070


10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
L02ZZ071

AIR CONDITIONER REFRIGERANT CHARGE - IF EQUIPPED

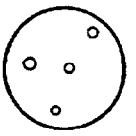
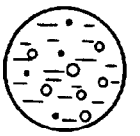
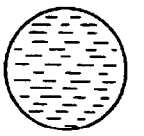
Check the air conditioner refrigerant charge twice a year, in spring and autumn.

Operate the air conditioner for 5 - 10 minutes at the coolest setting, then touch the high pressure hose and low pressure hoses at the refrigerant compressor by hand. Next, check the flow of refrigerant gas (freon 12) through the sight glass to check the gas level.

Contact your distributor for this inspection.

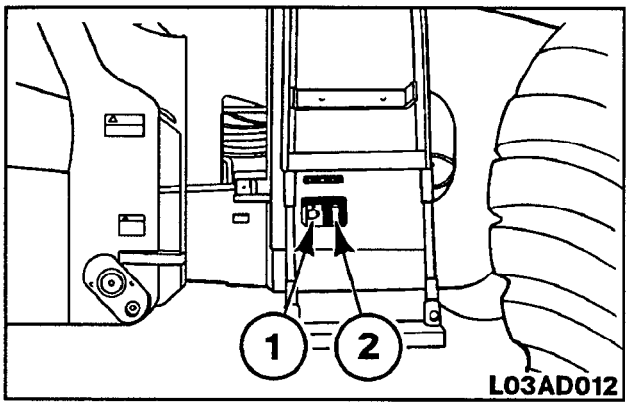
The sight glass is located on the air conditioner dryer receiver, which is located on the right side of the machine next to the condenser.

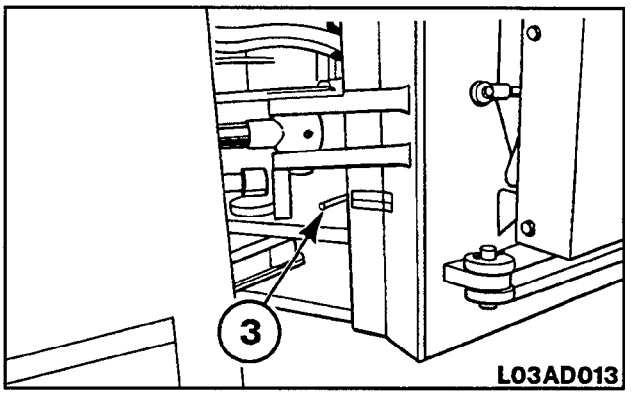
WARNING! Air conditioner refrigerant is colorless and odorless and does not cause pollution of the atmosphere, if handled properly. However, it may cause injury if it gets in the eyes or on the hands, so never loosen any parts of the refrigerant system.

CONDITION	NORMAL	ABNORMAL	
Temperature of high & low pressure lines	High pressure line is hot Low pressure line is cold Clear difference in temperature	High pressure line is warm Low pressure line is cold Little difference in temperature	Almost no difference in temperature between high & low pressure lines
Sight glass	Almost transparent. Any bubbles disappear if engine speed is raised or lowered. 	Bubbles are always flowing. Sometimes becomes transparent or white bubbles appear. 	Misty substance is flowing. 
System line connections	Properly connected	Some parts dirty with oil	Some parts very dirty with oil
General condition of air conditioner	Refrigerant level correct, no abnomalities. Ready for use.	May have refrigerant leak. Contact your distributor for inspection and repair.	Almost all refrigerant has leaked out. Contact your distributor for immediate repair.

AIR TANKS

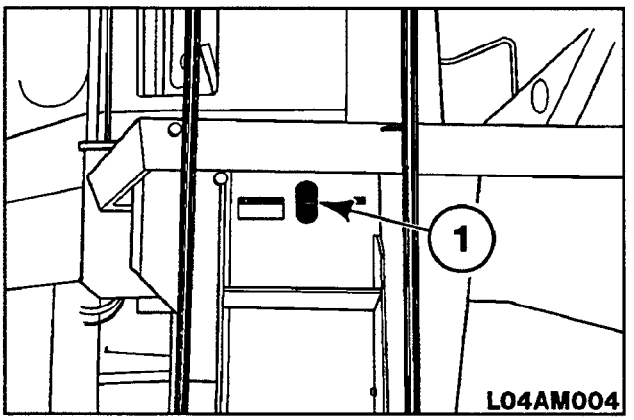
Upon completion of work, stop the engine, open drain valves (1), (2) and (3) and drain water out of the tanks.



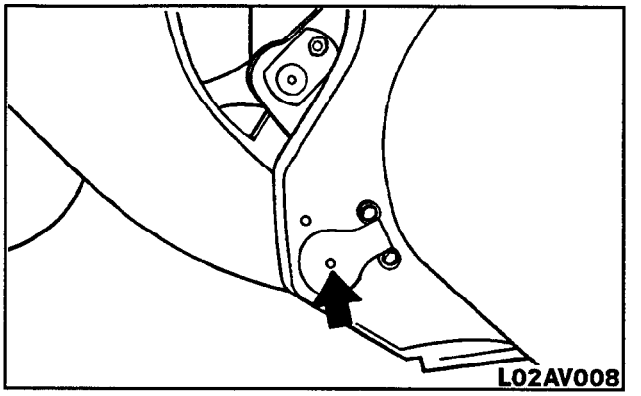


BRAKE OIL LEVEL

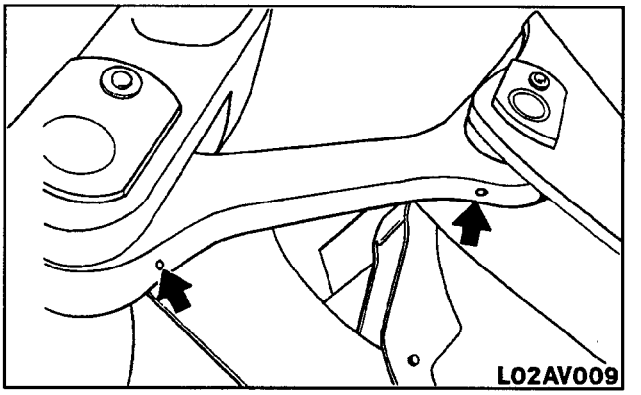
1. Check the brake oil level in oil tank (1), located on the left side of the machine. The oil level should be between the "MAX" and "MIN" oil level marks on the tank.



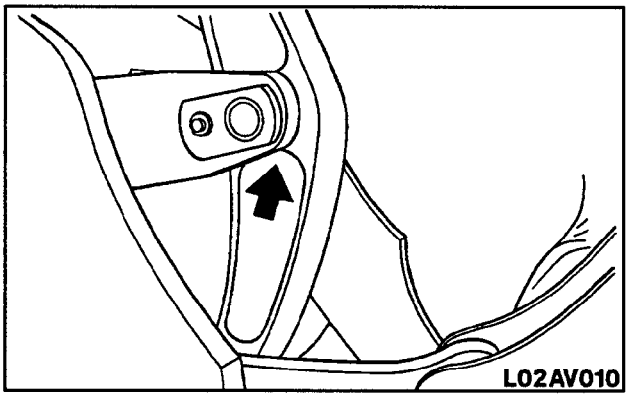
1. Bucket pins (2 points)



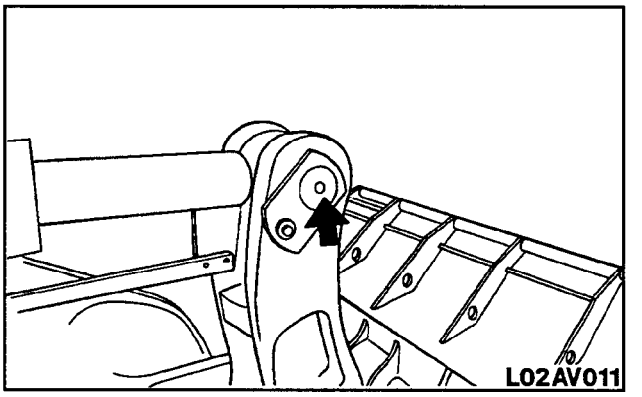
2. Bucket link pins (2 points)



3. Tilt lever pin (1 point)



4. Dump cylinder rod end pin (2 point)



CORROSION RESISTOR

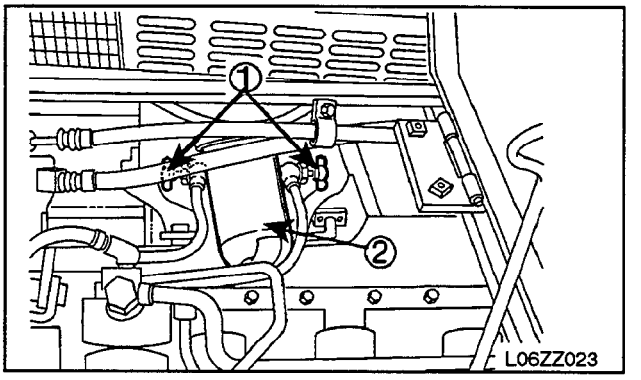
1. Open the engine side cover located on the right of the engine hood.
2. Close valves (1).
3. Using the filter wrench provided, remove the cartridge (2) by turning it counterclockwise. Fit a new cartridge after applying a dab of engine oil to the seal surface.

★ To fit the cartridge, put the seal face in contact with head, then screw it up about 2/3 of a turn. (Be careful not to apply excessive torque.)

4. After replacement, open valves (1).

★ Be sure to use a genuine cartridge.

★ After replacing the cartridge, start the engine and check that there are no leaks from the filter seal area.



TURBOCHARGER VARIOUS FASTENERS

If the engine is equipped with a turbocharger, check the mount bolts and all other connectors for looseness. If any need to be re-torqued, see the SHOP MANUAL.

AIR DRYER - IF EQUIPPED

Replace the following internal parts of the air dryer:

Desiccant, oil filter, filter, and all rubber parts.

Contact your distributor to have these items replaced.

ACCUMULATOR

Check the gas pressure charge within the accumulator as follows:

1. Stop the machine on level ground and apply the parking brake.
2. Raise the work equipment to the maximum height, then place the lift arm control lever the HOLD position.
3. Leave the work equipment in this position, and stop the engine.
4. Confirm that it is safe around the machine, then set the lift arm control lever in FLOAT and lower the work equipment to a position of 1 m (1 yd) from the ground.
5. When the work equipment reaches a position 1 m (1 yd) from the ground, move the lift arm control lever to the LOWER position, and lower the work equipment slowly to the ground.

★ If the work equipment stops moving during checking, the gas pressure may be below the service limit of 7 kg/cm^2 (100 psi / 689 kPa). If so, contact your distributor to have the gas pressure measured and/or gas charged.

★ Carry out the checks within five minutes of stopping the engine. If the machine is left with the engine stopped, the accumulator pressure will drop and it will be impossible to carry out the check.