# Operation & Maintenance Manual

SEAM018701

avance LOADER

# WA900-3

## WHEEL LOADER

SERIAL NUMBERS WA900-50001 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.

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# 6. GENERAL PRECAUTIONS

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

## SAFETY RULES

- Only trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
- Do not operate the machine if you are not feeling well, or if you are taking medicine which will make you sleepy, or if you have been drinking. Operating in such a condition will adversely affect your judgement and may lead to an accident.
- When working with another operator or with a person on worksite traffic duty, be sure that all personnel understand all hand signals that are to be used.
- Always follow all rules related to safety.

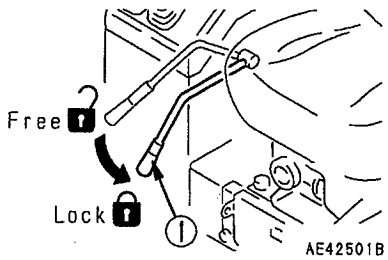
## SAFETY FEATURES

- Be sure all guards and covers are installed in their proper position. Have guards and covers repaired immediately if damaged.
  **Proper position → See "12.1.1 WALK-AROUND CHECK"**

- Use safety features such as safety lock lever ① and seat belts properly.

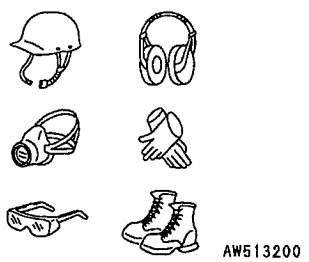
- NEVER remove any safety features. ALWAYS keep them in good operating condition.
  **Safety lock lever → See "12.13 PARKING MACHINE"**
  **Seat belts → See "12.1.3 ADJUSTMENT BEFORE OPERATION"**

- Improper use of safety features could result in serious bodily injury or death.



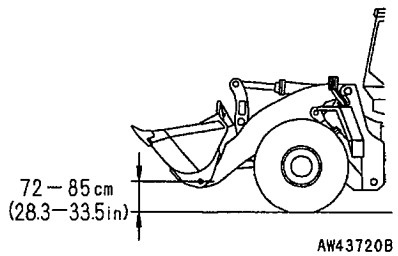

## CLOTHING AND PERSONAL PROTECTIVE ITEMS

- 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 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.
- Check that all protective equipment functions properly before using.



## PRECAUTIONS WHEN TRAVELING

- Never turn the key in the starting switch to the OFF position when traveling.
  It is dangerous if the engine stops when the machine is traveling, because the steering becomes heavy. If the engine stops, apply the brake immediately to stop the machine.
- It is dangerous to look around you when operating. Always concentrate on your work.
- It is dangerous to drive too fast, or to start suddenly, stop suddenly, turn sharply, or zigzag.
- If you find any abnormality in the machine during operation (noise, vibration, smell, incorrect gauges, air leakage, oil leakage, etc.), move the machine immediately to a safe place and look for the cause.
- Set the work equipment to a height of 72 – 85 cm (28.3 – 33.5 in) from the ground level and travel on level ground.
- When traveling, do not operate the work equipment control levers. If the work equipment control levers have to be operated, stop the machine first, then operate the levers.
- Do not operate the steering wheel suddenly. The work equipment may hit the ground surface and cause the machine to lose its balance, or may damage the machine or structures in the area.
- When traveling on rough ground, travel at low speed, and avoid sudden changes in direction.
- Avoid traveling over obstacles as far as possible. If the machine has to travel over an obstacle, keep the work equipment as close to the ground as possible and travel at low speed.
- When traveling or carrying out operations, always keep your distance from other machines or structures to avoid coming into contact with them.
- NEVER be in water which is in excess of the permissible water depth.
  **Permissible water depth → See "12.11 PRECAUTIONS FOR OPERATION".**
- When passing over bridges or structures on private land, check first that the structure is strong enough to support the mass of the machine. When traveling on public roads, check first with the relevant authorities and follow their instructions.
- Always obey the traffic regulations when traveling on public roads. This machine travels at a lower speed than normal automobiles, so keep to the side of the road and be careful to leave the center of the road free for other vehicles.
- If you drive the machine at high speed continuously for a long time, the tires will overheat and the internal pressure will become abnormally high. This may cause the tires to burst. If a tire bursts, it produces an extremely large destructive force, and this may cause serious injury or accident.
- If you are going to travel continuously, please consult your Komatsu distributor.



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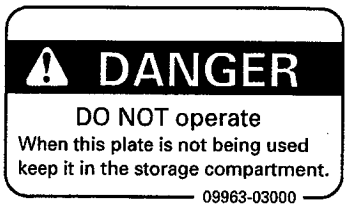
## 8.1 BEFORE CARRYING OUT MAINTENANCE

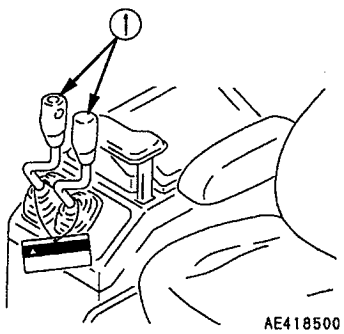
### NOTIFICATION OF FAILURE

Carrying out maintenance not described in the Komatsu operation and maintenance manual may lead to unexpected failures.
Please contact your Komatsu distributor for repairs.

### WARNING TAG

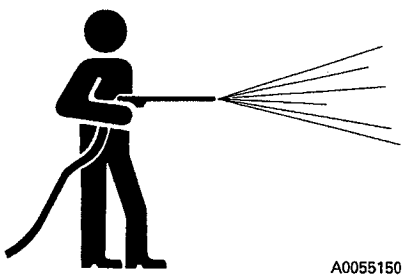
- If others start the engine or operate the controls while you are performing service or lubrication, you could suffer serious injury or death.
- ALWAYS attach the WARNING TAG to control lever ① in the operator's cab to alert others that you are working on the machine. Attach additional warning tags around the machine, if necessary.
- These tags are available from your Komatsu distributor. (Part No. 09963-03000)

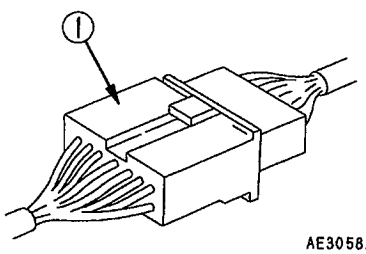



### CLEAN BEFORE INSPECTION AND MAINTENANCE

- Clean the machine before carrying out inspection and maintenance. This will ensure that dirt does not get into the machine and will also ensure that maintenance can be carried out safely.
- If inspection and maintenance are carried out with the machine still dirty, it will be difficult to find the location of problems, and there is also the danger that you will get dirty or mud in your eyes, and that you will slip and injure yourself.
- When washing the machine, always do as follows.
  - Wear non-slip shoes to prevent yourself from slipping on the wet surface.
  - When using high-pressure steam to wash the machine, always wear protective clothing. This will protect you from being hit by high-pressure water, and cutting your skin or getting mud or dust into your eyes.
  - Do not spray water directly on to the electrical system (sensors, connectors) ①. If water gets into the electrical system, there is danger that it will cause defective operation and malfunction.



## TIRE MAINTENANCE

Disassembly, repair, and assembly of tires requires specialist equipment and skill, so please ask your specialist tire repair shop to carry out repairs.

## CHECKS AFTER INSPECTION AND MAINTENANCE

Failure to carry out inspection and maintenance fully, or failure to check the function of various maintenance locations may cause unexpected problems and may even lead to personal injury or damage, so always do as follows.

- Checks when engine is stopped
  - Have all the inspection and maintenance locations been checked?
  - Have all the inspection and maintenance items been carried out correctly?
  - Have any tools or parts dropped inside the machine? It is particularly dangerous if they get caught in the lever linkage.
  - Has water and oil leakage been repaired? Have bolts been tightened?

- Checks when engine is running
  For details of checks when the engine is running, see "8.2 DURING MAINTENANCE, MAINTENANCE WITH ENGINE RUNNING", and be extremely careful to ensure safety.
  - Do the inspection and maintenance locations work normally?
  - Is there any oil leakage when the engine speed is raised and load is applied to the hydraulic system?

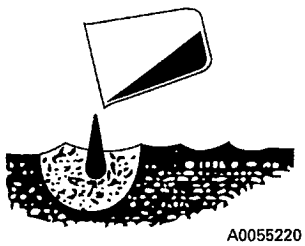
## WASTE MATERIALS

To prevent pollution, particularly in places where people or animals are living, always follow the procedures given below.

- Never dump waste oil in a sewer system, rivers, etc.

- Always put oil drained from your machine in containers. Never drain oil directly on the ground.

- Obey appropriate laws and regulations when disposing of harmful objects such as oil, fuel, coolant, solvent, filters, batteries, and others.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## MAINTENANCE OF AIR CONDITIONER

If the air conditioner refrigerant gets into your eyes or touches your skin, it may cause blindness or frostbite.

- When handling the refrigerant, follow the precautions given on the container.

- To prevent the refrigerant from leaking into the atmosphere, use a recovery recycling system.

- Never touch the refrigerant.

**METER DISPLAY PORTION (A, C, D) (11.1.2)**

These consist of the meters (speedometer, fuel gauge, engine water temperature gauge, torque converter oil temperature gauge, service meter, transmission shift indicator) and the pilot lamps (turn signal indicator, preheating, front working lamp, rear working lamp, transmission cut-off, parking brake).

**OPTION DISPLAY PORTION (F)**

This consists of the monitor lamps and switches for the auto-greasing system.

For details of each system or component, see OPTIONS, ATTACHMENTS.

**TESTING ACTUATION OF MACHINE MONITOR SYSTEM**

When the starting switch is turned to the ON position before starting the engine, all monitor lamps, gauges, and centralized warning lamps will light up for approx. 3 seconds, and the alarm buzzer will sound for approx. 1 second.

When this happens, 88 is displayed on the speedometer, and 8 is displayed on the transmission shift indicator.

Finally, there will be two beeps to indicate that the monitor check has been completed.

If the monitor lamps do not light up, there is probably a failure or disconnection, so please contact your Komatsu distributor for inspection.

When the starting switch is turned to the ON position, if the directional lever is not at the neutral position, the central warning lamp (CAUTION) will flash and the alarm buzzer will sound intermittently. If this happens, return the lever to the neutral position, and the lamps will go out and the buzzer will stop.

The monitor check cannot be carried out for at least 30 seconds after the engine has been stopped.

## 2. TRANSMISSION CUT-OFF SWITCH

**⚠ WARNING**

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

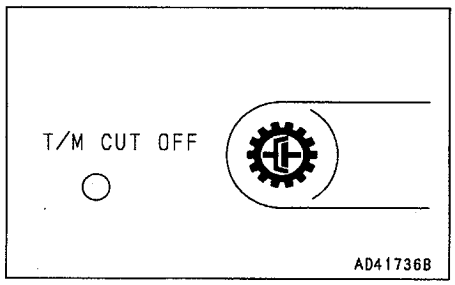
Press the push button to switch ON and OFF.

When the pilot lamp is pressed, it will light up and come ON; if it pressed again, the pilot lamp will go out and the transmission cut-off will be turned OFF.

Normally, put this switch in the ON position.

① OFF: Acts as normal brake.

② ON: Acts as normal brake, but also switches transmission to NEUTRAL.




If the switch is at ON, the transmission cut-off pilot lamp will light up.

**REMARK**

General loading work can be carried out more smoothly if the transmission cut-off function is not used.

## 3. FRONT WORKING LAMP SWITCH

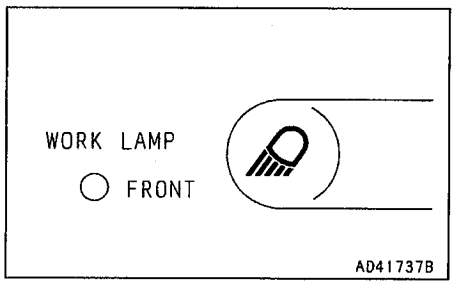
**⚠ WARNING**

**Always turn the working lamp off before traveling on public roads.**

When turning on the front working lamp, turn the lamp switch to the ON position for the side clearance lamp or ON position for the head lamp, then operate the switch.

When the pilot lamp is pressed, it will light up and come ON; if it pressed again, the pilot lamp will go out and the working lamp will be turned OFF.

The working lamp will not light up if the lamp switch is not at the ON position for the side clearance lamp or ON position for the head lamp.




## 4. REAR WORKING LAMP SWITCH

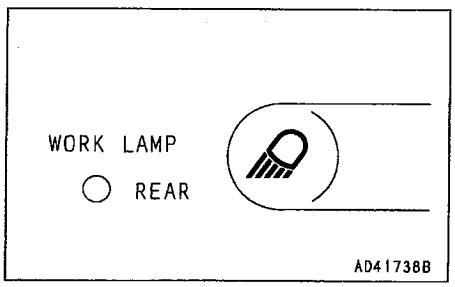
**⚠ WARNING**

**Always turn the working lamp off before traveling on public roads.**

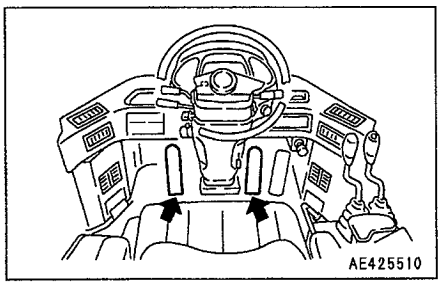
When turning on the rear working lamp, turn the lamp switch to the ON position for the side clearance lamp or ON position for the head lamp, then operate the switch.

When the pilot lamp is pressed, it will light up and come ON; if it pressed again, the pilot lamp will go out and the working lamp will be turned OFF.

The working lamp will not light up if the lamp switch is not at the ON position for the side clearance lamp or ON position for the head lamp.



## 7. BRAKE PEDALS




**⚠ WARNING**

- **When traveling downhill, use the engine as a brake, and always use the right brake pedal.**
- **Do not use the brake pedals repeatedly unless necessary.**
- **Do not put your foot on this pedal unless necessary.**

**Right brake pedal**

The right brake pedal operates the wheel brakes, and is used for normal braking.

**Left brake pedal**

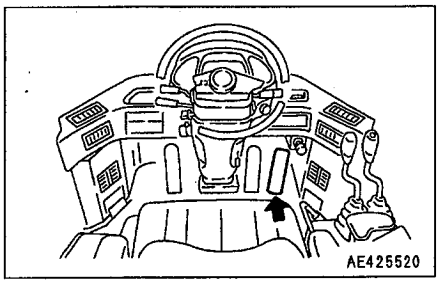
The left brake pedal operates the wheel brakes, and if the transmission cut-off switch is at ON, it also returns the transmission to neutral.

If the transmission cut-off switch is at OFF, the left brake pedal acts in the same way as the right brake pedal.

**REMARK**

When the accelerator is being used for operating the work equipment, always use the left brake pedal to slow or stop the machine after putting the transmission cut-off switch to the ON position.

## 8. ACCELERATOR PEDAL




This pedal controls the engine speed and output.

The engine speed can be freely controlled between low idling and full speed.

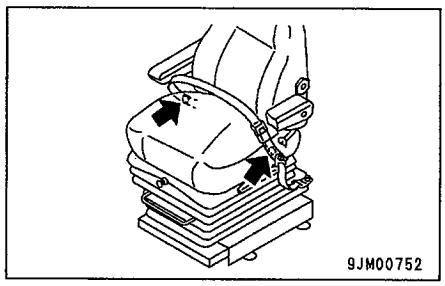
**11. Check seat belt and equipment (if equipped)**

**⚠ WARNING**

**Even if there appears to be no abnormality with the seat belt, always replace it once every three years.**

**REMARK**

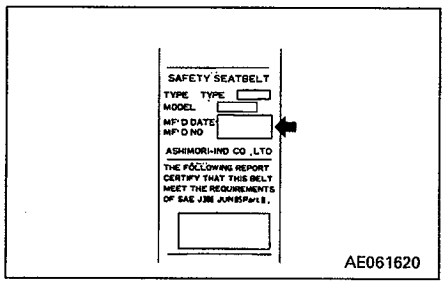
The date of manufacture of the seat belt is marked on the belt at the place indicated by the arrow in the diagram on the right.




Check that there are no loose bolts on the equipment mounting the seat belt to the machine, and tighten if necessary.

Tightening torque: 24.5 ± 4.9 N·m (2.5 ± 0.5 kgf·m, 18.1 ± 3.6 lbft)

If the belt is damaged or fluff is starting to form, or if there is any damage or deformation of the seat belt holders, replace the seat belt with a new part.




**12. Check for loose bolts on ROPS (If equipped)**

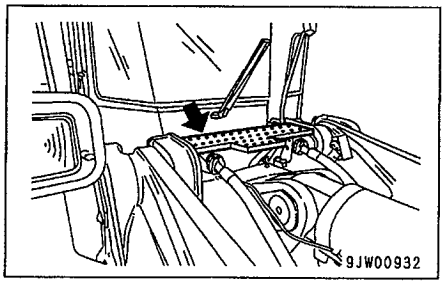
Check for any loose or damaged bolts. If any loose bolts are found tighten them to 2452 – 3050 N·m (250 – 310 kgf·m, 1808.3 – 2242.2 lbft).

If any bolts are damaged, replace them with genuine Komatsu bolts.

**13. Clean cab window**

Clean the cab window to ensure good visibility when operating the machine.

When cleaning the front window glass, stand on the central step of the front frame. To move the central step of the front frame, articulate the machine and stand on the floor step of the cab, and move to the central step, supporting yourself by grasping the handrails of the cab, etc.



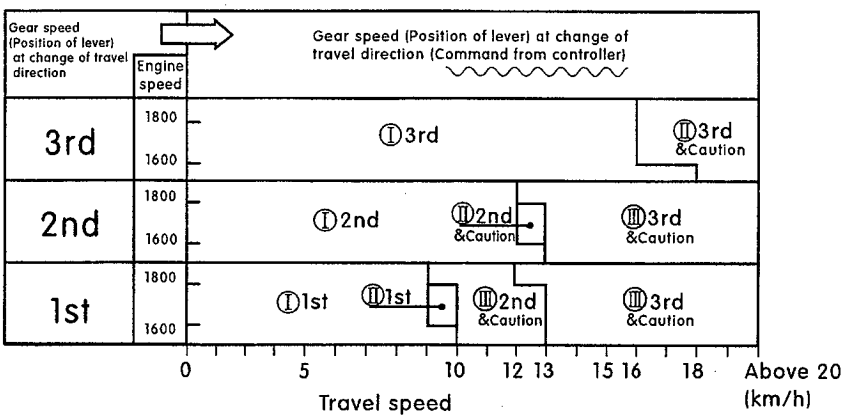
Ⓕ: **Adjusting height of headrest**
Move the headrest up and down to the desired height.
The adjustment range is 50 mm (2.0 in).

Ⓖ: **Adjusting headrest angle**
Rotate the headrest to the front or rear.

Ⓗ: **Adjusting angle of armrest**
Adjust the angle of the armrest by rotating knob ⑤.
The adjusting range is 30° (Forward tilt: 25°, Backward tilt: 5°).
Also, when the armrest is turned, it will spring up.

Ⓘ: **Lumbar support**
The tension of the waist part can be adjusted by turning grip ⑥.

F ↔ R Control for change of travel direction

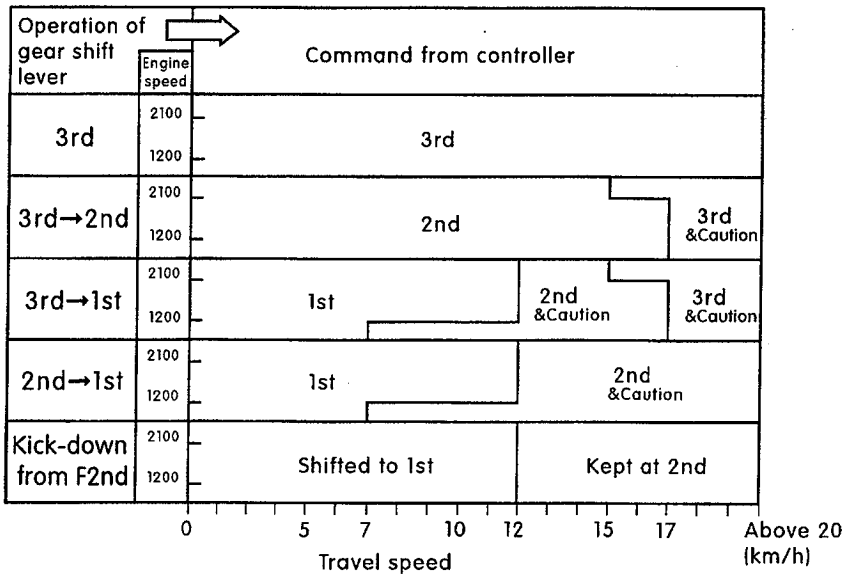



Ⅰ: Gear speed is changed as operated
Ⅱ: Gear speed is changed as operated + Caution
Ⅲ: Gear speed is not changed as operated + Caution (Controller controls gear speed according to travel speed)

## 12.6.2 CONTROL FOR SHIFTING GEAR DOWN AT HIGH TRAVEL SPEED

Shifting the gear down at high travel speed will be lowered the durability of the torque converter.

If you shift down the gear at high travel speed, the warning buzzer sounds for 3 seconds (quick intermittent sound) and the controller controls the gear shifting down operation to maintain the durability of the torque converter according to the following table. Be careful that the deceleration of the machine is lowered in this case.



## 12.11.4 PRECAUTIONS WHEN DRIVING MACHINE

When the machine travels at high speed for a long distance, the tires become extremely hot. This causes early wear of the tires, so it should be avoided as far as possible. If the machine must be driven for a long distance, take the following precautions.

- Follow the regulations related to this machine, and drive carefully.
- Before driving the machine, carry out the checks before starting.
- The most suitable tire pressure, travel speed, or tire type differ according to the condition of the travel surface. Contact your Komatsu distributor or tire dealer for information.
- When traveling with standard tires L-5 on a paved road surface, use the table as a guide.

| Ambient temperature(°C) | Max. travel speed (km/h) | Traveling time and breaking time |
|---|---|---|
| 50 | 20 | Travel → Break → Repeat<br>13 km or 40′ (3H) |
| | 25 | Travel → Break → Repeat<br>13 km or 35′ (3H) |
| | 28 | Travel → Break → Repeat<br>13 km or 25′ (3H) |
| 30 | 25 | Travel → Break → Repeat<br>13 km or 35′ (3H) |
| | 28 | Travel → Break → Repeat<br>15 km or 30′ (3H) |
| 0 | 28 | Travel → Break → Repeat<br>18 km or 40′ (3H) |

(Air pressure: 0.67 MPa (6.8 kgf/cm$^2$, 96.56 PSI)

- When driving the machine continuously, use the following as a guideline for one day's travel:
  Travel distance: within 20 km; travel time: Max. 1 hour
- When the machine is stopped, check the tires and all other parts for abnormalities, and check the oil and coolant levels.
- Check the tire pressure before starting, when the tire is cool.
- Always travel with the bucket empty.
- Never put calcium chloride or dry ballast in the tires when traveling.

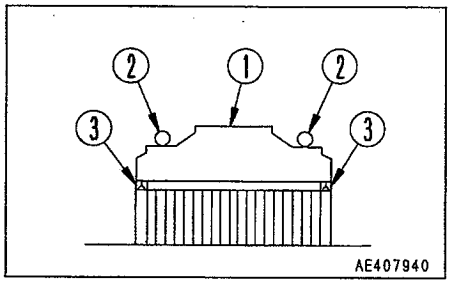
## INSTALLING THE BUCKET

**⚠ CAUTION**

**Align the pin holes with each other by using a rod. Never put your finger in the holes.**

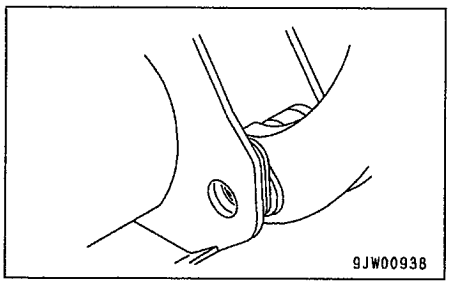
1. Set cord ring ② on top of lift arm boss ① as shown in the diagram.

   After completions of assembly of the bucket and adjustment with shims in step 8, move the cord ring down to the groove.

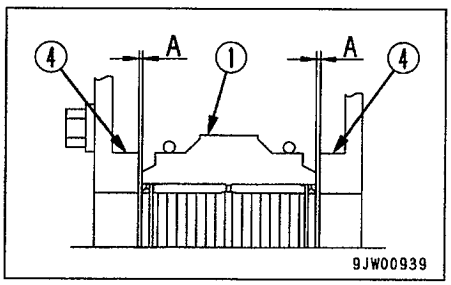



2. Coat dust seal lip portion ③ with grease.

3. Align the left and right bucket pin holes.

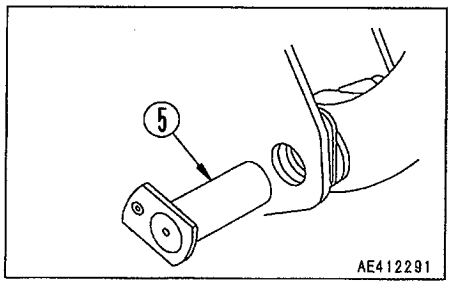



4. Select the number of shims so that clearance A between bucket hinge boss ④ and lift arm boss ① are less than 1.0 – 1.5 mm (0.04 – 0.06 in).

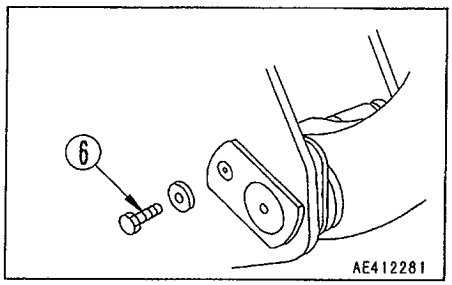



5. Assemble the shims the selected in Step 4, align the pin holes, then insert bucket hinge pin ⑤.
   Coat with grease to prevent damage to the dust seal when inserting the bucket hinge pin.

   Use a bucket hinge pin that has a grease hole.




6. Install mounting bolt ⑥.



- The towing machine should normally be of the same class as the machine being towed. Check that the towing machine has ample braking power, weight, and rimpull to allow it to control both machine on slopes or on the tow road.

- When towing a machine downhill, use a larger machine for towing to provide ample rimpull and braking power, or connect another machine to the rear of the machine being towed. In this way it is possible to prevent the machine from losing control and turning over.

- Towing may be carried out under various differing conditions, so it is impossible to determine beforehand the requirements for towing. Towing on flat horizontal roads will require the minimum rimpull, while towing on slopes or on uneven road surfaces will require the maximum rimpull.

### 16.2.1 WHEN ENGINE CAN BE USED

- If the transmission and steering wheel can be operated, and the engine is running, it is possible to tow the machine out of mud or to move it for a short distance to the edge of the road.

- The operator should sit on the machine being towed and operate the steering in the direction that the machine is towed.

### 16.2.2 WHEN ENGINE CANNOT BE USED

When towing a machine with the engine stopped, use the following procedure.

If leakage in the air circuit has caused the pressure inside the air tank to drop, the parking brake will be applied. When towing the machine, release the parking brake.

1. The transmission oil does not lubricate the system, so remove the front and rear drive shafts. If necessary, block the tires to prevent the machine from moving.

2. The steering cannot be operated, so remove the steering cylinder and steering linkage.
   Even if the brakes are in good condition, the brakes can only be used a limited number of times. There is no change in the operating force for the brake pedal, but the braking force is reduced each time the pedal is depressed.

3. Connect the towing equipment securely. When carrying out towing operations, use two machines of at least the same class as the machine being towed. Connect one machine each to the front and rear of the machine being towed, then remove the blocks from the tires and tow the machine.

## 16.4.3 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)<br>• Clogged oil filter cartridge<br>• Defective tightening of oil pipe joint, oil leakage from damaged part<br>• Defective engine oil pressure sensor | • Add oil to specified level, see CHECK BEFORE STARTING<br>• Replace cartridge, see EVERY 250 HOURS SERVICE<br>(• Check, repair)<br>(• Replace sensor) |
| Steam is emitted from top part of radiator (pressure valve) | • Cooling water level low, water leakage<br>• Loosen fan belt<br>• Dirt or scale accumulated in cooling system | • Add cooling water, repair, see CHECK BEFORE STARTING<br>• Adjust fan belt tension, see WHEN REQUIRED<br>• Change cooling water, clean inside of cooling system, see WHEN REQUIRED |
| Coolant temperature monitor lights up | • Clogged radiator fin or damaged fin<br>• Defective thermostat<br>• Loose radiator filler cap (high altitude operation)<br>• Defective water level sensor | • Clean or repair, see WHEN REQUIRED<br>(• Replace thermostat)<br>• Tighten cap or replace packing<br>(• Replace sensor) |
| Engine does not start when starting motor is turned | • Lack of fuel<br>• Air in fuel system<br>• Defective fuel injection pump or nozzle<br>• Starting motor cranks engine sluggishly<br>• Preheating monitor does not light up<br>• Defective compression<br>o Defective valve clearance | • Add fuel, see CHECK BEFORE STARTING<br>• Repair place where air is sucked in, see EVERY 500 HOURS SERVICE<br>(• Replace pump or nozzle)<br>See ELECTRICAL SYSTEM<br>(o Adjust valve clearance) |
| Exhaust gas is white or blue | • Too much oil in oil pan<br>• Improper fuel | • Add oil to specified level, see CHECK BEFORE STARTING<br>• Change to specified fuel |
| Exhaust gas occasionally turns black | • Clogged air cleaner element<br>• Defective nozzle<br>• Defective compression<br>• Defective turbocharger | • Clean or replace, see WHEN REQUIRED<br>(• Replace nozzle)<br>(• See defective compression above)<br>(• Clean or replace turbocharger) |

# 19. WEAR PARTS LIST

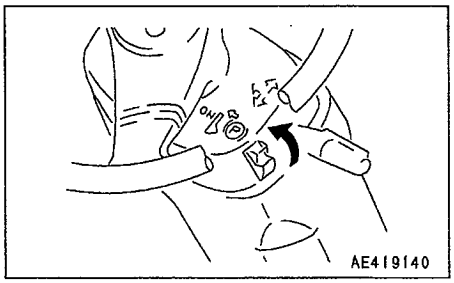
Wear parts such as the filter element, air cleaner element, bucket tooth, etc. are to be replaced at the time of periodic maintenance or before their abrasion limits.
The wear parts should be changed correctly in order to use the machine economically.
For part change, Komatsu genuine parts of excellent quality should be used.
When ordering parts, please check the part number in the parts book.

**The parts in parentheses are to be replaced at the same time.**

| Item | | | Part No. | Part Name | Q'ty | Replacement frequency |
|---|---|---|---|---|---|---|
| Engine oil filter | | | 600-211-1231 | Cartridge | 4 | EVERY 500 HOURS |
| By-pass filter | | | 600-212-1511 | Cartridge | 2 | EVERY 500 HOURS |
| Fuel filter | | | 600-311-7131 | Cartridge | 2 | EVERY 500 HOURS |
| Transmission oil filter | | | 424-16-11140<br>(07000-12125)<br>(07000-12014) | Element<br>(O-ring)<br>(O-ring) | 6<br>(12)<br>(6) | EVERY 500 HOURS |
| Corrosion resistor | | | 600-411-1171 | Cartridge | 2 | EVERY 1000 HOURS |
| Hydraulic filter | | | 07063-51210 | Element | 3 | EVERY 2000 HOURS |
| | | | (07000-15175) | (O-ring) | (3) | |
| Air cleaner | | | 6128-81-7042 | Element ass'y | 2 | — |
| | | | 600-181-4400 | Outer element ass'y | 2 | |
| Air conditioner air filter | | | 421-07-12312 | Element | 2 | — |
| Tip tooth | General rock | Long life | 427-70-13940<br>(427-70-13890) | Tooth<br>(Pin) | 10<br>(10) | — |
| | | Semi-long life | 427-70-13830<br>(427-70-13890) | Tooth<br>(Pin) | 10<br>(10) | |
| | Soft rock | Sharp | 427-842-1220<br>(428-72-13890) | Tooth<br>(Pin) | 10<br>(10) | |
| | Lime-stone | Long life | 427-842-1130<br>(427-70-13890) | Tooth<br>(Pin) | 10<br>(10) | |
| | | Sharp | 427-842-1140<br>(427-70-13890) | Tooth<br>(Pin) | 10<br>(10) | |

| SERVICE ITEM | PAGE |
|---|---|
| WHEN REQUIRED (continued) | |
| Bleeding air from hydraulic tank | 3-41 |
| Replace fan belt, adjust auto-tensioner | 3-43 |
| Selection and inspection of tires | 3-44 |
| Drain water from water separator (if equipped) | 3-45 |
| **CHECK BEFORE STARTING** | |
| Check monitor panel | 3-46 |
| Check coolant level, add water | 3-46 |
| Check oil level in engine oil pan, add oil | 3-47 |
| Check brake oil tank level, add oil | 3-48 |
| Check fuel level, add fuel | 3-49 |
| Check electric wiring | 3-50 |
| Check inflation pressure of tires | 3-50 |
| Check effect of parking brake | 3-51 |
| Check effect of brake | 3-52 |
| Check sound of horn and backup buzzer | 3-52 |
| Check flashing of lamps, check for dirt or damage | 3-52 |
| Check direction of rear view mirror, check for dirt or damage | 3-52 |
| Check engine exhaust color and sound | 3-52 |
| Check operation of gauges | 3-52 |
| Check play of steering wheel, check operation of steering | 3-52 |
| Check for water and sediment in water separator, drain water (if equipped) | 3-52 |
| **EVERY 50 HOURS SERVICE** | |
| Drain water, sediment from fuel tank | 3-53 |
| **EVERY 100 HOURS SERVICE** | |
| Lubricating | 3-54 |
| • Bucket pin (2 points) | 3-54 |
| • Bucket link pin (2 points) | 3-54 |
| • Lift arm hinge pin (2 points) | 3-55 |
| • Bucket cylinder pin (2 points) | 3-55 |

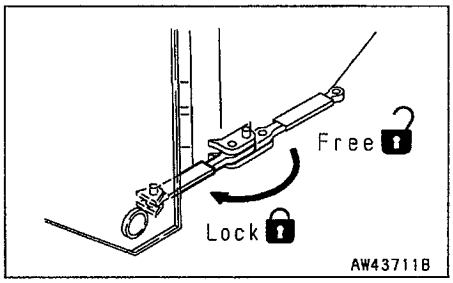
## 24.2.3 CHECK TRANSMISSION OIL LEVEL, ADD OIL



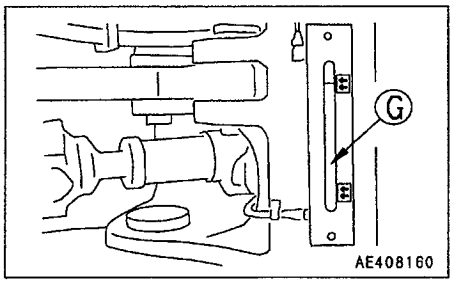

**⚠ WARNING**

- **When checking the oil level, apply the parking brake, and lock the front and rear frames with the safety bar and pin.**
- **The oil is at high temperature after the machine has been operated. Always wait for the temperature to go down before starting this operation.**

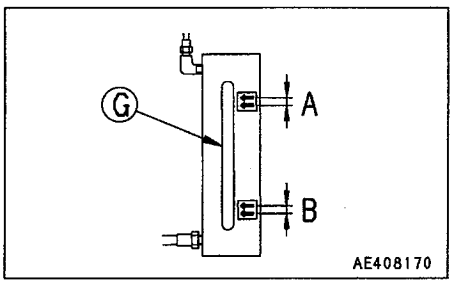
Carry out this procedure if there is any sign of oil on the transmission case, or if there is oil mixed with the cooling water.




1. Stop the engine.



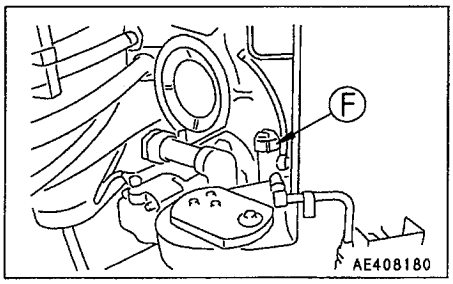

2. Use sight gauge Ⓖ to check the oil level.




3. If the oil level is not within the range at upper area A of the sight gauge, add engine oil through oil filler Ⓕ.

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

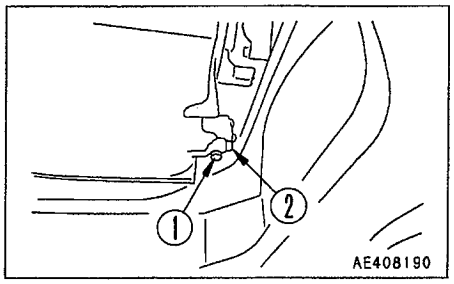
4. If the oil is above the A, remove drain plug ① and loosen plug ② to drain the excessive engine oil, then check the oil level again.




5. If the oil level is correct, then tighten the cap.

Make an oil level check before starting engine or 60 minutes or more after the engine is stopped. If oil remains at various portions, the correct oil level cannot be measured.

The oil level can also be checked at low idling. In this case, the oil should be within the range at bottom area B of the sight gauge. However, the time taken for the oil level to become steady will differ according to the idling speed and the oil temperature.



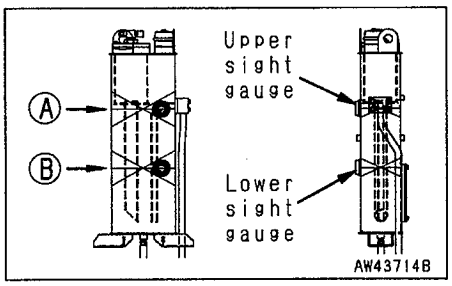
## 24.2.14 BLEEDING AIR FROM BRAKE HYDRAULIC CIRCUIT

After removing the piping of brake hydraulic circuit, bleed the air from inside of the circuit as follows:

1. After assembling the piping, be sure to check that the connectors are not loose.

2. Put blocks under the wheels.

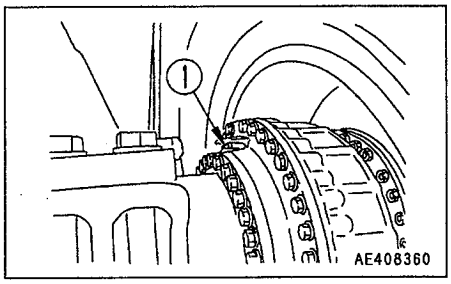
3. Check that the brake oil level is within the sight gauge on the side of the brake oil tank.
   - While the engine is stopped, the oil must be at level Ⓐ (10 hours or more after the engine is stopped).
   - While the engine is running, the oil must be at level Ⓑ (5 minutes or more after the engine is started).




4. Stop the engine.

5. Remove the air bleeder cap from the brake housing and insert one end of a vinyl hose in the brake housing and put the other end in a container.

6. Depress the brake pedal and loosen bleeder screw ① to bleed air. After tightening bleeder screw, release the brake pedal slowly.
   - This work are to be performed by two persons. One depresses the brake pedal, and the other bleeds air through the bleeder screw ①.
   - Use the left-hand brake pedal.
   - Supply brake oil periodically to keep the level sufficiently high.




7. Repeat this operation until air bubbles stop coming out of the hose. Then, depress the pedal to the end and tighten bleeder screw ① while the oil is flowing out.

**NOTICE**

**Bleed the air at all 4 locations. After bleeding the air, check the oil level in the brake oil tank.**

For details, contact your Komatsu distributor.

## 24.2.15 BLEEDING AIR FROM PPC CIRCUIT

When removing piping of PPC circuit, or removing strainer, after assembling, bleed air from inside of the circuit as follows:

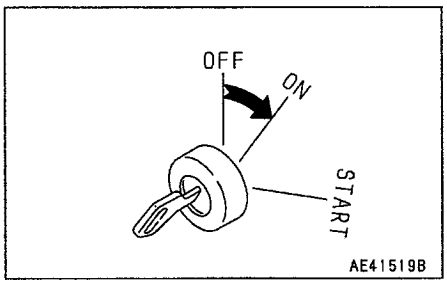
1) Put bucket control lever in TILT position and boom control lever in FLOAT position, and after cylinder reaches stroke end, keep in that position for one minute.
2) Put bucket control lever in DUMP position an d boom control lever in RAISE position, and after cylinder reaches stroke end, keep in that position for one minute.
   For details, contact your Komatsu distributor.

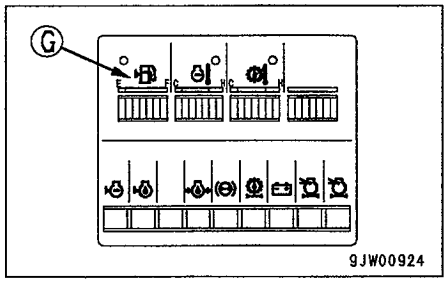
## 24.3.5 CHECK FUEL LEVEL, ADD FUEL

**⚠WARNING**

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

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

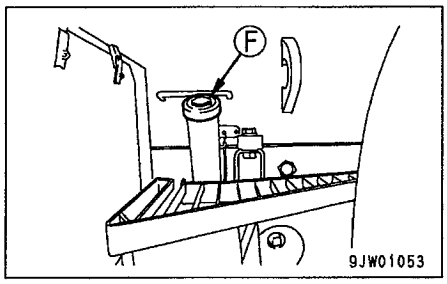



2. Upon completion of work, remove the mud guard cover and add fuel through filler Ⓕ until the fuel tank is full.

   For details of the method for opening and closing the cap, see "11.5 CAP WITH LOCK".

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



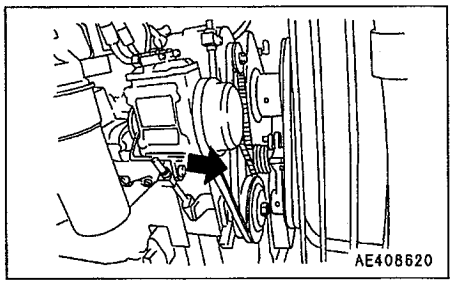

3. After adding fuel, tighten the cap securely.

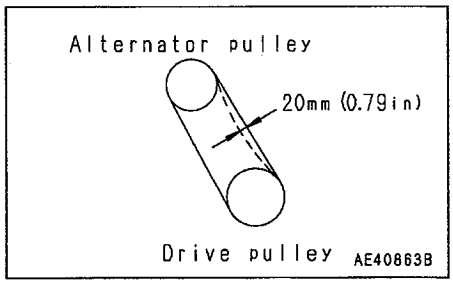
Fuel capacity: 1425 ℓ (376.2 US gal, 313.5 UK gal)

## 24.6.2 CHECK ALTERNATOR BELT TENSION, ADJUST

### Checking

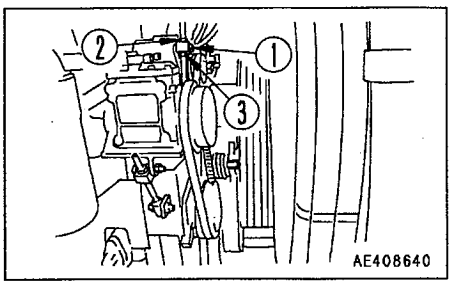
The belt should normally deflect by about 20 mm (0.79 in) when pressed with the finger (with a force of approx. 58.8N (6 kgf) at a point midway between the drive pulley and alternator pulley.



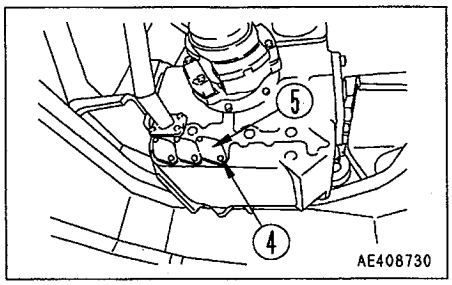




### Adjusting

1. Loosen bolt ① and lock nut ②.
2. Rotate adjusting nut ③ so that the deflection is approx. 20 mm (0.79 in) (at a force of approx. 58.8 N (6 kgf)).
3. After adjustment, tighten lock nut ② and bolt ① securely.
4. Check each pulley for damage, wear of the V-groove, and wear of the V-belt. In particular, be sure to check that the V-belt is not touching the bottom of the V-groove.
5. Replace the V-belt if it has stretched, leaving no allowance for adjustment, or if there is any cut or crack on belt.
6. After operating the machine for one hour with a newly exchanged V-belt, test and adjust the V-belt again.

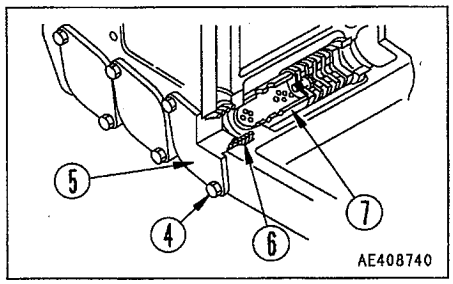


5. Remove bolt ④, then remove cover ⑤ and take out strainer ⑦ together with spring ⑥.




6. Remove any dirt stuck to strainer ⑦, then wash it in clean diesel oil or flushing oil. If strainer ⑦ is damaged, replace it with a new part.

7. Install spring ⑥ and strainer ⑦ to cover ⑤.
Replace the O-ring on the cover with a new part, then install the cover.

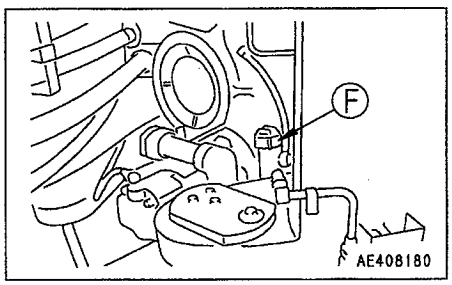



8. Pour in the specified amount of engine oil from oil filler Ⓕ.

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

9. After filling with oil, check that the oil is at the specified level. For details, see "24.2 WHEN REQUIRED".

10. Check for oil leakage from the transmission case and filter.



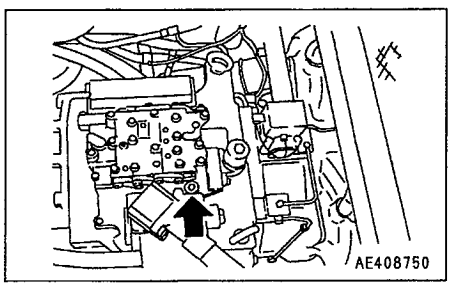

Make an oil level check before starting engine or 60 minutes or more after the engine is stopped.

If oil remains at various portions, the correct oil level cannot be measured.

## 24.8.2 CLEAN TRANSMISSION CASE BREATHER

Remove all mud and dirt from around the breather, then remove the breather. Put in cleaning fluid and clean the breather.

Take care not to allow dust and dirt to enter the transmission case through the port while the breather is removed.



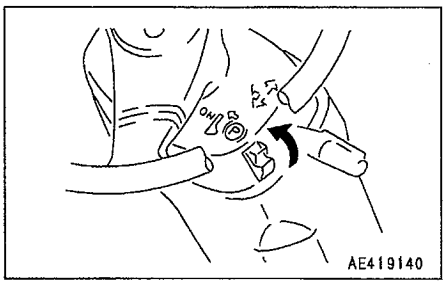
## 24.9.4 CHANGE AXLE OIL

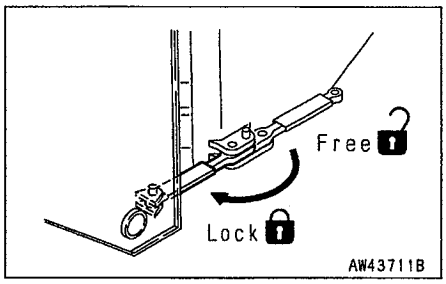
**⚠WARNING**

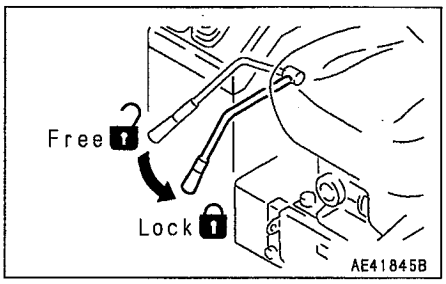
- **Apply the parking brake, and lock the front and rear frames with the safety bar and pin.**
- **Set the work equipment in a stable condition, then stop the engine and apply the locks securely to the work equipment control levers.**
- **The oil is at high temperature after the machine has been operated. Always wait for the temperature to go down before starting this operation.**

Prepare the following.

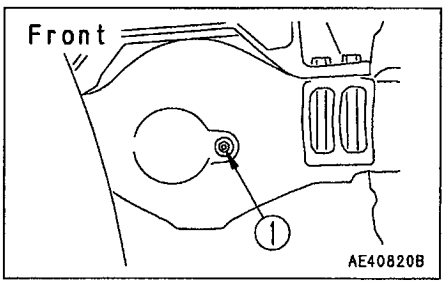
- Container to catch drained oil: min. 720 ℓ capacity
- Refill, capacity (front and rear, each):
  360 ℓ (95.0 US gal, 79.2 UK gal)

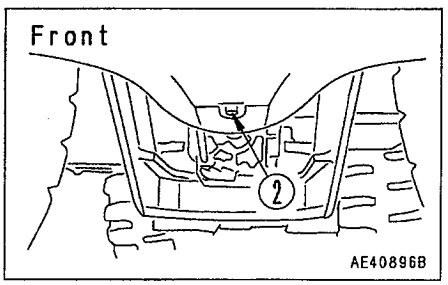



1. Remove front oil filler plugs ①, then remove drain plugs ② to drain the oil.



# 26. OPTIONAL PARTS AND ATTACHMENTS

| Name | Specification, use |
|---|---|
| Bucket | Capacity 13.0 $m^3$ (16.8 cu.yd)<br>(for spade nose rock bucket) |
| Bucket<br>(for high-lift boom) | Capacity 11.5 $m^3$ (14.9 cu.yd)<br>(for spade nose rock bucket) |
| Bucket tooth | • Tip type tooth for rock<br>• Tip type tooth for limestone |
| High-lift boom | Optimum for loading 120-ton class dump truck |
| Mesh chain | Tire protector |

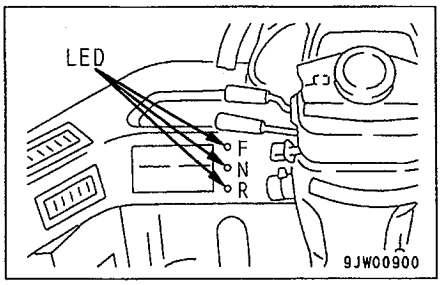
- ROPS canopy
- Emergency steering
- Tires
- Air conditioner
- Heater and front defroster
- Rear wiper and windwasher
- Car radio
- Fire extinguisher
- Tire inflation kit
- Joy stick steering system
- Auto grease system
- Hi-lift arm

These and various other parts and attachments are available, so please contact your Komatsu distributor.

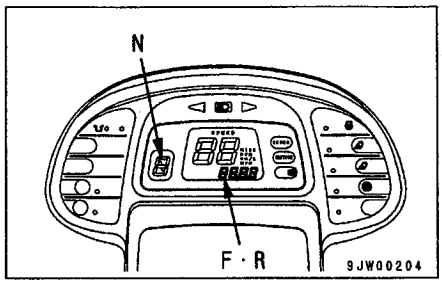
## 29.3 OPERATION METHOD OF JOYSTICK STEERING SYSTEM

**⚠ CAUTION**

**When operation with joystick lever ①, always adjust the angle of the steering wheel so that it is possible to see the F-N-R display (LED) on the left of the machine monitor.**
**The illuminance of the LED changes as the small lamp is turned ON and OFF.**




- F-N-R is also displayed on the two locations of the main monitor shown at right, synchronized with the F-N-R display of the LED. While F or R is displayed, the speed range is indicated on the N-portion




1. Adjustment of steering wheel

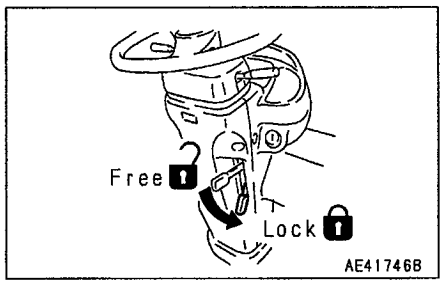
**⚠ WARNING**

**Stop the machine before adjusting the angle of the steering wheel.**

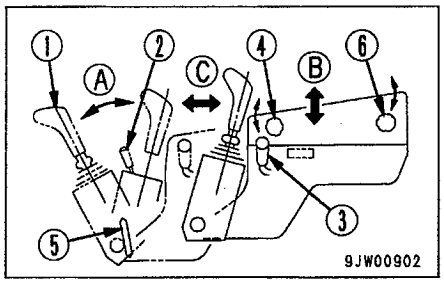
This lever allows the steering column to be tilted forward or backward.

Pull the lever up and move the steering wheel to the desired position. Then push the lever down to lock the steering wheel in position.

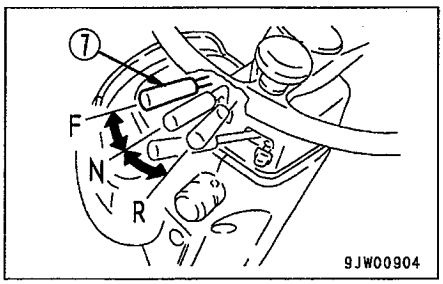
Range of adjustment: 125 mm (4.9 in) (stepless)




2. Sit on the operator's seat and pull up lever ③ to unlock the joystick console, then slide the latter from the rear position to the forward stroke end, then lock it securely.
   Under this condition, safety switch ④ is turned on. Adjust joystick ① to the angle for easy operation with console box adjustment lever ②. (See "29.5 ADJUSTMENT OF JOYSTICK CONSOLE".)

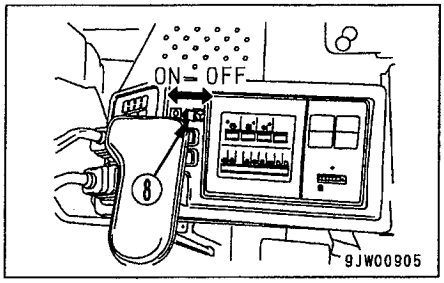



3. Fasten the seat belt.

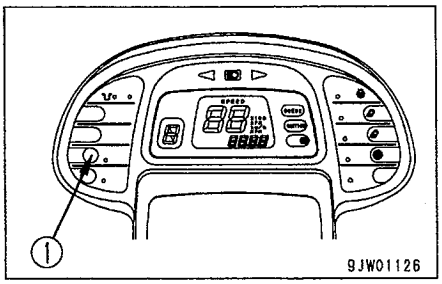



4. Confirm that joystick ① operates normally and forward/reverse lever ⑦ of the transmission is a the neutral position and the periphery of the vehicle is safe. Then, start the engine.

5. Turn on joystick ON/OFF switch ⑧.
   If the directional lever ⑦ of the transmission has been at F or R position, the transmission is set to N (Neutral) by the neutral interlock mechanism.
   In this case, return the directional lever ⑦ of the transmission to the N (Neutral) position, then start travel forward or in reverse.



## 31.1 METHOD OF OPERATING AUTO-GREASING SYSTEM

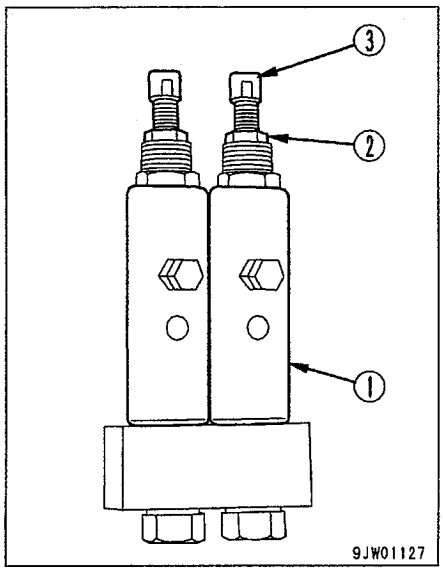



1. If the starting switch of the vehicle is turned ON, this system automatically starts the operation.

2. Auto-greasing switch ①

   If the auto-greasing switch ① is pressed, the grease pump is operated, regardless of the time count. The grease pump operates only while the auto-greasing switch is pressed and held. The grease pump stops immediately when the auto-greasing switch is released. This switch is mainly used to check the operation of the grease pump or supply additional grease.

## 31.2 PRECAUTIONS WHEN HANDLING AUTO-GREASING SYSTEM



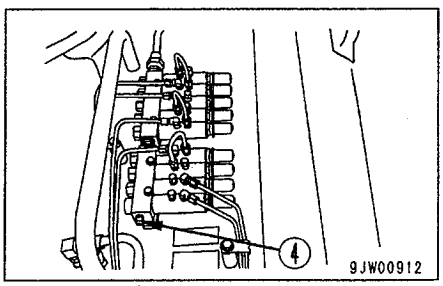

1. Adjustment of discharge from injector ①

   Set the all injectors to the maximum discharge.
   Loosen lock nut ② and turn adjustment screw ③ counterclockwise.

2. Method of bleeding air from main line

   Loosen the plug installed to each injector to bleed air from the main piping. This work shall be carry out by two persons. Start bleeding at the injector nearest the grease pump, then bleed at the other injectors in order (Rear frame → Front frame → Boom → Bell crank).

   1) One person removes plug ④ from one injector, then stays there.




This plug ④ is installed to the manifold end of each end injector. If air must be bled from the main piping, remove this plug.

   2) The other person presses the auto-greasing switch to start the grease pump.

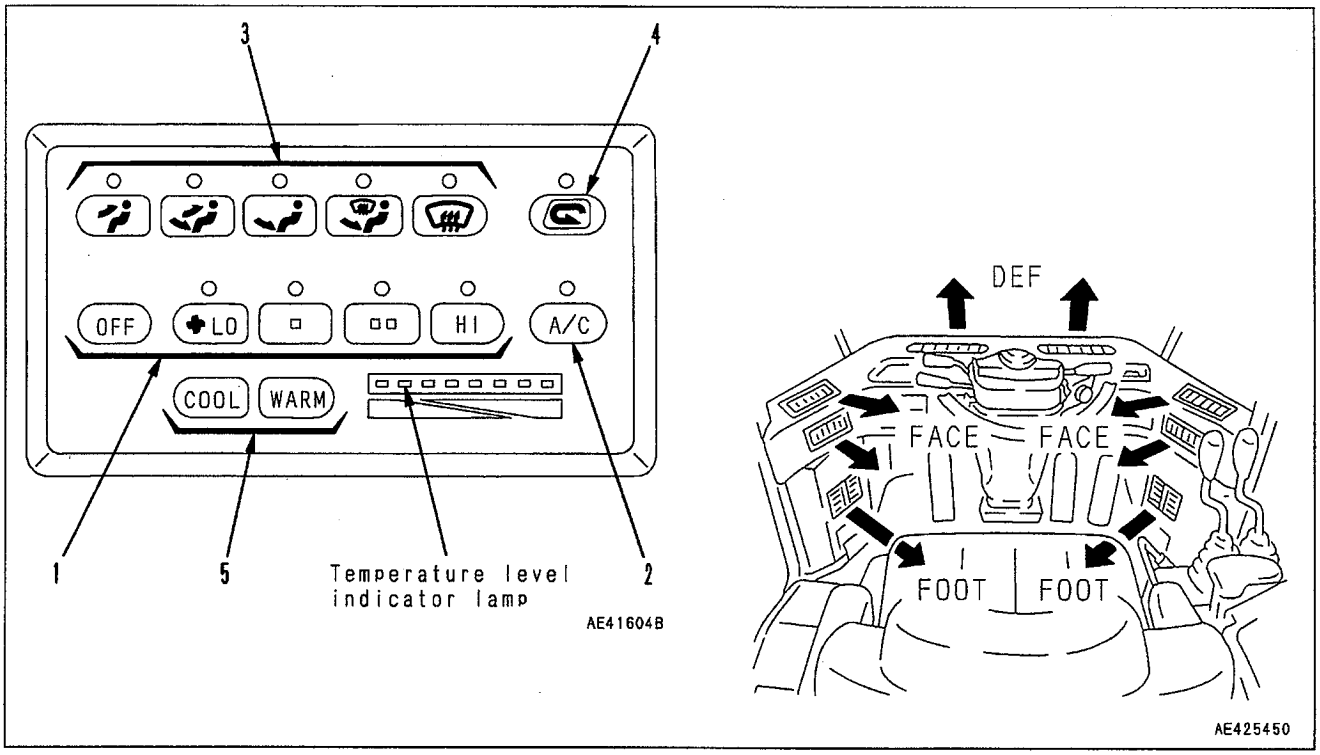
   3) Discharge the grease containing air (milky white in many cases) from the injector. If normal grease comes out, stop the grease pump.

   4) Tighten plug ④ of the injector to prevent the grease from leaking.

      It is impossible to see if the air has been bled by simply checking the pressure gauge. Even if air is mixed in the grease, the auto-grease system operates since the discharge pressure of the grease pump is high. To see if the greasing system is working normally, check that the grease pump is balanced and stopped in the specified (operating) time (60 seconds).

# 32. AIR CONDITIONER

## 32.1 GENERAL LOCATIONS AND FUNCTION OF CONTROL PANEL

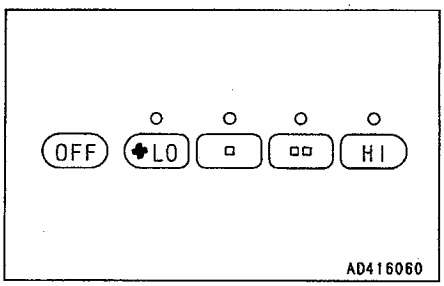



**1. FAN SWITCH**

This can be used to adjust the air flow to four stages.

This switch also acts as the main switch for the air conditioner.

When the switch is pressed, the indicator lamp above the switch lights up to indicate the air flow.

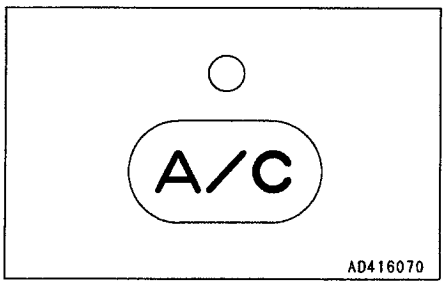



**2. AIR CONDITIONER SWITCH**

This is used to start or stop the cooling or dehumidifying function.

When the fan switch is turned ON and the air conditioner switch is pressed, the indicator lamp above the switch lights up.

When the switch is pressed again, the switch is turned OFF and the indicator lamp goes out.




**3. MODE SELECTOR SWITCH**

This is used to select the vents.

The following five vent modes are available: FACE, FACE/FOOT, FOOT, FOOT/DEF, DEF.

When the switch is pressed, the indicator lamp above the switch lights up to display the vent mode.