

# Operation & Maintenance Manual

DUMP TRUCK

**HD785-5**

SERIAL NUMBERS 4254 and up



## WARNING

Unsafe Use of this machine may cause serious injury or Death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept near the machine for reference and periodically reviewed by all personnel who will come into contact with it.

## NOTICE

Komatsu has Operation & Maintenance Manuals written in some other languages. If a foreign language manual is necessary, contact your local distributor for availability.

**KOMATSU**

# FOREWORD

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## **CALIFORNIA**

### **Proposition 65 Warning**

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

## **CALIFORNIA**

### **Proposition 65 Warning**

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

**Wash hands after handling.**

## FOREWORD

This manual provides rules and guidelines which will help you use this machine safely and effectively. The precautions in this manual must be followed at all times when performing operation and maintenance. Most accidents are caused by the failure to follow fundamental safety rules for the operation and maintenance of machines. Accidents can be prevented by knowing beforehand conditions that may cause a hazard when performing operation and maintenance.



### WARNING

Operators and maintenance personnel must always do as follows before beginning operation or maintenance.

- Always be sure to read and understand this manual thoroughly before performing operation and maintenance.
- Read the safety messages given in this manual and the safety labels affixed to the machine thoroughly and be sure that you understand them fully.

Keep this manual in the storage location for the operation and maintenance manual given below, and have all personnel read it periodically.

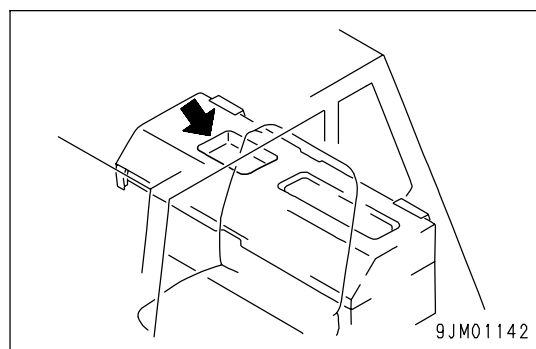
If this manual has been lost or has become dirty and cannot be read, request a replacement manual immediately from Komatsu or your Komatsu distributor.

If you sell the machine, be sure to give this manual to the new owners together with the machine.

Komatsu delivers machines that comply with all applicable regulations and standards of the country to which it has been shipped. If this machine has been purchased in another country or purchased from someone in another country, it may lack certain safety devices and specifications that are necessary for use in your country. If there is any question about whether your product complies with the applicable standards and regulations of your country, consult Komatsu or your Komatsu distributor before operating the machine.

#### Place to Keep the Manual

It is located behind the operator's seat.







## SAFETY INFORMATION

To enable you to use this machine safely, safety precautions and labels are given in this manual and affixed to the machine to give explanations of situations involving potential hazards and of the methods of avoiding such situations.

### Signal words

The following signal words are used to inform you that there is a potential hazardous situation that may lead to personal injury or damage.

In this manual and on machine labels, the following signal words are used to express the potential level of hazard.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. This word is used also to alert against unsafe practices that may cause property damage.

### Example of safety message using signal word



When standing up from the operator's seat, always place the safety lock lever in the LOCK position.

If you accidentally touch the control levers when they are not locked, this may cause a serious injury or death.

### Other signal words

In addition to the above, the following signal words are used to indicate precautions that should be followed to protect the machine or to give information that is useful to know.

## NOTICE

This word is used for precautions that must be taken to avoid actions which could shorten the life of the machine.

## REMARKS

This word is used for information that is useful to know.

# • Safety labels

Safety labels are affixed to the machine to inform the operator or maintenance worker on the spot when carrying out operation or maintenance of the machine that may involve hazard.

This machine uses "Safety labels using words" and "Safety labels using pictograms" to indicate safety procedures.

## Example of safety label using words



## Safety labels using pictogram

Safety pictograms use a picture to express a level of hazardous condition equivalent to the signal word. These safety pictograms use pictures in order to let the operator or maintenance worker understand the level and type of hazardous condition at all times. Safety pictograms show the type of hazardous condition at the top or left side, and the method of avoiding the hazardous condition at the bottom or right side. In addition, the type of hazardous condition is displayed inside a triangle and the method of avoiding the hazardous condition is shown inside a circle.



Komatsu cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore, the safety messages in this manual and on the machine may not include all possible safety precautions. If any procedures or actions not specifically recommended or allowed in this manual are used, it is your responsibility to take the necessary steps to ensure safety.

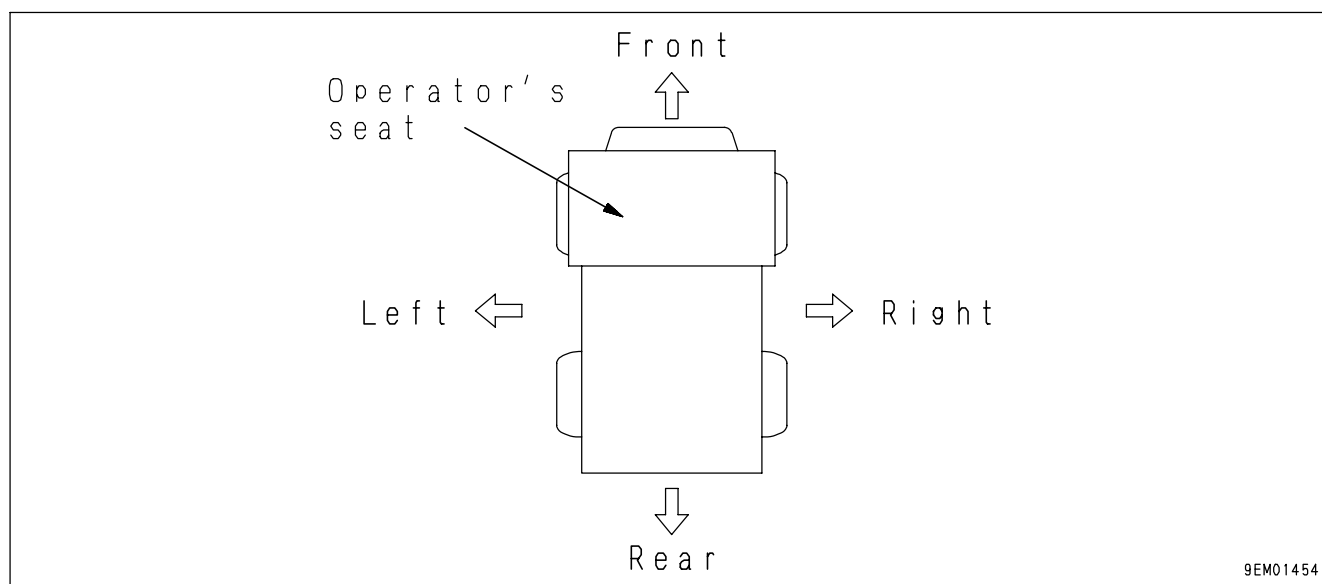
In no event should you engage in prohibited uses or actions described in this manual.

The explanations, values, and illustrations in this manual were prepared based on the latest information available at that time. Continuing improvements in the design of this machine can lead to changes in detail which may not be reflected in this manual. Consult Komatsu or your Komatsu distributor for the latest available information of your machine or for questions regarding information in this manual.

The numbers in circles in the illustrations correspond to the numbers in ( ) in the text. (For example: ① -> (1))

## INTENDED USE

### DIRECTIONS OF MACHINE



In this manual, the directions of the machine (front, rear, left, right) are determined according to the view from the operator's seat in the direction of travel (front) of the machine.



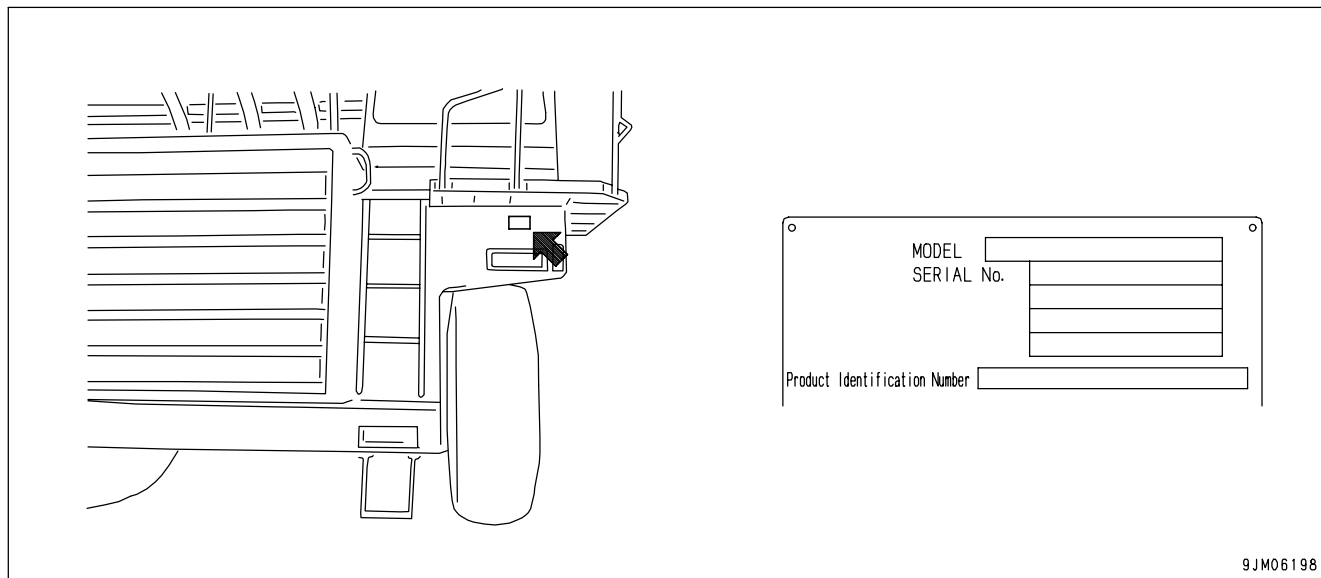
## LOCATION OF PLATES, TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

When requesting service or ordering replacement parts, please inform your Komatsu distributor of the following items.

### PRODUCT IDENTIFICATION NUMBER (PIN)/MACHINE SERIAL NO. PLATE

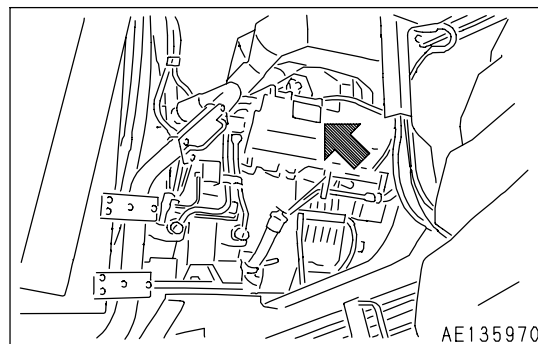
It is located on the left front end of the frame.

The design of the nameplate differs according to the territory.



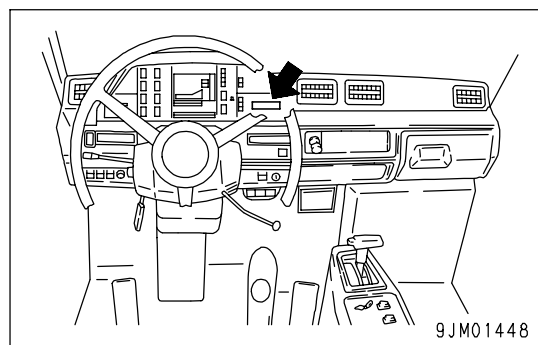
### ENGINE SERIAL NO. PLATE POSITION

The engine serial number plate is on the upper right side of (viewed from the fan) the cylinder block (on the intake manifold cover).



### SERVICE METER POSITION

It is located on the right side of the meter section.



**TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR**

Machine serial No.	
Engine serial No.	
Product identification number (PIN)	
Distributor name	
Address	
Service Personnel	
Phone/Fax	

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# SAFETY

## WARNING

Please read and make sure that you fully understand the precautions described in this manual and the safety labels on the machine. When operating or servicing the machine, always follow these precautions strictly.

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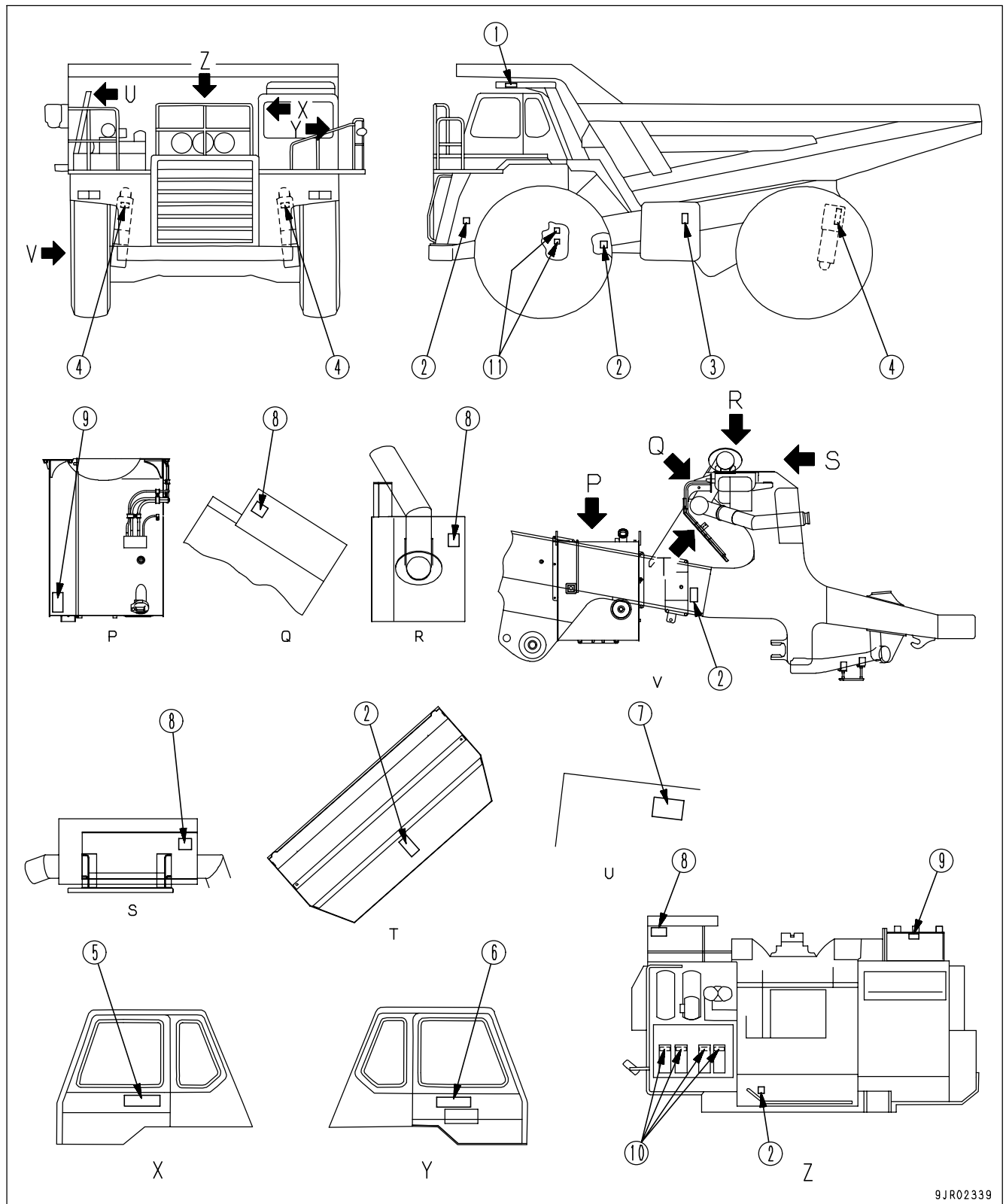
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## SAFETY LABELS

The following warning signs and safety labels are used on this machine.

- Be sure that you fully understand the correct position and content of labels.
- To ensure that the content of labels can be read properly, be sure that they are in the correct place and always keep them clean. When cleaning them, do not use organic solvents or gasoline. These may cause the labels to peel off.
- There are also other labels in addition to the warning signs and safety labels. Handle those labels in the same way.
- If the labels are damaged, lost, or cannot be read properly, replace them with new ones. For details of the part numbers for the labels, see this manual or the actual label, and place an order with Komatsu distributor.

## POSITION FOR ATTACHING SAFETY LABELS



9JR02339



- (4) Warning for handling suspension cylinder  
(09659-A0881)



There is the hazard of explosion causing injury.

Do not disassemble the accumulator, make holes in it, weld it, cut it, hit it, roll it or bring it near flame.

- (5) Warnings for electric wire

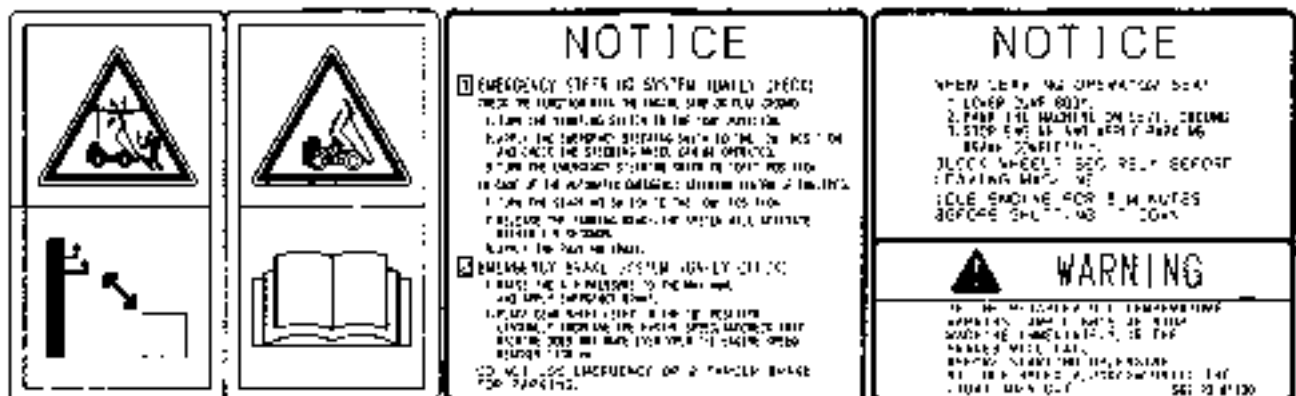
Warnings for crush hazard when inspection and maintenance

Warnings for inspection of emergency steering system, emergency brake system

Warning for leaving operator's seat, stopping engine

Warning for retarder oil temperature

(569-93-61730)



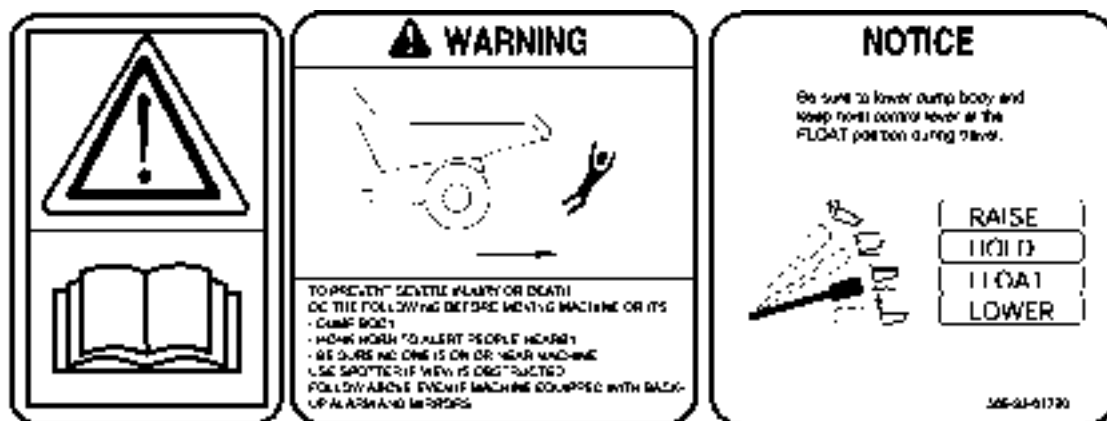
- If the machine comes too close to electric cables, there is danger of electrocution.  
**Always keep a safe distance from electric cables.**
- There is danger that the dump body may come down.  
**Before carrying out inspection or maintenance with the dump body raised, always read the Operation and Maintenance Manual and take the correct action.**

(6) Cautions before starting

Cautions when traveling in reverse

Cautions for operating hoist control lever (dump lever)

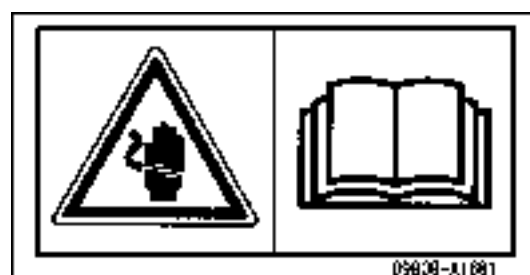
(569-93-61720)



**! WARNING**

Always read the Operation and Maintenance Manual before carrying out operation, maintenance, disassembly, assembly, or transportation of the machine.

(7) Caution when handling battery cable (09808-A1681)



Sign indicates an electric hazard from handling the cable. Read manual for safe and proper handling.

(8) Exhaust pipe is hot! (09817-A1103)



Sign indicates a burn hazard from touching heated parts, such as engine, motor, or muffler during or right after operation.

Never touch when hot.

(9) Caution for avoiding falling down (09805-C0881)



Sign indicates a hazard of falling.

Do not stand on this place here.

(10) Caution when handling battery  
(This plate is stick on the machine by the battery maker.)



(11) Jump start prohibited (09842-A0481)  
(This plate is stick on the starting motor.)



Start the engine only after sitting down in the operator's seat.

Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause a serious bodily injury or fire.

## GENERAL PRECAUTIONS

### SAFETY RULES

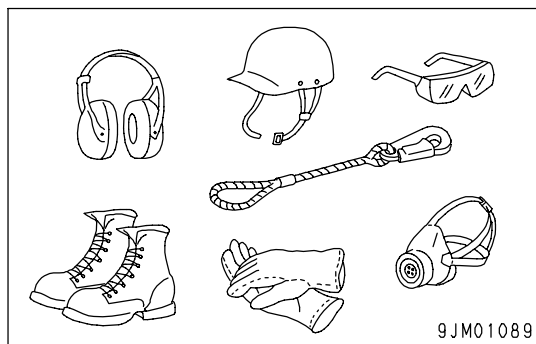
- Only trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
- If you are under the influence of alcohol or medication, your ability to safely operate or repair your machine may be severely impaired putting yourself and everyone else on your jobsite in danger.
- 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.

### IF PROBLEMS ARE FOUND

If you find any problems in the machine during operation or maintenance (noise, vibration, smell, incorrect gauges, smoke, oil leakage, etc., or any abnormal display on the warning devices or monitor), report to the person in charge and have the necessary action taken. Do not operate the machine until the problem has been corrected.

### CLOTHING AND PERSONAL PROTECTIVE ITEMS

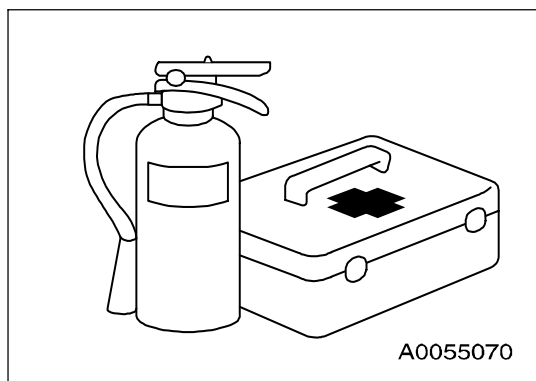
- Do not wear loose clothing and accessories. There is a hazard that they may catch on control levers or other protruding parts.
- If you have long hair and it hangs out from your hard hat, there is a hazard that it may get caught up in the machine, so tie your hair up and be careful not to let it get caught.
- Always wear a hard hat and safety shoes. If the nature of the work requires it, wear safety glasses, mask, gloves, ear plugs, and safety belt when operating or maintaining the machine.
- Check that all protective equipment functions properly before using it.



### FIRE EXTINGUISHER AND FIRST AID KIT

Always follow the precautions below to prepare for action if any injury or fire should occur.

- Be sure that fire extinguishers have been provided and read the labels to ensure that you know how to use them in emergencies.
- Carry out periodic inspection and maintenance to ensure that the fire extinguisher can always be used.
- Provide a first aid kit in the storage point. Carry out periodic checks and add to the contents if necessary.



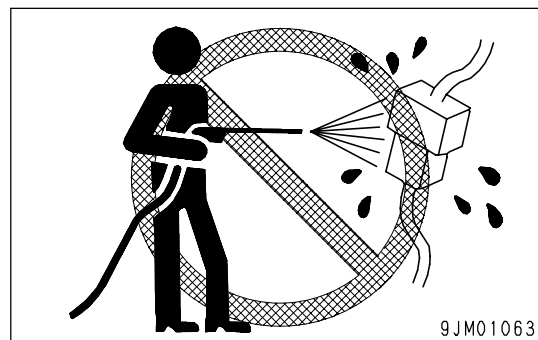
### SAFETY FEATURES

- Be sure that all guards and covers are in their proper position. Have guards and covers repaired immediately if they are damaged.
- Understand the method of use of safety features and use them properly.
- Never remove any safety features. Always keep them in good operating condition.



**KEEP MACHINE CLEAN**

- If water gets into the electrical system, there is a hazard that it will cause malfunctions or misoperation. Do not use water or steam to wash the electrical system (sensors, connectors).
- If inspection and maintenance is carried out when the machine is still dirty with mud or oil, there is a hazard that you will slip and fall, or that dirt or mud will get into your eyes. Always keep the machine clean.

**INSIDE OPERATOR'S COMPARTMENT**

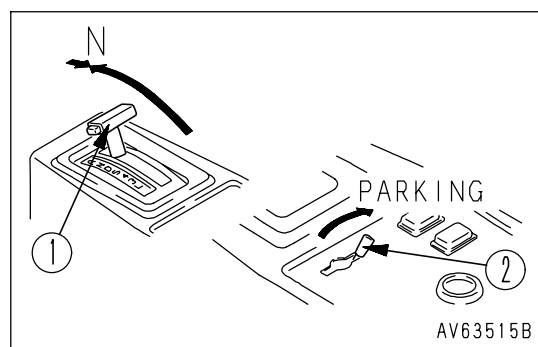
- When entering the operator's compartment, always remove all mud and oil from the soles of your shoes. If you operate the pedal with mud or oil affixed to your shoes, your foot may slip and this may cause a serious accident.
- Do not leave parts or tools lying around the operator's compartment.
- Do not stick suction pads to the window glass. Suction pads act as a lens and may cause fire.
- Do not use cellular telephones inside the operator's compartment when driving or operating the machine.
- Never bring any dangerous objects such as flammable or explosive items into the operator's compartment.

**ALWAYS APPLY LOCK WHEN LEAVING OPERATOR'S SEAT**

- Before adjusting or standing up from the operator's seat, always set the gear shift lever to the N position and the parking brake valve lever to the PARKING position, then stop the engine.
- If you touch or bump the control levers unintentionally, the machine could suddenly move, and cause an accident that might result in bodily harm.
- Place gear shift lever (1) at neutral and set parking brake valve lever (2) to the PARKING position.

Lower the dump body, set the dump lever to the HOLD position, then apply the lock.

Stop the engine. Apply all the lock and always remember to take the key with you and keep where it should be.



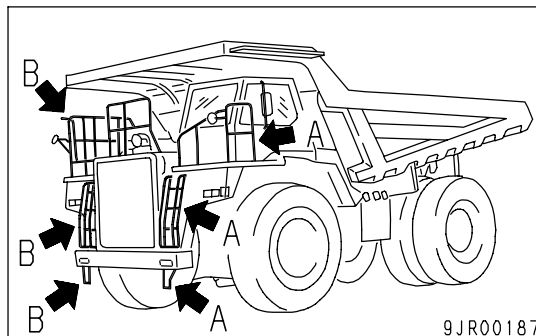
### HANDRAILS AND STEPS

To prevent personal injury caused by slipping or falling off the machine, always do as follows.

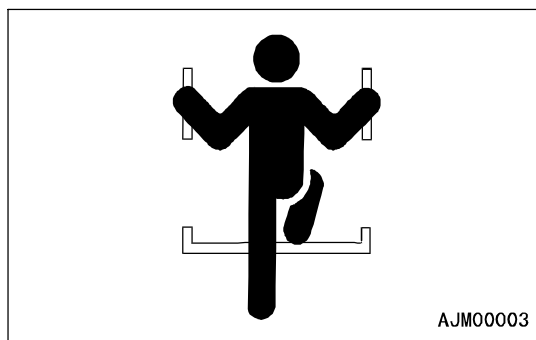
- Use the handrails and steps marked by arrows in the diagram below when getting on or off the machine.

A: For use when getting on or off the operator's seat from the left door

B: For use when getting on or off the operator's seat from the engine hood or right door



- To ensure safety, always face the machine and maintain three-point contact (both feet and one hand, or both hands and one foot) with the handrails and steps to ensure that you support yourself.
- Do not grip the dump lever when getting on or off the machine.
- Never climb on the engine hood or covers where there are no non-slip pads.
- Before getting on or off the machine, check the handrails and steps, and if there is any oil, grease, or mud on them, wipe it off immediately. In addition, repair any damage and tighten any loose bolts.
- Do not get on or off the machine while holding tools in your hand.



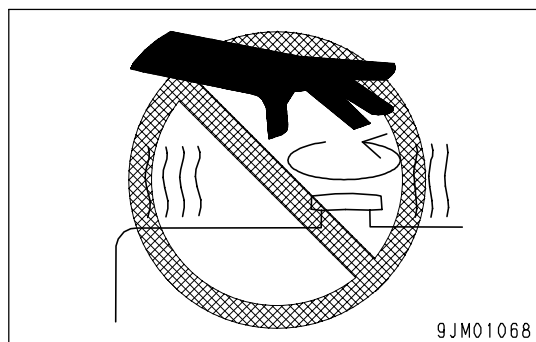
### MOUNTING AND DISMOUNTING

- Never jump on or off the machine. Never get on or off a moving machine.
- If the machine starts to move when there is no operator on the machine, do not jump on to the machine and try to stop it.

## PREVENTION OF BURNS

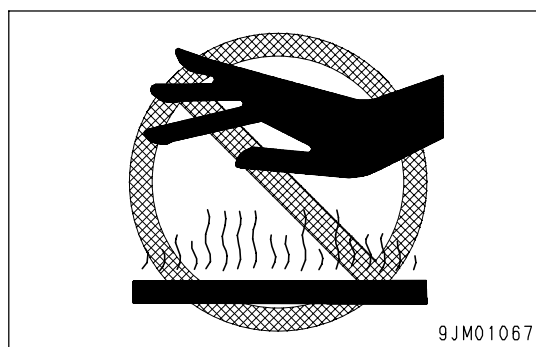
### Hot coolant

- To prevent burns from hot water or steam spurting out when checking or draining the coolant, wait for the water to cool to a temperature where it is possible to touch the radiator cap by hand before starting the operation. Even when the coolant has cooled down, loosen the cap slowly to relieve the pressure inside the radiator before removing the cap.



### Hot oil

- To prevent burns from hot oil spurting out when checking or draining the oil, wait for the oil to cool to a temperature where it is possible to touch the cap or plug by hand before starting the operation. Even when the oil has cooled down, loosen the cap or plug slowly to relieve the internal pressure before removing the cap or plug.

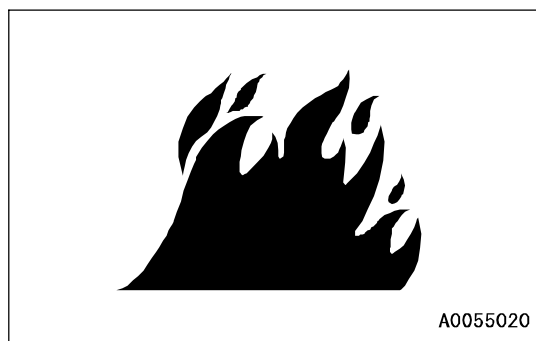


## FIRE PREVENTION

### • Fire caused by fuel or oil

Fuel, oil, antifreeze, and window washer liquid are particularly flammable and can be hazardous. To prevent fire, always observe the following:

- Do not smoke or use any flame near fuel or oil.
- Stop the engine before refueling.
- Do not leave the machine while adding fuel or oil.
- Tighten all fuel and oil caps securely.
- Do not spill fuel on overheated surfaces or on parts of the electrical system.
- Use well-ventilated areas for adding or storing oil and fuel.
- Keep oil and fuel in the determined place and do not allow unauthorized persons to enter.
- After adding fuel or oil, wipe up any spilled fuel or oil.
- When carrying out grinding or welding work on the chassis, move any flammable materials to a safe place before starting.
- When washing parts with oil, use a non-flammable oil. Diesel oil and gasoline may catch fire, so do not use them.
- Put greasy rags and other flammable materials into a safe container to maintain safety at the work place.
- Do not weld or use a cutting torch to cut any pipes or tubes that contain flammable liquids.



- **Fire caused by accumulation of flammable material.**

Remove any dry leaves, chips, pieces of paper, dust, or any other flammable materials accumulated or affixed around the engine, exhaust manifold, muffler, or battery, or inside the undercovers.

- **Fire coming from electric wiring**

Short circuits in the electrical system can cause fire.

- Always keep electric wiring connections clean and securely tightened.
- Check the wiring every day for looseness or damage. Tighten any loose connectors or wiring clamps. Repair or replace any damaged wiring.

- **Fire coming from hydraulic line**

Check that all the hose and tube clamps, guards, and cushions are securely fixed in position.

If they are loose, they may vibrate during operation and rub against other parts. This may lead to damage to the hoses, and cause high-pressure oil to spurt out, leading to fire damage or serious injury.

- **Explosion caused by lighting equipment**

- When checking fuel, oil, battery electrolyte, window washer fluid, or coolant, always use lighting with anti-explosion specifications. If such lighting equipment is not used, there is danger of explosion that may cause serious injury.
- When taking the electrical power for the lighting from the machine itself, follow the instructions in this manual.

#### **ACTION IF FIRE OCCURS**

If a fire occurs, escape from the machine as follows.

- Turn the start switch OFF to stop the engine.
- Use the handrails and steps to get off the machine.

#### **WINDOW WASHER LIQUID**

Use an ethyl alcohol base washer liquid.

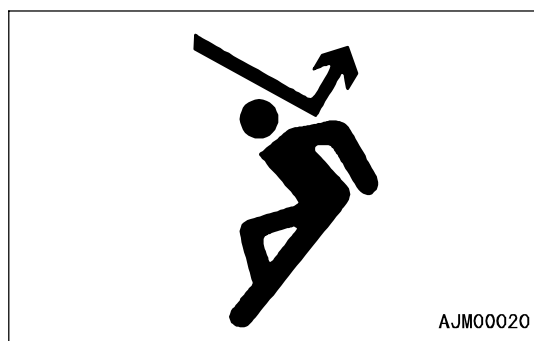
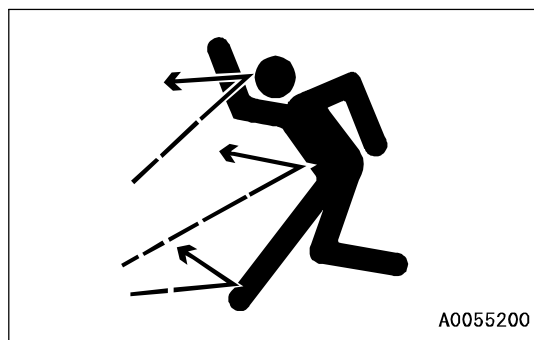
Methyl alcohol base washer liquid may irritate your eyes, so do not use it.

**PRECAUTIONS WHEN USING ROPS (Roll Over Protective Structure)**

Install ROPS when working in places where there is danger of falling rocks, such as in mines and quarries, or in places where there is danger of rolling over.

- If ROPS is installed, do not remove it when operating the machine.
- ROPS is installed to protect the operator when machine rolls over. When machine rolls over, ROPS supports its weight and absorbs its impact energy.
- If ROPS is modified, its strength may be reduced. When modifying, consult your Komatsu distributor.
- If ROPS is deformed by falling objects or by rolling over, its strength lowers and its design functions cannot be maintained. In this case, be sure to ask your Komatsu distributor about repair method.

Even when the ROPS is installed, if you do not fasten your seat belt securely, it cannot protect you properly. Always fasten your seat belt when operating the machine.



**PRECAUTIONS FOR ATTACHMENTS, OPTIONS**

- When installing optional parts or attachments, there may be problems with safety or legal restrictions. Therefore contact your Komatsu distributor for advice.
- Any injuries, accidents, or product failures resulting from the use of unauthorized attachments or parts will not be the responsibility of Komatsu.
- When installing and using optional attachments, read the instruction manual for the attachment, and the general information related to attachments in this manual.

**UNAUTHORIZED MODIFICATION**

Any modification made without authorization from Komatsu can create hazards. Before making a modification, consult your Komatsu distributor.

- Komatsu will not be responsible for any injuries, accidents, product failures or other property damages resulting from modifications made without authorization from Komatsu.

**SAFETY AT WORKSITE**

Before starting operations, thoroughly check the area for any unusual conditions that could be dangerous.

- Check the terrain and condition of the ground at the worksite, and determine the safest method of operation. Do not operate where there is a hazard of landslides or falling rocks.
- Take necessary measures to prevent any unauthorized person from entering the operating area.
- When traveling or operating in shallow water or on soft ground, check the shape and condition of the bedrock, and the depth and speed of flow of the water before starting operations.
- Always design and maintain the roads on the jobsite so that the machines can travel safely.

**WORKING ON LOOSE GROUND**

- Avoid traveling or operating your machine too close to the edge of cliffs, overhangs, and deep ditches. The ground may be weak in such areas. If the ground should collapse under the weight or vibration of the machine, there is a hazard that the machine may fall or tip over. Remember that the soil after heavy rain or blasting or after earthquakes is weak in these areas.
- When working on embankments or near excavated ditches, there is a hazard that the weight and vibration of the machine will cause the soil to collapse. Before starting operations, take steps to ensure that the ground is safe and to prevent the machine from rolling over or falling.

**DO NOT GO CLOSE TO HIGH-VOLTAGE CABLES**

Do not travel or operate the machine near electric cables. There is a hazard of electric shock, which may cause serious injury or property damage. On jobsites where the machine may go close to electric cables, always do as follows.

- Before starting work near electric cables, inform the local power company of the work to be performed, and ask them to take the necessary action.
- Even going close to high-voltage cables can cause electric shock, which may cause serious burns or even death. Always maintain a safe distance (see the table on the right) between the machine and the electric cable. Check with the local power company about safe operating procedure before starting operations.
- To prepare for any possible emergencies, wear rubber shoes and gloves. Lay a rubber sheet on top of the seat, and be careful not to touch the chassis with any exposed part of your body.
- Use a signalman to give warning if the machine approaches too close to the electric cables.
- When carrying out operations near high voltage cables, do not let anyone near the machine.
- If the machine should come too close or touch the electric cable, to prevent electric shock, the operator should not leave the operator's compartment until it has been confirmed that the electricity has been shut off. Also, do not let anyone near the machine.

Voltage of Cables	Safety Distance
100 V - 200 V	Over 2 m (7 ft)
6,600 V	Over 2 m (7 ft)
22,000 V	Over 3 m (10 ft)
66,000 V	Over 4 m (14 ft)
154,000 V	Over 5 m (17 ft)
187,000 V	Over 6 m (20 ft)
275,000 V	Over 7 m (23 ft)
500,000 V	Over 11 m (36 ft)

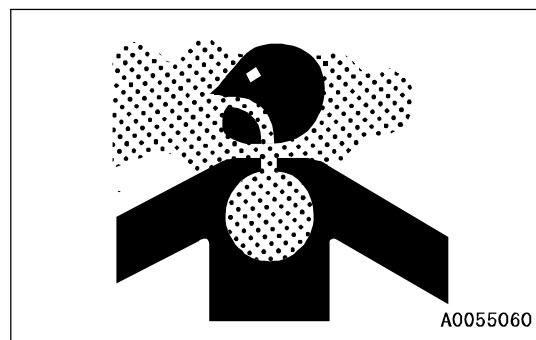
**ENSURE GOOD VISIBILITY**

- Check for any persons or obstacles in the area around the machine and check the conditions of the jobsite to ensure that operations and travel can be carried out safely. Always do as follows.
  - When working in dark places, turn on the working lamp and front lamps installed to the machine, and set up additional lighting in the work area if necessary.
  - Stop operations if the visibility is poor, such as in mist, snow, rain, or dust.

### **PRECAUTIONS ON INDOOR VENTILATION**

Exhaust fumes from the engine can kill.

- If it is necessary to start the engine within an enclosed area, or when handling fuel, flushing oil, or paint, open the doors and windows to ensure that adequate ventilation is provided to prevent gas poisoning.



### **CHECKING SIGNALMAN'S SIGNALS AND SIGNS**

- Set up signs to inform of road shoulders and soft ground. If the visibility is not good, position a signalman if necessary. Operators should pay careful attention to the signs and follow the instructions from the signalman.
- Only one signalman should give signals.
- Make sure that all workers understand the meaning of all signals and signs before starting work.

### **ASBESTOS DUST HAZARD PREVENTION**

Asbestos dust in the air can cause lung cancer if it is inhaled. There is danger of inhaling asbestos when working on jobsites handling demolition work or work handling industrial waste. Always observe the following.

- Spray water to keep down the dust when cleaning. Do not use compressed air for cleaning.
- If there is danger that there may be asbestos dust in the air, always operate the machine from an upwind position. All workers should use an approved respirator.
- Do not allow other persons to approach during the operation.
- Always observe the rules and regulations for the work site and environmental standards.

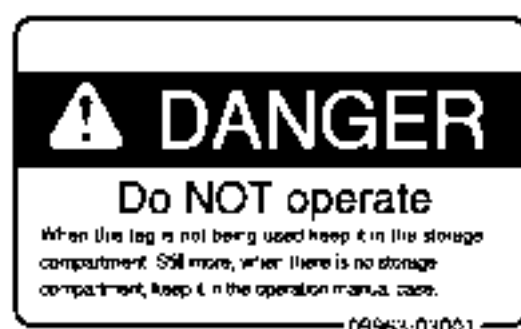
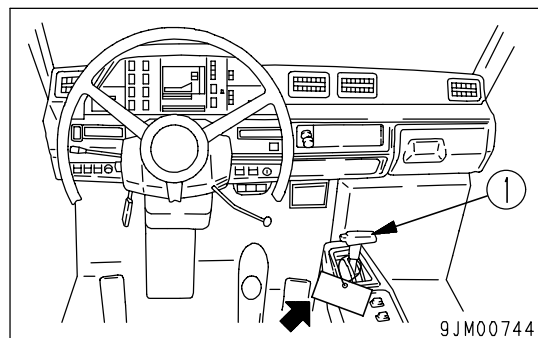


This machine does not use asbestos, but there is a danger that imitation parts may contain asbestos, so always use genuine Komatsu parts.

## PRECAUTIONS DURING OPERATION

### BEFORE STARTING ENGINE

If there is a warning tag hanging from gear shift lever (1), do not start the engine or touch the levers.



### CHECKS BEFORE STARTING ENGINE, ADJUST

Carry out the following checks before starting the engine at the beginning of the day's work.

- Remove all dirt from the surface of the window glass to ensure a good view.
- Remove all dirt from the surface of the lens of the front lamps, working lamps, and rear combination lamp, and check that they light up correctly.
- Check the coolant level, fuel level, and oil level in engine oil pan, check for clogging of the air cleaner, and check for damage to the electric wiring.
- Check that there is no mud or dust accumulated around the movable parts of the accelerator pedal or brake pedal, and check that the pedals work properly.
- Adjust the operator's seat to a position where it is easy to carry out operations, and check that there is no damage or wear to the seat belt or mounting clamps.
- Check the operation of the instruments and gauges, check the angle of the mirror, and check that the control levers are all at the Neutral position.
- Before starting the engine, make sure that the safety lock lever is in the LOCK position.
- Adjust the mirrors so that the rear of the machine can be seen clearly from the operator's seat.  
Refer to "WALK-AROUND CHECK (PAGE 3-54)".
- Check that there are no persons or obstacles above, below, or in the area around the machine.

### PRECAUTIONS WHEN STARTING ENGINE

- Start and operate the machine only while seated.
- Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause a serious bodily injury or fire.
- When starting the engine, sound the horn as a warning.
- If another person is allowed on the machine, that person may sit only in the assistant's seat.



**PRECAUTIONS IN COLD AREAS**

- Carry out the warming-up operation thoroughly. If the machine is not thoroughly warmed up before the control levers are operated, the reaction of the machine will be slow, and this may lead to unexpected accidents.
- If the battery electrolyte is frozen, do not charge the battery or start the engine with a different power source. There is a hazard that this will ignite the battery and cause the battery to explode.  
Before charging or starting the engine with a different power source, melt the battery electrolyte and check that there is no leakage of electrolyte before starting.
- Drain water in the air tank.
- If there is no sound of the air being released when the service brake or parking brake are operated, check the air tank pressure and remove any snow or ice from around the brake valve.

## AFTER STARTING ENGINE

### CHECKS AFTER STARTING ENGINE

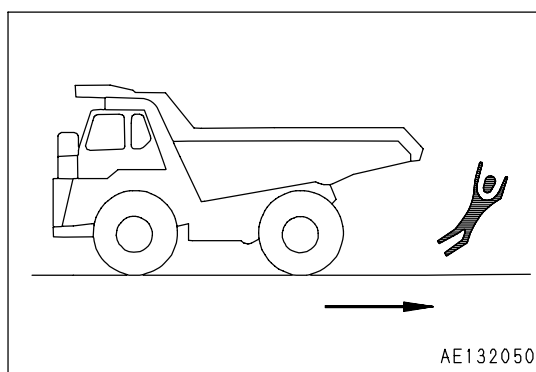
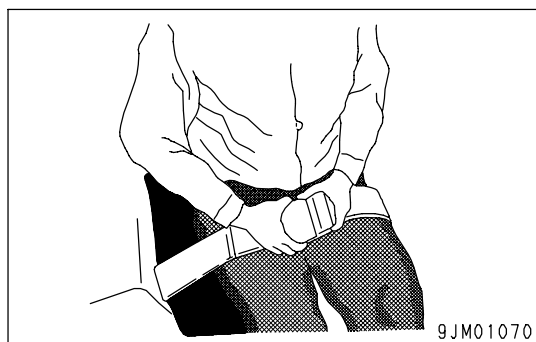
When carrying out the checks, move the machine to a wide area where there are no obstructions, and operate slowly. Do not allow anyone near the machine.

- Always fasten your seat belt.
- Check the operation of travel, steering and brake systems, and dump body control system.
- Check for any problem in the sound of the machine, vibration, heat, smell, or gauges; check also that there is no leakage of oil or fuel.
- If any problem is found, carry out repairs immediately.

### PRECAUTIONS WHEN TRAVELING FORWARD OR REVERSE

- Before travelling, check again that there is no one in the surrounding area, and that there are no obstacles.
- Before travelling, sound the horn to warn people in the area.
- Always operate the machine only when seated.
- Always fasten your seat belt.
- If another person is allowed on the machine, that person may sit only in the assistant's seat.
- Check that the backup alarm (backup warning buzzer) works properly.
- Always close the door and the window of the operator's compartment and check that the door lock is applied.

Always be sure to carry out the above precautions even when the machine is equipped with mirrors.



**PRECAUTIONS DURING OPERATION**

- Never turn the key in the starting switch to the OFF position. It is dangerous if the engine stops when the machine is traveling, because the steering becomes heavy. If the engine stops, depress the brake pedal immediately to stop the machine.
- Lower the dump body, setting the dump lever at FLOAT position, then travel.
- To prevent the machine from rolling over when traveling on rough ground, travel at low speed and avoid sudden changes in direction.
- When traveling or carrying out operations, always keep a safe distance from people, structures, or other machines to avoid coming into contact with them.
- When passing over bridges or structures, check first that the structure is strong enough to support the weight of the machine.
- When operating in tunnels, inside buildings, or under bridges or electric wires, or other places where the height is limited, operate slowly and be extremely careful not to let the machine or dump body contact anything.
- Continuous long time traveling at high speed may cause tires to heat up, abnormally increasing the inflation pressure inside the tires, and to blow up. The explosion of the tire is very destructive, and it can lead to serious injury or death.
- Contact with your Komatsu distributor before doing long continuous traveling.

**PRECAUTIONS WHEN TRAVELING ON THE SLOPES**

To prevent the machine from tipping over or slipping to the side, always do as follows.

- When traveling downhill, use the retarder brake to reduce speed. Do not turn the steering wheel suddenly.
- Travel on grass, fallen leaves, or wet steel plates with low speed. Even with slight slopes there is a hazard that the machine may slip.
- If the engine should stop on a slope, apply the brakes fully and apply the parking brake also to stop the machine.
- Do not shift the gear while traveling downhill or travel downhill with the transmission in neutral. If this is neglected, the engine does not work as a brake, and that is dangerous. Be sure to set the transmission in one of the lower gear speeds. In addition, apply the brake and use the engine as a brake, if necessary.

**PRECAUTIONS WHEN OPERATING DUMP BODY**

- Before starting the dumping operation, check to be sure there is no person or object behind the machine.
- Stop the machine in the correct position, and check again that there is no person or object behind the machine. Give the determined signal, then slowly operate the dump body.  
If necessary, use blocks for the wheels or position a flagman.
- Do not carry out dumping operations on slopes. The machine stability will become poor and there is the danger that it could tip over.
- Do not travel with the body raised.
- Do not leave or return to the operator's seat during loading work.

**PRECAUTIONS FOR OPERATION**

- Do not load the dump body above the maximum payload. The brakes will lose their effect.
- When operating in tunnels, or under bridges or electric wires, or in other places where the height is limited, operate slowly and be extremely careful not to let the dump body contact anything.
- To prevent accidents caused by hitting other objects, always operate the machine at a speed which is safe for operation, particular in confined spaces, indoors, and in places where there are other machines.

**METHOD OF USING BRAKES**

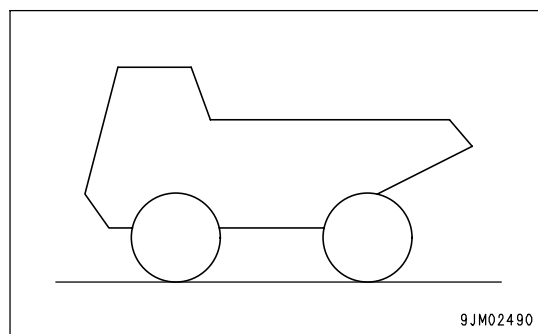
- Do not rest your foot on the brake pedal unless it is necessary.
- Do not depress the brake pedal repeatedly if not necessary.
- When traveling downhill, use the braking force of the engine, and always use the retarder at the same time.

### RECAUTIONS UNDER THE SNOWING AND FREEZING CONDITION

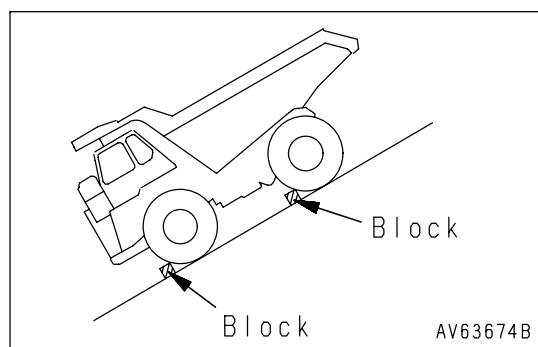
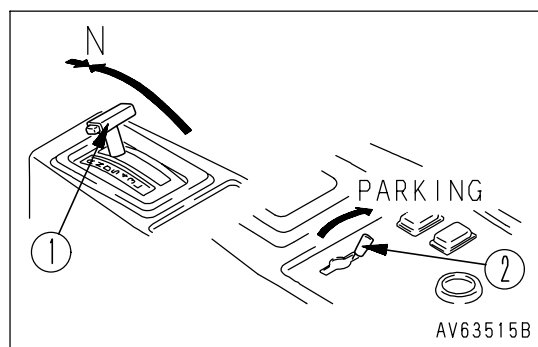
- Snow-covered or frozen surfaces are slippery, so be extremely careful when traveling or operating the machine, and do not operate the levers suddenly. Even a slight slope may cause the machine to slip, so be particularly careful when working on slopes.
- With frozen ground surfaces, the ground becomes soft when the temperature rises, and this may cause the machine to tip over.
- If the machine enters deep snow, there is a hazard that it may tip over or become buried in the snow. Be careful not to leave the road shoulder or to get trapped in a snow drift.
- When traveling on snow-covered roads, always fit tire chains.
- When traveling on snow-covered slopes, never apply the foot brake suddenly. Reduce the speed and use the engine as a brake while applying the foot brake intermittently (depress the brake intermittently several times). If necessary, lower the bucket to the ground to stop the machine.
- When the loaded materials in the dump body are frozen, do not dump. There is a danger that the machine could tip over.

### PRECAUTIONS FOR PARKING

- Park the machine on firm, level ground.
- Select a place where there is no hazard of falling rocks or landslides, or of flooding if the land is low.



- When leaving the machine, place the gear shift lever (1) at neutral and set the parking valve lever (2) to the PARKING position. Then, stop the engine.
- Always close the operator's cab door, and use the key to lock all the equipment in order to prevent any unauthorized person from moving the machine. Always remove the key, take it with you, and leave it in the specified place.
- If it is necessary to park the machine on a slope, set blocks under the wheels to prevent the machine from moving.

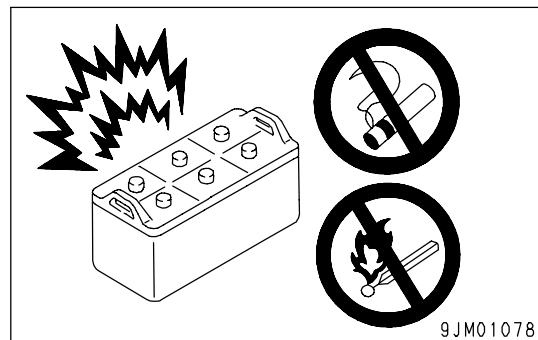


## BATTERY

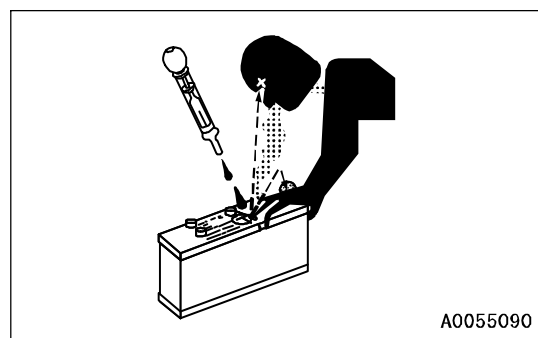
### BATTERY HAZARD PREVENTION

Battery electrolyte contains sulphuric acid, and batteries generate flammable hydrogen gas, which may explode. Mistaken handling can lead to serious injury or fire. For this reason, always observe the following precautions.

- Do not use or charge the battery if the battery electrolyte level is below the LOWER LEVEL line. This may cause an explosion. Check the battery electrolyte level periodically and add distilled water to bring the electrolyte level to the UPPER LEVEL line.
- When working with batteries, always wear safety glasses and rubber gloves.
- Never smoke or use any flame near the battery.



- If you spill acid on your clothes or skin, immediately flush the area with large amount of water.
- If acid gets into your eyes, flush them immediately with large amount of water and seek medical attention.



- Before working with batteries, turn the starting switch to the OFF position.

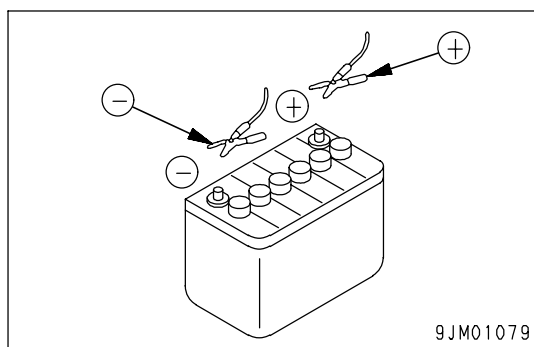
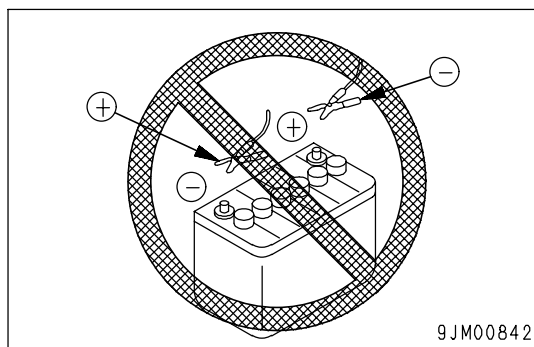
As there is a hazard that sparks will be generated, always do as follows.

- Do not let tools or other metal objects make any contact between the battery terminals. Do not leave tools or other metal objects lying around near the battery.
- Always disconnect the negative (-) terminal (ground side) first when removing the battery; when installing the battery, connect the positive (+) terminal first, and connect the ground last. Tighten the battery terminals securely.
- Flammable hydrogen gas is generated when the battery is charged, so remove the battery from the chassis, take it to a well-ventilated place, and remove the battery caps before charging it.
- Tighten the battery caps securely.
- Install the battery securely to the determined place.

### STARTING WITH BOOSTER CABLES

If any mistake is made in the method of connecting the booster cables, it may cause the battery to explode, so always do as follows.

- When starting with a booster cable, carry out the starting operation with two workers (one worker sitting in the operator's seat and the other working with the battery).
- When starting from another machine, do not allow the two machines to touch.
- When connecting the booster cables, turn the starting switch OFF position for both the normal machine and problem machine. There is a hazard that the machine will move when the power is connected.
- Be sure to connect the positive (+) cable first when installing the booster cables. Disconnect the negative (-) cable (ground side) first when removing them.
- When removing the booster cables, be careful not to let the booster cable clips touch each other or to let the clips touch the machine.
- Always wear safety glasses and rubber gloves when starting the engine with booster cables.
- When connecting a normal machine to a problem machine with booster cables, always use a normal machine with the same battery voltage as the problem machine.
- For details of the starting procedure when using booster cables, see "STARTING ENGINE WITH BOOSTER CABLE (PAGE 3-111)" in the OPERATION section.



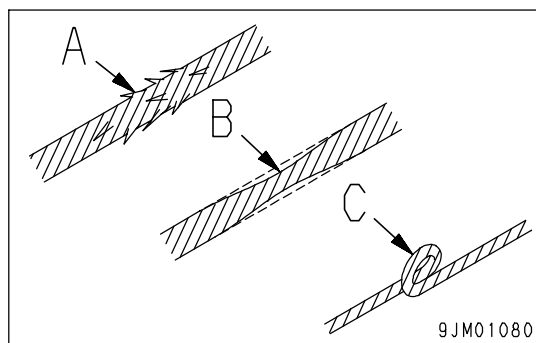
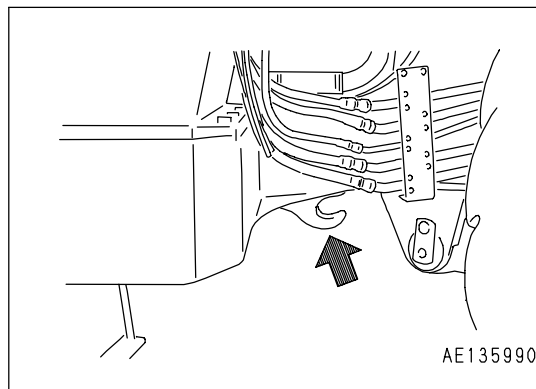
## TOWING

### WHEN TOWING

When towing or being towed, mistakes in the method of selecting and inspecting the wire rope or drawbar, or in the method of towing may lead to serious personal injury.

For details of the procedure for towing, see the "METHOD OF TOWING MACHINE (PAGE 3-104)"

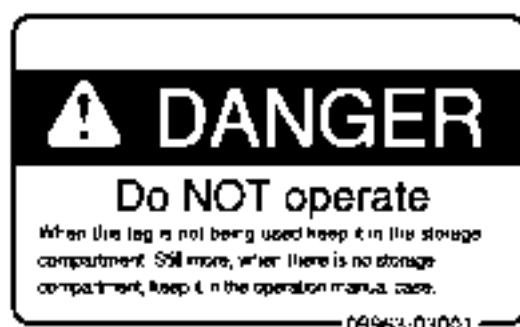
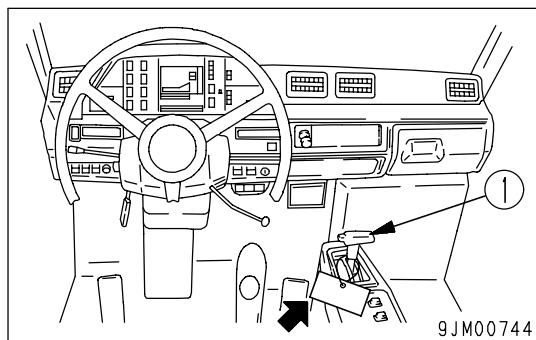
- Always confirm that the wire rope or drawbar used for towing has ample strength for the weight of the machine being towed.
- Never use a wire rope which has cut strands (A), reduced diameter (B), or kinks (C). There is danger that the rope may break during the towing operation.
- Always wear leather gloves when handling wire rope.
- Never tow a machine on a slope.
- During the towing operation, never stand between the towing machine and the machine being towed.



## PRECAUTIONS FOR MAINTENANCE

### WARNING TAG

- Attach the DO NOT OPERATE warning tag to gear shift lever (1) in the operator's cab during the inspection and maintenance. Attach additional warning tags around the machine if necessary. Warning tag Part No. 09963-03001  
Keep the warning tag in the tool box when it is not used. If the tool box is unavailable, keep it in the case for operation manual.
- If any person other than the serviceman starts the engine, or touches or operates the gear shift lever or dump lever while the serviceman is carrying out service or maintenance of the machine, it may lead to serious injury.



### KEEP WORK PLACE CLEAN AND TIDY

- Do not leave hammers or other tools lying around in the work place. Wipe up all grease, oil, or other substances that will cause you to slip. Always keep the work place clean and tidy to enable you to carry out operations safely. If the work place is not kept clean and tidy, there is the danger that you will trip, slip, or fall over and injure yourself.

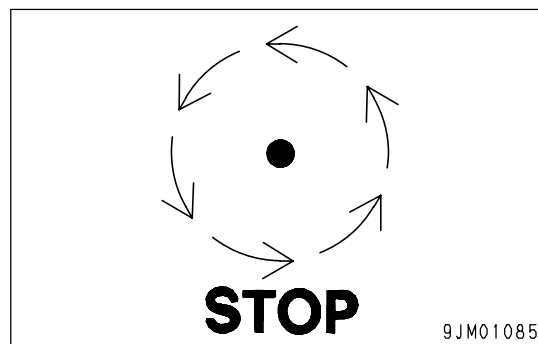
### APPOINT LEADER WHEN WORKING WITH OTHERS

- When repairing the machine or when removing and installing the attachment, appoint a leader and follow his instructions during the operation.  
When working with others, misunderstandings between workers can lead to serious accidents.

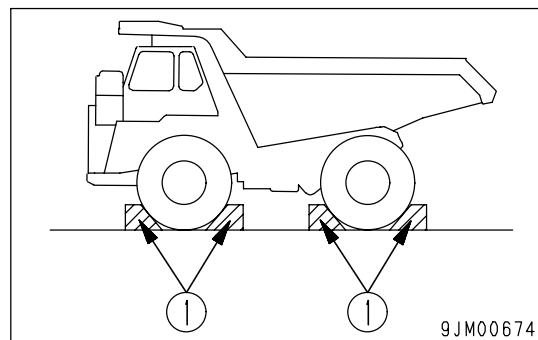
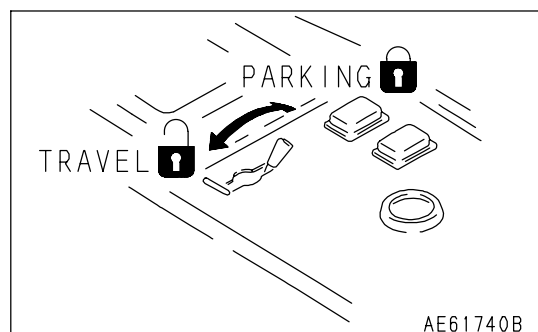


**STOP ENGINE BEFORE CARRYING OUT INSPECTION AND MAINTENANCE**

- Stop the machine on firm, level ground.
- Select a place where there is no hazard of falling rocks or landslides, or of flooding if the land is low.



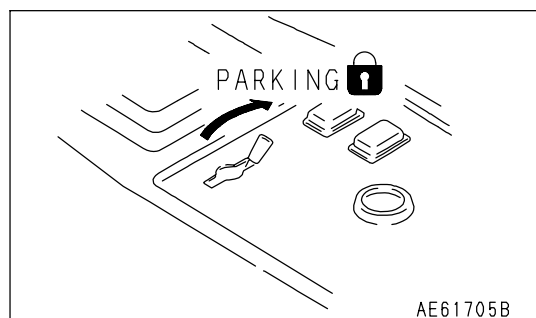
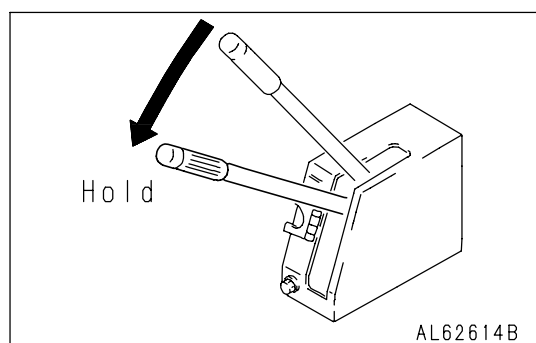
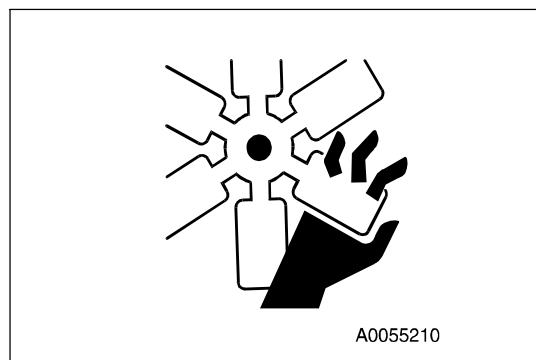
- Lower the dump body and stop the engine.
- Set parking brake valve lever to the PARKING position and put blocks (1) under the tires to prevent the machine from moving.



## TWO WORKERS FOR MAINTENANCE WHEN ENGINE IS RUNNING

To prevent injury, do not carry out maintenance with the engine running. If maintenance must be carried out with the engine running, carry out the operation with at least two workers and do as follows.

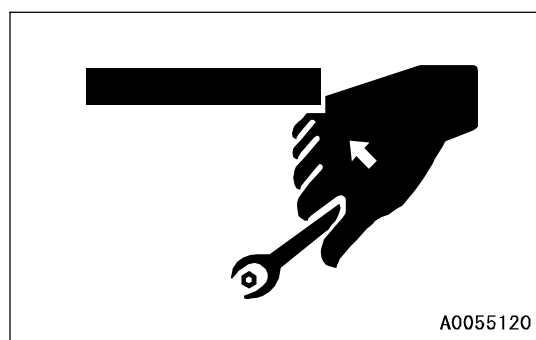
- One worker must always sit in the operator's seat and be ready to stop the engine at any time. All workers must maintain contact with the other workers.
- Lock the dump lever in HOLD position to prevent the operation cab from moving. Also, set parking brake valve lever to the PARKING position to prevent the machine from moving.



- When carrying out operations near the fan, fan belt, or other rotating parts, there is a hazard of being caught in the parts, so be careful not to come close.
- Do not touch any control levers. If any control lever must be operated, give a signal to the other workers to warn them to move to a safe place.
- Never drop or insert tools or other objects into the fan or fan belt. Parts may break or be sent flying.

## PROPER TOOLS

Use only tools suited to the task and be sure to use the tools correctly. Using damaged, low quality, faulty, makeshift tools or improper use of the tools could cause serious personal injury.



### **HANDLING SUSPENSION CYLINDER**

The suspension cylinder is charged with high-pressure nitrogen gas. If any mistake is made in handling, it may lead to serious injury. To prevent this, always do as follows.

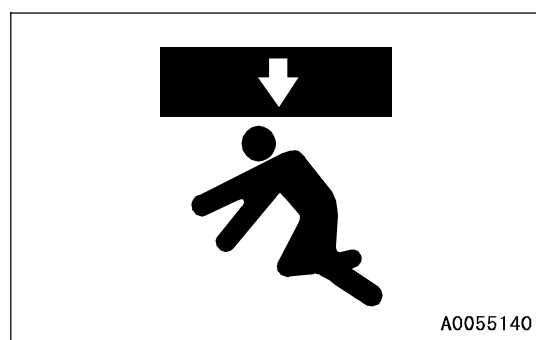
- Do not remove or disassemble the cylinder.
- Do not bring it near flame or dispose of it in fire.
- Do not make holes in it, weld it, or use a cutting torch.
- Do not bear any shock by hammering, rolling or similar activity.
- Ask for your Komatsu distributor when sealing gas into the cylinder or releasing gas from it.

### **PERSONNEL**

Only authorized personnel can service and repair the machine. Do not allow unauthorized personnel into the area. If necessary, employ an observer.

### **WORK UNDER THE MACHINE**

- If it is necessary to go under the machine when it is raised in order to carry out service or maintenance, support the machine securely with blocks and stands strong enough to support the weight of the machine.
- When carrying out inspection with the dump body raised, always set the dump lever to the HOLD position, and lock it in position, then insert the safety pin securely. When you use safety pin, see "SAFETY PIN (PAGE 3-35)".



### **NOISE**

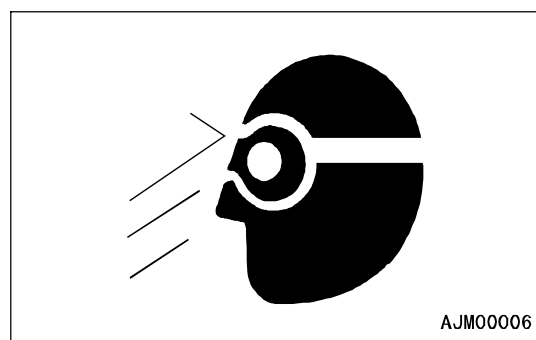
When carrying out maintenance of the engine and you are exposed to noise for long periods of time, wear ear covers or ear plugs while working.

If the noise from the machine is too loud, it may cause temporary or permanent hearing problems.

### **PRECAUTIONS WHEN USING HAMMER**

When using a hammer, pins may fly out or metal particles may be scattered. This may lead to serious injury. Always do as follows.

- If hard metal parts such as pins, and bearings are hit with a hammer, there is danger that small pieces will fly off; this may lead to serious injury. Wear protective glasses, hard hat, and other protective equipment.
- If pins are hit with a hammer, there is a hazard that the metal particles may fly out and injure people in the surrounding area. Always make sure that no one is in the surrounding area before using the hammer.
- There is a hazard that the pin hit with strong force may fly out and injure people in the surrounding area.



### **REPAIR WELDING**

Welding operations must always be carried out by a qualified welder and in a place equipped with proper equipment. There is a hazard of gas, fire, or electrocution when carrying out welding, so never allow any unqualified personnel to carry out welding.

### REMOVING BATTERY TERMINAL

When repairing the electrical system or when carrying out electrical welding, remove the negative (-) terminal of the battery to prevent the flow of current.

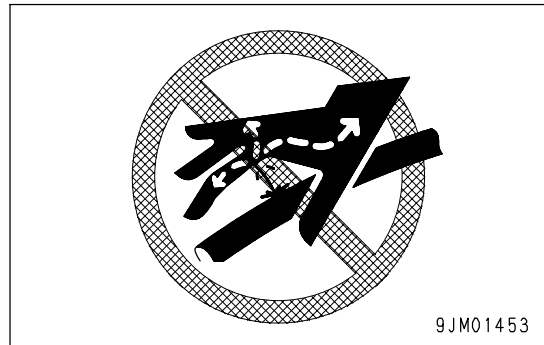
### PRECAUTIONS WITH HIGH-PRESSURE OIL

The hydraulic system is always under internal pressure. When inspecting or replacing piping or hoses, always check that the pressure in the hydraulic circuit has been released. If the circuit is still under pressure, it will lead to serious injury, so always do as follows.

- For details of the method of releasing the pressure: see the section on "INSPECTION AND ADJUSTMENT". Do not carry out any inspection or replacement operation before the pressure has been completely removed.
- If there is any leakage from the piping or hoses, the surrounding area will be wet, so check for cracks in the piping and hoses and for swelling in the hoses.

When carry out inspection, wear safety glasses and leather gloves.

- There is a hazard that high-pressure oil leaking from small holes may penetrate your skin or cause blindness if it contacts your eyes directly. If you are hit by a jet of high-pressure oil and suffer injury to your skin or eyes, wash the place with clean water, and consult a doctor immediately for medical attention.



### HANDLING HIGH-PRESSURE HOSES, PIPING

- If oil or fuel leaks from high-pressure hoses, it may cause fire or defective operation, which may lead to serious injury. If any loose bolts are found, stop work and tighten to the specified torque. If any damaged hoses are found, stop operations immediately and contact your Komatsu distributor.

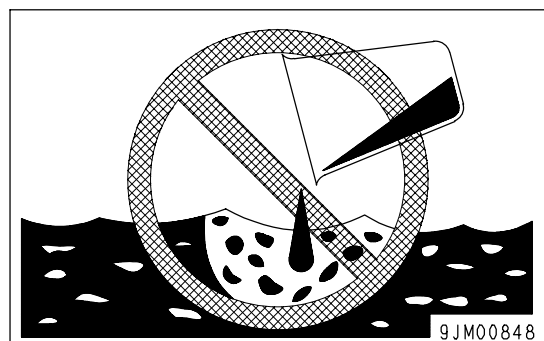
Replace the hose if any of the following problems are found.

- Damaged or leaking hydraulic fitting.
- Frayed or cut covering or exposed reinforcement wire layer.
- Covering swollen in places.
- Twisted or crushed movable portion.
- Foreign material embedded in covering.

### WASTE MATERIALS

To prevent pollution, pay careful attention to the method of disposing of waste materials.

- Always put oil drained from your machine in containers. Never drain oil directly onto the ground or dump into the sewage system, rivers, the sea, or lakes.
- Obey appropriate laws and regulations when disposing of harmful objects such as oil, fuel, coolant, solvent, filters, and batteries.



### MAINTENANCE OF AIR CONDITIONER

If air conditioner refrigerant gets into your eyes, it may cause blindness; if it touches your skin, it may cause frostbite. Never touch refrigerant.

**COMPRESSED AIR**

- When carrying out cleaning with compressed air, there is a hazard of serious injury caused by flying particles.
- When using compressed air to clean elements or the radiator, always wear safety glasses, dust mask, gloves, and other protective equipment.

**PERIODIC REPLACEMENT OF SAFETY-CRITICAL PARTS**

- In order for the machine to be operated safely for a long time, it is necessary to add oil and to carry out service and maintenance at periodic intervals. In order to further increase safety, components with a strong relationship to safety, such as hoses and seat belts, must be replaced at periodic intervals.

Replacement of safety-critical parts: See "PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS (PAGE 4-13)".

- The material of these components naturally changes over time, and repeated use causes deterioration, wear, and fatigue. As a result, there is a hazard that these components may fail and cause serious injury or death. It is difficult to judge the remaining life of these components from external inspection or the feeling when operating, so always replace them at the specified interval.
- Replace or repair safety-critical parts if any defect is found, even when they have not reached the time specified interval.

## PRECAUTIONS WITH TIRES

### HANDLING TIRES

If tires or rims are handled mistakenly, there is danger that the tire may explode or be damaged, or that the rim may fly off and cause serious injury or death.

To maintain safety, always do as follows.

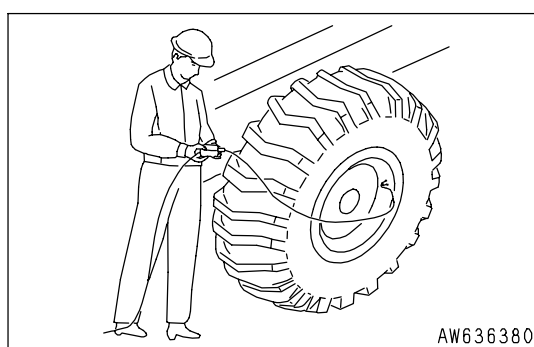
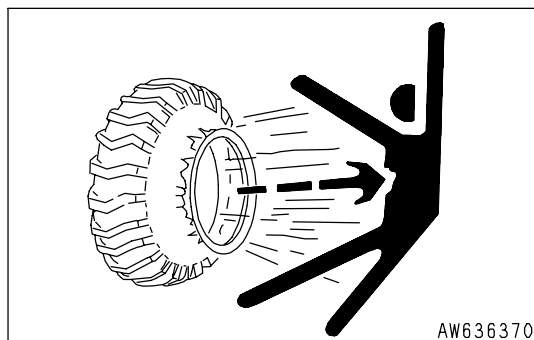
- Maintenance, disassembly, repair, and assembly of the tires and rims requires special equipment and special technology, so always ask your Komatsu distributor to carry out these operations.
- Use only the specified tires and inflate them to the specified pressure.

Suitable inflation pressure: see "SELECTION AND INSPECTION OF TIRES (PAGE 4-34)".

- When pumping up the tires, check that no other person is standing near the tire, and install an air chuck with a clip that can be secured to the air valve.

To prevent the tire inflation pressure from becoming too high, measure the pressure from time to time with an air gauge while pumping up the tire.

- If the tire pressure goes down abnormally or the rim parts do not fit the tire, there is a problem with the tire or rim parts. Always contact your Komatsu distributor for repairs.
- If the rim parts are not fitted properly when the tire is being pumped up, there is danger that the rim parts may fly off, so set up a protective fence around the tire, and do not stand directly in front of the rim. Stand beside the tread when pumping up the tire.
- Do not adjust the tire inflation pressure immediately after traveling at high speed or carrying out operations under heavy load.
- Never carry out welding or light a fire near the tire.



### PRECAUTIONS WHEN STORING TIRE

Tires for construction equipment are extremely heavy, so trying to hold the tire may lead to serious injury.

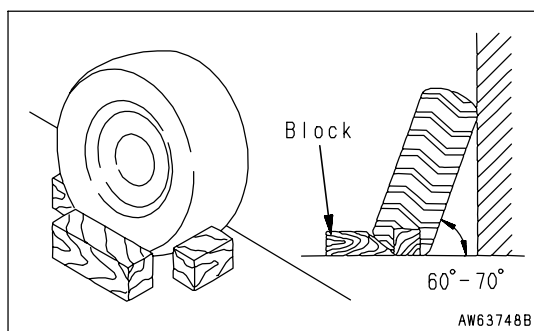
- As a basic rule, store the tires in a warehouse which unauthorized persons cannot enter.

If the tires must be stored outside, always erect a fence and put up "No Entry" signs.

- Stand the tire on level ground, and block it securely so that it cannot roll or fall over if any person should touch it.

Do not lay the tire on its side. This will deform the tire and cause it to deteriorate.

- If the tire should fall over, do not attempt to stop it. Get out of the way quickly.



# OPERATION

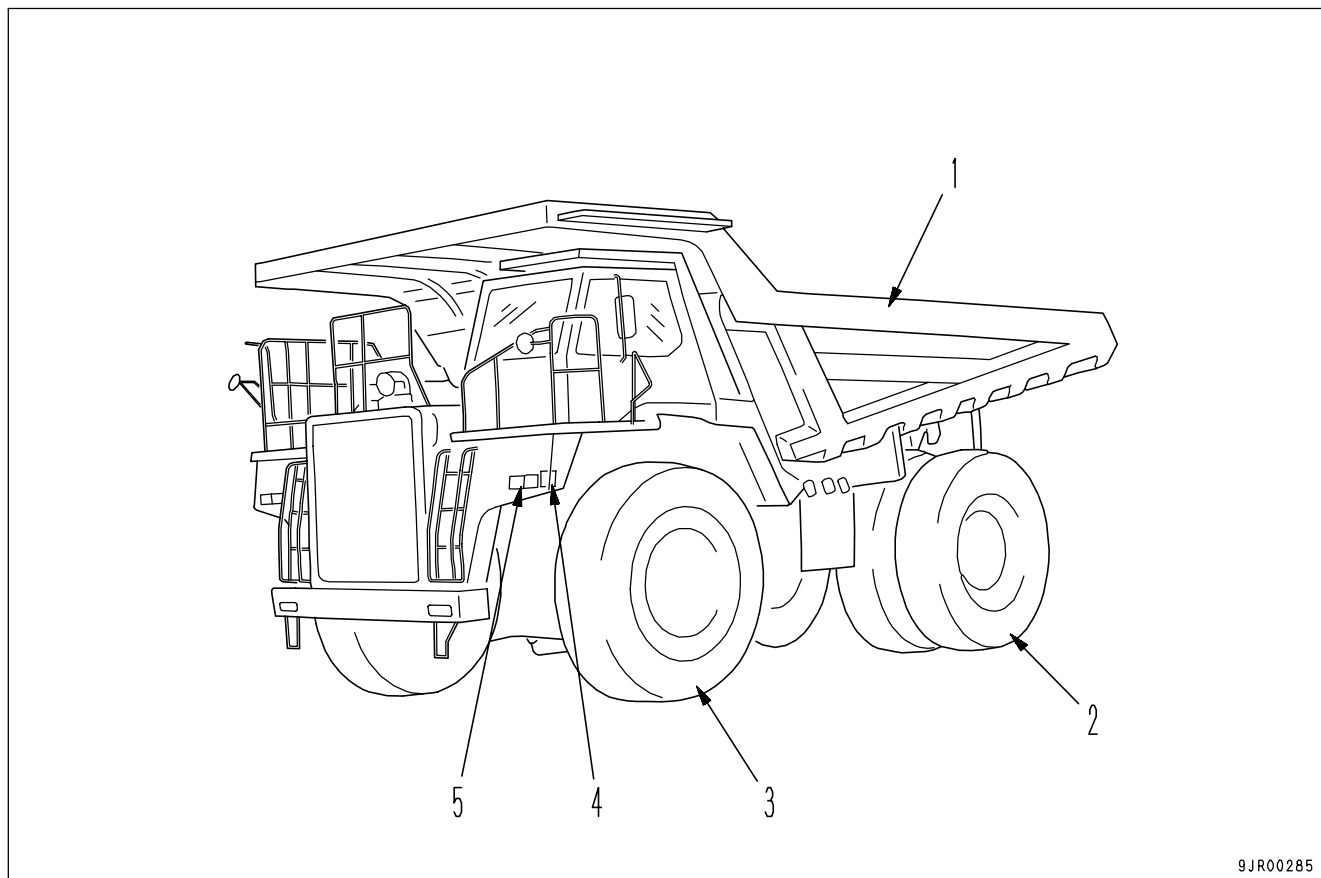
## WARNING

Please read and make sure that you understand the SAFETY section before reading this section.

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## GENERAL VIEW

### GENERAL VIEW OF MACHINE

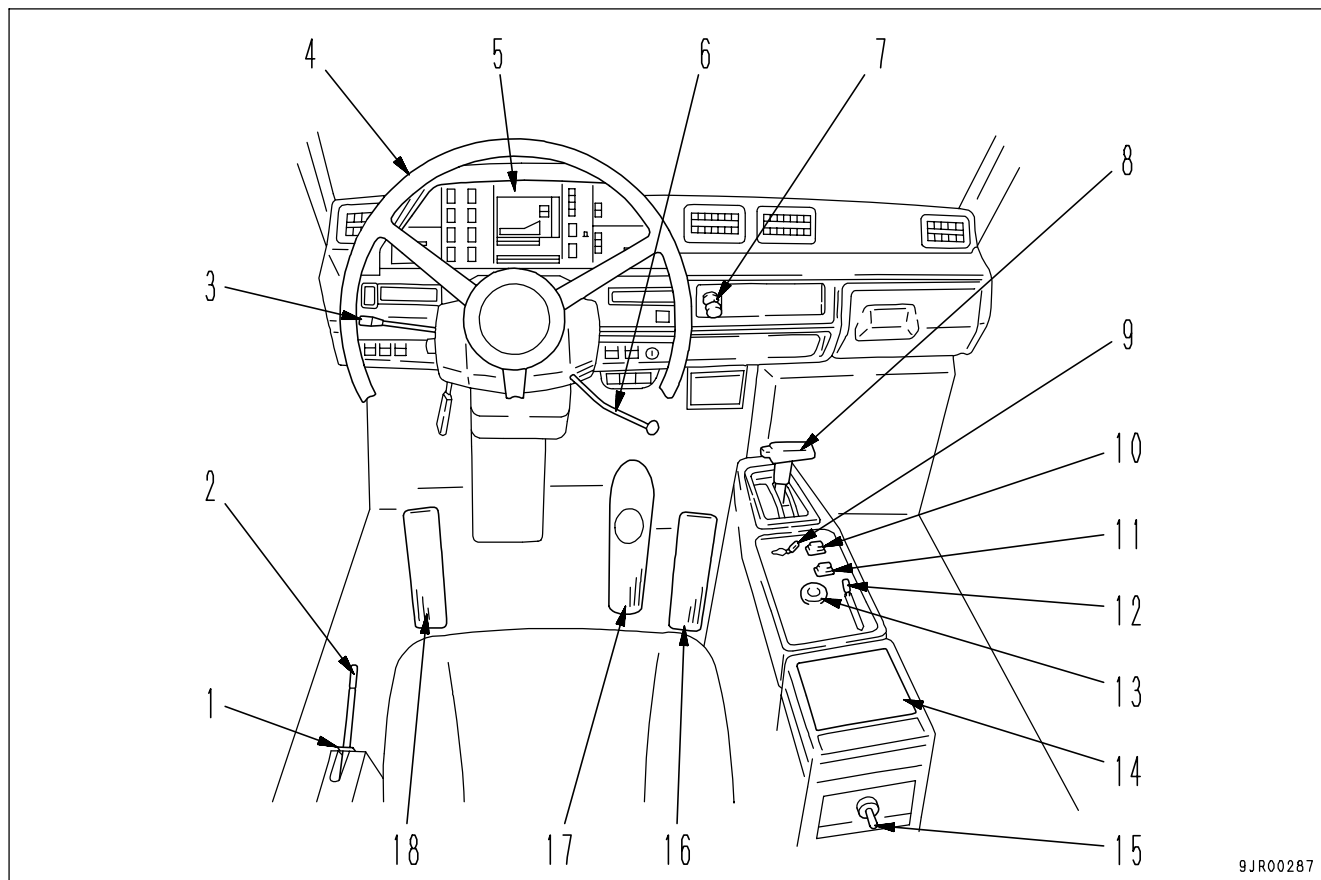


9JR00285

- |                 |                       |
|-----------------|-----------------------|
| (1) Dump body   | (4) Turn signal light |
| (2) Rear wheel  | (5) Head lamp         |
| (3) Front wheel |                       |



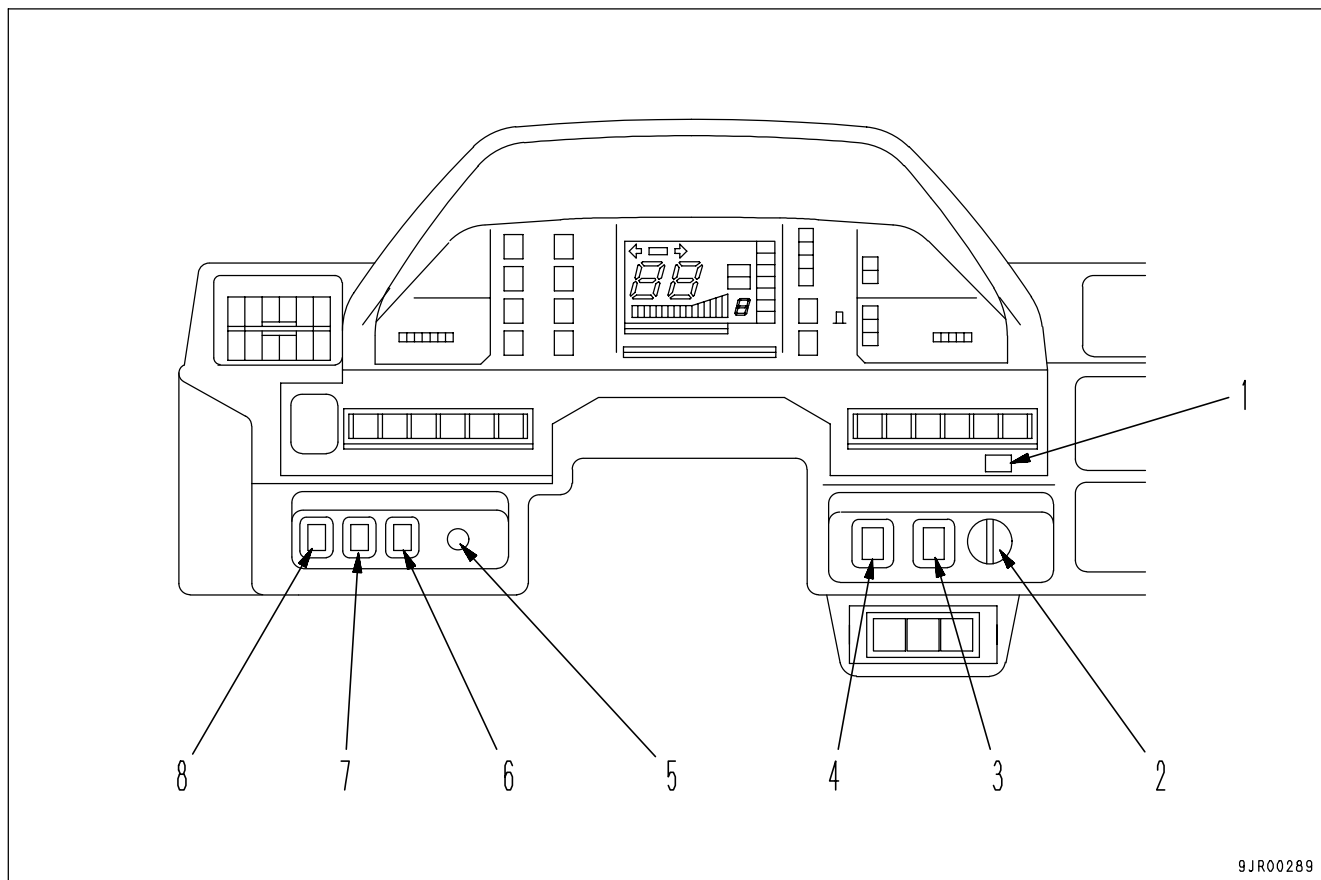
## GENERAL VIEW OF CONTROLS AND GAUGES



9JR00287

- |   |   |
|---|---|
| (1) Safety lock                                   | (10) Shift limiter switch                     |
| (2) Dump lever                                    | (11) Power mode selector switch (if equipped) |
| (3) Lamp switch, Turn signal lever, Dimmer switch | (12) Emergency brake lever                    |
| (4) Steering wheel                                | (13) Emergency steering switch                |
| (5) Machine monitor                               | (14) Message display for PMC (if equipped)    |
| (6) Retarder control lever                        | (15) Engine emergency stop switch             |
| (7) Cigarette lighter                             | (16) Accelerator pedal                        |
| (8) Shift lever                                   | (17) Brake pedal                              |
| (9) Parking brake valve lever                     | (18) Differential lock pedal (if equipped)    |

- Enlargement of machine monitor



9JR00289

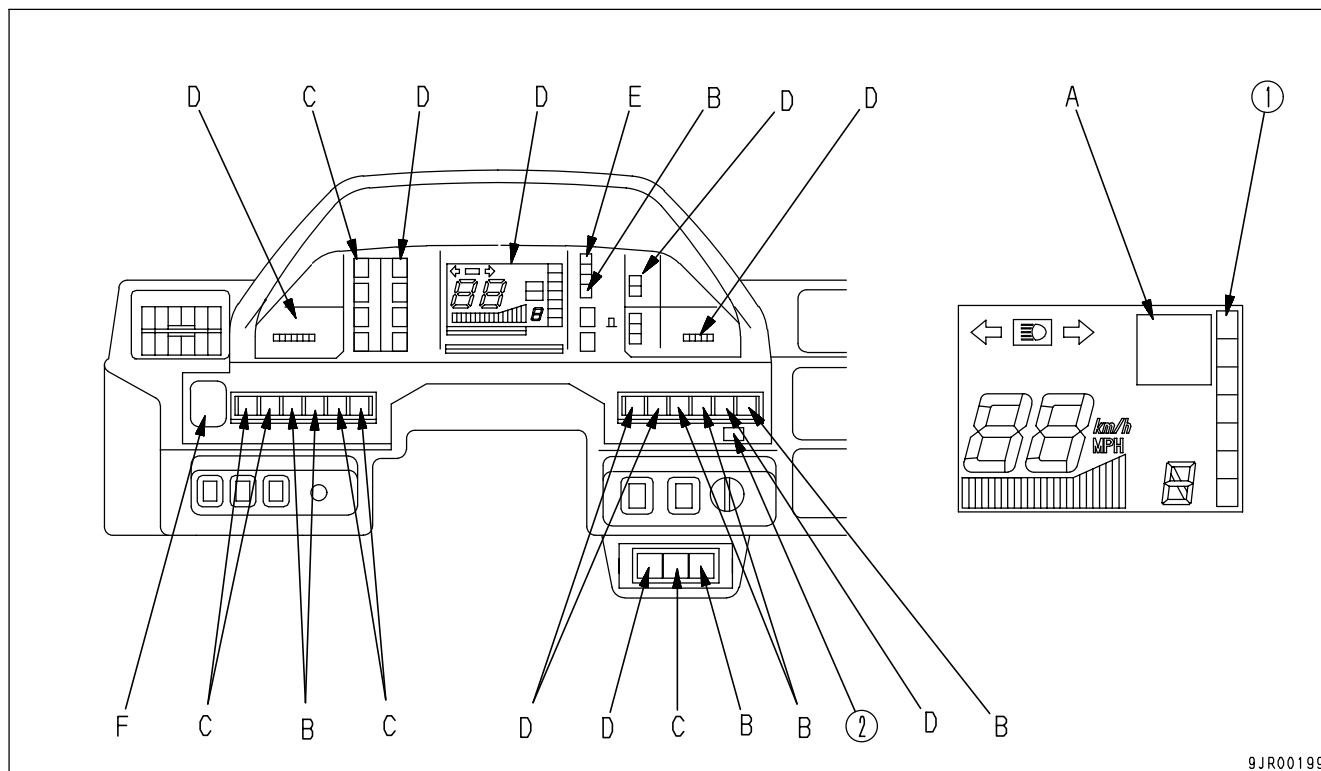
- |  |                                |
|--|--------------------------------|
| (1) Caution/pilot lamp bulb check switch | (5) Panel dimmer switch        |
| (2) Starting switch                      | (6) Hazard lamp switch         |
| (3) Preheating switch                    | (7) Front brake cut-off switch |
| (4) AISS LOW switch                      | (8) Exhaust brake switch       |

## EXPLANATION OF COMPONENTS

The following is an explanation of devices needed for operating the machine.

To perform suitable operations correctly and safely, it is important to completely understand methods of operating the equipment, and the meanings of the displays.

### MACHINE MONITOR



9JR00199

A: User code display

B: Caution items

C: Emergency stop item

D: Meter display portion

E: Mechatronic caution lamp portion

F: Central warning lamp

### NOTICE

When the starting switch is turned to the ON position before the engine is started, all the monitors, gauges, and the central warning lamp will light up for approx. 3 seconds, and the alarm buzzer will sound for approx. one second. When this happens, the speedometer will display 88.

If no monitor lamp lights up, then there is probably a failure or disconnection in that circuit, therefore contact your Komatsu distributor to have the circuit checked.

When the starting switch is at the ON position, if the shift lever is not at the neutral position, then the transmission shift lever position pilot lamp (1) and the central warning lamp will flash and the alarm buzzer will continue to sound intermittently. At this time, when the lever is placed in neutral, letter N is displayed, the central warning lamp goes out and the buzzer stops.

Checking for blown caution lamp or pilot lamp bulbs

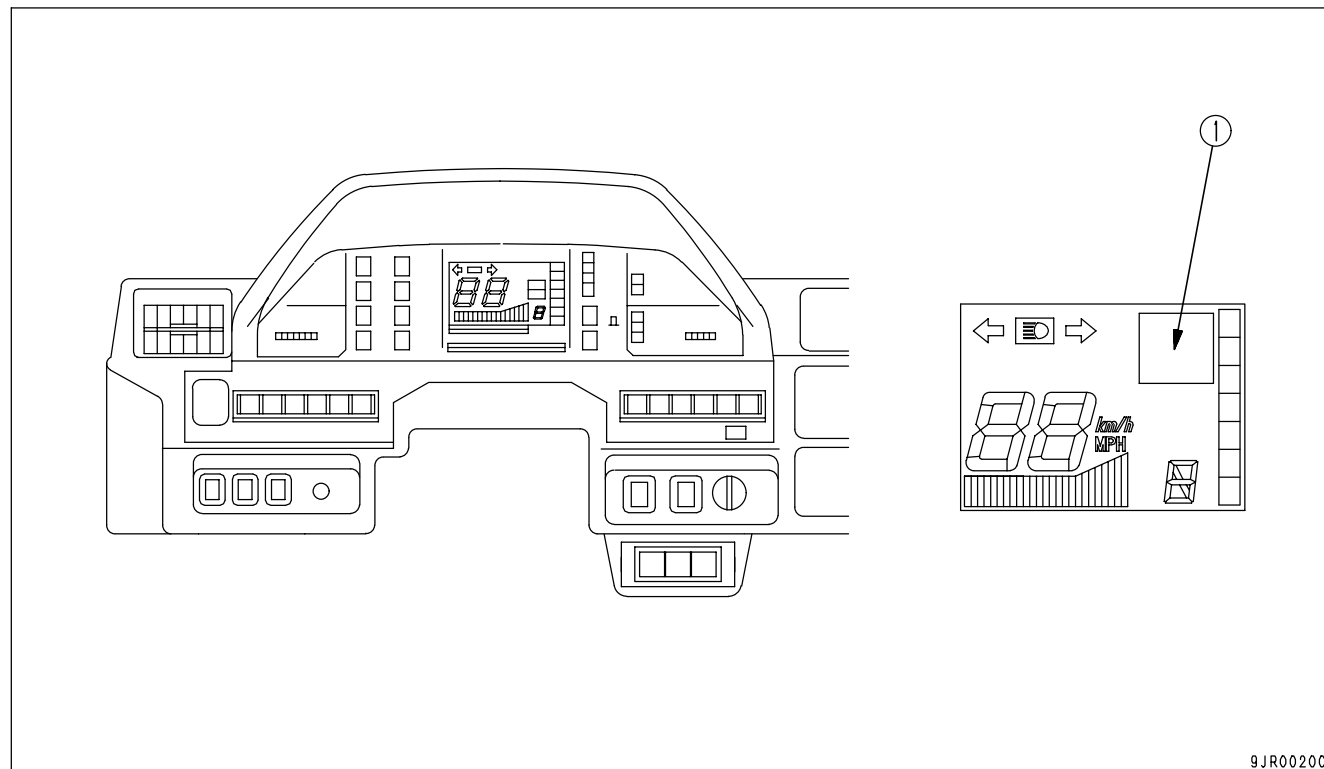
Turn the starting switch to the ON position before starting the engine, press bulb check switch (2) and check that no caution lamp or pilot lamp bulbs are blown.

If any lamp does not light up, the bulb is probably blown, so replace the bulb.

If the lamp does not light up even when the bulb is replaced, there is probably a failure or disconnection, so please contact your Komatsu distributor to have the circuit checked.

## USER CODE DISPLAY

If any failure occurred on the machine or if the operation needs to be changed or if checks and maintenance are required, the user code display (1) shows the user code indicating appropriate corrective action. At this time, the monitor related to the abnormal area lights up or flashes, and the central warning light flashes.



9JR00200

(1) User code display



## WARNING

If user code 02 or 04 is displayed, stop the machine immediately. See "SERVICE CODE (PAGE 3-118)", and check the service code number. Contact Komatsu distributor, telling them the service code number, for repair.

If letter "E-" and any user code of "01 to 07" is displayed in turn at the upper right of the liquid crystal display on the monitor panel, stop the machine once. Then, take the corrective action as follows after checking user code (1).

User code

- 02: Park the machine at a safe location and contact your Komatsu distributor.
- 04: Carry out an emergency stop. Stop the engine and contact your Komatsu distributor.
- 01: Carry out checks and maintenance according to the Operation and Maintenance Manual.
- 03: Operate the machine keeping the engine at low revolution and low travel speed.
- 05: Stop the machine. Run the engine at a mid-range speed under no load.
- 06: Restart the engine. Idle the engine for a while.
- 07: Do not raise the dump body.

- If the user code is displayed again even after taking the corrective action shown above when the user code 01, 03, 05, 06, or 07 is displayed, check the service code.

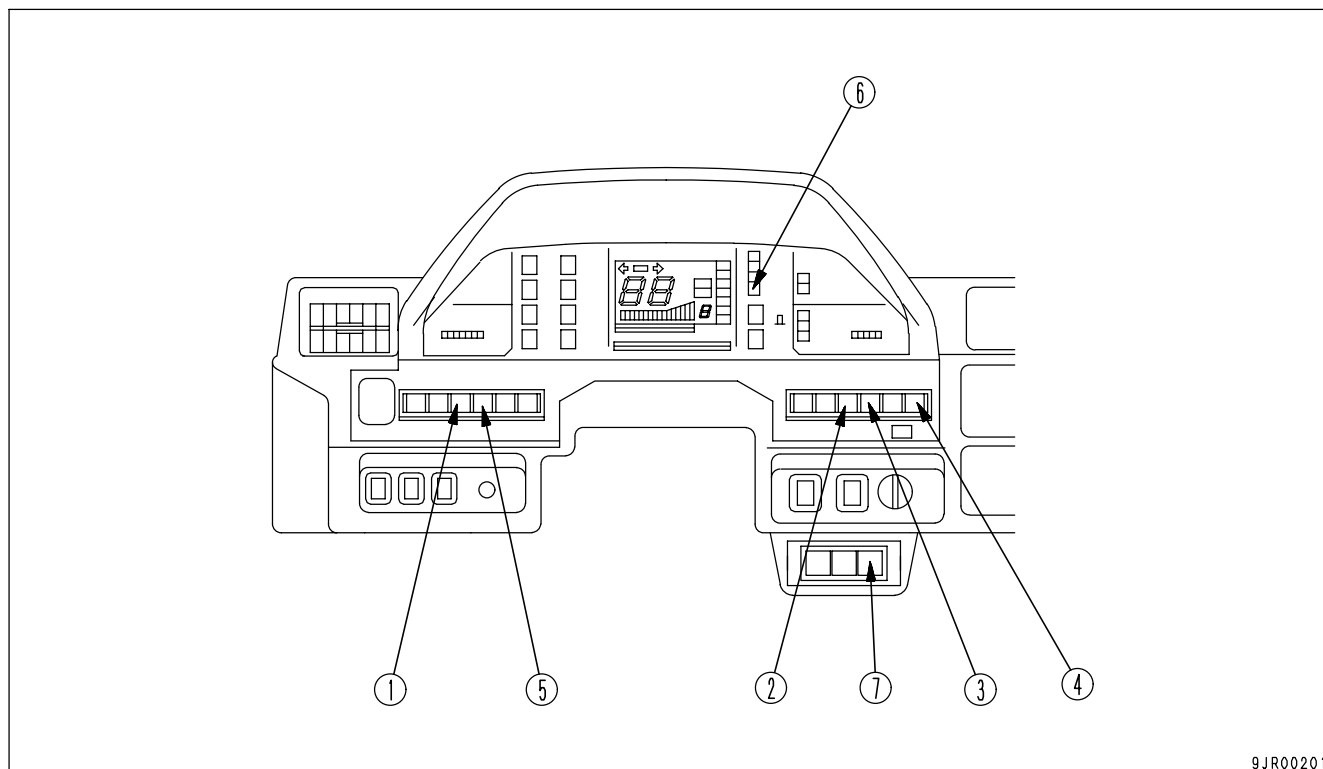
## CAUTION ITEMS



### CAUTION

If any of the warning monitors lights up, carry out the inspection and maintenance of the appropriate item as soon as possible. If it is left without the inspection and maintenance, it will lead to the trouble or failure.

If there is any abnormality for the caution items, the monitor for the corresponding abnormal area lights up.

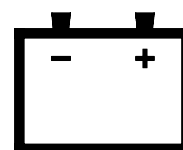


9JR00201

- |                                 |  |
|---------------------------------|--|
| (1) Battery charge              | (5) Transmission filter clogging           |
| (2) Emergency steering          | (6) Fuel level                             |
| (3) Parking brake               | (7) Maintenance caution lamp (if equipped) |
| (4) Dump body actuation caution |  |

### BATTERY CHARGE

This (1) notifies the operator of any abnormality in the charging system when the engine is running. If it lights up and simultaneously displays user code 01, check the charging circuit.

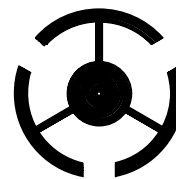


AK626740

**EMERGENCY STEERING**

This (2) lights up when the emergency steering is actuated.

If any abnormality should occur in the steering oil pressure circuit when the machine is traveling, the auto emergency steering is actuated and the related lamp lights up.



AK626750

**PARKING BRAKE**

This (3) lights up when the parking brake is applied.

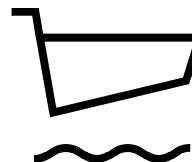
It goes on and out respectively responding to the parking brake lever shifting of PARK/TRAVEL.



AK626760

**DUMP BODY ACTUATION CAUTION**

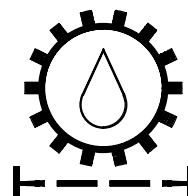
This monitor (4) lights up when the dump body control lever is at any position other than FLOAT or when the body is lifted. Always set the lever to the FLOAT position and lower the body during traveling.



AK626770

**TRANSMISSION FILTER CLOGGING**

This monitor (5) notifies the operator that the transmission filter is clogged. If it lights up and displays action code 01 at the same time, replace the transmission filter.

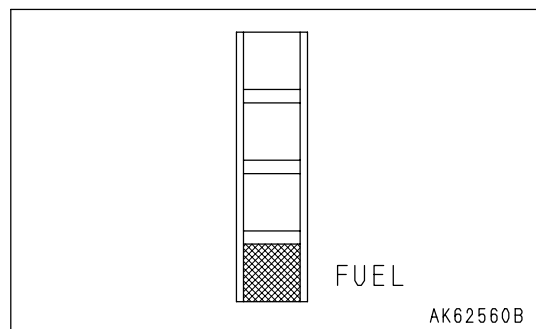


AK626780

### FUEL LEVEL

This monitor (6) flashes when the level of the fuel in the fuel tank goes below 170 liters (44.88 US gal).

If it flashes, check the fuel level and add fuel.



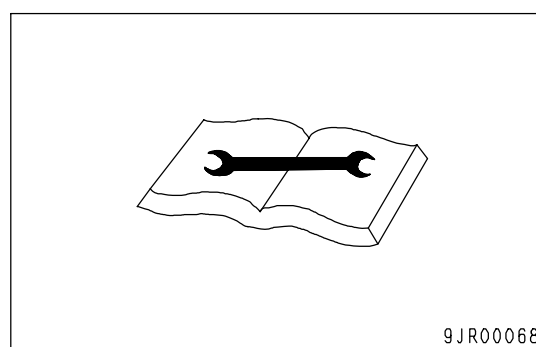
### MAINTENANCE CAUTION LAMP

(If equipped)

If the machine is in any of the following conditions, this lamp will light up.

If it lights up and displays user code 01 at the same time, carry out check, replenishment or replacement.

- Insufficient oil in the front brake oil tank
- Insufficient oil in the transmission case
- Insufficient oil in the hydraulic oil tank
- Clogging of the transmission filter (on the tank side)
- Clogging of the full flow filter (the engine oil filter)
- Clogging of the hydraulic oil filter
- Wear of the rear brake disc (right hand)
- Wear of the rear brake disc (left hand)
- Drop of the battery electrolyte level
- Insufficient oil in the engine oil pan
- Clogging of the air cleaner



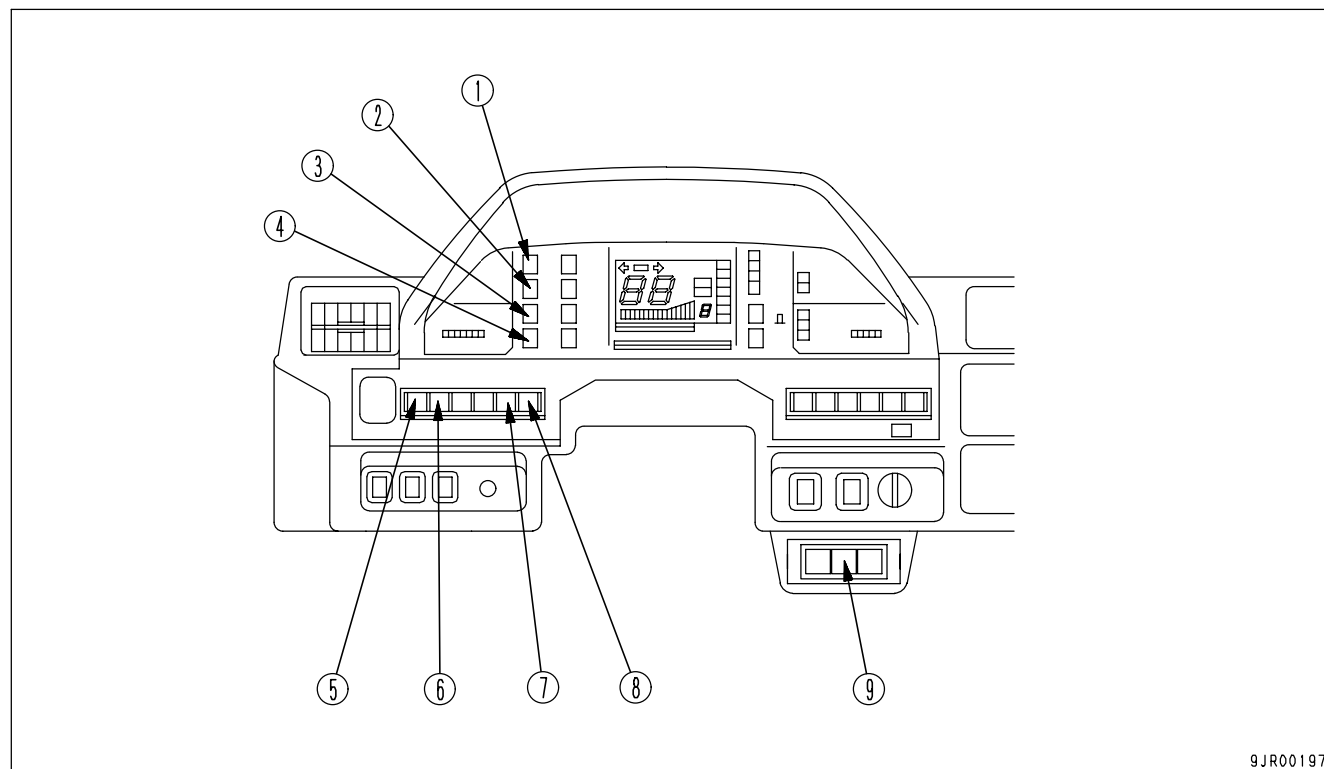
## EMERGENCY STOP ITEM



### CAUTION

If any of these monitor lights up or flashes, stop the engine immediately or put the engine in low idling, then check the corresponding area and carry out the action.

If the abnormality is found in the emergency items, the warning buzzer sounds and the monitor corresponds to the abnormal section lights up or flashes, and the central warning light flashes.

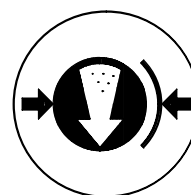


9JR00197

- |                                      |                              |
|--------------------------------------|------------------------------|
| (1) Air pressure                     | (6) Engine oil pressure      |
| (2) Engine water temperature         | (7) Angle warning            |
| (3) Torque converter oil temperature | (8) Rear brake caution lamp  |
| (4) Retarder oil temperature         | (9) Steering oil temperature |
| (5) Radiator water level             |                              |

### AIR PRESSURE

This monitor (1) warns the operator that the air pressure inside the air tank has dropped. If it flashes and displays the user code "05" at the same time, stop the machine, run the engine under no load at a mid-range speed, and wait until the lamp goes out.



9JM00675



**ENGINE WATER TEMPERATURE**

This (2) warns the operator that the engine cooling water temperature has risen.

For the machine equipped with an electronic governor (if equipped), the engine output is automatically limited.

If it flashes and displays user code 05 at the same time, stop the machine and run the engine under no load at a mid-range speed until the engine water temperature gauge enters the green range.

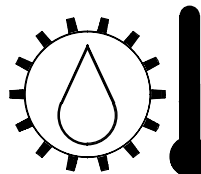


9JM00676

**TORQUE CONVERTER OIL TEMPERATURE**

This monitor (3) warns the operator that the torque converter oil temperature has risen.

If it flashes and displays user code "05" at the same time, stop the machine and run the engine under no load at a mid-range speed until the torque converter oil temperature gauges enters the green range.

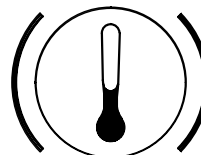


9JM00677

**RETARDER OIL TEMPERATURE**

This monitor (4) warns the operator that the retarder oil temperature has risen.

If it flashes and displays user code "05" at the same time, stop the machine, place the shift lever at the N (neutral) position, then run the engine under no load at a mid-range speed until the warning lamp goes out.

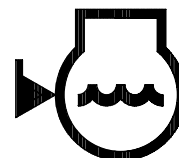


9JM00678

**RADIATOR WATER LEVEL**

This (5) warns the operator that the radiator water level has dropped.

If it lights up and displays user code 01 at the same time, stop the engine, check the level of the cooling water in the radiator, and add the water.



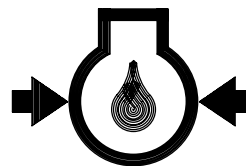
AK626800

**ENGINE OIL PRESSURE**

This (6) warns the operator that the engine lubricating oil pressure has dropped.

If it lights up and displays user code 04 at the same time, stop the machine safely. Then, stop the engine and carry out inspection.

The lamp lights up if the engine lubricating oil pressure goes below the specified value when the engine is running,  
If the engine is not running, the lamp does not light up.

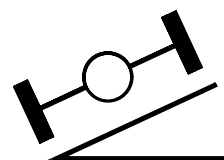


AK626960

**ANGLE WARNING**

When the dump body is raised, this monitor (7) warns the operator that the machine has tilted beyond the safety range to the left or right.

If it lights up and displays action code "07" at the same time, lower the body and move the machine to a safe, stable place.



AK626970

**REAR BRAKE CAUTION LAMP**

This monitor (8) lights up if the brake oil pressure drops under the normal value.

If it lights up and display user code "04" at the same time, immediately check the rear brake system.

After checking and repairing, depress the rod for the overstroke sensor on the brake chamber.

If depressing is not carried out, the rear brake caution lamp will continue to light up.

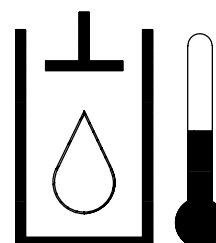


9JM00679

**STEERING OIL TEMPERATURE**

This monitor (9) warns the operator that the steering oil temperature has risen.

If it lights up and displays user code "05" at the same time, stop the machine, place the shift lever at the N (neutral) position, then run the engine under no load at a mid-range speed until the warning lamp goes out.

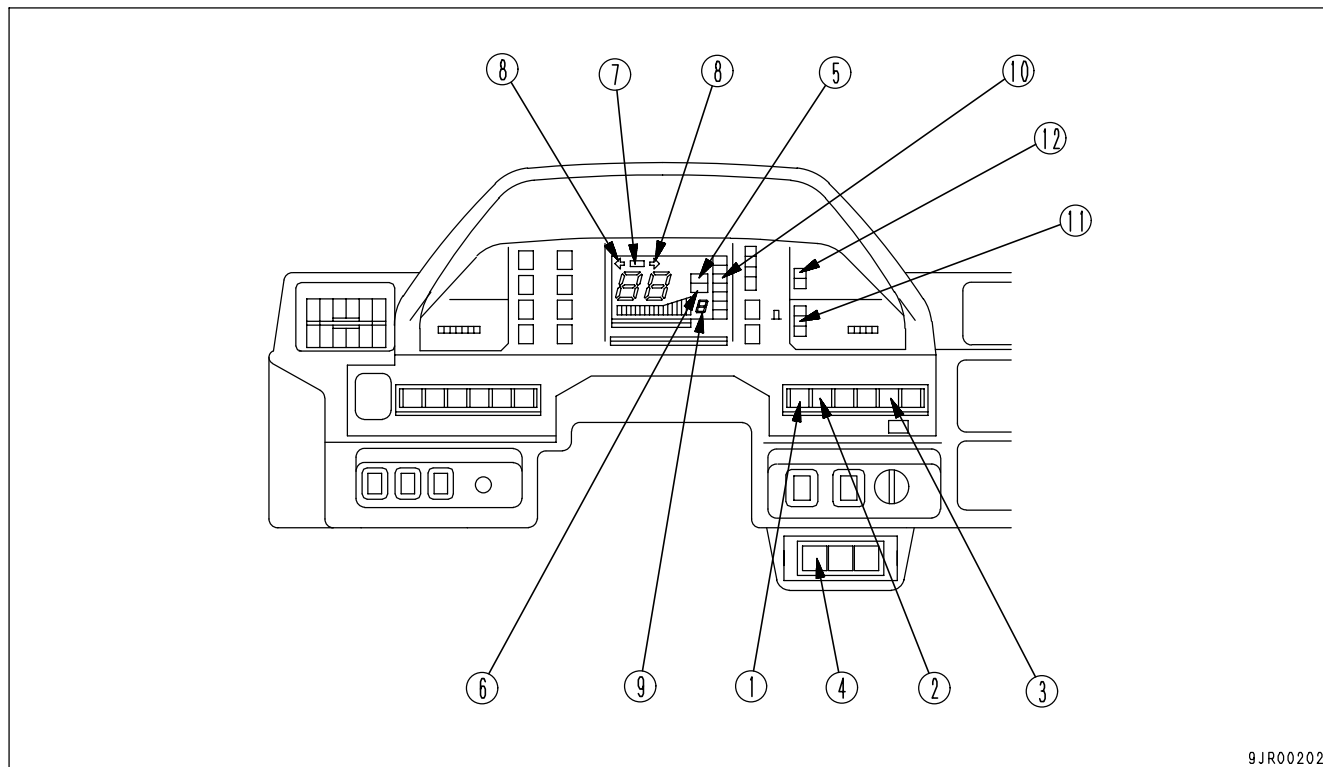


9JR00054

## METER DISPLAY PORTION

### PILOT DISPLAY PORTION

When starting switch is ON, the pilot display lights up when display items are functioning.

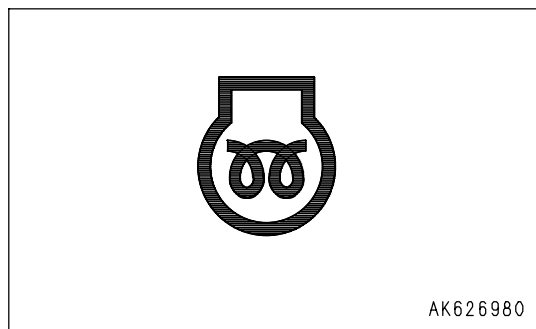


9JR00202

- |   |   |
|---|---|
| (1) Preheating monitor                    | (7) High beam                                     |
| (2) Exhaust brake pilot                   | (8) Turn signal pilot lamp                        |
| (3) Rear brake pilot (retarder)           | (9) Shift indicator (with lockup display)         |
| (4) Differential lock pilot (if equipped) | (10) Transmission shift lever position pilot lamp |
| (5) Lockup pilot lamp                     | (11) Auto suspension mode display lamp            |
| (6) Shift limiter pilot lamp              | (12) Power mode display lamp (if equipped)        |

### PREHEATING MONITOR

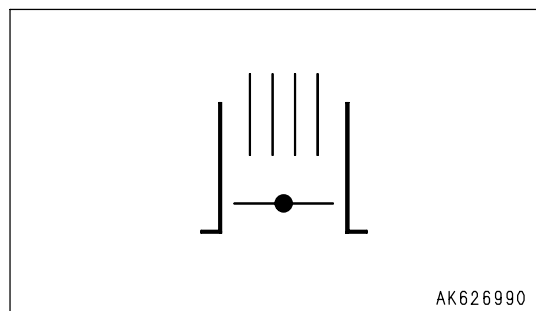
This lamp lights up when the electrical heater for preheating the engine is being actuated.



AK626980

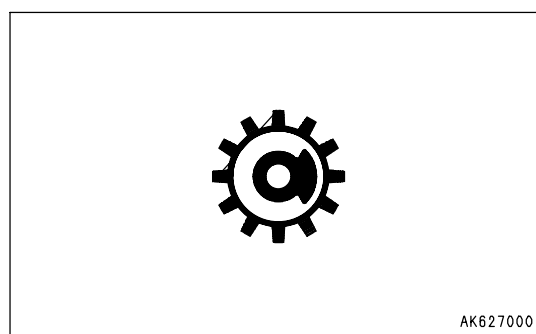
### EXHAUST BRAKE PILOT

This pilot lamp (2) lights up when the exhaust brake is actuated.



### REAR BRAKE PILOT (Retarder)

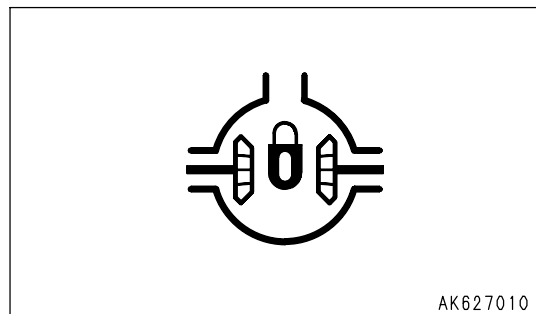
This pilot lamp (3) lights up when the foot brake is depressed or the retarder control lever is pulled, and the rear brake is applied.



### DIFFERENTIAL LOCK PILOT

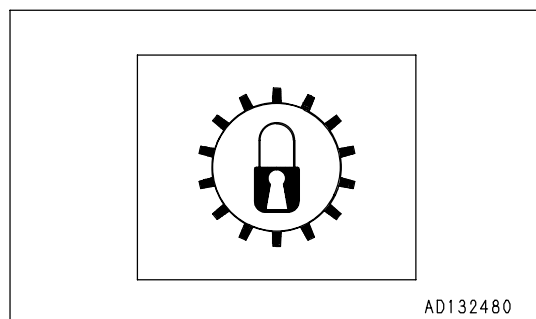
(If equipped)

This pilot lamp (4) lights up when the differential lock pedal (if equipped) is depressed and the differential lock is actuated.



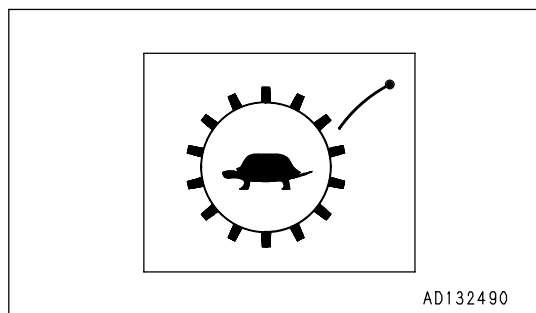
### LOCKUP PILOT LAMP

This pilot lamp (5) lights up when the torque converter lockup is engaged and the transmission is shifted to direct drive.



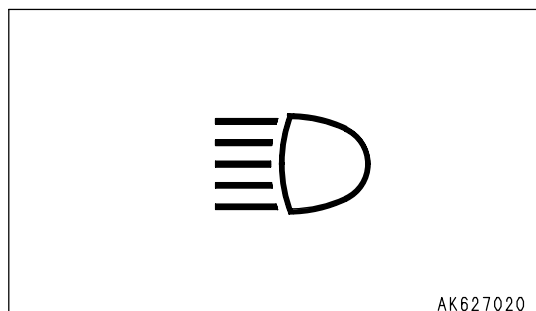
#### SHIFT LIMITER PILOT LAMP

This pilot lamp (6) lights up when the shift limiter switch is actuated.



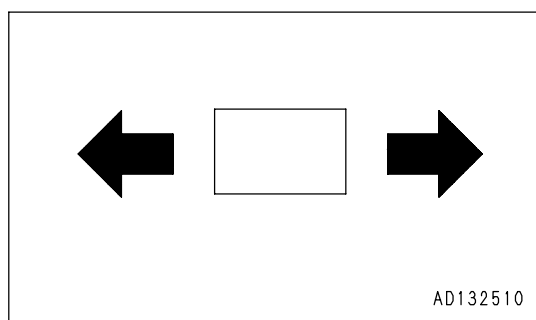
#### HIGH BEAM

This monitor (7) lights up when the head lamps are set to high beam.



#### TURN SIGNAL PILOT LAMP

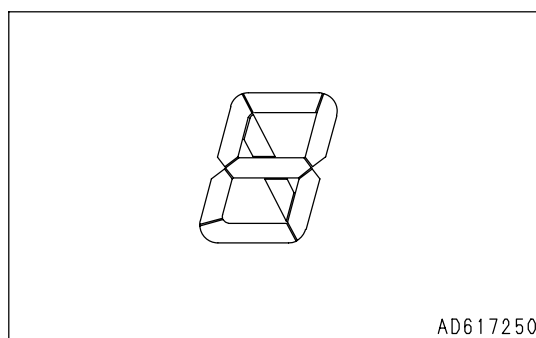
This pilot lamp (8) flashes at the same time as the turn signal lamp flashes.



#### SHIFT INDICATOR

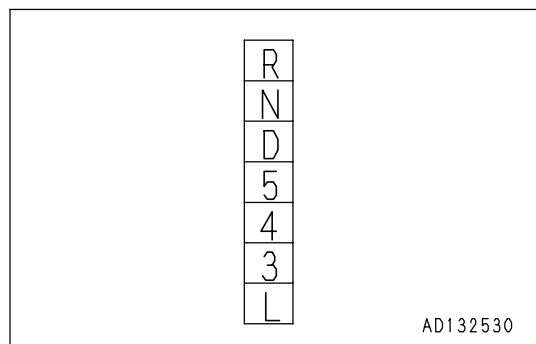
This monitor (9) displays the transmission shift range (speed range).

When the key was turned ON, if the shift lever is operated, it will display "2" at the lever position "D", "1" at the "5" - "L" position, and "R" at the R position even if the engine is stopped.



### TRANSMISSION SHIFT LEVER POSITION PILOT LAMP

This monitor (10) indicates the position of the transmission shift lever.

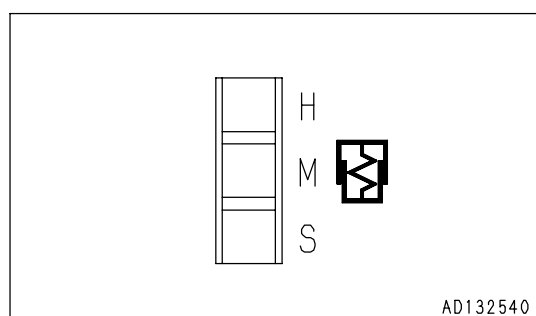


### AUTO SUSPENSION MODE DISPLAY LAMP

This monitor (11) displays the suspension mode, when the machine is equipped with the suspension controller.

An automatic suspension system is mounted which automatically switches the damping characteristics of the suspension according to the size of the load, use of the brake, operation of the steering, and operation of the dump control.

Normally it is set to the soft mode when the dump truck is traveling empty and to the medium mode when it is traveling loaded. When the foot brake is operated or the machine is suddenly turned, or the dump control is operated, the suspension mode is switched to insure the stability of the machine to the front and rear, and left and right.



H : Hard mode

M : Medium mode

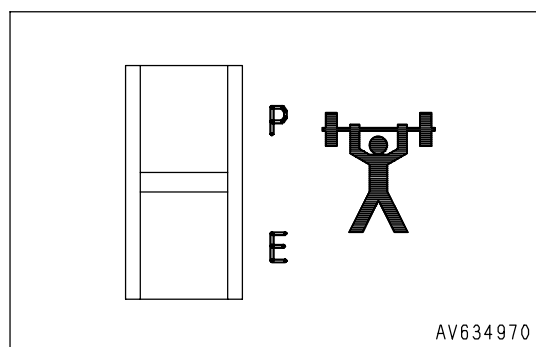
S : Soft mode

### POWER MODE DISPLAY LAMP

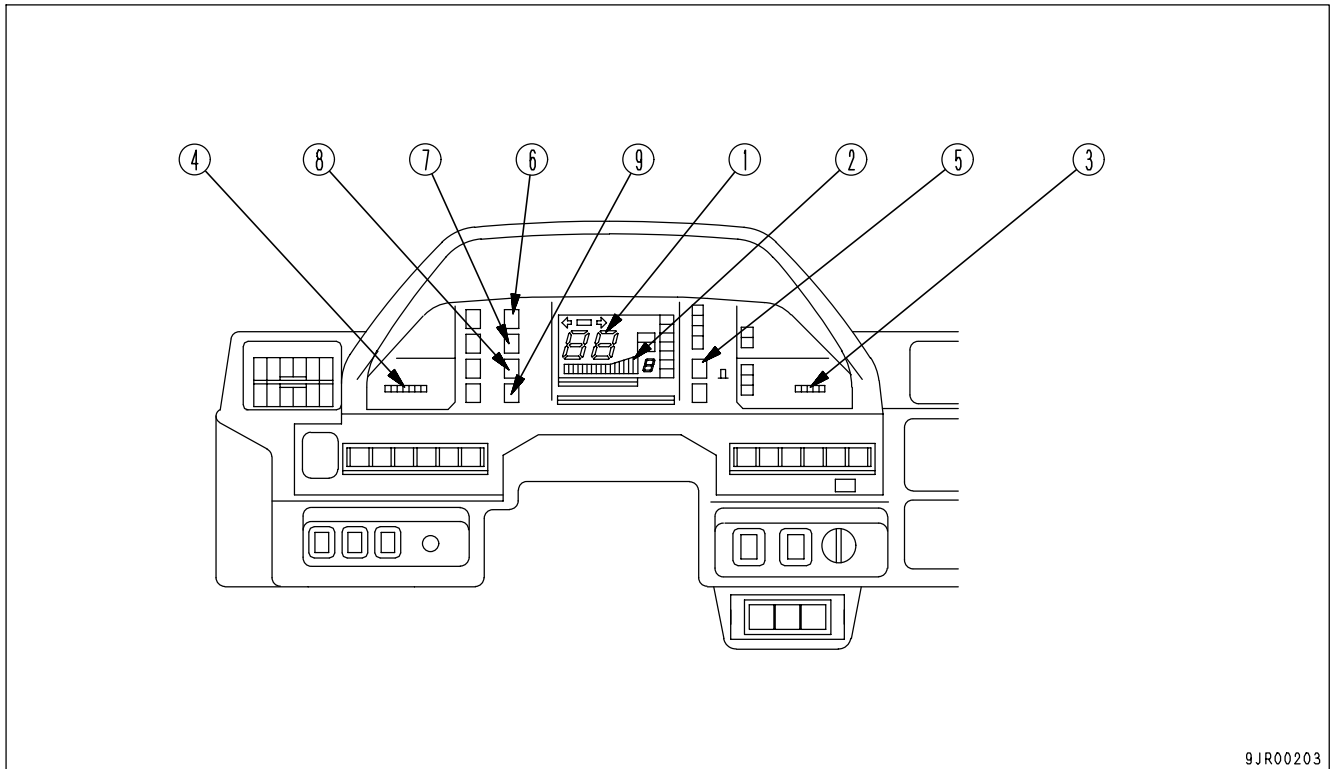
(If equipped)

This monitor (12) displays the power mode.

Select the mode with the power mode switch.



## METERS

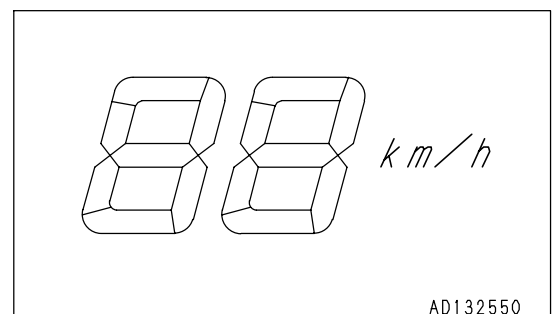


9JR00203

- |                       |  |
|-----------------------|--|
| (1) Speedometer       | (6) Air pressure gauge                     |
| (2) Engine tachometer | (7) Engine water temperature gauge         |
| (3) Service meter     | (8) Torque converter oil temperature gauge |
| (4) Odometer          | (9) Retarder oil temperature gauge         |
| (5) Fuel gauge        |  |

## SPEEDOMETER

This meter (1) indicates the travel speed of the machine.

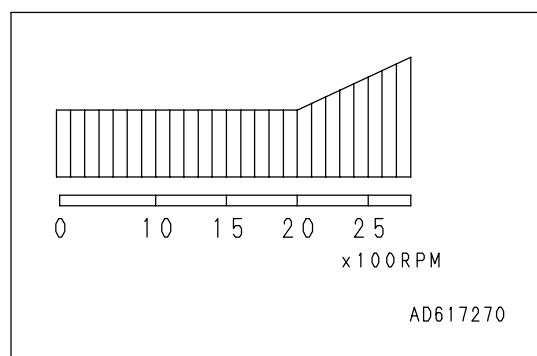


AD132550

### ENGINE TACHOMETER

This meter (2) indicates the speed of the engine.

While operating the machine, if the red range lights up, simultaneously the warning buzzer sounds and the central warning lamp flashes, then operate the machine while lowering the engine speed and the traveling speed.

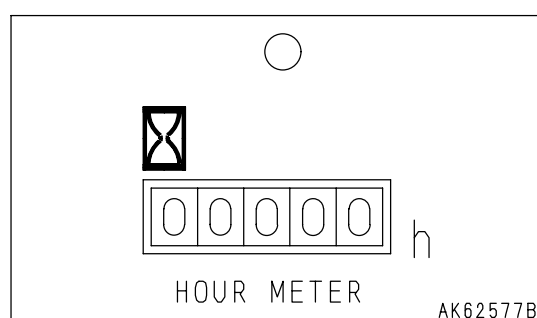


### SERVICE METER

This meter (3) shows the total hours of operation of the machine.

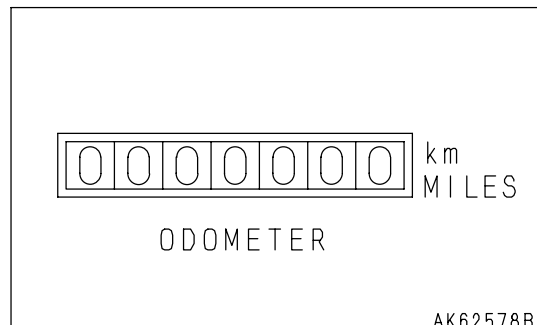
If the engine is running, the service meter will advance even if the machine is not moving.

The meter advances by 1 for every one hour of operation, regardless of the engine speed.



### ODOMETER

This (4) indicates the distance traveled in kilometers.

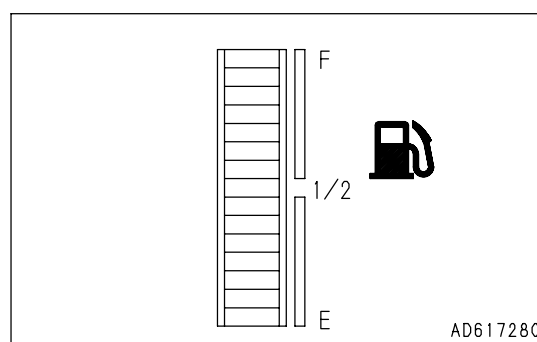


### FUEL GAUGE

This gauge (5) indicates the amount of fuel in the fuel tank.

The green range should be lighted up during operation.

If only the red range remains lighted during operation, it indicates that there is less than 120 liters (31.68 US gal) of fuel remaining in the tank, so check and add fuel.





### AIR PRESSURE GAUGE

This gauge (6) indicates the air pressure inside the air tank.

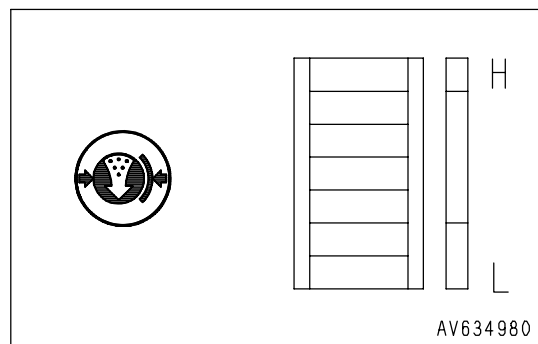
The green range should be lit up during operation.

If the red range lights up during operation, the alarm buzzer will sound, the central warning lamp will flash, and the air pressure monitor lamp will also flash at the same time.

If this happens, stop the machine, raise the engine speed, and wait until the green range lights up.

### REMARK

If the air pressure drops further, the parking brake is automatically applied.



### ENGINE WATER TEMPERATURE GAUGE

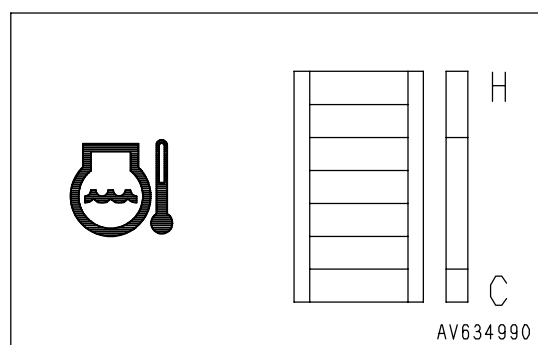
This gauge (7) indicates the engine cooling water temperature.

The green range should be lighted up during operation.

If the red range lights up during operation, the alarm buzzer will sound, the central warning lamp will flash, and the engine water temperature monitor lamp will flash at the same time.

If this happens, stop the machine, run the engine under no load at a mid-range speed, and wait until the green range lights up.

If the red range lights up, the engine output of the machine equipped with an electronic governor is automatically limited.

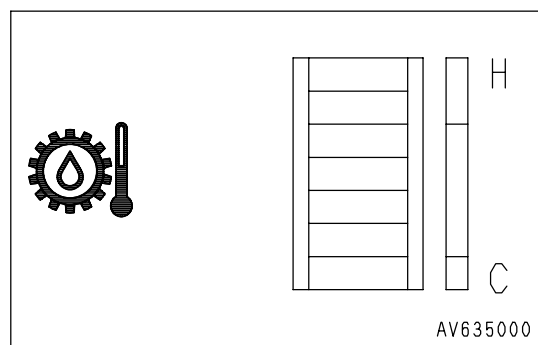


### TORQUE CONVERTER OIL TEMPERATURE GAUGE

This gauge (8) indicates the torque converter oil temperature.

The green range should be lit up during operation.

If the red range lights up during operation, the alarm buzzer will sound, the central warning lamp will flash, and the torque converter oil temperature monitor lamp will flash at the same time. If this happens, stop the machine, run the engine under no load at a mid-range speed, and wait until the green range lights up.

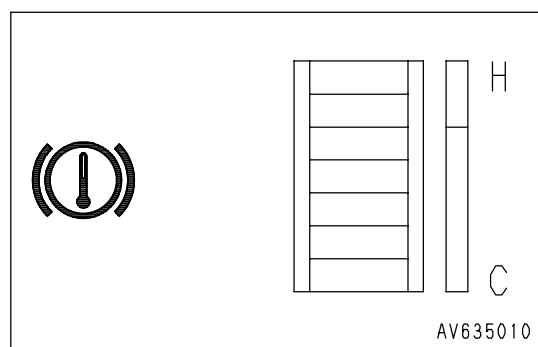


### RETARDER OIL TEMPERATURE GAUGE

This gauge (9) indicates the retarder cooling oil temperature.

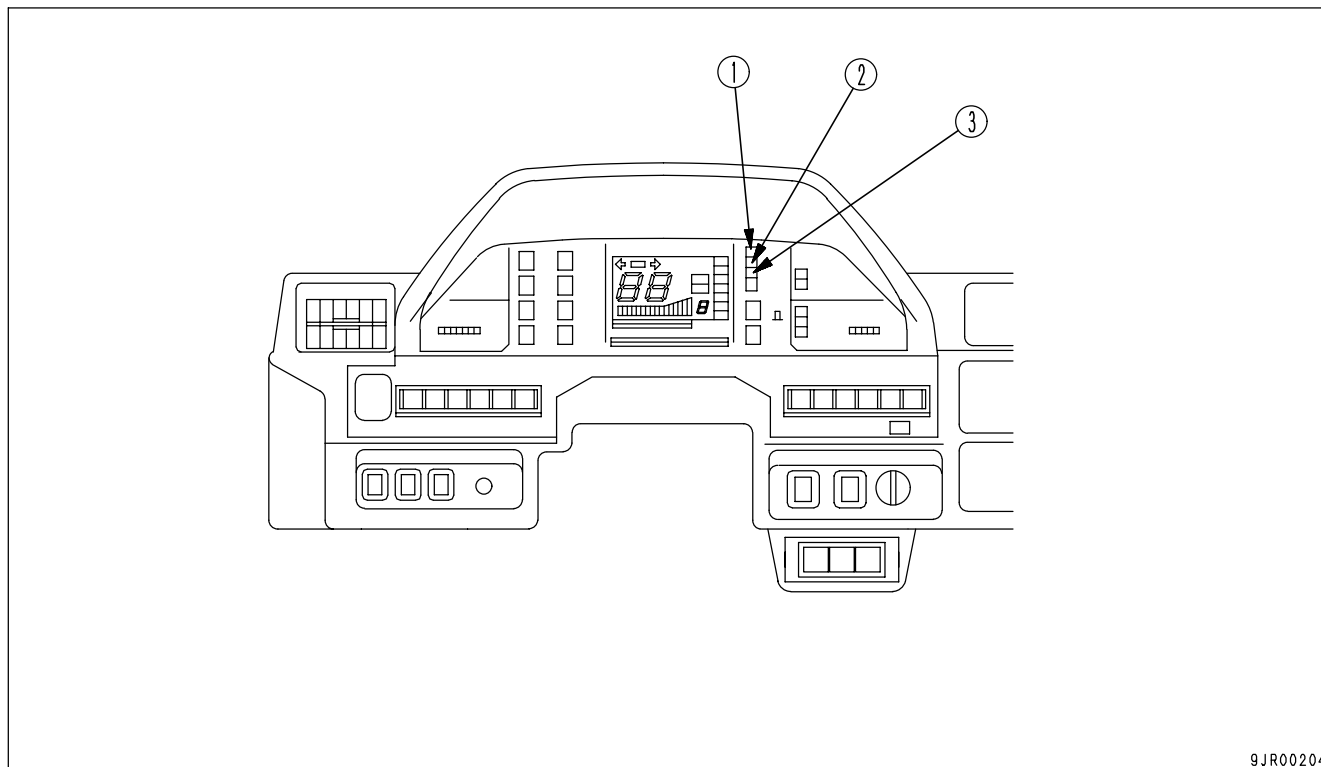
The green range should be lit up during operation.

If the red range lights up during operation, the alarm buzzer will sound, the central warning lamp will flash, and the retarder oil temperature monitor lamp will flash at the same time. If this happens, stop the machine, run the engine under no load at a mid-range speed, and wait until the green range lights up.



## MECHATRONIC CAUTION LAMP PORTION

If an abnormality is detected in the mechatronics-related parts of the control system, the monitor lamp and the central warning lamp light up and the alarm buzzer sounds intermittently. Stop the machine, then take appropriate corrective action according to the user code.

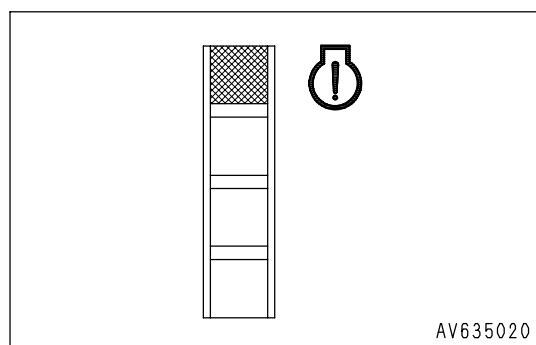


- |   |   |
|---|---|
| (1) Engine (Mechatronics-related)                 | (3) Mechatronics-related parts<br>(Excluding 1. and 2. above) |
| (2) Automatic transmission (Mechatronics-related) |   |

## ENGINE

(Mechatronics-related)

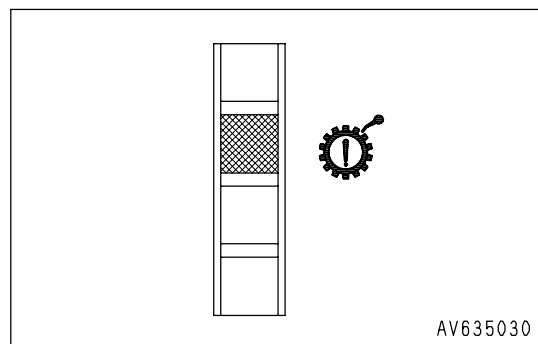
If an abnormality is detected in the mechatronics-related parts of the engine control system, this lamp (1) flashes to warn of the abnormality.



### AUTOMATIC TRANSMISSION

(Mechatronics-related)

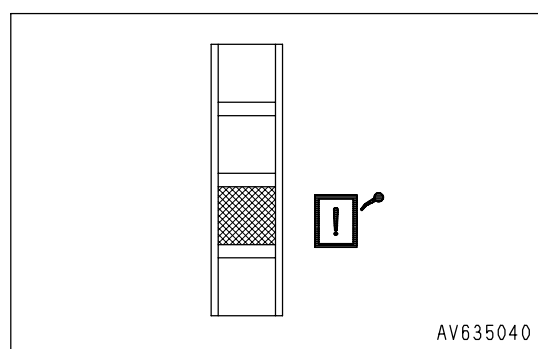
If an abnormality is detected in the mechatronics-related parts of the transmission control system, this lamp (2) flashes to warn of the abnormality.



### MECHATRONICS-RELATED PARTS

(Excluding 1. and 2. above)

If an abnormality is detected in the mechatronics-related parts of the control system other than those of the engine and transmission, this lamp (3) flashes to warn of the abnormality.



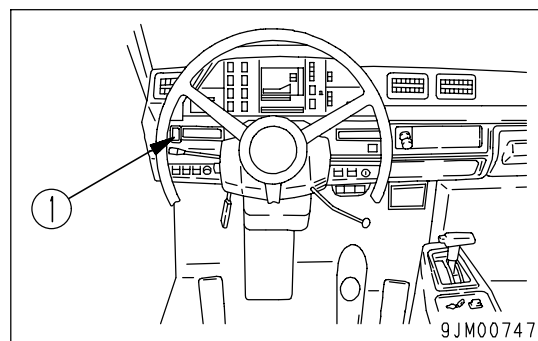
### CENTRAL WARNING LAMP

If the machine is in the following condition, this lamp will flash.

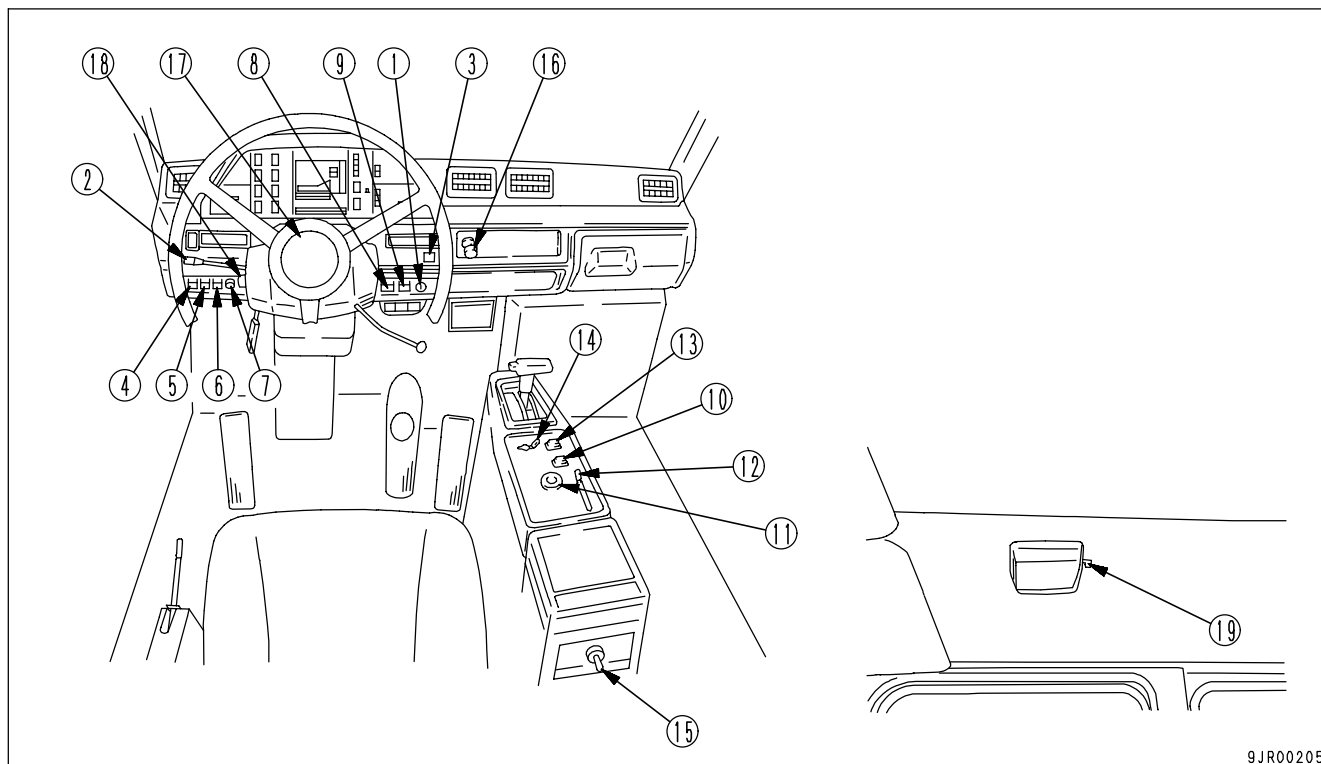
- When an abnormality has occurred in any of B caution items.
- When the abnormalities has occurred referred to "CAUTION ITEMS (PAGE 3-7)".

If the machine is in the following condition, this lamp will flash, and at the same time, the alarm buzzer will sound intermittently.

- When an abnormality has occurred in any of "EMERGENCY STOP ITEM (PAGE 3-10)".
- When "MECHATRONIC CAUTION LAMP PORTION (PAGE 3-20)" flashes.
- If the parking brake is applied, but the shift lever is not at neutral.
- When the dump lever is not at the FLOAT position and the shift lever is not at neutral.
- When engine tachometer red range lights up.



## SWITCHES



9JR00205

- |  |                                   |
|--|-----------------------------------|
| (1) Starting switch                      | (10) Power mode selector switch   |
| (2) Lamp switch                          | (11) Emergency steering switch    |
| Turn signal lever                        | (12) Emergency brake lever        |
| Dimmer switch                            | (13) Shift limiter switch         |
| (3) Caution/pilot lamp bulb check switch | (14) Parking brake valve lever    |
| (4) Exhaust brake switch                 | (15) Engine emergency stop switch |
| (5) Front brake cut-off switch           | (16) Cigarette lighter            |
| (6) Hazard lamp switch                   | (17) Horn button                  |
| (7) Night lighting dimmer switch         | (18) Wiper switch                 |
| (8) AISS LOW switch                      | (19) Room lamp switch             |
| (9) Preheating switch                    |                                   |

## STARTING SWITCH

This switch (1) is used to start or stop the engine.

### OFF position

At this position, the starting switch key can be inserted or removed. When the key is turned to this position, all the electric circuits are switched off and the engine stops.

### ON position

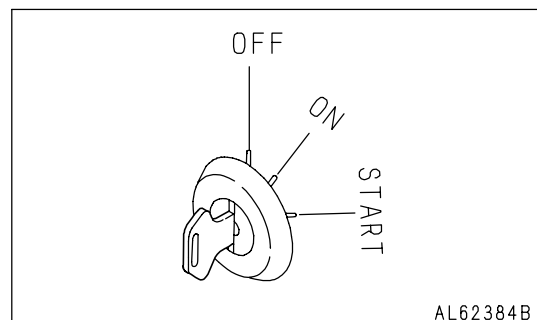
In this position, electric current flows in the charging and lamp circuits.

Keep the starting switch key at the ON position while the engine is running.

When turning the starting switch ON or OFF, if the starting switch is held at a position between ON and OFF, the controller may detect this as a problem. If this happens, return the starting switch to the OFF position, then operate it as usual to the ON position.

### START position

This is the position to start the engine. Hold the key at this position while cranking. Release the key immediately after the engine has been started. The key will return to the ON position when released.



## LAMP SWITCH

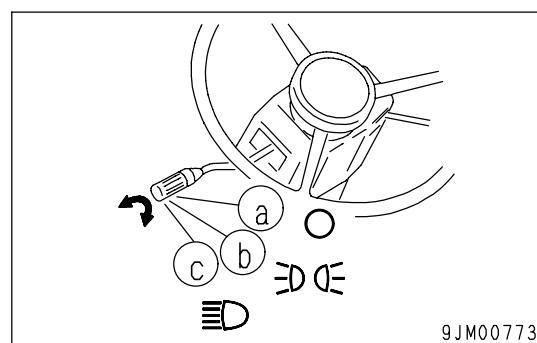
This (2) lights up the head lamps, side clearance lamps, tail lamps, machine monitor lighting, and rear lamps.

(a) position: OFF

(b) position: Side clearance lamps, tail lamps, rear lamps, machine monitor lighting light up

(c) position: The head lamps light up in addition to the lamps in the (b) position

The lamp switch can be operated regardless of the position of the lever.



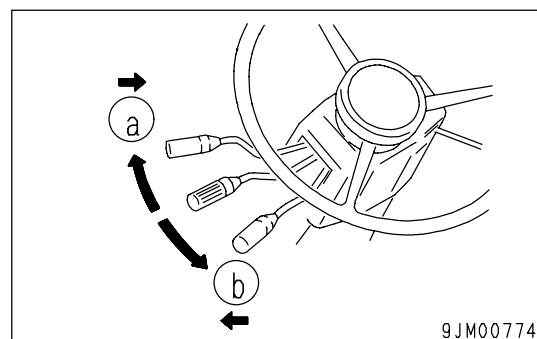
## TURN SIGNAL LEVER

This lever (2) operates the turn signal lamp.

(a) Right turn: Push the lever forward

(b) Left turn: Push the lever back

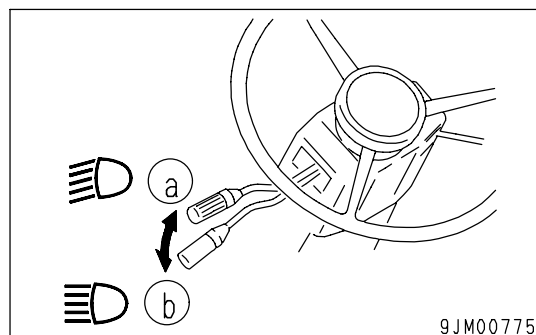
When the lever is operated, the turn signal pilot lamp also flashes. The lever is automatically returned when the steering wheel is turned back. If the lever does not return, move it by hand.



### DIMMER SWITCH

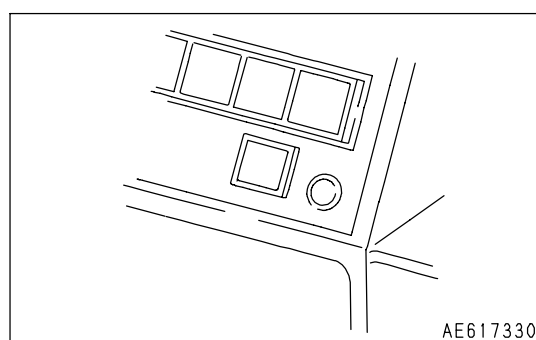
This (2) is used to switch the head lamps between high beam and low beam.

- (a) Low beam
- (b) High beam



### CAUTION/PILOT LAMP BULB CHECK SWITCH

Press this switch (3) when the starting switch is at the ON position to check for any blown bulbs.



### EXHAUST BRAKE SWITCH

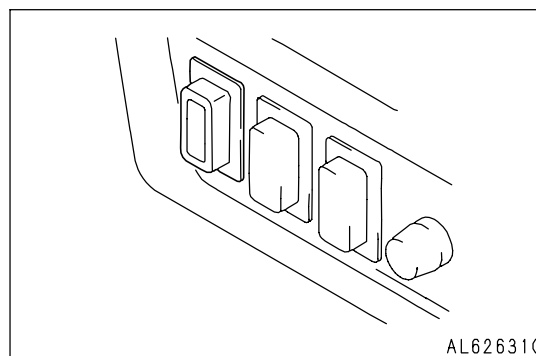
This switch (4) shows the operating condition of the exhaust brake. If it is pushed once, it lights up; and it goes off when it is pushed again.

OFF position (Light is off):

The exhaust brake is actuated when the brake pedal is depressed or the retarder control lever is operated if the torque converter is in the lockup condition.

ON position (Light is on):

The exhaust brake is actuated when the accelerator pedal is released if the torque converter is in the lockup condition.



## FRONT BRAKE CUT-OFF SWITCH



### WARNING

- When traveling on icy roads, on snow, or on other slippery road surfaces, set the front brake cut-off switch to the ON position and travel slowly at a safe speed.
- If the front brake cut-off switch is set to the OFF position, it becomes dangerously difficult to control the steering when traveling under the abovementioned conditions.

This switch (5) switches the braking method according to the road surface conditions.

If the switch is pressed, the lamp lights up, the front brake cut function is actuated, and the brakes are not applied to the front wheels.

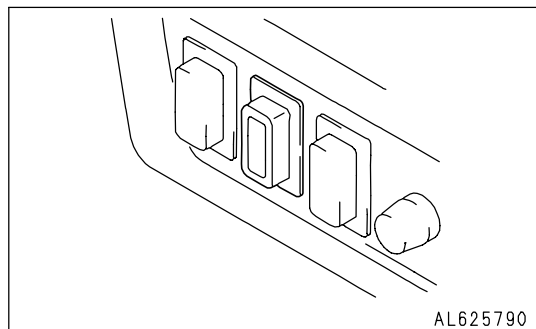
If the switch is pressed again, the lamp goes out and the front brake cut function is canceled.

OFF position (Light is off.):

When the brake pedal is depressed, the brakes are applied to both the front and rear wheels.

ON position (Light is on.):

When the brake pedal is depressed, the front brakes are not applied. The brakes are applied only to the rear wheels.



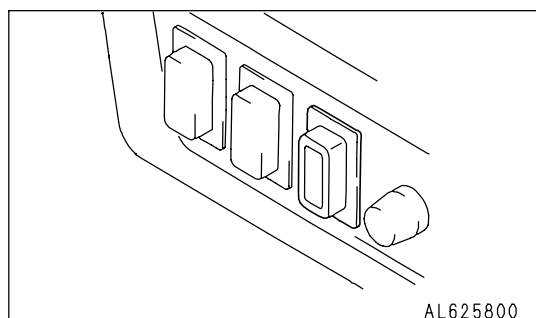
When traveling at high speed, on a road surface that has been properly watered, set the front brake cut-off switch to OFF position (lamp off), and normally use the retarder control lever to control the travel speed (retarder braking is applied only to the rear wheels).

To control the machine whenever emergency action is needed, such as when the machine slips to the side or when the machine has to be stopped suddenly, use the brake pedal to operate the brakes on the front wheels to give extra braking force.

## HAZARD LAMP SWITCH

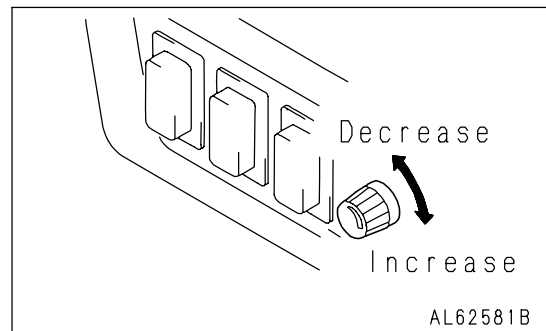
This switch (6) flashes the left- and right-hand turn signal lamps.

When the switch is turned on, the turn signal pilot lamp flashes at the same time. If the starting switch is OFF, the turn signal pilot lamp does not flash.



### NIGHT LIGHTING DIMMER SWITCH

This switch (7) is used to adjust the brightness of the monitor panel lighting and pilot lamps. Turn to the right to make the lighting brighter and turn it to the left to make the lighting dimmer.



### AISS LOW SWITCH

AUTO and LOW speed can be freely switched to each other with AISS LOW switch (8). Use each position as follows.

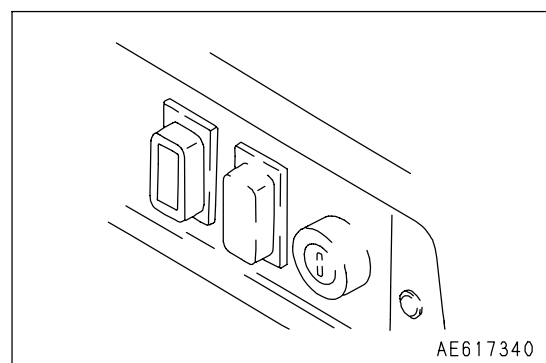
If the switch is depressed, it lights up, and if it is depressed once again, the light goes off.

OFF position (Light is off): AUTO position

At normal operation

ON position (Light is on): Low speed position

When the delicate start and operation is needed like putting the machine into garage



If the switch is at AUTO position:

1. When stopping the machine, by setting either parking brake or retarder brake at ON position, idling is set at low speed. When starting, by setting the parking brake at OFF position, idling is set at high speed.
2. Detecting the water temperature, idle is set at high speed automatically under the low temperature condition, and the warm-up time is shortened.

### PREHEATING SWITCH

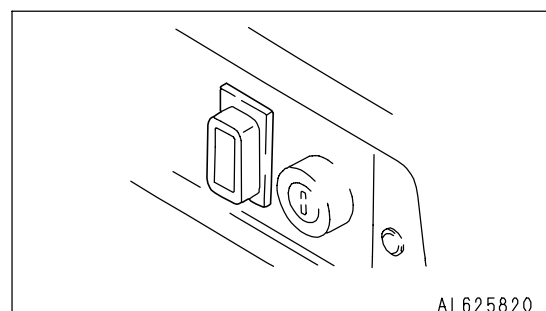
This switch (9) operate an electric heater to heat the intake air for the engine. If it is pushed, it lights up and perform preheating. If it is released, it returns to the original position.

OFF position (Light is off): If the ambient temperature is below approx. - 5°C (23°F), preheating is carried out automatically according to the ambient temperature.

ON position (Light is on): Preheating is carried out.

Press this switch if the engine does not start when only automatic preheating is carried out or when post-heating is required after the engine is started.

When the switch is released, it will return automatically to the automatic preheating position.





### POWER MODE SELECTOR SWITCH

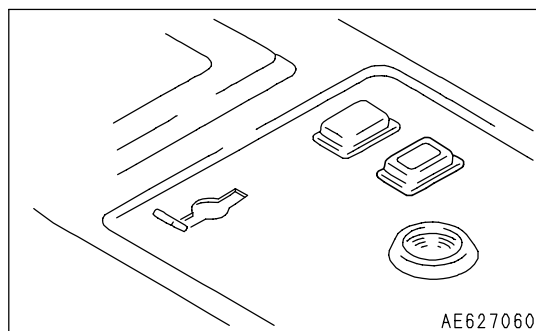
The power mode switch (10) can be switched to allow the machine to travel economically in a way suited to the operating conditions. If depressed once, it lights up; if depressed once again, the light goes off.

OFF position: High power (general operations)

This is used for general operating conditions.

ON position: economy (traveling in flat areas)

This position is used when the emphasis is on reducing fuel consumption, such as when traveling on flat ground where maximum output is not needed.



### EMERGENCY STEERING SWITCH

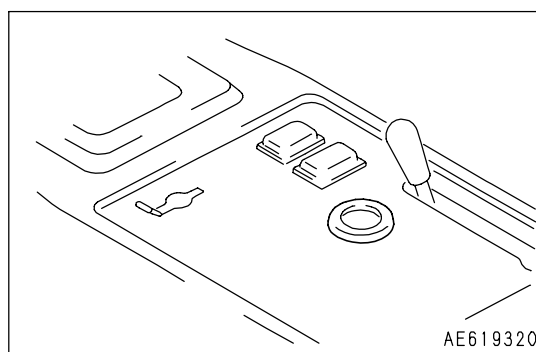
This switch (11) is used to actuate the emergency steering pump. When the switch is pressed, the emergency pump is actuated to make it possible to operate the steering.

When the switch is ON, the pilot lamp (red) inside the switch lights up.

The emergency steering pump can be used for a maximum of 90 seconds.

When using the emergency steering, travel at a speed of less than 5 km/h (3.1 MPH).

When the emergency steering is actuated, it is possible to use the dump lever to raise the dump body.



Automatic emergency steering will be actuated automatically in the following cases:

- When hydraulic pump for steering has trouble
- When engine has stopped during operation

When the automatic emergency steering is actuated, stop the machine promptly and perform inspection.

If the key switch is turned ON when the machine is stopped and the parking brake switch is OFF, the auto emergency steering is actuated after 1 second, so turn the parking brake switch to the ON (PARKING) position.

### EMERGENCY BRAKE LEVER

This lever (12) is used to actuate the emergency brake.

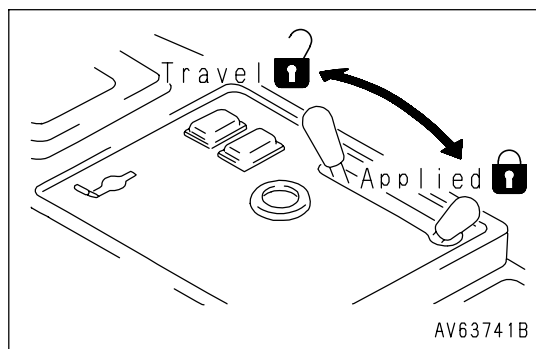
ON (applied): Emergency brake actuated

TRAVEL: Emergency brake released

If the pressure in the air tank drops below 0.22 MPa (2.2 kgf/cm<sup>2</sup>, 31.24 PSI), the emergency brake is automatically applied.

If the emergency brake is applied because of a failure in the air system, the central warning lamp flashes and the alarm buzzer sounds.

For details of releasing the brake when the emergency brake has been applied because of a failure in the air system, see "RELEASE METHOD WHEN PARKING BRAKE AND EMERGENCY BRAKE HAVE BEEN ACTUATED IN EMERGENCY (PAGE 3-107)"



### SHIFT LIMITER SWITCH

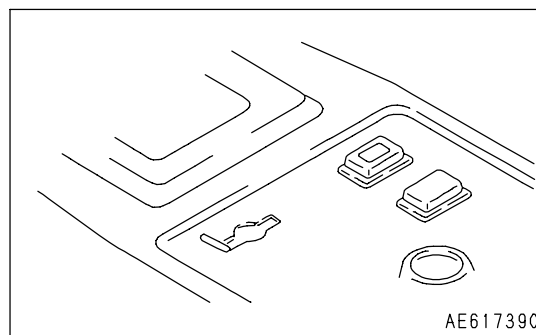
This switch (13) is used to limit the maximum speed range when the transmission shift lever is in the D or L range. If the switch is depressed, it lights up, and the shift limiter function get actuated; consequently the maximum speed for D range is limited to F6, and the speed for L range is limited to F1 only. If the switch is depressed again, the light goes away.

Light-off position: D range F2 - F7

L range F1 - F2

Light-on position: D range F2 - F6

L range F1



### PARKING BRAKE VALVE LEVER



### WARNING

- When parking or leaving the machine, always apply the parking brake.
- During loading operations, do not apply the parking brake. Pull the retarder lever to apply the brake.

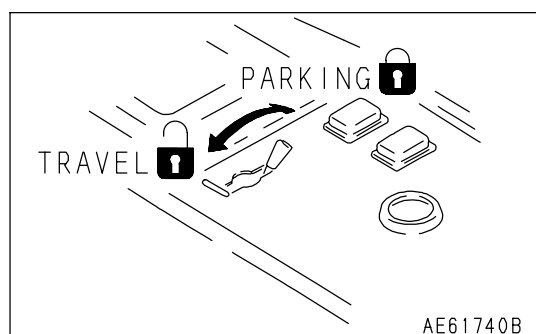
This lever (14) is used to actuate the parking brake valve.

PARKING: Parking brake actuated

TRAVEL: Parking brake is released.

When the lever is set to the PARKING position, the parking brake pilot lamp lights up.

When the lever is set to the PARKING position, if the gear shift lever is at any position other than N, the central warning lamp will flash and the alarm buzzer will sound.



If the air pressure drops and goes below 0.22MPa(2.2kgf/cm<sup>2</sup>, 31.24PSI), the emergency brake and parking brake are automatically applied.

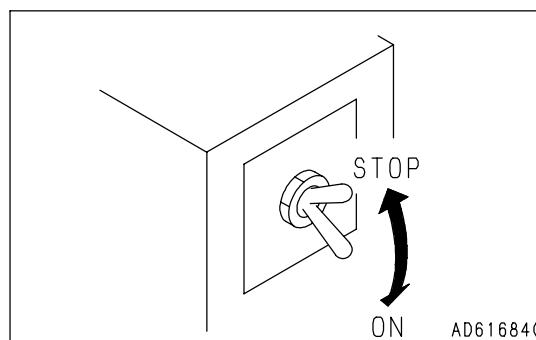
For details of releasing the brake when the emergency brake has been applied because of a failure in the air system, see "RELEASE METHOD WHEN PARKING BRAKE AND EMERGENCY BRAKE HAVE BEEN ACTUATED IN EMERGENCY (PAGE 3-107)"

### ENGINE EMERGENCY STOP SWITCH

#### NOTICE

This switch must not be used for stopping the engine under normal conditions. When the engine has completely stopped, return the switch to the ON (TRAVEL) position.

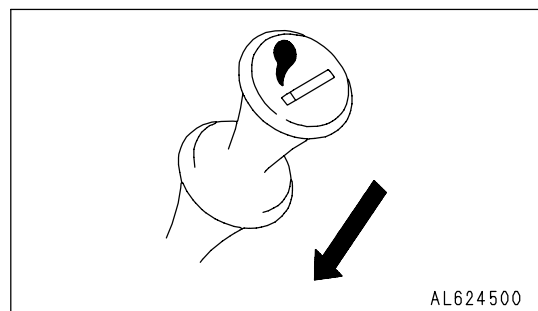
Use this switch (15) if the engine will not stop even when the starting switch is turned to the OFF position.



### CIGARETTE LIGHTER

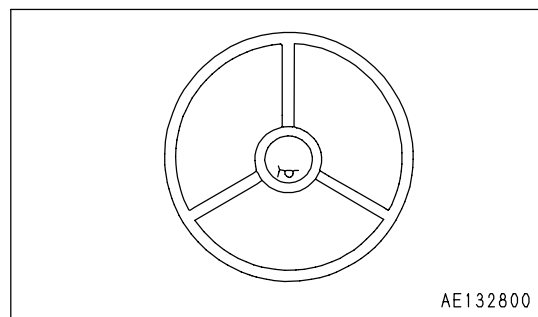
This (16) is used to light cigarettes.

When the cigarette lighter is pushed in, it will return to its original position after several seconds, so pull it out and use it to light your cigarette.



### HORN BUTTON

When the horn button (17) in the center of the steering wheel is pressed, the horn will sound.



### WIPER SWITCH

This switch (18) is used to operate the wiper.

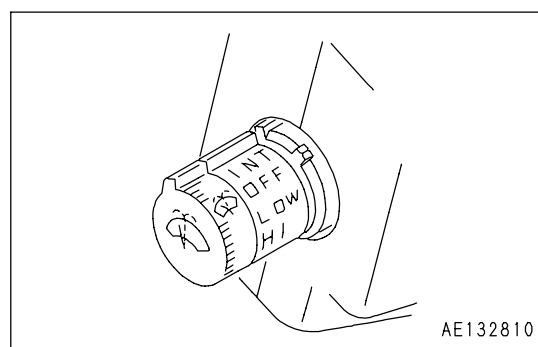
INT position: Wiper moves intermittently

OFF

LOW position: Wiper moves at low speed

HI position: Wiper moves at high speed

When the switch is pressed, washer fluid is sprayed out.

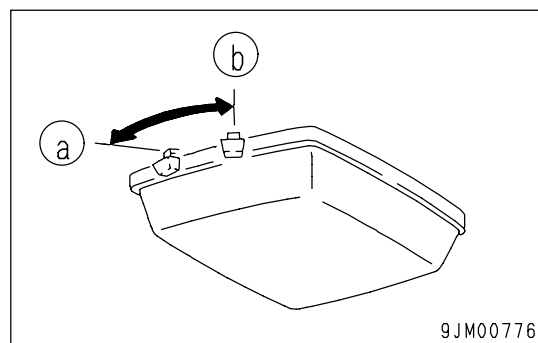


### ROOM LAMP SWITCH

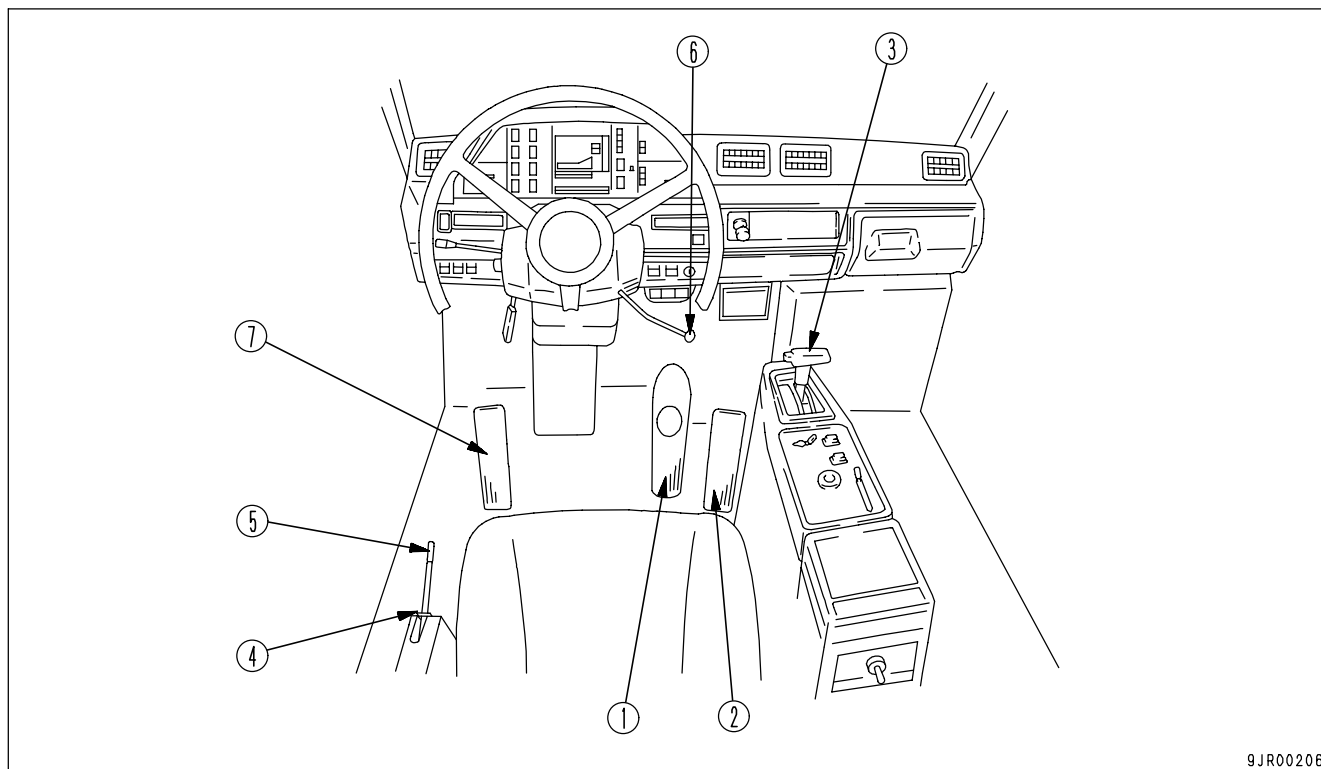
This (19) is used to switch the room lamp on or off.

(a) OFF

(b) ON



## CONTROL LEVERS AND PEDALS

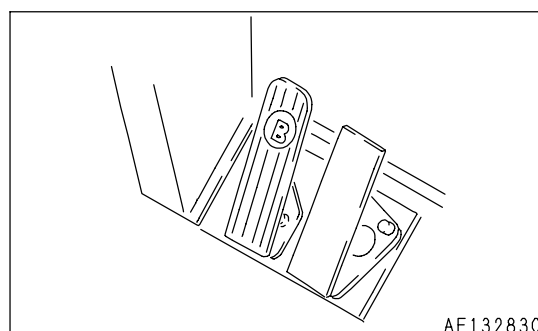


9JR00206

- |                       |   |
|-----------------------|---|
| (1) Brake pedal       | (5) Dump lever                            |
| (2) Accelerator pedal | (6) Retarder control lever                |
| (3) Shift lever       | (7) Differential lock pedal (if equipped) |
| (4) Safety lock       |   |

### BRAKE PEDAL

This pedal (1) is used to apply the wheel brakes.

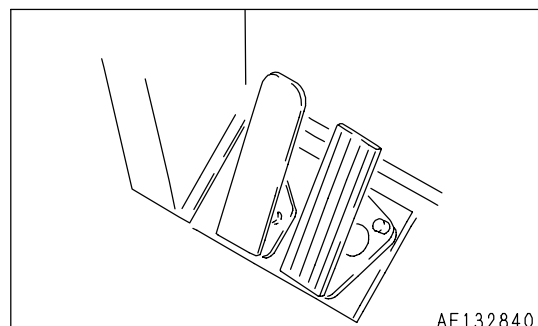


AE132830

### ACCELERATOR PEDAL

This pedal (2) is used to adjust the engine speed.

It can control freely the engine between the low idle and the full throttle.



### GEAR SHIFT LEVER

The gear range can be selected with this lever (3) to match the travel conditions.

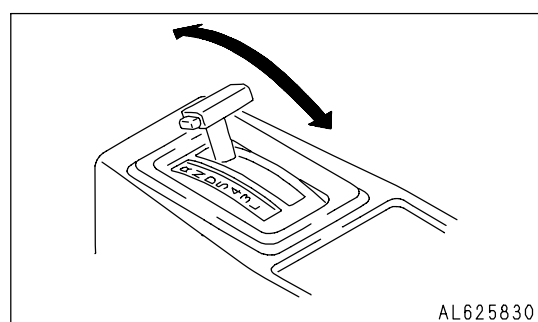
D position:

This is used for normal travel.

If the lever is placed in this position, the transmission is shifted automatically from 2nd (torque converter drive) to 7th (direct drive) to match the travel speed of the machine.

If the dump body is raised, the speed range is fixed at 2nd when the shift lever is at D position. Always lower the dump body when traveling.

The maximum speed in D position is 65 km/h (40.4 MPH).



R position:

This is used when traveling in reverse.

This position uses the torque converter drive.

The machine cannot travel in reverse if the dump lever is not at the FLOAT position. Set the dump lever to the FLOAT position before moving the shift lever to the R position.

5 - L position:

These positions are used in places where it is difficult to travel at high speed, or when traveling on soft ground, or when starting the machine off on a slope when it is loaded. They are also used when going downhill if it is needed to use the braking force of the engine.

- The speed ranges for each position are as follows.

Position	Speed range	Max. speed (km/h (MPH))
5	1st torque converter - 5th direct	36 (22.4)
4	1st torque converter - 4th direct	27 (16.8)
3	1st torque converter - 3rd direct	20 (12.4)
L	1st torque converter - 2nd direct	15 (9.3)

If the dump body is raised, it is impossible to shift up from 1st. Always lower the dump body when traveling.

When operating the shift lever, be sure to set it in position securely.

If the lever is not placed in position properly, the shift position display on the panel may go out and the transmission warning monitor lamp may light up.

Before shifting between forward and reverse, stop the machine completely and then run the engine at low idle.

When starting the engine, if the gear shift lever is not at the N position, the engine will not start.

When the starting switch is turned to the ON position, if the shift lever is not at the N (neutral) position, the transmission shift lever position pilot lamp and the central warning lamp will flash and the alarm buzzer will sound.

If shift lever is not at N (neutral) position when the parking brake is applied, the central warning lamp will flash and the alarm buzzer will sound.

When the dump lever is not at the FLOAT position and when the dump body has risen, if the shift lever is not at the N (neutral) position, the central warning lamp will flash and the alarm buzzer will sound.

The shift lever must not be returned to the N (neutral) position while traveling.

Release the accelerator pedal and run the engine at low idle when moving the shift lever from the N (neutral) position to the forward or reverse position.

When moving the gear shift lever from the N (neutral) position to the R (reverse) position or from the D positions to position 5 (or other lower position), press the lock button on the gear shift lever before moving it.

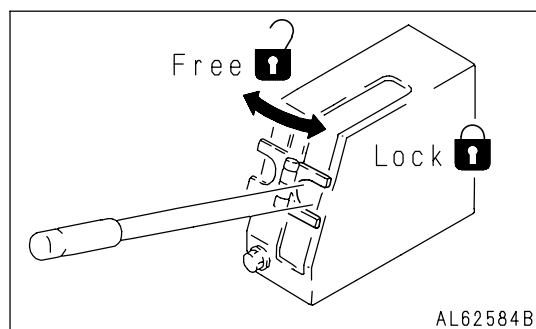
## SAFETY LOCK



### WARNING

When raising the dump body to inspect the machine, always place the dump lever at the HOLD position, apply the lock, and then use the safety pins.

This device (4) is used to lock the dump lever.



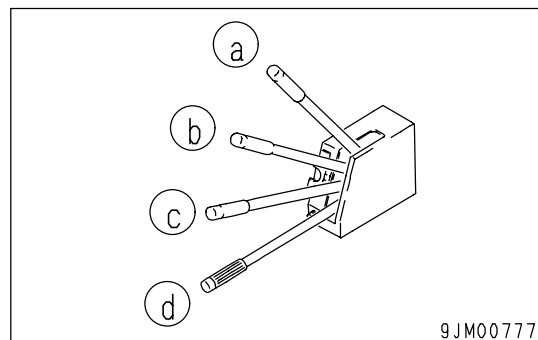
**DUMP LEVER****WARNING**

To prevent damage to the dump body through vibration from the road surface, always lower the dump body and set at **FLOAT** position before traveling.

This lever (5) is used to operate the dump body.

- (a) RAISE
- (b) HOLD: The dump body stops and is held in position.
- (c) FLOAT: The dump body moves freely under external force.
- (d) LOWER

For details, see "DUMP OPERATIONS (PAGE 3-88)".

**RETARDER CONTROL LEVER****CAUTION**

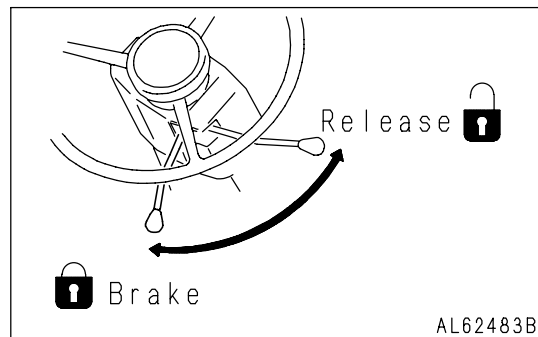
The retarder must not be used as a parking brake.

This lever (6) is used to operate the retarder, which applies the rear wheel brake when going downhill.

The more the lever is pulled, the greater the braking force becomes.

When the retarder is actuated, the rear brake pilot lamp lights up.

For details, see "TRAVELING DOWNHILL (PAGE 3-81)". When leaving the operator's seat, always apply the parking brake.

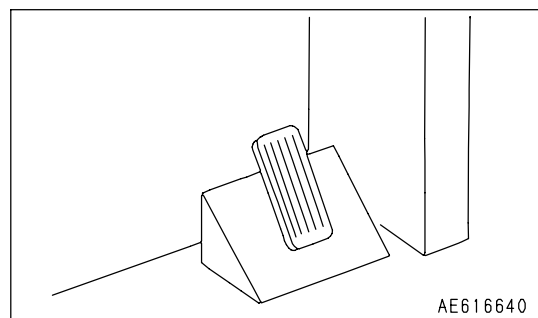
**DIFFERENTIAL LOCK PEDAL**

(If equipped)

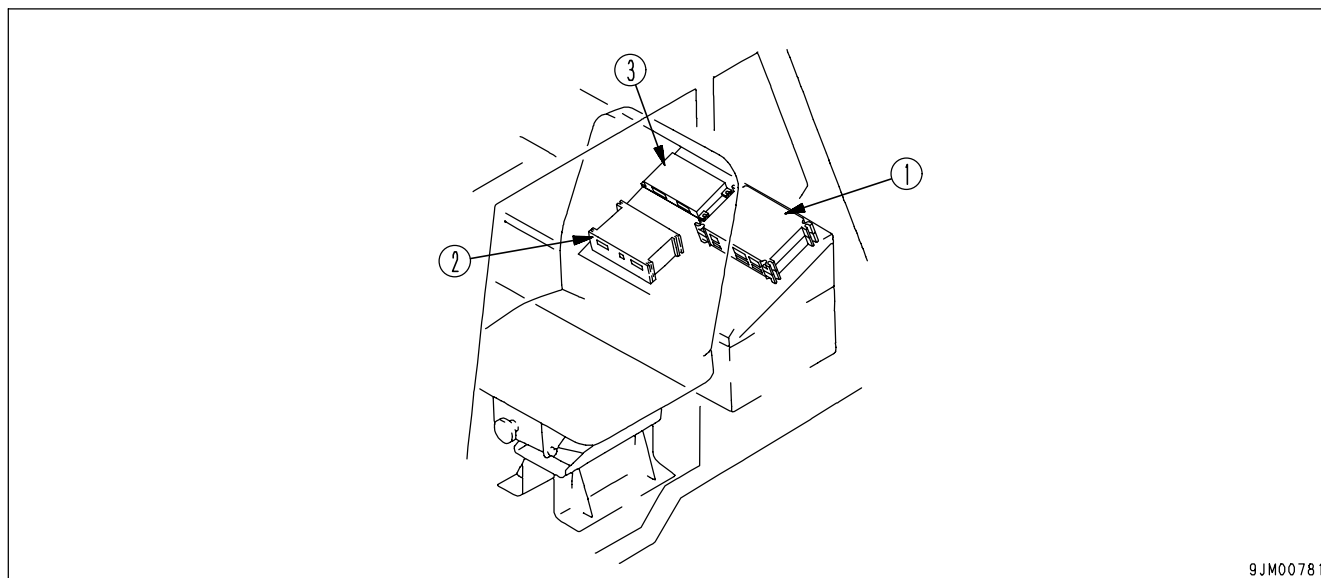
This pedal (7) is used to actuate the differential lock control.

When the pedal is depressed, the differential lock is actuated, and when it is released, the differential lock is canceled.

See "USING DIFFERENTIAL LOCK (PAGE 6-21)" for the details.



## MECHATRONICS EQUIPMENT CONTROLLER



(1) Transmission controller

(3) Suspension controller

(2) Engine controller

### TRANSMISSION CONTROLLER

A two-digit number followed by the service code is displayed in the inspection window of this controller (1) to identify the location of the abnormality. When the condition is normal, "0.0" or "0.C" is displayed.

For the method of checking the service code when an abnormality occurs, see "TRANSMISSION CONTROLLER (PAGE 3-119)".

### ENGINE CONTROLLER

For this controller (2), the last two-digit number of the service code is displayed in the inspection window to identify the location of the abnormality. When the condition is normal, "0.0" is displayed.

For the method to check the service code when the abnormality occurs, see "SERVICE CODE (PAGE 3-118)".

### SUSPENSION CONTROLLER

For this controller (3), the last two-digit number of the service code is displayed in the inspection window to identify the location of the abnormality. When the condition is normal, "0.0" is displayed.

For the method to check the service code when the abnormality occurs, see "SERVICE CODE (PAGE 3-118)".



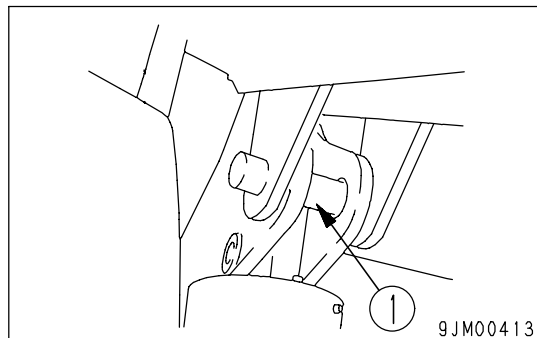
## SAFETY PIN



### WARNING

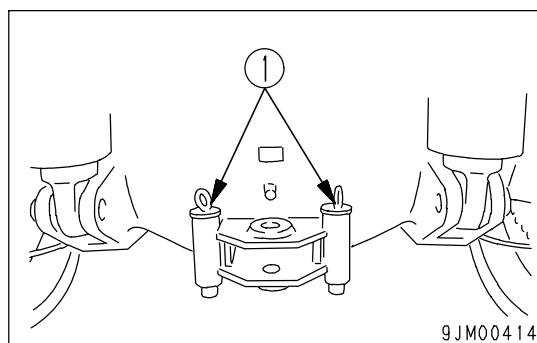
When raising the dump body to inspect the machine, always place the dump lever at the HOLD position, apply the lock, and then use the safety pins.

This is a safety device for the dump body, and is used when carrying out inspection or maintenance with the dump body raised. Raise the dump body fully, insert safety pins (1). Always insert the safety pins on both sides.



### STOWING SAFETY PIN

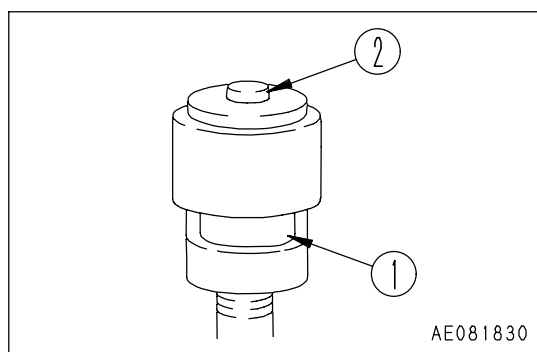
Safety pins (1) are stowed in the towing bracket of the rear axle housing.



## DUST INDICATOR

This device indicates clogging of the air cleaner element.

When red piston (1) appears in the transparent part of this indicator, the element is clogged. Immediately clean the element. After cleaning, push indicator button (2) to return the red piston to the original position.



## FUSES

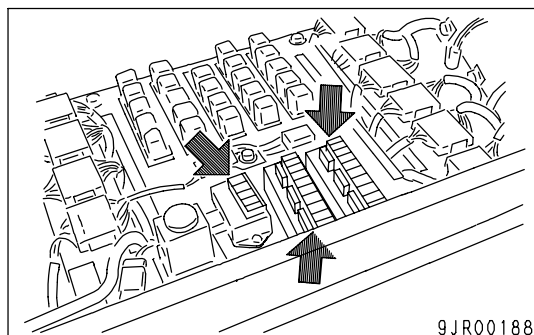


### WARNING

- When replacing any fuse, always turn the power off (turn the starting switch to OFF).
- When replacing the fuse, always use a fuse of the same capacity and type.

The fuses protect the electrical equipment and wiring from burning out.

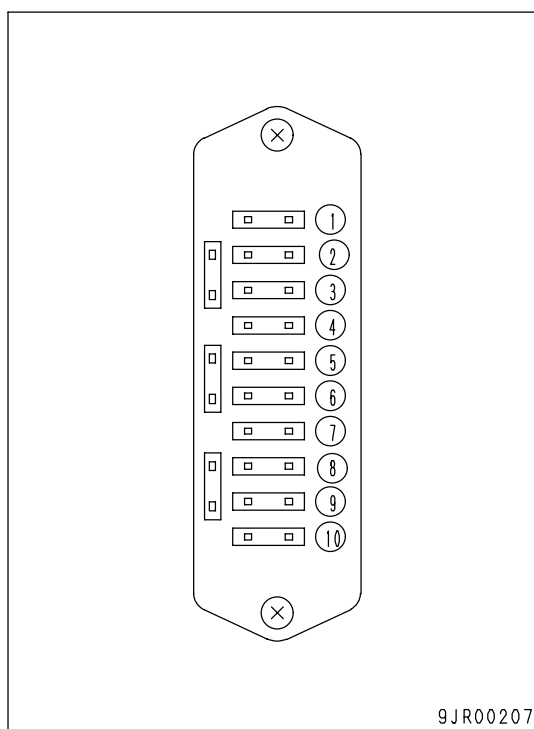
If the fuse becomes corroded, or white powder can be seen, or the fuse is loose in the fuse holder, replace the fuse.



## FUSE CAPACITY AND CIRCUIT NAME

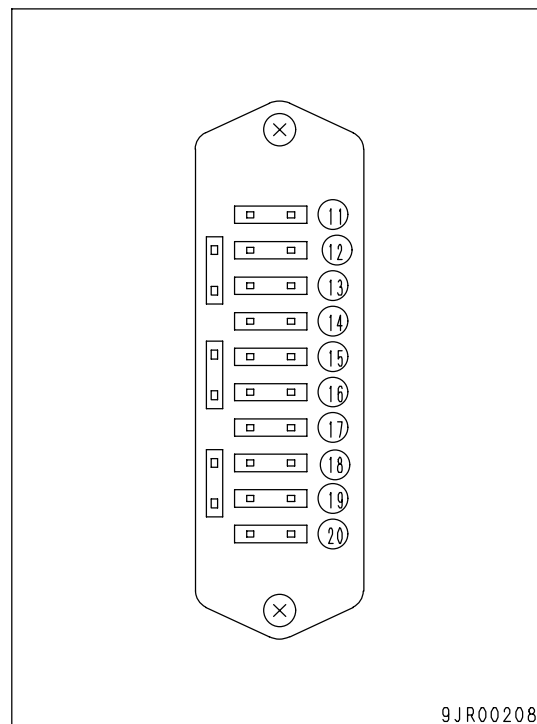
Fuse box I

No.	Fuse capacity	Circuit name
1	10A	Car radio, car stereo
2	10A	Horn switch
3	10A	Cigarette lighter
4	20A	Turn signal indicator lamp, fog lamp (if equipped)
5	10A	Engine start relay, neutral relay
6	20A	Head lamp (low beam), stop lamp, room lamp
7	20A	Head lamp (high beam), side clearance lamp, tail lamp, night lighting
8	10A	Backup lamp, backup buzzer
9	10A	Ribon heater relay, front brake cut-off solenoid, BCV relay solenoid
10	10A	Overrun prevention solenoid, transmission controller, exhaust brake solenoid



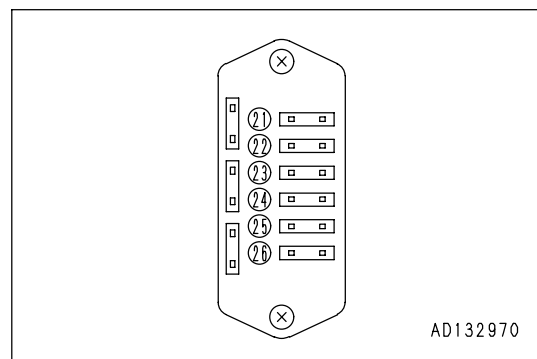
Fuse box II

No.	Fuse capacity	Circuit name
11	10A	Engine controller, governor cut relay
12	10A	Electronic display panel, caution pilot lamp, central warning lamp, buzzer, PMC (if equipped), MOM( if equipped)
13	5A	Suspension control solenoid, suspension controller
14	5A	Payload meter (if equipped), payload relay (if equipped)
15	20A	Payload external display lamp (if equipped)
16	5A	PMC (if equipped)
17	10A	Start switch, radio back-up, emergency engine stop solenoid (if equipped electronic governor), engine stop motor
18	10A	T/M controller, engine controller (if equipped), PMC (if equipped)
19	10A	Emergency steering
20	10A	Direct from battery (spare)



Fuse box III

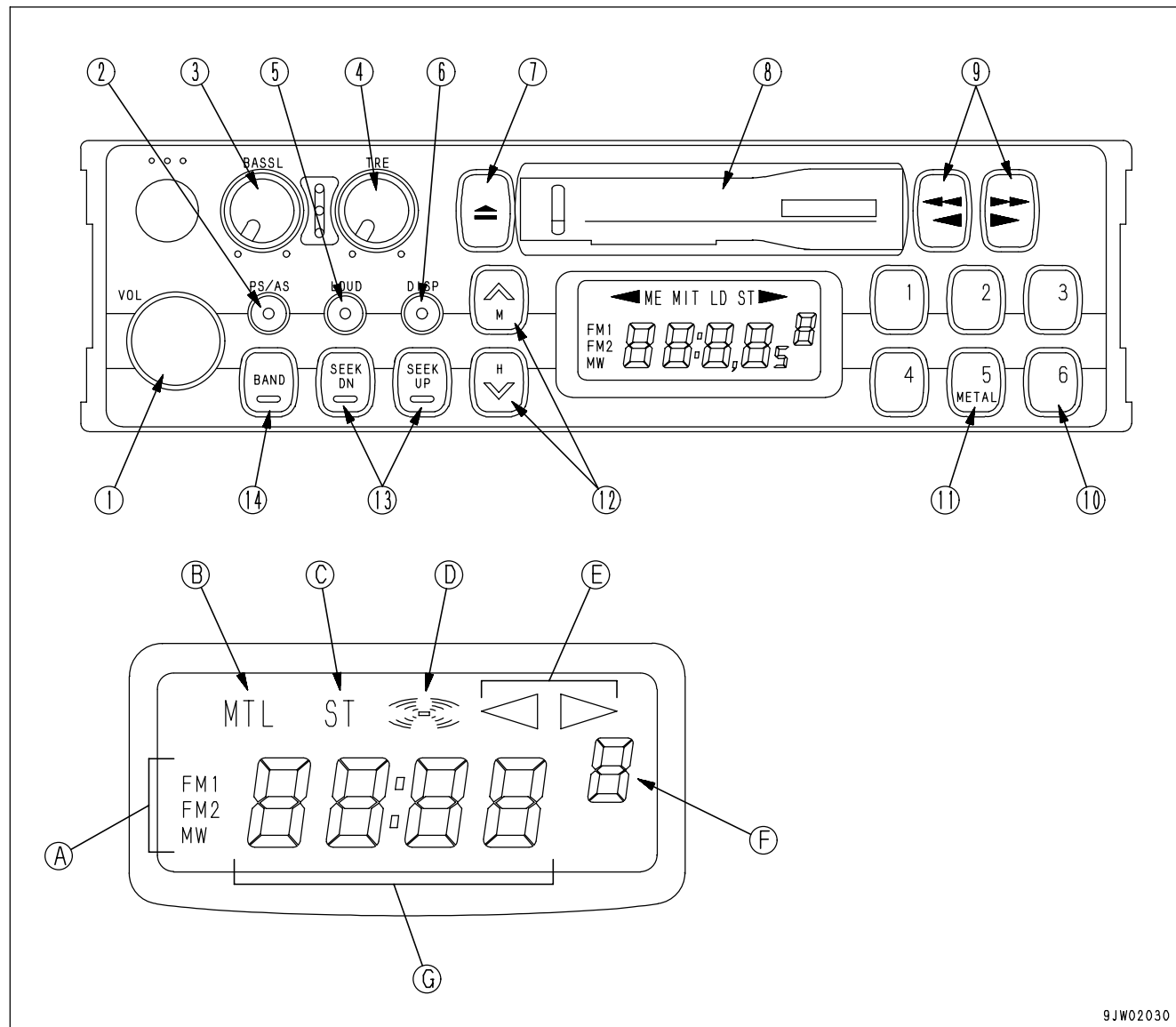
No.	Fuse capacity	Circuit name
21	10A	AISS motor
22	20A	Wiper motor, washer motor
23	20A	Air conditioner blower motor
24	10A	Air conditioner compressor
25	10A	Spare
26	10A	Spare



## CAR STEREO

(If equipped)

### EXPLANATION OF COMPONENTS



9JW02030

- (1) Power switch/Volume
- (2) Auto-store/Preset scan button
- (3) Bass control knob
- (4) Treble control knob
- (5) Loudness button
- (6) Time/Radio display selector button
- (7) Tape eject button

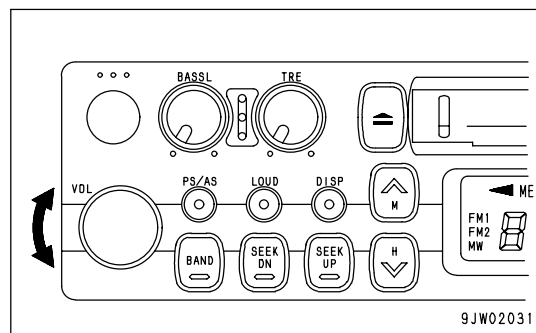
- (8) Cassette door
- (9) Fast forward, rewind buttons
- (10) Preset buttons
- (11) Metal tape button
- (12) Manual tuning buttons
- (13) Seek tuning buttons
- (14) Band selector button

- (A) Band display
- (B) Metal tape display
- (C) FM stereo reception display
- (D) Loudness display

- (E) Tape direction display
- (F) Preset channel display
- (G) Time/Frequency display

### POWER SWITCH/VOLUME

Turn this knob (1) to the right until it clicks to turn the power on.  
Turn it further to increase the volume.

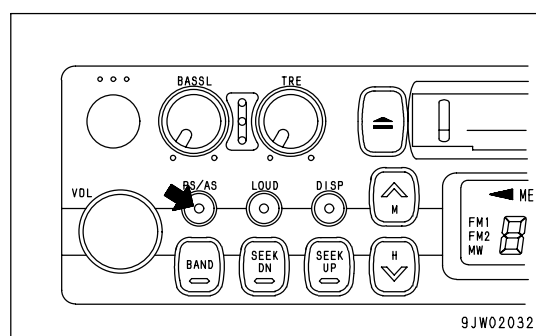


### AUTO-STORE/PRESET SCAN BUTTON

Use this button (2) to actuate the preset scan and auto-store functions.

- Auto-store

Each time this button is pressed for more than 2 seconds while in radio reception, this auto-store function automatically starts to search for the desired station within a receivable band, and memorize the frequency in the preset memory. During this scanning process, the frequency shown in the right side of display continues to change. This indicates that each frequency is memorized in the auto-store.



### REMARK

The auto-store function cannot be used when the channel display is flashing.

When the display is flashing, the preset scan function is being used.

- Preset scan

If this button is pressed for less than 0.5 second while in radio reception, programs from the six preset stations in the same band will be broadcast one after another for 5 seconds each, starting from No. 1 through No. 6 stations consecutively.

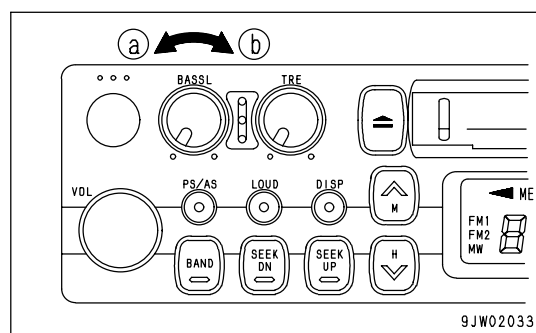
When the desired station is found, press the button again. This stops the preset scan tuning process and switches to ordinary broadcasting. The same process will be repeated continuously until the button is pressed again.

### BASS CONTROL KNOB

Turn this button (3) to the left to reduce the low tones; turn it to the right to emphasize the low tones.

Direction (a): Low tone reduced

Direction (b): Low tone emphasized

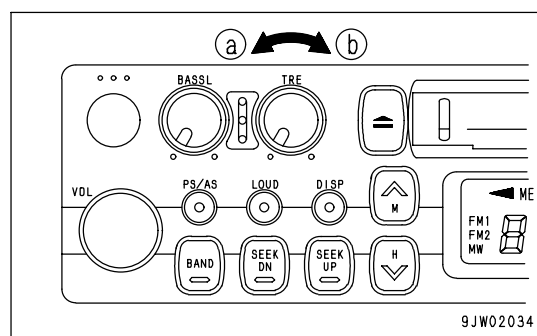


### TREBLE CONTROL KNOB

Turn this button (4) to the left to reduce the low tones; turn it to the right to emphasize the high tones.

Direction (a): High tone reduced

Direction (b): High tone emphasized

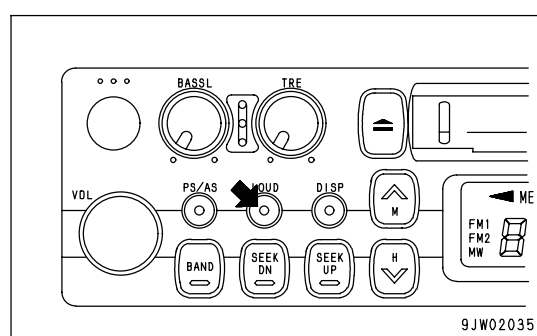


### LOUDNESS BUTTON

This button (5) is used when playing at low volume. It makes it possible to hear more easily by emphasizing the low tone when the low tones are weak.

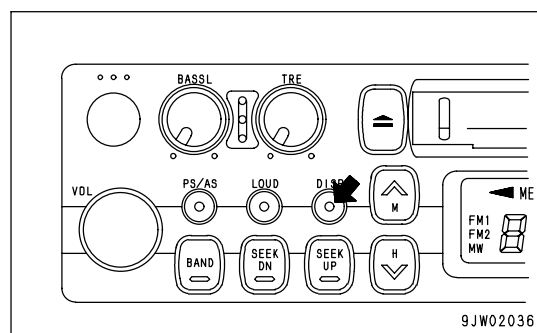
Push button: Actuated (ON)

Push button again: Canceled (OFF)



### TIME/RADIO DISPLAY SELECTOR BUTTON

This button (6) is used to switch between the "Radio/tape display" and the "Time display".



#### • Correcting the time

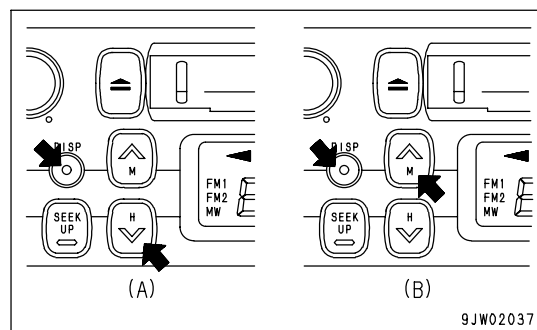
Press the button to set the time display.

(A) Correcting hour:

Keep the DISP button pressed and press the bottom (H) of the TUNING button to correct the hour.

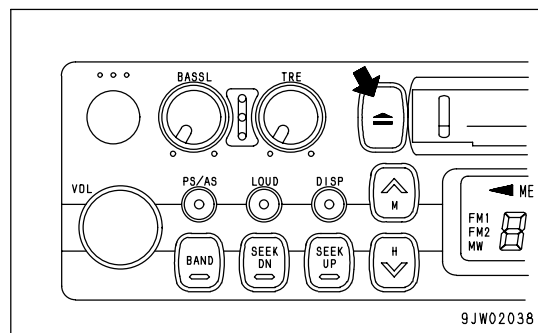
(B) Correcting minute:

Keep the DISP button pressed and press the top (M) of the TUNING button to correct the minute.



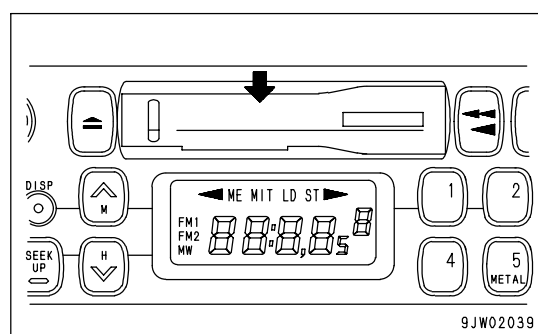
### TAPE EJECT BUTTON

This button (7) is used to stop the tape and to eject the cassette. When this button is pressed, the tape is ejected and the radio plays.



### CASSETTE DOOR

Set the cassette with the exposed portion of the tape on the right side and insert it through the cassette door (8).



### FAST FORWARD, REWIND BUTTONS

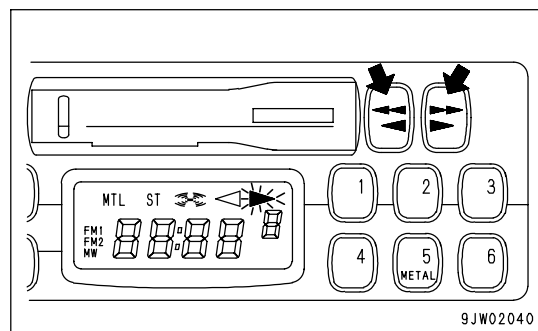
These buttons (9) are used to fast-forward or rewind the tape.

- Fast-forward/rewind

If you press the button pointing in the same direction as the lighted arrow indicating the direction of play, the tape will be fast-forwarded; if you press the button pointing in the opposite direction, the tape will rewind.

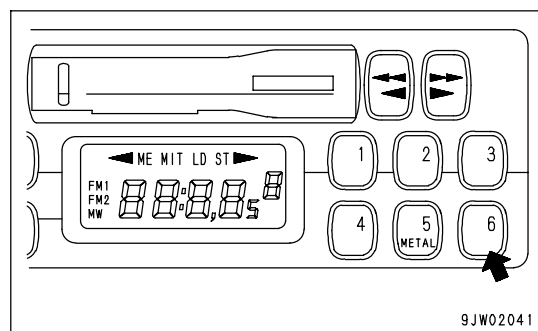
To stop the tape, lightly press the button that is not locked. The fast-forward or rewind operation will be canceled.

If the fast forward and rewind buttons are pressed at the same time, the tape will change sides.



### PRESET BUTTONS

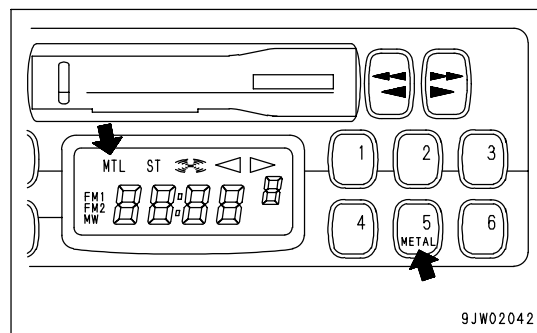
These buttons (10) are used to call up the broadcast station frequencies preset in memory for each of buttons No. 1 to No. 6. It is possible to preset 18 stations (FM: 12; AM: 6) with these buttons.



### METAL TAPE BUTTON

(used also for preset button No. 5)

This button (11) is used when playing a metal or chrome tape. This button is also used for preset button No. 5. When it is pressed, "MTL" appears on the display.



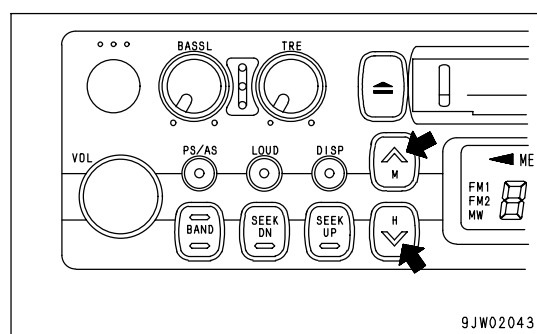
9JW02042

### MANUAL TUNING BUTTONS

These buttons (12) are used for manual tuning.

When "TUN ^" button is pressed, the frequency goes up 9 kHz for AM or 0.1 MHz for FM; when "TUN v" button is pressed, the frequency goes down 9 kHz for AM or 0.1 MHz for FM.

If the button is pressed down and held, the frequency will change continuously.



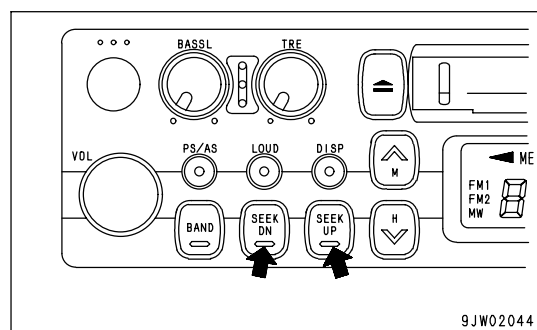
9JW02043

### SEEK TUNING BUTTONS

These buttons (13) are used to seek tuning.

When the "SEEK UP" button is pressed, the search automatically goes up; when the "SEEK DOWN" button is pressed, the search automatically goes down.

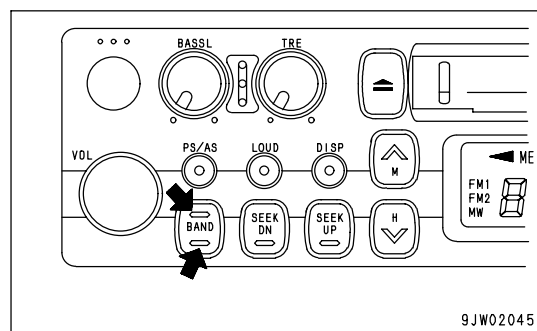
When the next station that can be received is found, it automatically stops.



9JW02044

### BAND SELECTOR BUTTON

When this button (14) is pressed, the band is switched between FM1, FM2, and MW (AM). The band is shown on the display.



9JW02045



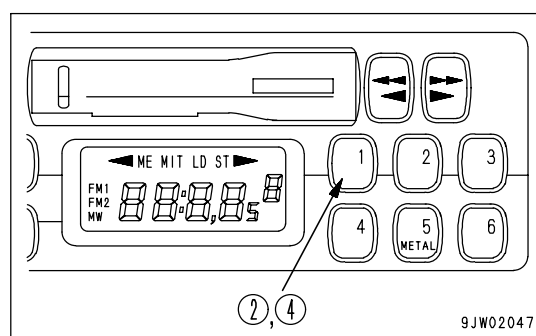
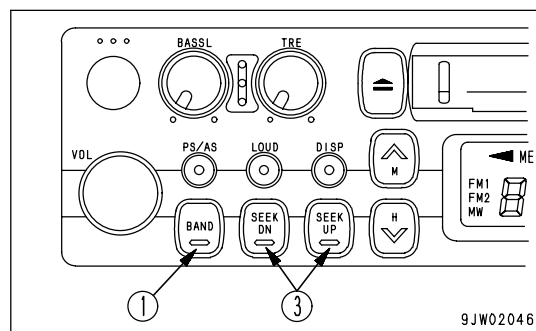
## METHOD OF OPERATION

### METHOD OF SETTING PRESET BUTTONS

To listen to a preset station, use band selector button (1) to select AM, FM1, or FM2, then press the preset switch number to listen to the desired station.

It is possible to preset six AM stations and 12 FM stations (FM1: 6, FM2: 6).

1. If you are playing a cassette, press the tape eject button to stop the tape.
2. Select the station to be preset.  
Use band selector button (1) to select MW (AM), FM1, or FM2, then use the manual tuning button to select the frequency of the broadcasting station.
3. Press manual memory button (2) or seek tuning button (3).
4. Press preset button (4) of the number to be preset for 2 seconds while the frequency display is being shown on the display. (The preset channel and frequency are displayed and the presetting is completed).
5. Repeat Steps 2 to 4 to preset other stations.

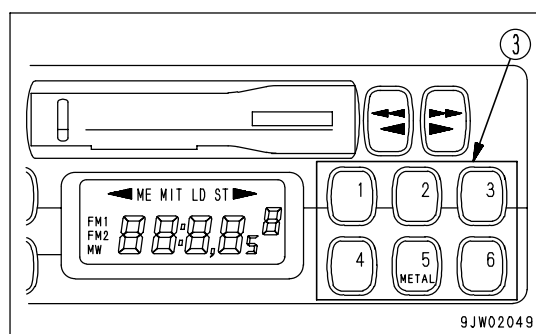
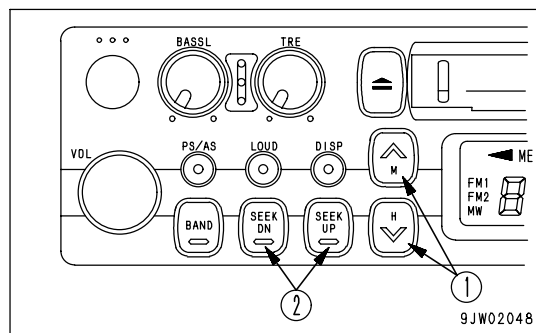


### REMARK

- Use Steps 2 to 4 also when changing the setting of a preset switch to another station.
- When the power is disconnected, such as when the battery is replaced, all the settings are deleted, so preset the stations again.

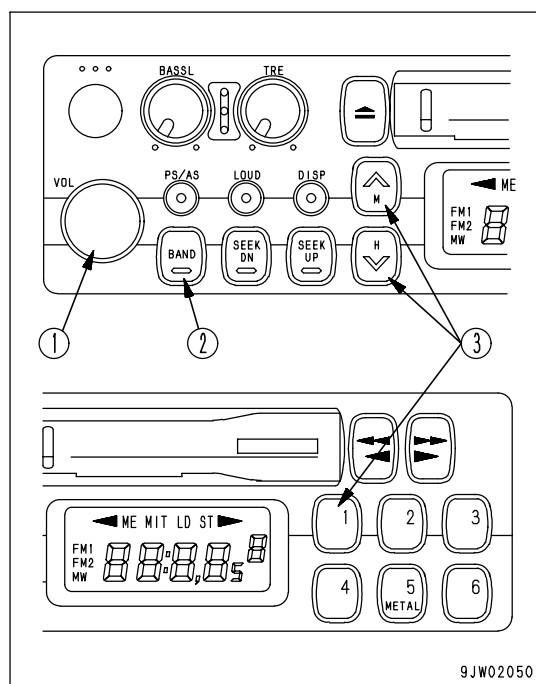
### MANUAL MEMORY BUTTON

Select the station to be preset with manual tuning button (1) or seek tuning button (2), then keep button No.1 to button No.6 of button (3) pressed for 2 seconds while the frequency is being displayed to preset the station.



### LISTENING TO RADIO

1. Turn the starting switch ON, then turn power switch (1) ON.
2. Set band selector button (2) to AM or FM.
3. Select the station with the preset buttons or manual tuning button (3).
4. Adjust the volume, balance, and tone as desired.
5. When turning the radio OFF, turn power switch (1) to the left until it clicks.



### REMARK

- To switch to the radio when listening to a cassette, press the cassette eject button to stop the tape.
- If you insert a cassette when listening to the radio, the tape will start to play.

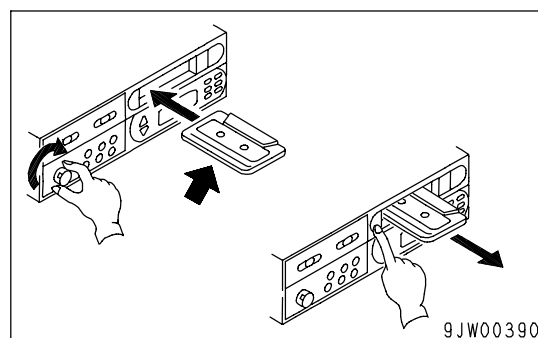
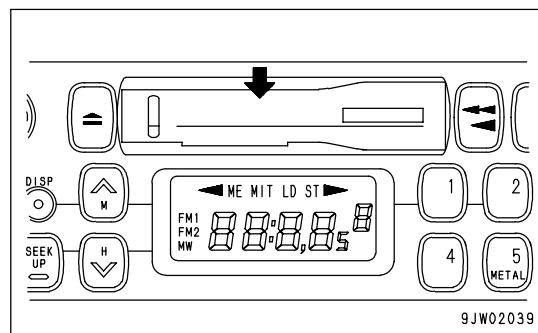
### LISTENING TO CASSETTE TAPE

1. Turn the starting switch ON, then turn power switch (1) ON.
2. Set the cassette with the exposed portion of the tape on the right side and push it past the cassette door. The tape will automatically start playing.

If the arrow indicating the direction of play is pointing to the right, the top side is being played; if the arrow is pointing to the left, the bottom side is being played.

When the tape reaches the end, it is automatically reversed and the other side starts to play.

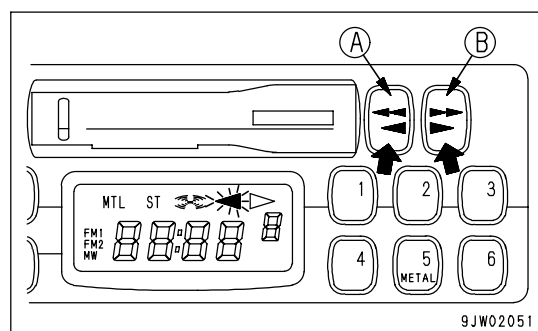
3. When finished with the tape, press the cassette eject button to eject the tape and automatically switch to the radio.



### REVERSING TAPE

When listening to the tape, press both FAST FORWARD, REWIND buttons (A) and (B) at the same time lightly.

When this is done, the tape direction display will be reversed.



## PRECAUTIONS FOR USE

- Stow the antenna when traveling in places with low overhead clearance.
- To ensure safety during operations, keep the volume at a level where it is possible to hear other machines.
- If water gets inside the speaker case or radio (auto tuning), it may cause a serious problem, take care not to let water get in these items.
- Do not wipe the scales or buttons with benzene, thinner, or any other solvent. Wipe with a soft dry cloth. Use a cloth soaked in alcohol if the equipment is extremely dirty.

## NOTICE

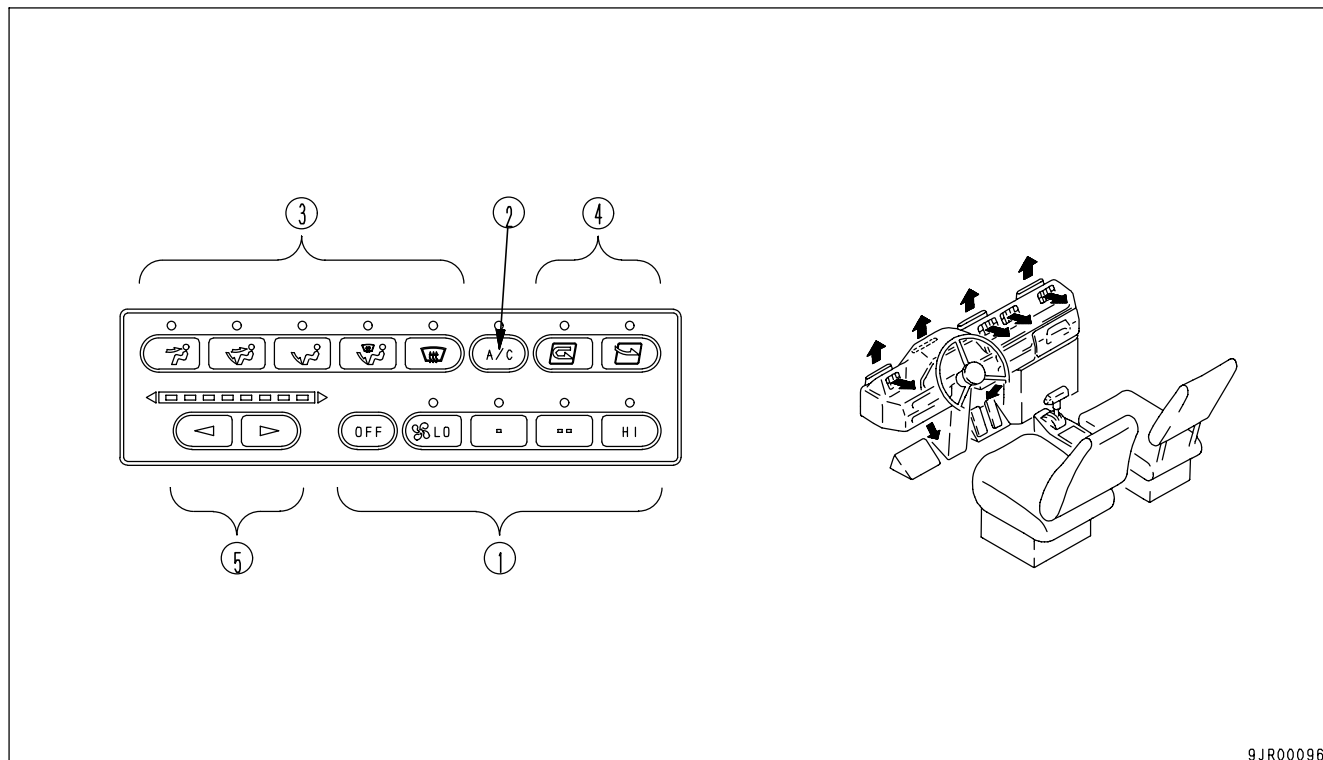
### Handling cassette tape

- Clean the tape head approx. once a month with a commercially available head cleaning tape.
- Do not leave the tape any place where it is exposed to direct sunlight, any place that is excessively dusty, or any place where there is a magnetic field.
- Do not use 120-minute tapes. The tape is thin and it easily gets caught up inside the machine.
- If the tape is slack, it easily gets caught up inside the machine. Use a pencil to wind in the tape to remove any slack.
- Do not use any cassette tape if the label has started to come off. It may cause defective rotation, or it may be impossible to get the tape out of the machine.

## AIR CONDITIONER

By taking fresh air into the cab through a filter, it is possible to raise the pressure inside the cab. This makes it possible to provide a pleasant working environment even on dusty jobsites.

### GENERAL LOCATIONS ON CONTROL PANEL



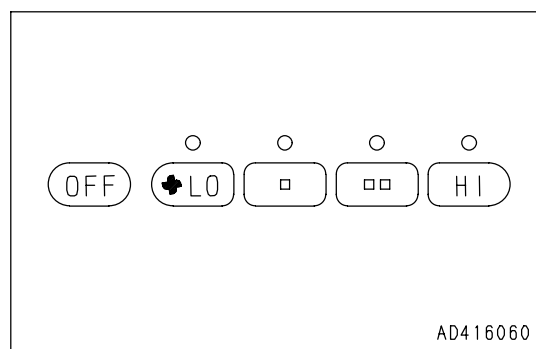
- |                            |                                  |
|----------------------------|----------------------------------|
| (1) Fan switch             | (4) RECIRC/FRESH selector switch |
| (2) Air conditioner switch | (5) Temperature control switch   |
| (3) Mode selector switch   |                                  |

### FAN SWITCH

This switch (1) can be used to adjust the air flow to 4 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.

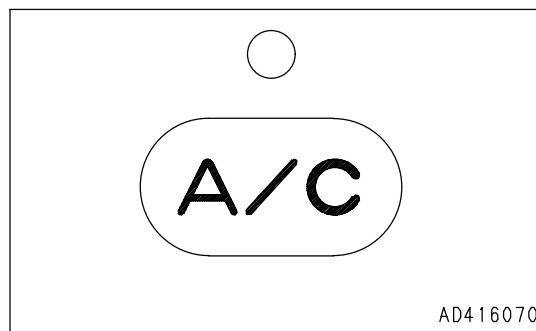


### AIR CONDITIONER SWITCH

This switch (2) 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.

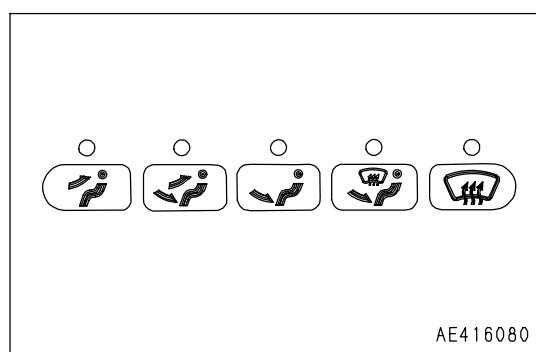


### MODE SELECTOR SWITCH

This switch (3) 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.



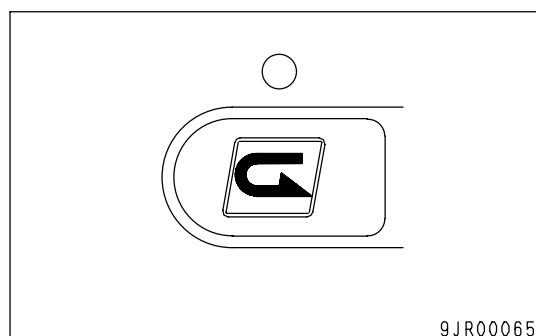
### RECIRC/FRESH SELECTOR SWITCH

This switch (4) changes between recirculation of the internal air (RECIRC) or intake of external air (FRESH).

When pressing the switch, the indicator lamp on the top of switch lights up.

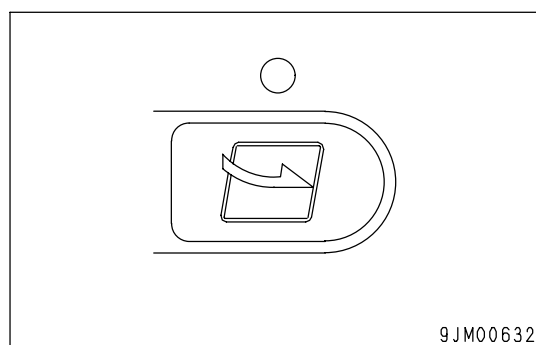
#### RECIRC

This switch (4) is used when wishing to quickly cool or warm the cab or when the air inside the cab is stale.



#### FRESH

This switch (4) is used to cool or warm the cab with the fresh. Also, it is used for fresh air intake or to remove condensation on windows.



### TEMPERATURE CONTROL SWITCH

The temperature can be adjusted with this switch (5) steplessly from low temperature to high temperature.

The temperature level indicator lamps light up to display the temperature of the air coming from the vents.

The more the green lamps light up, the lower the temperature is.

The color of the indicator lamp changes while the switch is being pressed.

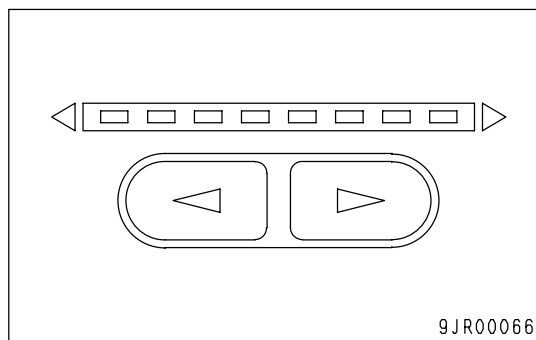
When the temperature reaches the desired level, release the switch to set the temperature.

The settings for each mode are retained in memory even when the starting switch is turned OFF.

However, in the following cases, the settings must be made again.

- When the machine has been out of use for more than 7 days
- When the battery voltage is extremely low
- When there has been abnormal interference from outside
- When the fan switch is turned OFF (the setting is not kept in memory with only the air conditioner switch)

If the air conditioner is used at the FRESH position, the inside of the cab will be pressurized and this will prevent the entry of dust. The higher the position of the fan switch, the more effective the pressurizing becomes.



## METHOD OF OPERATION

Switch		Fan switch	Air conditioner switch	Temperature control switch	RECIRC/FRESH selector switch	Mode selector switch
Condition of use						
Cooling	Rapid	HI	ON	All green	RECIRC	FACE
	Normal	HI - LO	ON	More than half are green	FRESH	FACE
Dehumidifying, heating		HI - LO	ON	More than half are red	FRESH	FOOT
Heating	Rapid	HI	OFF	All red	RECIRC	FOOT
	Normal	HI - LO	OFF	More than half are red	FRESH	FOOT
Defroster		HI	ON	More than half are red	FRESH	DEF
Ventilation or pressurizing		HI - LO	OFF	All green	FRESH	FACE

When carrying out the defrosting, if the temperature control switch is set so that all lamps are red, this will improve the performance for defrosting and demisting.

With the FACE vents, it is possible to adjust the direction of the air flow and to turn it on or off.

However, do not set to the FACE mode with the vents closed.

### • WHEN NOT USING THE AIR CONDITIONER REGULARLY

To lubricate each part of the compressor, operate cooling, dehumidifying and heating for 3 to 5 minutes once a month at low idle. Also, check the amount of cooling gas twice a year.

### REMARK

If the temperature inside the cab is low, the air conditioner may not work. In such cases, use the recirculated air to warm up the inside of the cab, then turn the air conditioner switch on. The air conditioner will be run.

## PRECAUTIONS WHEN USING AIR CONDITIONER

**Carry out ventilation from time to time when using the cooling.**

- If you smoke when using the cooling, your eyes may start to sting, so in such a case, carry out ventilation and cooling for a short time to remove the smoke.
- When using the air conditioner for a long period of time, carry out ventilation process at least once every hour.

**Be careful not to cool the cab too much.**

When using the air conditioner, it is recommended for health reasons, that it should only feel slightly cooler (5 or 6 °C (9 or 10.8°F) lower than the outside temperature) when you enter the cab.

Therefore, adjust the temperature to a suitable level.



## **INSPECTION AND MAINTENANCE**

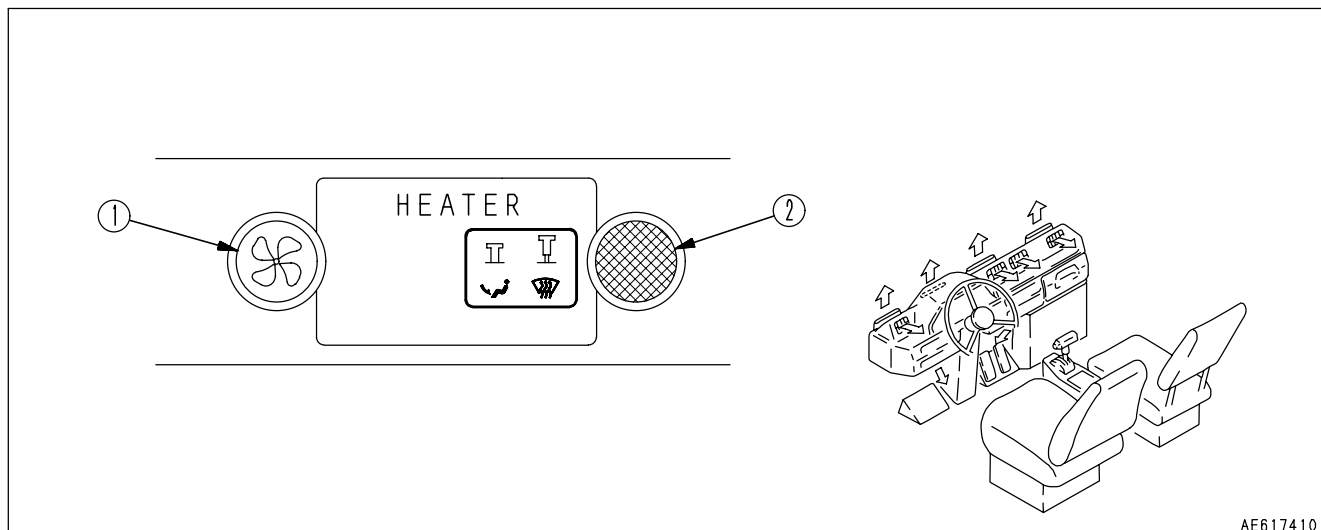
Even when not using the air conditioner, run the compressor at low speed for several minutes once a week to prevent the loss of the oil film at various parts of the compressor. (Run the engine at low speed and set the temperature control lever to the central position.)

Clean the air filter and check the refrigerant. For details, see "CLEAN AIR CONDITIONER AIR FILTER (PAGE 4-24)" and "CHECK REFRIGERANT (GAS) LEVEL (PAGE 4-25)".

To enable the air conditioner to perform to the full and to maintain a pleasant working environment, always contact your Komatsu distributor to have the air conditioner refilled with refrigerant and to carry out other checks.

## CAR HEATER

### GENERAL LOCATIONS ON CONTROL PANEL



(1) Heater switch

(2) Vent selector knob

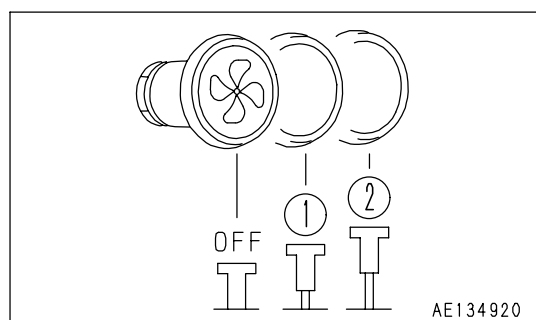
### HEATER SWITCH

This switch is used for turning the heater ON/OFF and for adjusting the air flow.

Stopped:OFF

(1) Low

(2) High

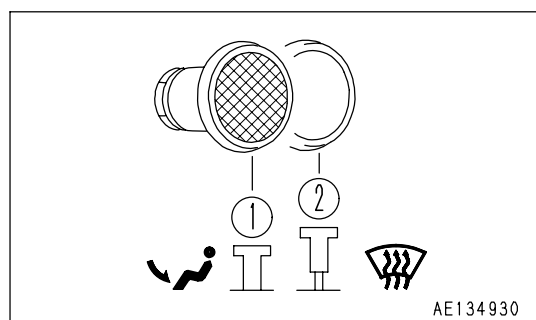


### VENT SELECTOR KNOB

This is used to select the vent.

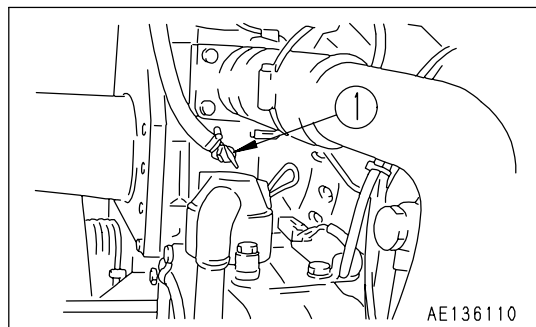
(1) Foot

(2) Defroster



## PRECAUTIONS WHEN HANDLING

1. When using the car heater, open valve (1) installed to the engine thermostat housing.
2. When the season for using the car heater ends, close valve (1).



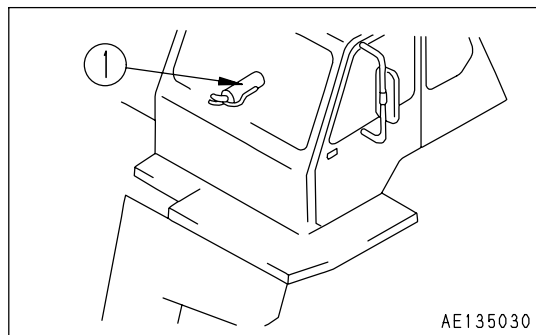
## PRECAUTIONS ON USING HEATER

- In winter season always use antifreeze fluid with the density suitable to outside air temperature. Do not use antifreeze fluid stored over a period longer than its recommended serviceable life.
- If you don't use antifreeze fluid in winter season for your car, drain the coolant from the radiator after at the end of each day.
- Be sure to change the water hose every two years.
- DAILY INSPECTION
  - If malfunctions are found as follows, go to the car dealer for repair.
    - Scratch cracks or swelling of hose.
    - Water leaks from the joint of water hose.
    - Removal of protection cover for the water hose.
    - Broken heater unit bracket or loosening of heater unit installation bolts.

Since this heater warms the cab by using hot water from the engine, it functions only while the engine coolant is hot.

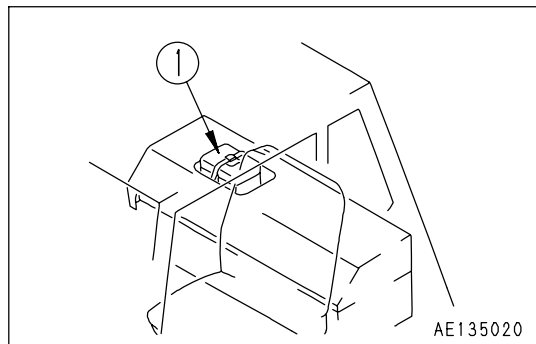
## LOCATION OF FIRE EXTINGUISHER

Fire extinguisher (1) is located on top of the air piping cover at the right outside rear.



## LOCATION OF FIRST AID KIT

First aid box (1) is located on top of the rear cover in the cab.



## OPERATION

### CHECK BEFORE STARTING ENGINE

#### WALK-AROUND CHECK

Before starting the engine, look around the machine and under the machine to check for loose nuts or bolts, or leakage of oil, fuel, or coolant, and check the condition of the hydraulic system.

Check also for loose wiring, play, and accumulation of dust in places that get very hot and are exposed to extremely high temperatures.



#### WARNING

- Be sure to attach the warning sign on the operation lever of the machine.
- Leakage of oil or fuel, or accumulation of flammable material around high temperature parts, such as the engine muffler or turbocharger, may cause fire. Check carefully, and if any abnormality is found, repair it or contact your Komatsu distributor.

Always carry out the following items before starting the engine each day.

1. Check the dump body, frame, tires, cylinders, linkage, and hoses for cracks or excessive wear or play.

Check the dump body, frame, tires, cylinders, linkage, and hoses for cracks or excessive wear or play, and carry out repairs if any problem is found.

2. Remove dirt from around engine, battery, radiator, and aftercooler.

Check that there is no dirt or dust accumulated around the engine, radiator or aftercooler. Check also that there is no flammable material (dry leaves, twigs, etc.) accumulated around the battery, or engine, muffler, turbocharger, or other high temperature parts of the engine. Remove any dirt or flammable materials that are found.

3. Check for leakage of water or oil around engine

Check that there is no oil leakage from the engine or coolant leakage from the cooling system. If any problem is found, repair it.

4. Check for oil leakage from transmission case, differential case, final drive case, brake oil tank, hydraulic tank, hose, joint

Check that there is no oil leakage. If any problem is found, repair the place where the oil is leaking.

Check for leakage of oil from the undercover. Check the ground for traces of oil leakage.

5. Check for loose air cleaner mounting bolts.

Check for the loose bolts. If loose, tighten them.

6. Check dump body mount rubber

Check for any cracks, embedded foreign objects, or loose bolts.

7. Check for damage to handrail, loose bolts

Repair any damage and tighten any loose bolts.

8. Check for damage to gauges, lamps on the instrument panel and loose bolts.

Check for damage to the panel, gauges and lamps. If any problem is found, replace the parts. Clean off any dirt on the surface. Tighten any loose bolts.

9. Check rear view mirror, under view mirror

Check for any damage to the mirrors, and if any damage is found, replace the mirror. Clean all dirt from the surface of the mirror and adjust the angle so that the view to the rear and below the machine can be seen from the operator's seat.

10. Check for damage to the seat belt and mounting clamps.

Check for damage to seat belt and mounting clamps. If damages are found, replace with the new one.

- Check for any loose bolts of the clamps mounting the equipment to the machine. Tighten any loose bolts.
- When the belt has been used for a long time, if any external damage or fraying of the belt can be seen, or if the clamps are broken or deformed, replace the seat belt.

11. Check cracks and damage of ROPS (if equipped) and check for loose bolts

Check if any bolt is loose or damaged. If it is loose, tighten up (torque:  $1720 \pm 196 \text{ N}\cdot\text{m}$   $175 \pm 20 \text{ kgf}\cdot\text{m}$ ,  $1265.8 \pm 144.7 \text{ lbft}$ ). If it is loose replace it with Komatsu genuine bolt.

12. Inspect tires.



## WARNING

If worn or damaged tires are used, they may burst and cause serious injury or death.

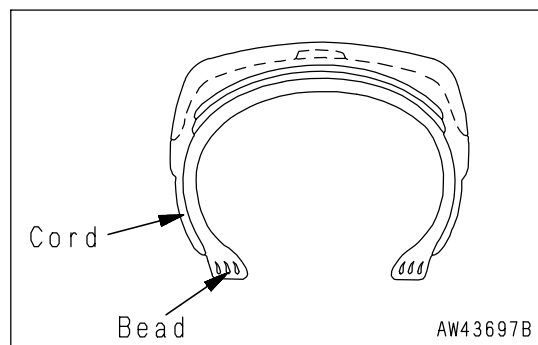
To ensure safety, do not use the following tires.

**Wear:**

- Tires with a tread grooves of less than 15% of that of a new tire
- Tires with extreme uneven wear or with stepped-type wear

**Damage:**

- Tires with damage that has reached the cords, or with cracks in the rubber
- Tires with cut or pulled cords
- Tires with peeled (separated) surface
- Tires with damaged bead
- Leaking or improperly repaired tubeless tires
- Deteriorated, deformed or abnormally damaged tires, which do not seem usable



13. Inspect rims.



## WARNING

Check the rims (wheels) and rings for deformation, corrosion and cracks.

In particular, check the side rings, lock rings and rim flanges thoroughly.

## CHECK BEFORE STARTING

Always perform the procedures in this section before starting the engine each day.

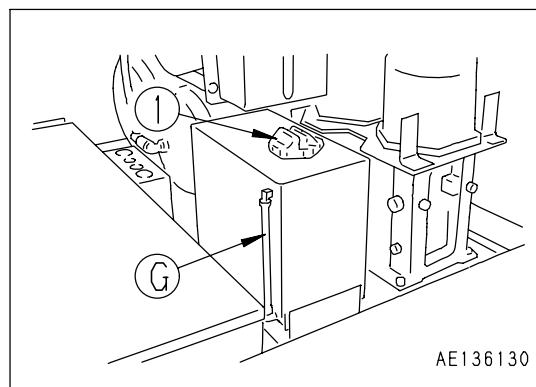
### CHECK COOLANT LEVEL, ADD COOLANT



## WARNING

- Do not open the radiator cap unless necessary. Wait for the engine to cool down before checking the coolant in the sub-tank.
- Immediately after the engine is stopped, the coolant is at a high temperature and the radiator is under high internal pressure. If the cap is removed to check the coolant level in this condition, there is a hazard of burns. Wait for the temperature to go down, then turn the cap slowly to release the pressure before removing it.

1. Check that the cooling water level is between the FULL and LOW marks on radiator reserve tank gauge (G).  
If the water level is low, add water through the water filler (1) of the reserve tank to the FULL level.
2. Check that there is no oil in the coolant or any other abnormality.
3. After adding coolant, tighten the cap securely.
4. If the volume of coolant added is more than usual, check for possible water leakage.



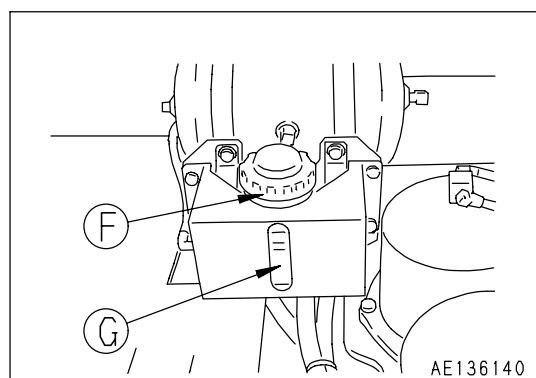
### CHECK OIL LEVEL IN FRONT BRAKE OIL TANK, ADD OIL



## CAUTION

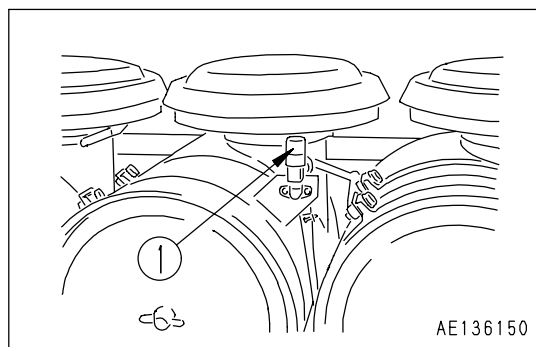
When adding oil to the brake oil tank, always use the recommended oil. For details, see "RECOMMENDED FUEL, COOLANT, AND LUBRICANT (PAGE 4-9)".

1. Check that the oil is between the FULL and LOW marks on sight gauge (G).  
If the oil level is low, add oil through oil filler (F).
2. After adding the oil, then tighten the cap securely.
3. If the oil level goes down right after oil has been added, then check for leakage in the oil lines.



### CHECK DUST INDICATOR

1. Check that the red piston has not appeared in the transparent portion of dust indicator (1).
2. If the red piston has appeared, clean or replace the air cleaner element immediately.  
For details of the method of cleaning the element, see "CHECK, CLEAN OR REPLACE AIR CLEANER (PAGE 4-19)".
3. After checking, cleaning, or replacing, press dust indicator (1) to return the red piston to its original position.

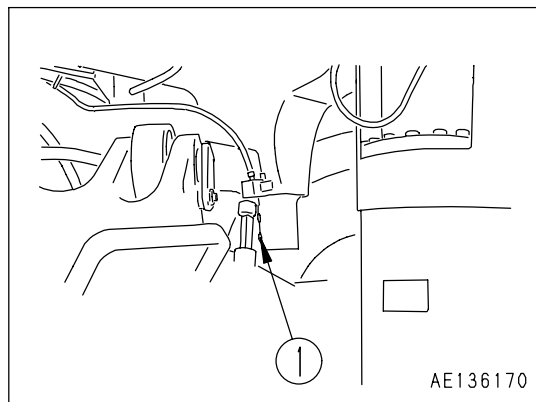
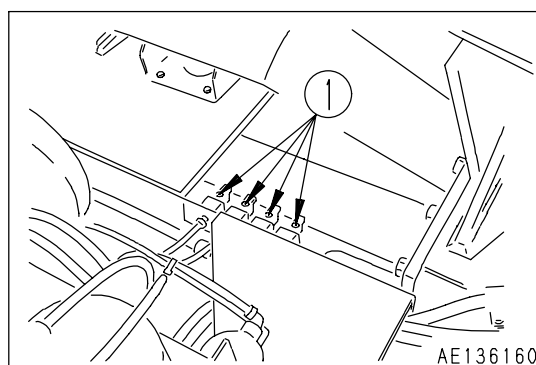


### DRAIN WATER FROM AIR TANK

1. After starting the engine, pull ring (1) of the tank drain valve to drain the water from the tank.
2. Carry out the same operation after completing work.

### NOTICE

In cold areas, there is danger of the water freezing, so drain the water from the air tank after operations when it is still warm.

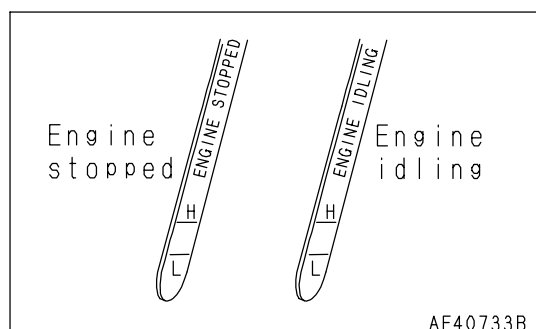
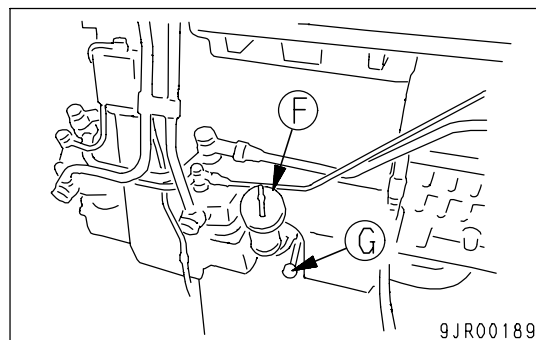


## CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL

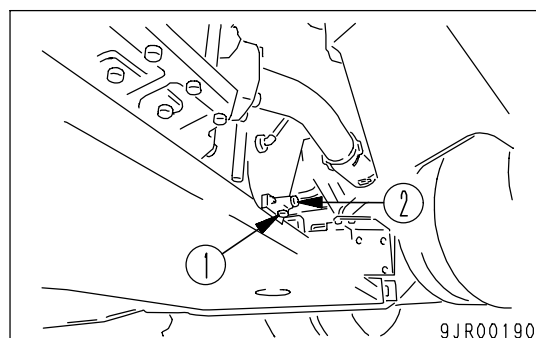
**WARNING**

Parts and oil are at high temperature immediately after the engine is stopped and may cause serious burns. Wait for the oil temperature to go down before performing this operation.

1. Check the oil level with dipstick (G).
2. Take out the dipstick (G) and wipe off the oil with cloth.
3. Fully insert dipstick (G) into filler pipe (F), then remove it.
4. The oil level should be between the H and L marks on the ENGINE STOPPED side of dipstick (G).  
If the oil is below the L mark, add oil through oil filler (F).



5. If the oil is above the H mark, remove drain plug (1), and loosen drain valve (2) to drain the excess engine oil, then check the engine oil level again.
6. If the oil level is correct, tighten the handle of the oil filler cap securely.

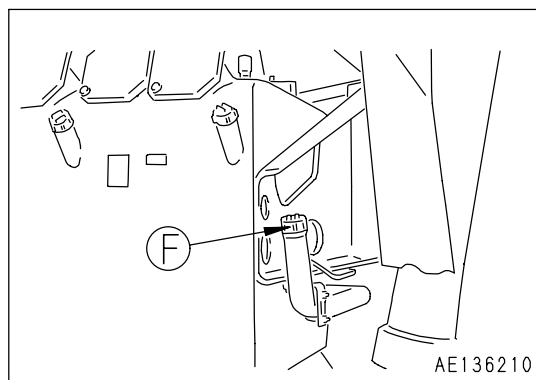
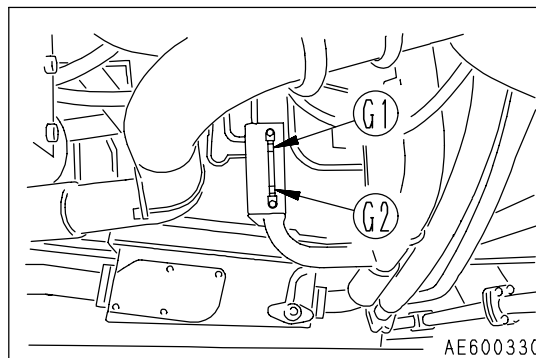
**REMARK**

- When checking the oil level after the engine has been operated, wait for at least 15 minutes after stopping the engine.
- The dipstick has the oil level marked on both sides: ENGINE STOPPED for measuring when the engine is stopped, and ENGINE IDLING for measuring when the engine is idling.
- When checking the oil level, stop the engine and check with the ENGINE STOPPED side of the dipstick. It is also possible to check when the engine is idling, but the following procedure must be used.
  - Check that the engine water temperature is in the green range.
  - Use the ENGINE IDLING side of the dipstick.
  - Remove the oil filler cap.



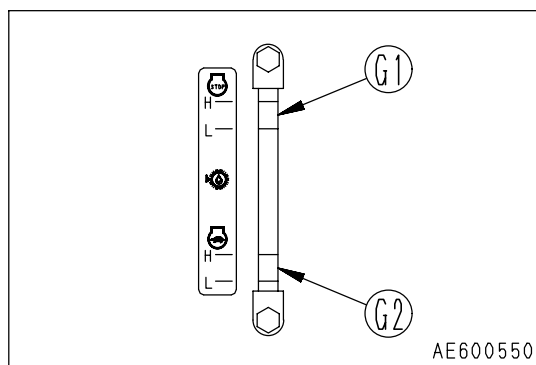
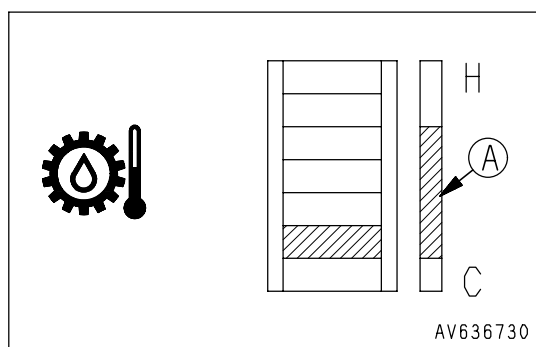
### CHECK OIL LEVEL IN TRANSMISSION CASE, ADD OIL

1. After starting the engine, run the engine at low idle and check the oil level with sight gauge (G2).
2. If the oil level is low, add oil through oil filler (F).



### NOTICE

- The oil level changes according to the oil temperature, so carry out the check after completing the warming-up operation. Check that the torque converter oil temperature gauge is in green range (A) on the monitor panel.
- During operations, or when the engine is running at idling after operations, the oil level be above (G2).
- When checking the oil level with the engine stopped, check with sight gauge (G1) as a guide line, and make the final check with (G2).



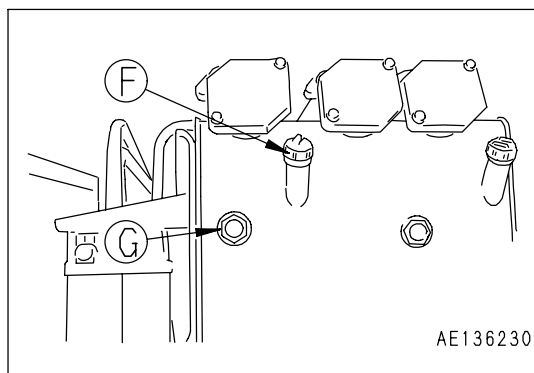
## CHECK OIL LEVEL IN STEERING AND HOIST OIL TANK, ADD OIL



### WARNING

If the oil filler cap is removed without releasing the internal pressure, oil will spurt out, so turn the oil filler cap slowly to release the internal pressure, then remove it carefully.

1. Check with sight gauge (G).
2. If the oil level is not up to the window of sight gauge (G), add oil through oil filler (F).



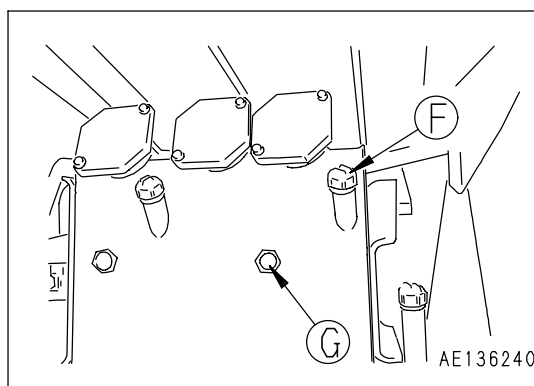
## CHECK OIL LEVEL IN REAR BRAKE COOLING OIL TANK, ADD OIL



### WARNING

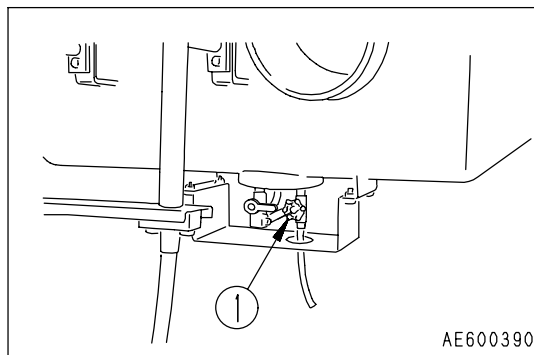
When removing the oil filler cap, oil may spurt out, so turn the cap slowly to release the internal pressure before removing the cap.

1. Check with sight gauge (G).
2. If the oil level is not up to the window of sight gauge (G), add oil through oil filler (F).



## DRAIN WATER, SEDIMENT FROM FUEL TANK

Loosen valve (1) at the bottom of the fuel tank, and drain the water and sediment collected at the bottom of the tank together with the fuel.



## CHECK FUEL LEVEL, ADD FUEL



### WARNING

When adding fuel, never let the fuel overflow. This may cause a fire. If any fuel is spilled, wipe it up completely. Never bring flames near fuel because it is highly flammable and dangerous.

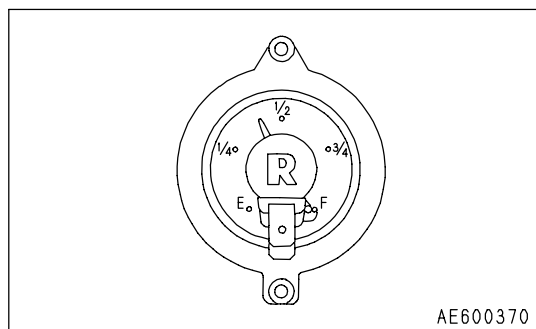
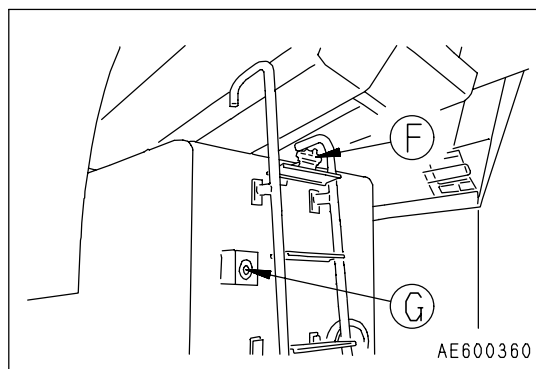
1. Check the fuel level with fuel gauge (G), which is installed in the side of the fuel tank.
2. After completing operations, add fuel through fuel filler (F) to fill the tank.

Fuel tank capacity: 1250 liters (330 US gal)

3. After adding fuel, tighten the cap securely.

### REMARK

If the breather hole in the cap becomes clogged, the pressure inside the tank will go down and the fuel may not flow, so clean the breather hole from time to time.



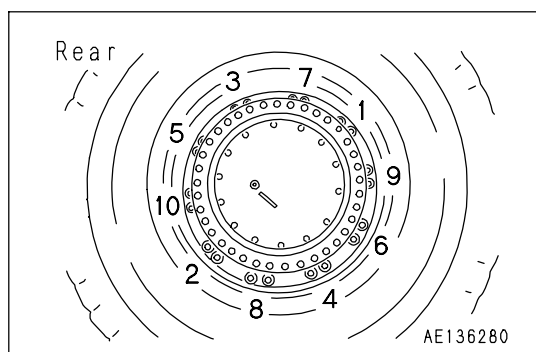
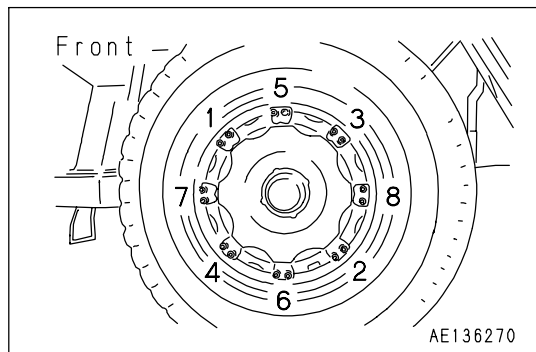
## CHECK WHEEL HUB NUTS, TIGHTEN

Check for loose hub nuts, and if any are loose, tighten 3 or 4 times to the specified torque in the order given in the diagram.

Tightening torque

- $2210 \pm 245 \text{ N}\cdot\text{m}$  ( $225 \pm 25 \text{ kgf}\cdot\text{m}$ ,  $1627.4 \pm 180.8 \text{ lbft}$ )  
(When thread are not coated with grease)
- $1720 \pm 196 \text{ N}\cdot\text{m}$  ( $175 \pm 20 \text{ kgf}\cdot\text{m}$ ,  $1265.8 \pm 144.7 \text{ lbft}$ )  
(When thread are coated with molybdenum disulphide grease)

Insert a socket wrench in a pipe, and apply a force of 2210 N (225 kgf) at a point 1 m from the fulcrum to give a tightening torque of 2210 N·m (225 kgf·m).

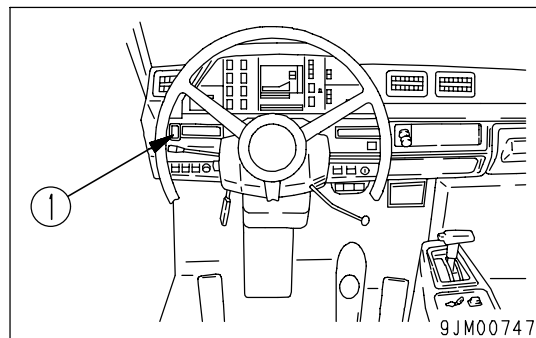


If any stud bolt used to install the rim is broken, replace all the stud bolts for that wheel.

**CHECK CENTRAL WARNING LAMP**

Carry out the following checks to prevent failure by the warning system due to defective operation of the buzzer or blown lamp bulb in central warning lamp (1). If any abnormality is found, ask Komatsu distributor for inspection.

- Stop the engine, turn the starting switch to the ON position, set the parking brake valve lever to the PARKING position, move the shift lever to any position other than N, and check. If the lamp flashes and buzzer sounds, it is normal.
- If the air pressure is below the specified pressure, the lamp should flash and the buzzer should sound when the starting switch is turned ON.

**CHECK BRAKING EFFECT**

Check if the braking capacity of the parking brake, foot brake, and retarder brake. If any abnormality is found, ask Komatsu distributor to repair.

**CHECK MACHINE MONITOR SYSTEM**

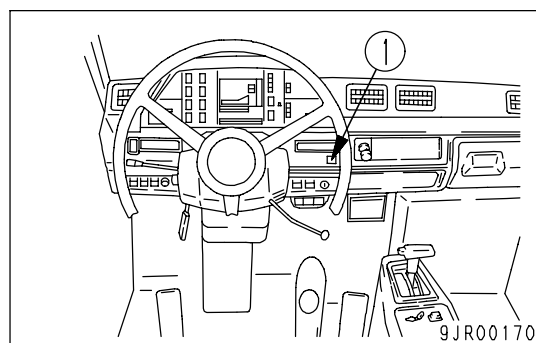
1. Before starting the engine, turn the starting switch to the ON position.
2. Check that all monitor lamps, gauges, and the central warning lamp light up for approx. 3 seconds and that the alarm buzzer sounds for approx. 1 second.

**REMARK**

- When this is done, the speedometer should display 88.
- When the starting switch is turned to the ON position, the pilot lamp at the transmission shift lever position will flash if the shift lever is not at the N position. When the shift lever is moved to the N position, N is displayed.
- After the engine is stopped, the monitor cannot be checked until at least 30 seconds have passed.

3. When checking the monitor, check for blown bulbs in the the caution lamps and pilot lamps at the same time. Before starting the engine, turn the starting switch to the ON position, press bulb check switch (1), and check that no caution lamp or pilot lamp bulb is blown.

If the monitor lamp, caution lamp, or pilot lamp do not light up, there is probably a failure or disconnection, therefore contact your Komatsu distributor for inspection.

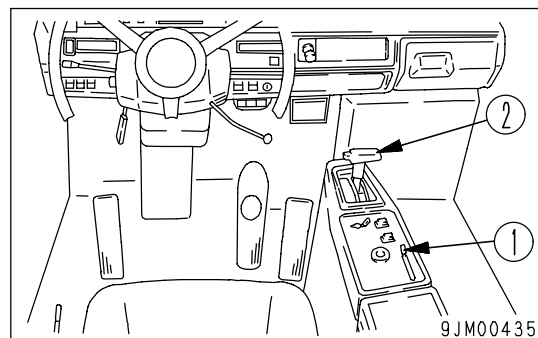


**CHECK BRAKING CAPACITY OF EMERGENCY BRAKE****WARNING**

If the machine moves, it will lead to the serious human injury. If the machine starts to move while checking the braking capacity, lower the engine speed and set the shift lever to N position. Then set the parking brake lever to PARKING position.

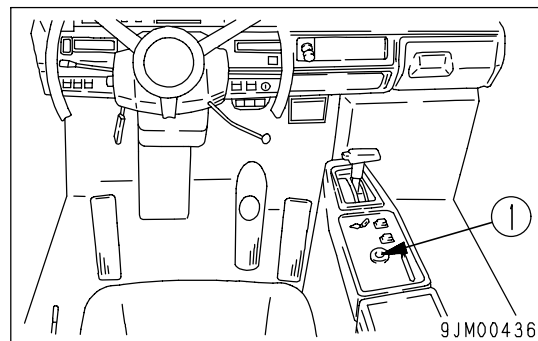
Check the braking capacity of the emergency brake as follows.

1. Set the air pressure to the maximum with the machine on flat ground, set the parking brake valve lever to TRAVEL position and move emergency brake lever (1) to the ON (applied) position.
2. Set gear shift lever (2) to the D position, gradually raise the engine speed, and check that the machine does not move even when the engine reaches full speed. If the machine does not move, it is normal.
3. Lower the engine speed and set the shift lever to N position. Set parking brake valve lever to PARKING position.

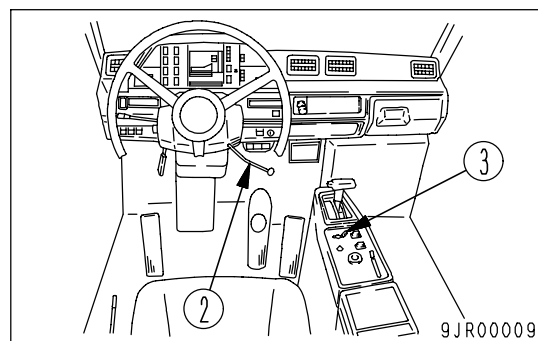
**CHECK EMERGENCY STEERING****Check manual emergency steering**

1. Turn the starting switch key to the ON position.
2. Turn emergency steering switch (1) ON, and check that the steering wheel can be operated.

If the steering wheel cannot be operated, please contact your Komatsu distributor.

**Check auto-emergency steering**

1. Turn the starting switch key to the START position and start the engine.
2. Check that the air pressure gauge is in the green range, then pull retarder lever (2) fully and stop the engine.
3. Turn the starting switch key to the ON position.
4. Check that the emergency steering is actuated and the steering can be operated 1.5 seconds after parking brake valve lever (3) is set to the TRAVEL position.

**CHECK BACKUP ALARM**

1. Turn the engine starting switch to the ON position.
2. Place the gear shift lever in the R position and check that the backup alarm is working.

**CHECK ELECTRIC WIRING****WARNING**

- If the fuses frequently blow or if there are traces of short circuits in the electrical wiring, locate the cause and immediately perform repairs, or contact your Komatsu distributor for repairs.
- Keep the top surface of the battery clean and check the breather hole in the battery cap. If it is clogged with dirt or dust, wash the battery cap to clean the breather hole.

Check for damage and wrong capacity of the fuse and any sign of disconnection or short circuit in the electrical wiring. Check also for loose terminals and tighten any loose parts.

Check the wiring of the "battery", "starting motor" and "alternator" carefully, in particular.

Always check if there is any accumulation of flammable material around the battery, and remove such flammable material.

Please contact your Komatsu distributor for investigation and correction of any problems found.

**CHECK INFLATION PRESSURE OF TIRES**

Measure the inflation pressure with a tire pressure gauge, while the tires are cool, before starting work.

Check for damage or wear to the tires and the rims.

Check for loose wheel hub nuts (bolts).

The proper inflation pressure is shown below.

Standard inflation pressure (front wheel and rear wheel)

Tire size	Inflation pressure
27.00R49 ★ ★ (standard)	0.69 MPa (7.00 kgf/cm <sup>2</sup> , 99.4 PSI)
27.00-49-48PR (if equipped)	0.55 MPa (5.60 kgf/cm <sup>2</sup> , 79.52 PSI)

**NOTICE**

If the tires are used when the inflation pressure is less than the value given in the table above, the rim may be damaged.

Always keep the tire inflation pressure within +0 to +0.03 MPa (0.3 kgf/cm<sup>2</sup>, 4.3 PSI) of the value in the table above.

## ADJUSTMENT BEFORE OPERATION

### ADJUSTING OPERATOR'S SEAT



### WARNING

- Adjust the seat position at the beginning of each shift or when operators change.
- Adjust the seat so that the brake pedal can be depressed all the way with the operators back against the backrest.

#### (A) Fore-and-aft adjustment

Move lever (1) to the right, set the seat to the desired position, then release the lever.

Adjustment range: 140 mm (5.5 in) (7 stages)

#### (B) Adjusting seat angle

Pull lever (2) up, set the seat angle to the desired position, then release the lever.

Adjustment range: Seat surface approx. 2.7° up and down

#### (C) Setting seat for operator's weight

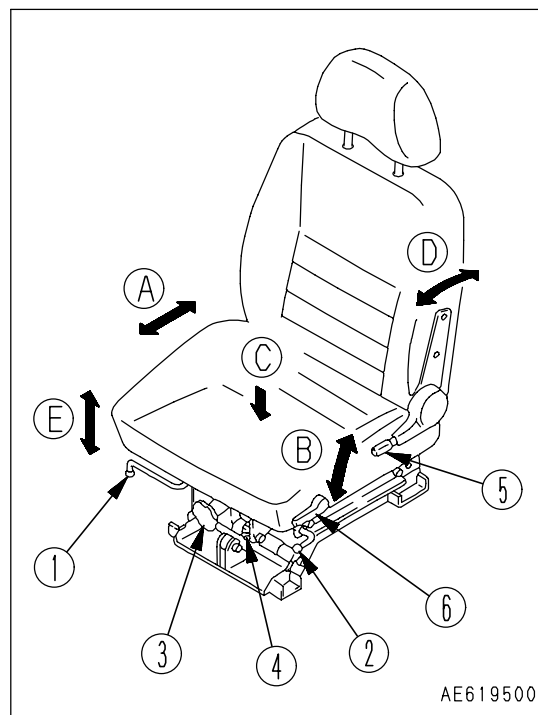
Turn grip (3) under the seat to adjust weight adjustment scale (4) to your own weight.

Adjustment range: 50 to 120kg (110 to 265 lb)

#### REMARK

To make the seat softer, adjust the weight to make it lighter; to make the seat harder, adjust the weight to make it heavier.

When traveling on rough road surfaces, make the seat harder before starting operations.



AE619500

#### (D) Adjusting backrest angle

Pull lever (5), set the backrest to the desired position, then release the lever.

Adjustment range: 28 stages (56°)

#### (E) Seat height adjustment

Move lever (6), set the seat to the desired position, then release the lever.

Adjustment range: 50 mm (2.0 in)

## ADJUST SEAT BELT

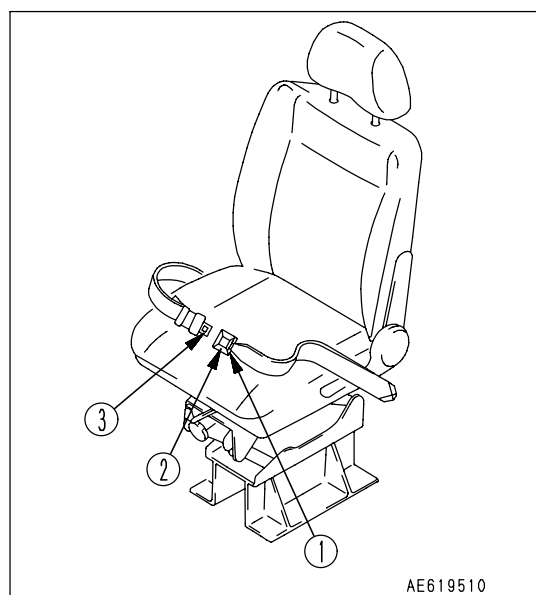
**WARNING**

- Before fastening the seat belt, check that there is no problem in the securing brackets or belt. If there is any wear or damage, replace.
- Even if there appears to be no problem in the seat belt, replace the seat belt once every 3 years. The date of manufacture is woven on the reverse side of the belt.
- Adjust and fasten the seat belt before operating the machine.
- Always use the seat belt when operating the machine.
- Do not use the seat belt with either half of the belt twisted.

#### Fastening and removing belt

1. Sit on the seat, depress the brake pedal fully, and adjust the seat so that your back is pressed against the backrest.
2. Sit on the seat, take buckle (1) and tongue (3) in your left and right hands, insert tongue (3) into buckle (1), and pull the belt to check that it is securely locked.
3. When removing the belt, press button (2) of buckle (1) to release the belt.

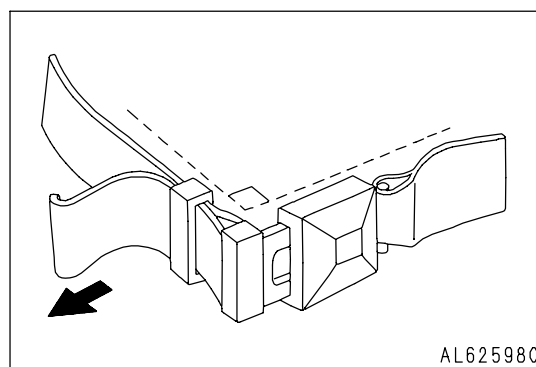
Fasten the belt along your body without kinking it. Adjust the lengths of the belt on both the buckle and the tongue sides so that the buckle is located at the front, mid-point of your body.



#### Adjust belt length

To make belt shorter:

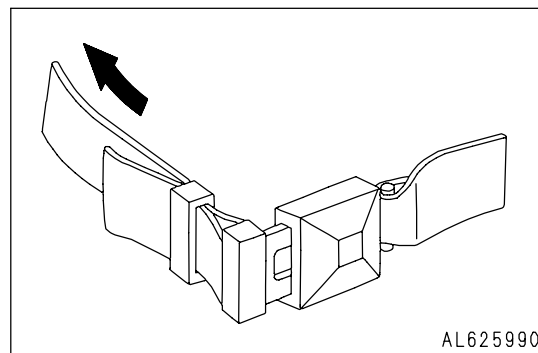
Pull the free end of the belt at the buckle end or tongue end.





To make belt longer:

Set the belt holding the buckle or tongue end at right angles to the buckle or tongue, and pull.



## ADJUST STEERING WHEEL TILT



### WARNING

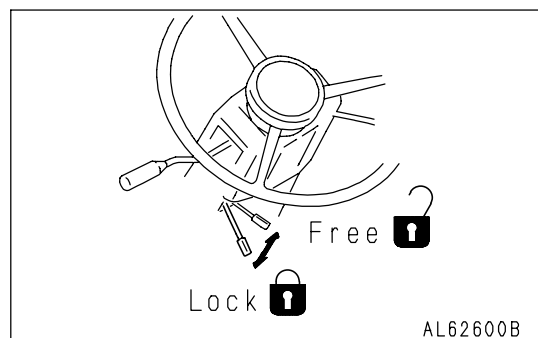
Always stop the machine before adjusting the tilt of the steering wheel.

The tilt of the steering wheel can be adjusted to the front and rear, and up and down. Pull lever up and set the steering wheel to the desired position, then push lever down to lock the steering wheel securely in position.

Adjustment range: Front-rear: 5 degrees

Up: 30 mm (1.2 in)

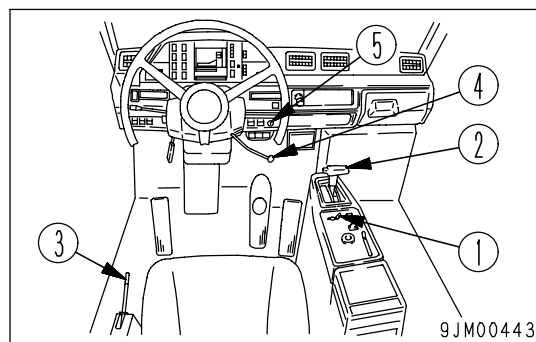
Down: 20 mm (0.8 in)



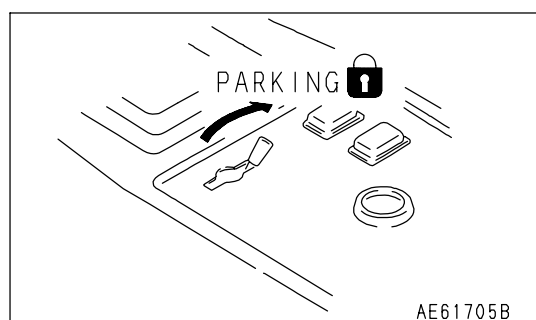
## OPERATIONS, CHECKS BEFORE STARTING

**WARNING**

- At the time of starting the engine, check that the shift lever is set at N (neutral) position and that the parking brake valve lever is at PARKING position.
- Before standing up from the operator's seat, place the gear shift lever at neutral, and set the parking brake valve lever to the PARKING position.



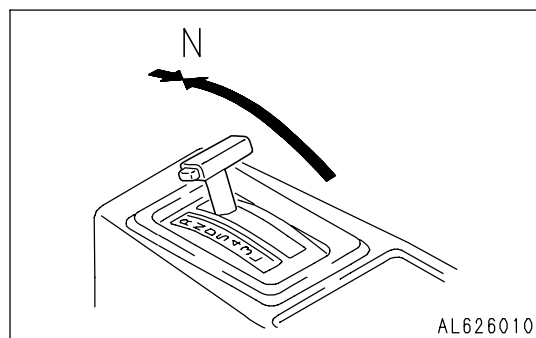
1. Check that parking brake valve lever (1) is at the PARKING position.



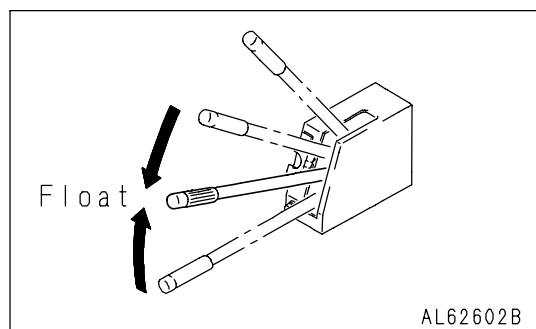
2. Check that gear shift lever (2) is at the N position.

**REMARK**

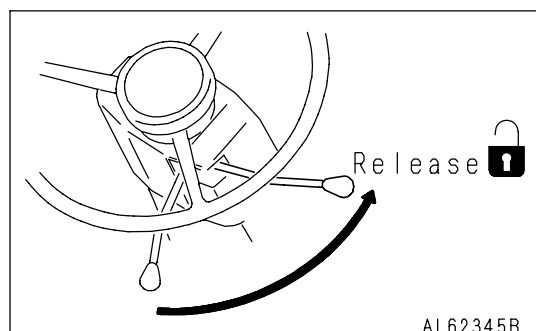
If the gear shift lever is not at the N (neutral) position, the engine will not start. If the starting switch is turned to the ON position when the gear shift lever is not at N (neutral), the transmission shift lever position pilot lamp and the central warning lamp will flash and the alarm buzzer will sound.



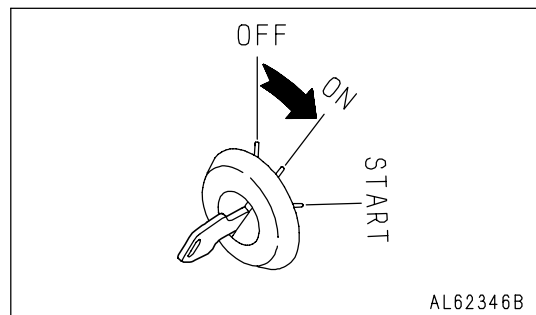
3. Check that dump lever (3) is at the FLOAT position.



4. Check that retarder control lever (4) is at the RELEASED position.



5. Check that there is no abnormality on the machine monitor or maintenance monitor when the key in starting switch (5) is turned to the ON position.



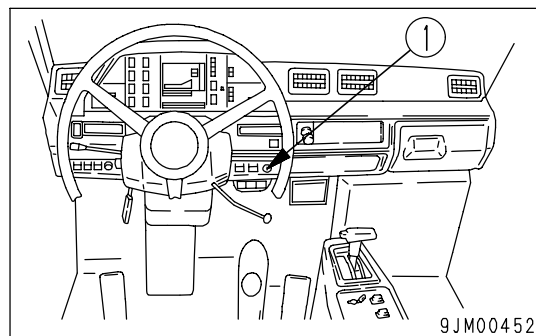
## STARTING ENGINE

### NORMAL STARTING



#### WARNING

- Sit down in the operator's seat before starting the engine.
- Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause serious bodily injury or fire.
- Check that there are no persons or obstacles in the surrounding area, then sound the horn and start the engine.
- Exhaust gas is toxic. When starting the engine in confined spaces, be particularly careful to ensure good ventilation.



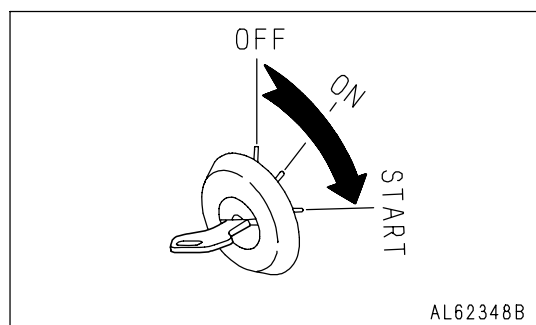
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#### NOTICE

Do not keep the starting motor rotating continuously for more than 20 seconds.

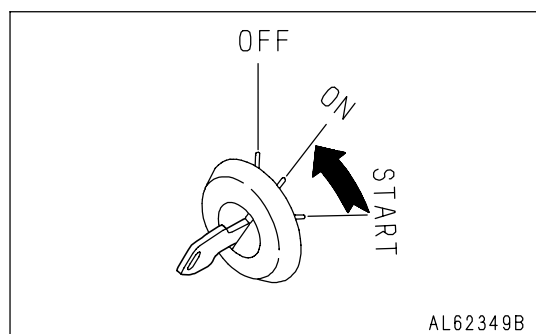
If the engine will not start, wait for at least 2 minutes before trying to start the engine again.

1. Turn the key of starting switch (1) to the START position to start the engine.



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2. When the engine starts, release the key in starting switch (1). The key will return automatically to the ON position.

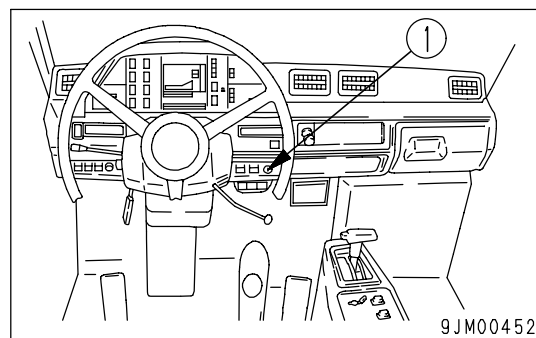


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## STARTING IN COLD WEATHER

**WARNING**

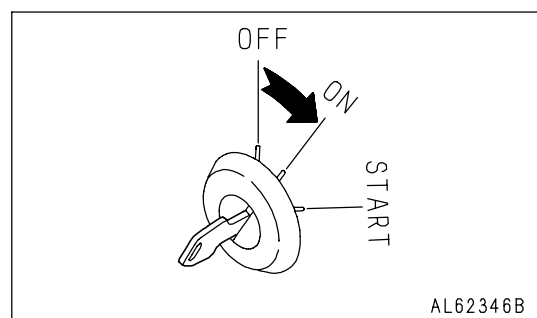
- Start the engine only after sitting down in the operator's seat.
- Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause a serious bodily injury or fire.
- Check that there are no persons or obstacles in the surrounding area, then sound the horn and start the engine.
- Never use starting aid fluids as they may cause explosions.
- Exhaust gas is toxic. When starting the engine in confined spaces, be particularly careful to ensure good ventilation.

**NOTICE**

Do not keep the starting motor rotating continuously for more than 20 seconds.

If the engine will not start, wait for at least 2 minutes before trying to start the engine again.

1. Turn the key of starting switch (1) to the ON position.
2. The preheating will start automatically and the preheating pilot lamp will light up.



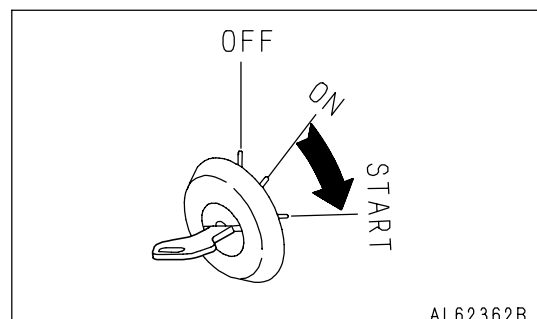
The pre-heating times are as shown below.

Ambient temperature	Preheating time
0°C to -5°C	—
-5°C to -10°C	30 to 40 seconds
-10°C to -20°C	60 seconds
-20°C to -30°C	90 seconds

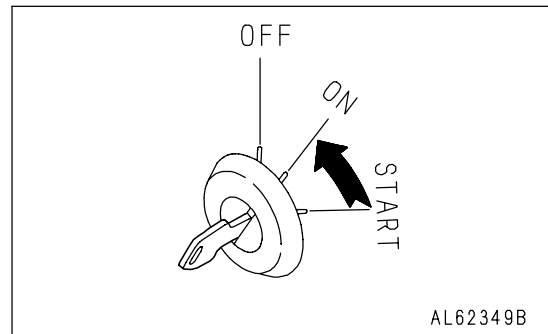
3. When the preheating is completed, the preheating pilot lamp will go out. Turn the key in starting switch (1) to the START position to start the engine.

**REMARK**

When starting the engine, the monitor may flash while the starting motor is turning, but if the monitor lamp goes out after the engine is started, there is no problem.



4. When the engine starts, release the key in starting switch (1).  
The key will return automatically to the ON position.



## OPERATIONS, CHECKS AFTER STARTING ENGINE

### BREAKING-IN THE MACHINE



#### CAUTION

Your Komatsu machine has been thoroughly adjusted and tested before shipment. However, operating the machine under severe conditions at the beginning can adversely affect the performance and shorten the machine life.

Be sure to break-in the machine for the initial 100 hours (as indicated by the service meter).

During break-in operations, follow the precautions described in this manual.

- Idle the engine for 5 minutes after starting it up.
- Avoid operation with heavy loads or at high speeds.
- Immediately after starting the engine, avoid sudden starts, sudden acceleration, unnecessary sudden stops, and sudden changes in direction.

### WARMING-UP OPERATION

#### NOTICE

Do not accelerate the engine suddenly until the warming-up operation has been completed.

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

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

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

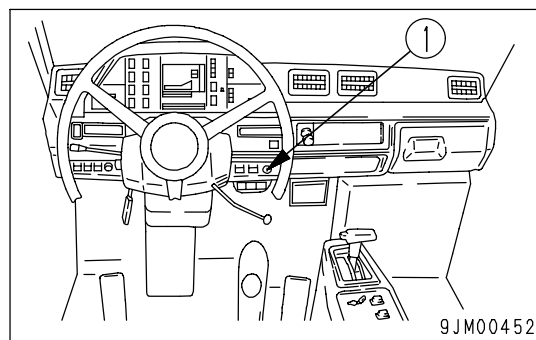
1. After starting the engine, run the engine at idle for 5 minutes for warming up operation.
2. After the warming-up operation, check that the machine monitor is normal.  
If there is any problem, carry out maintenance or repair.  
Run the engine under a light load until the engine water temperature gauge and air pressure gauge enter the green range.  
When the AISS switch is at the AUTO position and the engine water temperature is still low, high idling revolution is automatically maintained (for optional electronic governor specification).
3. Check if there is no abnormality in the steering operation, flashing of lights, sound of horn, exhaust gas color, noise, or vibration. If any abnormality is found, repair it.

## STOPPING ENGINE

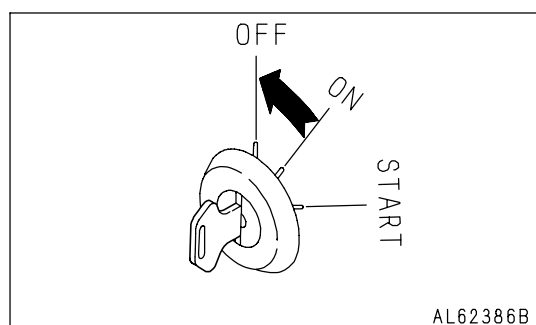
### NOTICE

If the engine is suddenly stopped without allowing it to cool down, there is danger that the life of the engine parts will be shortened, so never stop the engine suddenly except in emergency.

Allow the engine to cool down gradually before stopping it.



1. Run the engine at low idle for about 5 minutes to cool down gradually.
2. Turn the key of starting switch (1) to the OFF position to stop the engine.
3. Remove the key from starting switch (1).



## CHECKS AFTER STOPPING ENGINE

1. Walk around the machine and check the body work, and undercarriage, and check also for leakage of oil and water.
2. Fill the fuel tank.
3. Check the engine compartment for paper and debris. Clean out any paper and debris to avoid a fire hazard.
4. Remove any mud affixed to the undercarriage.



## MOVING MACHINE OFF (FORWARD, REVERSE), STOPPING

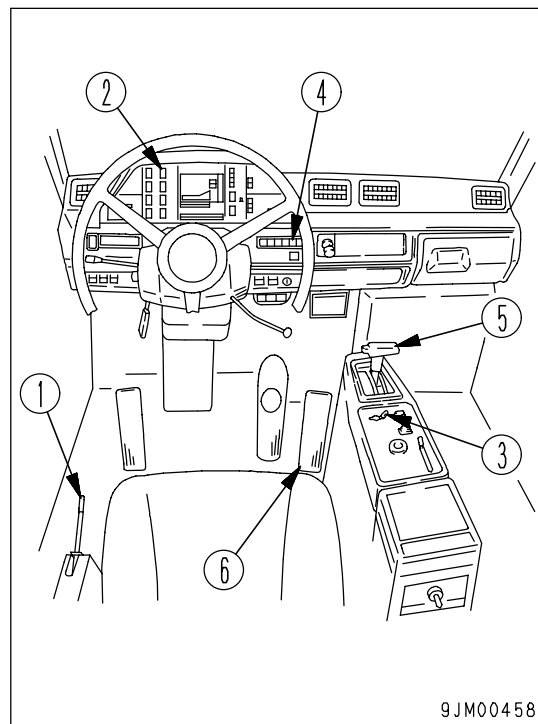
### MOVING MACHINE FORWARD



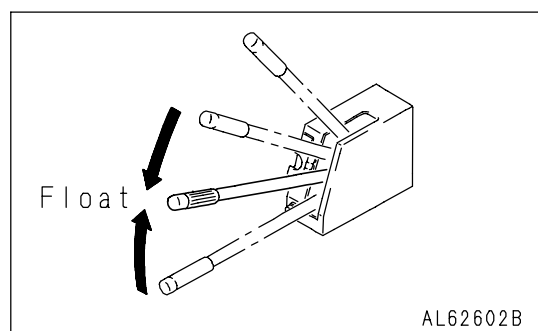
#### WARNING

- When moving the machine off, check that the area around the machine is safe, then sound the horn before starting.
- Do not allow people to get near the machine.
- Clear the machine's travel path of any obstacle.
- Pay a particular attention to the blind spot at the rear of the machine, when traveling the machine in reverse.

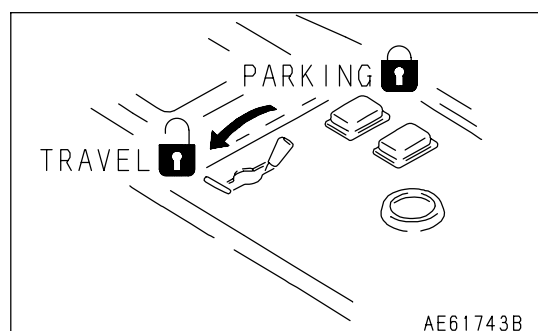
1. Check that there is no warning display on the machine monitor.



2. Check that your seat belt is fastened and that dump lever (1) is at the FLOAT position.



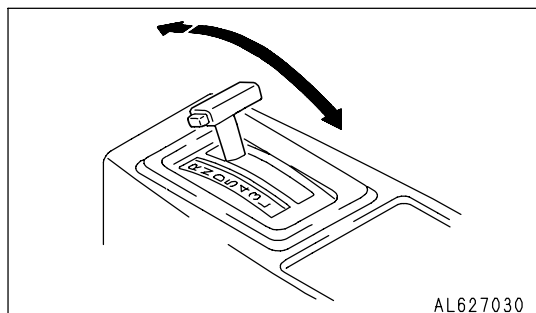
3. Depress the brake pedal fully. Check that air pressure gauge (2) is in the green range, then set parking brake valve lever (3) to the TRAVEL position to release the parking brake.



4. Check that retarder pilot lamp (4) has gone out, then set shift lever (5) to the desired position.

**NOTICE**

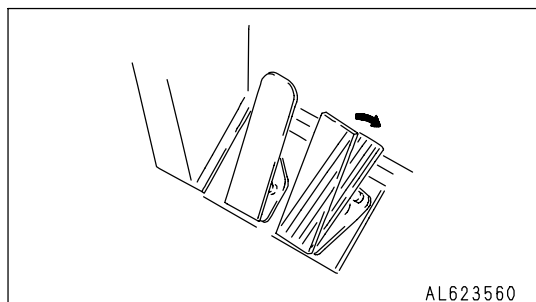
- When operating the shift lever, be sure to set it in position securely. If the lever is not placed in position properly, the shift position display on the panel may go out and the transmission warning monitor lamp may light up.
- Always release the accelerator pedal before shifting from N to R or F.



5. Depress accelerator pedal (6) to move the machine off.

**NOTICE**

- If the parking brake is not released, and the shift lever is shifted to a position other than N, the central warning lamp will flash and the alarm buzzer will sound.
- If the dump lever is not at the FLOAT position, and the shift lever is shifted to a position other than N, the central warning lamp will flash and the alarm buzzer will sound.
- Do not operate the shift lever with the accelerator pedal depressed. This will cause a big shock, and will also reduce the life of the machine.

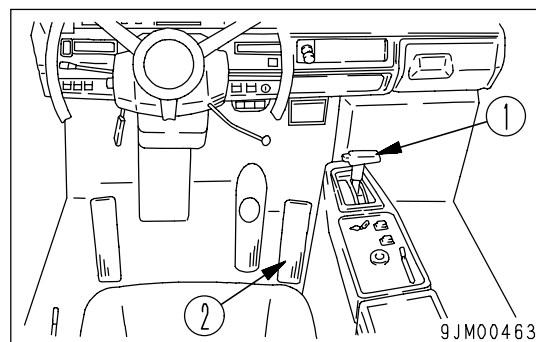


## MOVING MACHINE IN REVERSE



### WARNING

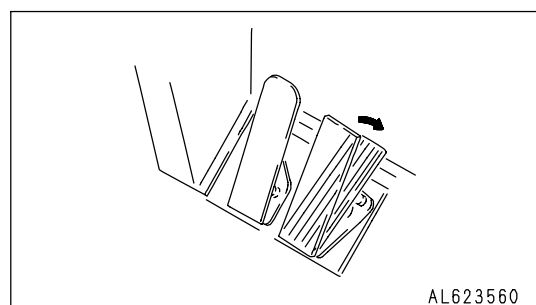
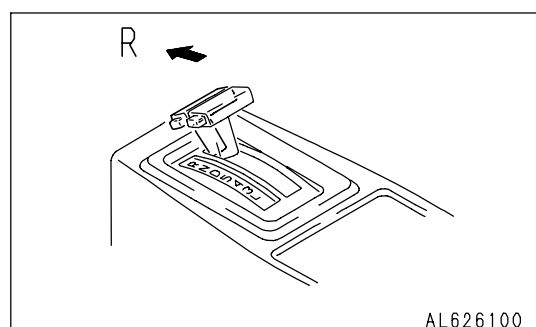
- When switching between FORWARD and REVERSE, check that the new direction of travel is safe.  
There is a blind spot behind the machine, so use extreme caution when reversing the machine.
- Always stop the machine completely before shifting between FORWARD and REVERSE.



Place gear shift lever (1) in the R position, then gradually depress accelerator pedal (2) to move the machine off.

### NOTICE

- The machine cannot travel in reverse if the dump lever is not at the FLOAT position. Place the dump lever at the FLOAT position before operating to the R position.
- When shifting between FORWARD and REVERSE, stop the machine completely, and run the engine at low idle when shifting the lever.  
After moving the gear shift lever, do not depress the accelerator until you detect that the transmission clutch has engaged.
- Do not operate the gear shift lever with the accelerator pedal depressed.  
This will cause a big shock, and will also reduce the life of the machine.

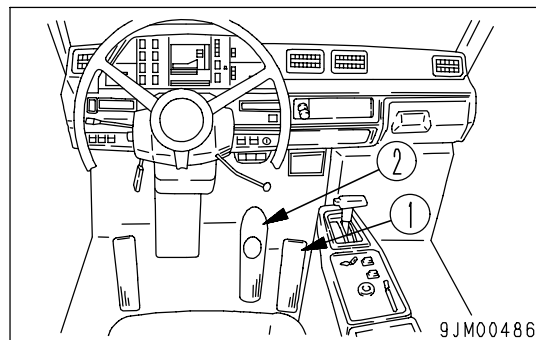


## STOPPING MACHINE



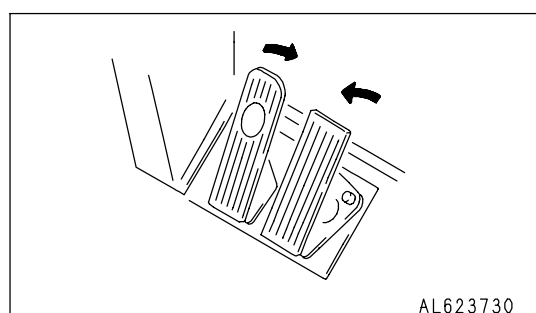
### WARNING

- Avoid stopping suddenly. Give yourself ample room when stopping.
- If the foot brake is used repeatedly or is kept depressed for a long time, the brake may overheat and its life will be shortened.
- If the parking brake is used to stop the machine, the brake will be damaged. Do not use the parking brake except when stopping in emergencies or when parking the machine after stopping it.



## NORMAL STOPPING

Release accelerator pedal (1), and depress brake pedal (2) to stop the machine.



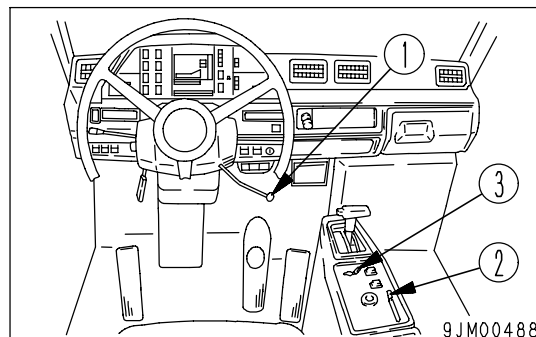
## STOPPING IN EMERGENCY

If there should be a failure in the foot brake, stop the machine as follows.

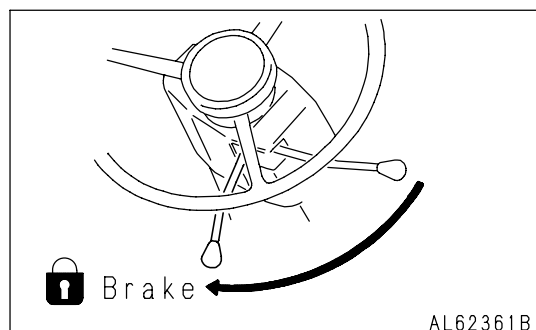


### WARNING

- When the machine stops, put blocks under the tires immediately.
- Immediately after making an emergency stop, the parking brake disc will be at high temperature, so wait for it to cool before carrying out repair or adjustment. Ask Komatsu distributor for repair and adjustment.

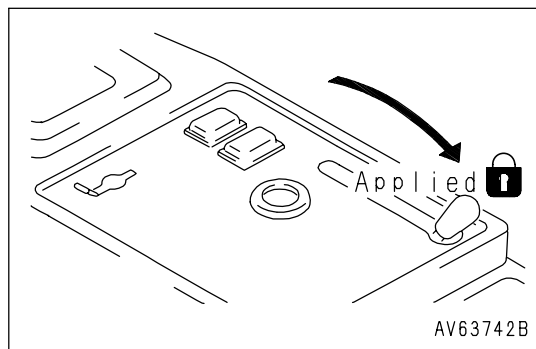


1. Pull retarder control lever (1) fully to apply the retarder.



2. If operating the retarder control lever dose not give enough braking force, set emergency brake lever (2) to the actuation position to apply the emergency brake.

When emergency brake lever (2) is placed at the actuation position, the parking brake is also automatically applied.

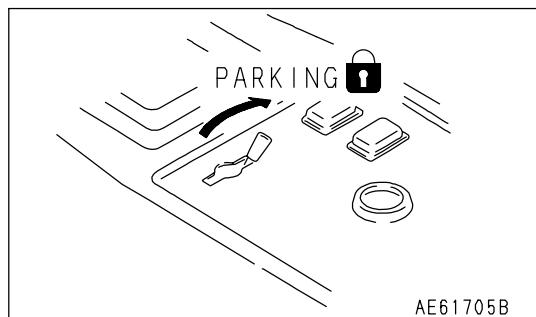


3. Set parking brake valve lever (3) to the right (to the PARKING) position.

4. If an emergency stop has been made, put blocks under the tires immediately, then try to find the cause, and repair it on site.

5. After the emergency operation of parking brake and emergency brake, see "RELEASE METHOD WHEN PARKING BRAKE AND EMERGENCY BRAKE HAVE BEEN ACTUATED IN EMERGENCY (PAGE 3-107)" in case that it is necessary to release the brake.

6. If emergency stop has been made, it is necessary to re-adjust the parking brake. Ask Komatsu distributor for adjustment.



## SHIFTING GEAR

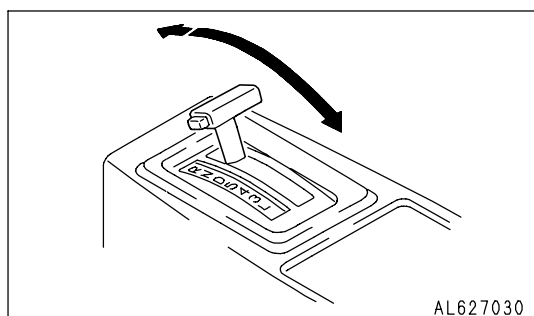
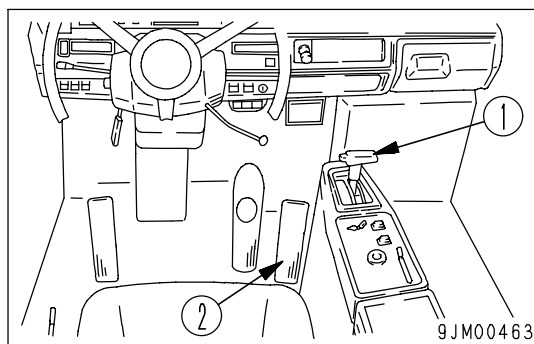
When shifting gear, do as follows.

This machine has an automatic transmission, so set gear shift lever (1) to the desired position, and the transmission will automatically shift to a position to match the travel speed.

When the dump body has risen, the speed range is locked to 2nd speed at the D position and 1st speed at the 5 - L position. While traveling, lower the dump body.

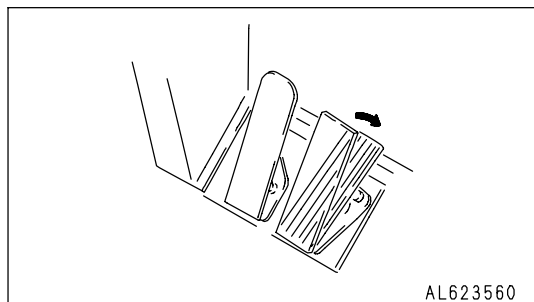
### NOTICE

- When shifting between **FORWARD** and **REVERSE**, stop the machine completely, and run the engine at low idle when shifting the lever. After moving the gear shift lever, do not depress the accelerator until you detect that the transmission clutch has engaged.
- Do not operate the gear shift lever with the accelerator pedal depressed. This will cause a big shock, and will also reduce the service life of the machine.



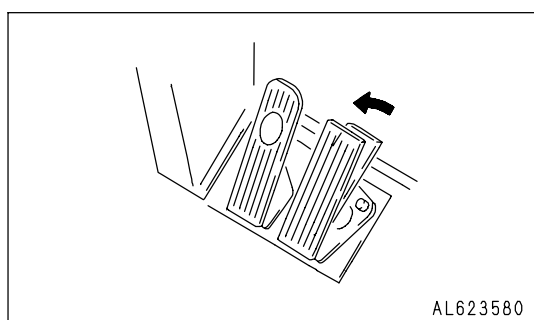
### SHIFTING UP

1. When accelerator pedal (2) is depressed to accelerate the machine, the lockup clutch is engaged to shift the transmission to direct drive.
2. If the machine is accelerated further, the transmission will automatically shift up.



### SHIFTING DOWN

If accelerator pedal (2) is released, the machine speed will be reduced, and the transmission will automatically shift down.



### OVERRUN PREVENTION DEVICE

If the travel speed goes above the maximum speed for the speed range while machine is traveling downhill, the overrun prevention device is actuated to act the retarder and to reduce the travel speed.

## TRAVELING DOWNHILL

When traveling downhill, travel at a safe speed which matches the width of the road, the condition of the road surface, and other conditions of the jobsite.



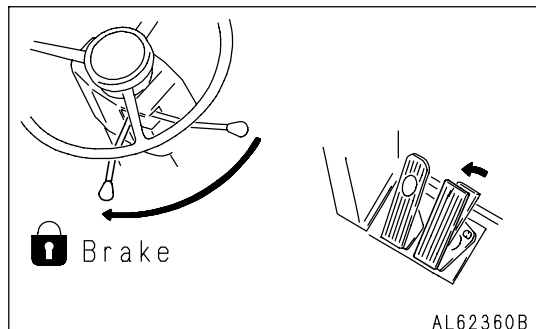
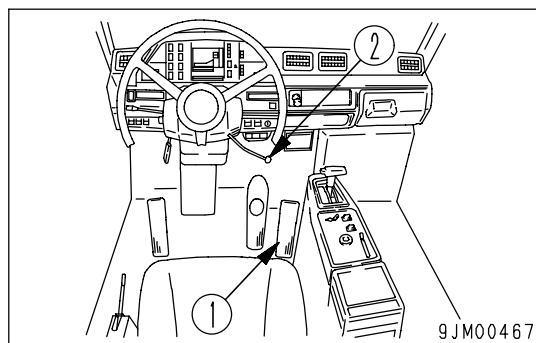
### WARNING

- If the machine is stopped, put blocks under the wheel immediately.
- For the maximum permissible speed when traveling downhill using the retarder, see the brake performance graph for the downhill distance and grade. Traveling continuously downhill at a speed greater than the maximum permitted speed on the brake performance graph is dangerous as the retarder brake may be damaged.
- If the retarder oil temperature monitor on the machine monitor flashes when using the retarder, shift down to travel downhill. (When this happens, the central warning lamp flashes and the alarm buzzer sounds.)  
If the monitor lamp does not go out even when the transmission is shifted down, stop the machine immediately, set the shift lever to the N position, run the engine at the 2000 rpm, and wait for the monitor to go out.
- If the retarder loses its effect when it is used for traveling downhill, do as follows.
  1. Release the retarder brake completely, then operate the retarder lever again.
  2. If the retarder still has no effect even when the retarder lever is operated again, return the retarder lever completely to the released position, then depress the brake pedal to stop the machine, and contact your Komatsu distributor for repairs.
- Operate the retarder slowly. If the brakes are applied suddenly, there is danger that the machine will skid.

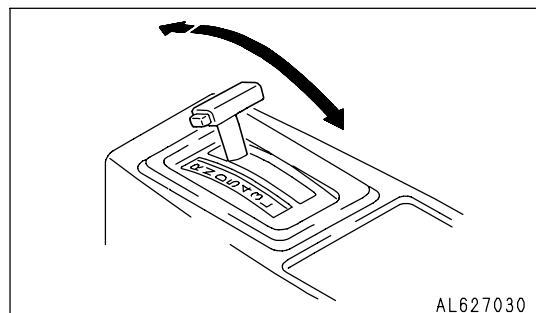
### NOTICE

- If the retarder lever is operated when traveling downhill, the transmission can be shifted down sooner than with normal deceleration. It is also possible to travel without shifting up.
- When traveling downhill, do not use the foot brake except in an emergency. Using the foot brake will cause overheating of the front brake and reduce the life.
- Do not accelerate or shift up when using the retarder. The engine speed will rise and this may cause the alarm buzzer to sound and the central warning lamp to flash.

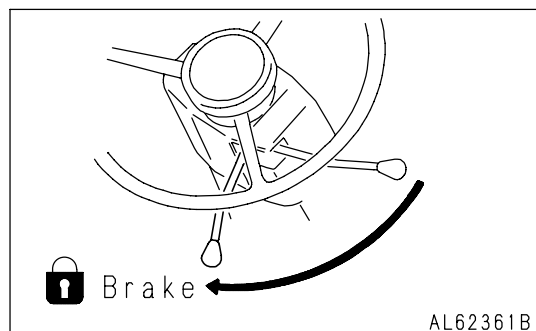
1. Before starting to travel downhill, release accelerator pedal (1) and operate retarder control lever (2) to slow the machine down.



2. Move the gear shift lever to a position (5, 4, 3, L) that matches the maximum permissible speed for the retarder brake performance.



3. When traveling downhill, operate retarder lever (2), run the engine at a speed of at least 1,800 rpm, and travel so that the retarder brake oil temperature gauge is in the green range.



For machines equipped with an exhaust brake, using the exhaust brake can provide more secure braking force for increased safety, and will also improve the durability of the brake.

For details of handling the exhaust brake, see "EXHAUST BRAKE SWITCH (PAGE 3-24)".



## BRAKE PERFORMANCE CURVE

- Method of using graph

Example: Downhill distance: 1500 m (4921 ft)

Travel resistance: - 11%

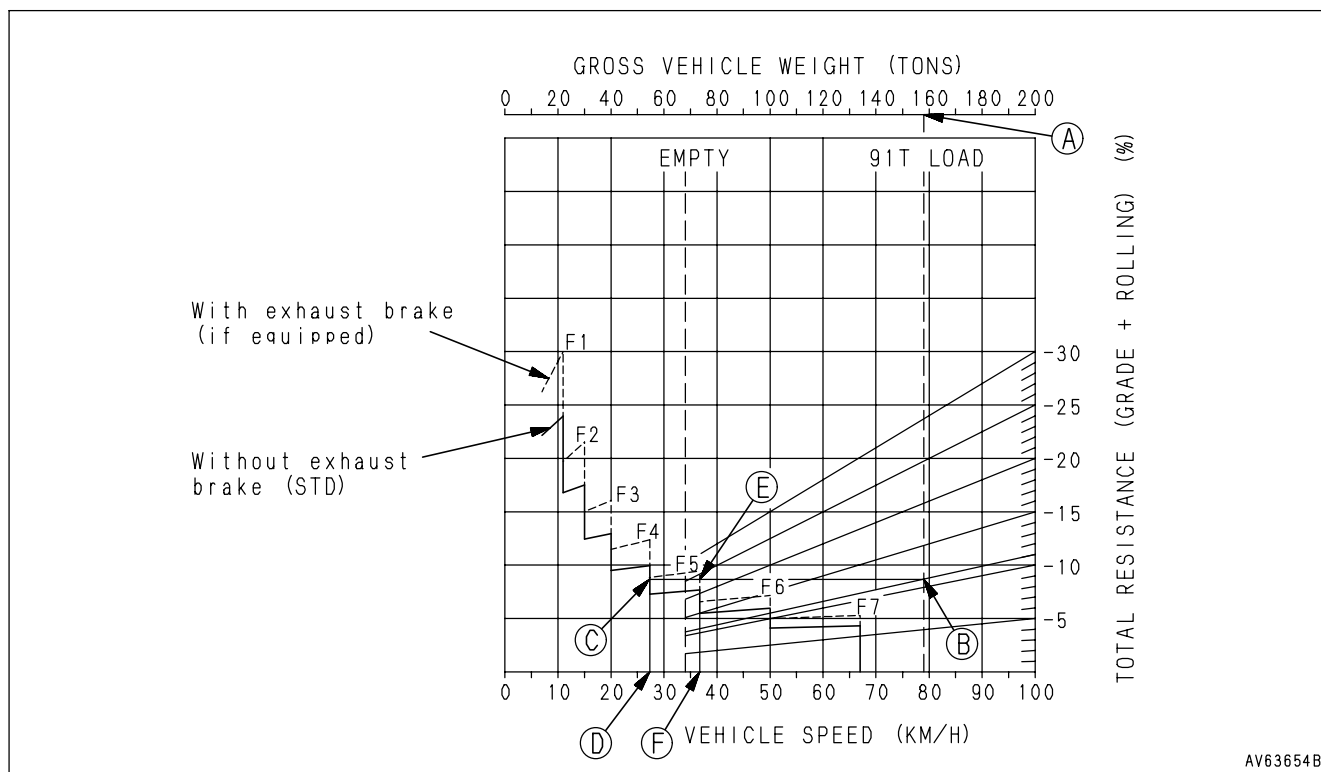
Grade resistance: - 13% [rolling resistance: 2%]

Load: 91 tons

Obtain the maximum permissible speed and the transmission speed range from the graph when traveling downhill under the above conditions.

1. Use the brake performance graph for the downhill distance of 1,500 m (4,921 ft).
2. Starting from point (A) which corresponds to the overall weight of the machine, draw a perpendicular line down.
3. Take the point where it crosses the line for travel resistance -11% as (B) and draw a horizontal line.
4. Take the point where it crosses the performance curve as (C), and draw a perpendicular line down. Take the point where this line crosses the travel speed scale as (D).
5. The following information can be obtained from this procedure.
  - Without exhaust brake
    - From point D: Maximum permissible speed = 27 km/h (16.8 MPH)
    - From point C: Speed range = F4
  - With exhaust brake (if equipped)
    - From point F: Maximum permissible speed = 36 km/h (22.4 MPH)
    - From point E: Speed range = F5

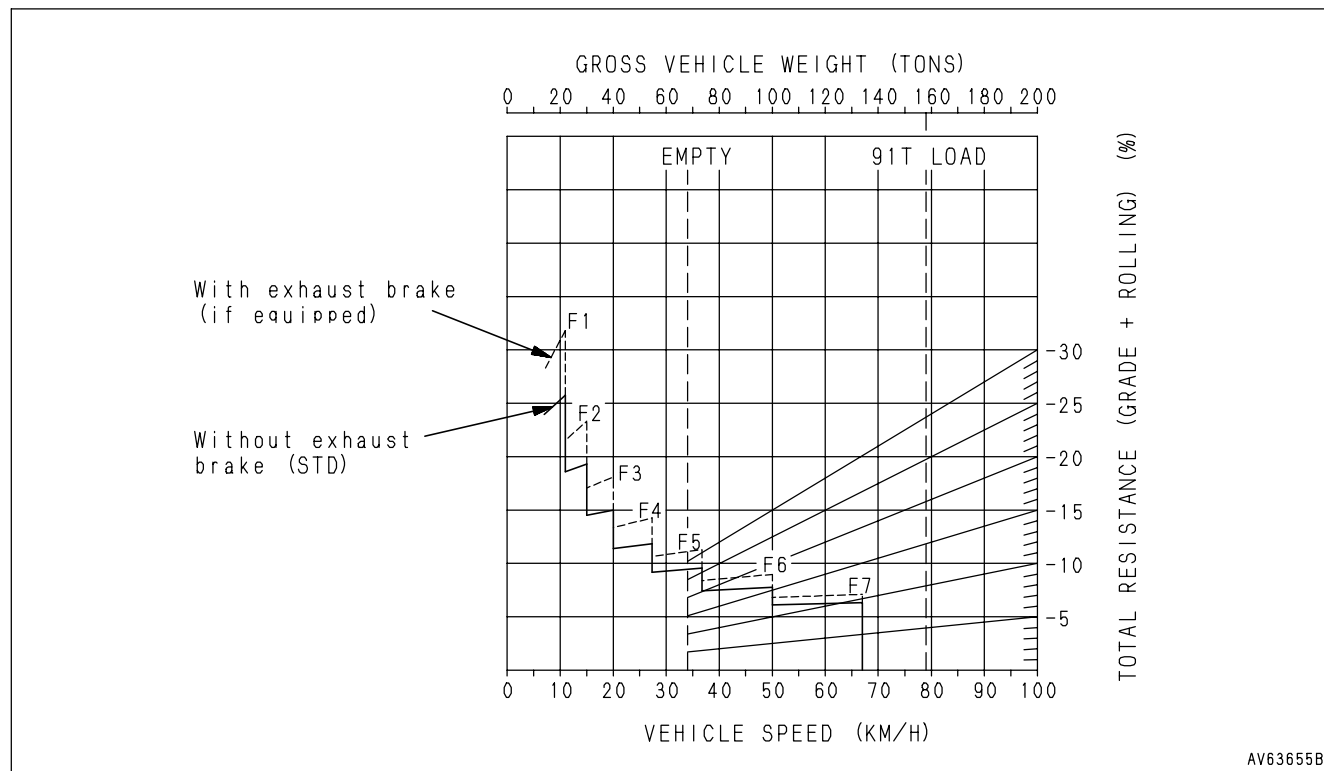
This maximum permissible speed is one guideline determined from the retarder brake performance, so on an actual jobsite, determine a safe downhill travel speed (below the maximum permissible speed) to match the conditions of the jobsite so that the retarder brake oil temperature gauge is always in the green range.



AV63654B

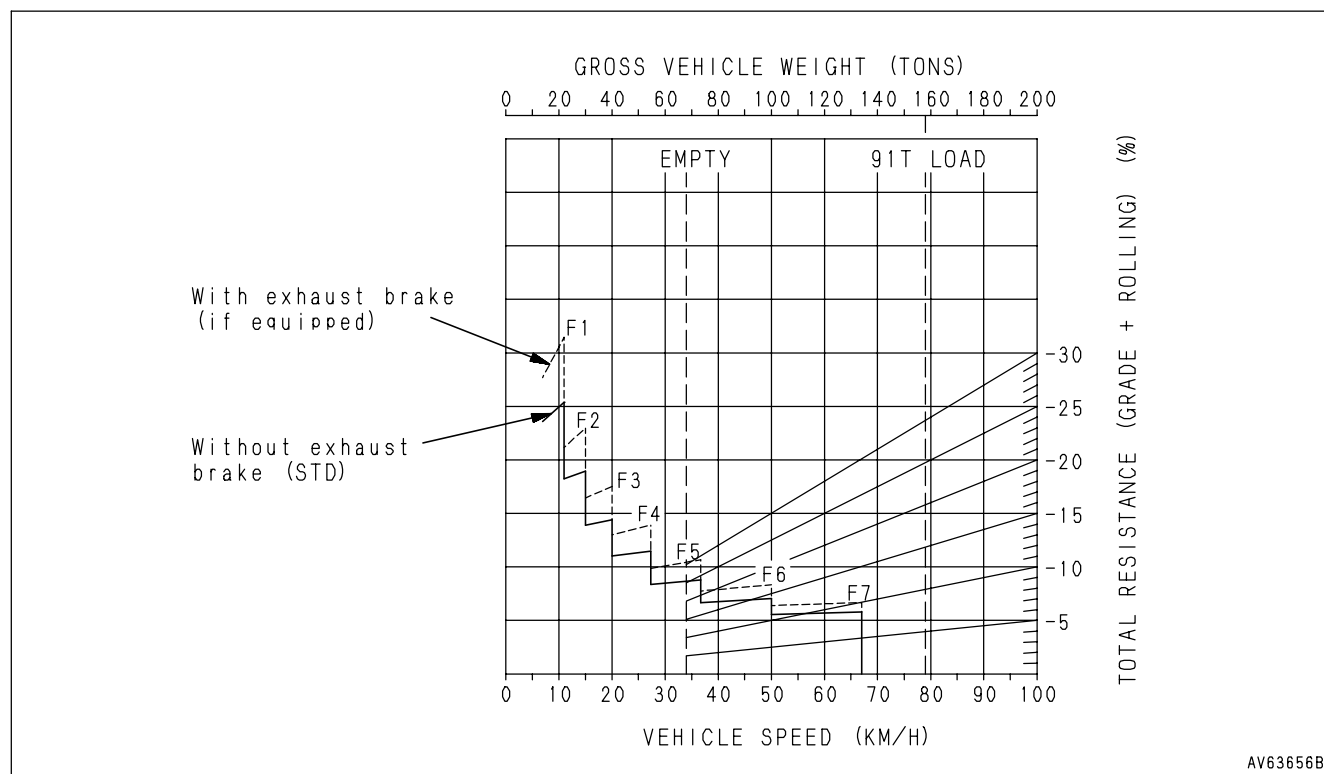
• Brake performance

[Downhill distance: 450 m (1476 ft)] (Tire size: 27.00R49 ★ ★)



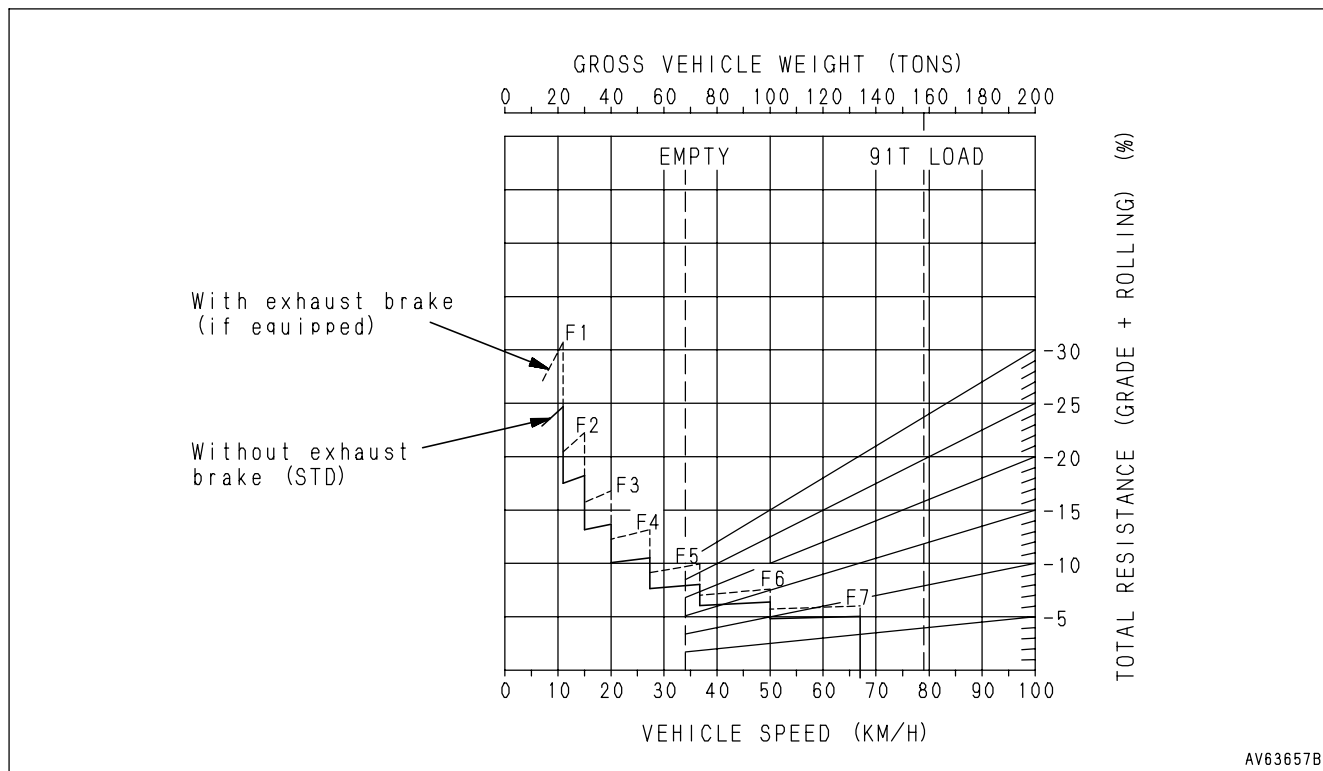
• Brake performance

[Downhill distance: 600m (1968ft)] (Tire size: 27.00R49 ★ ★)



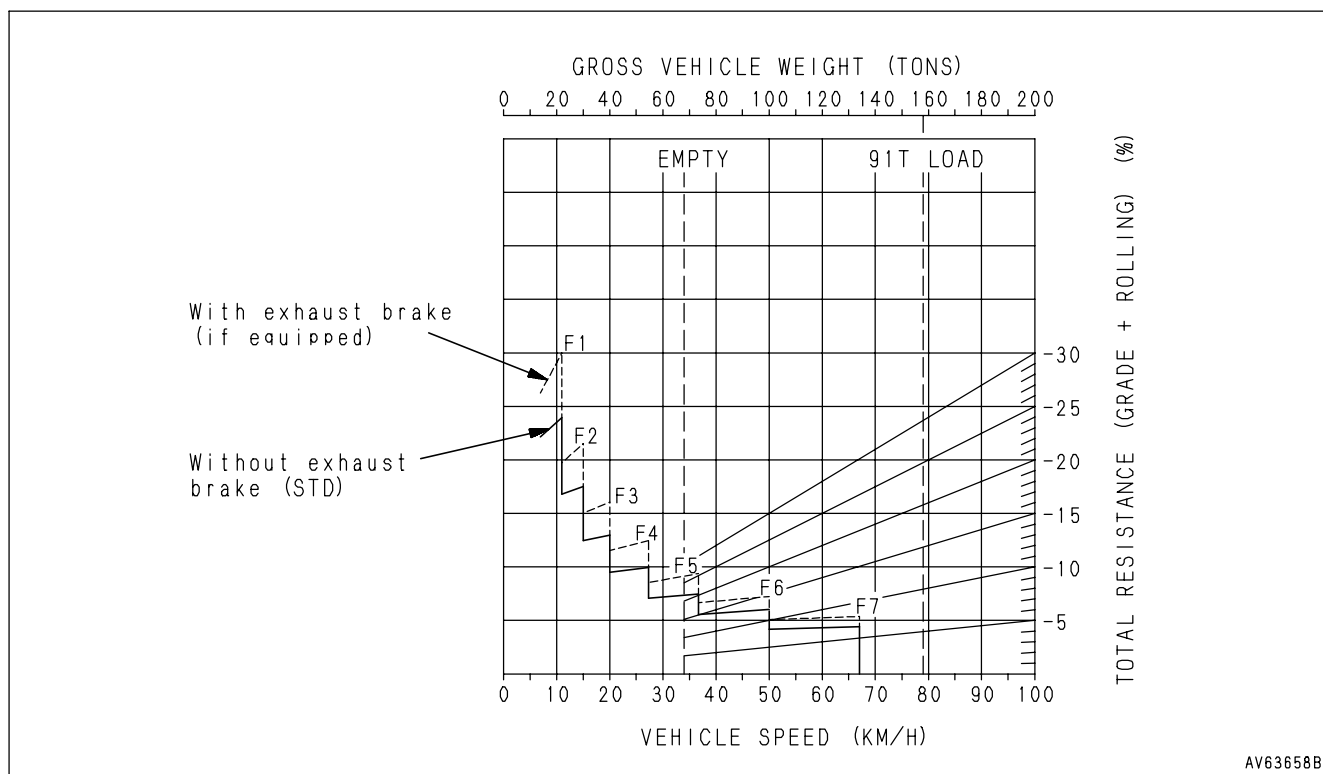
• Brake performance

[Downhill distace: 900m (2952ft)] (Tire size: 27.00R49★★)



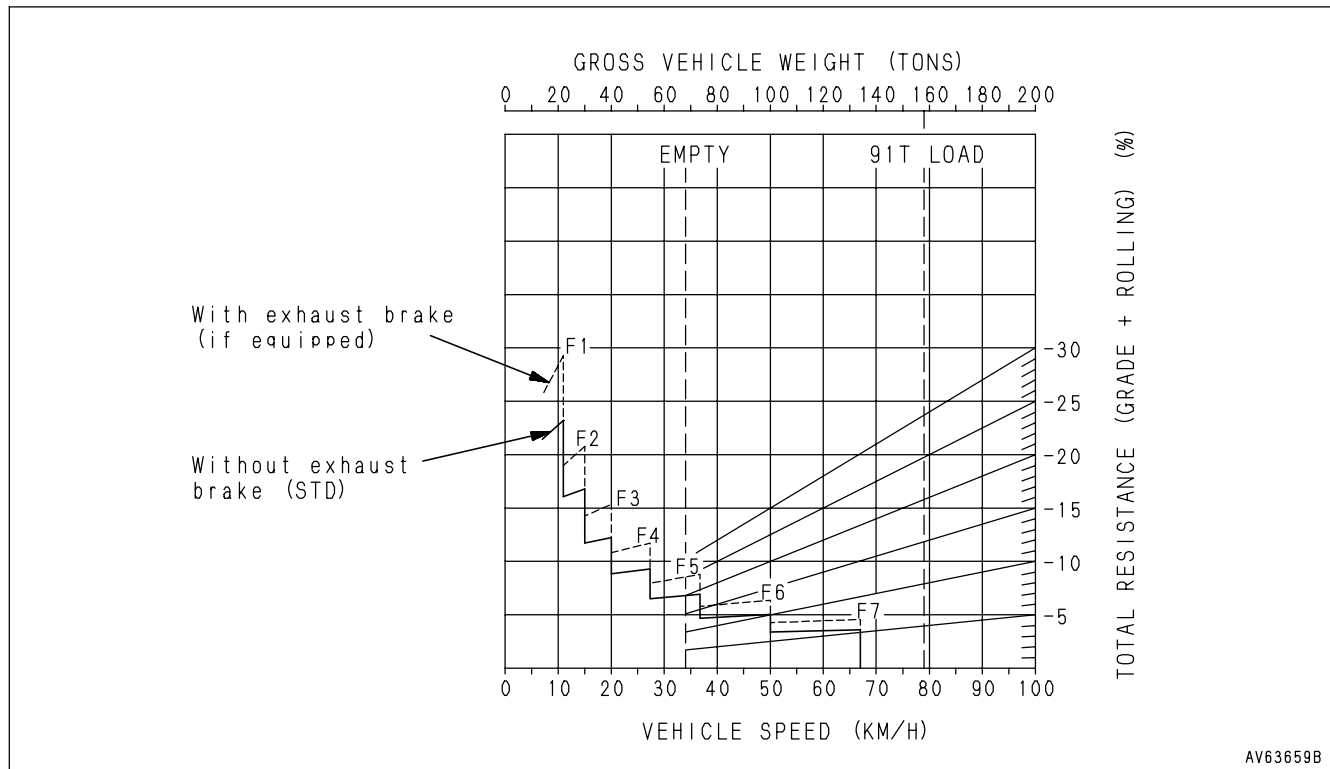
• Brake performance

[Downhill distace: 1500m (4921ft)] (Tire size: 27.00R49★★)



- Brake performance

[Downhill distance: Continuous] (Tire size: 27.00R49★ ★)



## STEERING THE MACHINE



### WARNING

If the machine is turned at high speed or on a steep slope, there is danger that it will turn over, so do not operate the steering in such conditions.

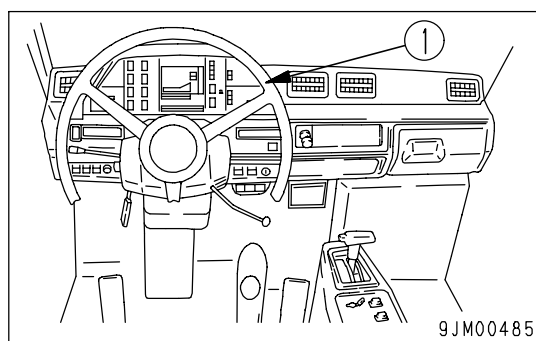


### CAUTION

Do not continue to apply force to the steering wheel when it has been turned fully to the left or right. This will make the oil temperature in the circuit rise and will cause overheating.

To turn the machine when traveling, turn steering wheel (1) in the direction of the turn.

When traveling around a curve, release the accelerator pedal before entering the curve, shift down to a lower speed range, then depress the accelerator pedal to travel around the curve. Never coast around the curves at high speed.



### REMARK

- The angle of the steering wheel may change (the position of the spoke may change slightly) when the machine is traveling, but this is not a failure.
- If force is applied to the steering wheel when the tires have been turned fully to the left or right, the steering wheel will turn a little at a time, but this is not a failure.

## LOADING OPERATIONS

When using a large wheel loader to load large rocks, if the rocks are loaded directly into the dump body parts of the dump body may be deformed. To prevent this, when loading large rocks, first load sand or soil to act as a cushion, then load the rocks on top of this to reduce the impact on the dump body.

In addition, when loading rocks that exceed the following conditions, install the optional dump body reinforcement plate.

- Rocks with one side over 0.5 m (1 ft 8 in)
- Rocks of hardness more than 4.5 (Mohs scale)
- Rocks with a weight of more than 300 kg (662 lb)
- When transporting steel ingots

### NOTICE

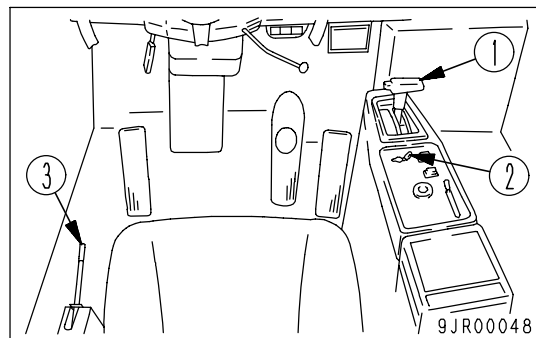
- When traveling, always set the dump lever to the FLOAT position regardless of whether the dump body is empty or loaded.
- If the dump lever is not at the FLOAT position and the shift lever is not at the N position, the central warning lamp will flash and the alarm buzzer will sound.

## DUMP OPERATIONS



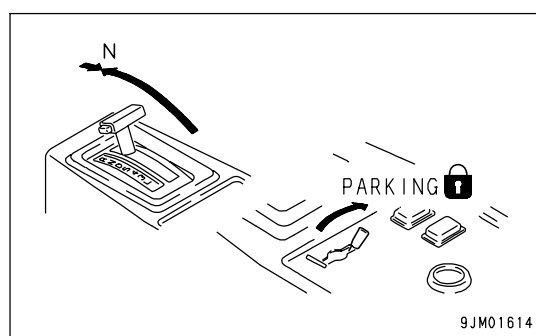
### WARNING

- When dumping a load, always carry out the dumping operation in accordance with the signals from the flagman.
- When dumping large rocks, operate the dump body slowly.
- Do not load the dump body while it is still raised.
- When carrying out inspection with the dump body raised, always use the safety pins, set the dump lever to the HOLD position and lock it securely. For details, see "SAFETY PIN (PAGE 3-35)".



Operate the dump body as follows.

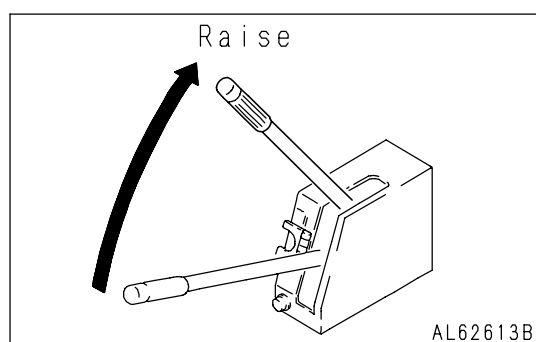
1. Place shift lever (1) at the N position, and set parking brake valve lever (2) to the PARKING position.



2. Move dump lever (3) to the RAISE position, then depress the accelerator pedal to raise the dump body.

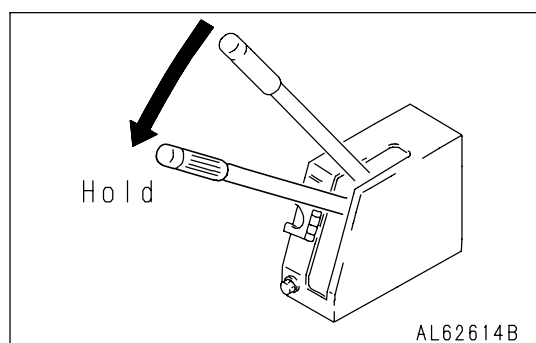
If the dump lever is released when it is at the RAISE position, it is held at the RAISE position and the dump body will continue to rise.

The dumping speed increases in proportion to the engine speed.

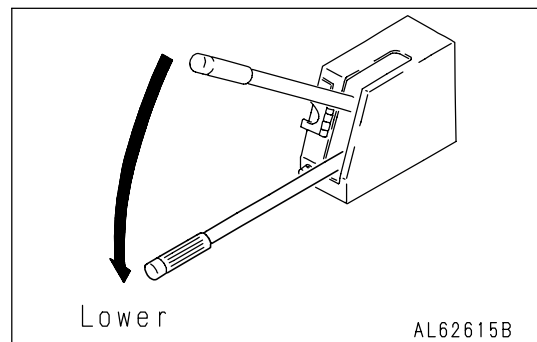


3. When the dump body rises to the previously set position (dump body positioner adjustment position), dump lever (3) is returned to the HOLD position. The dump body is then held at that position.

If it is necessary to raise the dump body further, move dump lever (3) back to the RAISE position and the dump body will rise. If dump lever (3) is released when doing this, it will return to the HOLD position and the dump body will stop at that position.

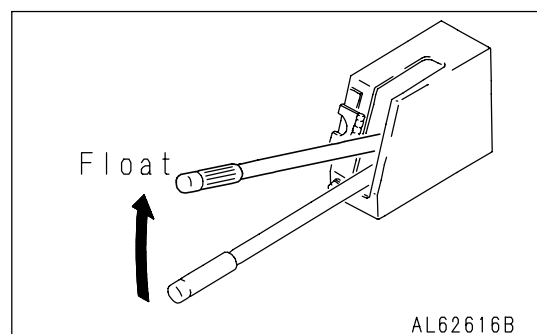


4. When dump lever (3) is moved to the LOWER position, the dump body will start to move down.



5. When the dump body has moved down a certain distance, move dump lever (3) to the FLOAT position. (When the lever is released, it will return to the FLOAT position.) The dump body will then move down under its own weight.

In the dump body raising operation, slow down the engine speed when the dump body has risen near the maximum angle to avoid any impact load on the hydraulic circuit or hoist cylinders.



When the dump body has risen, the speed range is locked to 2nd if shift lever is at the D position. While traveling, lower the dump body.

## PRECAUTIONS FOR OPERATION

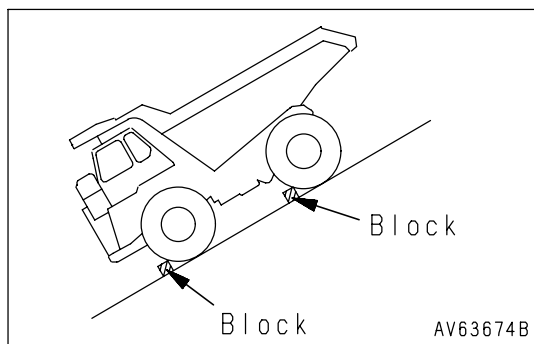
- When traveling on roads in rain or snow, or when traveling on muddy or soft ground, consider the loaded condition of the machine and be extremely careful not to let the tires slip or the machine spin and sink into the ground.
- If the engine should stop when the machine is traveling, stop the machine immediately, then move the gear shift lever to the N position, and start the engine again.
- If the central warning lamp and pilot lamp for any EMERGENCY item on the machine monitor should flash and the buzzer sounds during operation, stop the machine immediately and investigate the cause.  
For details, see "TROUBLESHOOTING (PAGE 3-104)".
- When loading, be careful to load the dump body uniformly, and be particularly careful to avoid loading too much at the front.
- On slippery road surfaces, apply the retarder control lever slowly and shift the transmission down to prevent the rear wheels from locking.
- When traveling through pools of water, water may get inside the front brakes and cause a big drop in the braking force, so drive carefully in such areas. If water should get into the brakes, apply the brakes several times while traveling to produce friction heat between the pad and disc to remove the water.

## PARKING MACHINE



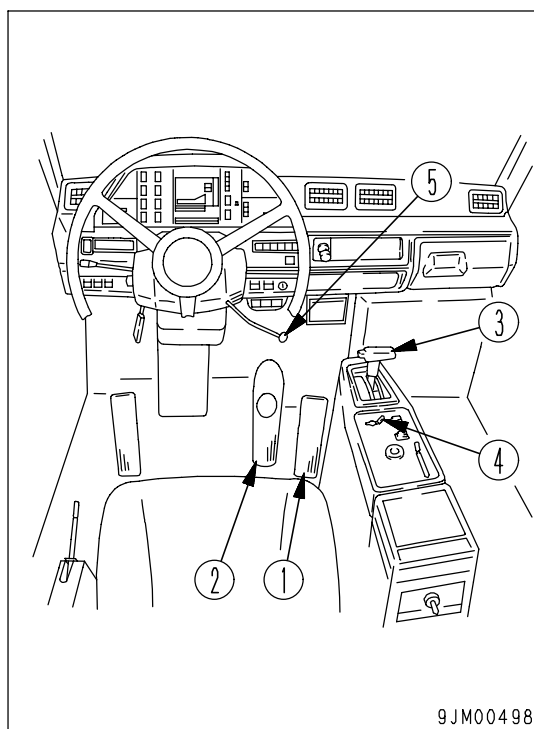
### WARNING

- Avoid stopping suddenly. Give yourself ample room when stopping.
- Park the machine on firm, horizontal ground.  
Do not park the machine on a slope.  
If it is unavoidably necessary to park the machine on a slope, put blocks under the tires to prevent the machine from moving and set parking brake valve lever to the PARKING position.
- If the shift lever is touched by mistake, the machine may move suddenly, and this may lead to a serious injury or death. Before leaving the operator's compartment, always set the parking brake valve lever securely to the PARKING position.
- The retarder must not be used as a parking brake.
- Do not use the retarder for long-term parking, regardless of the engine speed.

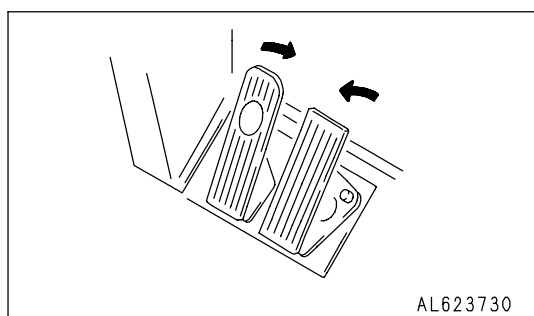


### CAUTION

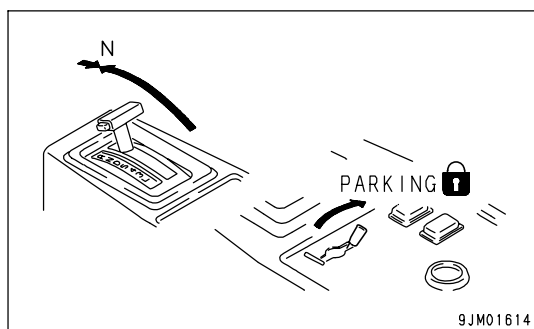
To prevent damage to the parking brake, apply the parking brake only when parking the machine.



1. Release accelerator pedal (1), then depress brake pedal (2) to stop the machine.



2. Move shift lever (3) to the N position, then move parking brake valve lever (4) to the PARKING position to apply the parking brake.

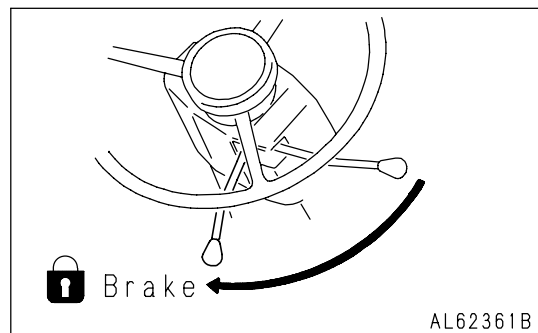




3. When in the operator's compartment, pull retarder control lever (5) fully to apply the retarder.

**NOTICE**

- The retarder must not be used as a parking brake.
- Do not use the retarder for long-term parking, regardless of the engine speed.



**CHECKS AFTER COMPLETION OF WORK**

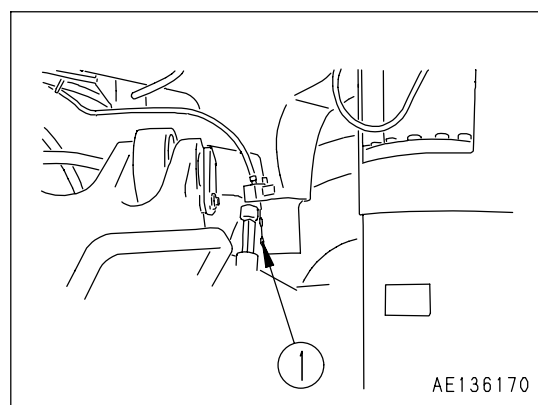
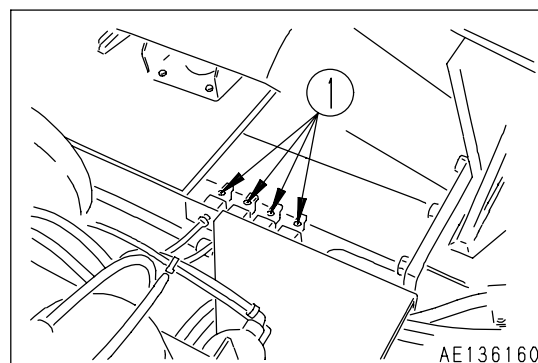
Use the machine monitor to check the engine water temperature, engine oil pressure, and fuel level. If the engine has overheated, do not stop the engine suddenly. Run it at a mid-range speed to cool it gradually before stopping.

**DRAIN WATER FROM AIR TANK**

1. After starting the engine, pull ring (1) of the tank drain valve to drain the water from the tank.
2. Carry out the same operation after completing work.

**NOTICE**

In cold areas, there is danger of the water freezing, so drain the water from the air tank after operations when it is still warm.



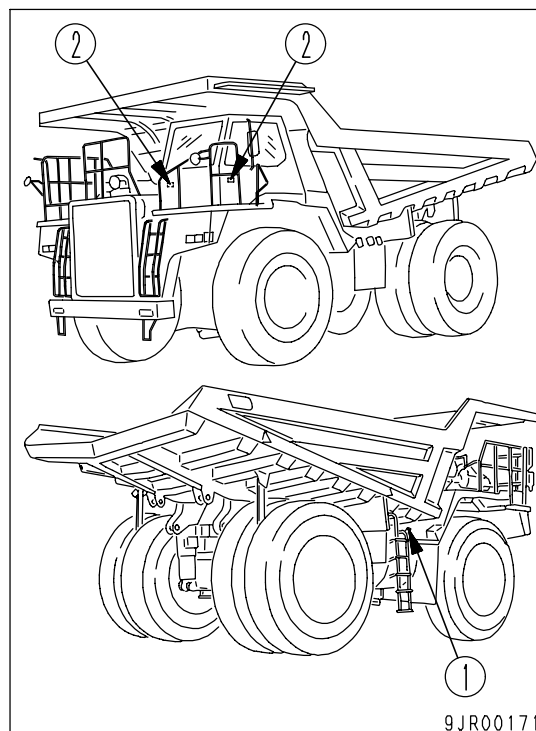
## LOCKING

Always lock the following places.

- (1) Fuel filler cap of fuel tank
- (2) Cab door (left, right)

### REMARK

The starting switch key is used for locking places (1) and (2).



## HANDLING TIRES

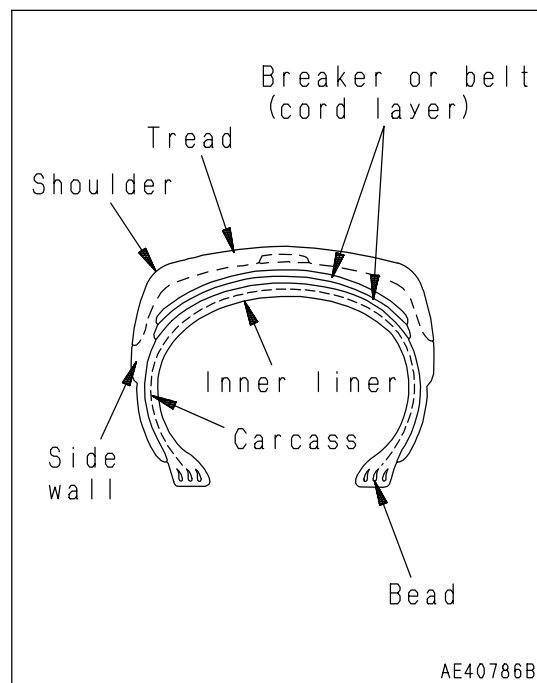
### PRECAUTIONS WHEN HANDLING TIRES



#### WARNING

To ensure safety, the defective tires given below must be replaced with new tires.

- Tires where the bead wire has been cut, broken, or greatly deformed
- Excessively worn tires where more than 1/4 of the circumference of the carcass ply (excluding the breaker) is exposed
- Tires where damage to the carcass exceeds 1/3 of the tire width
- Tires where ply separation has occurred
- Tires where radial cracks extend to the carcass
- Tires where there is abnormal deterioration, deformation, and damage, and the tire cannot withstand use.



Please contact your Komatsu distributor when replacing the tires. It is dangerous to jack up the machine without taking due care.

### T.Km.P.H (Ton-Km-Per-Hour Rating)

Tires for construction equipment are used under severe conditions that bear no comparison with the tires used on cars, buses, or ordinary trucks, so they are specially designed to withstand these conditions.

Compared with ordinary tires, far greater heat is produced in the rubber internal parts of off-road tires when the machine is traveling. If they are used continuously under conditions which exceed the permitted load and travel speed of the tire, the internal temperature will exceed the limit, and the rubber may become soft and heat separation occur.

To prevent such problems from occurring, the T.Km.P.H. is used as a standard to allow the machine to travel safely. If operations are carried out which exceed the T.Km.P.H. of the tire (when the T.Km.P.H. of the work exceeds the T.Km.P.H. of the tires), tire trouble will occur more frequently. In such cases, do as follows.

- Make the operating conditions easier so that the operation T.Km.P.H. of the work is lowered.
- Increase the size of the tires to a tire with a high T.Km.P.H.

**TIRE T.Km.P.H.AND MAXIMUM SPEED FOR CONTINUOUS TRAVEL (REFERENCE)**

	Tire T.Km.P.H. for ambient temperature				Max. speed for continuous travel for each ambient temperature				
	16°C	27°C	38°C	49°C		16°C	27°C	38°C	49°C
Size: 27.00R49 ★ ★ (standard) Structure: GP Code No.: E4 (TRA)	648	580	513	445	When empty (front wheel standard)	40	36	32	28
					When loaded (rear wheel standard)	24	22	19	17
Size: 27.00-49-48 PR (if equipped) Structure: GP Code No.: E4 (TRA)	495	463	431	399	When empty (front wheel standard)	31	29	27	25
					When loaded (rear wheel standard)	19	17	16	15
Size: 27.00-49-48 PR (if equipped) Structure: CR Code No.: E4 (TRA)	380	358	336	313	When empty (front wheel standard)	24	22	21	19
					When loaded (rear wheel standard)	14	13	12.6	12

**METHOD OF CALCULATING WORK T.Km.P.H.**

Work T.Km.P.H. = average load per tire x average travel speed for one day

Average travel speed = round trip distance x number of round trips per day / total operating hours per day

Average load = (load when empty + load when loaded) / 2

The total operating hours per day includes the stopping time and rest periods.

\* The T.Km.P.H. in the table may differ slightly according to the tire maker, so concerning operations which require travel near the travel speed given in the table, consult your Komatsu distributor.

**PRECAUTIONS FOR LONG DISTANCE TRAVEL**

If the machine travels continuously at high speed for a long distance, there will be a marked increase in the generation of heat in the tire. This may cause premature damage to the tire, so be careful of the following points.

- Travel only when empty.
- Check the tire inflation pressure before starting for the day when the tires are cold, and adjust to the following inflation pressure.
- Do not reduce the tire inflation pressure when traveling.

Tire size	Inflation pressure
27.00R49 ★ ★ (standard)	0.69 MPa (7.00 kgf/cm <sup>2</sup> , 99.4 PSI)
27.00-49-48PR (if equipped)	0.55 MPa (5.60 kgf/cm <sup>2</sup> , 79.52 PSI)

**NOTICE**

If the tires are used when the inflation pressure is less than the value given in the table above, the rim may be damaged.

Always keep the tire inflation pressure within +0 to +0.03 MPa (0.3 kgf/cm<sup>2</sup>, 4.3 PSI) of the value in the table above.

- The maximum travel speed must be kept to less than 40 km/h (24.9 MPH). Stop for at least one hour for every one hour of travel to allow the tires and other components to cool down.
- Never travel with water or dry ballast in the tires.

## DETERMINING AND MAINTAINING TRAVEL ROAD

Determining and traveling the road in the jobsite is an extremely important factor both for reasons of safety and for reducing the cycle time. To ensure safety in operations, do as follows.

### DETERMINING TRAVEL ROAD

- As far as possible, restrict the travel road to one-way travel.
- If it is impossible to keep to one-way traffic, make the road with ample width to enable trucks traveling in opposite directions to pass each other. If it is impossible to provide a sufficient road width, provide passing places at various points along the road.
- Always design the road so that the loaded truck passes on the side closest to the hill face.
- If there are curves with poor visibility along the road, set up mirrors.
- In places where the road shoulder is weak or likely to collapse, set up a sign at a point at least 1.5 m (4 ft 11 in) from the road shoulder to warn of the danger.
- It is important to set up lighting or reflectors to enable the road to be traveled at night.
- The grade of slope should be kept within 10% (approx. 6°) as far as possible, and emergency escape points should be set up on downhill slopes in case of any brake failure.
- Make the road as straight as possible, and particularly in intermediate areas with curves, where the machine is traveling at high speed, make the radius of the curve as large as possible.
- Small S curves are particularly dangerous, so avoid such curves. The radius of the curve must be a minimum of 12 to 15 m (39 ft 4 in to 49 ft 3 in).
- Make the radius of curves as large as possible.
- Make the road wider at curves than it is in straight areas.
- Make the outside of the curve slightly higher.
- Be particularly careful to strengthen the road shoulder on the outside of curve.
- As far as possible, design the road so that no other roads cross it. In particular, if roads cross at an angle on slopes, a stepped difference is formed in the road. This is extremely dangerous, as it causes the machine to roll when traveling at high speed.
- Cut the slope face to provide a special road for the trucks.

### MAINTAINING TRAVEL ROAD

Carry out the necessary action according to the conditions to insure that the road can always be traveled safely.

- Remove any unevenness in the travel surface, sloping to the left or right, or drooping of the road shoulder. Make the road of ample strength and remove such obstacles as rocks and tree stumps.
- Maintain the road from time to time with a bulldozer or motor grader.
- Spray the road with water at suitable intervals to prevent dust from rising and reducing the visibility.

## TRANSPORTATION

### PRECAUTIONS WHEN TRANSPORTING

Always obey the traffic regulations when transporting the machine by road.



#### **WARNING**

This machine must be disassembled for transportation. When transporting the machine, please consult your Komatsu distributor.

### STEPS FOR TRANSPORTATION

As a basic rule, always transport the machine on a trailer.

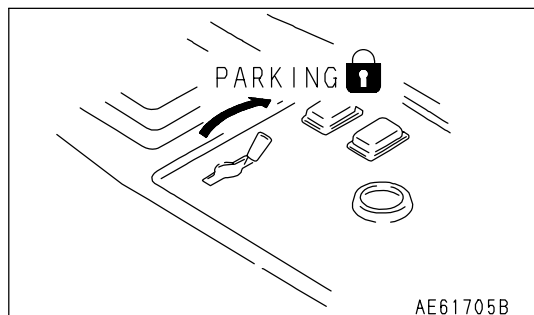
When selecting the trailer, see the weights and dimensions given in "SPECIFICATIONS (PAGE 5-2)".

Note that the specifications for the weights and dimensions for transportation differ according to the type of tires and type of dump body.

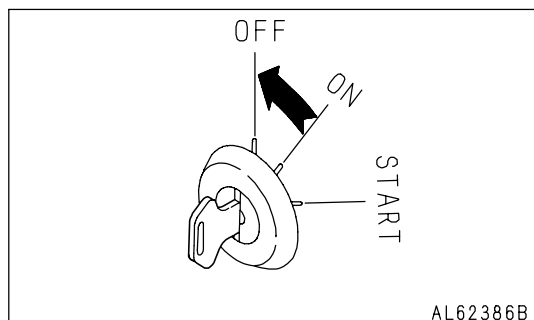
## METHOD OF SECURING MACHINE

After loading the machine in the specified position, secure it in place as follows.

1. Set the parking brake valve lever to the PARKING position to apply the parking brake.

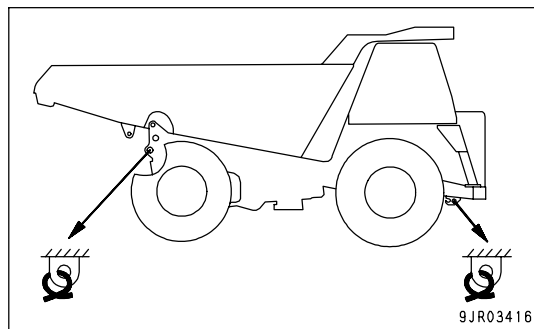


2. Turn the key in the starting switch to the OFF position to stop the engine.



3. Remove the key from the starting switch.

4. To prevent the machine from moving during transportation, insert blocks under the front and rear of each tire and secure the machine firmly in position with chains or wire rope. Be particularly careful to secure the machine firmly so that it does not slide to the side.



### NOTICE

Always retract the antenna and reassemble the mirrors so that they are within the width of the machine.

## METHOD OF LIFTING MACHINE

When lifting the machine at a port or any other place, always use the following procedure to lift it.



### WARNING

- The operator carrying out the lifting operation using a crane must be a properly qualified crane operator.
- Never raise the machine with any worker on it.
- Always make sure that the wire rope is of ample strength for the weight of this machine.
- When lifting, keep the machine horizontal.
- Always stop the engine and apply the brake before starting the lifting operation.
- Never enter the area around or under the machine when it is raised.

Never try to lift the machine in any posture other than the posture given in the procedure below or using lifting equipment other than in the procedure below.

There is a hazard that the machine may lose its balance.

### NOTICE

This method of lifting applies to the standard specification machine.

The method of lifting differs according to the attachments and options installed.

For details of the procedure for machines that are not the standard specification, please consult your Komatsu distributor.

For the weight of the standard specification machine, see "SPECIFICATIONS (PAGE 5-2)"

### NOTICE

- Use protectors to prevent the wire rope from being cut on sharp corners and to prevent the wire rope from cutting into the machine bodywork.
- When using a spreader bar, select an ample width to prevent contact with the machine.

Please consult your Komatsu distributor before carrying out lifting work.

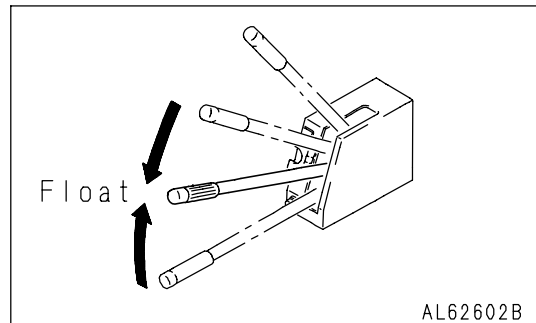


## LIFTING PROCEDURE

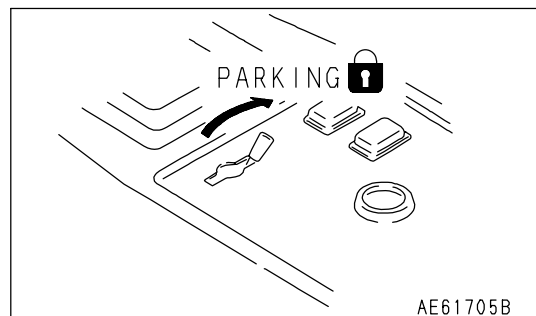
Lifting work can be carried out only with machines displaying a lifting mark.

When carrying out the lifting operation, stop the machine on firm level ground, and do as follows.

1. Start the engine, set the dump lever to the FLOAT position, and check that the body operation caution lamp goes out.



2. Stop the engine, apply the brake, and check that the area around the operator's compartment is safe.



3. Select wire ropes, slings, spreader bars and other lifting equipment to match the weight of the machine, and fit the wire ropes to the lifting positions.

### REMARK

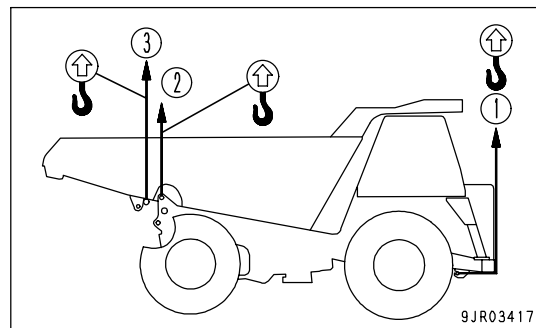
The lifting positions for the machine differs according to the conditions.

Machine with body: Positions (1) and (3)

Total: 4 places (2 at front, 2 at rear)

Machine without body: Positions (1) and (2)

Total: 4 places (2 at front, 2 at rear)



4. Fit protector blocks at the contact points between the lifting equipment and the body to prevent damage to the King equipment.
5. When the machine comes off the ground (raised 10 to 20 cm(3.9 to 7.9 in)), stop the lifting operation, check carefully that the machine is balanced and that the wire ropes are not loose, then continue the lifting operation slowly.

## COLD WEATHER OPERATION

### PRECAUTIONS FOR LOW TEMPERATURE

If the temperature becomes low, it becomes difficult to start the engine, and the coolant may freeze, 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 "RECOMMENDED FUEL, COOLANT, AND LUBRICANT (PAGE 4-9)".

### COOLANT



#### WARNING

- Antifreeze is toxic. Be careful not to get it into your eyes or on your skin. If it should get into your eyes or on your skin, wash it off with large amounts of fresh water and see a doctor at once.
- When changing the coolant or when handling coolant containing antifreeze that has been drained when repairing the radiator, please contact your Komatsu distributor or request a specialist company to carry out the operation. Antifreeze is toxic. Do not let it flow into drainage ditches or spray it onto the ground surface.
- Antifreeze is flammable. Do not bring any flame close. Do not smoke when handling antifreeze.

### NOTICE

- Use Komatsu Supercoolant wherever available, or use permanent type antifreeze coolant.
- Never use methanol, ethanol, or propanol-based antifreeze.
- Do not use any water leakage prevention agent, either alone, or in combination with antifreeze.
- Do not mix one brand of antifreeze with a different brand.

For details on the amount of antifreeze mixture and on when to change the coolant, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-21)".

**BATTERY****WARNING**

- The battery generates flammable gas. Do not bring fire or sparks near the battery.
- Battery electrolyte is dangerous. If it gets in your eyes or on your skin, wash it off with a large amount of water and consult a doctor.
- Battery electrolyte dissolves paint. If it gets on the bodywork, wash it off immediately with water.
- If the battery electrolyte is frozen, do not charge the battery or start the engine with a different power source. There is danger that the battery may explode.
- Battery electrolyte is toxic. Do not let it flow into drainage ditches or spray it on to the ground surface.

When the ambient temperature drops, the capacity of the battery will also drop. If the battery charge ratio is low, the battery electrolyte may freeze. Maintain the battery charge as close as possible to 100%. Insulate it against cold temperature to ensure the machine can be started easily the next morning.

Measure the specific gravity and calculate the rate of charge from the following conversion table.

Charging Rate (%) \ Electrolyte Temperature (°C)	20	0	-10	-20
100	1.28	1.29	1.30	1.31
90	1.26	1.27	1.28	1.29
80	1.24	1.25	1.26	1.27
75	1.23	1.24	1.25	1.26

When adding distilled water in cold weather, add it before starting operations in the morning to prevent the electrolyte from freezing.

**INSTALLATION OF RADIATOR CURTAIN**

(If equipped)

If the engine water temperature gauge does not enter the green range, install a radiator curtain. The amount that the radiator curtain is opened can be adjusted from fully closed, to one window open or two windows open. Adjust the amount of opening according to the ambient temperature so that the engine water temperature gauge enters the green range.

**PRECAUTIONS AFTER COMPLETION OF WORK**

To prevent mud, water, or the undercarriage from freezing and making it impossible for the machine to move on the following morning, observe the following precautions.

- Mud and water on the machine body should be completely removed. This is to prevent damage to the seal caused by water in mud or dirt getting inside the seal and freezing.
- Park the machine on hard, dry ground.

If this is impossible, park the machine on wooden boards.

The boards help protect the tires from being frozen in soil and the machine can start next morning.

- Bleed the air from the tank to prevent moisture from collecting inside the tank.
- Open the drain valve and drain any water collected in the fuel system to prevent it from freezing.
- As the battery capacity drops markedly in low temperatures, cover the battery or remove it from the machine, keep it in a warm place, and install it again the next morning.
- If the electrolyte level is low, add distilled water in the morning before beginning work. Do not add water after the day's work to prevent diluted electrolyte in the battery from freezing during the night.

## **AFTER COLD WEATHER**

When the season changes and the weather becomes warmer, do as follows.

- Replace the fuel and oil for all parts with oil of the viscosity specified.  
For details, see "RECOMMENDED FUEL, COOLANT, AND LUBRICANT (PAGE 4-9)".

## LONG-TERM STORAGE

### BEFORE STORAGE

When keeping in long-term storage (more than one month), store as follows.

- After every part is washed and dried, house the machine in a dry building. Never leave it outdoors.  
In case it is indispensable to leave it outdoors, park the machine on the flat ground and cover it with canvas etc.
- Completely fill the fuel tank. This prevents moisture from collecting.
- Lubricate and change the oil before storage.
- Coat the exposed portion of the hydraulic cylinder piston rod with grease.
- Disconnect the negative terminals of the battery and cover it or remove it from the machine and store it separately.
- Lock the dump lever at the HOLD position with the safety lock, and apply the parking brake.
- Set the tire inflation pressure for each tire to within the range of the specified inflation pressure for the type of tire.
- Open the drain valve of the air tank, release the air, then tighten the drain valve again.
- Push the retarder control lever forward to the OFF position.
- Place the gear shift lever at the N position and turn the starting switch OFF.
- To prevent corrosion, be sure to fill the cooling system with Supercoolant (AF-NAC) or permanent type antifreeze (density between 30% and 68%).

### DURING STORAGE



#### WARNING

If it is necessary to perform the rust-prevention operation while the machine is indoors, open the doors and windows to improve ventilation and prevent gas poisoning.

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

Before operating the work equipment, wipe off all the grease from hydraulic piston rods.

### AFTER STORAGE

#### NOTICE

If the machine has been stored without carrying out the monthly rust-prevention operation, consult your Komatsu distributor before using it.

When using the machine after long-term storage, do as follows before using it.

- Wipe off the grease from the hydraulic cylinder rods.
- Add oil and grease at all lubrication points.
- When the machine is stored for a long period, moisture in the air will mix with the oil. Check the oil before and after starting the engine. If there is water in the oil, change all the oil.

### PRECAUTIONS BEFORE TRAVELING AFTER LONG-TERM STORAGE

1. Check all the oil and water levels before traveling.
2. When traveling after long-term storage, travel forward at a speed of 10 to 15 km/h (6.2 to 9.3 MPH) for 5 minutes or 1 km to run the machine in, then change to normal travel.

## TROUBLESHOOTING

### AFTER RUNNING OUT OF FUEL

When starting after running out of fuel, fill with fuel, then bleed the air from the fuel system before starting. For details of the method of bleeding the air, see REPLACE FUEL FILTER CARTRIDGE (PAGE 4-55).

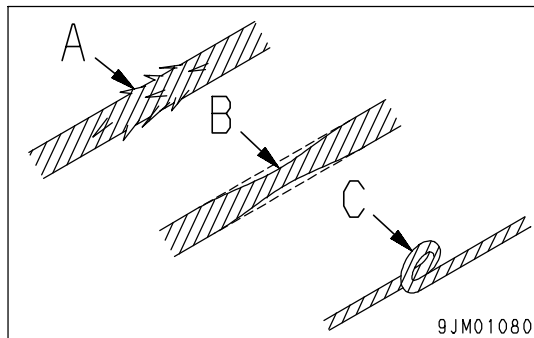
### METHOD OF TOWING MACHINE



#### WARNING

Injury or death could result if a disabled machine is towed incorrectly or if there is a mistake in the selection of the wire rope or drawbar.

- Always confirm that the wire rope or drawbar used for towing has ample strength for the weight of the machine being towed.
- Never use a wire rope which has cut strands (A), reduced diameter (B), or kinks (C). There is danger that the rope may break during the towing operation.
- Always wear leather gloves when handling wire rope.
- Never tow a machine on a slope.
- Never go between the towing machine and the towed machine during the towing operation.
- If the machine moves suddenly, a load is applied suddenly to the towing wire or drawbar, and the towing wire or drawbar may break. Move the machine gradually to a constant speed.
- Be extremely careful if there is a failure in the engine or brake system: the brakes will not work.
- If the steering and the brakes on the disabled machine cannot be operated, do not let anyone ride on the disabled machine.



#### NOTICE

- The permissible towing capacity for this machine is 491935N (50163 kg). Do not tow any load greater than this.
- Towing is only permitted in order to move a disabled machine to a place where it is possible to carry out inspection and maintenance. It must not be towed for long distances.
- Please consult your Komatsu distributor for information about towing a disabled machine.

This machine must not be towed except in emergencies. When towing the machine, take the following precautions.

- When towing a machine, tow it at a low speed of less than 2 km/h (1.2 MPH), and for a distance of a few meters to a place where repairs can be carried out. The machine should be towed only in emergencies. If the machine must be moved long distances, use a transporter.
- Use a towing machine 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 machines on slopes or on the tow road.
- Use the specified hook for both the towing machine and the machine being towed.
- To protect the operator if the towing wire or towing bar breaks, install protective plates on both the towing machine and the machine being towed.
- There are towing hooks installed to the bottom of the front frame and to the rear axle. Do not use any other place as a towing hook.
- When fitting the towing wire, check the condition of the hook to make sure that there is no problem.
- Keep the angle of the towing wire as small as possible.

Keep the angle between the center lines of the two machines to within 30 degrees.

- 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.

- If the pressure in the air tank has dropped abnormally because of leakage of air from the air circuit, the parking brake and emergency brake are applied, so release both brakes before towing the machine.
- Before releasing the parking brake, always put blocks under all four wheels. If the wheels are not blocked, there is danger that the machine may move.

Connect with the towing wire or drawbar, and remove the blocks from the wheels when the disabled machine is in a condition where it cannot run away.

- When carrying out the operation to release the parking brake, check that the surrounding area is safe.
- If the parking brake is released, the brakes will not work, so pay careful attention to safety.
- When towing down a slope, use two towing machines. One machine should be uphill from the disabled machine and should be connected with towing wire or a drawbar to pull the disabled machine back and keep it stable. The other machine should tow the disabled machine downhill.

## WHEN ENGINE RUNS

- 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.
- Check the effect of the brakes, and if the brakes do not work properly, take the action given in "When engine does not run".
- Check if it is possible to steer the machine. If the machine cannot be steered, follow the procedure given in "WHEN ENGINE DOES NOT RUN".
- The operator should sit on the machine being towed and operate the steering in the direction that the machine is towed.
- Always run the engine to allow the steering and brakes to be used.

## WHEN ENGINE DOES NOT RUN

- The brakes will not work, so be extremely careful.
- Connect the towing machine securely to the towed machine. Use two towing machines of the same class or larger than the machine being towed: connect one machine each to the front and rear of the machine being towed.
- If it is necessary to change the direction of the machine being towed, it is possible to use the emergency steering, but it can be used for a maximum of only 90 seconds.
- If the emergency steering cannot be used, disconnect two hydraulic hoses each on the left and right from the steering cylinders, then carry out the towing operation. When removing the hoses, block the hoses with plugs and fit oil containers to the mouthpiece of the cylinder to prevent oil from draining to the ground.



## RELEASE METHOD WHEN PARKING BRAKE AND EMERGENCY BRAKE HAVE BEEN ACTUATED IN EMERGENCY

If the pressure in the air tank has dropped abnormally because of leakage of air from the air circuit, the parking brake and emergency brake are applied automatically. After emergency actuation of the brakes, if they are not released, release the brakes as follows.

### METHOD OF RELEASING PARKING BRAKE

Please ask your Komatsu distributor to release the parking brake.

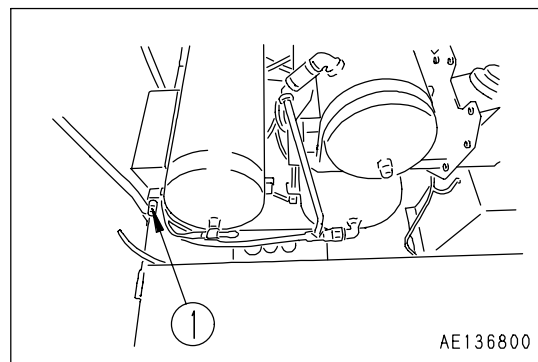


## WARNING

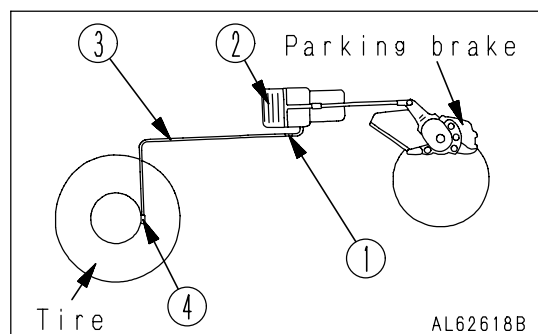
- If there is a failure in the air circuit, the brakes will not work. It is dangerous to drive the machine in this condition, so always tow the machine at low speed. When towing, run the engine so that it is possible to steer the machine.
- When releasing the parking brake, carry out the operation on flat ground and check that the surrounding area is safe. If the parking brake must be released on a slope because of an emergency or some other unavoidable reason, put blocks under the wheels before releasing the brake.

After emergency actuation of the parking brake, if the parking brake is not released even when the parking brake valve lever is placed at the TRAVEL position, release the parking brake as follows.

1. Remove air charge socket (1) installed to the front air tank.



2. Remove the air hose from parking brake chamber (2), then install removed socket (1) to chamber (2).
3. Install one end of air charge hose (3) (supplied with the machine) to air charge socket (1). (The hose and socket can be installed at a touch.)
4. Push the other end of air charge hose (3) into valve (4) of the tire. Air is supplied to the parking brake chamber, and the parking brake is released.



5. When the parking brake is released, tow the machine immediately to a safe position. For details of the method of towing, see "METHOD OF TOWING MACHINE (PAGE 3-104)".

## METHOD OF RELEASING EMERGENCY BRAKE

Please ask your Komatsu distributor to release the emergency brake.

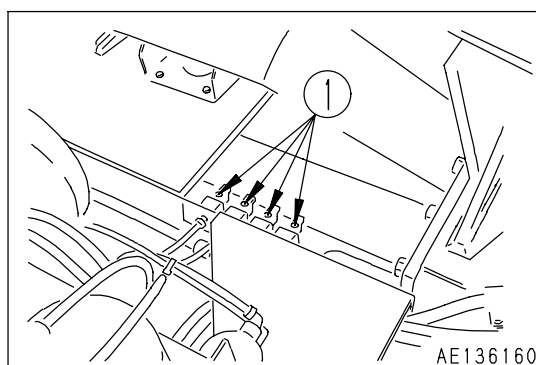


### WARNING

- When the emergency brake has been actuated, never drive the machine. This will cause burning out of the brake disc or lining, or failure of the torque converter or transmission.
- When releasing the air pressure from the emergency brake tank, check that the surrounding area is safe, and always put blocks under the tires before starting the operation.

After actuation of the emergency brake, if the emergency brake is not released when the emergency brake lever is placed at the TRAVEL position, release the emergency brake as follows.

1. When the preparations for towing the machine are completed, pull rings (1) of the air tank drain valve (4 places), and release the air pressure to release the emergency brake.
2. After releasing the emergency brake, release rings (1).



## IF BATTERY IS DISCHARGED



### WARNING

- It is dangerous to charge a battery when mounted on a machine. Make sure that it is dismantled before charging.
- When checking or handling the battery, stop the engine and turn the starting switch key to the OFF position.
- The battery generates hydrogen gas, so there is a hazard of explosion. Do not bring lighted cigarettes near the battery, or do anything that will cause sparks.
- Battery electrolyte is dilute sulfuric acid, and it will attack your clothes and skin. If it gets on your clothes or on your skin, immediately wash it off with a large amount of water. If it gets in your eyes, wash it out with fresh water and consult a doctor.
- When handling batteries, always wear safety glasses and rubber gloves.
- When removing the battery, first disconnect the cable from the ground (normally the negative (-) terminal). When installing, install the positive (+) terminal first.

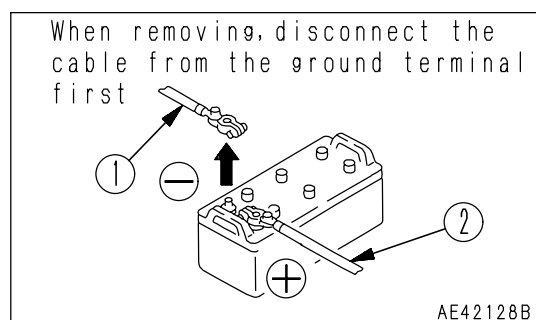
If a tool touches the positive terminal and the chassis, there is danger that it will cause a spark, so be extremely careful.

- If the terminals are loose, there is danger that the defective contact may generate sparks that will cause an explosion.
- When removing or installing the terminals, check which is the positive (+) terminal and which is the negative (-) terminal.

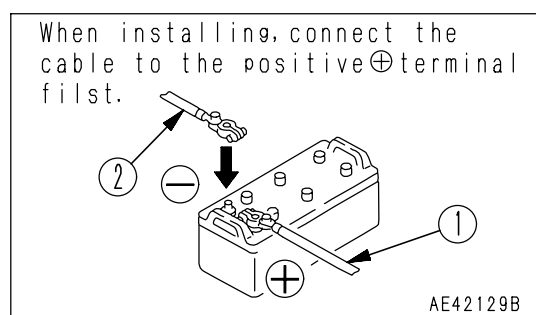
## REMOVAL AND INSTALLATION OF BATTERY

- Before removing the battery, remove the ground cable (normally connected to the negative (-) terminal).

If any tool touches between the positive terminal and the chassis, there is a hazard of sparks being generated.



- When installing the battery, connect the ground cable last.



## PRECAUTIONS FOR CHARGING BATTERY

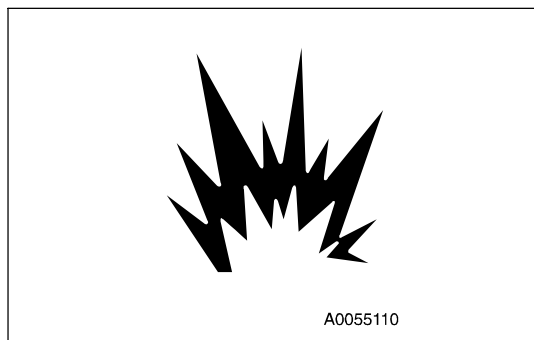
### CHARGING BATTERY WHEN MOUNTED ON MACHINE

When charging the battery, if the battery is not handled correctly, there is danger that the battery may explode. Always follow the instructions in "IF BATTERY IS DISCHARGED (PAGE 3-109)" and the instruction manual accompanying the charger, and do as follows.

- Set the voltage of the charger to match the voltage of the battery to be charged. If the correct voltage is not selected, the charger may overheat and cause an explosion.
- Connect the positive (+) charger clip of the charger to the positive (+) terminal of the battery, then connect the negative (-) charger clip of the charger to the negative (-) terminal of the battery. Be sure to attach the clips securely.
- Set the charging current to 1/10 of the value of the rated battery capacity; when carrying out rapid charging, set it to less than the rated battery capacity.

If the charger current is too high, the electrolyte will leak or dry up, and this may cause the battery to catch fire and explode.

- If the battery electrolyte is frozen, do not charge the battery or start the engine with a different power source. There is a danger that this will ignite the battery electrolyte and cause the battery to explode.
- Do not use or charge the battery if the battery electrolyte level is below the LOWER LEVEL line. This may cause an explosion. Check the battery electrolyte level periodically and add distilled water to bring the electrolyte level to the UPPER LEVEL line.



## STARTING ENGINE WITH BOOSTER CABLE

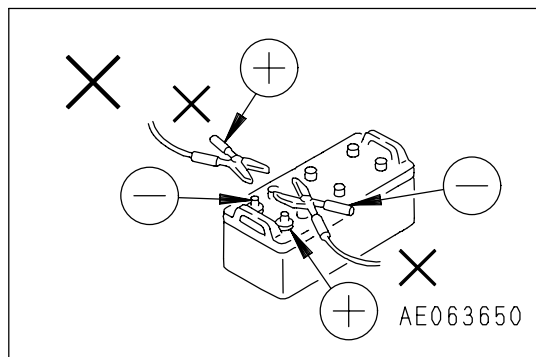
When starting the engine with a booster cable, do as follows:

### PRECAUTIONS WHEN CONNECTING AND DISCONNECTING BOOSTER CABLE



#### WARNING

- When connecting the cables, never contact the positive (+) and negative (-) terminals.
- When starting the engine with a booster cable, wear safety glasses and rubber gloves.
- Be careful not to let the normal machine and problem machine contact each other. This prevents sparks from generating near the battery which could ignite the hydrogen gas given off by the battery.
- Make sure that there is no mistake in the booster cable connections. The final connection is to the engine block of the problem machine, but sparks will be generated when this is done, so connect to a place as far as possible from the battery.
- When disconnecting the booster cable, take care not to bring the clips in contact with each other or with the machine body.



### NOTICE

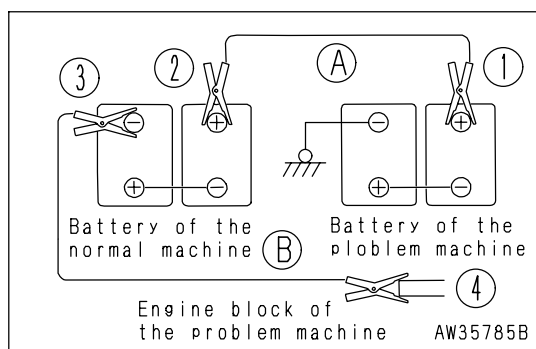
- The size of the booster cable and clip should be suitable for the battery size.
- The battery of the normal machine must be the same capacity as that of the problem machine.
- Check the cables and clips for damage or corrosion.
- Make sure that the cables and clips are firmly connected.

### CONNECTING THE BOOSTER CABLES

Keep the starting switch of the normal machine and problem machine in the OFF position.

Connect the booster cable as follows, in the order of the numbers marked in the diagram.

1. Connect one clip of booster cable (A) to the positive (+) terminal of the problem machine.
2. Connect the other clip of booster cable (A) to the positive (+) terminal of the normal machine.
3. Connect one clip of booster cable (B) to the negative (-) terminal of the normal machine.
4. Connect the other clip of booster cable (B) to the engine block of the problem machine.



## STARTING THE ENGINE

**CAUTION**

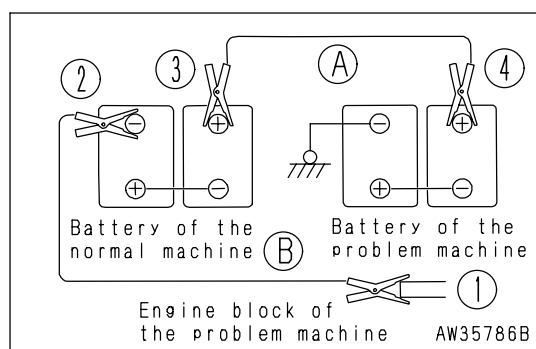
Make sure that the parking brake valve lever is at **PARKING** position and the shift lever is at **N (neutral)** position for both normal machine and the problem machine.

1. Make sure the clips are firmly connected to the battery terminals.
  2. Start engine of the normal machine and run it at high idle speed.
  3. Turn the starting switch of the problem machine to the **START** position and start the engine.
- If the engine doesn't start at first, try again after 2 minutes or so.

**DISCONNECTING THE BOOSTER CABLES**

After the engine has started, disconnect booster cables in the reverse order in which they were connected.

1. Remove one clip of booster cable (B) from the engine block of the problem machine.
2. Remove the other clip of booster cable (B) from the negative (-) terminal of the normal machine.
3. Remove one clip of booster cable (A) from the positive (+) terminal of the normal machine.
4. Remove the other clip of booster cable (A) from the positive (+) terminal of the problem machine.



## OTHER TROUBLE

### ELECTRICAL SYSTEM

- ( ): Always contact your Komatsu distributor when dealing with these items.
- In cases of problems or causes which are not listed below, contact your Komatsu distributor for repairs.

Problem	Main causes	Remedy
Lamp does not glow brightly even when engine runs at high speed	• Defective wiring	( • Check, repair loose terminals, disconnections) • Charge, add distilled water • Adjust alternator belt tension See EVERY 250 HOURS SERVICE.
Lamp flickers while engine is running	• Insufficient battery charge • Defective adjustment of belt tension	
Charge monitor lights up while running is engine	• Defective alternator • Defective wiring	( • Replace) ( • Check, repair)
Abnormal noise is generated from alternator	• Defective alternator	( • Replace)
Starting motor does not turn when starting switch is turned to START	• Defective wiring • Defective starting switch • Insufficient battery charge • Defective battery switch	( • Check, repair) ( • Replace switch) • Charge ( • Replace switch)
Starting motor turns engine sluggishly	• Defective wiring • Insufficient battery charge	( • Check, repair) • Charge
Starting motor disengages before engine starts	• Defective wiring • Insufficient battery charge	( • Check, repair) • Charge

## CHASSIS

- ( ): Always contact your Komatsu distributor when dealing with these items.
- In cases of problems or causes which are not listed below, contact your Komatsu distributor for repairs.

Problem	Main causes	Remedy
Torque converter oil temperature monitor lamp flashes	<ul style="list-style-type: none"> <li>• Leakage of oil or entry of air due to damage or defective tightening of oil pipe, pipe joint</li> <li>• Wear, scuffing of gear pump</li> <li>• Insufficient oil in transmission case</li> <li>• Loose fan belt</li> <li>• Clogged oil cooler</li> <li>• Long distance traveled in torque converter range</li> <li>• Disconnected, broken wiring to sensor</li> </ul>	<ul style="list-style-type: none"> <li>( • Check, repair)</li> <li>( • Check, repair)</li> <li>• Add oil to specified level. See CHECK BEFORE STARTING.</li> <li>• Replace belt. See EVERY 500 HOURS SERVICE.</li> <li>( • Clean or replace)</li> <li>• Drive in direct range</li> <li>( • Repair, connect wiring)</li> </ul>
Steering wheel is heavy	<ul style="list-style-type: none"> <li>• Lack of grease at link</li> <li>• Internal leakage inside steering cylinder</li> </ul>	<ul style="list-style-type: none"> <li>• Add grease</li> <li>( • Replace cylinder seal)</li> </ul>
Steering wheel pulls	<ul style="list-style-type: none"> <li>• Tire inflation pressure not uniform on left and right</li> <li>• Dragging, pulling of front brake</li> </ul>	<ul style="list-style-type: none"> <li>• Make tire inflation pressure uniform. See CHECK BEFORE STARTING.</li> <li>• Check wear of front brake pad. For details, see EVERY 500 HOURS SERVICE.</li> </ul>
Braking effect is poor when brake pedal is depressed	<ul style="list-style-type: none"> <li>• Pad has reached wear limit</li> <li>• Rear disc has reached wear limit</li> <li>• Insufficient air pressure</li> <li>• Insufficient brake oil</li> </ul>	<ul style="list-style-type: none"> <li>( • Replace pad)</li> <li>( • Replace disc)</li> <li>• Charge to specified pressure</li> <li>• Add brake oil. See CHECK BEFORE STARTING.</li> <li>• Bleed air. See WHEN REQUIRED.</li> </ul>
Brake pulls to one side	<ul style="list-style-type: none"> <li>• Air in brake circuit</li> </ul>	<ul style="list-style-type: none"> <li>• Bleed air. See WHEN REQUIRED.</li> </ul>
Dump body speed is slow	<ul style="list-style-type: none"> <li>• Defective gear pump</li> <li>• Insufficient oil</li> </ul>	<ul style="list-style-type: none"> <li>( • Replace gear pump)</li> <li>• Add oil to specified level. See CHECK BEFORE STARTING.</li> </ul>
Suspension is hard	<ul style="list-style-type: none"> <li>• Entry of soil or sand due to breakage of dust seal, gas leakage due to breakage of U-packing</li> <li>• Gas leaking from valve core</li> </ul>	<ul style="list-style-type: none"> <li>( • Replace U-packing)</li> <li>( • Replace valve core)</li> </ul>
Rear wheel on one side tends to slip	<ul style="list-style-type: none"> <li>• Air in rear brake circuit (between slack adjuster and rear brake)</li> <li>• Excessive difference in wear between left and right tires</li> <li>• Excessive difference in division of load between left and right wheels (unbalanced load)</li> <li>• Excessive deformation of disc</li> </ul>	<ul style="list-style-type: none"> <li>• Bleed air from rear brakes (left, right). See WHEN REQUIRED.</li> <li>( • Replace tires)</li> <li>• Make load uniform</li> <li>( • Disassemble and adjust brake)</li> </ul>



### **IF ACCELERATOR PEDAL HAS FAILED**

In addition to the potentiometer detecting the pedal depression depth, the check switch is installed on the accelerator pedal assembly in order to detect whether the accelerator pedal is depressed or not.

If the pedal depression depth is not detected correctly due to a failure of the accelerator pedal or incorrect electric wiring, the engine controller or PMC (if equipped) controls the engine speed responding to the signal from this check switch. The engine runs at 1400 rpm when the accelerator pedal is depressed, while the engine runs at low idling when the pedal is released. The engine speed varies depending on the load.

After moving the machine to a safe place by operating the accelerator pedal, check the service code, then contact your Komatsu distributor for repairs.

There are two methods when operating the accelerator pedal: either release the pedal and set to the OFF (low idling) position, or depress the pedal fully (1400 rpm).

If the accelerator pedal is held at an intermediate position, the system may not be able to judge if the accelerator pedal is being operated or not.

### **REMARK**

If the engine controller or PMC (if equipped) can not receive the signal of the accelerator pedal depth, the central warning lamp flashes and simultaneously the alarm buzzer sounds and user code 02 appears.

**ENGINE**

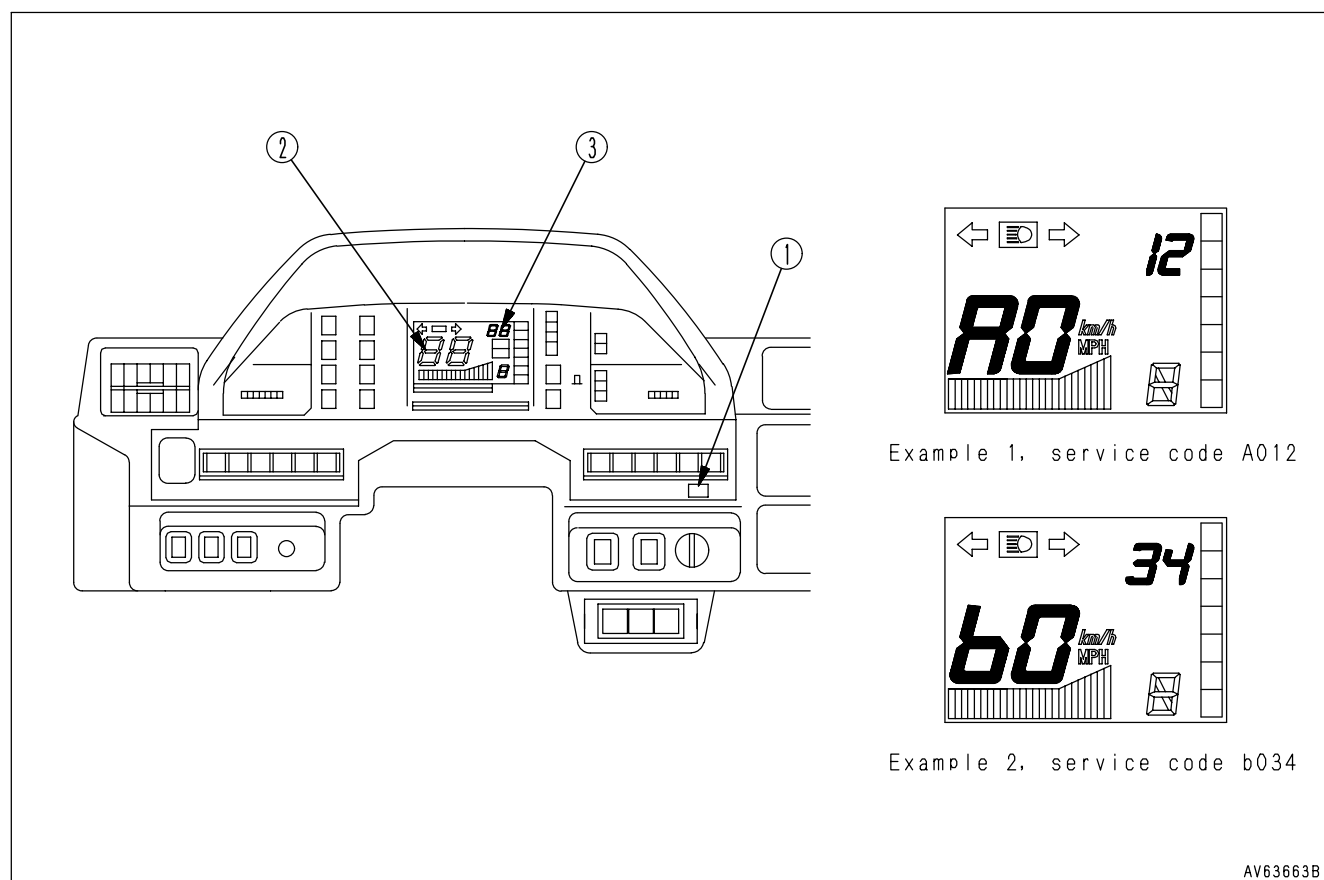
- ( ): Always contact your Komatsu distributor when dealing with these items.
- In cases of problems or causes which are not listed below, contact your Komatsu distributor for repairs.

Problem	Main causes	Remedy
Engine oil pressure monitor lights up	<ul style="list-style-type: none"> <li>• Insufficient oil in oil pan</li> <li>• Clogged oil filter cartridge</li> <li>• Oil leakage due to damage caused by defective tightening of oil pan, pipe joint</li> <li>• Disconnection, broken wiring to sensor</li> </ul>	<ul style="list-style-type: none"> <li>• Add oil to specified level. See CHECK BEFORE STARTING.</li> <li>• Replace cartridge, see EVERY 500 HOURS SERVICE</li> <li>( • Check, repair)</li> <li>( • Repair, connect wiring)</li> </ul>
Steam spurts out from top of radiator (pressure valve)	<ul style="list-style-type: none"> <li>• Insufficient coolant, water leakage</li> <li>• Loose fan belt</li> </ul>	<ul style="list-style-type: none"> <li>• Check, add cooling water. See CHECK BEFORE STARTING.</li> <li>• Replace belt. See EVERY 500 HOURS SERVICE.</li> </ul>
Radiator cooling water level monitor lights up	<ul style="list-style-type: none"> <li>• Dirt or scale accumulated in cooling system</li> <li>• Radiator fins clogged or damaged</li> </ul>	<ul style="list-style-type: none"> <li>• Change coolant, clean inside of cooling system. See WHEN REQUIRED.</li> <li>• Clean or repair. See EVERY 500 HOURS SERVICE.</li> </ul>
Water temperature gauge is in red range	<ul style="list-style-type: none"> <li>• Defective water temperature gauge</li> <li>• Defective thermostat</li> </ul>	<ul style="list-style-type: none"> <li>( • Replace water temperature gauge)</li> <li>( • Replace thermostat)</li> </ul>
Engine water temperature monitor flashes	<ul style="list-style-type: none"> <li>• Defective thermostat seal</li> <li>• Loose radiator filler cap</li> <li>• Disconnection, broken wiring to sensor</li> </ul>	<ul style="list-style-type: none"> <li>( • Replace thermostat seal)</li> <li>• Tighten or replace cap.</li> <li>( • Repair, connect wiring)</li> </ul>
Water temperature gauge display stays at lowest level and does not rise	<ul style="list-style-type: none"> <li>• Defective water temperature gauge monitor</li> <li>• Defective thermostat</li> <li>• In cold weather, cold wind is blowing strongly against engine</li> </ul>	<ul style="list-style-type: none"> <li>( • Replace water temperature gauge monitor)</li> <li>( • Replace thermostat)</li> <li>( • Install radiator curtain)</li> </ul>
Engine does not start even when starting motor is cranked	<ul style="list-style-type: none"> <li>• Insufficient fuel</li> <li>• Air in fuel system</li> <li>• No fuel in fuel filter</li> <li>• Starting motor cranks engine too slowly</li> <li>• Starting motor does not turn</li> <li>• Defective valve clearance (defective compression)</li> </ul>	<ul style="list-style-type: none"> <li>• Add fuel. See CHECK BEFORE STARTING.</li> <li>( • Repair place where air is leaking in)</li> <li>• Fill filter with fuel. See EVERY 500 HOURS SERVICE.</li> <li>• See electrical components</li> <li>• See electrical components</li> <li>( • Adjust valve clearance)</li> </ul>
Fuel stops from time to time	<ul style="list-style-type: none"> <li>• Crushed fuel tank breather tube</li> </ul>	<ul style="list-style-type: none"> <li>( • Replace breather tube)</li> </ul>

Problem	Main causes	Remedy
Excessive oil consumption	<ul style="list-style-type: none"> <li>• Oil leakage</li> <li>• Excessive oil in oil pan</li> </ul>	<ul style="list-style-type: none"> <li>( • Check, repair)</li> <li>• Add oil to specified level. See CHECK BEFORE STARTING.</li> </ul>
Exhaust gas is white or bluish	<ul style="list-style-type: none"> <li>• Worn piston, ring, cylinder liner</li> <li>• Improper fuel</li> <li>• Defective turbocharger seal</li> </ul>	<ul style="list-style-type: none"> <li>( • Replace)</li> <li>• Replace with specified fuel</li> <li>( • Check, replace)</li> </ul>
Exhaust gas is black	<ul style="list-style-type: none"> <li>• Clogged air cleaner element</li> <li>• Worn piston, ring, cylinder liner</li> <li>• Defective compression</li> <li>• Defective turbocharger</li> <li>• Defective exhaust brake</li> </ul>	<ul style="list-style-type: none"> <li>• Clean or replace. See WHEN REQUIRED.</li> <li>( • Check, repair)</li> <li>• See adjustment of clearance above</li> <li>( • Check, replace)</li> <li>( • Check, replace, repair)</li> </ul>
Engine hunts	<ul style="list-style-type: none"> <li>• Air entering suction side of fuel line</li> </ul>	<ul style="list-style-type: none"> <li>( • Repair place where air is leaking in)</li> </ul>
There is "breathing sound" in combustion.	<ul style="list-style-type: none"> <li>• Nozzle defect</li> </ul>	<ul style="list-style-type: none"> <li>( • Replace nozzle)</li> </ul>
There is knocking (combustion or mechanical)	<ul style="list-style-type: none"> <li>• Poor quality fuel being used</li> <li>• Overheating</li> </ul>	<ul style="list-style-type: none"> <li>• Replace with specified fuel</li> <li>• See "water temperature gauge is in red range" above.</li> </ul>

## SERVICE CODE

If any abnormality occurs, stop the machine, apply the parking brake and check the service code, then contact your Komatsu distributor for repairs.



If user code appears, check as follows:

1. Stop the machine safely and apply the parking brake.
2. While the user code is displayed, continue to depress check switch (1) for the caution pilot lamp bulb.
3. If the service code indicating possible cause is displayed on speedometer (2) and user code display (3), release the check switch for caution pilot lamp bulb and check the service code.  
Immediately after checking the service code, stop the engine.
4. After checking the service code, contact your Komatsu distributor for repairs.

## REMARK

- Upper 2 digits are displayed on speedometer (2); and lower 2 digits are displayed on user code display (3).
- First 1 digit is in English letter; next 3 digits are numerical.
- After the display of service code for 3 seconds, the display returns to normal. If multiple failures occur simultaneously, each service code shows up for 3 seconds one by one.

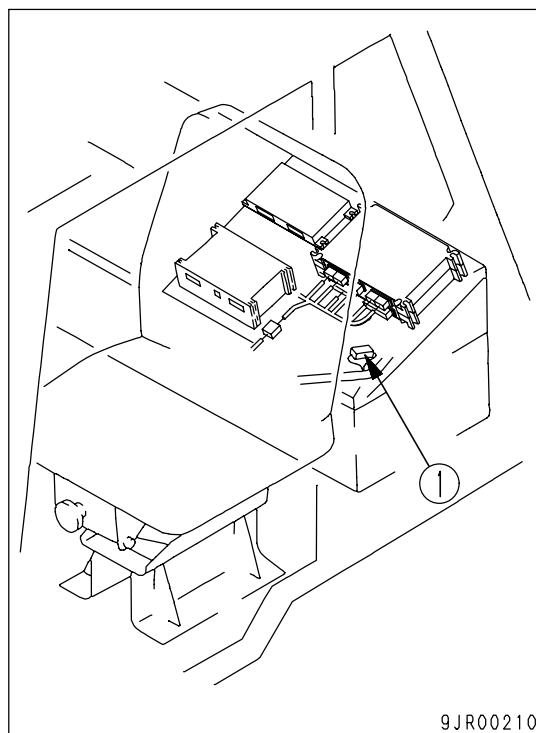
### TRANSMISSION CONTROLLER

If any abnormality occurs in the transmission, reduce the travel speed by using the brake, stop the machine on a safe place. Gear shifting may not work for some failure modes.

If necessary, move the shift lever to the N position, remove emergency escape connector (1) (connector No. A-1, A-2, black 1-pin connector) and insert again, then operate the shift lever to move the machine without depressing the accelerator pedal.

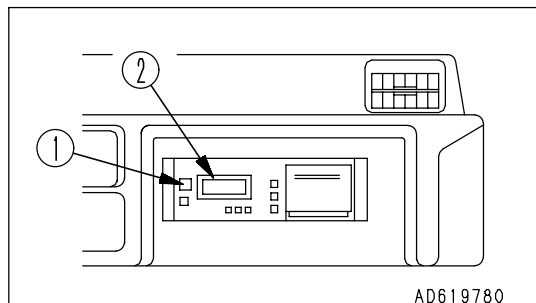
If the shift lever is operated with the accelerator pedal depressed, the emergency escape function will not work. Furthermore, the emergency escape function may also not work for some failure modes.

While the emergency escape function is working, the shift indicator of machine monitor panel alternately displays E and transmission shift range.



### PAYLOAD METER (PRINTER TYPE)

Once an error has been displayed, it continues to be displayed in display unit (2) until CAL switch (1) is pressed. If the controller detects one of the abnormalities in the above table, all the external display lamps light up.



# MAINTENANCE

## WARNING

Please read and make sure that you understand the SAFETY section before reading this section.

---

## GUIDES TO MAINTENANCE

Do not perform any inspection and maintenance operation that is not found in this manual.

### **CHECK SERVICE METER:**

Check the service meter reading every day to see if the time has come for any necessary maintenance to be performed.

### **KOMATSU GENUINE REPLACEMENT PARTS:**

Use Komatsu genuine parts specified in the Parts Book as replacement parts.

### **KOMATSU GENUINE OILS:**

Use Komatsu genuine oils and grease. Choose oils and grease with proper viscosities specified for ambient temperature.

### **ALWAYS USE CLEAN WASHER FLUID:**

Use automobile window washer fluid, and be careful not to let any dirt get into it.

### **ALWAYS USE CLEAN OIL AND GREASE:**

Use clean oil and grease. Also, keep the containers of the oil and grease clean. Keep foreign materials away from oil and grease.

### **CHECKING FOREIGN MATERIALS IN DRAINED OIL AND ON FILTERS:**

After oil is changed or filters are replaced, check the old oil and filters for metal particles and foreign materials. If large quantity of metal particles or foreign materials are found, always report to the person in charge, and carry out suitable action.

### **OIL CHANGE:**

If your machine is equipped with a fuel strainer, do not remove it while fueling.

### **WELDING INSTRUCTIONS:**

- Turn off the engine starting switch.
- Do not apply more than 200 V continuously.
- Connect grounding cable within 1 m (3.3 ft) of the area to be welded. If grounding cable is connected near instruments, connectors, etc., the instruments may malfunction.
- If a seal or bearing happens to come between the part being welded and grounding point, change the grounding point to avoid such parts.
- Do not use the area around the hydraulic cylinders as the grounding point.  
Sparks will cause damage to the plated portion.

### **DO NOT DROP THINGS INSIDE MACHINE:**

- When opening inspection windows or the oil filler port of the tank to carry out inspection, be careful not to drop nuts, bolts, or tools inside the machine.  
If such things are dropped inside the machine, it may cause damage and/or malfunction of the machine, and will lead to failure. If you drop anything inside the machine, always remove it immediately.
- Do not put unnecessary things in your pockets. Carry only things which are necessary for inspection.

**DUSTY WORKSITES:**

When working at dusty worksites, do as follows:

- Inspect the air cleaner clogging monitor frequently to see if the air cleaner is clogged.  
Clean the air cleaner element at a shorter interval than specified.
- Clean the radiator core frequently to avoid clogging.
- Clean and replace the fuel filter frequently.
- Clean electrical components, especially the starting motor and alternator, to avoid accumulation of dust.
- When inspecting or changing the oil, move the machine to a place that is free of dust to prevent dirt from getting into the oil.

**AVOID MIXING OILS:**

If a different brand or grade of oil has to be added, drain the old oil and replace all the oil with the new brand or grade of oil. Never mix different brand or grade of oil.

**LOCKING INSPECTION COVERS:**

Lock inspection cover securely into position with the lock bar. If inspection or maintenance is performed with inspection cover not locked in position, there is a danger that it may be suddenly blow shut by the wind and cause injury to the worker.

**BLEEDING AIR FROM HYDRAULIC CIRCUIT:**

If the hydraulic components have been repaired or replaced and if the hydraulic hoses, pipes, etc. have been disconnected, it is necessary to bleed air in the circuit. See "WHEN REQUIRED (PAGE 4-19)".

**PRECAUTIONS WHEN INSTALLING HYDRAULIC HOSES:**

- When removing parts at locations where there are O-rings or gasket seals, clean the mounting surface, and replace with new parts.  
When doing this, be careful not to forget to assemble the O-rings and gaskets.
- When installing the hoses, do not twist them or bend them sharply. If they are installed so, their service life will be shortened extremely and they may be damaged.

**CHECKS AFTER INSPECTION AND MAINTENANCE:**

If you forget to perform the checks after inspection and maintenance, unexpected problems may occur, and this may lead to serious injury or property damage. Always do the following:

- Checks after operation (with engine stopped)
  - Have any inspection and maintenance points been forgotten?
  - Have all inspection and maintenance items been performed correctly?
  - Have any tools or parts been dropped inside the machine? It is particularly dangerous if parts are dropped inside the machine and get caught in the lever linkage mechanism.
  - Are there any leakage of coolant or oil? Have all nuts and bolts been tightened?
- Check when the engine is running
  - See "TWO WORKERS FOR MAINTENANCE WHEN ENGINE IS RUNNING (PAGE 2-28)" in the section on safety for checking when the engine is running. Pay enough attention for safety.
  - Check if the inspected and serviced area is normally operated.
  - Increase the engine speed to check for the leak of fuel and oil.



## OUTLINE OF SERVICE

- Always use Komatsu genuine parts for replacement parts, grease or oil.
- When changing the oil or adding oil, do not mix different types of oil. When changing the type of oil, drain all the old oil and fill completely with the new oil. Always replace the filter at the same time. (There is no problem if the small amount of oil remaining in the piping mixes with the new oil.)
- Unless otherwise specified, when the machine is shipped from the factory, it is filled with the oil and coolant listed in the table below.

Item	Type
Engine oil pan	Engine oil EO15W40DH (Komatsu genuine parts)
Transmission case	Power train oil TO30 (Komatsu genuine parts)
Front brake oil tank Hydraulic tank Steering, hoist oil tank Rear brake cooling oil tank Front suspension Rear suspension	Power train oil TO10 (Komatsu genuine parts)
Differential case Final drive case	Power train oil TO30 (Komatsu genuine parts)
Radiator	Supercoolant AF-NAC (Density:30% or above)(Komatsu genuine parts)

## HANDLING OIL, FUEL, COOLANT, AND PERFORMING OIL CLINIC

### OIL

- Oil is used in the engine and hydraulic equipment under extremely severe conditions (high temperature, high pressure), and deteriorates with use.  
Always use oil that matches the grade and maximum and minimum ambient temperatures recommended in the Operation and Maintenance Manual. Even if the oil is not dirty, always change the oil at the specified interval.
- Oil corresponds to blood in the human body, always be careful when handling it to prevent any impurities (water, metal particles, dirt, etc.) from getting in.  
The majority of problems with the machine are caused by the entry of such impurities.  
Take particular care not to let any impurities get in when storing or adding oil.
- Never mix oils of different grades or brands.
- Always add the specified amount of oil.  
Having too much oil or too little oil are both causes of problems.
- If the oil in the work equipment is not clear, there is probably water or air getting into the circuit. In such cases, please contact your Komatsu distributor.
- When changing the oil, always replace the related filters at the same time.
- We recommend you have an analysis made of the oil periodically to check the condition of the machine. For those who wish to use this service, please contact your Komatsu distributor.
- When using commercially available oil, it may be necessary to reduce the oil change interval.  
We recommend that you use the Komatsu oil clinic to carry out a detailed checks of the characteristics of the oil.

## FUEL

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

## COOLANT AND WATER FOR DILUTION

- The coolant has the important function of preventing corrosion as well as preventing freezing.  
Even in the areas where freezing is not an issue, the use of antifreeze coolant is essential.  
Komatsu machines are supplied with Komatsu Supercoolant (AF-NAC). Komatsu Supercoolant (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for 2 years or 4000 hours. Komatsu Supercoolant (AF-NAC) is strongly recommended wherever available.
- When diluting the antifreeze coolant, use distilled water or tap water (soft water).  
Natural water, such as a river water or well water (hard water), contains large amounts of minerals (calcium, magnesium, etc.), and this makes it easier for scale to form inside the engine or radiator. Once scale is deposited inside the engine or radiator, it is extremely difficult to remove. It also causes overheating due to poor heat exchange, so when you dilute the coolant, we recommend that you use water with an overall hardness of less than 100 PPM.
- When using antifreeze, always observe the precautions given in the Operation and Maintenance Manual.
- Antifreeze coolant is flammable, so be sure to keep it away from flame.
- The ratio of Supercoolant (AF-NAC) to water differs according to the ambient temperature.  
For details of the ratio when mixing, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-21)".  
Supercoolant (AF-NAC) may be supplied already mixed. In such cases, never dilute with water.
- If the engine overheats, wait for the engine to cool before adding coolant.
- If the coolant level is low, it will cause overheating, and will also cause problems with corrosion due to air entering the coolant.

## GREASE

- Grease is used to prevent seizure and noises at the joints.
- This construction equipment is used under heavy-duty conditions. Always use the recommended grease and follow the change intervals and recommended ambient temperatures given in this Operation and Maintenance Manual.
- The nipples not included in the maintenance section are nipples for overhaul, so they do not need grease.  
If any part becomes stiff after being used for long time, add grease.
- Always wipe off all of the old grease that is pushed out when greasing.  
Be particularly careful to wipe off the old grease in places where sand or dirt sticking in the grease would cause wear of the rotating parts.

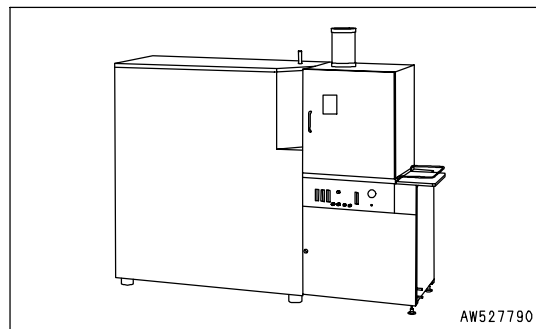
## CARRYING OUT KOWA (Komatsu Oil Wear Analysis)

KOWA is a maintenance service that makes it possible to prevent machine failures and downtime. With KOWA, the oil is periodically sampled and analyzed. This enables early detection of wear of the machine drive parts and other problems.

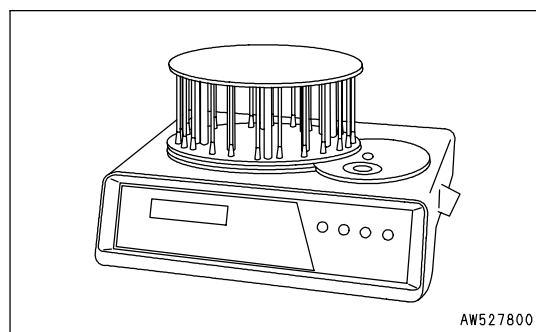
We strongly recommend you to use this service. The oil analysis is carried out at actual cost, so the cost is low, and the results of the analysis are reported together with recommendations which will reduce repair costs and machine downtime.

### KOWA ANALYSIS ITEMS

- Measurement of density of metal wear particles  
This uses an ICP (Inductively Coupled Plasma) analyzer to measure the density of iron, copper, and other metal wear particles in the oil.



- Measurement of quantity of particles  
This uses a particle quantifier index measurement machine to measure the quantity of iron particles of 5 $\mu$  or more, enabling early detection of failures.



- Others  
Measurements are made of items such as the ratio of water in the oil, density of the antifreeze coolant, ratio of fuel in the oil, and dynamic viscosity, enabling a highly precise diagnosis of the machine's health.

### OIL SAMPLING

- Sampling interval  
250 hours: Engine  
500 hours: Other components
- Precautions when sampling
  - Make sure that the oil is well mixed before sampling.
  - Perform sampling at regular fixed intervals.
  - Do not perform sampling on rainy or windy days when water or dust can get into the oil.

For further details of KOWA, please contact your Komatsu distributor.

## STORING OIL AND FUEL

- Keep indoors to prevent any water, dirt, or other impurities from getting in.
- When keeping drum cans for a long period, put the drum on its side so that the filler port of the drums is at the side to prevent moisture from being sucked in.  
If drums have to be stored outside, cover them with a waterproof sheet or take other measures to protect them.
- To prevent any change in quality during long-term storage, be sure to use in the order of first in - first out (use the oldest oil or fuel first).

## FILTERS

- Filters are extremely important safety parts. They prevent impurities in the fuel and air circuits from entering important equipment and causing problems.  
Replace all filters periodically. For details, see the Operation and Maintenance Manual.  
However, when working in severe conditions, replace the filters at shorter intervals according to the oil and fuel (sulfur content) being used.
- Never try to clean the filters (cartridge type) and use them again. Always replace with new filters.
- When replacing oil filters, check if any metal particles are attached to the old filter. If any metal particles are found, contact your Komatsu distributor.
- When replacing the engine oil filter, fill the new filter with the specified clean oil, then install it.
- Do not open packs of spare filters until just before they are to be used.
- Use of Komatsu genuine filter elements is strongly recommended.

## OUTLINE OF ELECTRIC SYSTEM

- It is extremely dangerous if the electrical equipment becomes wet or the covering of the wiring is damaged. This will cause an electrical short circuit and may lead to malfunction of the machine. Do not wash the inside of the operator's cab with water. When washing the machine, be careful not to let water get into the electrical components.
- Service relating to the electric system is checking fan belt tension, checking damage or wear to the fan belt and checking battery fluid level.
- Never install any electric components other than those specified by Komatsu.
- External electro-magnetic interference may cause malfunction of the control system controller, before installing a radio receiver or other wireless equipment, contact your Komatsu distributor.
- When working at the seashore, carefully clean the electric system to prevent corrosion.
- When installing an operator's cab cooler or any other electrical equipment, connect it to an independent power source connector. The cables to supply power to the optional equipment must never be connected to the fuse, starting switch, or battery relay.

## WEAR PARTS

Wear parts such as the filter element, air cleaner element, 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.

## WEAR PARTS LIST

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
Bypass filter	600-212-1511	Cartridge	2	EVERY 500 HOURS
Fuel filter	600-311-7111	Cartridge	2	EVERY 500 HOURS
Transmission oil filter	424-16-11140	Element	4	EVERY 500 HOURS
	(424-16-11130)	(O-ring)	(4)	
	(424-16-11630)	(O-ring)	(8)	
	(07002-01223)	(O-ring)	(4)	
Hydraulic filter ( • Steering, hoist oil) ( • Rear brake cooling oil)	07063-01210 (07000-25175)	Element (O-ring)	3 (3)	EVERY 1000 HOURS
Corrosion resistor	600-411-1171	Cartridge	2	EVERY 1000 HOURS
Air cleaner	561-02-62520	Inner element Ass'y	3	—
	561-02-62530	Outer element Ass'y	3	
Payload meter paper (if equipped)	7818-27-2910	Paper	1	—
Payload meter inner battery (if equipped)	7818-27-2860	Battery	1	—

## RECOMMENDED FUEL, COOLANT, AND LUBRICANT

- Komatsu genuine oils are adjusted to maintain the reliability and durability of Komatsu construction equipment and components.

In order to keep your machine in the best conditioner for long periods of time, it is essential to follow the instructions in this Operation and Maintenance Manual.

- Failure to follow these recommendations may result in shortened life or excess wear of the engine, power train, cooling system, and/or other components.
- Commercially available lubricant additives may be good for the machine, but they may also cause harm. Komatsu does not recommend any commercially available lubricant additive.
- Use the oil recommended according to the ambient temperature in the chart below.
- Specified capacity means the total amount of oil including the oil in the tank and the piping. Refill capacity means the amount of oil needed to refill the system during inspection and maintenance.
- When starting the engine in temperatures below 0°C (32°F), be sure to use the recommended multi-grade oil, even if the ambient temperature may become higher during the course of the day.
- If the machine is operated at a temperature below -20°C (-4°F), a separate device is needed, so consult your Komatsu distributor.
- When the fuel sulfur content is less than 0.5%, change the engine oil according to the period inspection table given in this Operation and Maintenance Manual.

If the fuel sulfur content is more than 0.5%, change the oil according to the following table.

Fuel sulfur content	Engine oil change interval
0.5 to 1.0%	1/2 of regular interval
Above 1.0%	1/4 of regular interval

# USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE

Reservoir	Fluid Type	Ambient Temperature, degrees Celsius										Recommended Komatsu Fluids
		-22	-4	14	32	50	68	86	104	122	F	
		-30	-20	-10	0	10	20	30	40	50	°C	
Engine oil pan	Engine oil	SAE0W30EOS and HTHS 3.5min. (Note.1)										Komatsu EOS0W30
		SAE5W40EOS and HTHS 3.5min. (Note.1)										Komatsu EOS5W40
		SAE10W30DH										Komatsu EO10W30DH
		SAE15W40DH										Komatsu EO15W40DH
Transmission Case	Power train oil (Note.2)	SAE30DH										Komatsu EQ30DH
		T010										T010
		T030										T030
Front brake oil tank Hydraulic tank Steering hoist oil Rear brake cooling Front suspension Rear suspension	Power train oil	T010										T010
Differential case Final drive case	Power train oil	T030										T030
Grease fitting	Hyper grease (Note.3)	G2-T, G2-TE										G2-T, G2-TE
	Lithium EP grease	G2-LI										G2-LI
Cooling system	Supercoolant AF-NAC	AF-NAC (Note.4)										AF-NAC
Fuel tank	Diesel fuel	No.2-D										ASTM No.2-D
		No.1-D										ASTM No.1-D

- SAE: Society of Automotive Engineers
- ASTM: American Society of Testing and Material

Reservoir		Engine oil pan	Transmission case	Front brake oil tank	Steering, hoist oil tank	Rear brake cooling oil tank	Front suspension (each)
Capacity							
Specified amount of oil	Liters	135	125	2	248	366	20
	US gal	35.64	33.0	0.53	65.47	96.62	5.28
Refill amount of oil	Liters	130	102	2	153	246	—
	US gal	34.32	26.93	0.53	40.39	64.94	—

Reservoir		Rear suspension (each)	Differential case	Final drive case (each)	Fuel tank	Cooling system
Capacity						
Specified amount of oil	Liters	17.5	132	59	1250	228
	US gal	4.62	34.85	15.58	330	60.19
Refill amount of oil	Liters	—	132	59	—	—
	US gal	—	34.85	15.58	—	—

Note 1: SAE0W30EOS and SAE5W40EOS must be fully synthetic and HTHS ( High-Temperature High-Shear Viscosity 150°C) must be equal to or higher than 3.5 cP. Komatsu EOS0W30 and EOS5W40 are the most suitable oils. If these oils are not available, follow the instruction "RECOMMENDED BRANDS, RECOMMENDED QUALITY FOR PRODUCTS OTHER THAN KOMATSU GENUINE OIL (PAGE 4-11)" at the end of this chapter.

Note 2: Powertrain oil has different properties from engine oil. Be sure to use the recommended oils.

Note 3: Hyper grease (G2-T, G2-TE) has a high performance.

When it is necessary to improve the lubricating ability of the grease in order to prevent squeaking of pins and bushings, the use of G2-T or G2-TE is recommended.

Note 4: Supercoolant (AF-NAC)

1) The coolant has the important function of preventing corrosion as well as preventing freezing.

Even in the areas where freezing is not an issue, the use of antifreeze coolant is essential.

Komatsu machines are supplied with Komatsu Supercoolant (AF-NAC). Komatsu Supercoolant (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for 2 years or 4000 hours. Komatsu Supercoolant (AF-NAC) is strongly recommended wherever available.

2) For details of the ratio when diluting super coolant with water, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-21)".

When the machine is shipped from the factory, it may be filled with coolant containing 30% or more Supercoolant (AF-NAC). In this case, no adjustment is needed for temperatures down to -10°C (14°F). (never dilute with water)

3) To maintain the anticorrosion properties of Supercoolant (AF-NAC), always keep the density of Supercoolant between 30% and 68%.

## RECOMMENDED BRANDS, RECOMMENDED QUALITY FOR PRODUCTS OTHER THAN KOMATSU GENUINE OIL

When using commercially available oils other than Komatsu genuine oil, or when checking the latest specifications, refer to the Komatsu web page or consult your Komatsu distributor.



# STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS

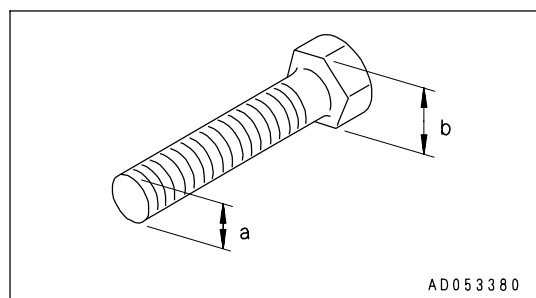
## TORQUE LIST

Unless otherwise specified, tighten the metric nuts and bolts to the torque shown in the table below.

The tightening torque is determined by the width across the flats (b) of the nut and bolt.

If it is necessary to replace any nut or bolt, always use a Komatsu genuine part of the same size as the part that was replaced.

Thread diameter of bolt (mm) (a)	Width across flats (mm) (b)	Tightening torque [N·m (kgf·m)]	
		Target value	Permissible range
6	10	13.2 (1.35)	11.8 - 14.7 (1.2 - 1.5)
8	13	31 (3.2)	27 - 34 (2.8 - 3.5)
10	17	66 (6.7)	59 - 74 (6.0 - 7.5)
12	19	113 (11.5)	98 - 123 (10.0 - 12.5)
14	22	177 (18.0)	157 - 196 (16.0 - 20.0)
16	24	279 (28.5)	245 - 309 (25.0 - 31.5)
18	27	382 (39.0)	343 - 425 (35.0 - 43.5)
20	30	549 (56.0)	490 - 608 (50.0 - 62.0)
22	32	745 (76.0)	662 - 829 (67.5 - 84.5)
24	36	927 (94.5)	824 - 1030 (84.0 - 105.0)
27	41	1320 (135.0)	1180 - 1470 (120.0 - 150.0)
30	46	1720 (175.0)	1520 - 1910 (155.0 - 195.0)
33	50	2210 (225.0)	1960 - 2450 (200.0 - 250.0)
36	55	2750 (280.0)	2450 - 3040 (250.0 - 310.0)
39	60	3280 (335.0)	2890 - 3630 (295.0 - 370.0)

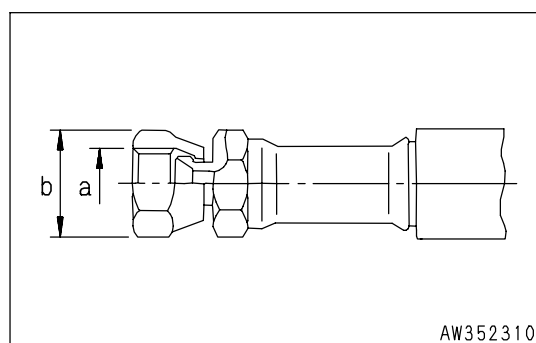


## NOTICE

When tightening panels or other parts having tightening fixtures made of plastic, be careful not to use excessive torque: doing so will damage the plastic parts. Pay enough attention when you tighten up.

Apply the following table for Hydraulic Hose.

Thread diameter a (mm)	Width across flats b (mm)	Tightening torque					
		Target value			Permissible range		
		N·m	kgf·m	lbft	N·m	kgf·m	lbft
10	14	14.7	1.5	10.8	12.7 - 16.7	1.3 - 1.7	9.4 - 12.3
14	19	29.4	3.0	21.7	27.5 - 39.2	2.8 - 4.0	20.3 - 28.9
18	24	78.5	8.0	57.9	58.8 - 98.1	6.0 - 10.0	43.4 - 72.3
22	27	117.7	12.0	86.6	88.3 - 137.3	9.0 - 14.0	65.1 - 101.3
24	32	147.1	15.0	108.5	117.7 - 176.5	12.0 - 18.0	86.8 - 130.2
30	36	215.7	22.0	159.1	176.5 - 245.2	18.0 - 25.0	130.2 - 180.8
33	41	255.0	26.0	188.1	215.7 - 284.4	22.0 - 29.0	159.1 - 209.8



## PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS

To ensure safety at all times when operating or driving the machine, the user of the machine must always carry out periodic maintenance. In addition, to further improve safety, the parts in the safety-critical parts list on the next page must also be replaced at the specified interval. These parts are particularly closely connected to safety and fire prevention, so please contact your Komatsu distributor to have them replaced.

Material quality of these parts can change as time passes and they are likely to wear out or deteriorate. However, it is difficult to determine the extent of wear or deterioration at the time of periodic maintenance. Hence, it is required to replace them with new ones regardless of their condition after a certain period of usage. This is important to ensure that these parts maintain their full performance at all times.

Furthermore, should anything abnormal be found on any of these parts, replace it with a new one even if the periodic replacement time for the part has not yet arrived.

If any of the hose clamps show deterioration like deformation or cracking, replace the clamps at the same time as the hoses.

Also perform the following checks with hydraulic hoses which need to be replaced periodically. Tighten all loose clamps and replace defective hoses, as required.

When replacing hoses, always replace O-rings, gaskets, and other such parts at the same time.

**SAFETY CRITICAL PARTS**

NO.	Safety parts for periodic replacement	Replacement interval	Remarks
1	Fuel hose (Fuel tank - hand priming pump)	Every 4000 hours or every two years, whichever comes first	
2	Fuel hose (Hand priming pump - injection pump)		
3	Fuel hose (Injection pump - adapter)		
4	Fuel hose (Adapter - fuel filter)		
5	Fuel hose (Fuel filter - adapter)		
6	Fuel hose (Adapter - emergency stop valve)		
7	Fuel hose (Emergency stop valve - injection pump)		
8	Fuel hose (Emergency stop valve - overflow valve)		
9	Fuel hose (Over flow valve - fuel tank)		
10	Fuel spill hose (between nozzles)		
11	Turbocharger lubrication hose		Replace as assembly
12	Rubber hoses of brake piping		
13	High-pressure hoses in steering circuit (pump ↔ demand valve ↔ steering valve ↔ steering cylinder)		
14	High-pressure hose in hoist circuit (pump ↔ demand valve ↔ hoist valve ↔ hoist cylinder)		
15	Outlet hose of retarder cooling oil pump		
16	Outlet hose of transmission oil pump		
17	Brake valve parts	Every 2000 hours or every one year, whichever comes first	Replace as a service kit
18	Parking brake valve parts		
19	Relay valve parts		
20	Air governor parts		
21	Retarder control valve parts		
22	Emergency relay valve parts		
23	Emergency brake valve parts		
24	Quick release parts		
25	Parking brake chamber parts		
26	Brake chamber parts (Front and rear)		
27	Seat belt	Every 3 years	Replace

## MAINTENANCE SCHEDULE CHART

### MAINTENANCE SCHEDULE CHART

#### INITIAL 250 HOURS SERVICE (ONLY AFTER THE FIRST 250 HOURS)

Change oil in engine oil pan, replace engine oil filter cartridge .....	4- 53
Replace fuel filter cartridge .....	4- 55
Replace transmission oil filter element .....	4- 56
Change oil in transmission case .....	4- 59
Replace steering, hoist oil tank and rear brake cooling oil tank filter element .....	4- 60
Change oil in steering, hoist oil tank .....	4- 63
Change oil in rear brake cooling oil tank .....	4- 64
Change oil in final drive case .....	4- 65
Change oil in differential case .....	4- 65
Check, adjust engine valve clearance .....	4- 66

#### WHEN REQUIRED

Check, clean and replace air cleaner .....	4- 19
Clean inside of cooling system .....	4- 21
Check level of window washer fluid, add fluid .....	4- 24
Clean air conditioner air filter .....	4- 24
Check refrigerant (gas) level .....	4- 25
Check dump body .....	4- 25
Check electric intake air heater .....	4- 25
Check length of suspension cylinder, check oil level .....	4- 26
Bleed air from rear brake .....	4- 28
Bleed air from front brake .....	4- 28
Adjust parking brake .....	4- 29
Adjust body positioner .....	4- 30
Replace fan belt, adjust auto tensioner .....	4- 32
Check play of output coupling of output shaft .....	4- 33
Selection and inspection of tires .....	4- 33

#### CHECK BEFORE STARTING

#### EVERY 100 HOURS SERVICE

Check alcohol level in alcohol injector, add alcohol .....	4- 37
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**EVERY 250 HOURS SERVICE**

Check oil level in differential case, add oil .....	4- 38
Check oil level in final drive case, add oil .....	4- 38
Lubricating .....	4- 39
Check level of battery electrolyte .....	4- 42
Check alternator belt, adjust .....	4- 45
Check tension of air conditioner compressor belt, adjust .....	4- 46
Clean breathers .....	4- 47
Check drive shaft .....	4- 48
Check frame .....	4- 48
Check braking capacity of foot brake .....	4- 49
Check braking capacity of retarder brake .....	4- 49
Check braking capacity of parking brake .....	4- 50
Check wear of parking brake pads .....	4- 50
Check, clean automatic suspension .....	4- 51
Inspection of engine emergency stop .....	4- 52

**EVERY 500 HOURS SERVICE**

Change oil in engine oil pan, replace engine oil filter cartridge .....	4- 53
Replace fuel filter cartridge .....	4- 55
Replace transmission filter element .....	4- 56
Check wear of front disc brake pad .....	4- 57
Clean, check radiator fins .....	4- 57
Check fan belt for wear and replace .....	4- 57

**EVERY 1000 HOURS SERVICE**

Replace corrosion resistor cartridge .....	4- 58
Change oil in transmission case, clean transmission case strainer .....	4- 59
Replace steering, hoist oil tank and rear brake cooling oil tank filter element .....	4- 60
Lubricating .....	4- 60
Check wear of rear brake discs .....	4- 62
Check tightening of turbocharger .....	4- 62

**EVERY 2000 HOURS SERVICE**

Change oil in steering, hoist oil tank .....	4- 63
Change oil in rear brake cooling oil tank .....	4- 64
Change oil in final drive case .....	4- 65
Change oil in differential case .....	4- 65
Clean differential case breather .....	4- 66
Clean emergency relay valve .....	4- 66
Check alternator, starting motor .....	4- 66
Check, adjust engine valve clearance .....	4- 66
Clean, check turbocharger .....	4- 66
Check play of turbocharger rotor .....	4- 66
Lubricate dump control linkage (5 points) .....	4- 67
Clean air dryer filter and deflector (if equipped) .....	4- 68
Replace plug with strainer from make-up tank of rear brake chamber .....	4- 68

**EVERY 4000 HOURS SERVICE**

Check water pump .....	4- 69
Check air compressor .....	4- 69
Check fan pulley and tension pulley .....	4- 69
Check vibration damper .....	4- 69
Check injection pump rack rubber boot, replace .....	4- 69
Replace injection pump screen filter .....	4- 69
Clean injection pump oil inlet strainer .....	4- 70
Adjust front wheel bearing .....	4- 70
Adjust rear wheel bearing .....	4- 70

**EVERY 15000 HOURS SERVICE**

CHECK, REPLACE STEERING A ARM MOUNTING BOLT .....	4- 71
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## SERVICE PROCEDURE

### INITIAL 250 HOURS SERVICE (ONLY AFTER THE FIRST 250 HOURS)

Perform the following maintenance only after the first 250 hours.

- Change oil in engine oil pan, replace engine oil filter cartridge
- Replace fuel filter cartridge
- Replace transmission oil filter element
- Change oil in transmission case
- Replace steering, hoist oil tank and rear brake cooling oil tank filter element
- Change oil in steering and hoist oil tank
- Change oil in rear brake cooling oil tank
- Change oil in final drive case
- Change oil in differential case
- Check engine valve clearance, adjust

For details of the method of replacing or maintaining, see EVERY 500 HOURS, EVERY 1000 HOURS and EVERY 2000 HOURS SERVICE.

## WHEN REQUIRED

### CHECK, CLEAN OR REPLACE AIR CLEANER



#### WARNING

- If inspection, cleaning, or maintenance is carried out with the engine running, dirt will get into the engine and damage it. Always stop the engine before carrying out these operations.
- When using compressed air, there is danger that dirt may be blown around and cause serious injury. Always use protective glasses, dust mask, and other protective equipment.

### CHECKING

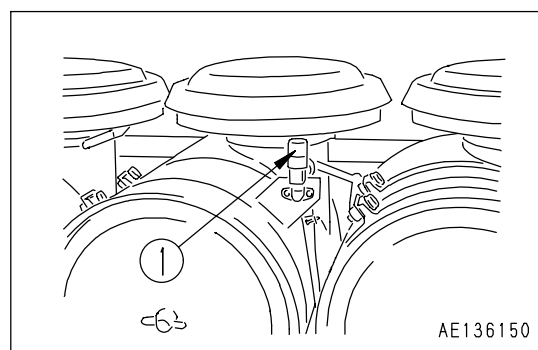
Clean the air cleaner element if the dust indicator (1) shows red.

### NOTICE

Do not clean the air cleaner element before red piston in dust indicator appears.

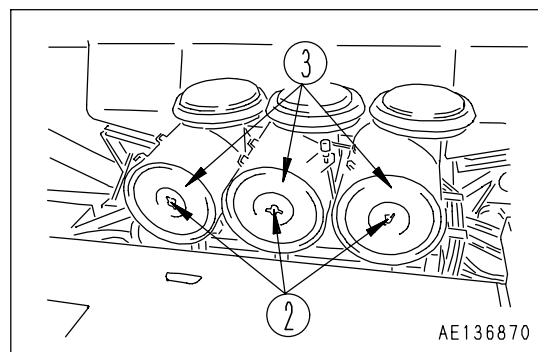
If the element is cleaned frequently before the red piston appears, the air cleaner will not be able to display its performance fully, and the cleaning efficiency will also go down.

In addition, during the cleaning operation, more dirt stuck to the element will fall inside the inner element.



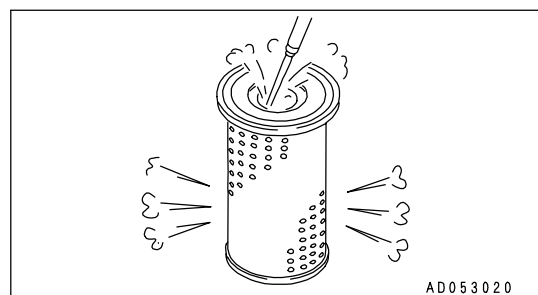
### CLEANING OR REPLACING OUTER ELEMENT

1. Remove the wing nut (2), then remove the outer element (3).
2. Clean the air cleaner body interior and the cover.



3. Direct dry compressed air (less than 0.69 MPa (7 kgf/cm<sup>2</sup>, 99.4 PSI)) to the element from inside along its folds, then direct it from outside along its folds and again from inside.

- 1) Remove one seal from the element whenever the element has been cleaned.
- 2) Replace the outer element if it has been cleaned 6 times repeatedly or used throughout a year. Replace the inner element at the same time.
- 3) Replace both inner and outer elements when the dust indicator red piston appears soon after installing the cleaned outer element even though it has not been cleaned 6 times.
- 4) Check inner element mounting nuts for looseness and, if necessary, retighten.

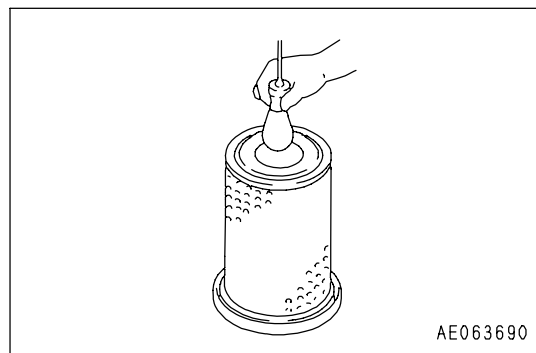




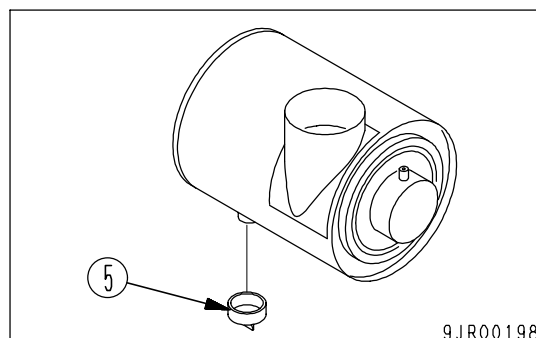
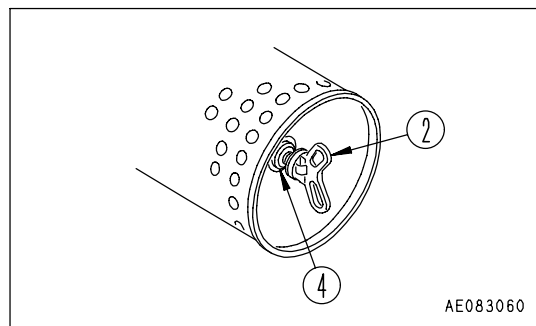
4. If small holes or thinner parts are found on the element when it is checked by shining a light through it after cleaning, replace the element.

#### NOTICE

When cleaning the element, do not hit or beat it against anything.  
Do not use an element whose folds, gasket or seal are damaged.



5. Remove the cloth or tape cover fitted in Step 1.
6. Set the cleaned element in position, and secure it with the wing nut (2).
7. If any seal washer (4) or wing nut (2) is damaged, replace it with a new part.
8. Remove vacuator valve (5) and clean with compressed air. After cleaning, install again.



#### REPLACING INNER ELEMENT

1. First remove the cover and the outer element, and then remove the inner element.
2. Cover the air connector side (outlet side) with a clean cloth or tape.
3. Clean the air cleaner body interior, then remove the cover installed in Step 2.
4. Fit a new inner element to the body and tighten it with nuts.  
Do not clean and reinstall an inner element.
5. Install the outer element and fasten it with the wing nut.
6. Remove vacuator valve (5) and clean with compressed air.  
After cleaning, install again.
7. After replacing the element, return the red piston in the dust indicator to its original position.

#### REMARK

For both of inner element and outer element, when the element is attached, nuts should be tighten up with the shaking motion of element in the way that the sealing rubber of the tip of the element closely contact with the inside of the body.

## CLEAN INSIDE OF COOLING SYSTEM



### WARNING

- Soon after the engine has been stopped, the coolant is hot and the pressure inside of the radiator is high. Removing the cap and draining the water under this condition can cause bodily burn. Allow the engine to cool, then slowly turn the cap to release the pressure..
- Cleaning is performed while the engine is running. When standing up or leaving from operator's seat, set the shift lever at N position and parking brake valve lever at PARKING position.
- See "OPERATIONS, CHECKS BEFORE STARTING (PAGE 3-68)", "STARTING ENGINE (PAGE 3-70)" in the section of "Operation" for starting engine.
- There is the danger of contacting with fan when the undercover is removed. Never approach the engine when the engine is running.

Clean the inside of the cooling system, change the coolant and replace the corrosion resistor according to the table below.

Antifreeze coolant	Interval of cleaning inside of cooling system and changing antifreeze coolant	Replacing corrosion resistor
Komatsu supercoolant (AF-NAC)	Every two years or every 4000 hours whichever comes first	Every 1000 hours and when cleaning the inside of the cooling system and when changing coolant.
Permanent type antifreeze (All-season type, *)	Every year (autumn) or every 2000 hours whichever comes first.	

\*: Permanent type antifreeze shall meet the requirements of ASTM D3306-03.

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

The coolant has the important function of preventing corrosion as well as preventing freezing.

Even in the areas where freezing is not an issue, the use of antifreeze coolant is essential.

Komatsu machines are supplied with Komatsu Supercoolant (AF-NAC). Komatsu Supercoolant (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for 2 years or 4000 hours. Komatsu Supercoolant (AF-NAC) is strongly recommended wherever available.

To maintain the anticorrosion properties of Supercoolant (AF-NAC), always keep the density of Supercoolant between 30% and 68%.

When deciding the ratio of antifreeze to water, check the lowest temperature in the past, and decide from the mixing table given below.

It is actually better to estimate and temperature about 10°C (18°F) lower when deciding the mixing ratio.

The mixing ratio depends on the ambient temperature, but it should always be a minimum of 30% by volume (antifreeze/total amount of coolant x 100).

The freezing temperature of undiluted antifreeze is -15°C (5°F). Do not store undiluted antifreeze at a temperature of below -15°C (5°F).

#### Mixing rate of water and antifreeze

Lowest ambient temperature	°C	-10	-15	-20	-25	-30
	°F	14	5	-4	-13	-22
Amount of antifreeze	Liters	68.4	79.8	95.76	102.6	114
	US gal	18.06	21.07	25.07	27.09	30.10
Amount of water	Liters	159.6	148.2	132.24	125.4	114
	US gal	42.13	39.12	35.12	33.10	30.09



#### WARNING

Antifreeze coolant is flammable, so keep it away from flame.

Antifreeze coolant is toxic. When removing the drain plug, be careful not to get water containing antifreeze coolant on you. If it gets in your eyes, flush your eyes with large amount of fresh water and see a doctor at once.

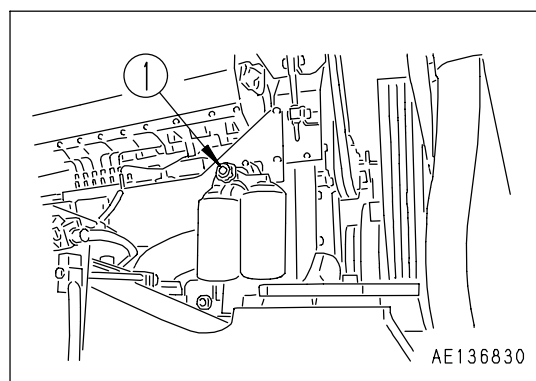
Use antifreeze and appropriate water for diluting (for details, see "COOLANT AND WATER FOR DILUTION (PAGE 4-5)")

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

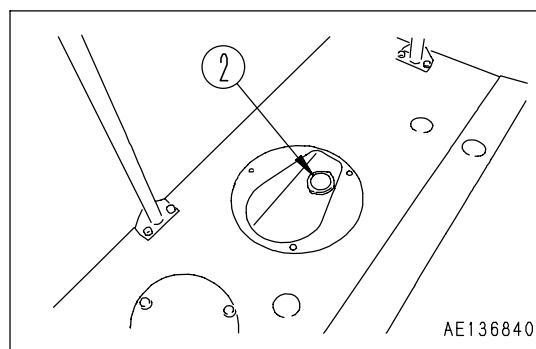
Prepare a container whose capacity is larger than the specified coolant volume to catch drained coolant.

Prepare a hose to supply antifreeze coolant and water.

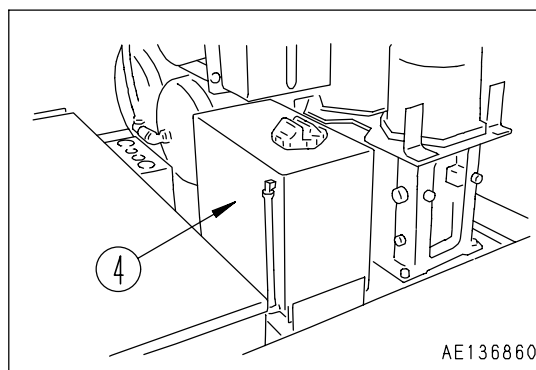
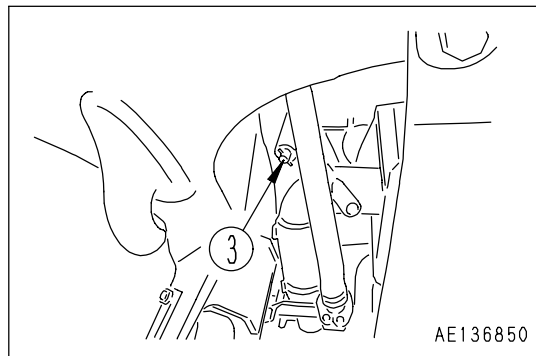
1. Stop the engine and close the valve (1) of corrosion resistor cartridge.



2. Turn radiator cap (2) slowly to remove it.



3. Prepare the container to catch the coolant mixed water. Open drain valve (3) at the bottom of the radiator and drain the coolant.  
Drain the air compressor unit for the brake by opening the drain plugs (4 places).
4. After draining the coolant, close drain valve (3) and fill with city water.
5. When the radiator is full, start the engine, and run it at low idle.  
Keep the engine running at low idle for 10 minutes until the water temperature reaches more than 90°C (194°F).
6. After flushing, stop the engine, open drain valve (3), then close it after all the water has drained out.
7. After draining the water, clean the cooling system with cleaning agent.  
For the cleaning method, see the instructions for the cleaning agent.
8. After flushing, open drain valve (3), drain all the water out.
9. Close drain valve (3).
10. Replace the corrosion resistor, and open valve (1).  
For replacing corrosion resistor, see "REPLACE CORROSION RESISTOR CARTRIDGE (PAGE 4-58)".
11. Add coolant mixed with antifreeze until it overflows from the water filler.  
Decide the proportions of antifreeze and water according to the table for the mixing rate of water and antifreeze.
12. To remove the air contained in the coolant, run the engine at low idle for 5 minutes, then run for another 5 minutes at high idle. (When doing this, leave the coolant filler cap OFF.)
13. Stop the engine. About 3 minutes later, supply the coolant up to the coolant filler, then close radiator cap.
14. Drain the coolant inside reserve tank (4) and fill again with the coolant to a point between the H and L lines.



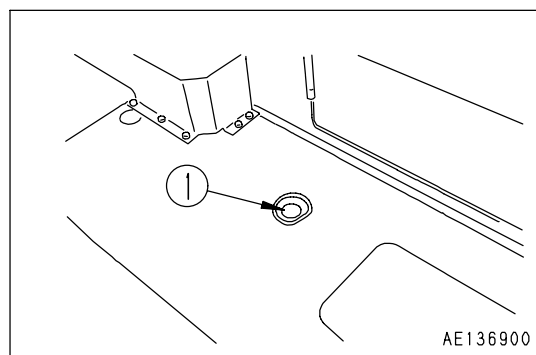
## CHECK LEVEL OF WINDOW WASHER FLUID, ADD FLUID

Carry out this check if there is air in the window washer fluid.

Check the level of the fluid in window washer tank (1), and if it is low, fill with automobile window washer fluid.

Be careful not to let dirt or dust get in when adding fluid.

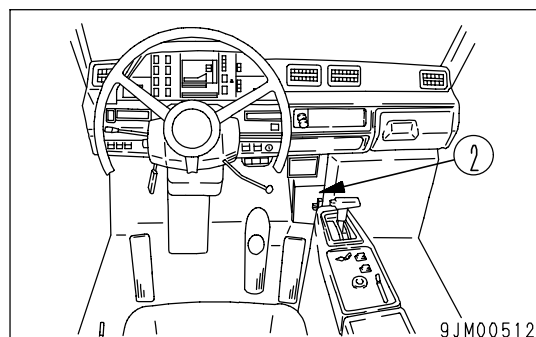
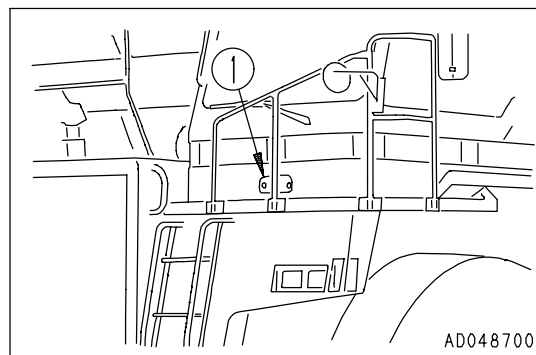
When operating at below freezing point, use fluid with antifreeze.



## CLEAN AIR CONDITIONER AIR FILTER

If the air filter at the suction port of the air conditioner unit or the air filter at the fresh air intake port become clogged, the cooling or heating capacity will drop, so clean the filters once a week.

1. Remove cover (1) at the front of the cab.
2. Pull out the air filter and clean it by blowing it with compressed air.
3. Release the catch of cover (2) on the right side of the accelerator pedal to open it.
4. Pull out the air filter (recirculated air filter) in the air conditioner unit suction port at the end of the duct, and blow off the dust with a weak flow of compressed air or with a soft brush.



## CHECK REFRIGERANT (GAS) LEVEL



### WARNING

If the refrigerant used in the air conditioner gets into your eyes or on your hands, it may cause loss of sight or frostbite. Do not touch the refrigerant. Never loosen any part of the refrigerant circuit.

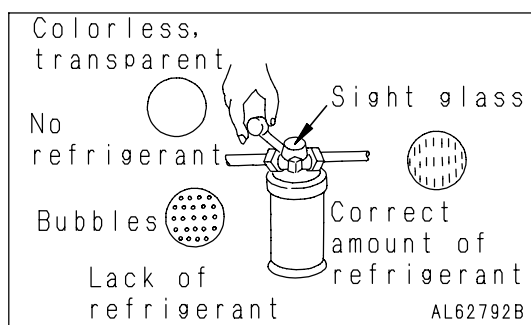
Do not bring any flame close to any point where the refrigerant gas is leaking.

If the cooling effect is poor, the level of the refrigerant (gas) is probably low.

Check the sight glass of the receiver dryer on the inside left of the radiator guard.

### REMARK

Run the engine at idle, and if bubbles appear in the sight glass when the air conditioner is set to cooling, the refrigerant level is low, so please contact your Komatsu distributor to have it refilled.



## CHECK DUMP BODY

Check that there are no cracks in the dump body.

1. Clean the dump body to make it easier to check.
2. Check all parts of the dump body for damage.

If any cracks or abnormal wear are found, carry out repairs.

Contact your Komatsu distributor for details of the repair procedure.

## CHECK ELECTRIC INTAKE AIR HEATER

Before the start of the cold season (once a year), contact your Komatsu distributor to have the electrical intake air heater checked for dirt or disconnections.

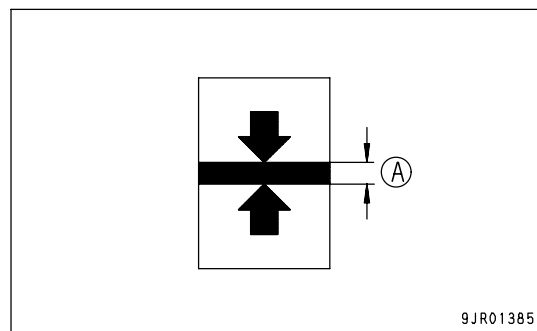
## CHECK LENGTH OF SUSPENSION CYLINDER, CHECK OIL LEVEL

When traveling, if the unevenness of the road surface is transmitted directly to the chassis (the machine bounces or the cylinders retract and hit the stopper), carry out the following checks.

### CHECK LENGTH OF CYLINDER

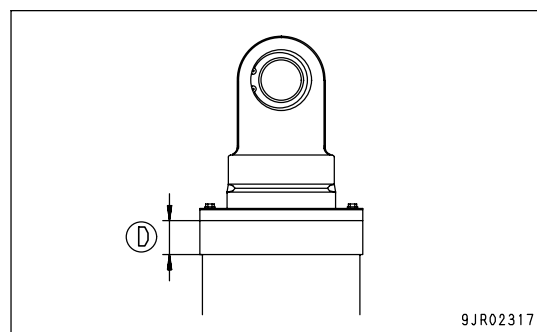
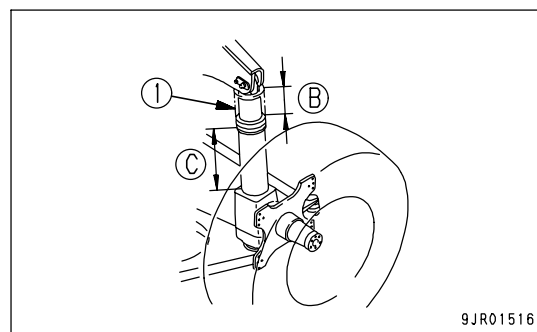
#### Front

Check that the bottom of the suspension cylinder cover is within range (A) shown by the arrow on the label when the machine is unloaded and on flat ground.



At the same time, when the machine is not loaded, remove cover (1), then measure dimension (B) from the shoulder of the rod head of the suspension cylinder to the top surface of the flange.

	Standard specification	Buffering specification
(B)	252 - 272 mm (9.9 - 10.7 in)	236 - 256 mm (9.3 - 10.1 in)
Reference (C)	474 - 494 mm (18.7 - 19.5 in)	474 - 494 mm (18.7 - 19.5 in)
Flange thickness (D)	49 mm (1.9 in)	65 mm (2.6 in)

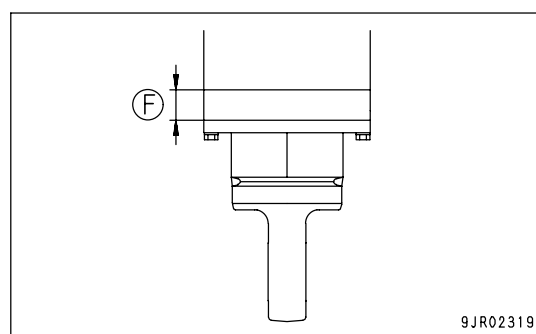
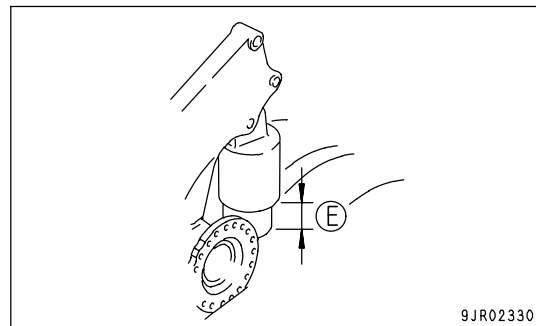


After checking, contact your Komatsu distributor for repairs if any problem is found.

**Rear**

Measure dimension (E) from the shoulder of the rod head of the suspension cylinder to the top surface of the flange.

	Standard specification	Buffering specification
(E)	230 - 250 mm (9.1 - 9.9 in)	210 - 230 mm (8.3 - 9.1 in)
Flange thickness (F)	50 mm (2.0 in)	70 mm (2.8 in)



After checking, contact your Komatsu distributor for repairs if any problem is found.

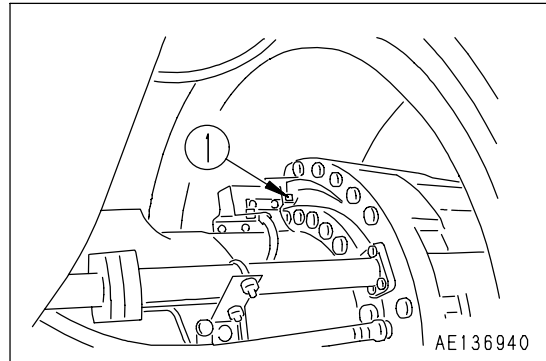


**BLEED AIR FROM REAR BRAKE****WARNING**

Stop the machine on level ground and put blocks under the wheels before bleeding the air.

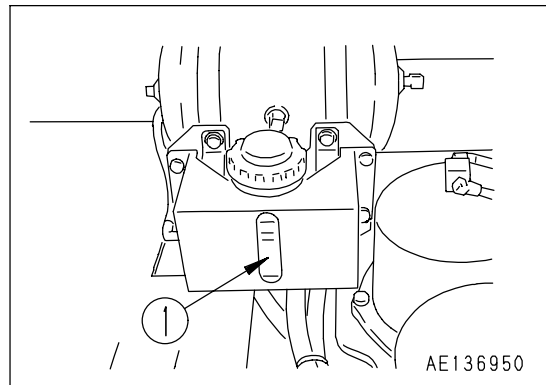
To make it easier to bleed the air, warm the oil up to a temperature of at least 40°C (104°F) before bleeding the air.

1. Pull the retarder brake lever, loosen air bleed plug (1) to bleed the air from the circuit, then tighten plug (1) and release the retarder brake lever.
2. Repeat this procedure until no more bubbles come out from air bleed plug (1). After completely bleeding the air, tighten plug (1) securely.

**BLEED AIR FROM FRONT BRAKE****WARNING**

Stop the machine on level ground and put blocks under the wheels before bleeding the air.

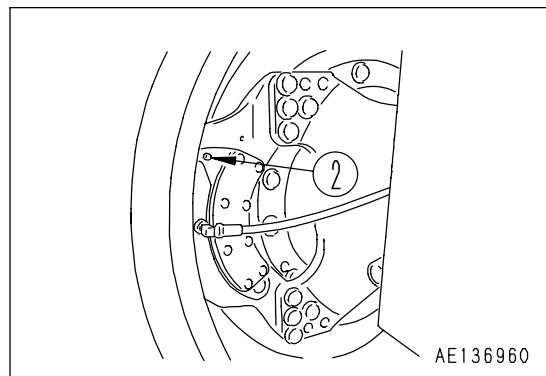
1. Start the engine and raise the pressure to the maximum position in the green range on the air pressure gauge.
2. Fill oil reservoir (1) with oil.



3. Remove the cap of bleeder screw (2), insert a vinyl hose (inside diameter: 8 mm (0.315in)), then loosen the bleeder screw approx. 3/4 turns and depress the brake pedal slowly. After tightening the bleeder screw, release the brake pedal. Repeat this procedure until no more bubbles come out from the vinyl hose.

Do not keep the brake pedal depressed continuously. Depress it each time slowly to bleed the air.

After bleeding the air, tighten bleeder screw (2) securely and fit the cap.



4. After completion of the air bleeding procedure, fill the oil reservoir to the specified level (MAX).

Repeat the same procedure on the left and right sides.

When bleeding the air from the front brakes and rear brakes at the same time, bleed the air from the rear brakes first.

## ADJUST PARKING BRAKE

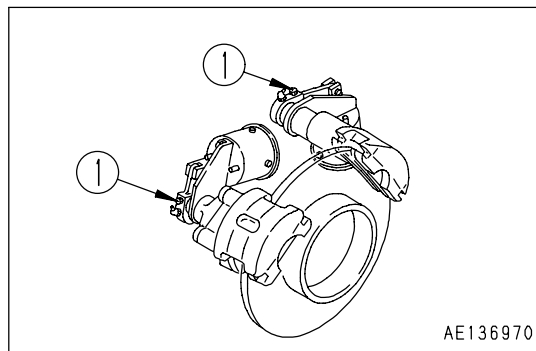


### WARNING

- When carrying out the adjustment, raise the air pressure high enough to prevent the parking brake from being applied automatically, and hang a warning sign on the parking brake valve lever to prevent any other person from operating it.
- Never put any oil or grease on the surface of the pad or disc.

If the parking brake effect is poor, adjust as follows.

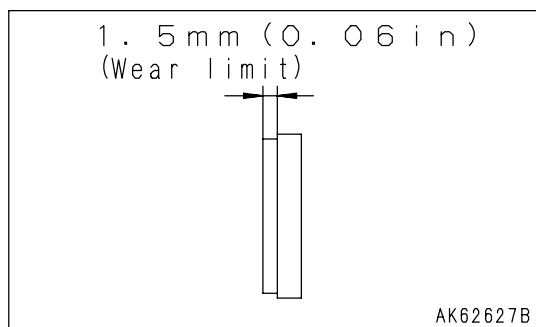
1. Check that the air pressure gauge is in the green range, then release the parking brake.
2. Turn bolts (1) (2 places) clockwise to bring the pad into tight contact with the disc.
3. Turn bolt (1) back 2/3 turns (4 clicks) in the counterclockwise direction.



Measure the thickness of the pad, and if it is less than 1.5 mm (0.06 in), contact your Komatsu distributor to have it replaced.

When making the first adjustment after replacing the pad, turn bolt (1) turn (6 clicks) in the counterclockwise direction.

After adjusting, check the braking capacity of the parking brake. See "CHECK BRAKING CAPACITY OF PARKING BRAKE (PAGE 4-50)". If the machine moves, contact your Komatsu distributor for inspection.



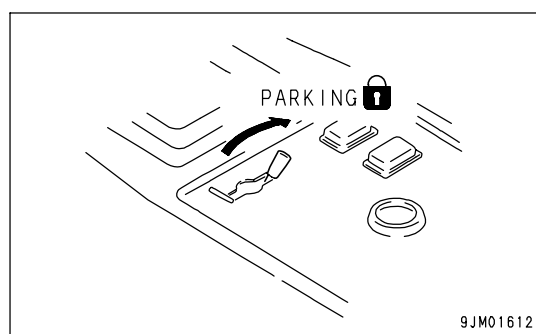
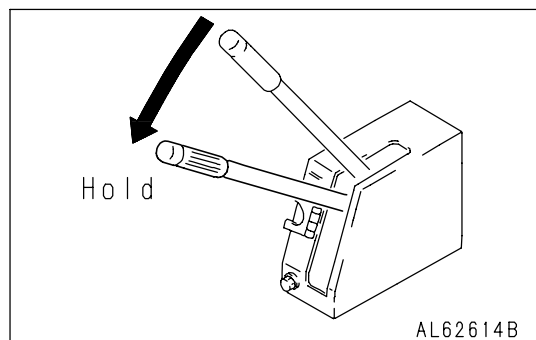
## ADJUST BODY POSITIONER



### WARNING

If for any reason the maintenance is performed while the engine is running, strictly follow the next rules.

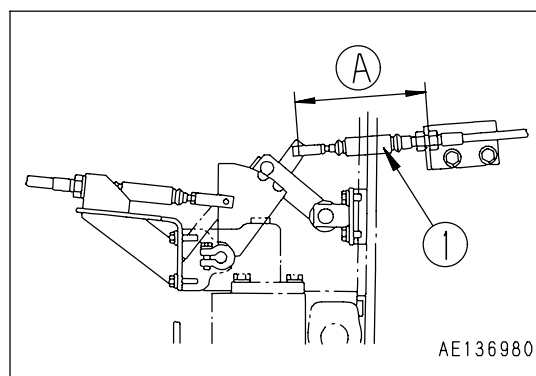
- One should sit on the operator's seat, preparing to stop the engine at any moment, and contact with the other.
- Set the dump lever at HOLD position to prevent the dump body from moving. Also, set the parking brake valve lever at PARKING position to prevent the machine from moving.
- When working near fan or belts, do not bring your body or any materials closer that can be dragged into.
- Do not touch the operation lever. If for any reason you have to move the lever, be sure to contact with the other person to let him/her move to the safe area.
- If the materials or tools are dropped onto fan or belts, they fly away or cut. Never drop or insert materials or tools.



With the positioner device, it is possible to automatically stop the dump body when it rises to the desired position (to the dump body elevation). Adjust if it does not automatically stop or if the shock still remains.

## ADJUSTING

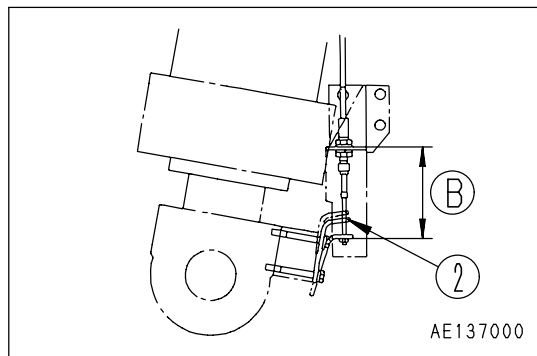
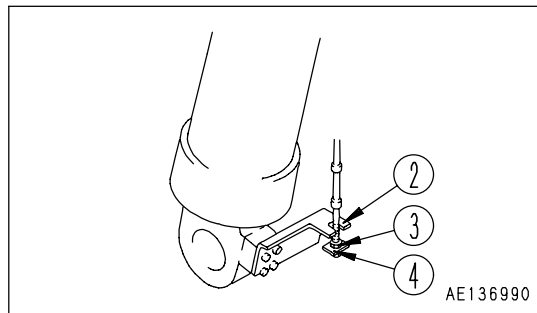
1. Set the dump lever to the HOLD position.
2. Adjust push cable (1) to the standard length.  
Standard length A: 180 mm (7.1 in)



3. Raise the dump body until the hoist cylinder is 50 mm (2.0 in) before the end of its stroke, then stop the engine.

4. Loosen locknut (3), put plate (4) into contact with bracket (2), then tighten locknut (3).

Reference dimension B: 147 mm (5.8 in)



5. After adjusting, start the engine, operate the dump lever, and check that the lever is automatically returned to the HOLD position when the dump body rise to a point 50 mm (2.0 in) before the end of the hoist cylinder stroke.

**REMARK**

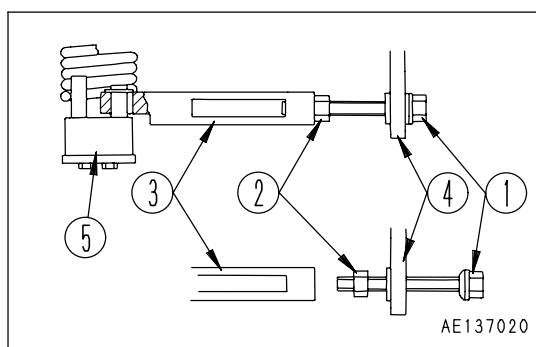
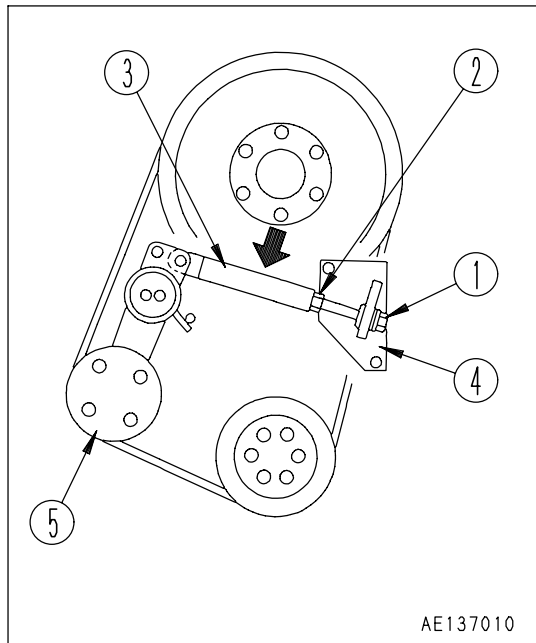
Check the operation of the body positioner before starting operations each day.

## REPLACE FAN BELT, ADJUST AUTO TENSIONER

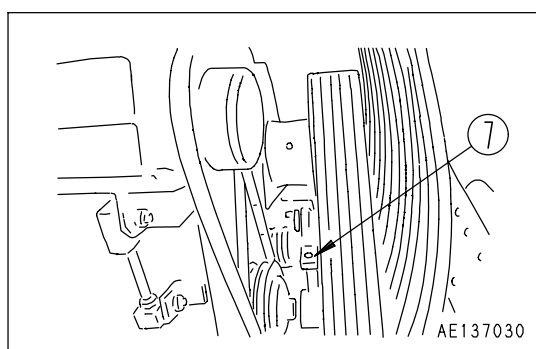
Replace the belt if the V-belt contacts the bottom of the pulley groove, or if the fan belt is lower than the outside edge of the pulley, or if there are any cracks, peeling, or other damage to the V-belt.

### REPLACEMENT

1. Loosen lock nut (2), then loosen adjustment bolt (1). After that, remove yoke (3) with locknut (2) still installed.  
There is danger of losing parts, so do not remove bolt (1) from bracket (4).

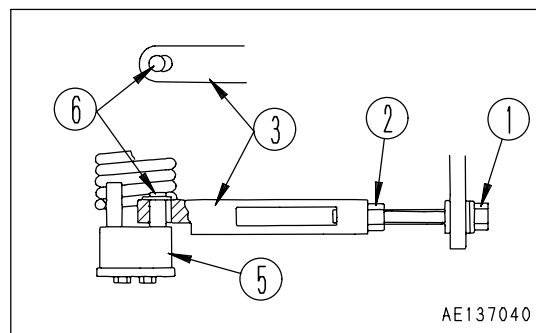


2. Insert a bar of a length of approx. 50 cm (20 in) into hole (7) (diameter: 24) of the tension pulley bracket, and pull forward strongly.
3. The spring is extended and the tension pulley (5) moves inwards, so remove the old belt and replace it with a new one.  
Always replace the V-belt as a set (5 belts).



## ADJUSTMENT

1. Install adjustment bolt (1) and locknut (2) to yoke (3).
2. Tighten adjustment bolt (1) until the clearance is 0 mm (0 in) between the both ends of the oblong hole of yoke (3) and pin (6) of tension pulley (5), then tighten a further 3 turns.  
Tighten locknut (2) to hold in position.
3. Run for one hour, then check the clearance between the end of the oblong hole of yoke (3) and pin (6) of tension pulley (5).  
If there is any clearance, repeat Step 2 to adjust again.  
If the fan belt makes any abnormal noise, adjust in the same way.



## CHECK PLAY OF OUTPUT COUPLING OF OUTPUT SHAFT

If any abnormal noise occurs around the output shaft or front drive shaft, the rubber inside the output shaft may be deteriorated or damaged, so check the play of the coupling as follows.

Play in circumferential direction

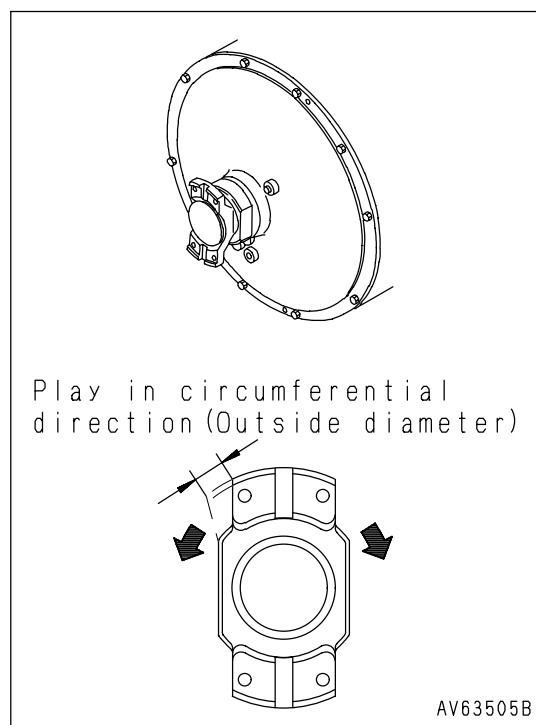
Using a bar, move the coupling in the direction of the circumference and check the play in the circumferential direction at the outside diameter of the coupling.

Standard: Max. 15 mm (0.6 in)

### REMARK

If the play range is exceeded, the engine fan will start to rotate, so when inspecting the play, check first that the engine fan is not rotating.

If the result of the measurement shows that it is greater than the standard value, please contact your Komatsu distributor for disassembly and inspection.

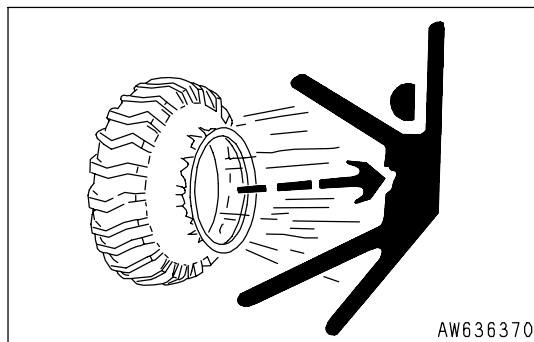


## SELECTION AND INSPECTION OF TIRES

**WARNING**

If a tire or a rim is handled improperly, the tire may burst or may be damaged and the rim may be broken and scattered, and that can cause serious injury or death.

- Since maintenance, disassembly, repair and assembly of the tires and rims require special equipment and skill, be sure to ask a tire repair shop to do the work.
- Do not heat or weld the rim to which the tire is installed. Do not make a fire near the tire.



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## SELECTION OF TIRES

**WARNING**

Select the tires according to the conditions of use and the weight of the attachments on the machine. Use only specified tires and inflate them to the specified pressure.

Select the tires according to the conditions of use and the weight of the attachments of the machine. Use the following table.

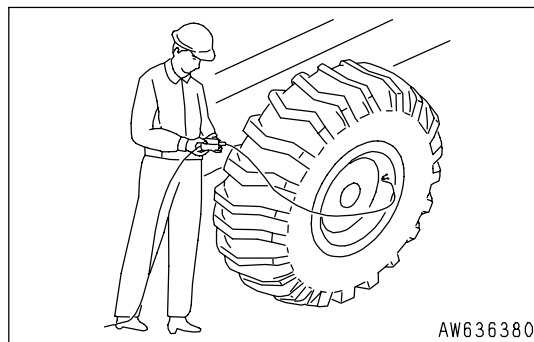
Since the travel speed indicated on the speedometer varies with the tire size, consult your Komatsu distributor when using optional tires.

	Specification of tire [kg (lb)]	Size	Remarks
Front wheel	27250 (60086)	27.00R49 ★ ★	Type 1 for construction equipment
	25000 (55125)	27.00-49-48PR	
Rear wheel	27250 (60086)	27.00R49 ★ ★	
	25000 (55125)	27.00-49-48PR	

## CHECK OF INFLATION PRESSURE OF TIRES AND INFLATION OF THEM

**WARNING**

- When inflating a tire, check that any person will not enter the working area and use an air chuck which has a clip and which can be fixed to the air valve.
- While inflating the tire, check the inflation pressure occasionally so that it will not rise too high.
- If the rim is not fitted normally, it may be broken and scattered while the tire is inflated. Accordingly, place a guard around the tire and do not work in front of the rim but work on the tread side of the tire.
- Abnormal drop of inflation pressure and abnormal fitting of the rim indicate a trouble in the tire or rim. In this case, be sure to ask a tire repair shop for repair.
- Be sure to observe the specified inflation pressure.
- Do not adjust the inflation pressure of the tires just after high-speed travel or heavy-load work.

**Check**

Measure the inflation pressure with a tire pressure gauge, while the tires are cool, before starting work.

**Inflation of tires**

Adjust the inflation pressure properly.

When inflating a tire, use an air chuck which can be fixed to the air valve of the tire as shown in the figure. Do not work in front of the rim but work on the tread side of the tire.

The proper inflation pressure is shown below.

Tire size	Inflation pressure
27.00R49 ★ ★ (standard)	0.69 MPa (7.00 kgf/cm <sup>2</sup> , 99.4 PSI)
27.00-49-48PR (if equipped)	0.55 MPa (5.60 kgf/cm <sup>2</sup> , 79.52 PSI)

**NOTICE**

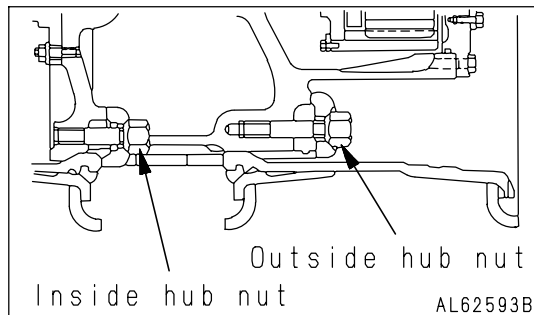
If the tires are used when the inflation pressure is less than the value given in the table above, the rim may be damaged.

Always keep the tire inflation pressure within +0 to +0.03 MPa (0.3 kgf/cm<sup>2</sup>, 4.3 PSI) of the value in the table above.

**PRECAUTIONS WHEN REPLACING TIRE**

If the hub nuts have been tightened again after replacing the tire, travel for 5 to 6 km, then tighten again to settle all the contacting parts.

In particular, there are more contacting parts on the rear wheels than on the front wheels, so it will take time for the parts to settle. For this reason, repeat the tightening process for the first 50 hours after installation. However, on the rear wheels, there are hub nuts at 3 places on the inside, but these are for temporary assembly, so there is no need to tighten the inside hub nuts after the outside hub nuts are tightened.





## CHECK BEFORE STARTING

For the following items, see "CHECK BEFORE STARTING (PAGE 3-56)".

- Check coolant level, add coolant
- Check oil level in front brake oil tank, add oil
- Check dust indicator
- Drain water from air tank
- Check oil level in engine oil pan, add oil
- Check oil level in transmission case, add oil
- Check oil level in steering and hoist oil tank, add oil
- Check oil level in rear brake cooling oil tank, add oil
- Drain water, sediment from fuel tank
- Check fuel level, add fuel
- Check wheel hub nuts, tighten
- Check central warning lamp
- Check braking effect
- Check machine monitor system
- Check braking capacity of emergency brake
- Check manual emergency steering
- Check auto-emergency steering
- Check backup alarm
- Check electric wiring
- Check inflation pressure of tires

## EVERY 100 HOURS SERVICE

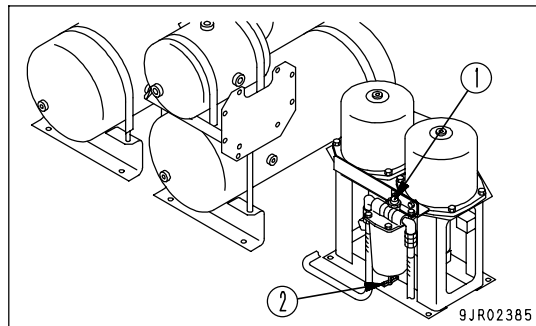
### CHECK ALCOHOL LEVEL IN ALCOHOL INJECTOR, ADD ALCOHOL

(Machines equipped with alcohol injector)

During the cold season, check the ethyl alcohol level every 100 hours on the service meter.

When removing filler cap (1) of the alcohol injector to carry out the inspection, loosen it slowly to release the remaining pressure before removing it.

If the alcohol level is low, add alcohol to the bottom surface of the threaded portion of the filler cap.



#### REMARK

- On this machine, air is used to operate the brakes. When the machine is operated in cold weather, the moisture in the air will freeze and cause problems such as defective operation of the valve, so add ethyl alcohol to the air system to lower the freezing point.
- When filling the alcohol injector with alcohol before the cold season, release the remaining pressure, remove the cap, then add 1.4 liters (0.37 US gal) of ethyl alcohol through the filler port.
- After the cold season, loosen drain valve (2) and drain the ethyl alcohol.

## EVERY 250 HOURS SERVICE

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

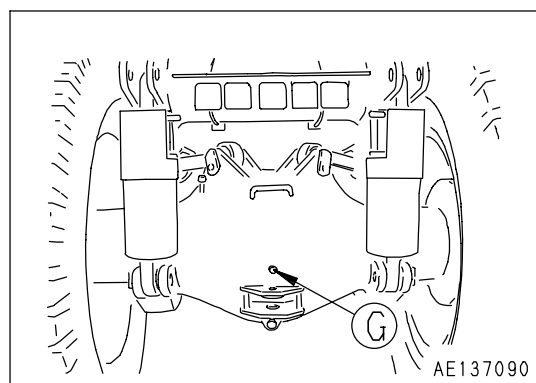
### CHECK OIL LEVEL IN DIFFERENTIAL CASE, ADD OIL



#### WARNING

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.
- When removing plug, oil may spout out. So turn the plug gradually to release the internal pressure, then carefully remove it.

1. Remove plug (G) and check that the oil level is near the bottom of the plug hole.
2. If the oil level is too low, add oil through the plug hole until the oil overflows.



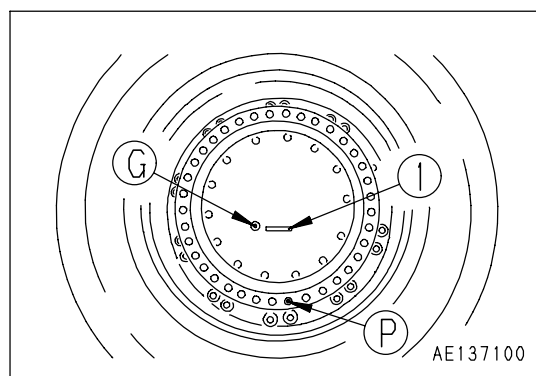
### CHECK OIL LEVEL IN FINAL DRIVE CASE, ADD OIL



#### WARNING

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.
- If there is still pressure remaining inside the case, the oil or plug may fly out. Loosen the plug slowly to release the pressure.

1. Stop the machine so that casting line (1) is horizontal and drain plug (P) is immediately at the bottom.
2. Remove plug (G) and check that the oil level is near the bottom of the plug hole.
3. If the oil level is too low, add oil through the plug hole until the oil overflows.

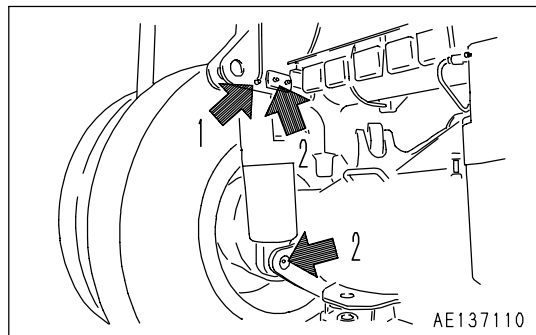


## LUBRICATION

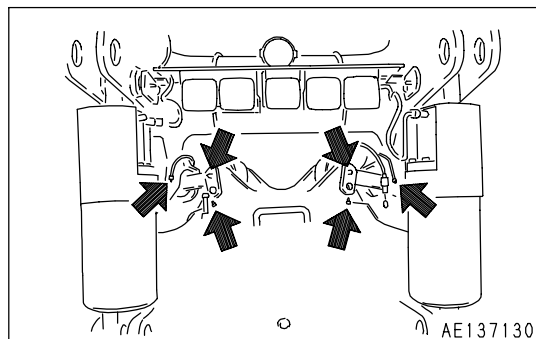
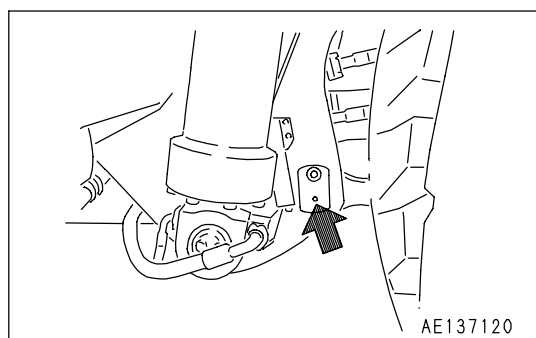
1. Stop the engine.
2. Using a grease pump, pump in grease through the grease fittings marked by the arrows.
3. After greasing, wipe off any old grease that was pushed out.

Carry out the greasing operation every day when operating in places where the grease flows out easily, such as when traveling through mud or water.

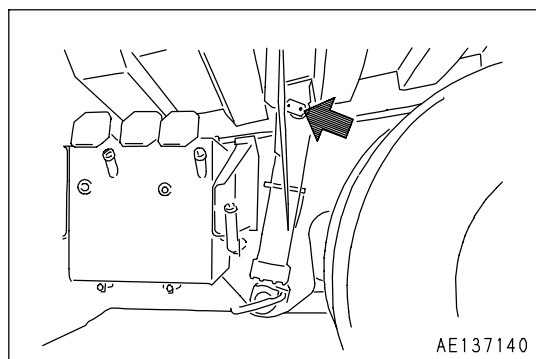
- (1) Dump body hinge pin (left and right: 1 place each)
- (2) Rear suspension (left and right: 2 places each)



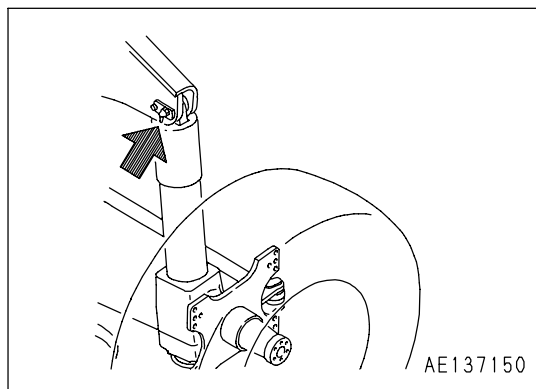
- (3) Differential support (left and right: 4 places each)



- (4) Hoist cylinder pin (left and right: 2 places each)

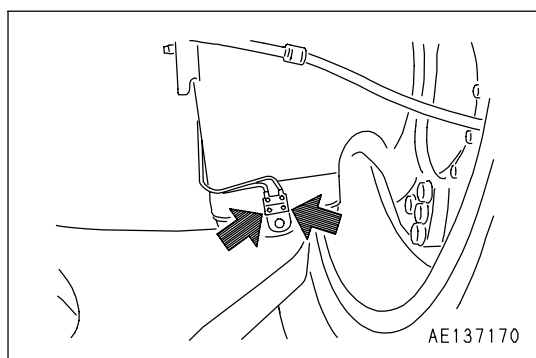
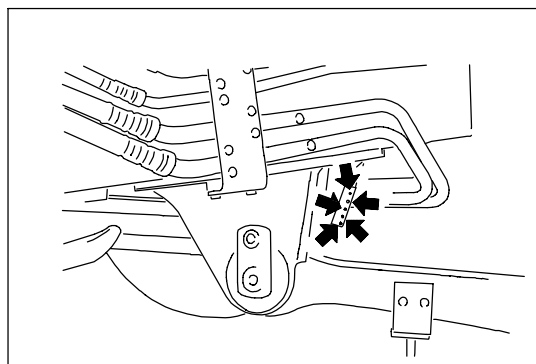
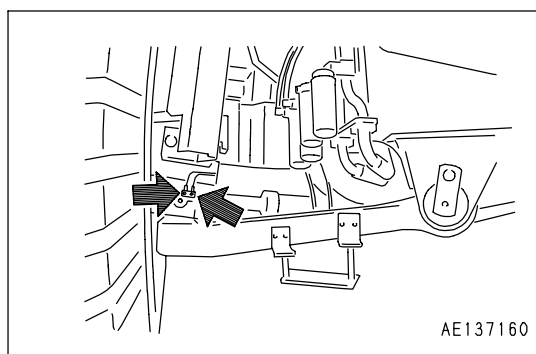


(5) Front suspension (left and right: 1 place each)

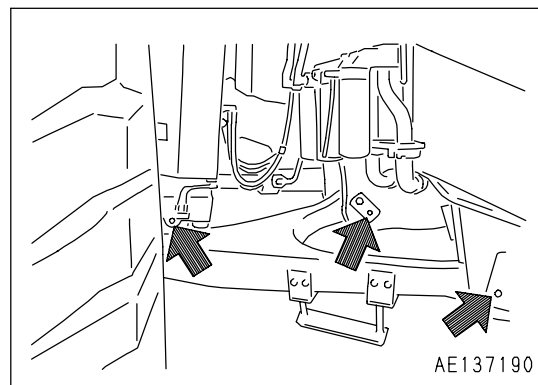


(6) Steering cylinder pin (4 places)

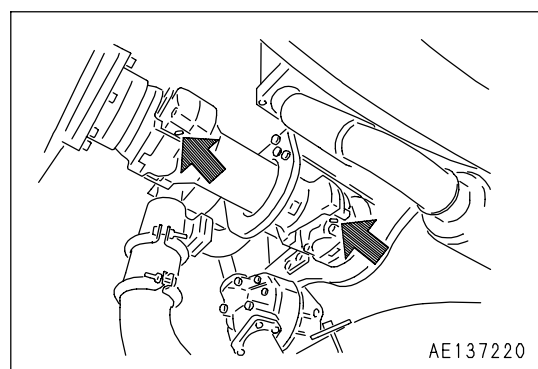
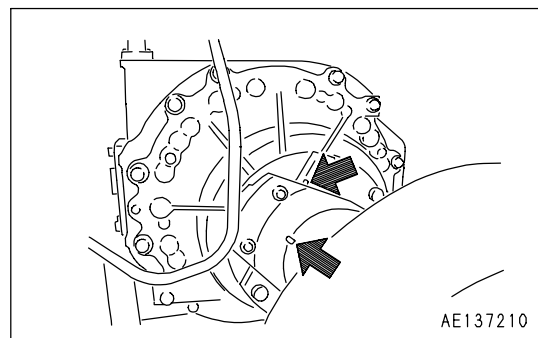
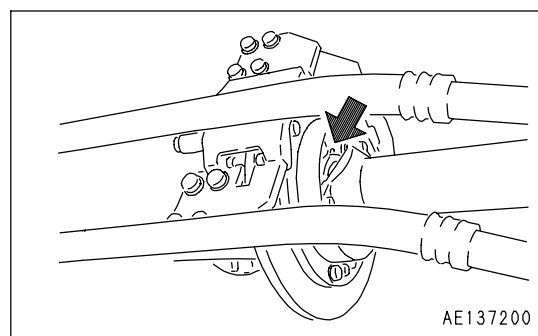
(7) Steering link pin (5 places)



(8) Steering linkage (left and right: 3 places each)



(9) Drive shaft (5 places)



## CHECK LEVEL OF BATTERY ELECTROLYTE

Perform this check before operating the machine.



### WARNING

- Do not use the battery if the battery electrolyte level is below the LOWER LEVEL line. This will accelerate deterioration of the inside of the battery and reduce the service life of the battery. In addition, it may cause an explosion.
- The battery generates flammable gas and there is danger of explosion, do not bring fire or sparks near the battery.
- Battery electrolyte is dangerous. If it gets in your eyes or on your skin, wash it off with a large amount of water and consult a doctor.
- When adding distilled water to the battery, do not allow the battery electrolyte to go above the UPPER LEVEL line. If the electrolyte level is too high, it may leak and cause damage to the paint surface or corrode other parts.

### NOTICE

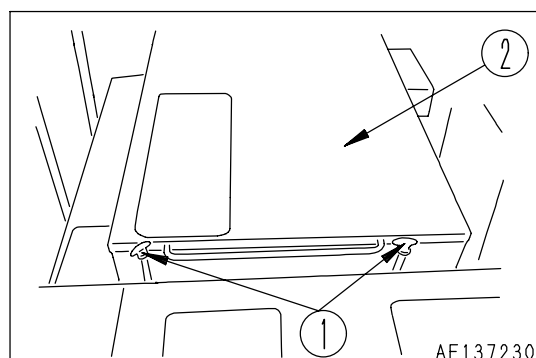
When adding distilled water in cold weather, add it before starting operations in the morning to prevent the electrolyte from freezing.

Inspect the battery electrolyte level at least once a month and follow the basic safety procedures given below.

### WHEN CHECKING ELECTROLYTE LEVEL FROM SIDE OF BATTERY

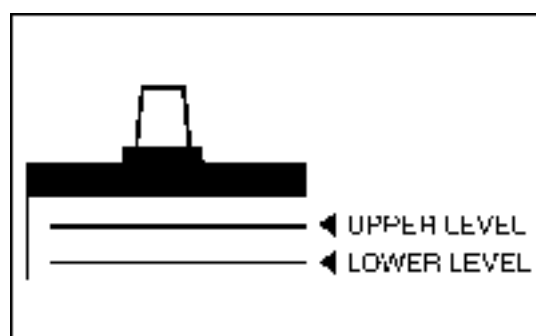
If it is possible to check the electrolyte level from the side of the battery, check as follows.

1. Remove hook (1), then open inspection cover (2).



2. Use a wet cloth to clean the area around the electrolyte level lines and check that the electrolyte level is between the UPPER LEVEL (U.L.) and LOWER LEVEL (L.L.) lines.

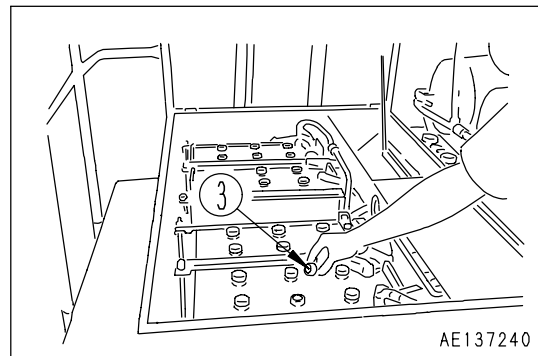
If the battery is wiped with a dry cloth, static electricity may cause a fire or explosion.



3. If the battery electrolyte level is below the mid point between the UPPER LEVEL and LOWER LEVEL, immediately remove cap (3) and add distilled water (or commercially available battery filler solution) to the UPPER LEVEL.
4. After adding distilled water, tighten cap (3) securely.

**REMARK**

If distilled water is added to above the U.L. line, use a syringe to lower the level to the U.L. line. Neutralize the removed fluid with baking soda (sodium bicarbonate), then flush it away with a large amount of water or consult your Komatsu distributor or battery maker.

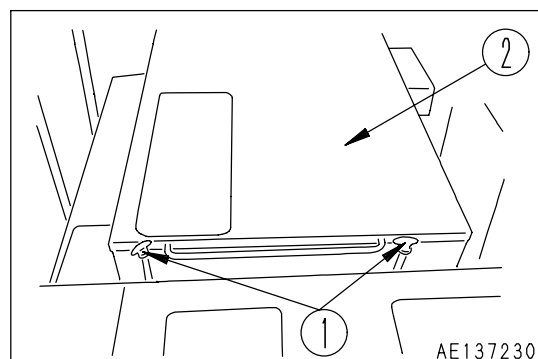


AE137240

**WHEN IT IS IMPOSSIBLE TO CHECK ELECTROLYTE LEVEL FROM SIDE OF BATTERY**

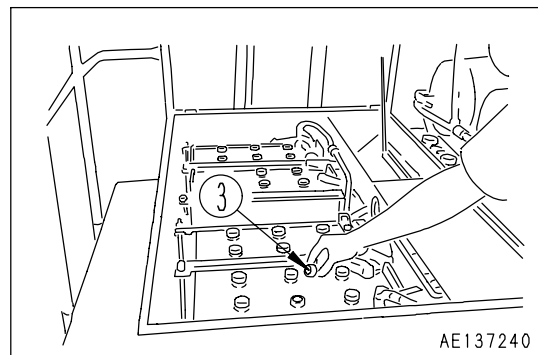
If it is impossible to check the electrolyte level from the side of the battery, or there is no display of the UPPER LEVEL line on the side of the battery, check as follows.

1. Remove hook (1), then open inspection cover (2).



AE137230

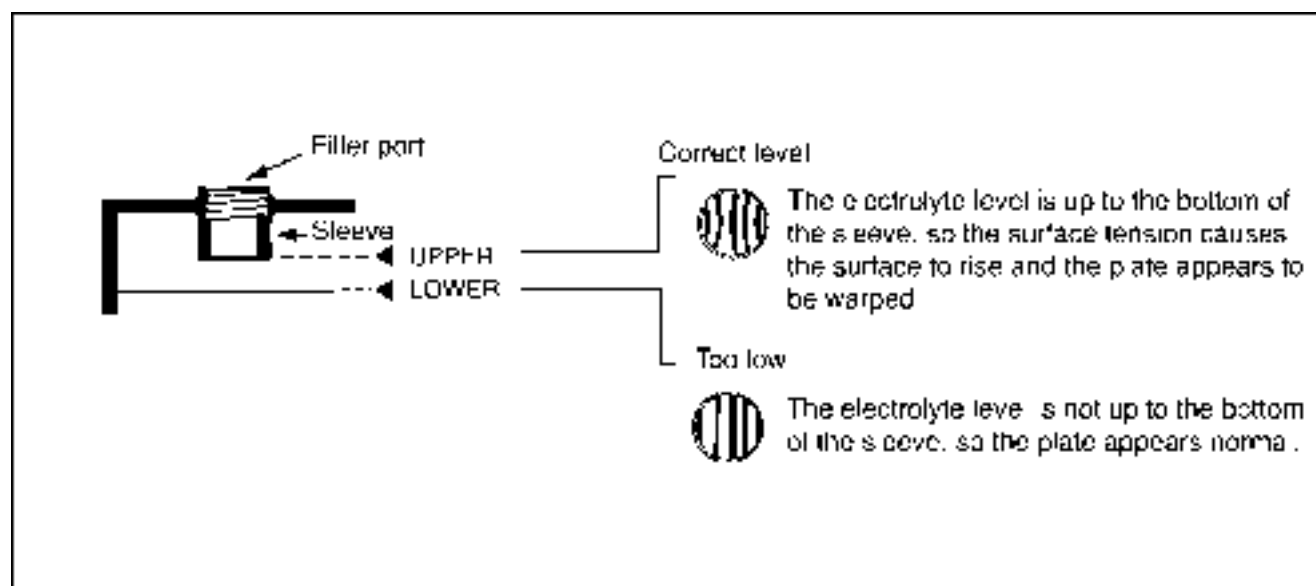
2. Remove cap (3) at the top of the battery and look through the filler port to check the electrolyte level. If the electrolyte is not up to the sleeve, immediately add distilled water (or commercially available battery filler solution) to the bottom of the sleeve (UPPER LEVEL).



AE137240



Use the diagram below for reference, and check if the electrolyte reaches the bottom of the sleeve.



3. After adding distilled water, tighten cap (3) securely.

#### REMARK

If distilled water is added to above the bottom of the sleeve, use a syringe to lower the level to the bottom of the sleeve. Neutralize the removed fluid with baking soda (sodium bicarbonate), then flush it away with a large amount of water or consult your Komatsu distributor or battery maker.

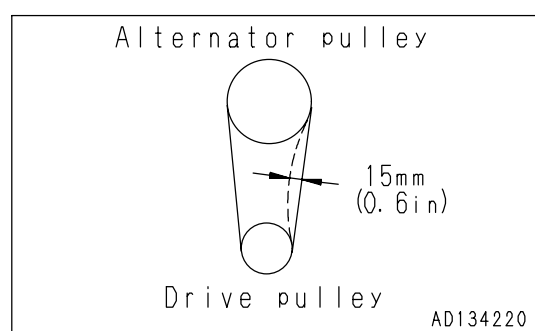
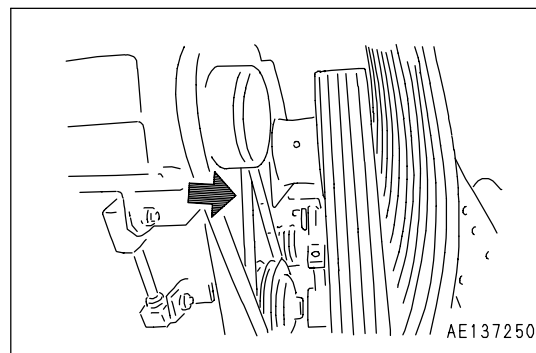
#### WHEN IT IS POSSIBLE TO USE INDICATOR TO CHECK ELECTROLYTE LEVEL

If it is possible to use an indicator to check the electrolyte level, follow the instructions given.

## CHECK ALTERNATOR BELT, ADJUST

### CHECKING

The belt should normally deflect by above 15 mm (0.6 in) when pressed with the thumb (with a force of approx. 58.8 N (6 kgf) at a point midway between the drive pulley and alternator pulley.

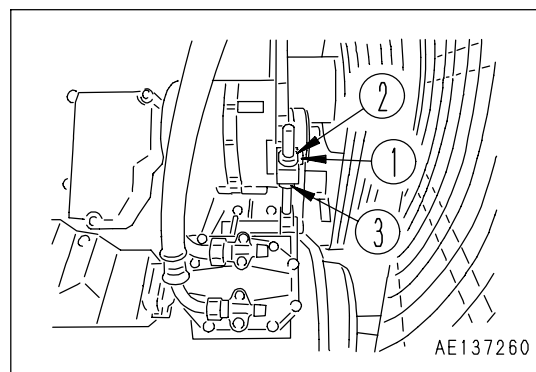


### ADJUSTING

1. Loosen bolt (1) and lock nut (2).
2. Rotate adjusting nut (3) so that the deflection is approx. 15 mm (0.6 in) (at a force of approx. 58.8 N (6 kgf).)
3. After adjustment, tighten lock nut (2) and bolt (1) securely.

### REMARK

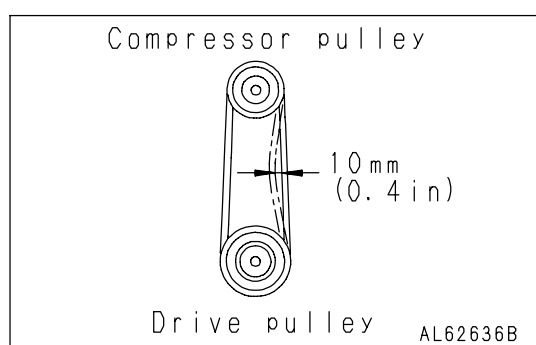
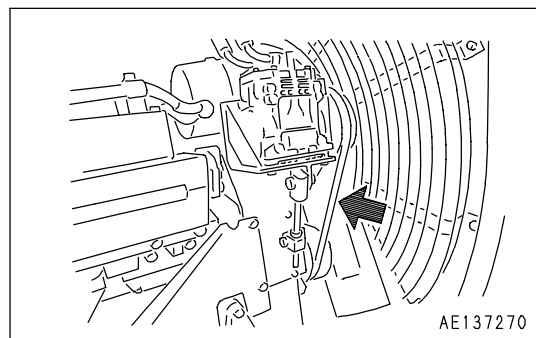
- Check each pulley for breakage and wear of the V-groove. In particular, check that the V-belt does not touch the bottom of the V-groove.
- If any abnormality is found, ask your Komatsu distributor for replacement of the pulley.
- If the V-belt is so lengthened that it cannot be adjusted any more or if it has any cuts or cracks, replace it.
- When adjusting the V-belt, do not press the alternator directly with a bar, but put a wood piece, etc. in-between them.
- If the V-belt has been replaced with a new part, there will be initial elongation, so inspect and adjust it again after one-hour of operation.



## CHECK AIR CONDITIONER COMPRESSOR BELT TENSION, ADJUST

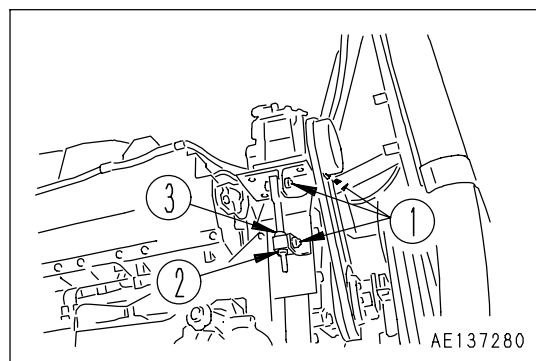
### CHECKING

The belt should normally deflect by 10 mm (0.4 in) when pressed with the thumb (with a force of approx. 58.8 N (6 kgf)) at a point midway between the air compressor pulley and drive pulley.



### ADJUSTING

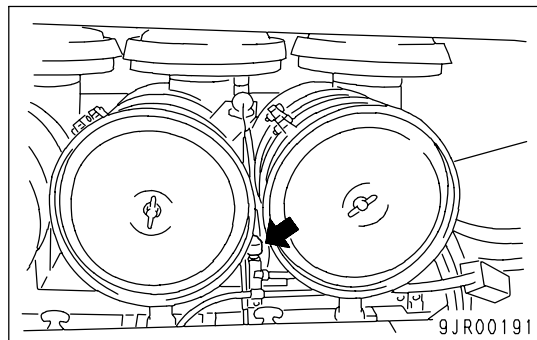
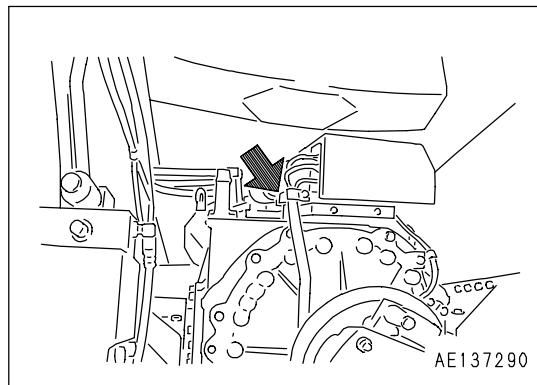
1. Loosen bolt (1) and lock nut (3).
2. Rotate adjusting nut (2) so that the deflection is approx. 10 mm (0.4 in) (at a force of approx. 58.8 N (6 kgf)).
3. After adjustment, tighten lock nut (3) and bolt (1) securely.
4. Check for damage to the pulleys, and wear of the V-groove and V-belt. Be particularly careful to check that the V-belt is not in contact with the bottom of the V-groove.
5. If the V-belt is so lengthened that it cannot be adjusted any more or if it has any cuts or cracks, replace it.
6. If the V-belt has been replaced with a new part, there will be initial elongation, so adjust the belt again after operating for 2 to 3 days.



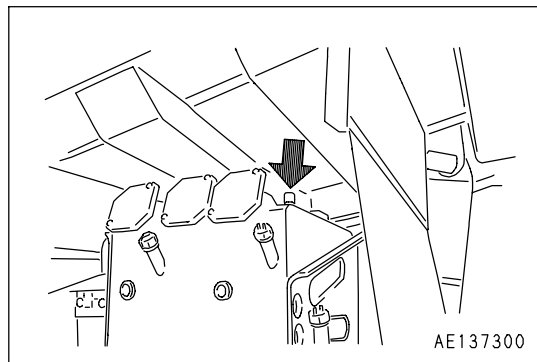
## CLEAN BREATHERS

Remove the mud and dirt from around the breathers, then remove the breathers and wash out the dirt with clean diesel oil or flushing oil.

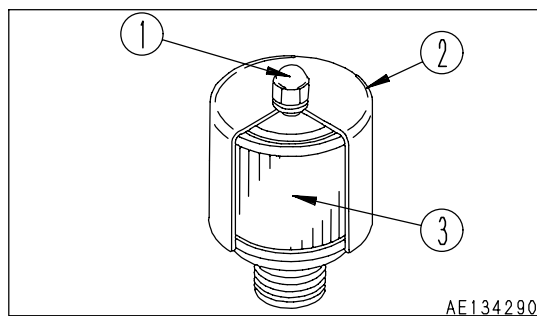
- Transmission case breather (2 places)  
Transmission valve, bracket section of air conditioner installment



- Hydraulic tank

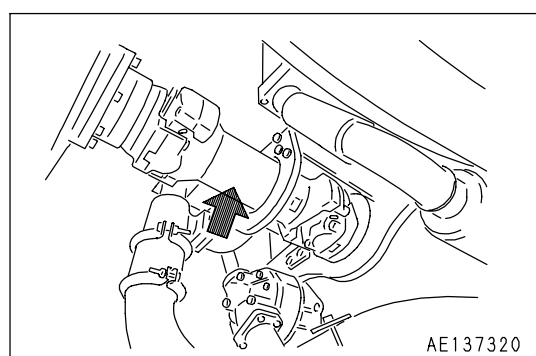
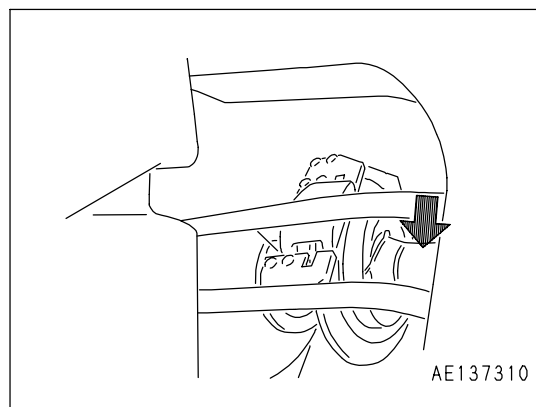


1. Remove nut (1), then remove cover (2) and wash element (3).
2. Install element (3), then install cover (2) and nut (1).



## CHECK DRIVE SHAFT

If there is any problem, such as looseness of the drive shaft connection, play in the spline or bearing portion, or runout of the shaft, please contact your Komatsu distributor for repair.



## CHECK FRAME

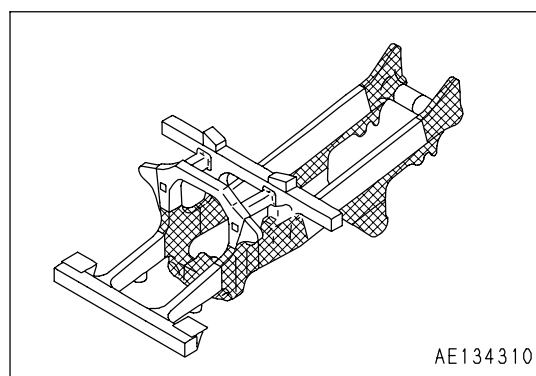


### WARNING

When the inspection is performed with the dump body raised, be sure to lock the dump lever at HOLD position, and use safety pins.

1. Wash the frame to make it easier to check.
2. Check all parts of the frame for damage.

In particular, check the colored portions in the diagram and if any cracks or damage are found, repair the damage. Please contact your Komatsu distributor for details of the repair procedure.



## CHECK BRAKING CAPACITY OF FOOT BRAKE

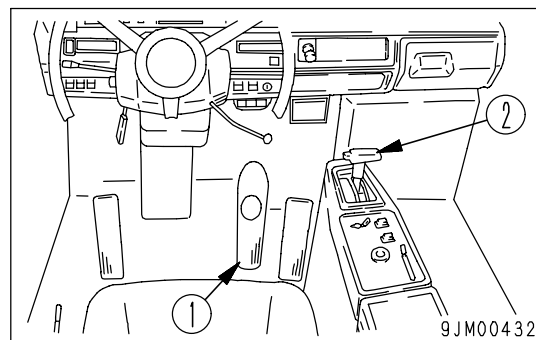


### WARNING

If the machine moves, it will lead to serious injury or death. If machine begins to move during the inspection of braking capacity, lower the engine speed immediately, set shifting lever at N position, and then set parking brake valve lever at PARKING position.

Check the braking capacity of the foot brake as follows.

1. Set the air pressure to the maximum with the machine on flat ground, and depress foot brake (1).
2. Set shift lever (2) to the D position, gradually raise the engine speed, and check that the machine does not move even when the engine speed reaches 1750 rpm. If the machine does not move, it is normal.
3. Lower the engine speed, set shift lever at N position, and then set parking brake valve lever at PARKING position. If any abnormality is found, ask your Komatsu distributor for repair.



## CHECK BRAKING CAPACITY OF RETARDER BRAKE

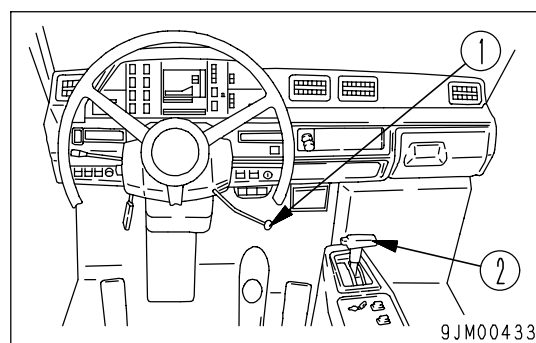


### WARNING

If the machine moves, it will lead to serious injury or death. If machine begins to move during the inspection of braking capacity, lower the engine speed immediately, set gear shift lever at N position, and then depress the foot brake.

Check the braking capacity of the retarder brake as follows.

1. Set the air pressure to the maximum with the machine on flat ground, and pull retarder lever (1) fully.
2. Set shift lever (2) to the D position, gradually raise the engine speed, and check that the machine does not move even when the engine speed reaches 1300 rpm. If the machine does not move, it is normal.
3. Lower the engine speed, set gear shift lever at N position. If any problem is found, ask your Komatsu distributor for repair.



## CHECK BRAKING CAPACITY OF PARKING BRAKE

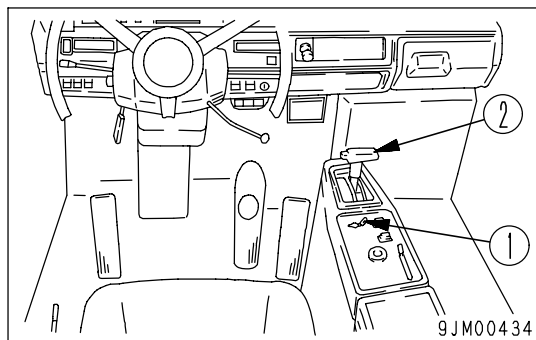


### WARNING

If the machine moves, it will lead to serious injury or death. If machine begins to move during the inspection of braking capacity, lower the engine speed immediately, set gear shift lever at N position, and then depress the foot brake.

Check the braking capacity of the parking brake as follows.

1. Set the air pressure to the maximum with the machine on flat ground, and set parking brake valve lever (1) to the PARKING position.
2. Set gear shift lever (2) to the D position, gradually raise the engine speed, and check that the machine does not move even when the engine reaches full speed. If the machine does not move, it is normal.
3. Lower the engine speed, set gear shift lever at N position. If any problem is found, ask your Komatsu distributor for repair.



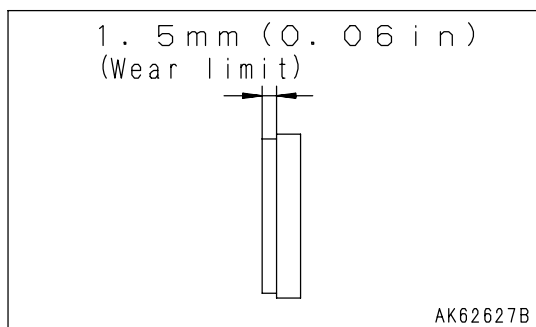
## CHECK WEAR OF PARKING BRAKE PADS



### WARNING

Never put any oil or grease on the surface of the pad or disc.

Measure the thickness of the pad, and if it is less than 1.5 mm (0.06 in), contact your Komatsu distributor.

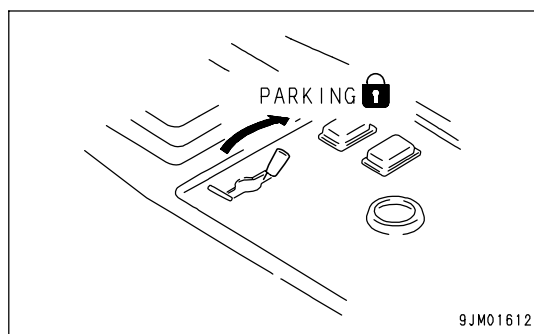
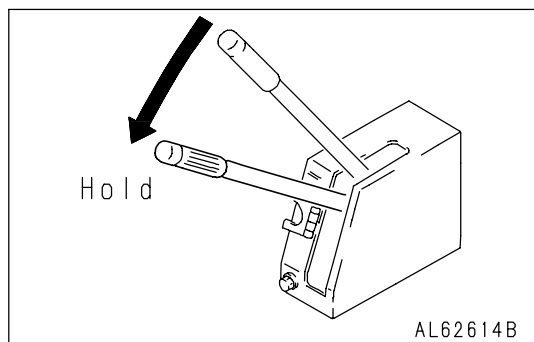


## CHECK, CLEAN AUTOMATIC SUSPENSION

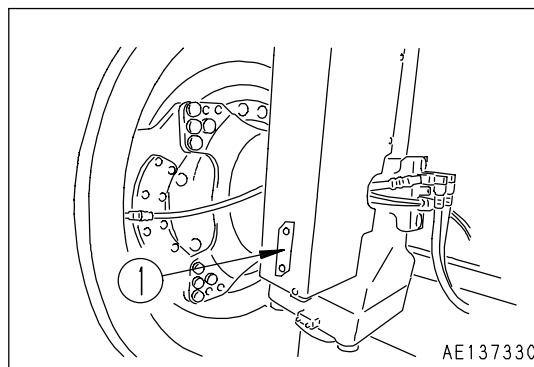
**WARNING**

If for any reason the maintenance is performed while the engine is running, strictly follow the next rules.

- One should sit on the operator's seat, preparing to stop the engine at any moment, and contact with the other.
- Set the dump lever at **HOLD** position to prevent the dump body from moving. Also, set the parking brake valve lever at **PARKING** position to prevent the machine from moving.
- When working near fan or belts, do not bring your body or any materials closer that can be dragged into.
- Do not touch the operation lever. If for any reason you have to move the lever, be sure to contact with the other person to let him/her move to the safe area.
- If the materials or tools are dropped onto fan or belts, they fly away or cut. Never drop or insert materials or tools.



1. Remove the cover (1) used for inspection.

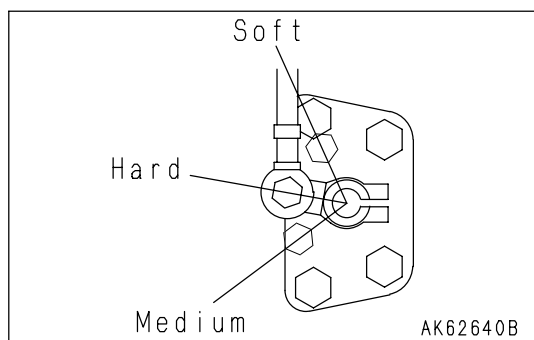


2. Check the positions of the link. Check that it moves to the following positions:

For normal travel when empty: soft

When the brake is depressed: medium

When the dump lever is at any position other than **FLOAT**: hard.



If any problem is found, please contact your Komatsu distributor for inspection and adjustment.

If operations are carried out on muddy or wet ground, mud will stick to the link, and the movement may become slow, so check and clean.

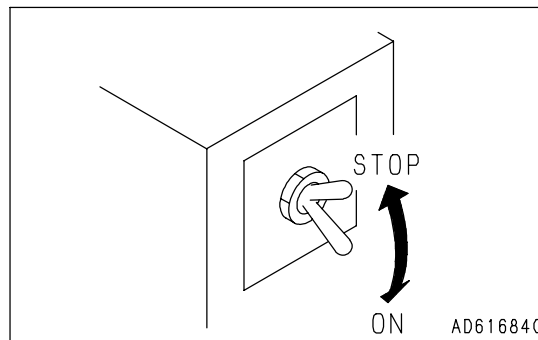


## INSPECTION OF ENGINE EMERGENCY STOP



### WARNING

Do not use this switch to stop the engine except in an emergency case. Once it is used and the engine stops completely, return it to the ON (Start) position.



1. Start the engine and run it at low idling speed.

2. Turn the engine emergency stop switch to the STOP position (Position to stop the engine), and confirm that the engine stops.

The engine will stop 10 to 20 sec later. If it fails to stop, ask your Komatsu distributor for inspection and adjustment.

**EVERY 500 HOURS SERVICE**

Carry out maintenance for EVERY 100 HOURS and EVERY 250 HOURS SERVICE at the same time.

**CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE****WARNING**

The parts and oil is at high temperature after the engine has been operated, and it can result in a burn. Wait for the oil to cool down before changing it.

- Refill capacity: 130 liters (34.32 US gal)
- Prepare a filter wrench

1. Set a container to catch the oil immediately under the drain valve under the chassis.

2. Remove drain plug (1), then loosen drain valve (2) slowly to avoid getting oil on yourself, and drain the oil. Be careful not to loosen the drain valve too far and deform the stopper pin inside the valve.

When draining the oil, fit a standard hose to the drain valve to prevent the oil from spraying out.

3. Check the drained oil, and if there are excessive metal particles or foreign material, please contact your Komatsu distributor.

4. Tighten drain valve (2) and drain plug (1).

Tightening torque

Drain plug (1), drain valve (2):  $68.6 \pm 9.8\text{N}\cdot\text{m}$

( $7 \pm 1\text{ kgf}\cdot\text{m}$ ,  $50.6 \pm 7.2\text{ lbft}$ )

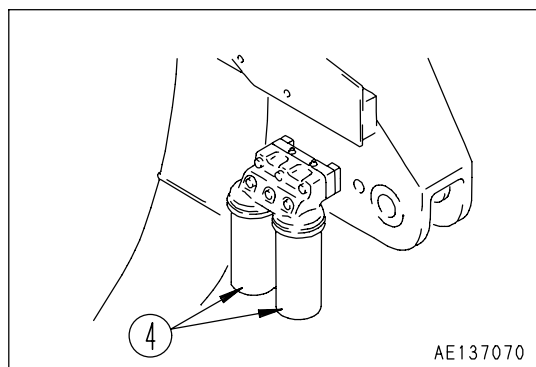
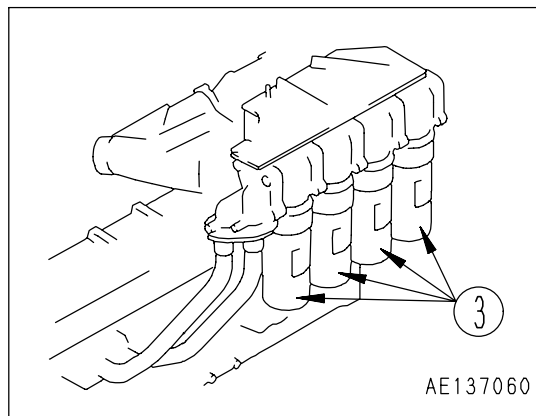
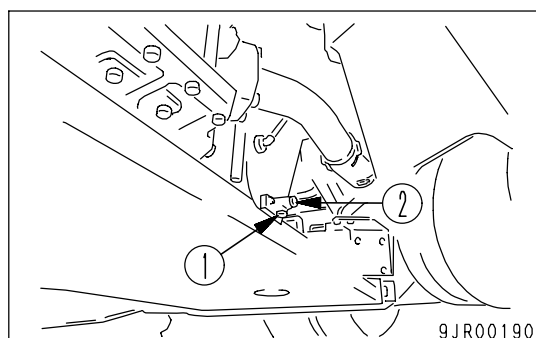
5. Using the filter wrench, turn 4 full-flow filter cartridges (3) and 2 bypass filter cartridges (4) to the left to remove them.

When doing this, to prevent getting oil on yourself, do not carry out this operation from immediately under the cartridge.

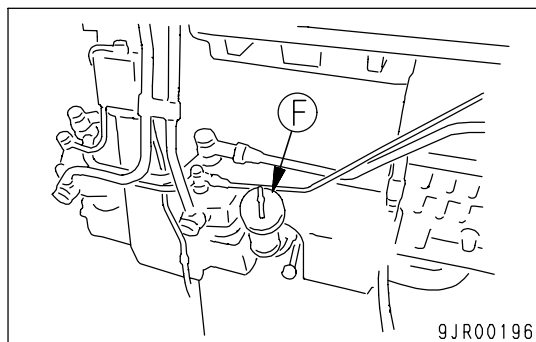
In particular, if this operation is carried out immediately after stopping the engine, a large amount of oil will come out, so wait for 10 minutes before starting the operation.

6. Clean the filter holder, fill the new filter cartridge with oil, then coat the seal and thread of the filter cartridge with oil (or coat thinly with grease) and install.

7. When installing the filter cartridge, tighten until the packing face is in contact with the filter holder, then tighten a further  $\frac{3}{4}$  - 1 turn.



8. Pour in the specified amount of engine oil from oil filler (F).
9. Run the engine for a short time at idling, then check if the oil is at the specified level. For details, see CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL (PAGE 3-58).



## REPLACE FUEL FILTER CARTRIDGE



### WARNING

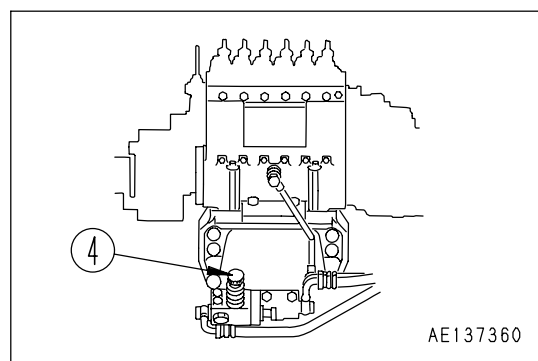
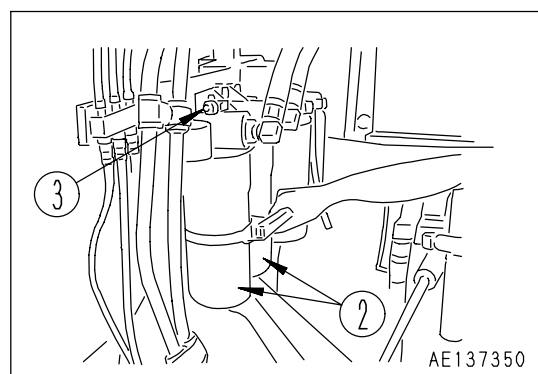
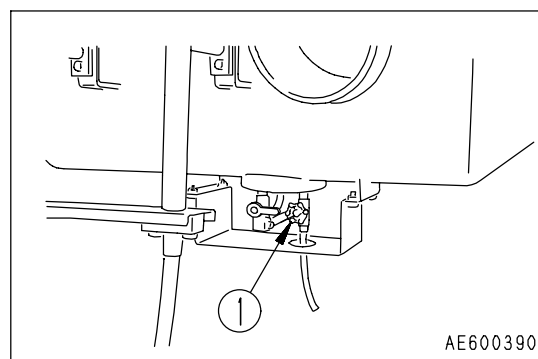
- Each part is at high temperature after the engine has been operated, so never change the filter immediately after finishing operations. Wait for each part to cool down before changing it.
- Do not bring fire or sparks near the fuel.

- Prepare a filter wrench

1. Close supply valve (1) of the fuel tank.
2. Set the container to catch the fuel under the filter cartridge.
3. Using a filter wrench, turn filter cartridge (2) counterclockwise to remove it.
4. Clean the filter holder, fill a new filter cartridge with clean fuel, coat the packing surface with engine oil, then install it to the filter holder.
5. When installing, tighten until the packing surface contacts the seal surface of the filter holder, then tighten a further 1/2 to 3/4 turns.

If the filter cartridge is tightened too far, the packing will be damaged and this will lead to leakage of fuel. If the filter is too loose, fuel will also leak from the packing, so always tighten the correct amount.

6. After replacing filter cartridge (2), loosen air bleed plug (3), and open supply valve (1).
7. Loosen knob (4) (one each on left and right) of the feed pump, and move it up and down to make the fuel overflow until no more bubbles come out from air bleed plug (3).
8. Tighten air bleed plug (3), then push in knob (4) (one each on left and right) of the feed pump, and tighten it.
9. After replacing the filter cartridge, start the engine and check that there is no leakage of fuel from the filter seal surface. If there is any leakage of fuel, check the tightening of the filter cartridge. If there is still leakage of fuel, follow Step 2 and 3 to remove the filter cartridge, then check the packing surface for damage or foreign material. If any damage or foreign material is found in the packing, replace the cartridge with a new part, then repeat Steps 4 to 9 to install the filter cartridge.



When the engine is started after stopping because fuel is used up, if misfiring or black exhaust emission occur, bleed air from the fuel line according to the following procedure.

10. Loosen the air bleed plugs of both injection pumps, bleed air by operating both feed pumps as explained in Steps 6 - 8 above.

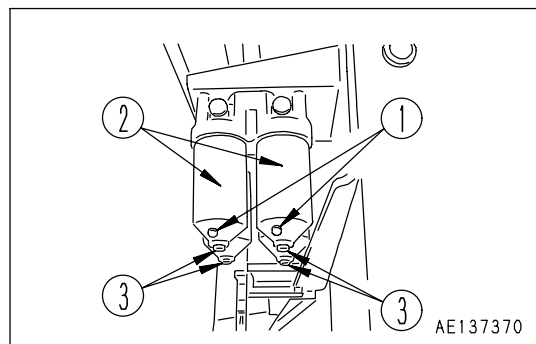
Be sure to use both priming pumps to bleed air.

If any air remains in the fuel line, it can cause a problem in the fuel system.

**REPLACE TRANSMISSION OIL FILTER ELEMENT****WARNING**

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

1. Set the container to catch the oil under the filter case.
2. Remove drain plug (1) at the bottom of the filter case, drain the oil, then tighten the plug again.
3. Hold down case (2), loosen center bolt (3), then remove case (2).
4. Remove the element and clean the inside of the case.
5. Replace the filter gasket and O-ring with new parts. Coat the gasket and O-ring thinly with clean engine oil before installing.



6. Assemble the new element to the case, set the case in position, and install with center bolt (3).  
Be careful not to tighten center bolt (3) too far.  
Tightening torque:  $152 \pm 14.7 \text{ N}\cdot\text{m}$  ( $15.5 \pm 1.5 \text{ kgf}\cdot\text{m}$ ,  $112.1 \pm 10.8 \text{ lbft}$ )
7. Run the engine for a short time at idling, then stop the engine, and check that the oil is up to the specified level.  
For details, see "CHANGE OIL IN TRANSMISSION CASE, CLEAN TRANSMISSION CASE STRAINER (PAGE 4-59)".

Run the engine at high idling, and when the oil is warmed up, if the transmission filter clogging monitor lamp flashes, replace the element immediately.

## CHECK WEAR OF FRONT DISC BRAKE PADS



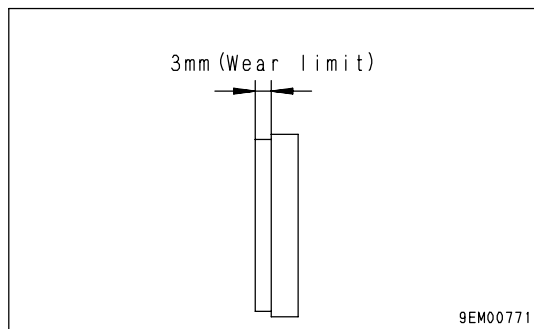
### WARNING

- If the pad is continued to use after the period of wear limit, not only the disk will be damaged but also the brake will lose its effect, and it is dangerous. If the period of wear limit approaches, check frequently the condition to change the pad at proper time.
- Perform inspection every 250 hours if the work site is covered by lots of earth and sand and if it is at the location where the foot brake is frequently used.

Measure the thickness of pad, and if the thickness is less than 3 mm (0.12 in), please contact your Komatsu distributor for replacement.

The pad wear is not necessarily the same for the left and right wheels, so always check the pads on both the left and right. If any of the pads has reached the wear limit, always replace all 4 pads.

If the work is performed on the muddy and watery ground, the mud sticks to caliper or disc. Leaving the mud will increase the wear of pad, so wash out thoroughly with water.



## CLEAN, CHECK RADIATOR FINS



### WARNING

If compressed air scattered around dust and debris, there is danger of injury. Always wear protective equipment such as protective glasses and mask.

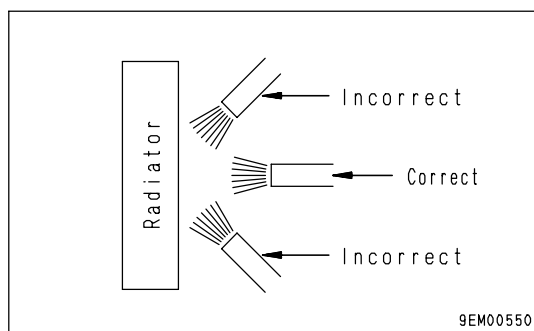
If the radiator fins become clogged or bent, this may cause overheating of the engine, so always clean or carry out inspection and take the necessary actions.

- Cleaning can be carried out by using jets of air, steam, or water, but be careful not to let the nozzle contact the fin.

Air pressure : Max. 0.98 MPa (10 kgf/cm<sup>2</sup>, 142 PSI)

Steam pressure : Max. 0.39 MPa (4 kgf/cm<sup>2</sup>, 56.8 PSI)

- When using compressed air or steam, keep the nozzle at 90 degrees to the radiator.
- Examine the rubber hose, and if any cracks or brittle places are found, replace the hose. In addition, check also for loose hose clamps.



## CHECK FAN BELT FOR WEAR AND REPLACE

Since inspection and replacement of the fan belt requires special tools, contact your Komatsu distributor.

The machine is equipped with an auto-tensioner, so there is no need to carry out any adjustment until the belt is replaced.

For details of replacing the fan belt, see REPLACE FAN BELT, ADJUST AUTO TENSIONER (PAGE 4-32).

## EVERY 1000 HOURS SERVICE

Carry out the EVERY 100 HOURS MAINTENANCE, EVERY 250 HOURS MAINTENANCE, and EVERY 500 HOURS MAINTENANCE at the same time.

## REPLACE CORROSION RESISTOR CARTRIDGE



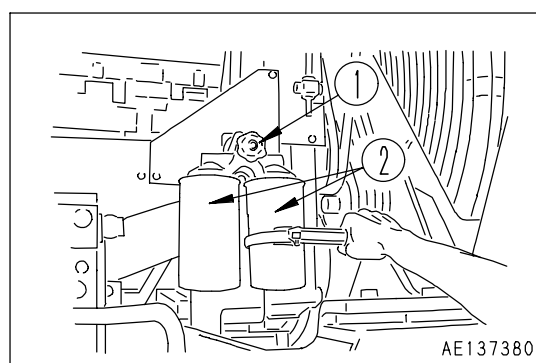
### WARNING

All the engine parts are at high temperature after the engine has been operated, so never replace the cartridge immediately after finishing operations.

Wait for the oil to cool down before replacing the cartridge.

- Prepare a filter wrench

1. Screw in valve (1) at the top of the corrosion resistor.
2. Set the container to catch the water under the cartridge.
3. Using a filter wrench, remove cartridge (2).
4. Clean the filter holder, coat the steel surface of the new filter cartridge with clean engine oil, then install it.
5. When installing, tighten until the gasket contacts the seal surface of the filter holder, then tighten a further 2/3 turns.  
If the filter cartridge is tightened too far, the gasket will be damaged and this will lead to leakage of water. If the filter is too loose, water will also leak from the gap at the gasket, so always tighten the correct amount.



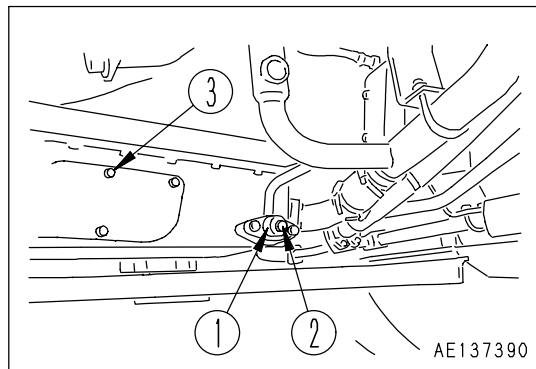
6. Open valve (1).
7. After replacing the cartridge, start the engine and check that there is no leakage of water from the filter seal surface. If there is any leakage of water, check the tightening of the filter cartridge.

**CHANGE OIL IN TRANSMISSION CASE, CLEAN TRANSMISSION CASE STRAINER****WARNING**

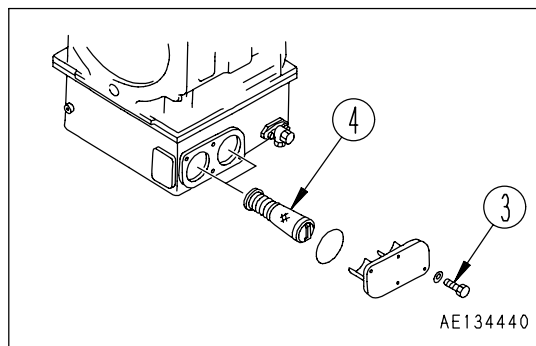
- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

- Refill capacity: 102 liters (26.93 US gal)

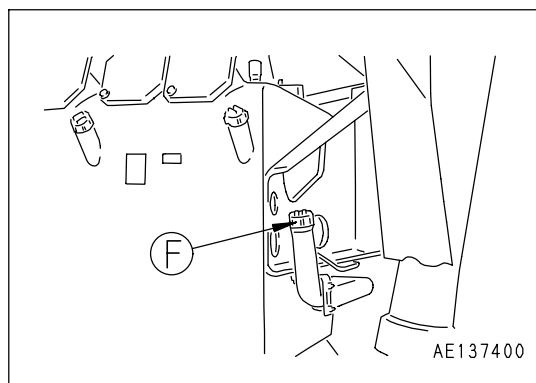
1. Set the container to catch the oil directly under the drain plug. Remove drain plug (1), then loosen drain valve (2) slowly to avoid getting oil on yourself, and drain the oil, then tighten the plug again.



2. Remove bolt (3), then remove the cover and take out strainer (4).
3. Remove any dirt stuck to the strainer, then wash in clean diesel fuel or flushing oil. If the strainer is damaged, replace it.



4. After installing the strainer, add oil through oil filler (F) to the specified level.
5. After adding oil, check that the oil is at the specified level. See "CHECK OIL LEVEL IN TRANSMISSION CASE, ADD OIL (PAGE 3-59)".





## REPLACE STEERING, HOIST OIL TANK AND REAR BRAKE COOLING OIL TANK FILTER ELEMENT

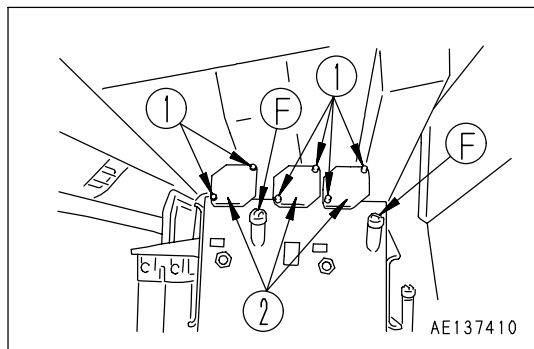


### WARNING

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

1. Turn the cap of oil filler (F) slowly to release the internal pressure, then remove the cap.
2. Remove bolt (1), then remove cover (2).
3. Take out the element, then wash the inside of the case and the removed parts.
4. Install the new element, then install cover (2) with bolt (1).

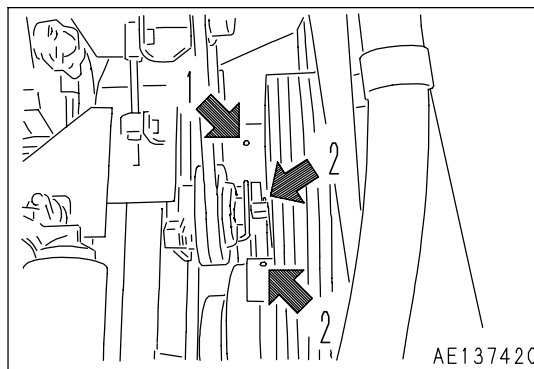
If the filter element clogging caution lamp lights up when the engine water temperature gauge is in the green range and the engine is running at 1200 - 2100 rpm, replace the element immediately.



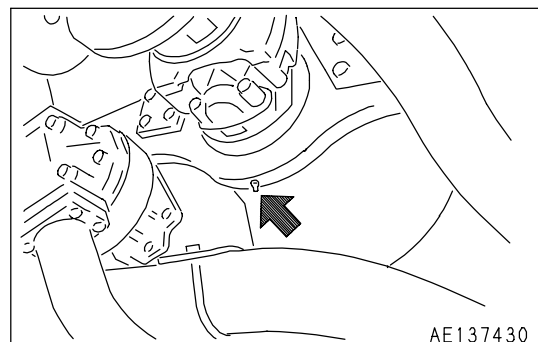
## LUBRICATION

1. Using a grease pump, pump in grease through grease fittings marked by arrows.
2. After greasing, wipe off any old grease that was pushed out.

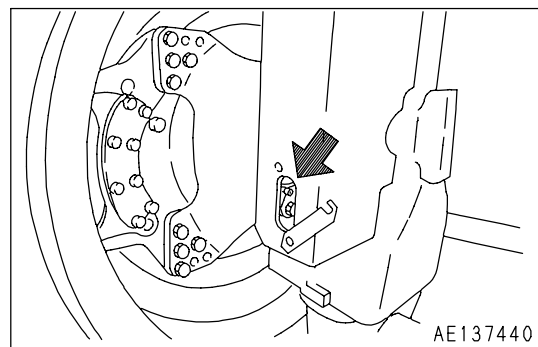
- (1) Fan pulley (1 place)  
(2) Tension pulley (2 places)



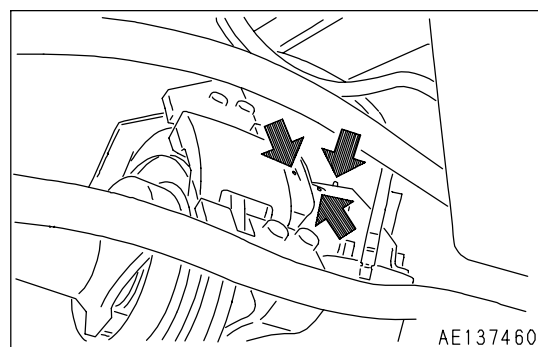
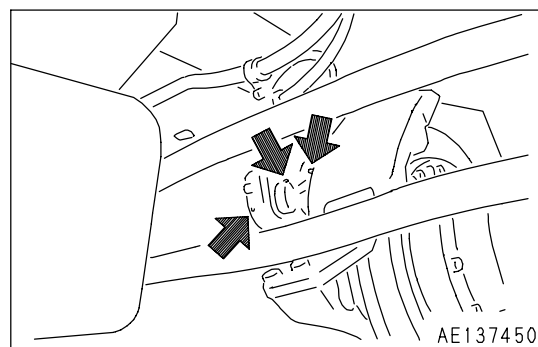
(3) Transmission mount (1 place)



(4) Automatic suspension link (left and right: 1 place each)



(5) Parking brake linkage (3 places/one caliper)



## CHECK WEAR OF REAR BRAKE DISC



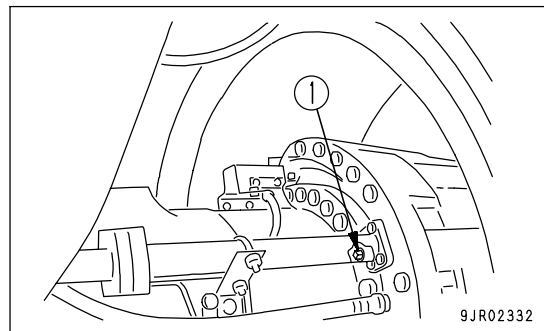
### WARNING

- Carry out this check when the brake oil temperature is below 60°C (140°F).
- When carrying out the work with two workers, if the retarder control lever is pulled suddenly, there is danger that the rod of the disc wear measurement gauge may fly out suddenly under hydraulic pressure. Pull the rod out fully, and operate the retarder control lever slowly over a period of approx. 10 seconds.
- If the disc wear approaches the wear limit, check the condition frequently, regardless of the maintenance interval. In addition, check the retarder capacity carefully.

1. Stop the machine on level ground, set the parking brake valve lever to the PARKING position, then check that the other brakes are not applied before starting inspection.
2. Remove plug (1) from the rear brake and install the disc wear measurement gauge.

When doing this, tighten the nipple fully and pull the rod of the disc wear measurement gauge out fully. If it is not pulled out, there is danger that the rod may fly out under hydraulic pressure when the retarder lever is pulled.

Part number for gauge: 561-98-61122

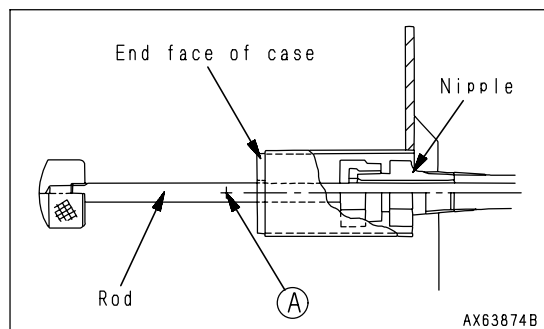


3. Turn the starting switch to the ON position and check that the air pressure gauge is in the green range.
4. If the air pressure is low, start the engine and run the engine at 2,000 rpm until the air pressure gauge enters the green range. When it enters the green range, turn the starting switch OFF.
5. Operate the retarder control lever slowly over approx. 10 seconds to apply the brake. In this condition, push the gauge rod in slowly until it contacts the piston.

6. If mark (A) of the disc wear measurement gauge goes in beyond the end face of the case, this means that the disc has reached the wear limit.

If this happens, please contact your Komatsu distributor for inspection and maintenance.

If the rod is released suddenly after measurement, there is great danger that the rod may fly out under hydraulic pressure. Keep the rod held down and let it back slowly. When it reaches the end of its stroke, release it.



7. Return the retarder control lever.
8. Remove the disc wear measurement gauge and install plug (1).
9. Bleed all the air from the circuit. For details, see "BLEED AIR FROM REAR BRAKE (PAGE 4-28)".

## CHECK TIGHTENING PARTS OF TURBOCHARGER

Contact your Komatsu distributor to have the tightening portions checked.

## EVERY 2000 HOURS SERVICE

Carry out the periodic maintenance work of every 100, 250, 500 and 1000 hours of operation at the same time.

### CHANGE OIL IN STEERING, HOIST OIL TANK

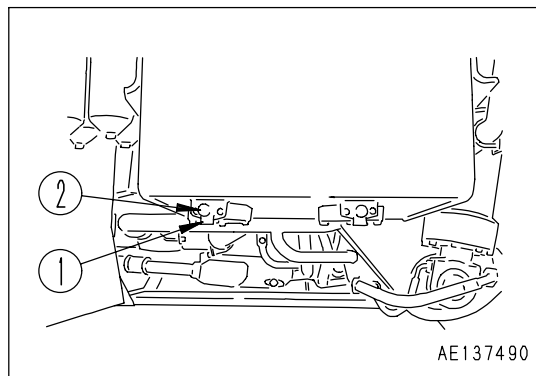
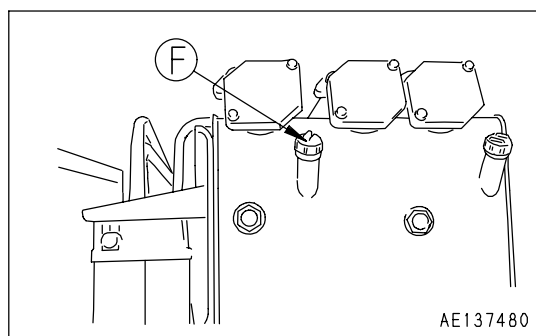


#### WARNING

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

- Refill capacity: 153 liters (40.39 US gal)

1. Lower the dump body and stop the engine.
2. Turn the cap of oil filler (F) to release the internal pressure before removing the cap.
3. Remove drain plug (1), then loosen drain plug (2) slowly to avoid getting oil on yourself, and drain the oil.
4. Pour in the specified amount of engine oil from oil filler (F).  
After adding oil, check that the oil is at the specified level. See CHECK OIL LEVEL IN STEERING AND HOIST OIL TANK, ADD OIL (PAGE 3-60).



## CHANGE OIL IN REAR BRAKE COOLING OIL TANK

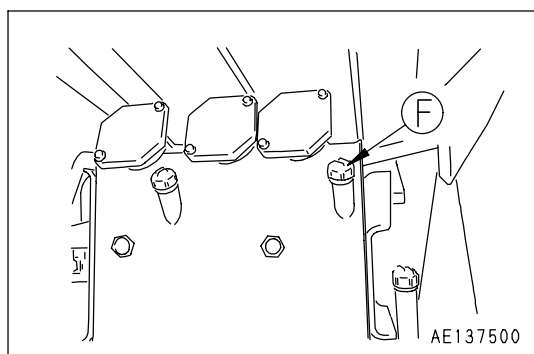


### WARNING

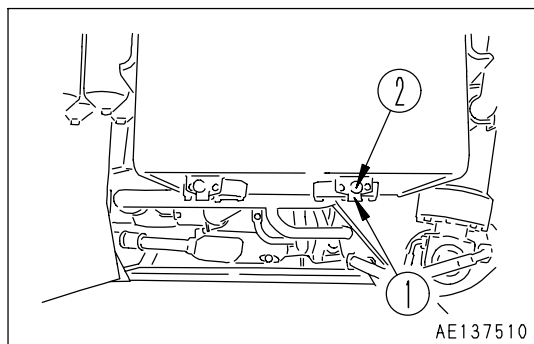
- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

- Refill capacity: 246 liters (64.94 US gal)

1. Lower the dump body and stop the engine.
2. Turn the cap of oil filler (F) to release the internal pressure before removing the cap.



3. Remove drain plug (1), then loosen drain plug (2) slowly to avoid getting oil on yourself, and drain the oil.
4. Pour in the specified amount of engine oil from oil filler (F).
5. For details of the oil to use, see CHECK OIL LEVEL IN REAR BRAKE COOLING OIL TANK, ADD OIL (PAGE 3-60).



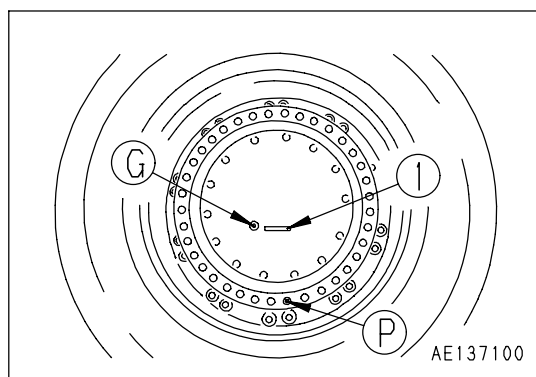
## CHANGE OIL IN FINAL DRIVE CASE

**WARNING**

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.
- If there is still pressure remaining inside the case, the oil or plug may fly out.  
Loosen the plug slowly to release the pressure.

- Refill capacity (left and right each): 59 liters (15.58 US gal)

1. Stop the machine so that casting line (1) is horizontal and drain plug (P) is at the bottom.
2. Remove drain plug (P), drain the oil, then tighten the plug again.
3. Add oil through the hole for plug (G) to the specified level.
4. After adding oil, check that the oil is at the specified level. See "CHECK OIL LEVEL IN FINAL DRIVE CASE, ADD OIL (PAGE 4-38)".



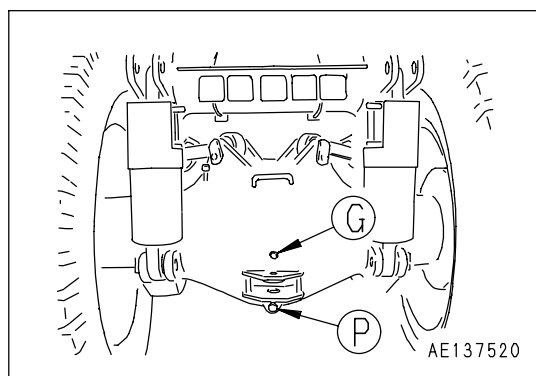
## CHANGE OIL IN DIFFERENTIAL CASE

**WARNING**

- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

- Refill capacity: 132 liters (34.85 US gal)

1. Remove drain plug (P), drain the oil, then tighten the plug again.
2. Add oil through the hole for plug (G) to the specified level.
3. After adding oil, check that the oil is at the specified level. See "CHECK OIL LEVEL IN DIFFERENTIAL CASE, ADD OIL (PAGE 4-38)".

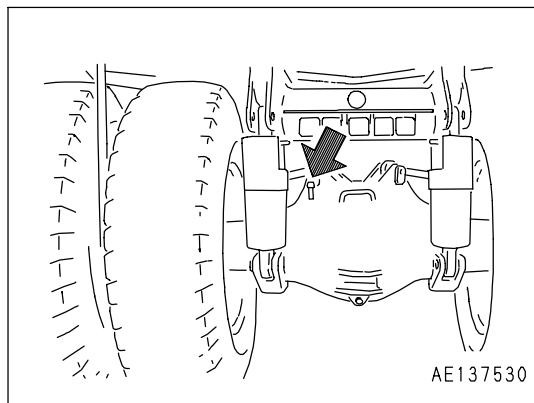


## CLEAN DIFFERENTIAL CASE BREATHER



### WARNING

- The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before cleaning the engine breather.
- When using compressed air, there is a hazard that dirt may be blown up and cause serious injury.  
Always use safety glasses, dust mask, or other protective equipment.



Remove the mud and dirt from around the breather, then remove the breather and wash out the dirt from inside with clean diesel oil or flushing oil.

## CLEAN EMERGENCY RELAY VALVE

Contact your Komatsu distributor to have the valve disassembled and cleaned.

## CHECK ALTERNATOR, STARTING MOTOR

The brush may be worn or have no grease on the bearing, so contact your Komatsu distributor for inspection or repair.

If the engine is started frequently, carry out inspection every 1000 hours.

## CHECK, ADJUST ENGINE VALVE CLEARANCE

Special tools are needed for the inspection and maintenance, so please contact your Komatsu distributor to have this work carried out.

## CLEAN, CHECK TURBOCHARGER

Contact your Komatsu distributor for cleaning and inspection.

## CHECK PLAY OF TURBOCHARGER ROTOR

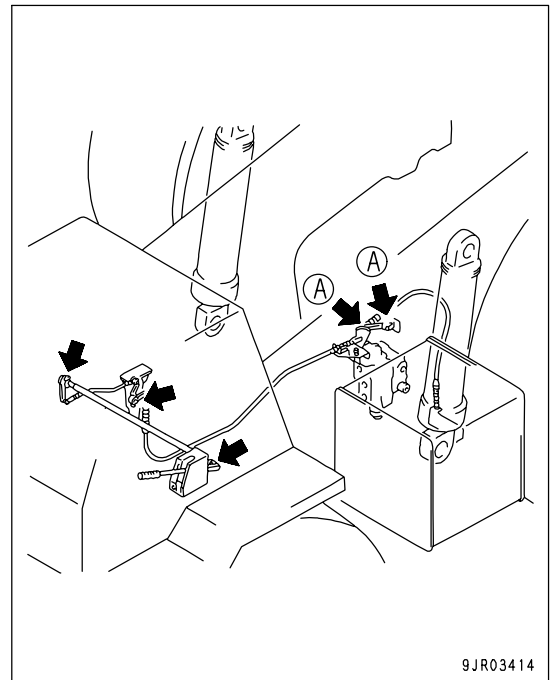
Contact your Komatsu distributor to have the rotor play checked.

## LUBRICATE DUMP CONTROL LINKAGE

(5 places)

1. Stop the engine.
2. Use the grease pump to pump in grease through the grease fitting marked by the arrow.
3. After greasing, wipe off any old grease that was pushed out.

Apply grease to the parts of (A) mark (2 places) once every year regardless of the operation time of dump control linkage.



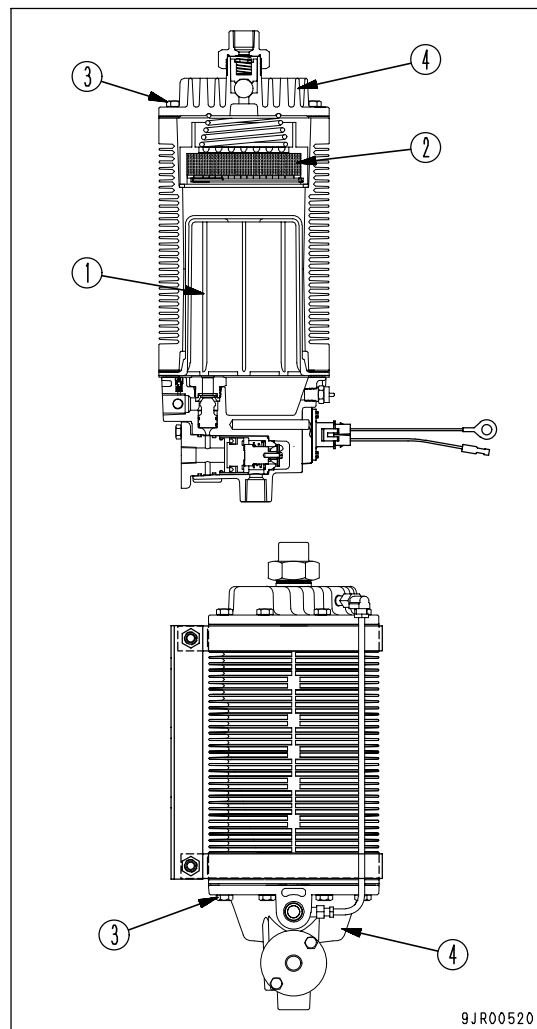


**CLEAN AIR DRYER FILTER AND DEFLECTOR**

(If equipped)

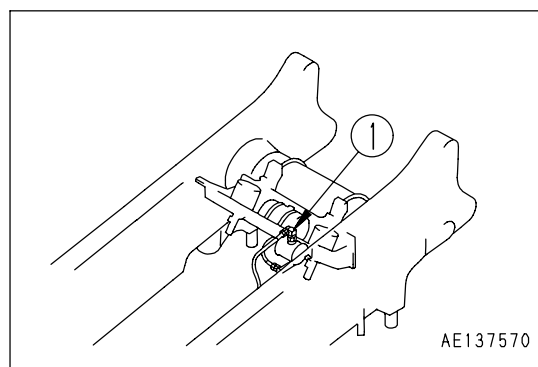
Always clean once every 6 months regardless of the operating hours.

1. Remove bolt (3), then remove cap (4).
2. Disassemble deflector (1) and filter (2) and wash in diesel oil.

**REPLACE PLUG WITH STRAINER FROM MAKE-UP TANK OF REAR BRAKE CHAMBER**

Replace this part every 2000 hours or every year, whichever comes sooner.

1. Change the oil in the rear brake cooling oil tank, and at the same time remove the hose and tee installed to the top of the make-up tank, then remove plug (1) and replace it with a new plug.
2. When replacing the plug, check the oil in the tank, then add the same type of oil as the brake cooling oil to fill to the top of the tank.
3. Install the hose and tee to the top of the plug.



## EVERY 4000 HOURS SERVICE

Carry out the EVERY 100 HOURS MAINTENANCE, EVERY 250 HOURS MAINTENANCE, EVERY 500 HOURS MAINTENANCE, EVERY 1000 HOURS MAINTENANCE, and EVERY 2000 HOURS MAINTENANCE at the same time.

### CHECK WATER PUMP

Check for play in the pulley, leakage of grease or water, or clogging of the drain hole. If any problem is found, contact your Komatsu distributor for disassembly and repair or replacement.

### CHECK AIR COMPRESSOR

Ask your Komatsu distributor to carry out this work.

### CHECK FAN PULLEY AND TENSION PULLEY

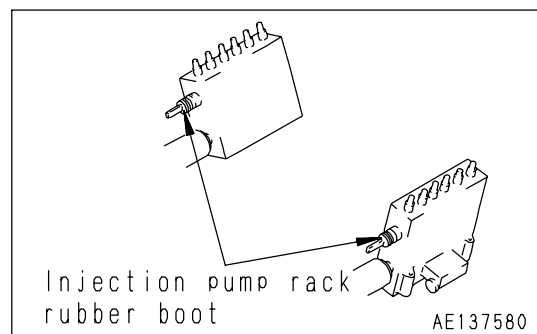
Check for play of the pulley and leakage of grease. If any problem is found, please contact your Komatsu distributor.

### CHECK VIBRATION DAMPER

There is the possibility of drop in the level of the damper fluid and runout of the concave surface. So, please contact your Komatsu distributor to inspect or replace.

### CHECK INJECTION PUMP RACK RUBBER BOOT, REPLACE

Check the injection pump rack rubber boot for cracks and oil leakage. If any abnormality is found, please contact your Komatsu distributor for replacement.

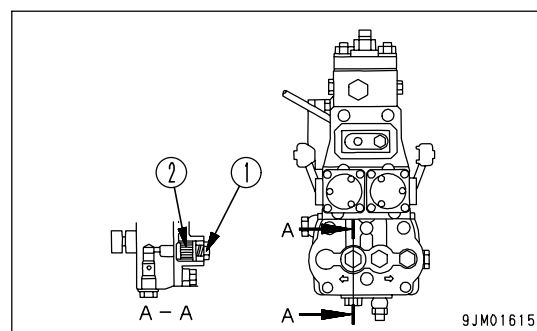


### REPLACE INJECTION PUMP SCREEN FILTER

Remove injection pump cap (1), then replace screen filter (2) with a new part.

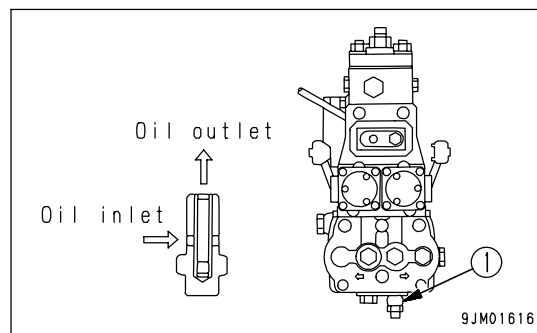
The side of the screen filter with the holes is assembled facing the inside.

Tightening torque of cap (1):  $22.1 \pm 2.45 \text{ N}\cdot\text{m}$  ( $2.25 \pm 0.25 \text{ kgf}\cdot\text{m}$ ,  $16.3 \pm 1.8 \text{ lbft}$ )



## CLEAN INJECTION PUMP OIL INLET STRAINER

1. Remove oil inlet strainer (1), soak the whole strainer in diesel oil, then rinse it clean.
2. Blow compressed air in through the oil discharge port at the tip of the strainer.



Repeat Steps 1 and 2 two or three times to clean the strainer.

Tightening torque of strainer (1):  $11.3 \pm 1.5 \text{ N}\cdot\text{m}$  ( $1.15 \pm 0.15 \text{ kgf}\cdot\text{m}$ ,  $8.3 \pm 1.1 \text{ lbft}$ )

## ADJUST FRONT WHEEL BEARING

Please ask your Komatsu distributor to carry out adjustment every 4000 hours or every 100,000 km of travel.

## ADJUST REAR WHEEL BEARING

Please ask your Komatsu distributor to carry out adjustment every 4000 hours or every 100,000 km of travel.

## EVERY 15000 HOURS SERVICE

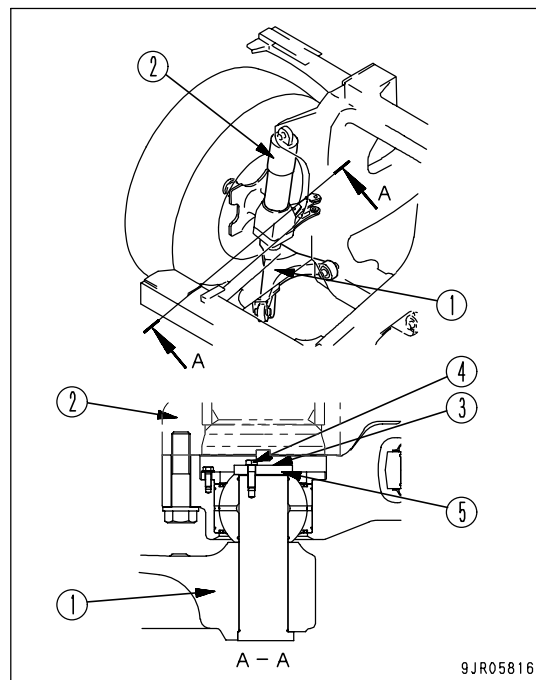
Maintenance for every 100, 250, 500, 1000, 2000 and 4000 hours service should be carried out at the same time.

### CHECK, REPLACE STEERING A ARM MOUNTING BOLT

Check and replace the A arm mounting bolts, lock plate, and holder.

Please consult your Komatsu distributor when checking and replacing.

- (1) A arm
- (2) Front suspension
- (3) Lock plate
- (4) Bolt
- (5) Holder

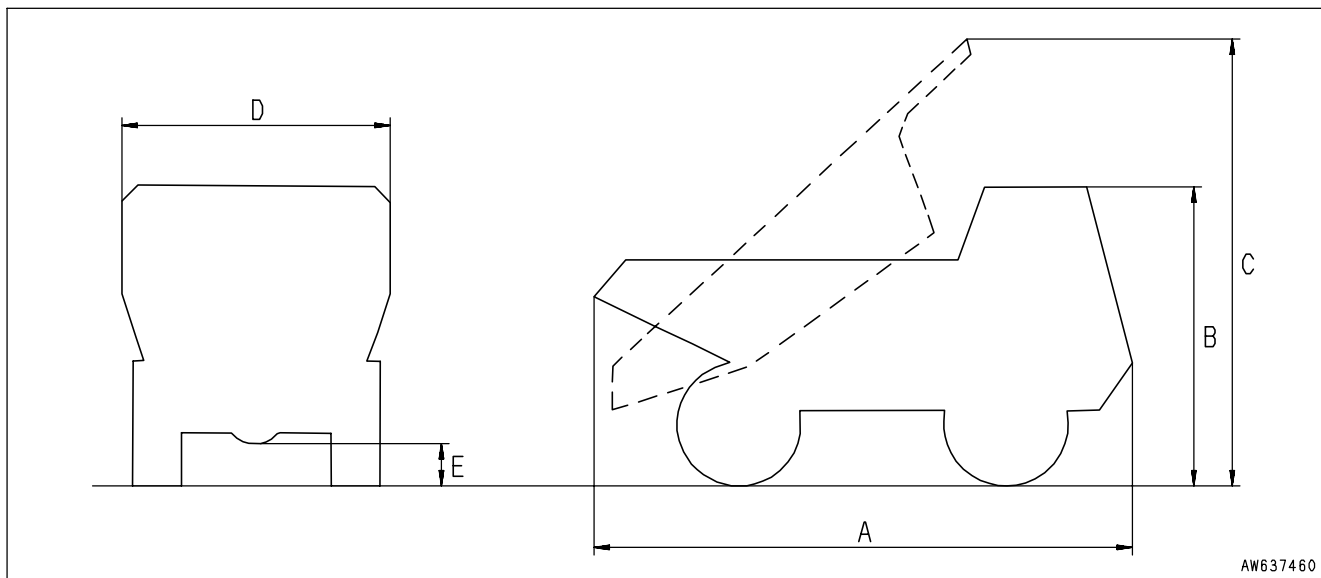


# **SPECIFICATIONS**

# SPECIFICATIONS

HD785-5

Item			Unit		
Overall weight (unladen weight + max. payload + 1 operator (80kg(176lb)))			kg (lb)	158605 (349724)	
Unladen weight			kg (lb)	66930 (147581)	
Unladen weight (without body)			kg (lb)	50900 (112235)	
Max. payload			kg (lb)	91000 (200655)	
Dump body capacity		Struck	m³ (cu·yd)	40 (51.8)	
		Heaped (2 : 1)	m³ (cu·yd)	60 (77.7)	
Engine type				Komatsu SA12V140 diesel engine	
Flywheel horsepower of engine			kW(HP)/rpm	753.15 (1011) / 2000rpm	
A	Overall length		mm (ft in)	10490 (34'5")	
B	Overall height		mm (ft in)	5050 (16'7")	
C	Overall height at dumping		mm (ft in)	10080 (33'1")	
D	Overall width		mm (ft in)	5210 (17'1")	
E	Min. ground clearance (bottom of rear axle)		mm (ft in)	810 (2'8")	
Min. turning radius			mm (ft in)	9900 (32'6")	
Travel speed		Forward	1st	km/h (MPH)	11.0 (6.8)
			2nd	km/h (MPH)	15.5 (9.3)
			3rd	km/h (MPH)	20 (12.4)
			4th	km/h (MPH)	27 (16.8)
			5th	km/h (MPH)	36 (22.4)
			6th	km/h (MPH)	49 (30.5)
			7th	km/h (MPH)	65 (40.4)
		Reverse		1st	km/h (MPH)
Sound level					
Surrounding (sound power level L WA) dB (A)			dB (A)	84	
Operator's (sound pressure level L PA) dB (A) measurement procedures described in ISO6394 or 86/622/EEC			dB (A)	79.2	
Vibration level					
Hands/Arms	The weighted root mean square acceleration Measurement standards: ISO7096		m/S²	2.07	
Whole body			m/S²	0.50	



# ATTACHMENTS, OPTIONS

## **WARNING**

Please read and make sure that you understand the SAFETY section before reading this section.

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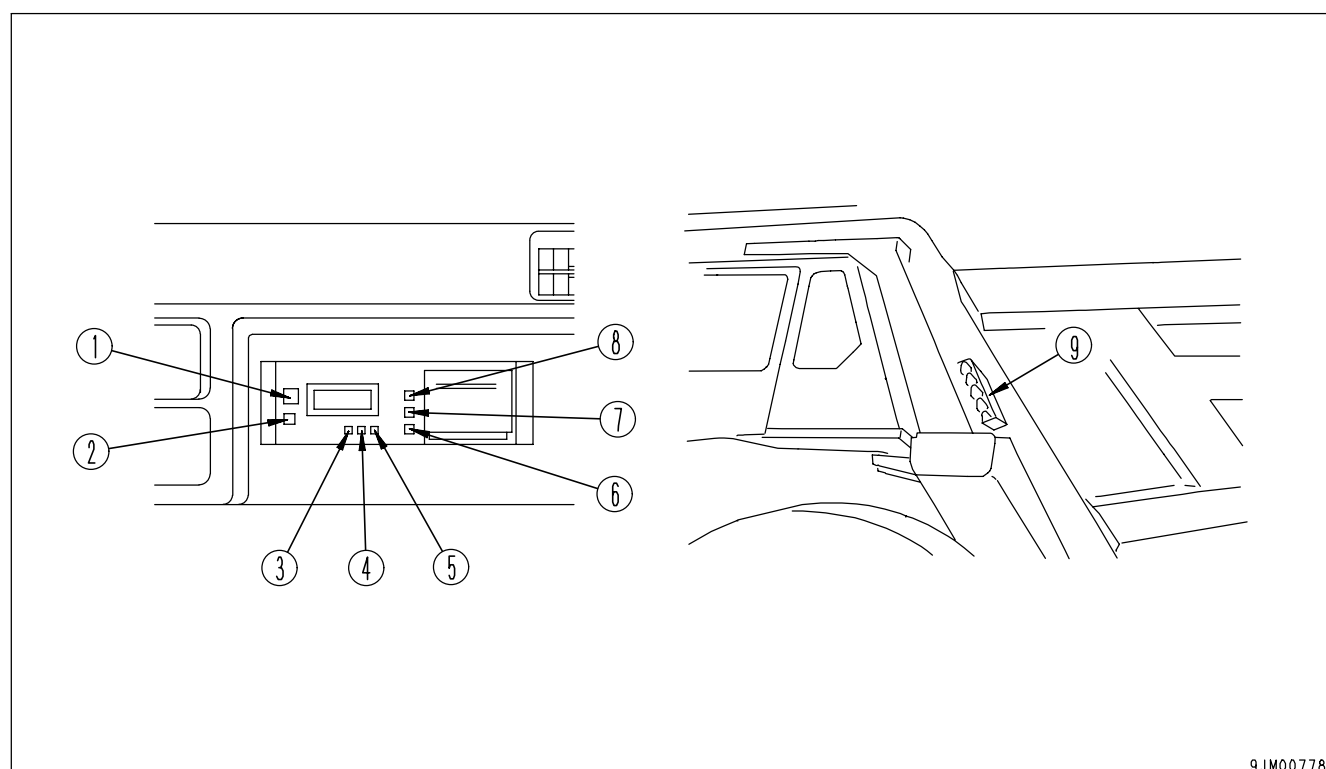
## HANDLING PAYLOAD METER

There are two types of payload meter: a card type and a printer type. The explanation for the payload meter given here is for the printer type. For details of handling the card type payload meter, see the separate operation manual for payload meter II.

The payload meter inputs the signals from the pressure sensors, clinometer, body float detection, neutral detection, and other signals, and calculates the weight of the load using its built-in micro computer. It displays the results on the panel and also uses the external display lamps to show the condition of the load.

In addition, the data saved in memory can be printed out together with the date the load was dumped and the number of loads.

### NAME OF PARTS



9JM00778

- |                                      |                              |
|--------------------------------------|------------------------------|
| (1) Calibration switch               | (6) Memory data clear switch |
| (2) Night lighting dimmer switch     | (7) Printer feed switch      |
| (3) Clock setting adjustment switch  | (8) Print switch             |
| (4) Clock adjustment shift switch    | (9) External display lamps   |
| (5) Clock adjustment increase switch |                              |

## EXTERNAL DISPLAY LAMPS

- When the actual load is displayed, the lamps light up as follows.

Lamp 1 (green): Displays load between 56 tons and 67 tons

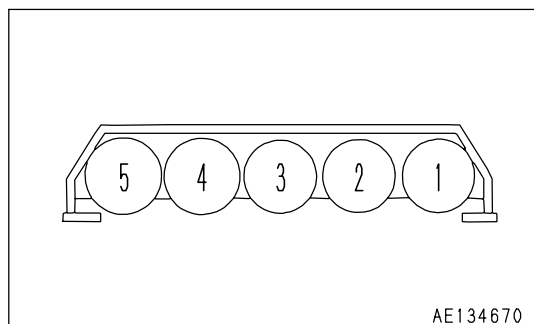
Lamp 2 (green): Displays load between 67 tons and 85 tons

Lamp 3 (green): Displays load between 85 tons and 91 tons

Lamp 4 (yellow): Displays load between 91 tons and 96 tons

Lamp 5 (red): Displays load over 96 tons

- If the shift lever is not at neutral and the dump lever is not at the FLOAT position, none of the display lamps light up.
- All the lamps light up for 10 seconds after the power is turned ON.
- To prevent overloading, use the lamps for loading up to the point where the 3 green lamps light up.



## PREDICTION DISPLAY

- In the case where the weight of the load changes as each bucket is emptied into the dump body, the average weight of the load up to that point is calculated to predict what the weight of the load will be if one more bucket is loaded. The appropriate lamp flashes, so it is possible to adjust the weight of the next load when operating the loader.

The prediction display for the load level and the actual load display are shown at the same time.

Example:





1st bucket: 23 tons

2nd bucket: 21 tons (44 tons)

3rd bucket: 22 tons (66 tons)

4th bucket: 24 tons (90 tons)

If the load changes as above, the external display lamps will give the display in the table below.

No. of loads	External display lamp	Remarks
1st bucket		<ul style="list-style-type: none"> <li>The weight actually loaded is 23 tons, so no lamp lights up.</li> <li>The predicted load is 46 tons (23 tons x 2), so no lamp flashes.</li> </ul>
2nd bucket		<ul style="list-style-type: none"> <li>The weight actually loaded is 44 tons (23 tons + 21 tons), so no lamp lights up.</li> <li>The predicted load is 88 tons (44 tons + 44/2 tons), so the first green lamp flashes.</li> </ul>
3rd bucket		<ul style="list-style-type: none"> <li>The weight actually loaded is 66 tons (44 tons + 22 tons), so the first green lamp lights up.</li> <li>The predicted load is 88 tons (66 tons + 66/3 tons), so the 3rd lamp flashes.</li> </ul>
4th bucket		<ul style="list-style-type: none"> <li>The weight actually loaded is 90 tons (66 tons + 24 tons), so three green lamps lights up.</li> <li>The predicted load is 112.5 tons (90 tons + 90/4 tons), so the red lamp flashes.</li> </ul>

## OPERATING PAYLOAD METER

Resetting power (the power can be reset by turning the power ON.)

- The display for the first 3 seconds is 88:88, and after that, the time is displayed for 7 seconds.
- After 10 seconds, the normal display is given.
- The printer feeds one line of paper and stops at the home position.

## CONTENT OF DISPLAY

- When the dump lever is at FLOAT and the shift lever is at neutral, the actual load is displayed.
- When the load is less than 3.9 tons, or if the dump lever is not at FLOAT, the display is 0.
- If the dump lever is at FLOAT but the shift lever is not at neutral, the time display is given.  
A maximum of 200 cycles of data can be written to memory. If this level is exceeded, FULL is displayed. If FULL is displayed, print out the data and clear the data from the memory. For details, see "DELETING DATA FROM MEMORY (PAGE 6-7)".
- After completion of operations, we recommend that you stop the machine, print out the data, and clear the data from memory.
- There may be a slight change between the load displayed at the loading point and the load displayed at the dumping point.
- Save the data to memory when the dump lever is raised.  
When the machine is completely stopped, it is possible to carry out accurate calculation if the load is dumped when the swaying of the machine has completely stopped. We recommend that the slope at the dumping point be kept to within  $\pm 5$  degrees.
- When the value displayed by the payload meter becomes stable, move the dump lever to the RAISE position. If the machine is still swaying violently when the dump lever is moved to the RAISE position, \*\*\*\*\* is printed when the print out is made.
- When the dump lever is returned from LOWER to FLOAT, wait for at least 5 seconds before turning the starting switch OFF.

## OPERATION OF SWITCHES

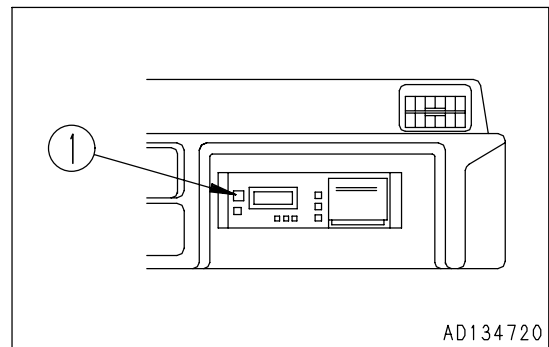
### WHEN CARRYING OUT CALIBRATION

Carry out calibration at the following occasions.

- When the machine is delivered, and once every month after that.
- When the gas pressure and oil have been adjusted in the suspension cylinder.  
(When the suspension has been adjusted.)
- When the machine has been modified and the unladen weight has changed more than 100 kg (221 lb).
- When the suspension pressure sensor has been replaced.
- When other modifications have been made around the suspension.
- When the built-in battery has been replaced.
- When CAL is displayed.

### METHOD OF CARRYING OUT CALIBRATION

1. Set the machine with the dump body empty.
2. Place the shift lever at the N position, and press calibration switch (1) for at least 2 seconds. (The letters CAL flash)
3. Drive the machine slowly and when the travel speed reaches approx. 10 km/h (6.2 MPH), press calibration switch (1) again. (The letters CAL light up) The display returns to the time display to show that the calibration operation is completed.



Carry out calibration on a flat even road surface.

Travel in a straight line. (Distance: Approx. 100 m (328 ft))

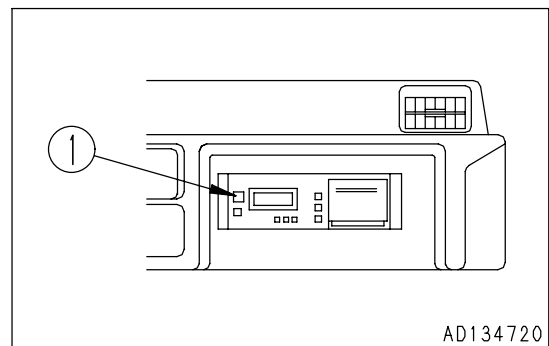
Keep the machine traveling at a constant travel speed.

The calibration data are written to the internal RAM, and are retained even when the power is turned off.

To stop the calibration operation (when in neutral), press calibration switch (1) again. The display will change from a flashing CAL to a flashing SCH. When calibration switch (1) is pressed again, the display will return to the normal display.

### CARRYING OUT SENSOR CHECK

1. Drive the machine unloaded on flat ground.
2. Set the shift lever to "N" and press calibration switch (1) for at least 2 seconds, then press calibration switch (1) again for at least 2 seconds. (The letters SCH will flash)
3. When traveling at a speed of approx. 10 km/h (6.2 MPH), press calibration switch (1) again. (The letters SCH will light up) If the display returns to the time display, the sensor check operation is completed. If there is an abnormality in any sensor, the error code is displayed.

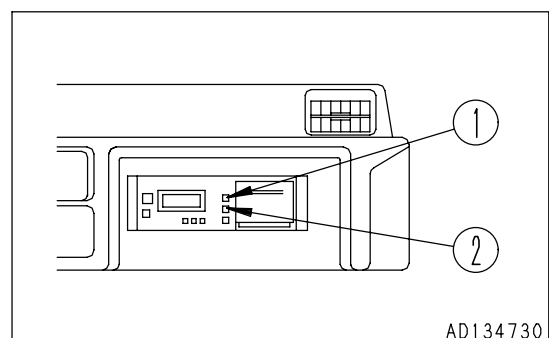


Carry out the sensor check at least once every month.

### PRINTING OUT

1. When print out switch (1) is pressed for at least 2 seconds, the data are printed out.
  2. When print feed switch (2) is pressed for at least 2 seconds, the paper is fed.
- To stop the print during the printout, press the print switch again for at least 2 seconds.

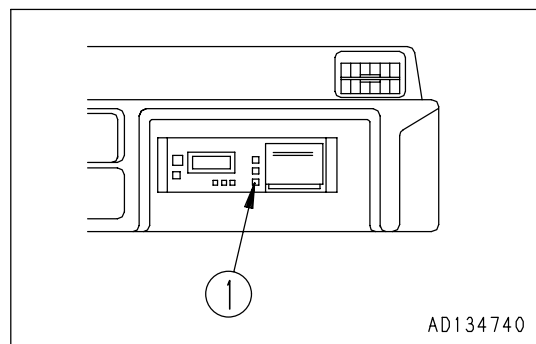
Do not hold the paper coming out from the printer during the printout. This will cause the print to overlap.



### DELETING DATA FROM MEMORY

1. Print out the necessary data before clearing the memory.
2. Press memory data clear switch (1) for at least 2 seconds. (The letters CLEA will flash)
3. Press memory data clear switch (1) again for at least 2 seconds to complete the data clearing operation.

After completion of work, we recommend that you stop the machine, print out the data, and clear the data from memory.



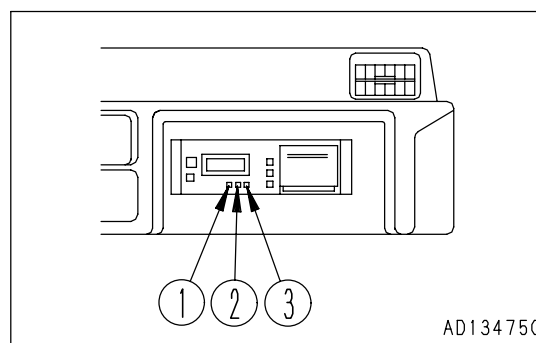
### RESETTING TIME



### WARNING

Never try to reset the time when traveling.

1. When time set adjustment switch (1) is pressed for at least 2 seconds, the minute display will flash. Press time adjustment increase switch (3) to set the minute display correctly.
2. When time adjustment switch (2) is pressed for at least 2 seconds, the hour display will flash. Press time adjustment increase switch (3) to set the hour display correctly.
3. Following this, each time that time adjustment switch (2) is pressed, the flashing point changes to day, month, and year. Press time adjustment increase switch (3) to correct any item that needs correcting.
4. After setting the time correctly, press time set adjustment switch (1).



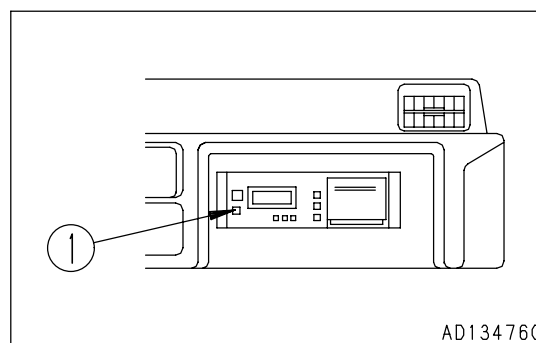
### OPERATING LIGHTING DIMMER SWITCH

To change the brightness of the display, do as follows.

1. Each time dimmer switch (1) is pressed, the lighting becomes one stage dimmer. If the switch is pressed again after it reaches the dimmest level, it will change to the brightest level.

The brightness can be changed in 10 stages.

If it is pressed continuously, the brightness will change continuously.



## SETTING PAPER IN PRINTER

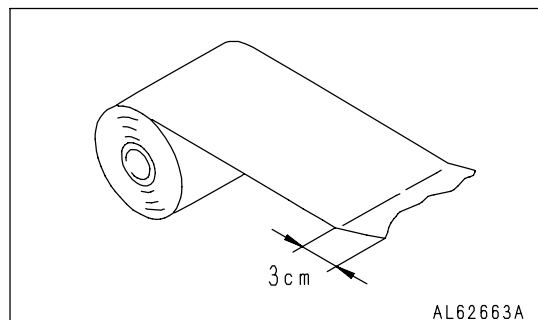
When there is only 30 cm (12 in) of paper remaining in the printer, a red line will appear on the left edge to show that it is time to replace the paper.

Press the FEED switch to feed out the remaining paper.

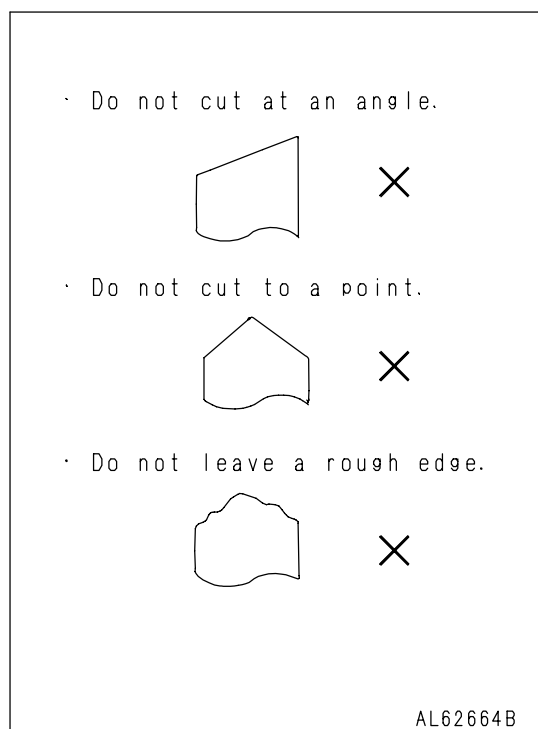
Never try to pull the paper out forcibly.

Always use Komatsu genuine printer paper (7818-27-2910).

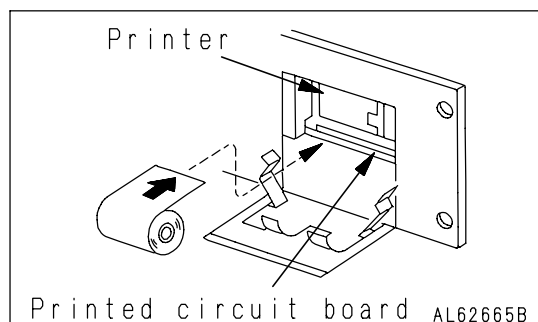
1. Open the roll of printer paper, fold the paper at a point approx. 3 cm (1.2 in) from the end of the paper, then cut the paper straight along the fold.



Never cut the paper in the way shown on the right. It will cause the paper to jam.



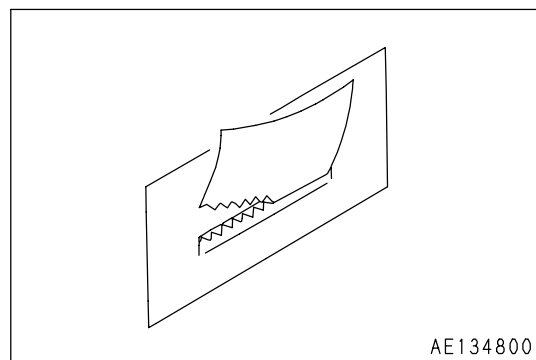
2. Set the print paper with the printing side facing up, and insert it straight into the paper feed hole. If the FEED switch is pressed while feeding in the paper, the paper will feed automatically.
3. When the paper comes out from the printer, pass it through the slit in the lid of the printer, then close the lid.



### METHOD OF CUTTING PRINTER PAPER

1. Press the FEED switch to feed the paper out to the necessary position.
2. Put the paper in contact with the cutter on the lid, then pull up to cut the paper from one side to the other.

Do not pull the paper out and cut it without using the paper cutter.



### STORING PRINTER PAPER

The printer paper is thermal paper, so store it in a place where the temperature range is between 0°C (32°F) and 40°C (104°F).

Do not keep it in a place exposed to direct sun light.

### IF ERROR MESSAGE "E-33" IS DISPLAYED

When the starting switch key is turned to the OFF position, the payload meter uses the internal battery to prevent the load data from being deleted.

If the battery voltage drops, error message E-33 is displayed, so replace the battery as follows.

#### Replacing battery

Move the machine to a place where it is safe to carry out the replacement operation.

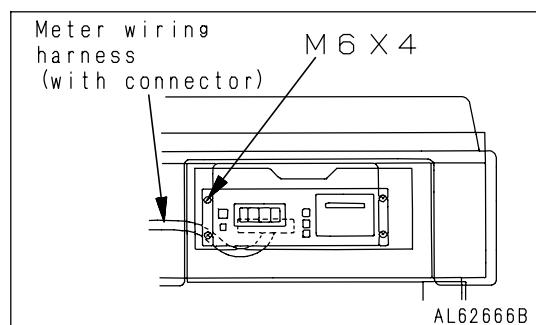
##### • Parts to prepare

Crosshead screwdriver

Socket wrench (for M4 nut)

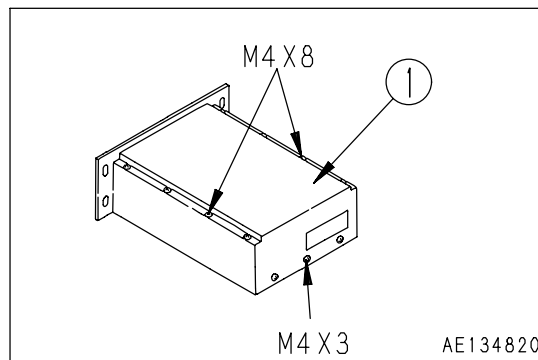
New battery (7818-27-2860)

1. Turn the starting switch key to the ON position, press the PRINT switch for at least 2 seconds, and print out the load data from memory.  
Do not start the engine when doing this.
2. Turn the starting switch back to the OFF position.
3. Remove the screws (M6 x 4) holding the payload meter, then pull the payload meter out to the front.

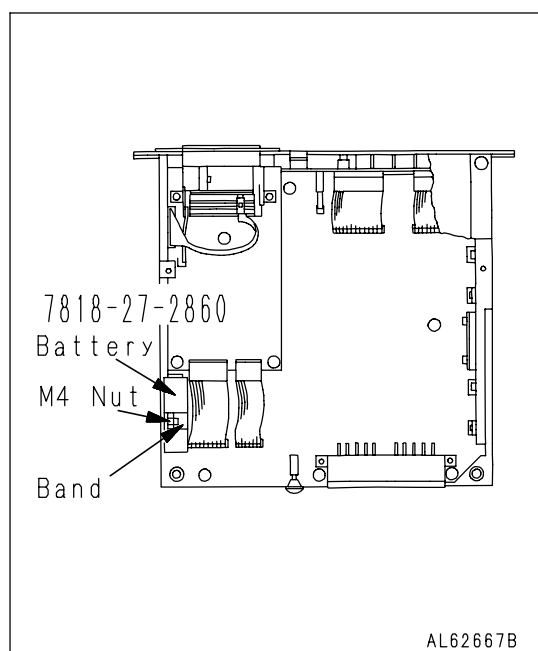




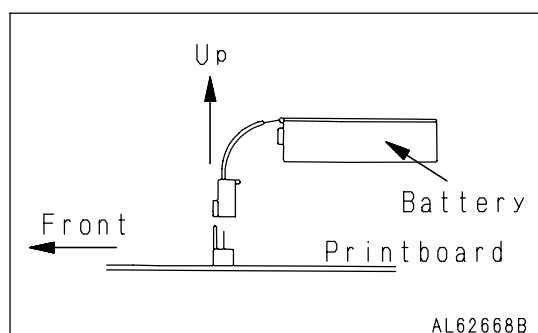
4. Remove the connectors, remove the screws (top: M4 x 8, rear: M4 x 3) of top cover (1) of the payload meter, then remove top cover (1).



5. Remove the nut (M4) and the band holding the battery. Do not wear gloves when carrying out this operation. Be careful not to let dirt, dust, or metal particles get inside the controller. Be careful not to drop any nuts or washers inside the controller.



6. Pull the battery connectors up directly from the printboard to remove them.
7. Push the connectors of the new battery down straight to connect them to the printboard.
8. Fit the battery band, then fix the battery to the payload meter with the nut (M4) and washer (flat spring). Check that the battery has not moved out of position.
9. Install the top cover.
10. Install the payload meter to its original position on the panel.



After replacing the battery, do as follows.

- 1) Turn the starting switch to the ON position.
- 2) Press the memory data clear switch (CLR) twice to delete the data from memory. (The first time, it will flash; the second time, it will light up and then display the load.)
- 3) Carry out calibration.
- 4) After carrying out calibration, operate the dump lever once FLOAT → LOWER → FLOAT with the dump body empty.

Replace the battery within 48 hours.

The life of the battery is approx. 2 years.

### OPERATION AFTER REPLACING CONTROLLER

After replacing the controller, always carry out calibration, and operate the dump lever FLOAT → LOWER → FLOAT with the dump body empty.

### IF ERROR MESSAGE "PAPE" FLASHES (PAPER JAM)

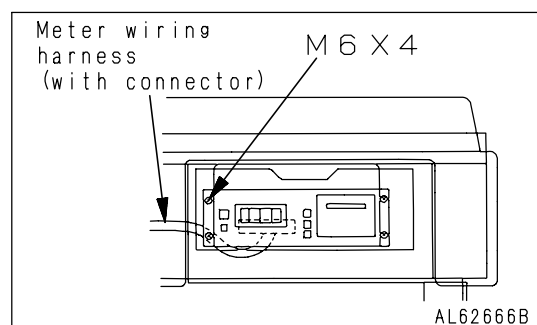
#### NOTICE

Never touch the printer head (white). If the printer head is removed, it is impossible to install it again.

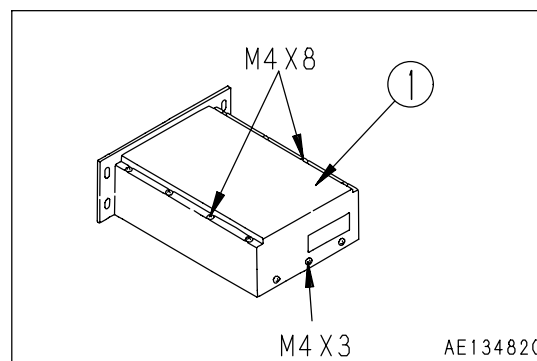
Always be extremely careful not to let any dust or metal particles inside the controller.

If the paper jams, PAPE is displayed on the load display, so move the machine to a safe place and clear the paper jam as follows.

1. Turn the starting switch key to the OFF position.
2. Remove the screws (M6 x 4) holding the payload meter, then pull the payload meter out to the front.



3. Remove the connectors, remove the screws (top: M4 x 8, rear: M4 x 3) of top cover (1) of the payload meter, then remove top cover (1).



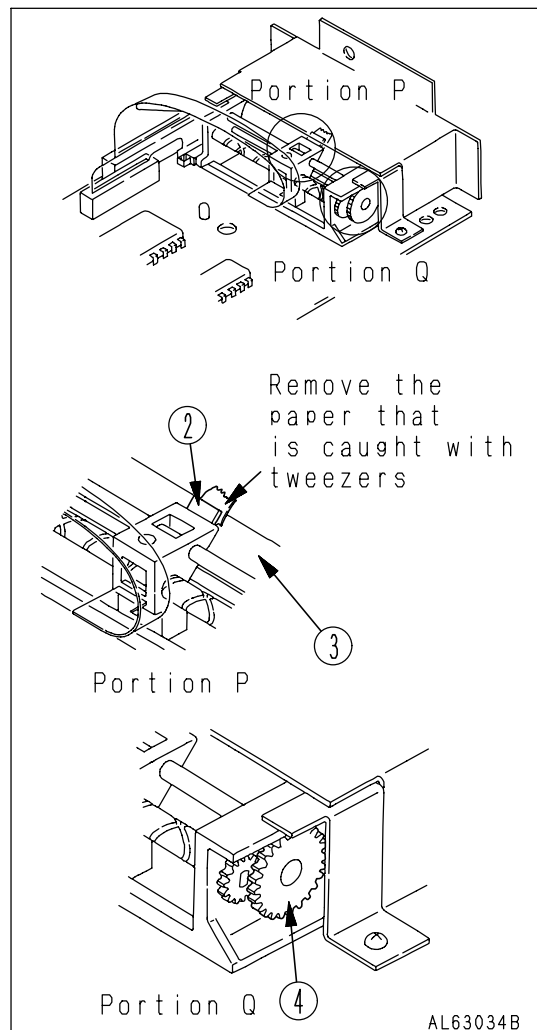
4. Use tweezers to remove the paper caught between printer head (2) and guide (3).

Do not wear gloves when carrying out this operation.

When using tweezers to remove the jammed paper, press the guide with your finger to make a clearance between the printer head and guide to make it easier to remove the paper.

If there is any paper remaining immediately under the printer head, turn gear (4) with the flat of your fingers to move the head. If gear (4) is turned counterclockwise, the head will move to the right.

5. After removing the paper, install the connectors before installing the top cover.



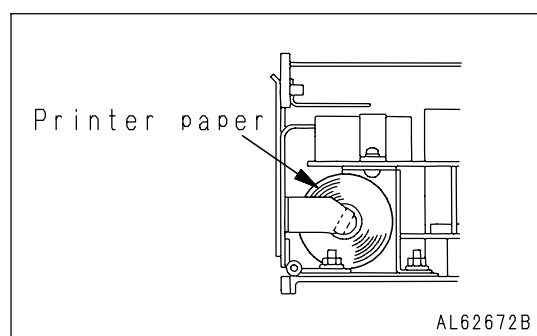
6. Remove the printer paper remaining inside the printer, and cut the leading end of the paper.

For details of the method of cutting the end of the paper, see "METHOD OF CUTTING PRINTER PAPER (PAGE 6-9)".

7. Turn the starting switch key to the ON position, and press the FEED switch.

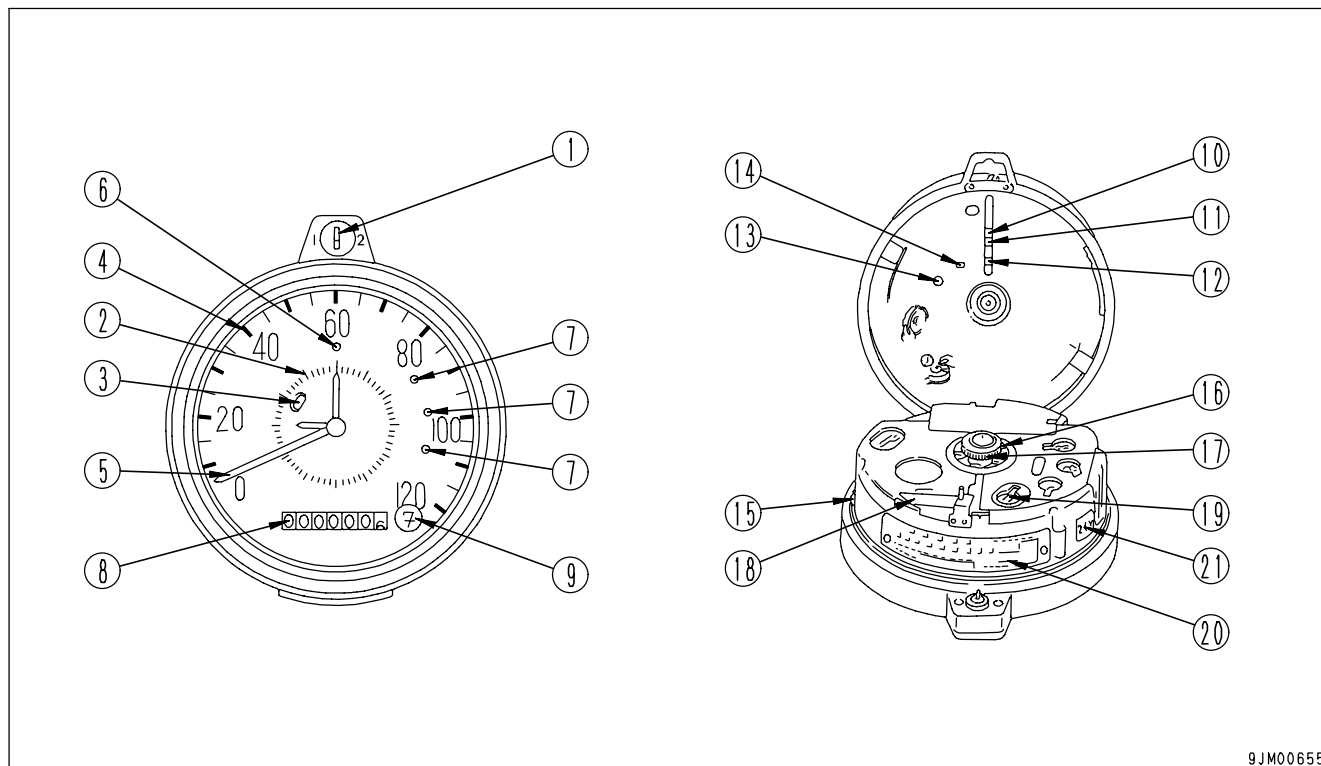
For details of the method of inserting the paper, see "SETTING PAPER IN PRINTER (PAGE 6-8)".

8. Turn the starting switch key to the OFF position, remove the connectors, then assemble to the original condition.



## TACHOGRAPH (TCO 15-6)

### EXPLANATION OF COMPONENTS



9JM00655

- |   |  |
|---|--|
| (1) Instrument lock                       | (12) Travel distance recording stylus                              |
| (2) Clock dial                            | (13) Adjustment screw for speed warning lamp                       |
| (3) Clock operation confirmation aperture | (14) Speed confirmation aperture for speed warning lamp indication |
| (4) Speed scale                           | (15) Clock setting knob  |
| (5) Speed indicator                       | (16) Chart support   |
| (6) Speed warning lamp                    | (17) Pressing ring   |
| (7) Speed indication confirmation lamp    | (18) Cutting knife   |
| (8) Odometer                              | (19) Instrument lighting lamp                                      |
| (9) Period indicating label               | (20) Name plate  |
| (10) Speed recording stylus               | (21) Voltage indication label                                      |
| (11) Operator change recording stylus     |  |

#### INSTRUMENT LOCK

This (1) can be used for the instrument lock key when replacing the charts, or for operator change identification keys 1 and 2.

#### CLOCK DIAL

One line here (2) indicates one minute.

#### CLOCK OPERATION CONFIRMATION APERTURE

It is possible to check the action of the second hand with this (3) when the clock is working.

#### SPEED SCALE

This (4) is the scale for the machine travel speed.

### **SPEED INDICATOR**

This (5) indicates the machine travel speed.

### **SPEED WARNING LAMP**

When the machine exceeds the maximum set speed, the lamp (6) lights up to warn the operator.

Models with the speed warning lamp do not have the speed indication confirmation lamp.

### **SPEED INDICATION CONFIRMATION LAMP**

This lamp (7) is interconnected with the speedometer and is used to confirm the speed indication. When using the confirmation switch to light up the confirmation lamp during checks before starting, always check for any disconnection in the three indication confirmation lamps.

Models with the speed warning lamp do not have the speed indication confirmation lamp.

### **ODOMETER**

This meter (8) displays the total distance (km) traveled by the machine.

### **PERIOD INDICATING LABEL**

This (9) indicates that it is for 7 days.

### **SPEED RECORDING STYLUS**

This (10) records the momentary speed of the machine on the chart.

### **OPERATOR CHANGE RECORDING STYLUS**

When the operator change key is used, the operator change is recorded on the chart (11).

### **TRAVEL DISTANCE RECORDING STYLUS**

This (12) records the distance travel by the machine on the chart. One up-and-down recording motion is 10 km.

### **ADJUSTMENT SCREW FOR SPEED WARNING LAMP**

The speed at which the lamp gives a warning can be set as desired with this screw (13).

### **SPEED CONFIRMATION APERTURE FOR SPEED WARNING LAMP INDICATION**

This (14) is the speed indication aperture for setting the desired speed.

### **CLOCK SETTING KNOB**

Turn this knob (15) clockwise to advance the hand, and counterclockwise to turn the hand back.

### **CHART SUPPORT**

This (16) is the rotating part of the clock and has teeth to prevent the chart from slipping.

### **PRESSING RING**

This ring (17) is a ring that presses the chart and holds it against the chart support.

### **CUTTING KNIFE**

This knife (18) cuts the tape connecting the charts.

### **INSTRUMENT LIGHTING LAMP**

This lamp (19) is used for light up the instrument.

## NAME PLATE

This (20) indicates the type and model.

## VOLTAGE INDICATION LABEL

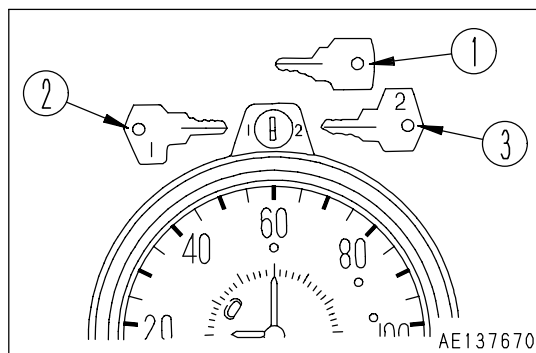
This label (21) indicates the voltage.

## METHOD OF USING KEY

There are three types of key. Key (1) with no mark is used for opening and locking the instrument. Key (2) (marked with No. 1) is change key 1, and key (3) (marked with No. 2) is change key 2. With these three keys, it is possible to know the details of the operation and the change of operator.

To use the change key, remove the instrument open/lock key and insert change key 1 in the same key hole, then turn 45° in the No. 1 direction.

Use change key 2 in the same way and turn to the No. 2 direction.



The change key will only turn in the direction of its number.

The change keys cannot be used to open the instrument.

Recording width of chart

When using key with no mark: 1.45 mm (0.057 in)

When using key with No. 1 mark: 2.15 mm (0.085 in)

When using key with No. 2 mark: 0.7 mm (0.028 in)

## METHOD OF USE

1. Check the operation of clock.

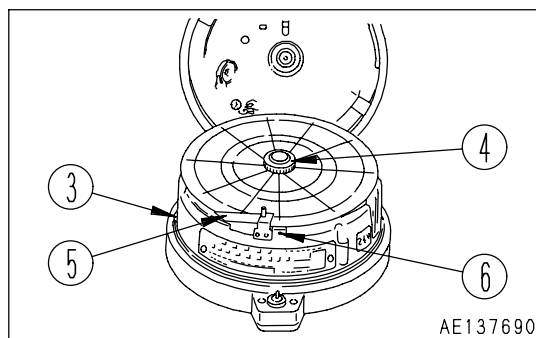
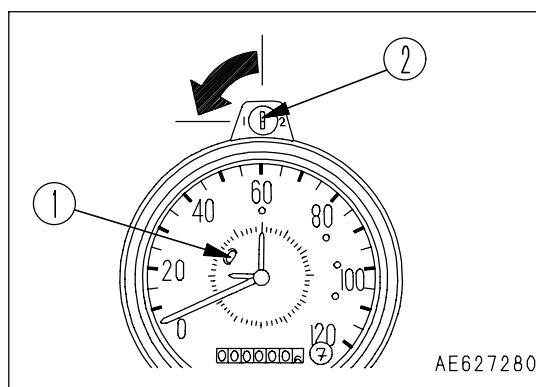
Watch through clock operation confirmation aperture (1) to confirm that the clock is working.

The clock is electric, so there is no need to wind it up.

2. Open the cover.

Insert the instrument open/lock key in hole (2), turn counterclockwise 90°, then pull open carefully.

The cover can be opened approx. 115°. Do not open it further than that, or pull it strongly, or put anything heavy on the cover, as these will cause failures.



3. Turn time setting knob (3) to set the time.

**Precautions when setting time**

Always set the time with the time setting knob. Turn the hand in the direction of rotation 10 minutes beyond the correct time, then turn back to the correct time.

4. Fill in chart.

Before inserting new chart paper, always fill in the required items. (Operator code No., machine code No., date, etc.)

Fill in the above items with a steel pen.

Handle the charts carefully with clean hands, and do not fold or scratch them.

5. Push down pressing ring (4) holding the charts, turn counterclockwise, and pull out the pressing ring at the point where it contacts the stopper, then remove the charts.

6. Insert new charts.

Remove pressing ring (4), then set the charts under cutting knife (5). When doing this, align the time on the charts (for example when the starting time is 9 am) exactly with red point (6) on the instrument body.

**Precautions when replacing the charts**

When aligning the charts with the center of the chart support, do not force them into position or use your finger to make the hole in the center of the chart paper larger. If the size of the hole changes, it may cause an error in the recording.

Stop the engine completely before inserting the new charts.

Use Komatsu genuine charts (P/N: YZ762929-980) for 90 km/h (55.9 MPH) 7 days.

7. Close the cover.

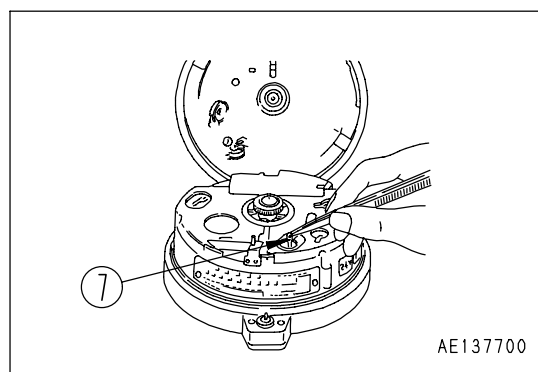
Lift up the cover to close it, then turn the instrument open/lock key 90° clockwise.

**Replacing instrument lighting lamp bulb**

Raise contact piece (7), and take out the old bulb with a pincette. It comes out easily.

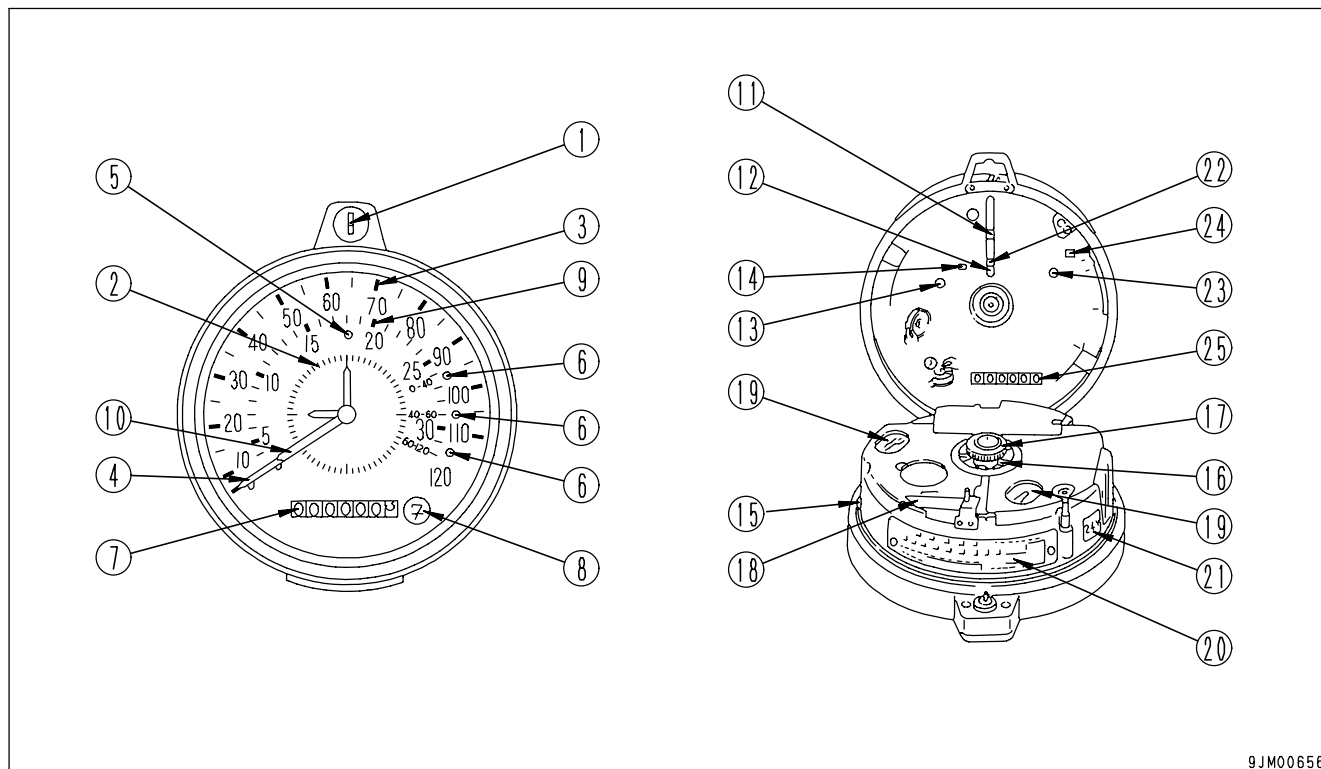
After replacing, check that the contact piece is holding down the lamp base firmly.

Use a 24 V bulb.



## REVO TACHOGRAPH (TCO 15-7)

### EXPLANATION OF COMPONENTS



9JM00656

- |  |  |
|--|--|
| (1) Instrument lock                          | (14) Speed confirmation aperture for speed warning lamp indication |
| (2) Clock dial                               | (15) Clock setting knob  |
| (3) Speed scale                              | (16) Chart support   |
| (4) Speed indicator                          | (17) Pressing ring   |
| (5) Speed warning lamp                       | (18) Cutting knife   |
| (6) Speed indication confirmation lamp       | (19) Instrument lighting lamp                                      |
| (7) Odometer                                 | (20) Name plate  |
| (8) Period indicating label                  | (21) Voltage indication label                                      |
| (9) RPM scale                                | (22) RPM recording stylus  |
| (10) RPM indicator                           | (23) Adjustment screw for RPM warning lamp                         |
| (11) Speed recording stylus                  | (24) Speed confirmation aperture for RPM warning lamp indication   |
| (12) Travel distance recording stylus        | (25) Total revolution counter                                      |
| (13) Adjustment screw for speed warning lamp |  |

#### INSTRUMENT LOCK

This (1) can be used for the key to open when replacing the chart.

#### CLOCK DIAL

One line here (2) indicates one minute.

#### SPEED SCALE

This (3) is the scale for the machine travel speed.



### **SPEED INDICATOR**

This (4) indicates the machine travel speed.

### **SPEED WARNING LAMP**

When the machine exceeds the maximum set speed, the lamp (5) lights up to warn the operator.

Models with the speed warning lamp do not have the speed indication confirmation lamp.

### **SPEED INDICATION CONFIRMATION LAMP**

This lamp (6) is interconnected with the speedometer and is used to confirm the speed indication. When using the confirmation switch to light up the confirmation lamp during checks before starting, always check for any disconnection in the three indication confirmation lamps.

Models with the speed warning lamp do not have the speed indication confirmation lamp.

### **ODOMETER**

This meter (7) displays the total distance (km) traveled by the machine.

### **PERIOD INDICATING LABEL**

This (8) indicates that it is for 7 days.

### **RPM SCALE**

This (9) is the scale for the momentary speed in revolutions per minute (rpm).

### **RPM INDICATOR**

This (10) shows the momentary speed in revolutions per minute (rpm).

### **SPEED RECORDING STYLUS**

This (11) records the momentary speed of the machine on the chart.

### **TRAVEL DISTANCE RECORDING STYLUS**

This (12) records the distance travel by the machine on the chart. One up-and-down recording motion is 10 km.

### **ADJUSTMENT SCREW FOR SPEED WARNING LAMP**

The speed at which the lamp gives a warning can be set as desired with this screw (13).

### **SPEED CONFIRMATION APERTURE FOR SPEED WARNING LAMP INDICATION**

This (14) is the speed indication aperture for setting the desired speed.

### **CLOCK SETTING KNOB**

Turn this knob (15) clockwise to advance the hand, and counterclockwise to turn the hand back.

### **CHART SUPPORT**

This (16) is the rotating part of the clock and has teeth to prevent the chart from slipping.

### **PRESSING RING**

This ring (17) is a ring that presses the chart and holds it against the chart support.

### **CUTTING KNIFE**

This knife (18) cuts the tape connecting the charts.

### INSTRUMENT LIGHTING LAMP

This lamp (19) is used for light up the instrument.

### NAME PLATE

This (20) indicates the type and model.

### VOLTAGE INDICATION LABEL

This label (21) indicates the voltage.

### RPM RECORDING STYLUS

This (22) records the momentary engine speed on the chart.

### ADJUSTMENT SCREW FOR RPM WARNING LAMP

The speed at which the lamp gives a warning can be set as desired with this screw (23).

### SPEED CONFIRMATION APERTURE FOR RPM WARNING LAMP INDICATION

This (24) is the speed indication aperture for setting the desired speed of revolution.

### TOTAL REVOLUTION COUNTER

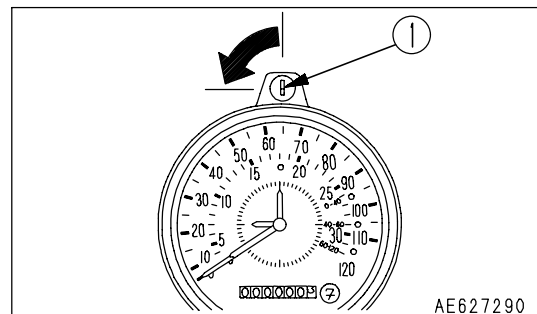
This meter (25) indicates the total number of revolutions (x 1000) of the engine.

## METHOD OF USE

#### 1. Open the cover.

Insert the instrument open/lock key in hole (1), turn counterclockwise 90°, then pull open carefully.

The cover can be opened approx. 115°. Do not open it further than that, or pull it strongly, or put anything heavy on the cover, as these will cause failures.

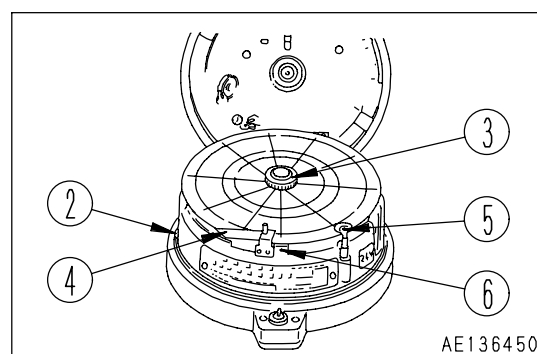


#### 2. Set the time.

Turn time setting knob (2) to set the time.

Always set the time with the time setting knob. Turn the hand in the direction of rotation 10 minutes beyond the correct time, then turn back to the correct time.

Check the clock operation with the movement of minute hand. The clock is electric, so there is no need to wind it up.



#### 3. Fill in chart.

Before inserting new chart paper, always fill in the required items. (Operator code No., machine code No., date, etc.)

Fill in the above items with a steel pen.

Handle the charts carefully with clean hands, and do not fold or scratch them.

4. Removing used charts

Push down pressing ring (3) holding the charts, turn counterclockwise, and pull out the pressing ring at the point where it contacts the stopper, then remove the charts.

Handle the charts carefully with clean hands, and do not fold or scratch them.

5. Insert new chart.

Remove pressing ring (3), then set the charts under cutting knife (4), and below fan-shaped rotating transfer shaft (5) on the right. When doing this, align the time on the charts (for example when the starting time is 9 am) exactly with red point (6) on the instrument body.

Precautions when replacing the charts

When aligning the charts with the center of the chart support, do not force them into position or use your finger to make the hole in the center of the chart paper larger. If the size of the hole changes, it may cause an error in the recording.

Stop the engine completely before inserting the new charts.

Use Komatsu genuine charts (P/N: YZ762929-730) for 90 km/h (55.9 MPH) 7 days.

6. Close the cover.

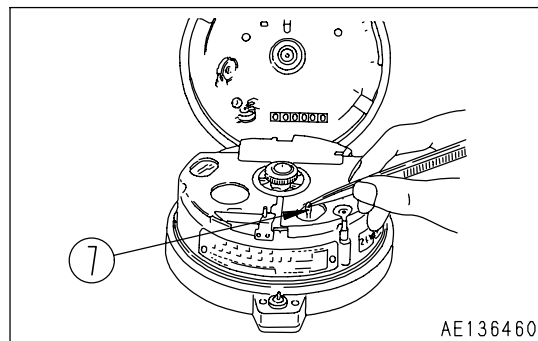
Lift up the cover to close it, then turn the instrument open/lock key 90° clockwise. When operating the machine, remove the instrument open/lock key.

Replacing instrument lighting lamp bulb

Raise contact piece (7), and take out the old bulb with a pincette. It comes out easily.

After replacing, check that the contact piece is holding down the lamp base firmly.

Use a 24 V bulb.

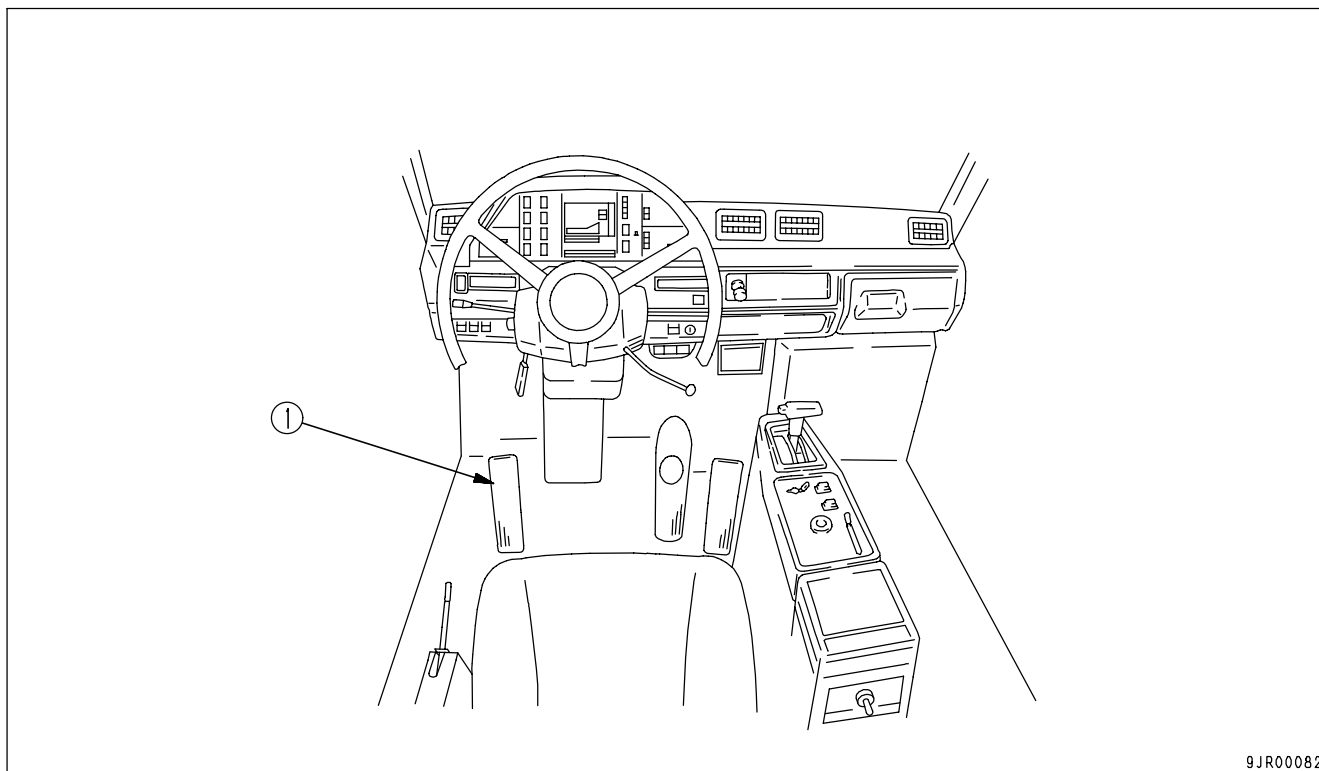


## USING DIFFERENTIAL LOCK

### DIFFERENTIAL LOCK PEDAL

The differential lock is used on snow-covered or muddy areas where the tires are likely to slip.

The left and right wheels on the rear axle are locked together to prevent slipping and to provide a powerful drive force. This also helps to extend the service life of the tires.



9JR00082

(1) Differential lock pedal



### WARNING

- Do not use the differential lock pedal when traveling at high speed (4th gear, 20 km/h (12.4 MPH) and above).
- Do not use the differential lock pedal when turning.

### NOTICE

Do not use the differential lock pedal when the wheels are already slipping. This may reduce the durability. First, stop the machine, then depress the differential lock pedal, and start the machine again.

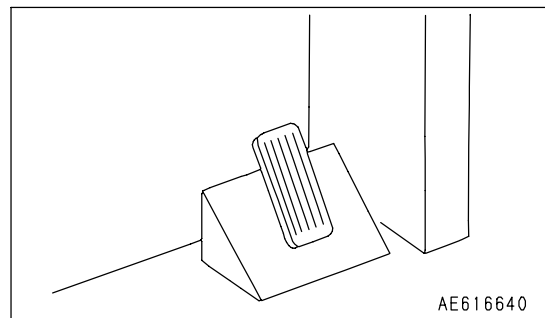
**DIFFERENTIAL LOCK PEDAL**

This pedal (1) actuates the differential lock control.

When the pedal is depressed, the differential lock is actuated; when the pedal is released, the differential lock is cancelled.

**REMARK**

When traveling on soft ground where the wheel on one side slips, or when traveling on road surfaces where the tires are likely to slip, depress the differential lock pedal. This actuates the differential lock and makes both the left and right wheels rotate at the same speed to prevent slipping.

**PRECAUTIONS AND METHOD OF USE**

- Depress the differential lock pedal to actuate the differential lock 5 to 10m (16 ft 5 in to 32 ft 10 in) before entering the area where the tires may slip.

**REMARK**

Using the differential lock before the tires slip makes it possible to obtain the full capacity of the differential lock, and also extends the tire life.

- If the differential lock is applied when the tires are already slipping, the durability may be reduced.  
Do not actuate the differential lock when the tires are slipping.
- If the tires should slip and it becomes impossible to escape, stop the machine, then depress the differential lock pedal and start the machine again.
- When traveling on road surfaces where the tires may slip, be particularly careful to avoid sudden changes in travel speed (decelerating or accelerating).
- Do not use the differential lock pedal when traveling at high speed (4th gear, 20 km/h (12.4 MPH) and above).
- Do not use the differential lock pedal when turning.

If the differential lock is used when turning, it will cause the following problems.

- It will be more difficult to turn than when the differential lock is not used, so the truck may be unable to turn on curves where it could normally turn easily.
- The inside wheels and outside wheels will turn at the same speed when turning, so one side will spin and reduce the tire life, and it may also damage the road surface.
- In order to absorb the difference in rotation of the left and right tires which is caused when the machine turns, the differential lock disc will slip, and this will reduce the durability of the differential lock.
- An excessive load will be brought to bear on the final drive, and this may reduce the life of the final drive.

**NOTICE**

If the tires are likely to slip on the road surface on curves, carry out maintenance of the road surface to reduce this problem.

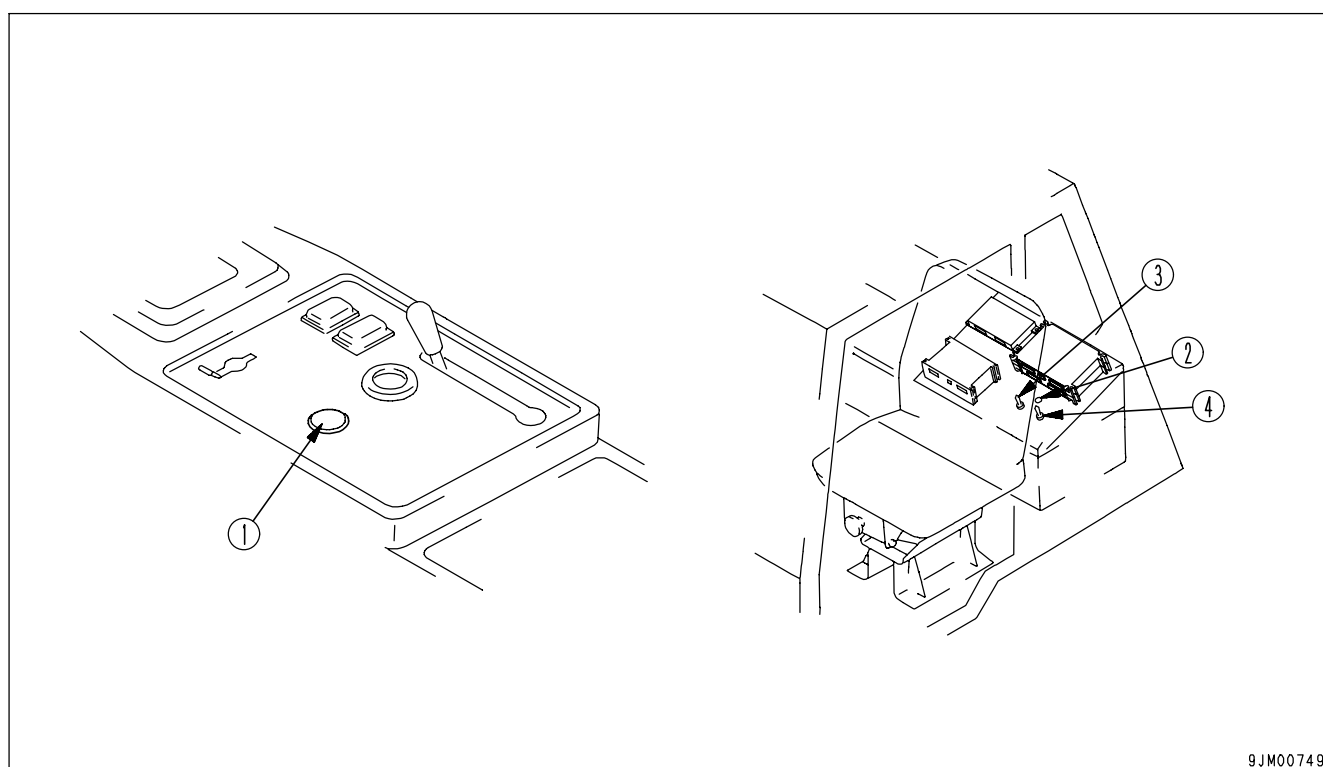
## OPERATION OF ABS AND ABS/ASR

[ABS (ANTI-SKID BRAKE SYSTEM), ASR (AUTOMATIC SPIN REGULATOR)]

**ABS:** When the machine is braked suddenly or braked on a slippery snow-covered road, etc., this system works to prevent the tires from locking and skidding. Accordingly, a stable machine behavior and good steering performance is secured.

**ABS/ASR:** In addition to the above functions of the ABS, this system has a function to prevent slipping of the drive wheels caused by excessive torque. Accordingly, the machine can start and travel normally even on a bad or frozen road surface.

## EXPLANATION OF COMPONENTS



(1) Warning lamp

(2) ASR information lamp

(3) ABS/ASR main switch

(4) Troubleshooting switch

### WARNING LAMP

This lamp (1) lights up at engine start and when the ABS/ASR is turned off or malfunctions.

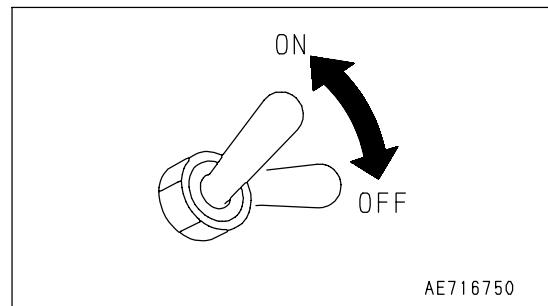
### ASR INFORMATION LAMP

(Yellow) (Also used as troubleshooting lamp)

This lamp (2) lights up when the ASR operates and during troubleshooting.

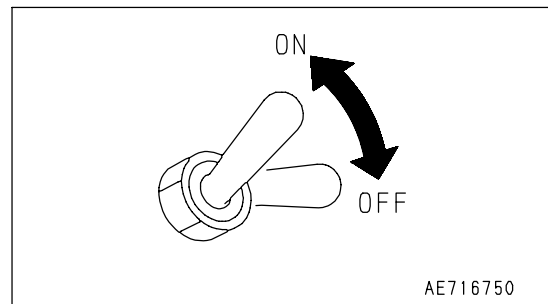
### ABS/ASR MAIN SWITCH

This switch (3) is used to turn the ABS/ASR system on/off.



### TROUBLESHOOTING SWITCH

This switch (4) is used for troubleshooting.



## OPERATION METHOD

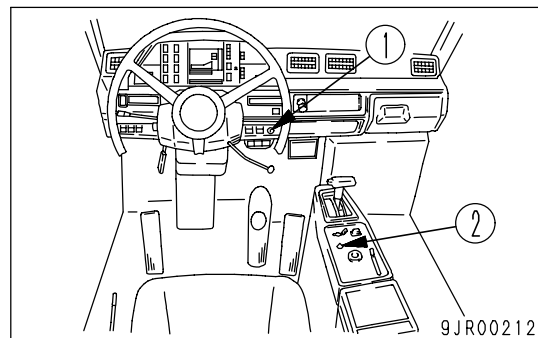
### ABS OPERATION



#### WARNING

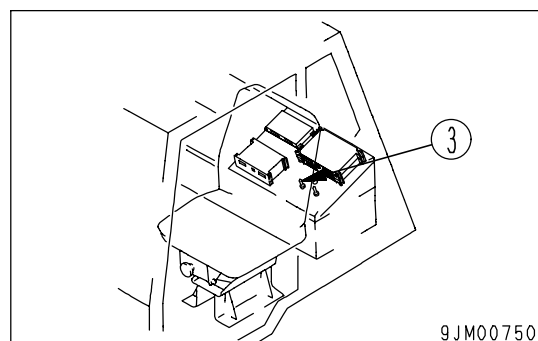
Always stop the machine before turning on the ABS/ASR main switch (3). If it is turned on while the machine is running, the ABS/ASR may not function normally.

1. Turn on the starting switch (1). At this time, warning lamp (2) will light up.



2. Turn on the ABS/ASR main switch (3). Start the machine. When the speed rises to about 10 km/h (6.2 MPH), the warning lamp (2) will go off.

If the starting switch (1) is turned on/off while the ABS/ASR main switch (3) is turned on, the electric power for the ABS/ASR system will also be turned on/off. Accordingly, keep the ABS/ASR main switch turned on for normal operation.



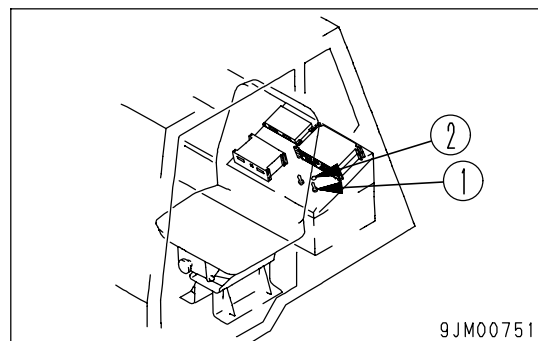
### ASR OPERATION



#### WARNING

Turn on the troubleshooting switch (1) only when performing troubleshooting on the machine. The ABS/ASR system will not function while the troubleshooting switch is turned on.

1. Since the ASR and ABS are interlocked, if the ABS is turned on, the ASR is also turned on automatically.
2. The ASR information lamp (2) lights up when the system detects slippage of the rear wheels, and the ASR starts functioning.





## PRECAUTIONS FOR USE



### WARNING

- If the ABS functions while traveling on a slippery road, the braking distance may be slightly lengthened. Even if the ABS is turned on, the tires may lock when the machine is braked when running at a very low speed. Accordingly, take care when driving on slippery roads.
- If the machine is braked while running at high speed or on a slippery road, more air is consumed by the ABS/ASR. If the air pressure drops and the warning buzzer sounds, stop the machine in a safe place. Wait until the air pressure is restored sufficiently, then start again.
- Even with the ABS/ASR system installed, there may be instances where the machine can not travel safely such as on a road having an extremely low coefficient of friction (a frozen road, etc.) or on a steep slope. In this case, repair the road surface before driving.

- The machine can be travel normally even if the ABS/ASR main switch is turned off. In this case, however, watch out for lateral skidding of the machine.
- Even if the ABS/ASR system malfunctions, the machine can be travel normally. Watch out for lateral skidding in this case, however, while traveling on slippery roads. If the warning lamp lights up, the system is automatically turned off and the ABS/ASR system does not function.
- Even if the ABS/ASR system is installed, the emergency brake function is maintained.
- If the ABS/ASR main switch is turned on with the brake pedal depressed or the retarder control lever pulled, exhaust sound will be momentarily emitted from the ABS valve. This does not indicate a fault.
- If both rear wheels slip at the same speed, the ASR will not function. In this case, adjust the engine output with the accelerator pedal.
- When installing a wireless device on the machine, select one which does not violate the wireless device-related laws/regulations and use it according to law. Mount it as far away from the devices and wiring harness of the ABS/ASR system as possible.

## TROUBLESHOOTING

- When the starting switch is turned on, if the warning lamp does not light up, it may be broken. In this case, replace the lamp.
- If the ABS/ASR system malfunctions while being used, the warning lamp (Red) will light up. In this case, stop the machine at a safe place immediately, then ask your Komatsu distributor to carry out repair.

The positions of each switch and the statuses of the corresponding warning lamps are as follows.

Starting switch	ABS/ASR Main switch	Warning lamp
OFF	OFF	Goes off
OFF	ON	Goes off
ON	OFF	Lighted (Normal)
ON	ON	<ul style="list-style-type: none"> <li>• Stays lighted until travel speed rises to about 10 km/h (6.2 MPH), then goes off (Normal).</li> <li>• Lights up when a fault occurs (Malfunction).</li> </ul>

## ARSC (AUTOMATIC RETARDER SPEED CONTROL)

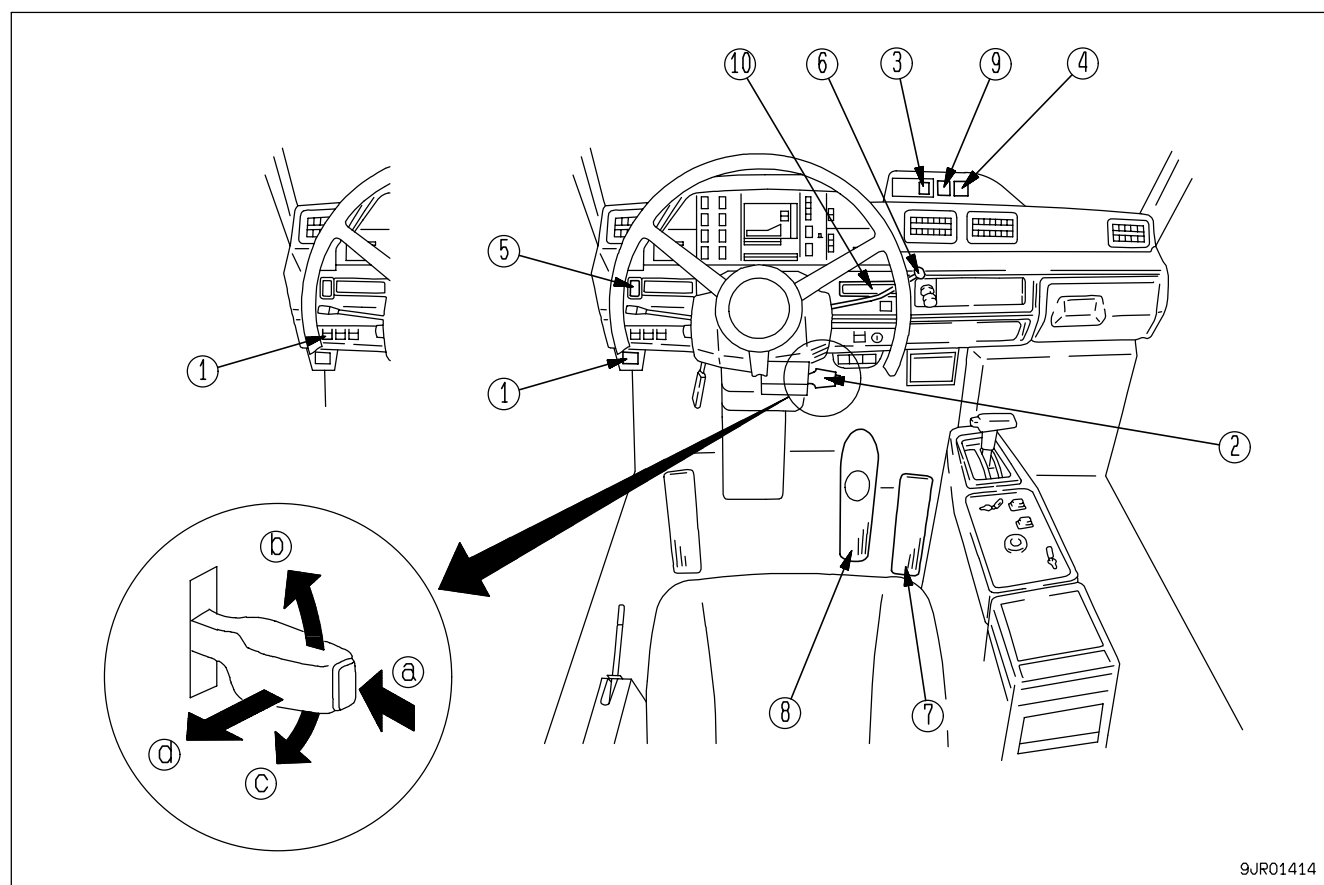
When traveling downhill, if the switch is pressed at the speed that is to be maintained, the retarder is automatically actuated to prevent the travel speed from exceeding the set speed, so this makes retarder operations easy.



### WARNING

- The ARSC system is actuated when the system switch is ON. Before traveling downhill, check that the system switch is ON.
  - If the speed is set to a speed that exceeds the maximum permissible speed obtained from the brake performance graph, there is danger that there will be overheating and that the retarder brake may be damaged. Always set the speed so that it does not exceed the maximum permissible speed.
  - When the ARSC is actuated on slippery roads, the tires may lock. If this happens, cancel the ARSC.
  - If any abnormality occurs in the system and braking cannot be carried out properly, the alarm sounds and the system is turned OFF to cancel the ARSC. If necessary, control the machine with the retarder control lever and foot brake to stop the machine in a safe place, then turn the system switch OFF.
-

## EXPLANATION OF COMPONENTS



9JR01414

The position of system switch (1) may differ according to the combination of optional equipment.

- |                          |                            |
|--------------------------|----------------------------|
| (1) System switch        | (6) Retarder control lever |
| (2) ARSC set lever       | (7) Accelerator pedal      |
| (3) Set speed display    | (8) Brake pedal            |
| (4) ARSC caution lamp    | (9) Ready lamp             |
| (5) Central warning lamp | (10) Rear brake pilot lamp |

- |                    |                    |
|--------------------|--------------------|
| (a) Set            | (c) Decrease speed |
| (b) Increase speed | (d) Cancel         |

### SYSTEM SWITCH

This switch (1) is used to turn the ARSC system ON/OFF.

### ARSC SET LEVER

This lever (2) is used in the following cases:

When setting the travel speed

When making fine adjustments to the set speed (tap up/tap down)

When canceling the speed setting

### **SET SPEED DISPLAY**

This (3) displays the speed (km/h) that has been set.

The display goes out when the system switch is OFF.

It displays 0 when the set value is canceled.

When the starting switch is ON or the system switch is ON, the display shows -- and then shows 0.

### **ARSC CAUTION LAMP**

This lamp (4) flashes if there is any abnormality in the ARSC system when the system switch is ON.

It lights up for 3 seconds when the starting switch is turned ON to check the bulb.

### **CENTRAL WARNING LAMP**

This lamp (5) lights up together with the ARSC caution lamp if there is a serious abnormality in the ARSC system when the system switch is ON.

### **RETARDER CONTROL LEVER**

Even when the ARSC is in operation, the retarder can be operated with this lever (6).

### **ACCELERATOR PEDAL**

The ARSC is actuated only when the accelerator pedal (7) is not being pressed.

### **BRAKE PEDAL**

This pedal (8) operates the wheel brake even when the ARSC is being operated.

### **READY LAMP**

When this lamp (9) is lighted up, it shows that the travel speed is set and that operation of the ARSC is possible.

When it is out, the ARSC is not actuated.

It lights up for 3 seconds when the starting switch is turned ON to check the bulb.

### **REAR BRAKE PILOT LAMP**

This lamp (10) lights up when the retarder or brake pedal are operated, even when the ARSC is being operated.

## METHOD OF OPERATION

### ACTUATION OF ARSC SYSTEM

The ARSC system is actuated when the system switch is ON.

If the set switch on the ARSC set lever is pressed, the travel speed at that moment is set as the downhill travel speed. If the travel speed exceeds the set downhill speed, the retarder is automatically actuated.

The set travel speed is displayed on the set travel speed display and is stored in memory.

If the accelerator pedal is pressed while the ARSC is being operated, the ARSC is canceled and the speed increases.

If the brake pedal or retarder control lever are operated while the ARSC is being operated, it is possible to reduce the machine speed or stop in the same way as during normal brake operations.

### METHOD OF SPEED SETTING



### WARNING

If the speed is set to a speed that exceeds the maximum permissible speed obtained from the brake performance graph, there is danger that there will be overheating and that the retarder brake may be damaged. Always set the speed so that it does not exceed the maximum permissible speed.

If the actual machine speed during the setting operation is less than 10 km/h (6.2 MPH), the speed is set to 10 km/h (6.2 MPH). In all other cases, it is set to the actual travel speed.

The travel speeds that can be set depend on the selection of the gearshift lever as follows.

When the shift lever is at the D, 5, 4, 3, or L positions, the range for the set speed is 10 to 55 km/h (6.2 to 34.2 MPH).

It is impossible to set the speed when the shift lever is at the N or R positions.

### METHOD OF CARRYING OUT FINE ADJUSTMENT OF SET TRAVEL SPEED

To raise the set travel speed 1 km/h (0.6 MPH), push the ARSC set lever forward once.

To decrease the set travel speed 1 km/h (0.6 MPH), pull the ARSC set lever back once.

### REMARK

Release the ARSC set lever after changing the set travel speed.

If the set and cancel operations are carried out at the same time, the cancel operation is given priority.

If the set and tap up operations are carried out at the same time, the tap up operation is given priority.

If the set and tap down operations are carried out at the same time, the tap down operation is given priority.

The tap up and tap down operations are used for making fine adjustment of the set travel speed.

It is possible to adjust the set travel speed up to  $\pm 5$  km/h (3.1 MPH) when traveling in ARSC (when the accelerator pedal is released). When the accelerator pedal is being depressed, the ARSC is canceled, so it is possible to adjust the set speed freely in a range from 10 to 55 km/h (from 6.2 to 34.1 MPH).

### METHOD OF INCREASING SET TRAVEL SPEED

If it is desired to increase the set speed, depress the accelerator pedal to increase speed, and when the desired set travel speed is reached, press the set switch on the ARSC set lever. The set travel speed will be changed to the new speed.

### **METHOD OF DECREASING SET TRAVEL SPEED**

If it is desired to decrease the set speed, operate the retarder control lever to reduce speed, and when the desired set travel speed is reached, press the set switch on the ARSC set lever. The set travel speed will be changed to the new speed.

#### **REMARK**

After using the retarder control lever to reduce the speed, return it to its original position.

### **TRAVELING AGAIN AT SET TRAVEL SPEED**

If the machine repeatedly travels on the same slope, once the travel speed has been set, it is possible to operate the ARSC without carrying out the setting operation each time.

Before entering a downhill slope, if the travel speed has been adjusted to a speed lower than the set speed displayed on the travel speed display, the READY lamp (green) lights and the ARSC is actuated when the accelerator pedal is released.

#### **REMARK**

When traveling at a speed greater than the set speed displayed on the travel speed display, the ARSC is not actuated even when the accelerator pedal is released. When this happens, the READY lamp (green) also does not light up. Always adjust the travel speed to a speed lower than the set speed displayed on the travel speed display, and check that the READY lamp lights up.

### **METHOD OF CANCELING SET TRAVEL SPEED**

Method 1: If the cancel operation is carried out for more than 1 second, the control is stopped. When this happens, the set speed display shows 0.

Method 2: If the system switch is turned OFF, the control is canceled. When this happens, the set speed display goes out.

#### **REMARK**

For Method 1, cancel operation must be continued for at least 1 second (different from other switches) to cancel the control. This is to prevent any problem of the control being canceled if the switch is touched by mistake.

### **RELATIONSHIP WITH EXHAUST BRAKE**

If the exhaust brake switch is at ON position (light is on), the exhaust brake is actuated in the normal way when the accelerator pedal is released if the torque converter lock-up is ON (Lock-up pilot lamp lights up). When the machine attempts to travel at a speed greater than the set speed, the ARSC is also actuated if the speed is set in the way stated above.

If the exhaust brake switch is at OFF position (light is off), the exhaust brake is not actuated when the ARSC is being operated. If the foot brake or retarder control lever are operated, the exhaust brake is actuated in the same way as normal.

If the downhill slope is not steep and the engine brake and exhaust brake have ample effect, the machine will not accelerate to the set travel speed, so the ARSC may not be actuated.

### **RECOMMENDED SET TRAVEL SPEED**

Set the travel speed so that the engine speed is at least 1,800 rpm, and travel so that the retarder oil temperature gauge is in the green range.

### **OVERHEAT WARNING**

If there is danger that the retarder oil may overheat, the ARSC caution lamp lights up and the set travel speed is automatically reduced 1 km/h (0.6 MPH) every 3 seconds. The lower value for the set travel speed when the speed is automatically reduced is 10 km/h (6.2 MPH).

## TROUBLESHOOTING

### WHEN A PROBLEM OCCURS IN THE SYSTEM

This system is equipped with a self-diagnostic function. If any problem occurs, a failure code is displayed by the controller LED under the assistant's seat.

No.	Failure code	Detail	Remedy pattern*
1	0.1	Abnormality in power source	1
2	1.0	Disconnection, short circuit with ground, short circuit in engine speed sensor system	1
3	1.3	Disconnection, short circuit with ground, short circuit in transmission output shaft speed sensor system	1
4	1.5	Short circuit with ground in retarder oil temperature sensor system	1
5	1.7	Disconnection, short circuit with ground, short circuit in accelerator signal	1
6	1.8	Disconnection, short circuit with ground in suspension pressure sensor (left) system	1
7	1.9	Disconnection, short circuit with ground in suspension pressure sensor (right) system	1
8	4.2	Disconnection, short circuit in exhaust brake signal system	2
9	4.3	Disconnection, short circuit in ARSC caution lamp system	1
10	4.4	Disconnection in READY lamp system	2
11	4.5	Disconnection, short circuit in central warning lamp system or buzzer system	2
12	5.2	Short circuit with ground in exhaust brake signal system	2
13	5.3	Short circuit with ground in ARSC caution lamp system	1
14	5.4	Short circuit with ground in READY lamp system	2
15	5.5	Short circuit with ground in central warning lamp system or buzzer system	2
16	6.0	Failure in engine speed sensor system	1
17	7.0	Disconnection, short circuit in set speed display up output	2
18	7.1	Disconnection, short circuit in set speed display down output	2
19	7.2	Disconnection, short circuit in set speed display clear output	2
20	7.3	Short circuit with ground in set speed display up output	2
21	7.4	Short circuit with ground in set speed display down output	2
22	7.5	Short circuit with ground in set speed display clear output	2
23	8.1	Short circuit with ground in pressure control valve system	1
24	8.3	Short circuit with ground in pressure control valve system	1
25	8.5	Failure in pressure control valve (retarder remains applied) or failure in pressure switch 1 system	1
26	8.7	Failure in pressure control valve (retarder has no effect) or failure in pressure switch 1 system	1
27	8.9	Short circuit with ground in pressure cracking valve	1
28	9.0	Disconnection, short circuit in pressure cracking valve	1
29	9.1	Failure in pressure cracking valve (remains open) or failure in pressure switch 2 system	1
30	9.2	Failure in pressure cracking valve (does not open) or failure in pressure switch 2 system	1
31	9.3	Disconnection, short circuit in system switch system	1
32	9.4	Short circuit with ground in system switch system	1
33	9.5	Disconnection, short circuit with ground in travel speed set switch system	1

\*See next page.

#### Remedy pattern 1

If the central warning lamp and the ARSC caution lamp flash and the buzzer sounds, it means that a serious problem has occurred in the ARSC system.

Operation of the ARSC system is stopped. Operate the brake pedal or retarder lever as necessary to ensure safety. When the system switch is turned OFF, the central warning lamp and ARSC caution lamp go out and the buzzer stops.

#### REMARK

If the starting switch is turned ON when the air pressure in the air tank has dropped, failure code "9.2" may be displayed. If this happens, start the engine and raise the air pressure to the normal level, then start again.

If the failure code is "9.3" or "9.4", it shows that there is a failure in the system switch, so even if the system switch is turned OFF, the central warning lamp and ARSC caution lamp will flash and the buzzer will sound.

#### Remedy pattern 2

When only the ARSC caution lamp flashes

The ARSC system continues to be actuated, but an abnormality has occurred in the system.

Turn the system switch OFF to stop use of the ARSC.

When the system switch is turned OFF, the ARSC caution lamp will go out.

In the case of patterns 1 and 2 above, turn the system switch OFF quickly, stop use of the ARSC and contact your Komatsu distributor for repairs.

The set travel speed display is also equipped with a self- diagnostic function, and a failure code is displayed on the set travel speed display

No.	Failure code	Detail	Method of resetting
1	E1	Abnormality in CPU	Turn the starting switch ON again or turn the system switch ON again.
2	E2	Abnormality in memory	Turn the starting switch ON again or turn the system switch ON again.

#### WHEN SYSTEM IS NORMAL

The code is displayed on the controller LED under the assistant's seat.

No.	Code	Condition
1	0.0	When accelerator pedal is being depressed ( "." is not shown for 0 on the right)
2	0.0.	When accelerator pedal is not being depressed ( "." is shown for 0 on the right)

#### REMARK

If the above code is not displayed when the accelerator pedal is being depressed or not being depressed, it is necessary to adjust the accelerator link. If it is not properly adjusted, the ARSC system will not be able to judge correctly if the accelerator pedal is being depressed or not, so the ARSC may not work normally.



## METHOD OF DISPLAYING MODEL SELECTION, TIRE LARGE DIAMETER/SMALL DIAMETER, FAILURE CODE

When the starting switch is turned ON, the codes below are automatically displayed in the following order on the controller LED.

1. LEDs all light up.
2. Model  
Code: 78
3. Tire diameter (Large/small)

Code	Tire Large/Small
B. –	Large size (standard)
S. –	Small size (if equipped)

4. Latest failure code
5. Failure code that occurred immediately before the failure code in 4.
6. Failure code that occurred immediately before the failure code in 5.

## METHOD OF CLEARING FAILURE CODE

Turn machine starting switch to ON (the engine is not started) and disconnect connectors CR1 and CR2 under the assistant's seat.

When this is done, "– –" is displayed on the controller LED.

When the "– –" changes from flashing and stays lighted up (3 seconds), the failure code has been cleared.

## REMARK

When using the ARSC for the first time, always clear the failure codes.

After clearing the codes, connect connectors CR1 and CR2.

## **PMC (POWERTRAIN MANAGEMENT CONTROLLER) AND MOM (MESSAGE FOR OPERATION AND MAINTENANCE)**

### **CHECK BEFORE STARTING**

1. Turn ON the starting switch. If the maintenance caution lamp continues lighting up after all monitors and the central warning lamp light up for approx. 3 seconds and then goes out, check the service code and its description displayed on MOM and carry out the indicated checks and maintenance.
2. After starting the engine, move the shift lever to the N position while keeping the air pressure in the normal range (the green range lights up). Pull the retarder control lever fully for 10 seconds or longer to check that the brake does not exceed the wear limit. If the wear exceeds the limit, the maintenance caution lamp lights up and simultaneously displays the service code and its description on MOM.

In this case, carry out checks and maintenance referring to "EVERY 1000 HOURS SERVICE (PAGE 4-58)".

Unless 15 minutes or longer has elapsed after the engine stopped, the maintenance caution lamp may light up and the service code and its description may be displayed even if the oil level is shown as normal.

### **ABNORMALITY DISPLAYED DURING OPERATION**

If an abnormality occurs during operation, the maintenance caution lamp also lights up and the service code and its description are displayed.

However, the clogging of filters can not be detected unless the oil temperature rose to the specified value or over.

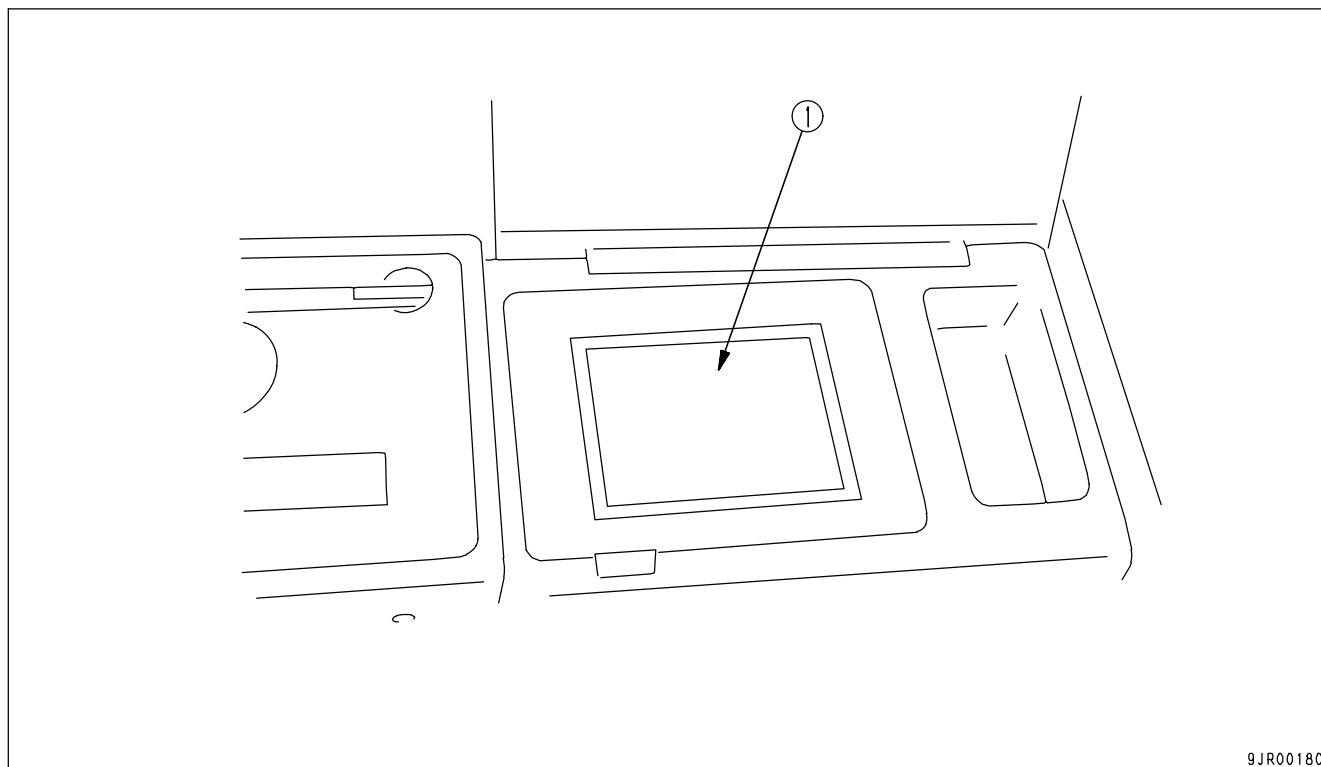
PMC detects abnormality in the maintenance items and displays the service code and its description on MOM connected with PMC. If the controller other than PMC detects any abnormality, MOM also displays the service code and its description and some message useful for operating the machine smoothly.

### **HOW TO DOWNLOAD THE STORED DATA IN PMC AND OTHER CONTROLLERS**

Download of the stored data is available by connecting your service tool (personal computer) to PMC.

For details, see SERVICE MANUAL.

## MESSAGE FOR OPERATION AND MAINTENANCE (MOM)



9JR00180

(1) MOM panel

MOM is a message display for operator and service person, and has some touch switches in its surface. MOM always informs operator of various and useful data as follows.

- Machine conditions
  - When starting switch is turned on before starting engine
  - Engine start is OK or WAIT
  - The reason why engine start is not acceptable
  - When engine is running before departure
  - Departure is OK or WAIT
  - The reason why departure is not acceptable
- Production data (Only when optional PLM II is installed in the machine)
  - Current payload
  - Total payload
  - Total numbers of cycle
- Fault information at occurrence
  - Service code and its description
  - User code and its description
- Others
  - Year/month/date, Clock

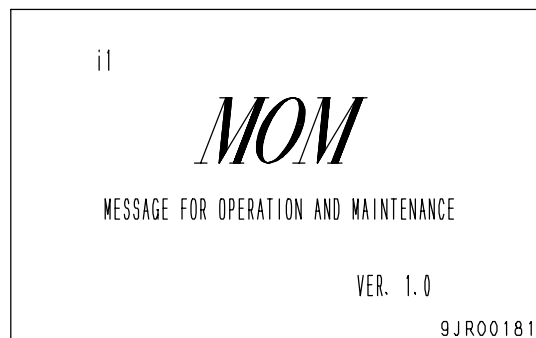
It is recommended to obey MOM's requests in order to drive safely, keep the machine good condition, and prevent severe malfunction.

However, it is always possible to start engine and to depart because of emergency use even if MOM indicates WAIT.

### THE PICTURE OF INITIAL MESSAGE (i1)

When starting switch is turned on, the initial message (i1) is displayed for three seconds after a system message (Japanese). The picture number (i1), title, and program version number are indicated in this picture. After displayed for three seconds, (i1) is changed to the picture of initial check 1 (i2) automatically.

If PMC and any controller connected to PMC detect fault, (i1) is changed to the picture of warning message (i6) automatically after three seconds of initial message (i1).

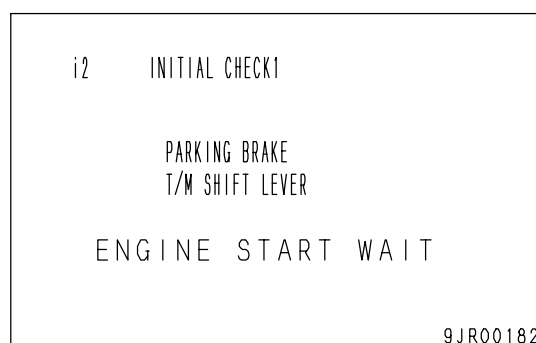


### THE PICTURE OF INITIAL CHECK 1 (i2)

This picture is displayed after (i1) is displayed and before engine is started in order to inform operator that engine start is acceptable or not.

When MOM judges that engine start is acceptable, "ENGINE START OK" is indicated.

When MOM judges that engine start is not acceptable, "ENGINE START WAIT" is indicated.



The reason why engine start is not acceptable is indicated also and they are as follows.

- When parking brake is not applied, "PARKING BRAKE" is indicated.
- When shift lever is not neutral position, "T/M SHIFT LEVER" is indicated.

Engine is able to be started even if "PARKING BRAKE" is indicated for emergency use. When shift lever is not neutral position, change to neutral in order to start engine.

When engine is started, (i2) is changed to the picture of initial check 2 (i3) automatically.

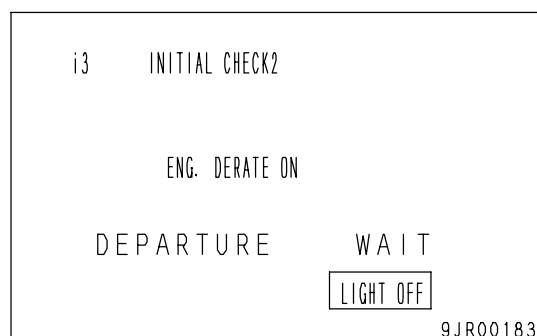
If any controller detects fault, (i2) is changed to the picture of warning message (i6) automatically.

### THE PICTURE OF INITIAL CHECK 2 (i3)

This picture is displayed after engine is started and before shift lever is changed from neutral position in order to inform operator that departure is acceptable or not.

When MOM judges that departure is acceptable, "DEPARTURE OK" is indicated.

When MOM judges that departure is not acceptable, "DEPARTURE WAIT" is indicated.



Machine is able to be departed even if "DEPARTURE WAIT" is indicated for emergency use.

When engine is started, (i2) is changed to the picture of initial check (i3) automatically.

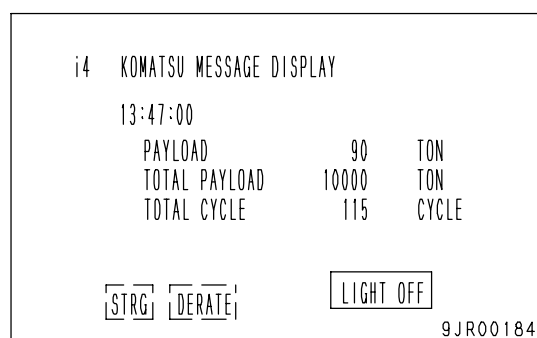
If you touch LIGHT OFF area in (i3), then the back light of MOM is turned off and (i3) is turned to be dark (i7). It can be used when annoyed by the glare during the driving at night. If the dark picture is touched, the back light lights up again.

If any controller detects fault, (i3) is changed to the picture of warning message (i6) automatically.

### THE ORDINARY PICTURE (i4)

This picture is displayed while machine is running after shift lever is changed to non-neutral position. Once shift lever is changed to non-neutral position, (i4) keeps to be displayed until starting switch is turned off even if shift lever is not at neutral position.

Time, current payload, total payload, and total number of cycle are indicated in this picture.



MOM indicates data of current payload, total payload, and total number of cycle only when optional PLM II is installed in the machine.

The period that PLM II sends these data are as follows.

- When PLM II recognizes that machine is loading condition, then PLM II starts sending the data of current payload to MOM and keep sending data successively until payload meter recognizes that loading condition is finished or machine is changed to dumping condition.
- When PLM II recognizes the completion of loading, MOM's payload display value is fixed until the dumping.
- When PLM II recognizes dumping condition.

If any data are not indicated in MOM, please dump, load, and dump again in order to initialize the recognition of machine condition of PLM II. (Until the current payload, total payload, and total number of cycle are sent by PLM II, it can happen that the data are not indicated.)

As to details of the operation of PLM II, see another payload meter operation manual.

When you want to change units of these data or adjust clock, contact your Komatsu distributor.

If you touch "LIGHT OFF" area in (i4), then the back light of MOM is turned off and (i4) is changed to be dark (i7). It can be used when annoyed by the glare during the driving at night. If the dark picture is touched, the back light lights up again.

If any controller detects fault, (i4) is changed to the picture of warning message (i6) automatically.

## THE PICTURE OF WARNING MESSAGE (i6)

When any controller detects fault, its occurrence is informed operator of as follows.

- MOM indicates the fault code, user code, and their descriptions in the picture of warning message (i6).
- Monitor panel also indicates the user code.
- In case of need, the central warning lamp is turned on and off, and the alarm buzzer is turned on also.

When the fault which has an exclusive caution lamp in dashboard or has an exclusive caution area in electronic display panel occurs, this exclusive caution lamp or area also turned on to light up or flash. When the fault occurs, take proper action based on the user code on monitor panel.

### NOTICE

If user code "01 to 07" and "E-"are displayed alternately on the right upper side of the monitor panel LED, stop the machine, confirm the user code (A), then follow the procedure described next.

#### User code (A)

- 01: CHECK AND MAINTENANCE
- 02: STOP MACHINE AT SAFE SPOT
- 03: REDUCE ENGINE/MACHINE SPEED
- 04: STOP SAFELY/SHUT OFF ENGINE
- 05: WAIT WITH ENGINE MID. SPEED
- 06: START ENGINE/KEEP LOW IDLE
- 07: DO NOT RAISE BODY

Two fault information are indicated in one picture.

If the number of active faults is three or more, all information are able to be indicated by touching "FWD" or "REV" area in (i6).

The number assigned to each fault is the order of occurrence.

1 is the oldest. The larger, the newer.

When the display of fault occurrence indicated in MOM is not necessary after confirmation, this indication is able to be erased by touching the number of each fault area located at left side of description.

This action only erases the indication in MOM, therefore the fault is still active, monitor panel keeps indicating the user code, and the other caution areas keeps on.

Once the indication of fault is erased, the same indication is not appeared until recurrence and detection of the fault.

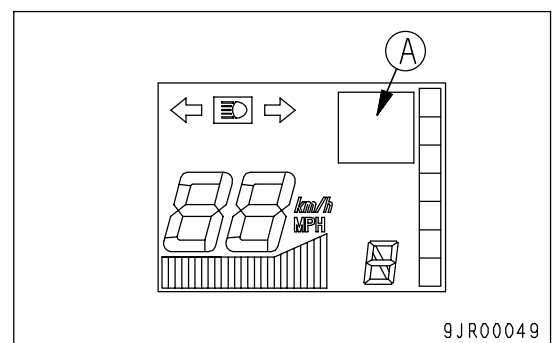
When all faults are recovered or erased in MOM, i6 is returned to i2, i3, or i4 automatically according to truck condition.

i6 WARNING MESSAGE

NO. (CLR)	SERV. CODE ACTION CODE	SERVICE MESSAGE ACTION
1	E054	ACCEL. SENSOR FAILED LOW
	2	STOP VEHICLE AT SAFE SPOT
2	B046	LOW COOLANT LEVEL
	1	CHECK AND MAINTENANCE

FWD REV

9JR00185

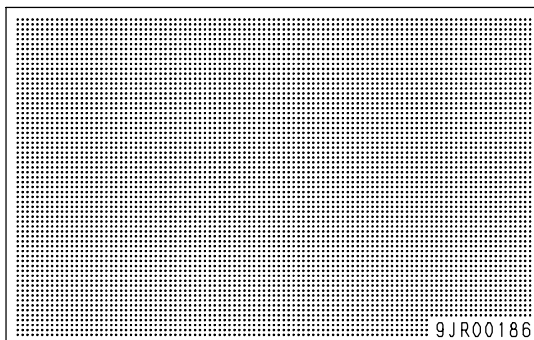


### THE BACK LIGHT OF PICTURE (i7)

The back light of MOM is turned off and nothing is indicated in (i7), therefore please use this picture when MOM is too glaring while operating at night.

By touching LIGHT OFF area in (i3) or (i4), (i3) or (i4) is changed to (i7). If you touch any place in (i7), (i7) is returned to (i2), (i3), or (i4) according to truck condition.

If fault is detected by any controller, (i7) is changed to (i6) automatically with back light on.

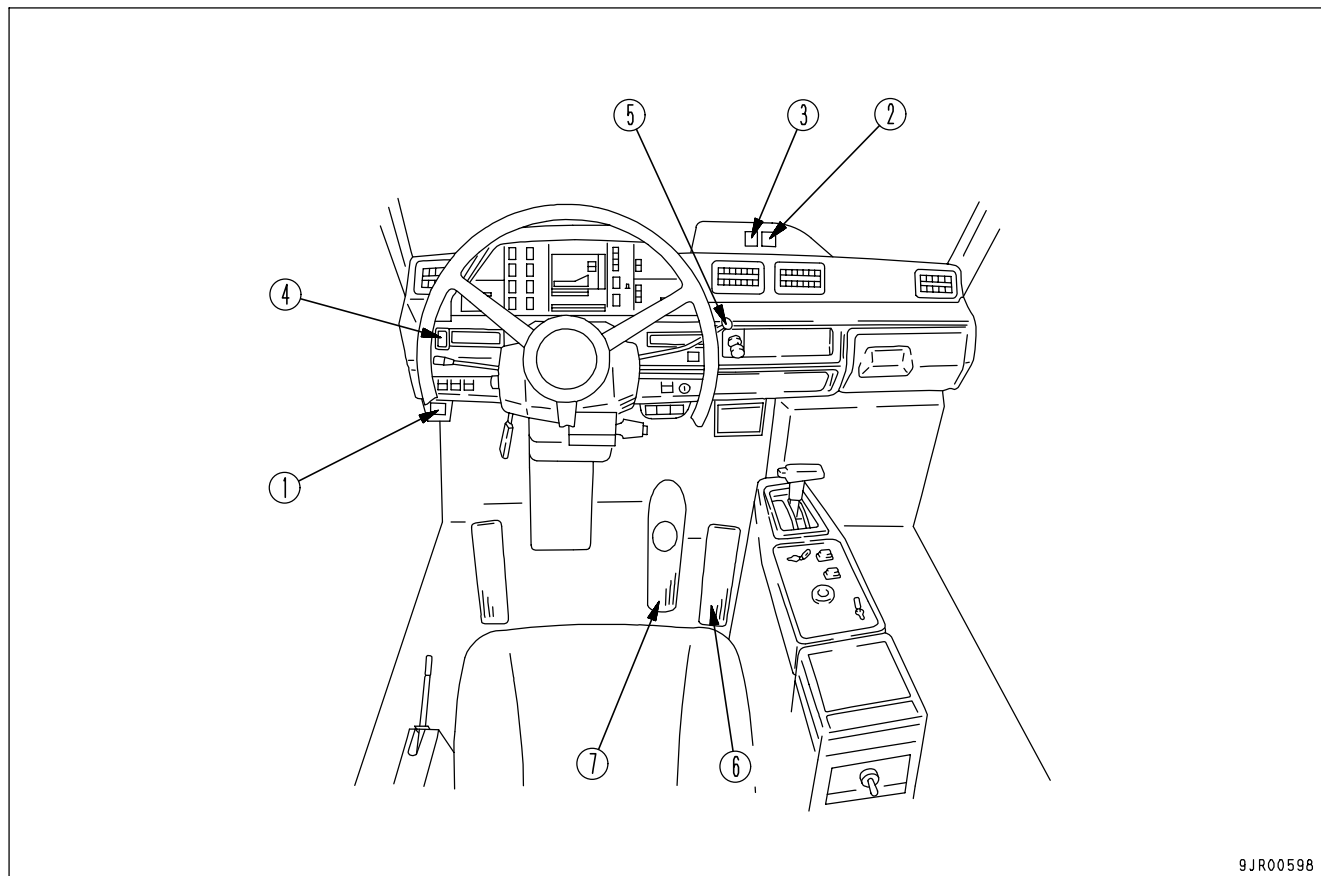


If the display is too glaring when operating at night, turn on the room lamp (only when the machine stops). If it is necessary to look at the display while traveling, close the cover of the consol, and look through the cover.

## ASR-II (AUTOMATIC SPIN REGULATOR II)

ASR is a function to prevent slipping of the drive wheels caused by excessive torque. Accordingly, the machine can start and travel normally even on a bad or frozen road surface.

### EXPLANATION OF COMPONENTS



- |                          |                            |
|--------------------------|----------------------------|
| (1) System switch        | (5) Retarder control lever |
| (2) ASR operation lamp   | (6) Accelerator pedal      |
| (3) ASR caution lamp     | (7) Brake pedal            |
| (4) Central warning lamp |                            |

#### SYSTEM SWITCH

This switch (1) is used to turn the ASR system on/off.

#### ASR OPERATION LAMP

This lamp (2) lights up when the system detects slippage of the rear wheels, and the ASR starts functioning.

#### ASR CAUTION LAMP

This (3) flashes if there is any abnormality in the ASR system when the system switch is ON. It lights up for 3 seconds when the machine starting switch is turned ON to check the bulb.

#### CENTRAL WARNING LAMP

This (4) lights up together with the ASR caution lamp if there is a serious abnormality in the ASR system when the system switch is ON.



### RETARDER CONTROL LEVER

When ASR is operated, if the retarder gets started with this lever (5), ASR system stops its operation.

### ACCELERATOR PEDAL

ASR system operates only when the pedal (6) is depressed with the travel speed range of 0 to 30km/h (0 to 18.6 MPH). If stops depressing the pedal, ASR system stops its operation.

### BRAKE PEDAL

When ASR is operated, if this pedal (7) is depressed, ASR system stops its operation.

## ACTUATION OF ASR-II SYSTEM

ASR system can function under the condition that the system switch is turned on. ASR operation lamp lights up when the system detects slippage of the rear wheels and the ASR starts functioning.

## PRECAUTIONS WHEN USING



### WARNING

- ASR system operates when the system switch is turned on.
  - If abnormality occurs in the system and the travel cannot be controlled securely, the system is turned off with the warning buzzer sound and the operation of the system stops. Stop the machine in a safe place immediately to turn off the system switch.
  - Even with the ASR system installed, there may be instances where the machine can not travel safely such as on a road having an extremely low coefficient of friction (a frozen road, etc.) or on a steep slope.
  - On a slippery road, more air is consumed by the operation of ASR. If the air pressure drops and the warning buzzer sounds, stop the machine in a safe place. Wait until the air pressure is restored sufficiently, then start again.
- 
- The machine can be driven normally even if the ASR system switch is turned off. In this case, however, watch out for lateral skidding of the machine on slippery roads.
  - If both rear wheels slip at the same speed, the ASR will not function. In this case, adjust the engine output with the accelerator pedal.

## TROUBLESHOOTING

### WHEN A PROBLEM OCCURS IN THE SYSTEM

This system is equipped with a self-diagnostic function. If any problem occurs, a failure code is displayed by the controller LED behind the assistant's seat.

No.	Failure code	Details	Remedy pattern
1	0.1	Abnormality in power source	1
2	1.0	Disconnection, short circuit with ground, short circuit in engine speed sensor system	1
3	1.1	Disconnection in RR wheel revolution sensor	1
4	1.2	Disconnection in RL wheel revolution sensor	1
5	1.3	Disconnection, short circuit with ground, short circuit in transmission output shaft speed sensor system	1
6	1.6	Failure of steering rudder angle sensor	2
7	1.7	Disconnection, short circuit with ground, short circuit in accelerator signal system	1
8	4.3	Disconnection, short circuit in ARSC & ASR caution lamp system	1
9	4.5	Disconnection, short circuit in central warning lamp system or buzzer system	2
10	5.3	Short circuit with ground in ARSC & ASR caution lamp system	1
11	5.5	Short circuit with ground in central warning lamp system or buzzer system	2
12	6.0	Failure in engine speed sensor system	1
13	6.1	Failure in RR wheel revolution sensor system	1
14	6.2	Failure in RL wheel revolution sensor system	1
15	6.3	Failure in transmission output axis revolution sensor system	1
16	8.1	Short circuit with ground in pressure control valve system (right)	1
17	8.2	Short circuit with ground in pressure control valve system (left)	1
18	8.3	Disconnection, short circuit in pressure control valve system (right)	1
19	8.4	Disconnection, short circuit in pressure control valve system (left)	1
20	8.5	Failure in pressure control valve (right) or failure in pressure switch 1 system	1
21	8.6	Failure in pressure control valve (left) or failure in pressure switch 1 system	1
22	8.7	Failure in pressure control valve (right) or failure in pressure switch 1 system	1
23	8.0	Failure in pressure control valve (left) or failure in pressure switch 1 system	1
24	8.9	Short circuit with ground in pressure cracking valve	1
25	9.0	Disconnection, short circuit in pressure cracking valve	1
26	9.1	Failure in pressure cracking valve (remains open) or failure in pressure switch 2 system	1
27	9.2	Failure in pressure cracking valve (does not open) or failure in pressure switch 2 system	1

#### Remedy pattern 1

If the central warning lamp and the ASR caution lamp flash and the buzzer sounds, it means that a serious problem has occurred in the ASR system.

Operation of the ASR system is stopped.

Stop in a safe place quickly and stop using the ASR by turning the system switch off.

When the system switch is turned OFF, the central warning lamp and ASR caution lamp go out and the buzzer stops.

**Remedy pattern 2**

When only the ASR caution lamp flashes

The ASR system continues to be actuated, but an abnormality has occurred in the system.

Stop at the safe place quickly and turn the system switch OFF to stop use of the ASR.

When the system switch is turned OFF, the ASR caution lamp will go out.

In the case of patterns 1 and 2 above, turn the system switch OFF quickly, stop use of the ASR and contact your Komatsu distributor for repairs.

**WHEN SYSTEM IS NORMAL**

The code (0.0) is displayed by the controller LED behind the assistant's seat.

**METHOD OF DISPLAYING MODEL SELECTION, TIRE LARGE DIAMETER/SMALL DIAMETER, FAILURE CODE**

When the starting switch is turned ON, the codes below are automatically displayed in the following order on the controller LED.

1. LEDs all light up.

2. Model

Code: 78

3. Tire diameter (Large/small)

Code	Tire Large/Small
B. –	Large size (standard)
S. –	Small size (if equipped)

4. Latest failure code

5. Failure code that occurred immediately before the failure code in 4.

6. Failure code that occurred immediately before the failure code in 5.

**METHOD OF CLEARING FAILURE CODE**

When the starting switch is at ON position (when the engine is not started), disconnect the connectors CR1 and CR2 located behind the operator's seat. At this time, "– –" is displayed on controller LED. When the flashing of "– –" turns to the lighting up of "– –" (3 seconds), then failure code is cleared.

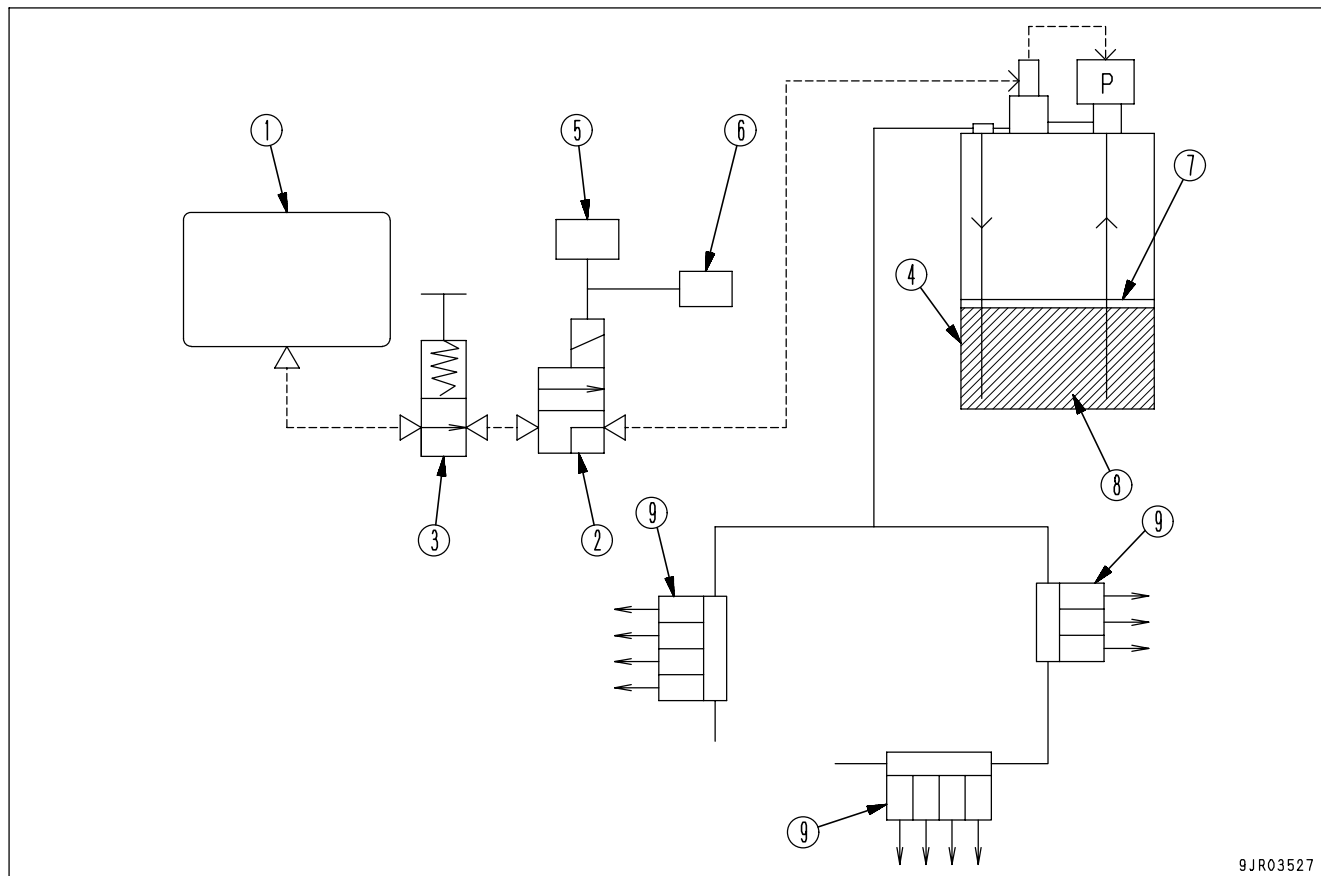
**REMARK**

When the ASR is used at the first time, be sure to clear the failure code. Connect the connectors CR1 and CR2 after the clearance.

## HANDLING AUTO-GREASING SYSTEM

This system uses a timer control to automatically carry out greasing for all parts of the machine. As a result, the greasing operation can be carried out easily.

### OUTLINE OF AUTO-GREASING SYSTEM



9JR03527

The dashed line shows the air line and the solid line shows the grease line.

1. The air from air tank (1) passes through solenoid valve (2) and air regulator (3), and is connected to the grease pump (4).
2. The action of timer (5) or operation of the manual lube switch (6) on the dashboard sends compressed air to push down follower plate (7) of grease pump (4), and grease (8) inside grease pump (4) is force fed to injector (9).
3. Injector (9) is connected to all greasing points and carries out greasing.

#### REMARK

Normally, the timer is actuated when the starting switch is turned ON and greasing is carried out at the set interval. The manual lube switch makes it is possible to carry out greasing as desired, and is also used for bleeding the air and other inspections.

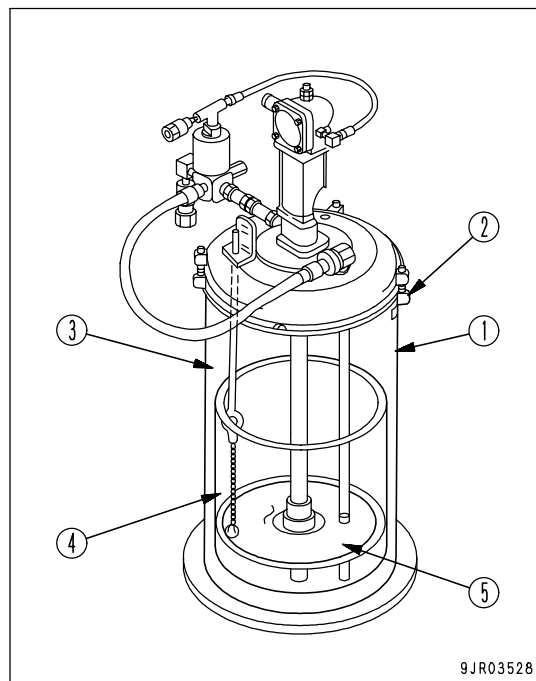
## SETTING GREASE CAN

### NOTICE

Check that there is no dent in the can. If there is a dent, the follower plate will not go down to the bottom and it will be impossible to carry out greasing.

This brings the danger of damage caused by insufficient greasing of the machine.

1. Release 4 latches (2) of grease pump (1), and open the top of the grease pump.
2. Insert grease can (4) into case (3) of the grease pump.



The applicable follower plate differs according to whether the grease can is used or not. Use the appropriate part No. follower plate.

	Follower plate part No.
When using grease can	427-S95-2510
When not using grease can	427-S95-2520

### REMARK

Follower plate 427-S95-2510 is applicable for cans with an inside diameter from 275 mm to 290 mm.

3. Insert the pump tube at the top of the grease pump into the grease, then set follower plate (5) inside grease can (4).
4. Check that there is no leakage of grease from between grease can (4) and follower plate (5).
5. Secure with latches (2) at the top of grease pump (1).

## INITIAL SETTING OF AUTO-GREASING SYSTEM

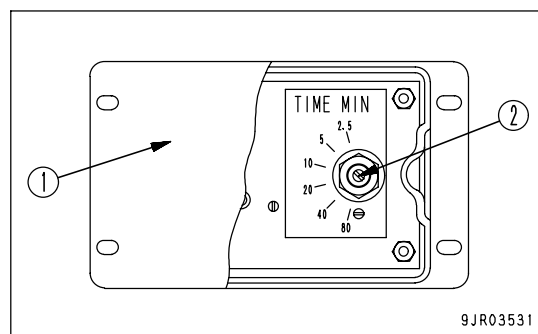
### NOTICE

Use a suitable follower plate.

If the follower plate is not suitable, the grease pump will be unable to feed the grease even when there is grease remaining in the grease can.

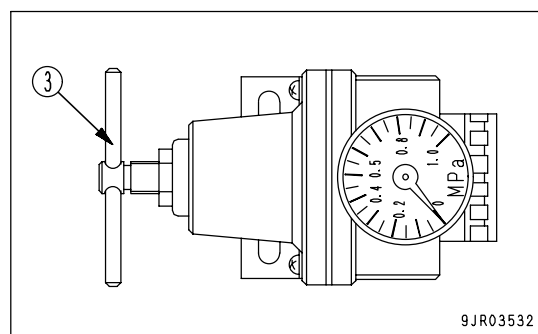
This brings the danger of damage caused by insufficient greasing of the machine.

1. Open top cover (1) of the timer box, then set greasing interval adjustment screw (2) to 5 minutes.



2. Adjust the pressure of air regulator valve (3) to 0.39 MPa (4 kgf/cm<sup>2</sup>, 56.8 PSI).

3. Close top cover (1) of the timer box.



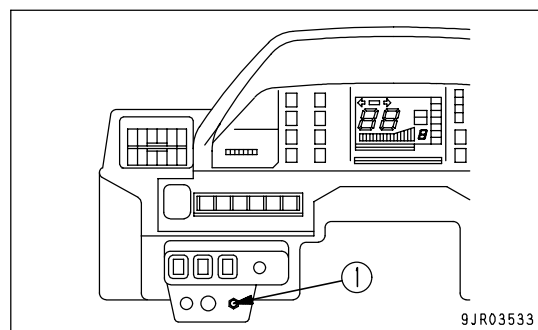
When starting to use the auto-greasing system, grease is not supplied sufficiently to the charging portion, so set the timer to a shorter time. After 2-3 days, the grease will fill the charging portion, so set the timer to 20 minutes. Adjust the timer setting according to the grease condition.

## METHOD OF OPERATING AUTO-GREASING SYSTEM

- With this system, when the machine starting switch is turned ON, greasing starts automatically according to the interval set by the timer.
- When manual lube switch (1) on the dashboard is set to the ON position, greasing will start regardless of the timer setting. When the switch is turned OFF, greasing will stop.

### REMARK

With the manual lube switch, it is possible to carry out greasing regardless of the timer. This can be used mainly when checking the action of the grease pump or when carrying out additional greasing.



## PRECAUTIONS WHEN HANDLING AUTO-GREASING SYSTEM

### BLEEDING AIR FROM GREASE CIRCUIT



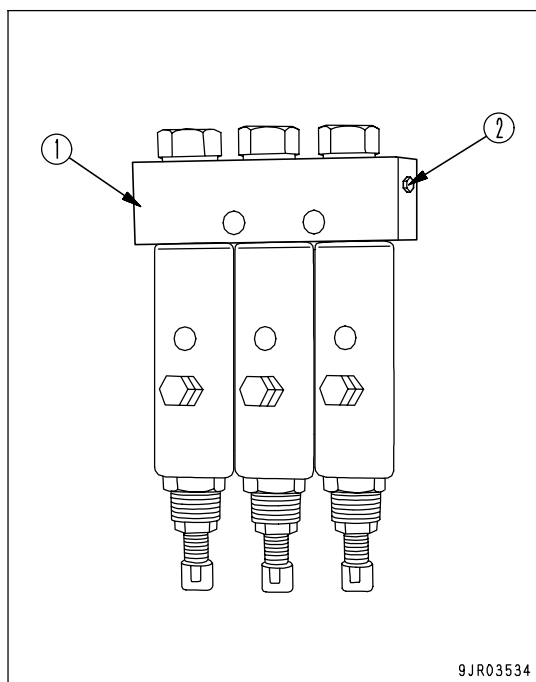
#### WARNING

When bleeding the air, the operation must be carried out by two workers who cannot see each other: one in the operator's seat and one under the machine. When carrying out the operation, maintain contact with each other and check that you understand the content of your partner's work. If the machine is moved without warning, there is danger that the worker operating under the machine will be caught in the machine and suffer serious personal injury.

#### NOTICE

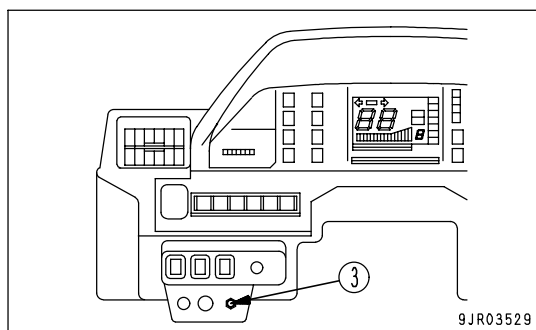
Always bleed the air from the grease circuit. If there is air in the grease circuit, the grease pressure will not rise to the specified pressure, and this will lead to damage from insufficient lubrication at all parts of the machine.

1. Remove blind plug (2) from the tip of injector manifold (1) at the rear right of the front axle of the machine.
2. Turn the starting switch ON.



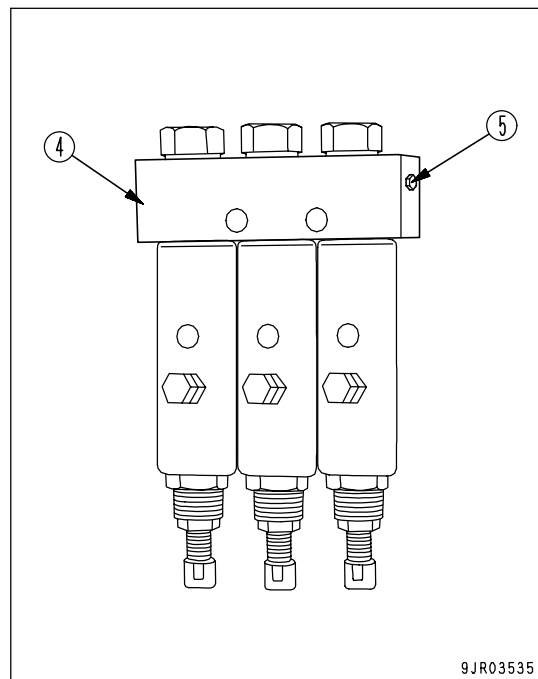
9JR03534

3. Turn manual lube switch (3) ON.
4. Milky white grease mixed with air comes out from the hole for blind plug (2) in manifold (1). When this milky white grease changes to normal grease, turn manual lube switch (3) OFF.
5. Install blind plug (2) to manifold (1).

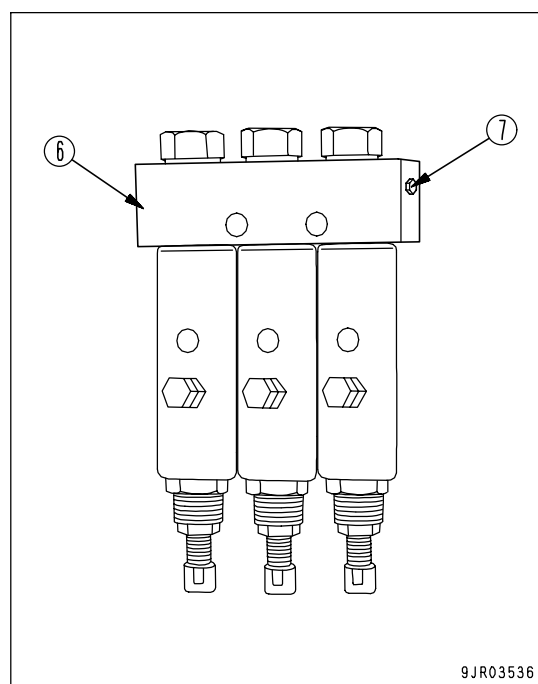


9JR03529

6. Remove blind plug (5) from the tip of injector manifold (4) at the rear left of the front axle of the machine.
7. Turn the starting switch ON.
8. Turn manual lube switch (3) ON.
9. Milky white grease mixed with air comes out from the hole for blind plug (5) in manifold (4). When this milky white grease changes to normal grease, turn manual lube switch (3) OFF.
10. Install blind plug (5) to manifold (4).



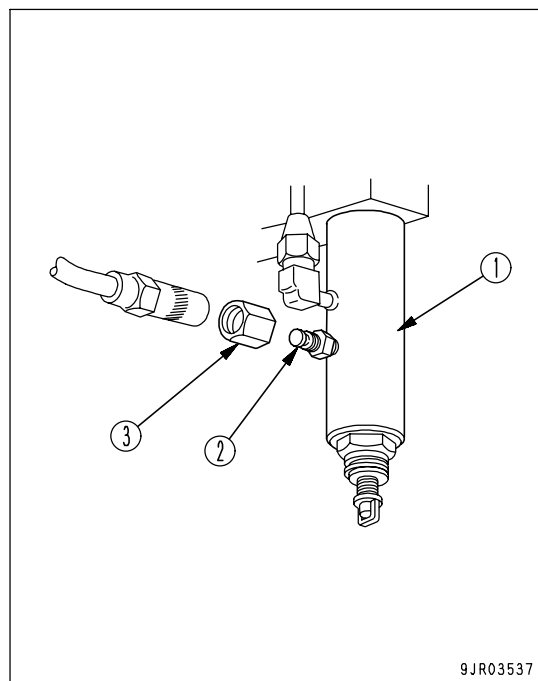
11. Remove blind plug (7) from the tip of injector manifold (6) at the rear of the rear axle of the machine.
12. Turn the starting switch ON.
13. Turn manual lube switch (3) ON.
14. Milky white grease mixed with air comes out from the hole for blind plug (7) in manifold (6). When this milky white grease changes to normal grease, turn manual lube switch (3) OFF.
15. Install blind plug (6) to manifold (7).





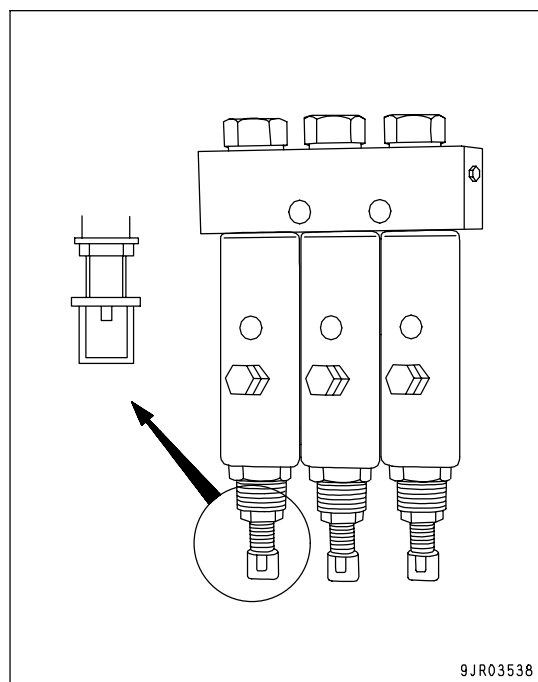
## CHARGING BRANCH LINE WITH GREASE

1. Remove cap (3) of grease fitting (2) of each injector (1).
2. Using a grease pump, charge each grease fitting (2) with grease to fill the branch line with grease up to the greasing point.



## CHECKING OPERATION OF INJECTOR

1. Turn the starting switch ON.
2. Check that the indicator of each injector moves up and down one stroke when greasing.  
If the indicator does not move one stroke, greasing is not being carried out properly.  
Bleed the air. If the indicator still does not move, please contact your Komatsu distributor.

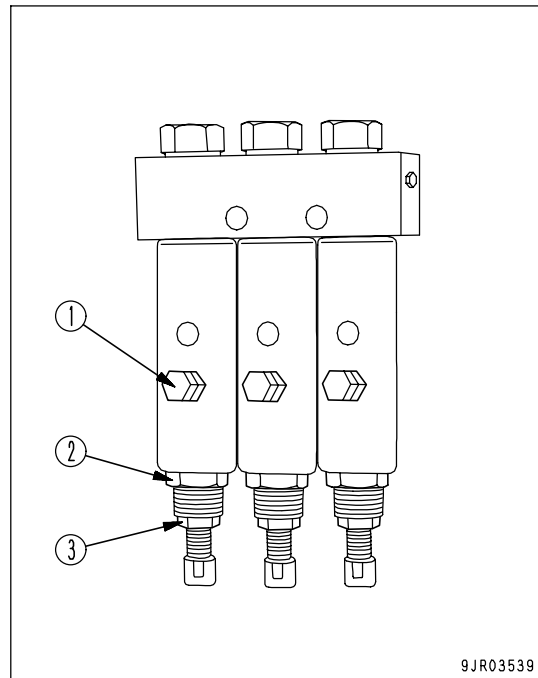


## ADJUSTING GREASE DISCHARGE AMOUNT

It is possible to adjust the injector within a range of 0.128 cc to 1.28 cc for one cycle.

Set to the injector to the minimum discharge amount. When changing the discharge amount, adjust as follows.

1. Remove cap (1) of the injector.
2. Loosen locknut (2) and turn adjustment nut (3) to adjust.



The relationship between the adjustment nut and the discharge amount is as follows.

Turning adjustment nut	Discharge amount per turn
Turn adjustment nut clockwise until it contacts stopper	0.128 cc (minimum)
Turn adjustment nut counterclockwise 10 turns from stopper position	1.28 cc (maximum)

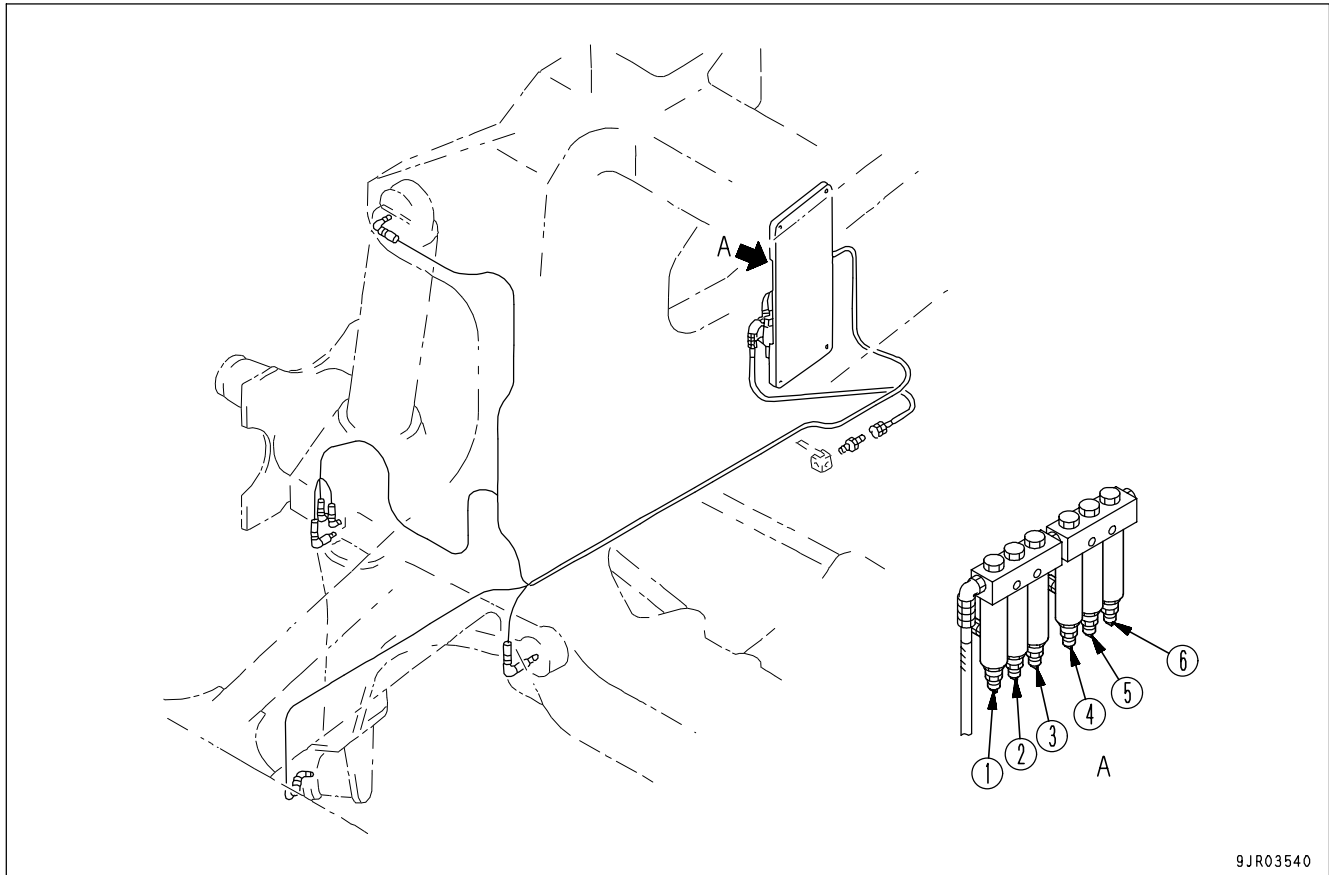
### REMARK

After the nut contacts the stopper, turn it back counterclockwise. The discharge amount is reduced according to the amount the nut is turned back.

## POSITION OF EACH INJECTOR

The relationship between each injector and the greasing point is as follows.

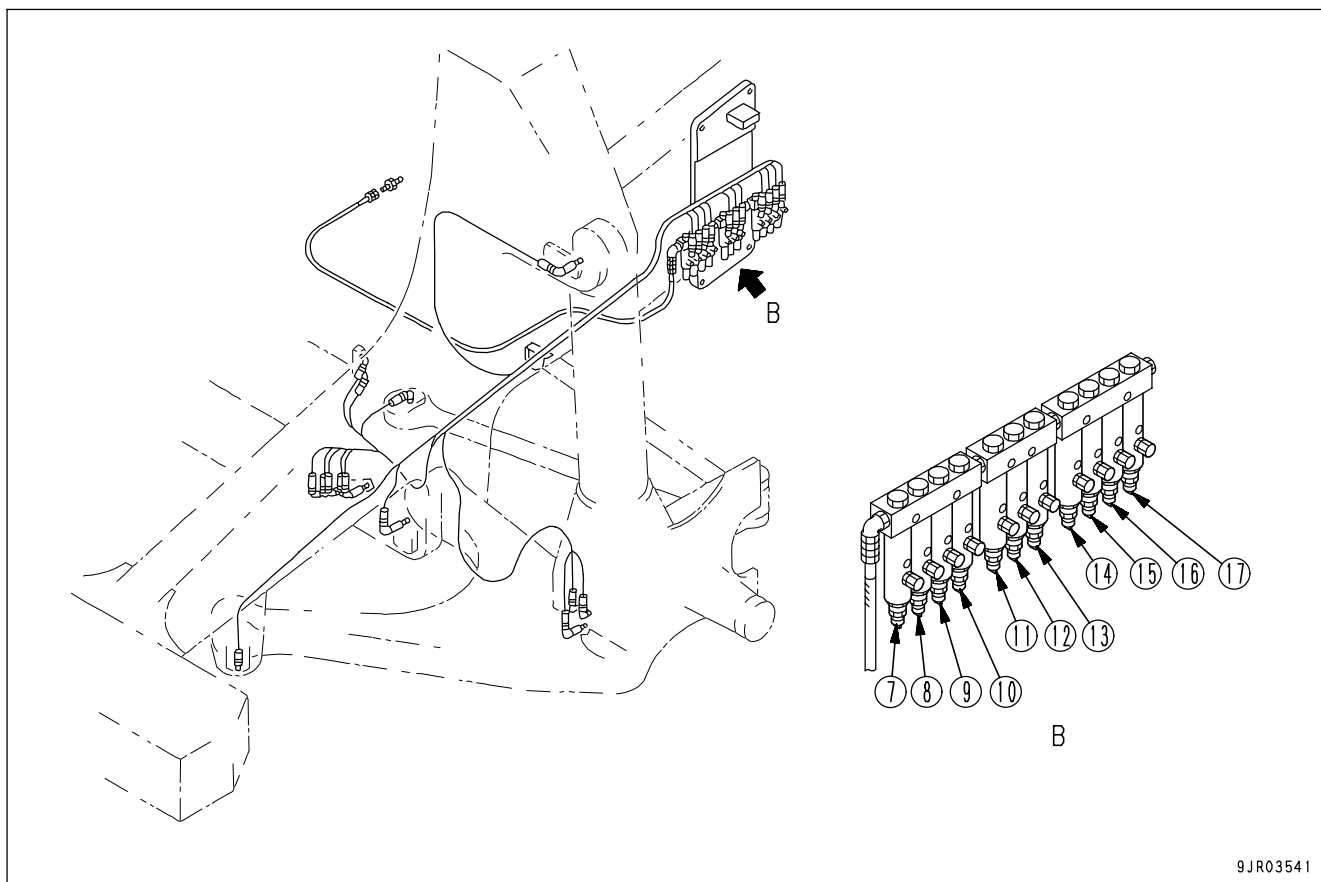
Front right



9JR03540

- |                                     |                               |
|-------------------------------------|-------------------------------|
| (1) Right knuckle arm (right)       | (4) Right knuckle arm (rear)  |
| (2) Right steering cylinder (right) | (5) Right front suspension    |
| (3) Right tie rod (right)           | (6) Right knuckle arm (front) |

Front left

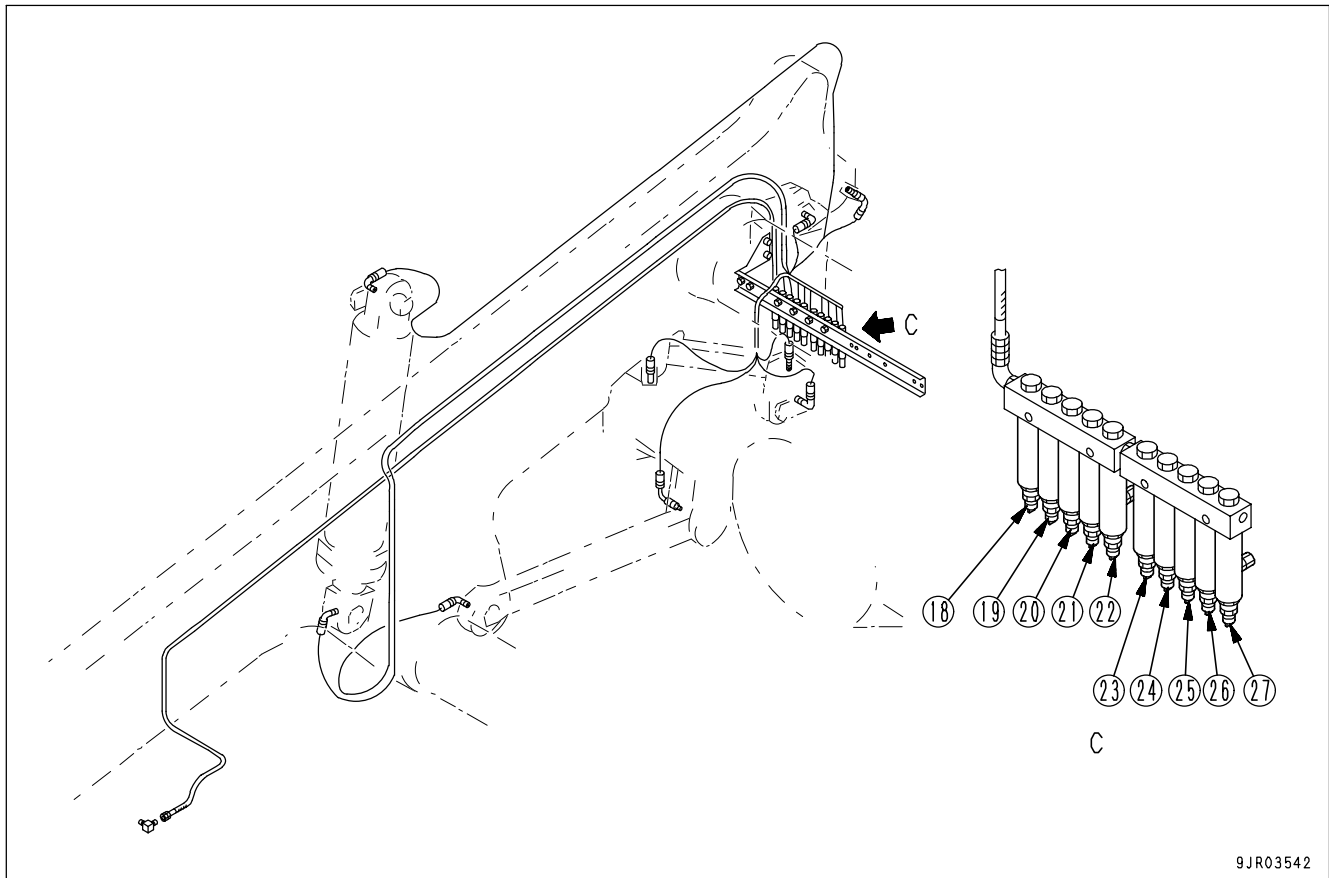


9JR03541

- (7) Left knuckle arm (left)
- (8) Left steering cylinder (left)
- (9) Left tie rod (left)
- (10) Left knuckle arm (rear)
- (11) Left front suspension
- (12) Left knuckle arm (front)

- (13) Left steering cylinder (right)
- (14) Center lever
- (15) Left tie rod (right)
- (16) Right tie rod (left)
- (17) Right steering cylinder (left)

Rear right

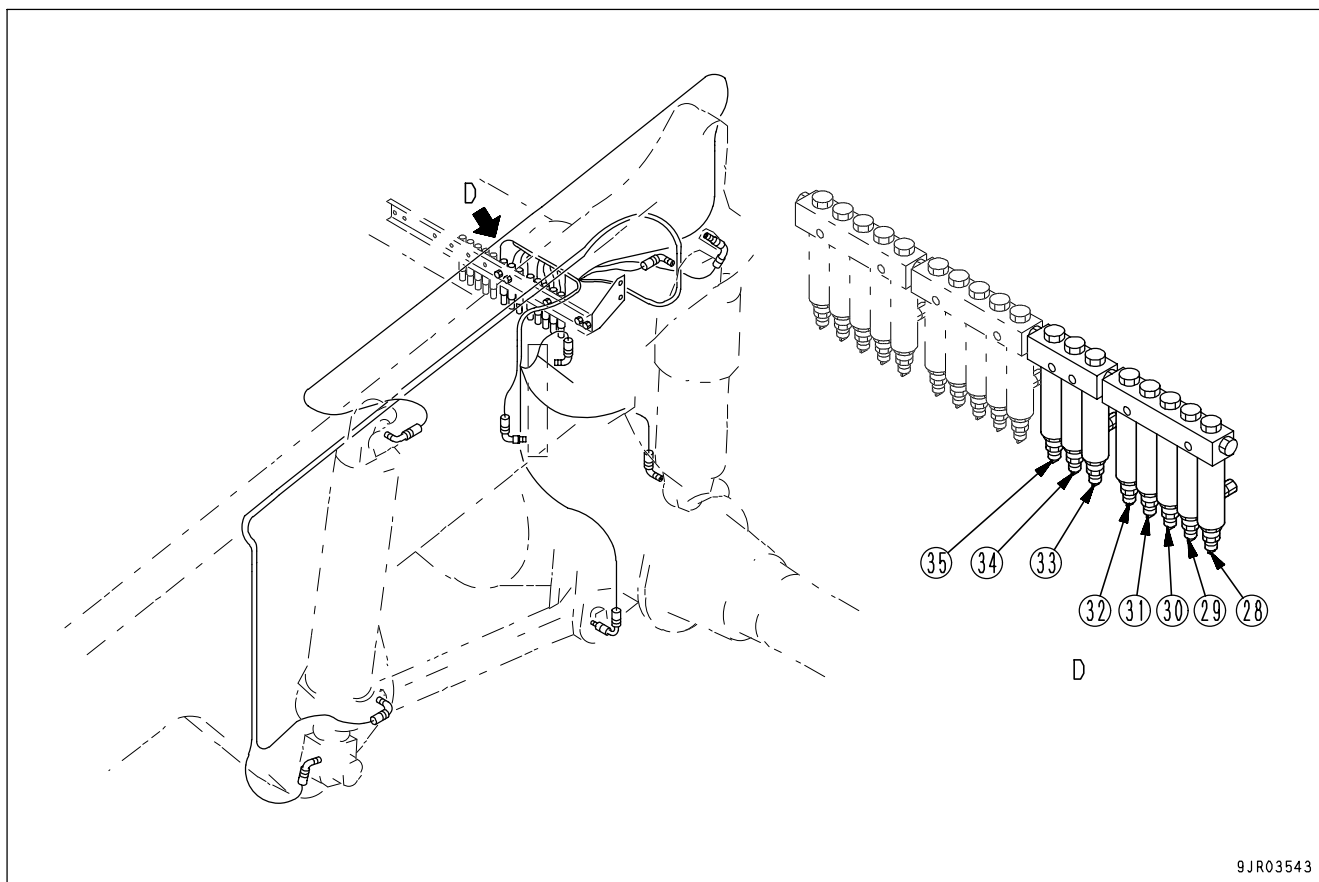


9JR03542

- (18) Right hoist cylinder (bottom)
- (19) Right hoist cylinder (top)
- (20) Bottom right radius rod (front)
- (21) Top right radius rod (rear)
- (22) Top right radius rod (front)

- (23) Bottom right radius rod (rear)
- (24) Right rear suspension (bottom)
- (25) Right rear suspension (top)
- (26) Right body hinge pin
- (27) Left body hinge pin

Rear left



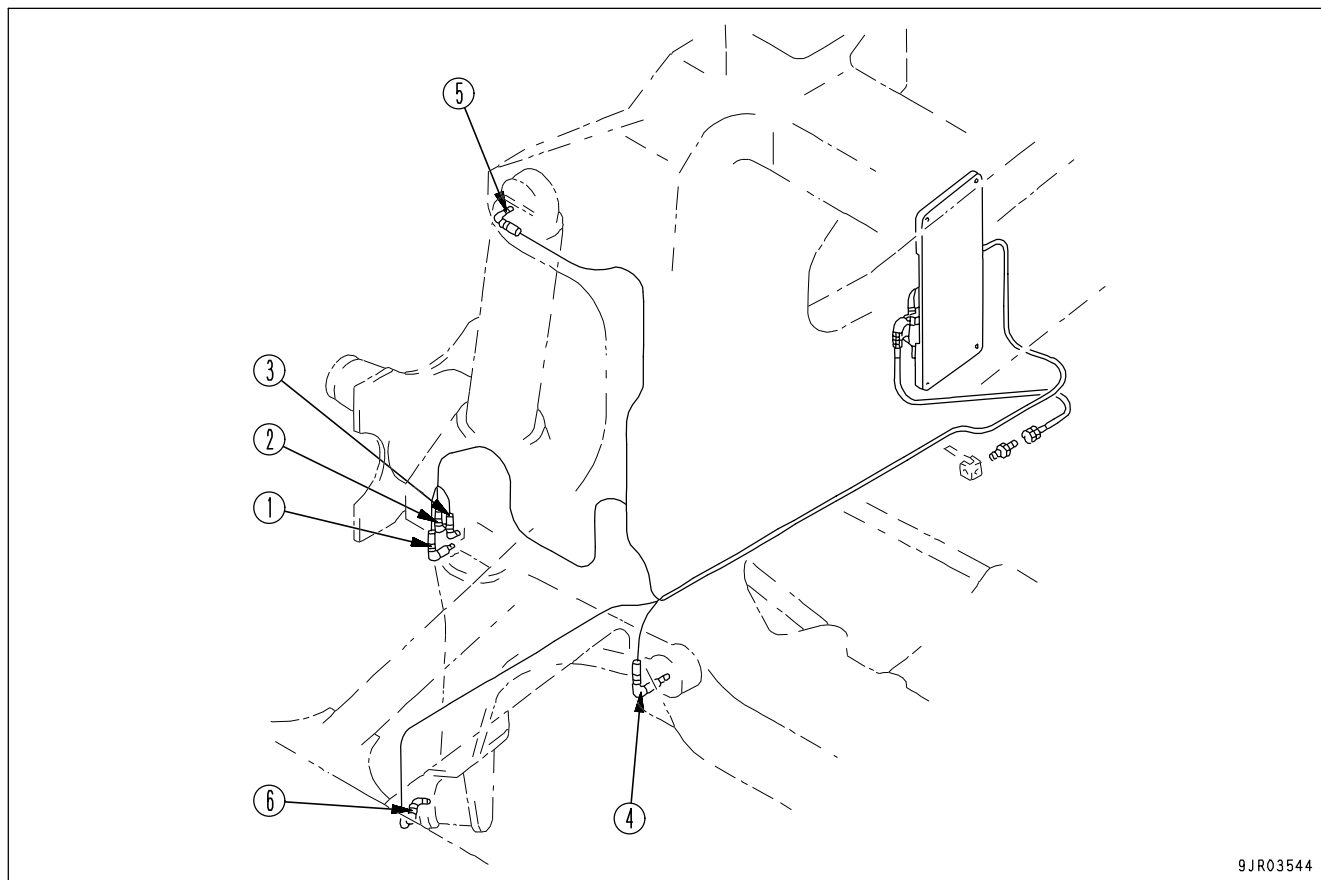
9JR03543

- (28) Left hoist cylinder (bottom)
- (29) Left hoist cylinder (top)
- (30) Bottom left radius rod (front)
- (31) Top left radius rod (rear)

- (32) Top left radius rod (front)
- (33) Bottom left radius rod (rear)
- (34) Left rear suspension (bottom)
- (35) Left rear suspension (top)

## GREASING POINTS FOR EACH INJECTOR

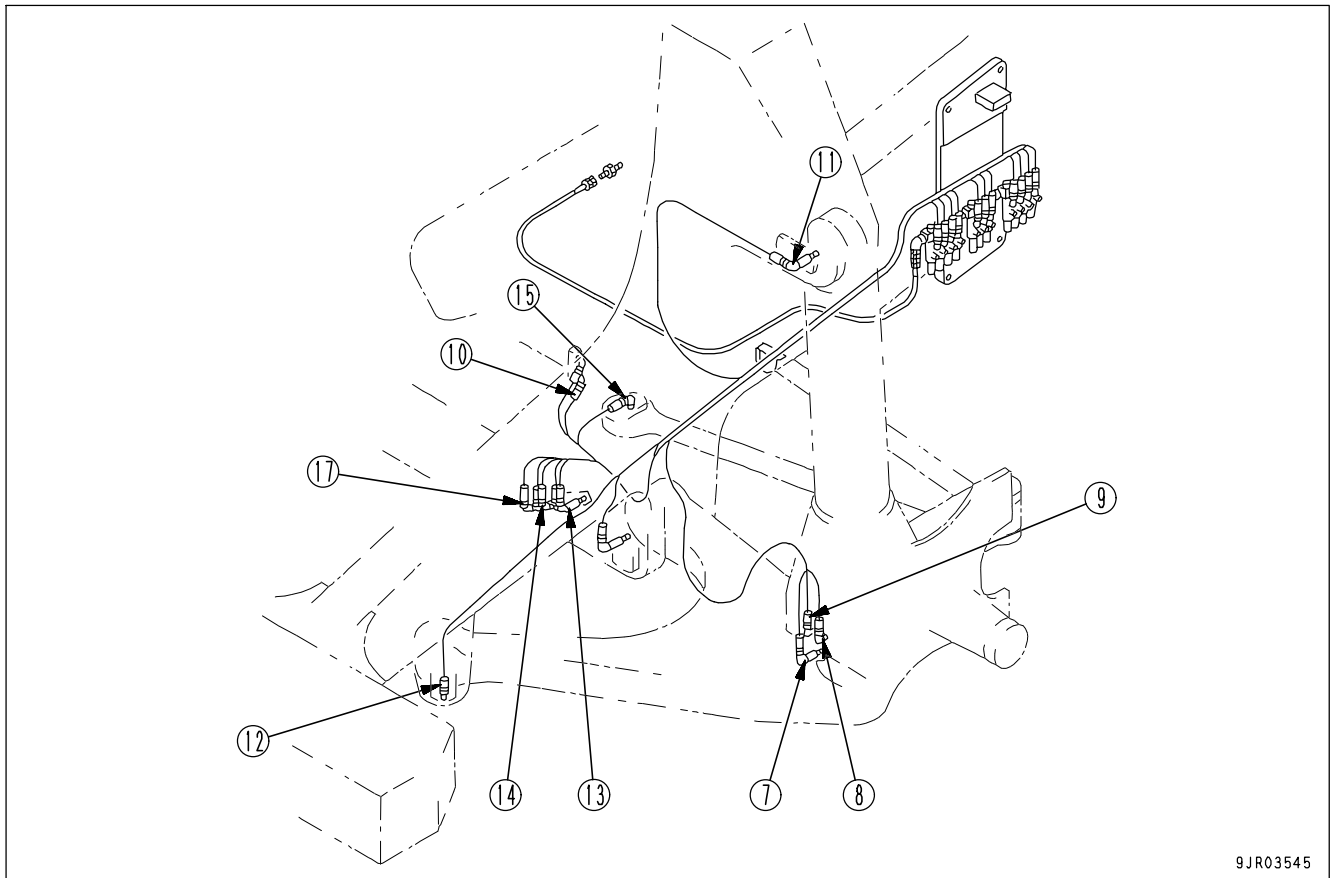
Greasing points for front right injectors



9JR03544

- |                                     |                               |
|-------------------------------------|-------------------------------|
| (1) Right knuckle arm (right)       | (4) Right knuckle arm (rear)  |
| (2) Right steering cylinder (right) | (5) Right front suspension    |
| (3) Right tie rod (right)           | (6) Right knuckle arm (front) |

Greasing points for front left injectors

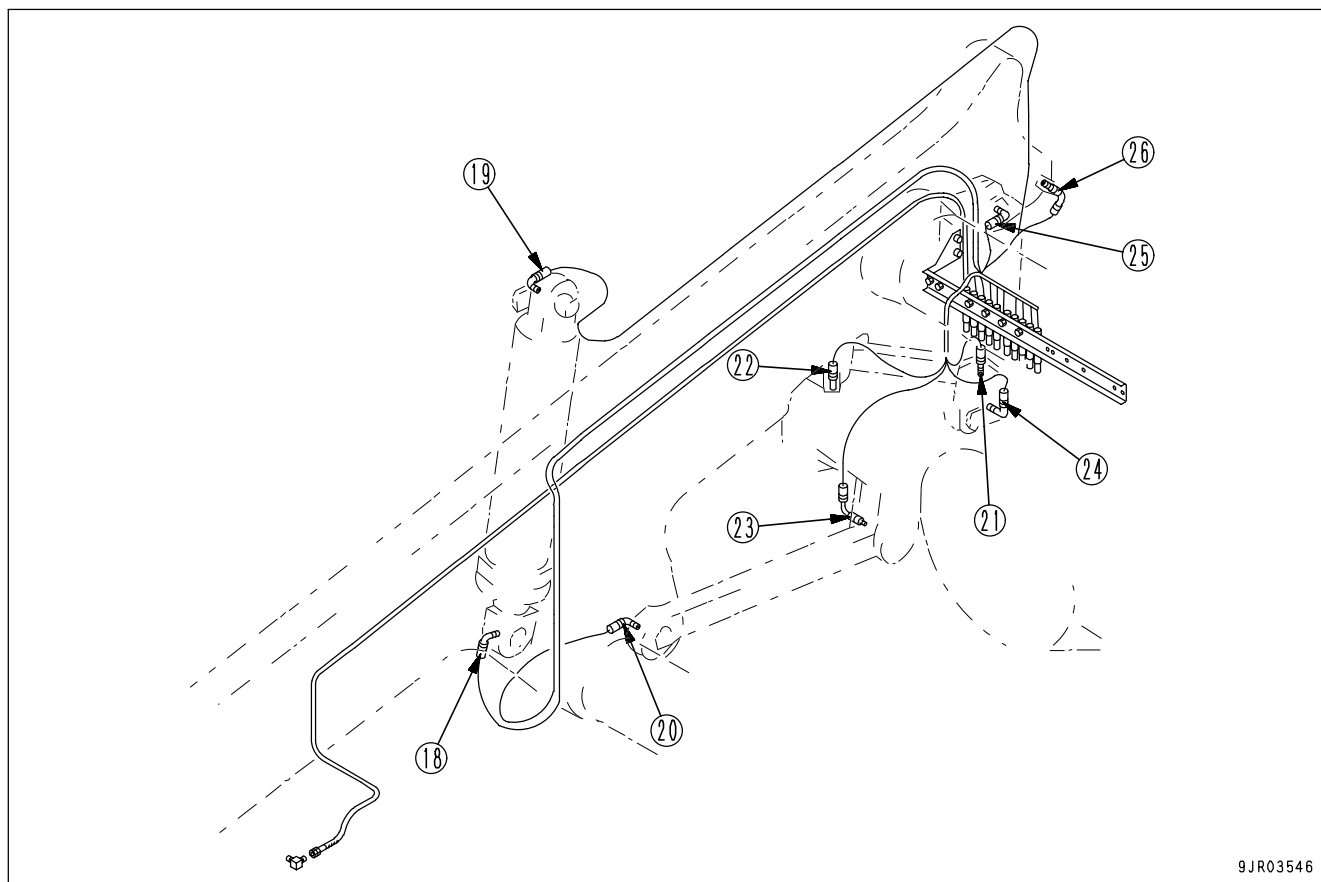


9JR03545

- |                                   |                                     |
|-----------------------------------|-------------------------------------|
| (7) Left knuckle arm (left)       | (13) Left steering cylinder (right) |
| (8) Left steering cylinder (left) | (14) Center lever                   |
| (9) Left tie rod (left)           | (15) Left tie rod (right)           |
| (10) Left knuckle arm (rear)      | (16) Right tie rod (left)           |
| (11) Left front suspension        | (17) Right steering cylinder (left) |
| (12) Left knuckle arm (front)     |                                     |



Greasing points for rear right injectors

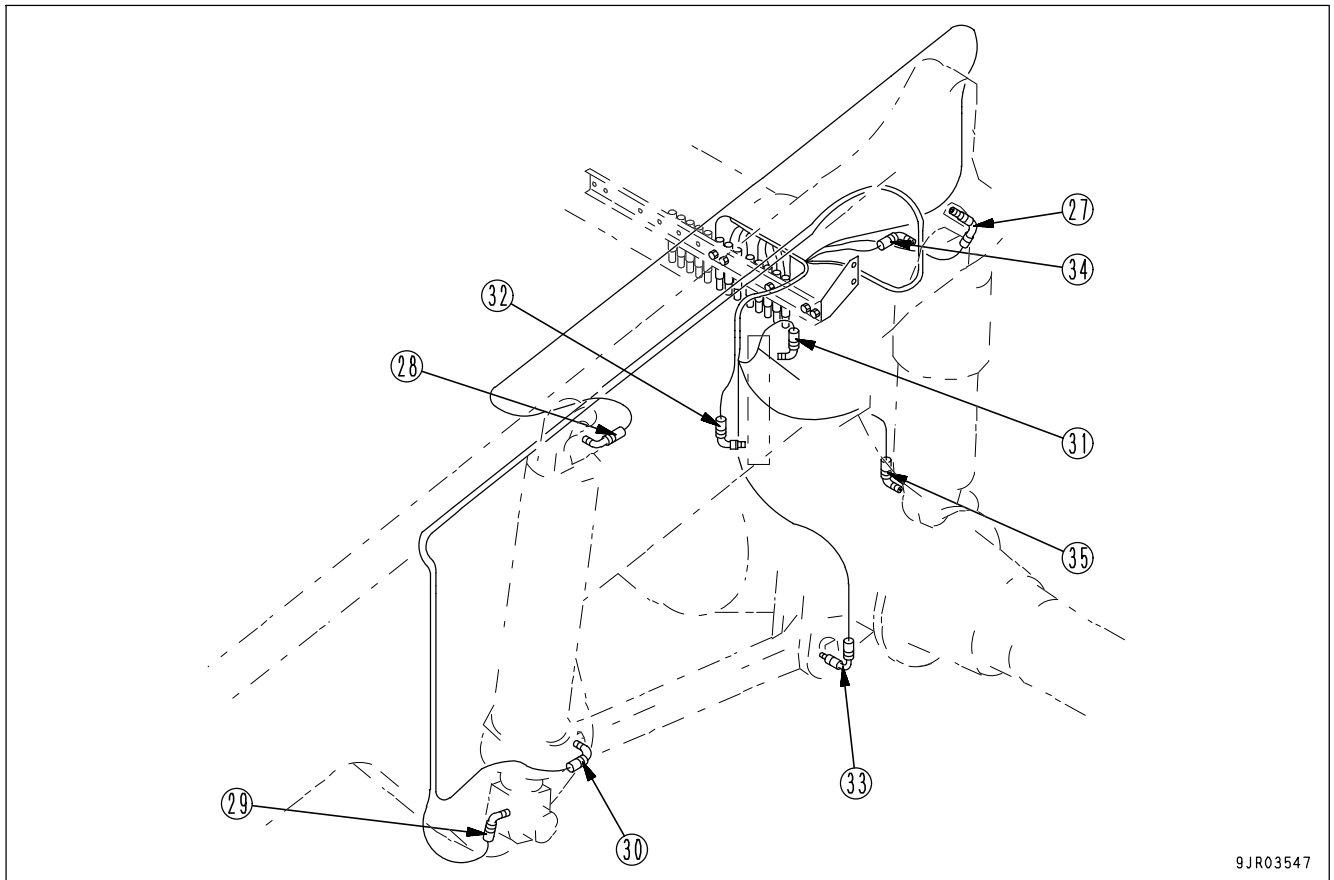


9JR03546

- (18) Right hoist cylinder (bottom)
- (19) Right hoist cylinder (top)
- (20) Bottom right radius rod (front)
- (21) Top right radius rod (rear)
- (22) Top right radius rod (front)

- (23) Bottom right radius rod (rear)
- (24) Right rear suspension (bottom)
- (25) Right rear suspension (top)
- (26) Right body hinge pin

Greasing point for rear left injectors



9JR03547

- |                                     |                                    |
|-------------------------------------|------------------------------------|
| (27) Left body hinge pin            | (32) Top left radius rod (front)   |
| (28) Left hoist cylinder (bottom)   | (33) Bottom left radius rod (rear) |
| (29) Left hoist cylinder (top)      | (34) Left rear suspension (bottom) |
| (30) Bottom left radius rod (front) | (35) Left rear suspension (top)    |
| (31) Top left radius rod (rear)     |                                    |

# **HIGH ALTITUDE SPECIFICATIONS**

The hydraulic tank on the high altitude specification machine is pressurized to prevent cavitation of the hydraulic pump.

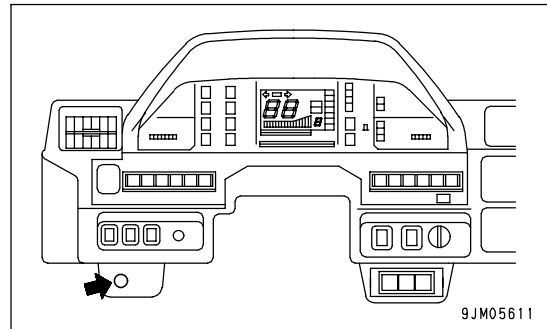
This section gives information about parts that are different from the standard specification machine. Any part not given here is the same as the standard specification machine, so see the manual for the standard specification machine for details.

## EXPLANATION OF COMPONENTS

### PRESSURE CAUTION LAMP

This lamp lights up when the pressurizing pressure in the hydraulic tank goes down. If it lights up, check that the pressurizing valve is closed and that the pressurizing piping is not disconnected.

If the body is raised to near the maximum height, the lamp may light up, but this does not indicate any abnormality.



## SERVICE PROCEDURE



### WARNING

Always release the pressure inside the tank before removing the oil filler. If the pressure is not released, there is danger that oil will spurt out. Close the pressurizing valve before removing the oil filler.

When carrying out any of the following operations, always stop the engine and release the pressure inside the tank as follows.

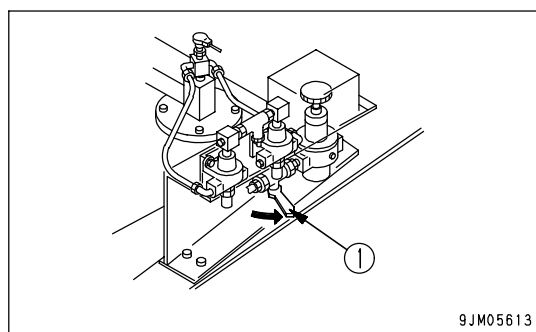
"CHECK OIL LEVEL IN REAR BRAKE COOLING OIL TANK, ADD OIL (PAGE 3-60)",

"CHECK OIL LEVEL IN STEERING AND HOIST OIL TANK, ADD OIL (PAGE 3-60)",

"REPLACE STEERING, HOIST OIL TANK AND REAR BRAKE COOLING OIL TANK FILTER ELEMENT (PAGE 4-60)", "CHANGE OIL IN STEERING, HOIST OIL TANK (PAGE 4-63)",

"CHANGE OIL IN REAR BRAKE COOLING OIL TANK (PAGE 4-64)".

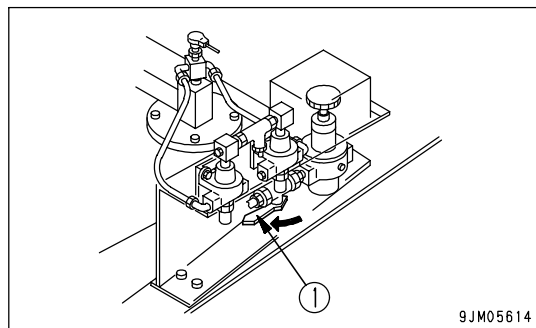
1. Pull pressurizing valve (1) to shut off the pressure coming from the air tank.
2. After shutting off the pressure coming from the air tank, turn the oil filler slowly and remove it.
3. After carrying out the procedure in Steps 1 and 2, change the oil.



4. Return pressurizing valve (1) to its original position and open the pressurizing circuit.

### NOTICE

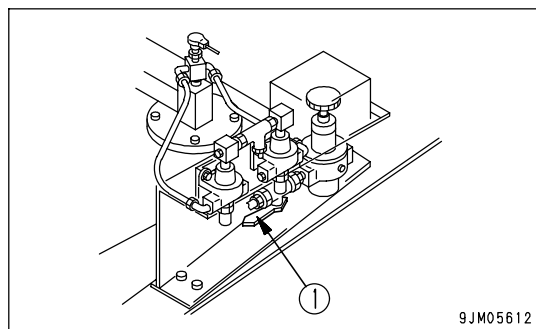
If the pressurizing valve is not returned to its original position, it will cause cavitation and the hydraulic pump may be damaged.



## CHECK BEFORE STARTING

Carry out these checks at the beginning of each day's work before starting the engine.

Check that pressurizing valve (1) is at the OPEN position and that there is no dirt or mud stuck to muffler (2).



## EVERY 2000 HOURS SERVICE

### REPLACE HYDRAULIC TANK PRESSURIZING COMPONENT

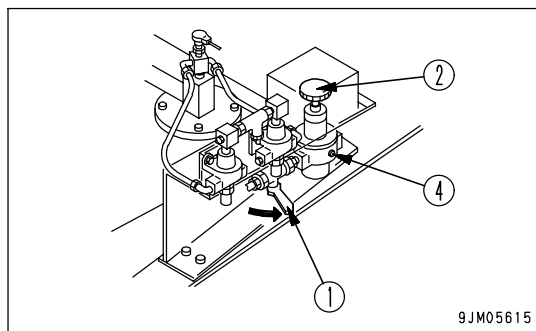
Ask your Komatsu distributor to carry out replacement every 2000 hours or every year, whichever comes sooner.

### ADJUSTING PRESSURIZING PRESSURE FOR HYDRAULIC TANK

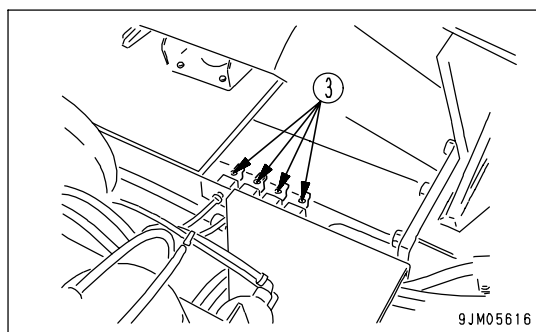
When the component used to pressurize the hydraulic tank is replaced, the pressurization pressure must be adjusted, so ask your Komatsu distributor to carry out the adjustment.

### INSTALLING PRESSURE GAUGE

1. Stop the engine and close the pressurizing valve (1).
2. To avoid high pressure from being applied to the hydraulic tank, turn the knob (2) of the pressure reducing valve fully in the clockwise direction.

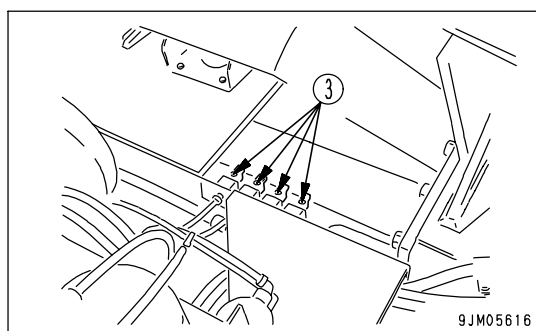


3. Pull the ring of drain valve (3) and release the air from the air tank.
4. Remove plug (4) of the pressure reducing valve, then install the pressure gauge. Use a pressure gauge that can measure 9.8 to 98 kPa (0.1 to 1.0 kgf/cm<sup>2</sup>, 1.4 to 14.2 PSI).



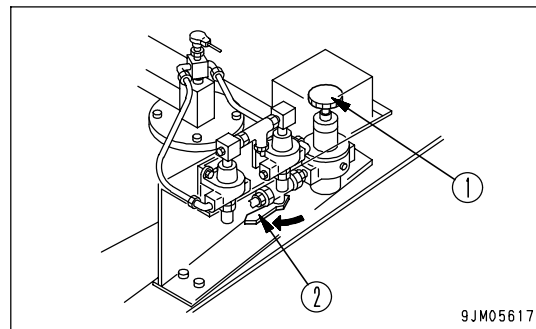
### REMOVING PRESSURE GAUGE

1. Stop the engine, pull the ring of drain valve (1), and release the air from the air tank.
2. Remove the pressure gauge and install the plug.

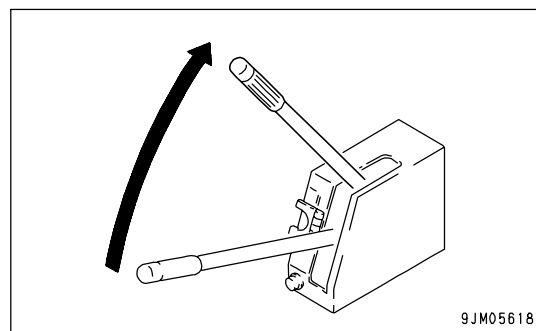


### ADJUSTING PRESSURIZING PRESSURE

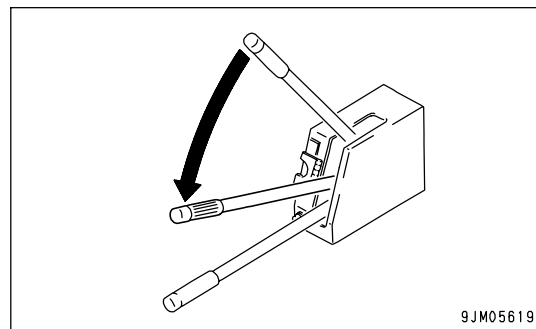
1. Start the engine and charge the air tank with air.
2. Turn knob (1) of the pressure reducing valve clockwise and set the pressure to 49 kPa (0.5 kgf/cm<sup>2</sup>, 7.1 PSI).
3. Open pressurizing valve (2) and pressurize the tank.



4. Operate the dump lever to the RAISE position and raise the dump body slowly. With this operation, the indicator on the pressure gauge will go down.



5. Operate the dump lever to the FLOAT position and lower the dump body slowly. With this operation, the indicator on the pressure gauge will go up to a point where the air is discharged from the quick relief valve, and the rise in pressure stops.
6. Repeat the procedure in Steps 4 and 5 2 to 3 times and seat in the dump body. The value indicated by the pressure gauge when the dump body is seated is the set pressure at that point.
7. Turn knob (1) of the pressure reducing valve to set to the specified pressure.  
Specified pressure: 78.4 kPa (0.8 kgf/cm<sup>2</sup>, 11.4 PSI).
8. Repeat the procedure in Steps 4 to 7 to adjust the pressure.



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HD785-5 DUMP TRUCK

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