

Operation & Maintenance Manual

WHEEL LOADER

WA800-3E0

WA900-3E0

SERIAL NUMBERS

WA800-70063

WA900-60162

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

CALIFORNIA

Proposition 65 Warning

Mercury and mercury compounds are known to the State of California to cause developmental problems. Mercury in this machine is sealed in non-removable backlight bulbs in the monitor display and/or HID lamps. There is no risk of exposure unless the lamps are broken. However, the monitor and lamps must be reused, recycled or properly disposed of in accordance with Local, State and Federal Laws at the end of their useful lives.

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.

BEFORE READING THIS MANUAL

This manual gives details of the operation and methods of inspection and maintenance for this machine that must be obeyed in order to use the machine safely. Most accidents are caused by the failure to follow fundamental safety rules for the operation and maintenance of machines.

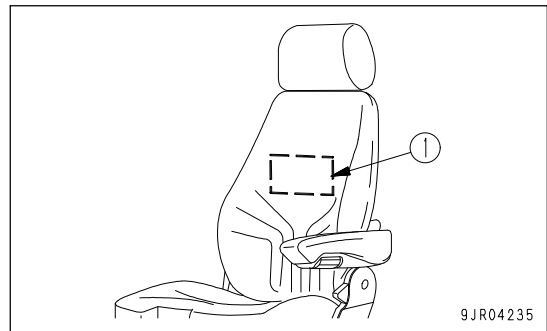
Read, understand and follow all precautions and warnings in this manual and on the machine before performing operation and maintenance. Failure to do so may result in serious injury or death.

Komatsu cannot predict every circumstance that might involve a potential hazard when the machine is used. Therefore, the safety messages in this manual and on the machine may not include all possible safety precautions. If you carry out any operation, inspection, or maintenance under conditions that are not described in this manual, understand that it is your responsibility to take the necessary precautions to ensure safety. In no event should you or others engage in the prohibited uses or actions described in this manual. Improper operation and maintenance of the machine can be hazardous and could result in serious injury or death.

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

Always keep this Operation and Maintenance Manual in the location shown on the right so that all relevant personnel can read it at any time.

Storage location for the Operation and Maintenance Manual:
Pocket (1) at rear of operator's seat



If this manual is lost or damaged, contact your distributor immediately to arrange for its replacement. For details regarding the machine serial No. you will need to provide your Komatsu distributor, see "TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR (PAGE 1-8)".

This manual uses the international units (SI) for units of measurement. For reference, units that have been used in the past are given in ().

The explanations, values, and illustrations in this manual have been prepared based on the latest information available as of the date of its publication. Continuing improvements in the design of this machine may lead to additional changes that are not reflected in this manual. Consult Komatsu or your Komatsu distributor for the latest available information concerning your machine or with questions regarding information contained in this manual.

- The numbers in circles in the illustrations correspond to the numbers in () in the text.

(For example: ① → (1))




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, 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.

SAFETY INFORMATION

To enable you to use the machine safely, and to prevent injury to operators, service personnel or bystanders, the precautions and warnings included in this manual and the safety signs attached to the machine must always be followed.

To identify important safety messages in the manual and on the machine labels, the following signal words are

The "Safety Alert Symbol" identifies important safety messages on machines, in manuals, and elsewhere. When you see this symbol, be alert to the risk of personal injury or death. Follow the instructions in the safety message.

- | | |
|--|--|
|  DANGER | This signal word indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. |
|  WARNING | This signal word indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. |
|  CAUTION | This signal word indicates a potentially hazardous situation exists which, if not avoided, may result in minor or moderate injury. |

The following signal words are used to alert you to information that must be followed to avoid damage to the machine.

- | | |
|----------------|--|
| NOTICE | This precaution is given where the machine may be damaged or the service life reduced if the precaution is not followed. |
| REMARKS | This word is used for information that is useful to know. |

INTRODUCTION

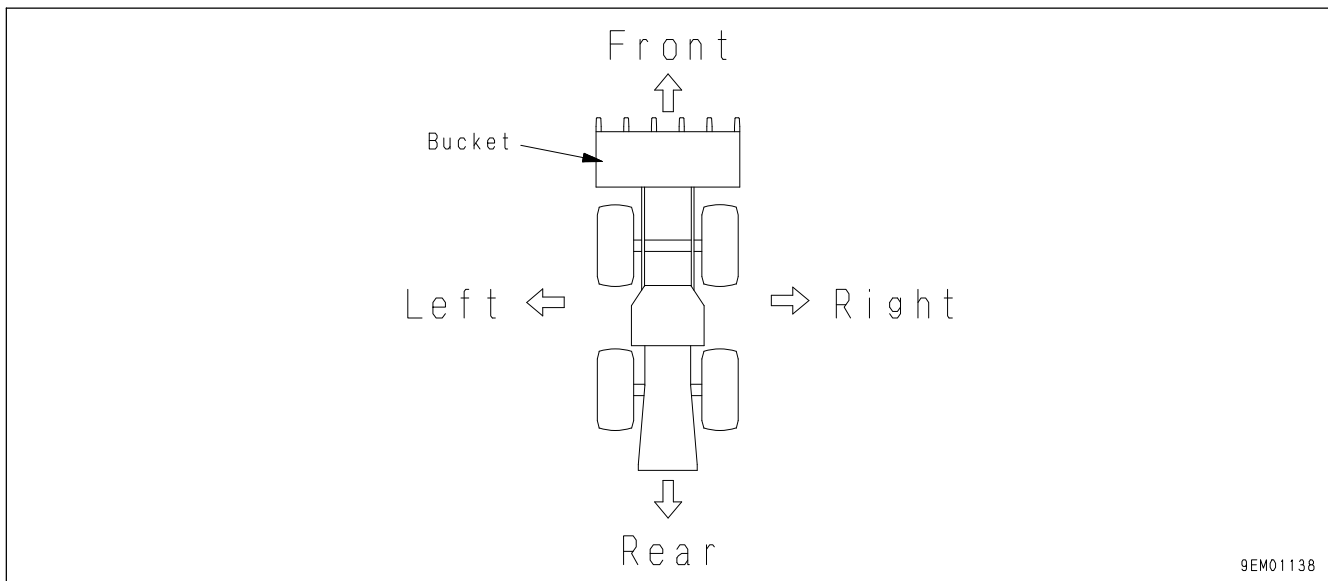
USE OF MACHINE

This Komatsu machine is designed to be used mainly for the following work:

- Digging work
- Smoothing
- Pushing work
- Loading work

For details of the operating procedure, see "WORK POSSIBLE USING WHEEL LOADER (PAGE 3-115)".

FRONT/REAR, LEFT/RIGHT 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.

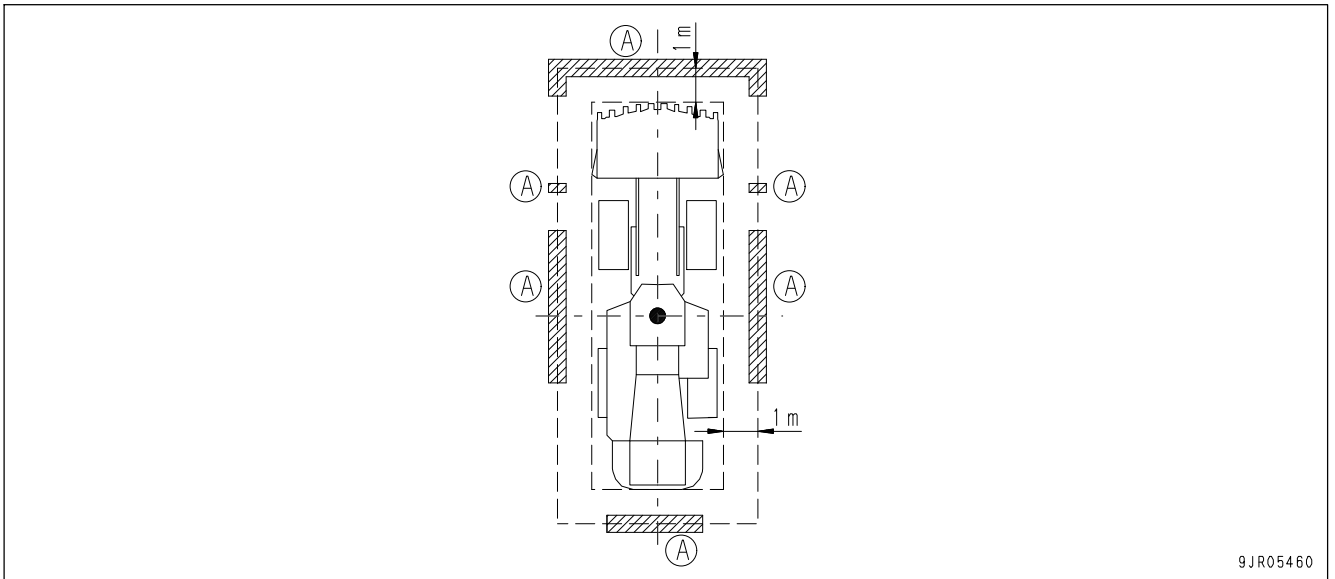
VISIBILITY FROM OPERATOR'S SEAT

The visibility standards (ISO 5006) for this machine require a view shown in the diagram below.

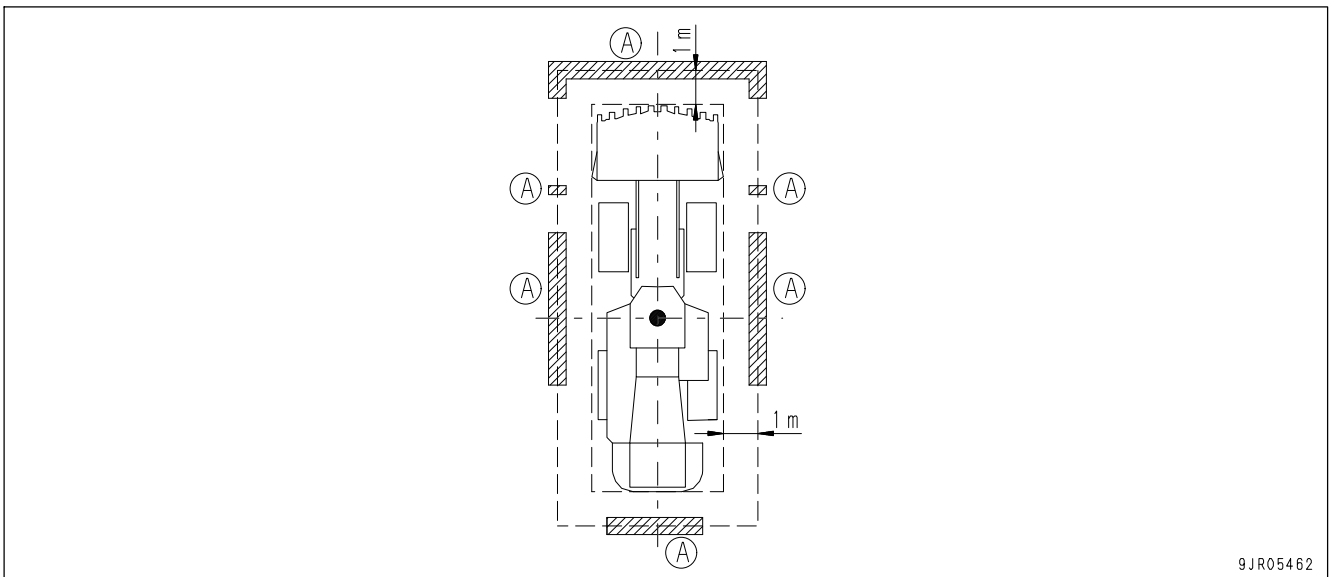
VISIBILITY IN IMMEDIATE AREA

The visibility of this machine in the area 1 m (3 ft 3in) from the outside surface of the machine at a height of 1.5 m (4 ft 11 in) is shown in the diagram below. The hatched area (A) shows the area where the view is blocked by part of the machine when mirrors or other aids to visibility are installed as standard. Please be fully aware that there are places that cannot be seen when operating the machine.

WA800-3E0



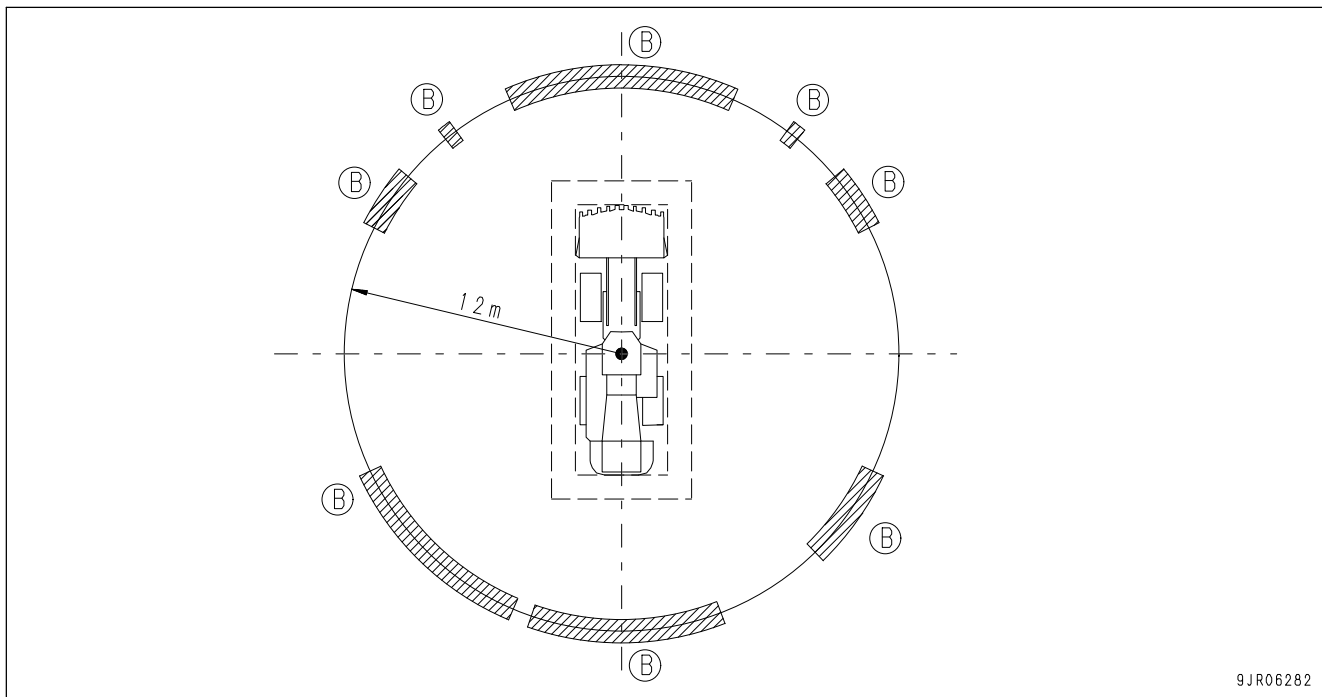
WA900-3E0



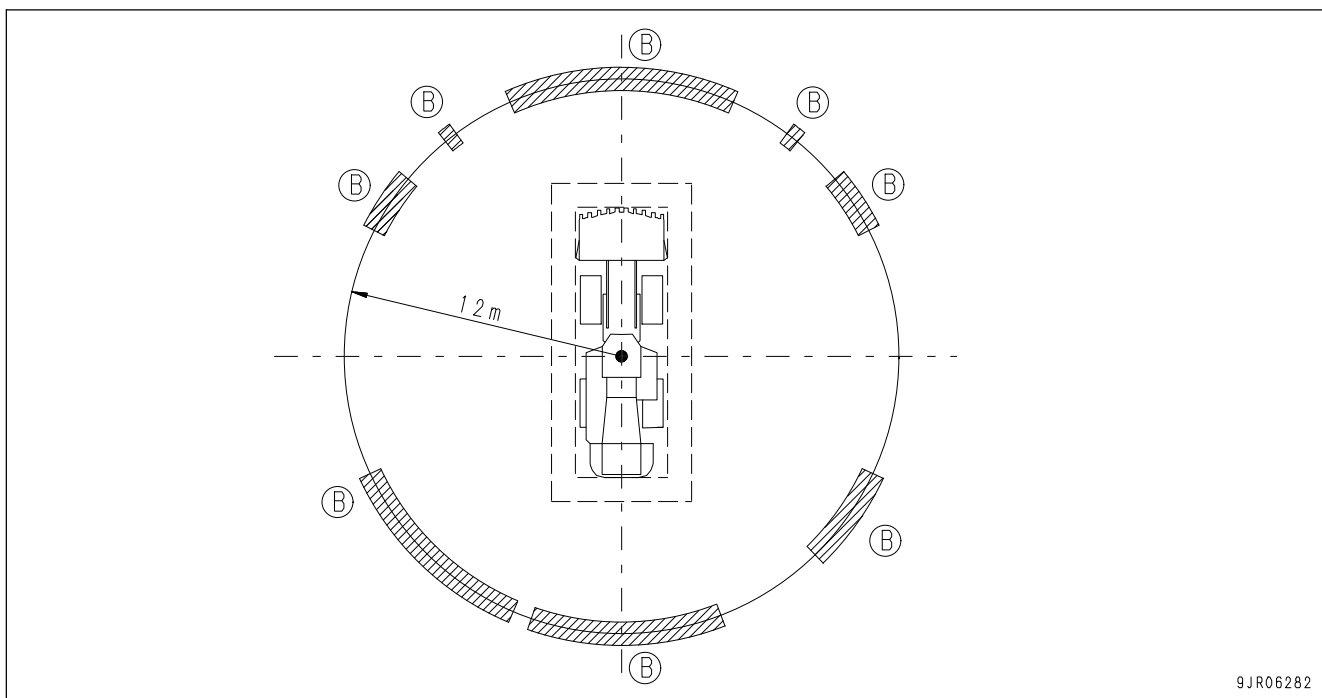
12-M RADIUS VISIBILITY

The visibility at a radius of 12 m from the machine is as shown in the diagram below. The hatched areas (B) show the areas where the view is blocked when mirrors or other aids to visibility are installed as standard. Please be fully aware that there are places that cannot be seen when operating the machine.

WA800-3E0



WA900-3E0



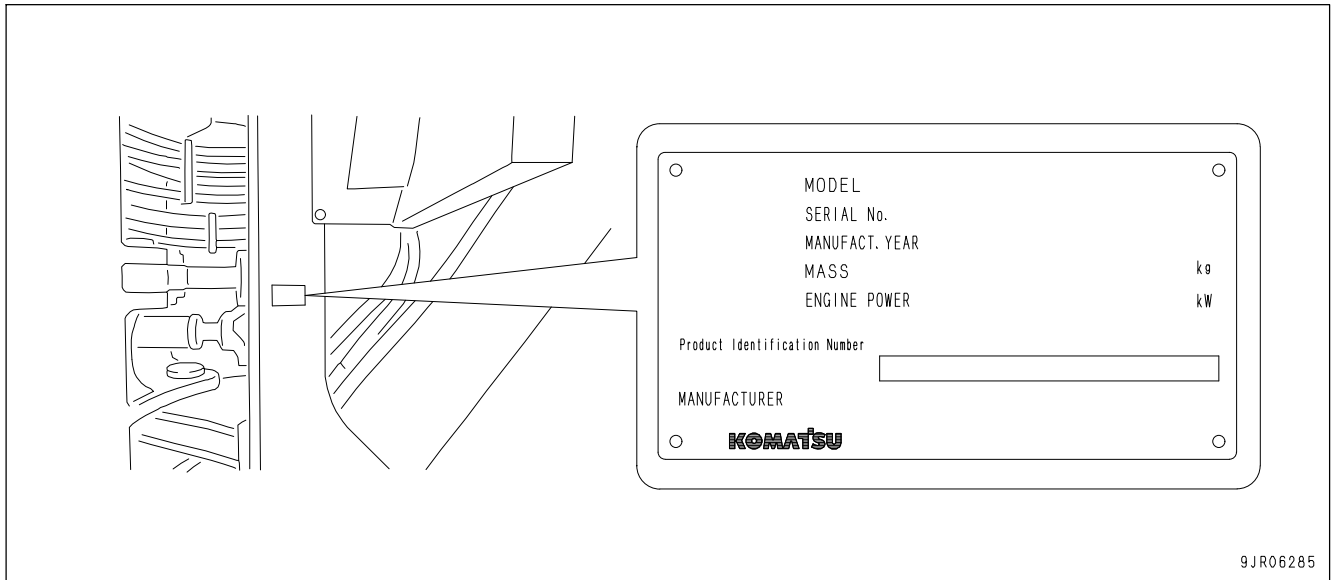
NECESSARY INFORMATION

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

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

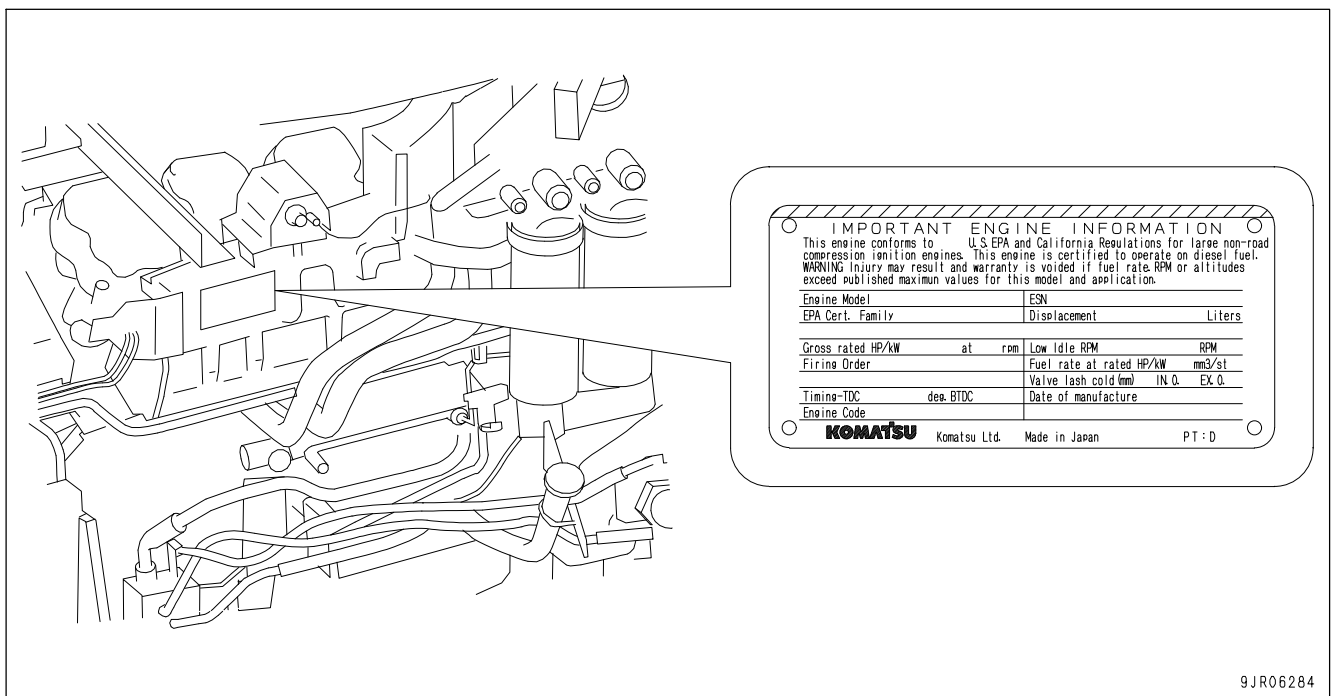
On the center right of the front frame.

The design of the nameplate differs according to the territory.



EPA REGULATIONS, ENGINE NUMBER PLATE

On the upper left of the cylinder block, when seen from the fan side.



EPA: Environmental Protection Agency, U.S.A.

POSITION OF SERVICE METER

On the lower right of maintenance monitor.

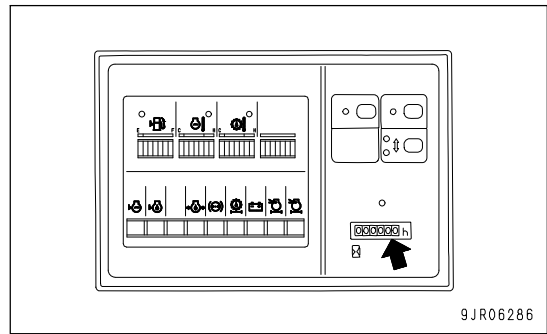


TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

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.

SAFETY

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SAFETY LABELS

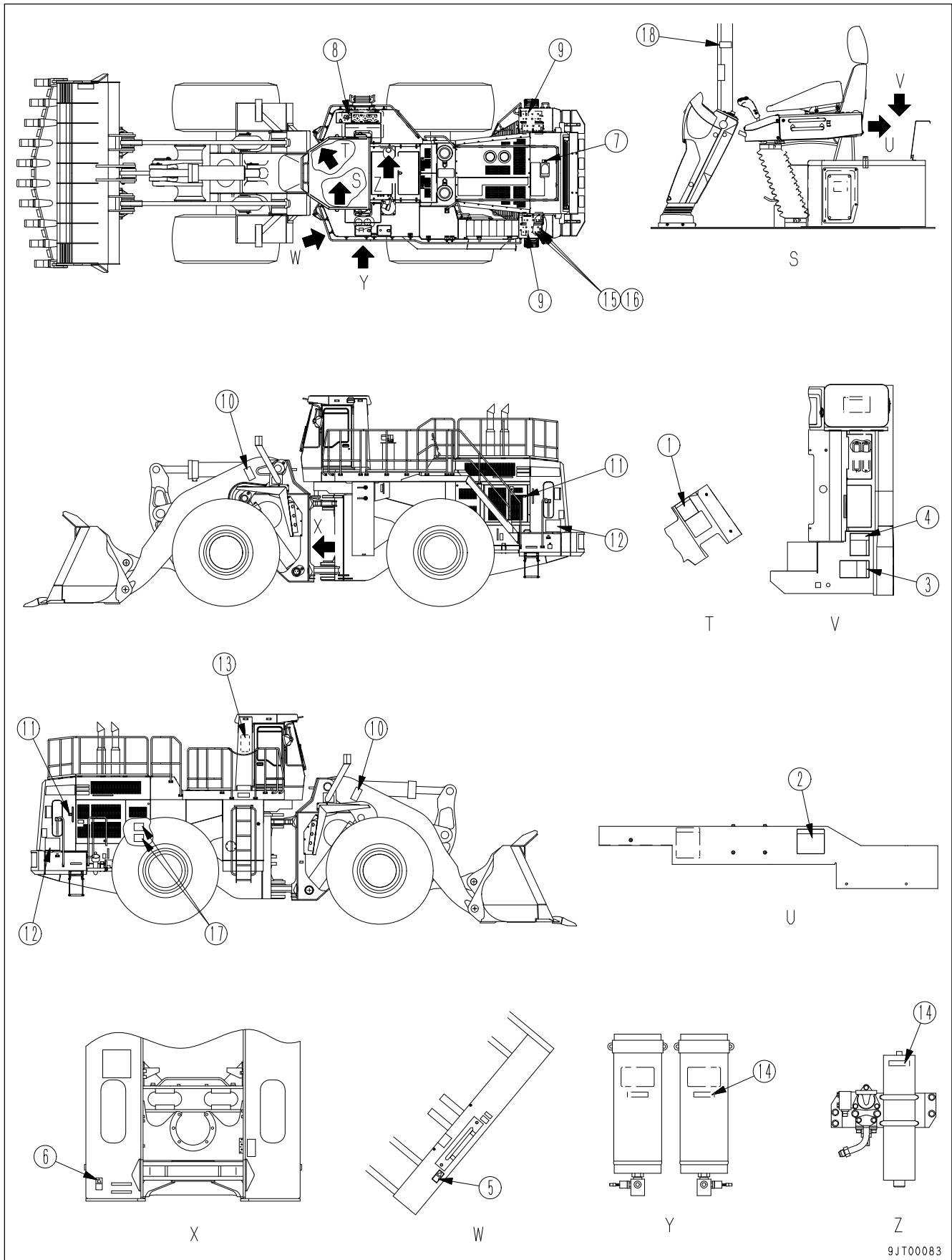
The following safety labels are used on this machine. Be sure that you fully understand the correct position and content of these safety labels.

To ensure that the content of these safety labels can be read properly, be sure that they are in the correct place and always keep them clean. When cleaning them, use soap and water. Do not use organic solvents or gasoline. These may cause the safety labels to peel off.

If the safety labels are damaged or lost, or cannot be read, replace them with new parts. For details of the part numbers, see this manual or check on the actual part, and order the new part from your Komatsu distributor.

There are also other labels in addition to the safety labels. Handle these labels in the same way.

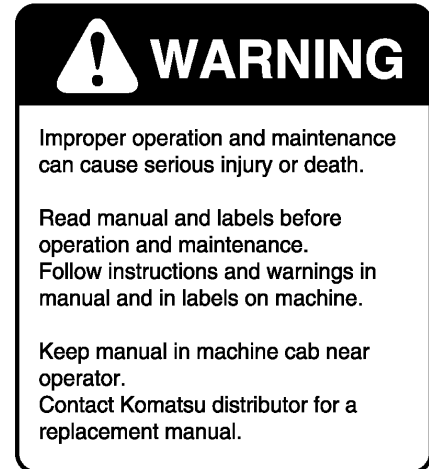
LOCATION OF SAFETY LABELS



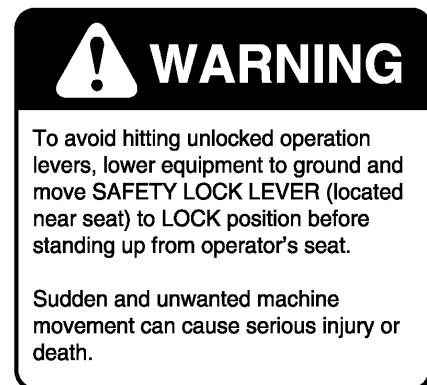
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SAFETY LABELS

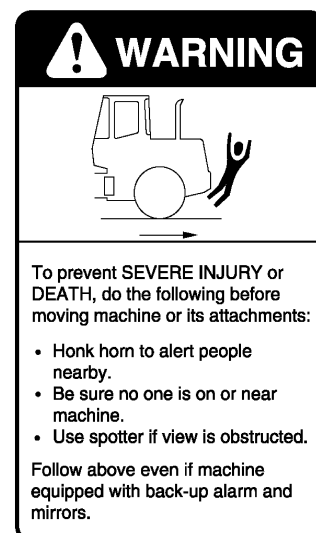
(1) Caution before starting



(2) Caution for lock lever



(3) Caution when traveling in reverse



(4) Caution for going close to electric cables (09801-13001)

VOLTAGE		SAFE DISTANCE
LOW VOLTAGE	100V 200V	2 m
	6,600V	2 m
	22,000V	3 m
SPECIAL HIGH VOLTAGE	66,000V	4 m
	154,000V	5 m
	187,000V	6 m
	275,000V	7 m
	500,000V	11 m

09801-13001

(5) Do not enter

Crush Hazard. Can cause severe injury or death. When machine is being operated, never place yourself in articulated area of machine.

(6) Caution for frame lock bar

If safety bar is unlocked, machine can jackknife unexpectedly when it is being transported or hoisted.

Jackknifing can cause serious injury or death to bystanders.

- Always lock safety bar when machine is being transported or hoisted.
- If necessary, lock safety bar during servicing or maintenance.

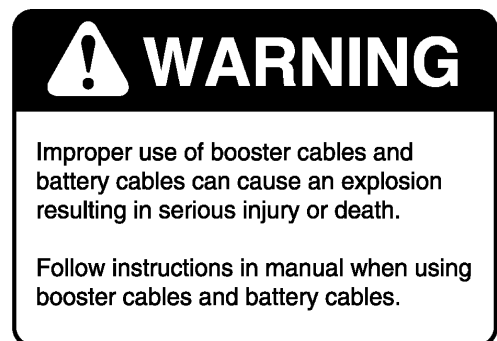
(7) Caution when coolant is at high temperature



(8) Caution when oil is at high temperature



(9) Caution when handling battery cable



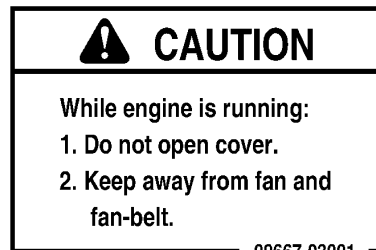
(10) "Do not go under work equipment" sign (09807-C1683)



Sign indicates a crush hazard from falling off of working device.

Keep away when the working device is raised.

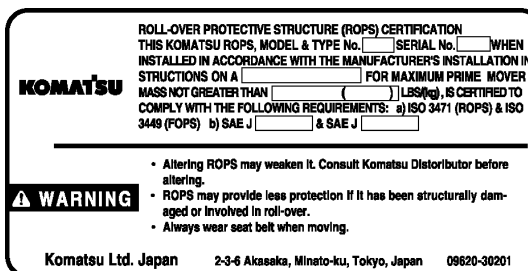
(11) Caution when opening while engine is running (09667-03001)



(12) Do not come near machine sign (09812-03000)



(13) "Do not modify ROPS" sign (09620-30201)



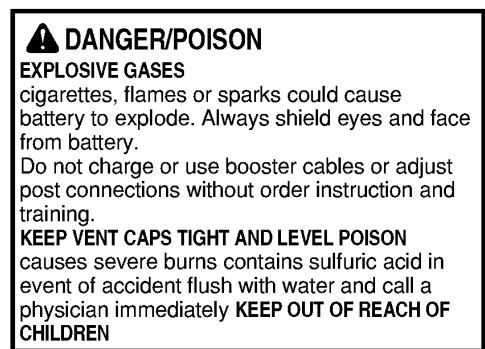
(14) High pressure warning
 (Caution when handling accumulator)
 (09659-53000)



(15) Warning for battery



(16) Precaution when handling battery (09664-30000)



Distr. By
 KOMATSU AMERICA CO.
 :Vernon Hills, IL 60061-8112, USA
 KOMATSU LATIN AMERICA CORP.
 :Miami, FL 33126, USA

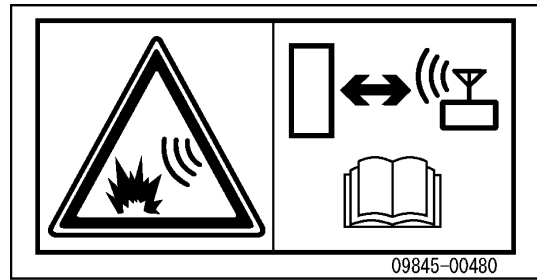
(17) Prohibition of engine start by short-circuiting (09842-A0481)



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.

(18) Caution blast site (09845-00480)
(only when equipped with KOMTRAX Plus)



Sign indicates an explosion hazard caused by active radio transmitter at a blast zone.

Keep machine at a safe distance from a blast zone and detonator.

Safety label (15) is stuck on the machine by the battery maker
Safety label (17) is fixed to the engine starting motor.
Parts numbers for the safety labels (1), (2), (4): 427-93-25110.
Parts numbers for the safety labels (5) to (9): 427-93-21311.

GENERAL PRECAUTIONS COMMON TO OPERATION AND MAINTENANCE

Mistakes in operation, inspection, or maintenance may result in serious personal injury or death. Before carrying out operation, inspection, or maintenance, always read this manual and the safety labels on the machine carefully and obey the warnings.

PRECAUTIONS BEFORE STARTING OPERATION

ENSURING SAFE OPERATION

- Only trained and authorized personnel can operate and maintain the machine.
- Follow all safety, precautions, and instructions in this manual when operating or performing inspection or maintenance on the machine.
- If you are not feeling well, or 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 job site in danger.
- When working with another operator or with the person on the worksite traffic duty, discuss the content of the operation beforehand and use the determined signals when carrying out the operation.

UNDERSTANDING THE MACHINE

Before operating the machine, read this manual thoroughly. If there are any places in this manual that you do not understand, ask the person in charge of safety to give an explanation.

PREPARATIONS FOR SAFE OPERATION

PRECAUTIONS REGARDING SAFETY-RELATED EQUIPMENT

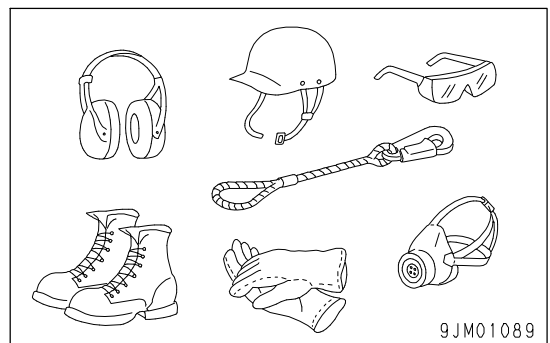
- Be sure that all guards, covers and mirrors are in their proper position. Have guards and covers repaired immediately if they are damaged.
- Understand the method of use of safety features and use them properly.
- Never remove any safety features. Always keep them in good operating condition.

INSPECTING MACHINE

Check the machine before starting operations. If any abnormality is found, do not operate the machine until repairs of the problem location have been completed.

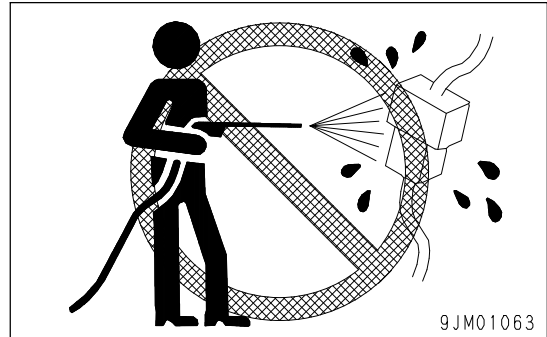
WEAR WELL-FITTING CLOTHES AND PROTECTIVE EQUIPMENT

- Do not wear loose clothes or any accessories. If these catch on the control levers or protruding parts, there is danger that it may cause the machine to move unexpectedly.
- 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.
- 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.
- Check that all protective equipment functions properly before using it.



KEEP MACHINE CLEAN

- If you get on or off the machine or carry out inspection and maintenance when the machine is dirty with mud or oil, there is a hazard that you will slip and fall. Wipe off any mud or oil from the machine. Always keep the machine clean.
- If water gets into the electrical system, there is a hazard that it will cause malfunctions or misoperation. If there is any misoperation, there is danger that the machine may move unexpectedly and cause serious personal injury or death. When washing the machine with water or steam, do not allow the water or steam to come into direct contact with electrical

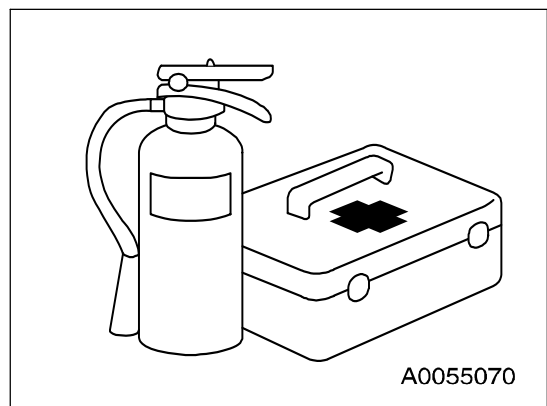
**PRECAUTIONS INSIDE OPERATOR'S COMPARTMENT**

- 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 tools or a machine parts lying around inside the operator's compartment. If tools or parts get into the control devices, it may obstruct operation and cause the machine to move unexpectedly, resulting in serious personal injury or death.
- Do not stick suction pads to the window glass. Suction pads act as a lens and may cause fire.
- Do not use a cell phone when driving or operating the machine. This may lead to mistakes in operation, which could cause serious personal injury or death.
- Never bring any dangerous objects such as flammable or explosive items into the operator's compartment.

PROVIDE 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
- 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.

**IF ANY PROBLEM IS 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.

FIRE PREVENTION

ACTION IF FIRE OCCURS

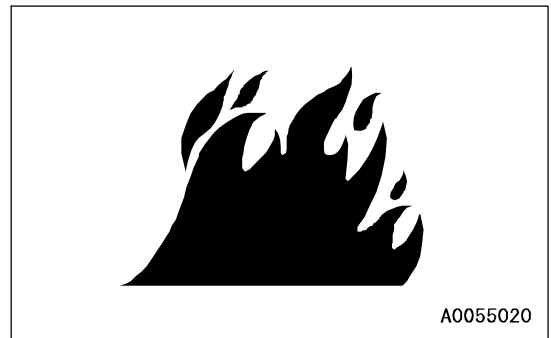
- Turn the start switch OFF to stop the engine.
- Use the handrails and steps to get off the machine.
- Do not jump off the machine. There is the danger of falling and suffering serious injury.

PRECAUTIONS TO PREVENT FIRE

- **Fire caused by fuel, oil, COOLANT or window washer fluid**

Do not bring any flame or fire close to flammable substances such as fuel, oil, COOLANT or window washer fluid. There is danger that they may catch fire. To prevent fire, always observe the following:

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



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

Remove any dry leaves, chips, pieces of paper, coal 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. To prevent fire, always observe the following.

- Keep all 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 piping**

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. There is danger that this may lead to damage to the hoses and cause high-pressure oil to spurt out, leading to fire, serious personal injury or

- **Explosion caused by lighting equipment**

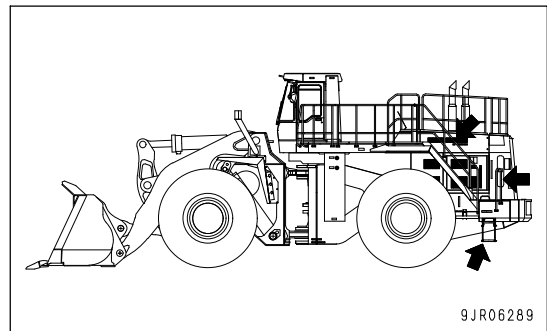
- When checking fuel, oil, battery electrolyte, or coolant, always use lighting with anti-explosion specifications.
- When taking the electrical power for the lighting from the machine itself, follow the instructions in this manual.

PRECAUTIONS WHEN GETTING ON OR OFF MACHINE

USE HANDRAILS AND STEPS WHEN GETTING ON OR OFF MACHINE

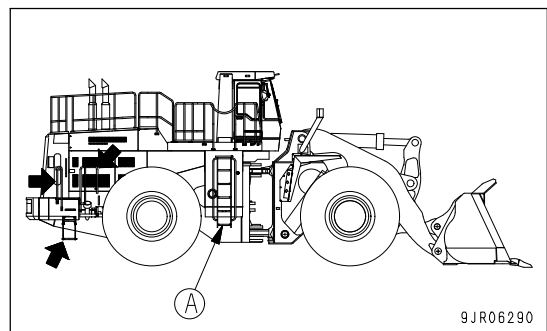
To prevent personal injury caused by slipping or falling off the machine, always do as follows.

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

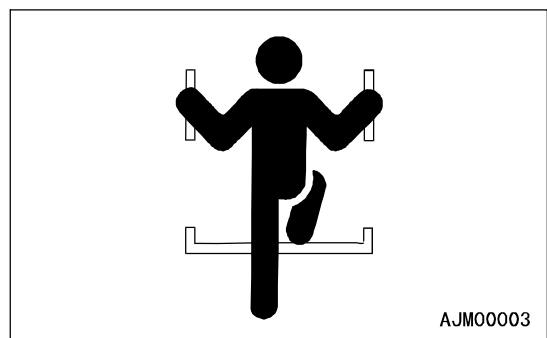


- (A) is the emergency escape step.

Use this when escaping from the machine in a fire or other emergencies. Do not use it normal situations.



- Always face the machine and maintain at least three-point contact (both feet and one hand, or both hands and one foot) with the handrail and steps to ensure that you support yourself.



- 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 grip the control levers and work equipment lock lever when getting on or off the machine.
- Never climb on the engine hood or covers where there are no non-slip pads.
- Never move from the step at the rear of the machine or the step at the side of the cab to stand on top of the tire.
- Do not get on or off the machine while holding tools in your hand.

NO JUMPING ON OR OFF MACHINE

- 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.

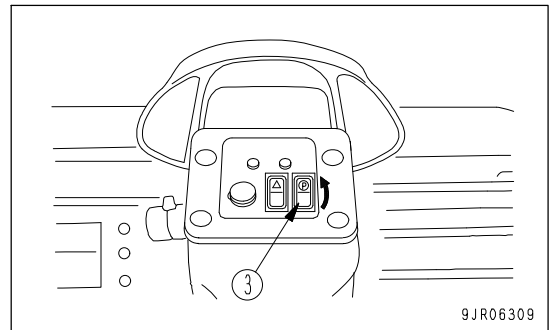
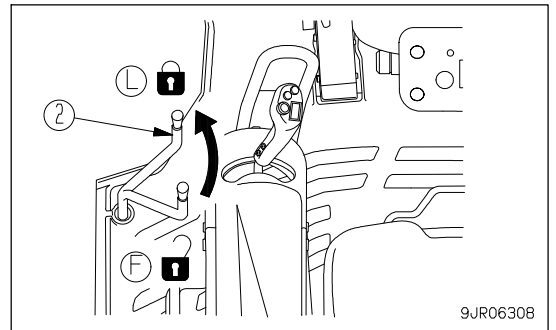
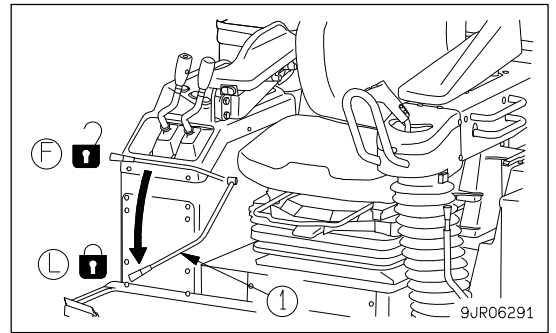
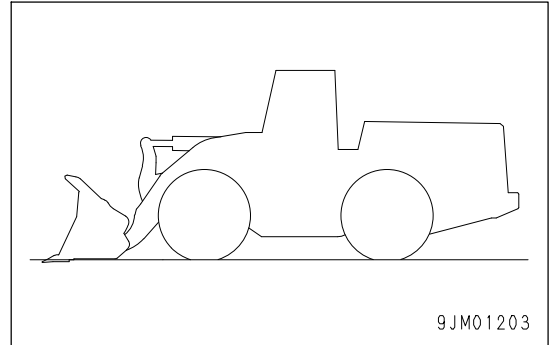
NO PEOPLE ON ATTACHMENTS

Never let anyone ride on the work equipment or other attachments. There is a hazard of falling and suffering serious personal injury or death.

PRECAUTIONS WHEN STANDING UP FROM OPERATOR'S SEAT

Before standing up from the operator's seat, such as when adjusting the position of the seat, always lower the work equipment completely to the ground, set work equipment lock lever (1) and steering lock lever (2) to the lock position (L), turn parking brake switch (3) ON, and stop the engine.

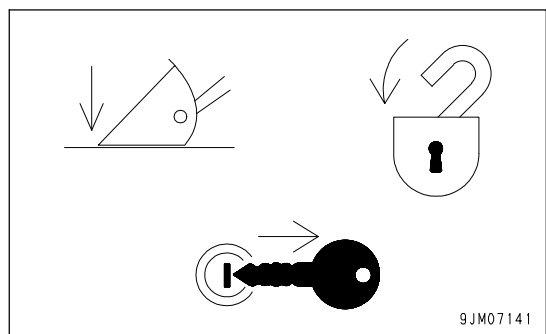
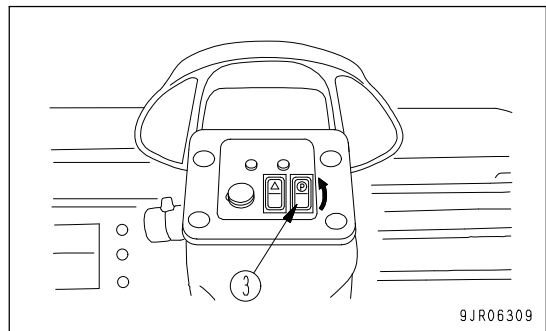
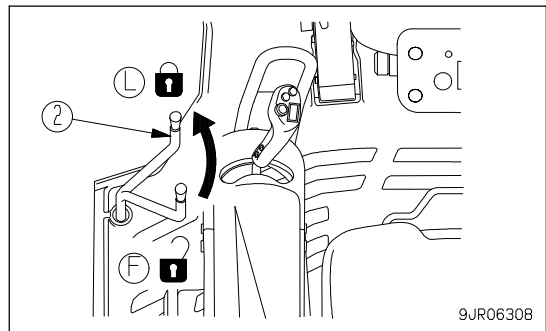
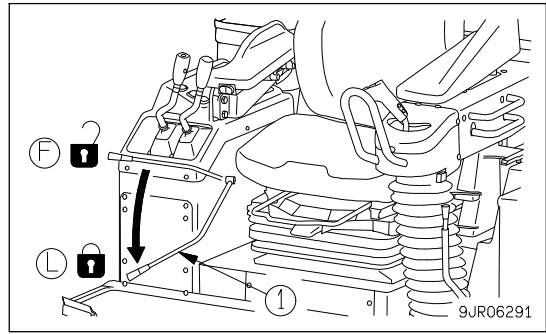
If the control levers are touched by mistake, the machine may suddenly move and cause serious personal injury or death.



PRECAUTIONS WHEN LEAVING MACHINE

If the proper procedures are not taken when parking the machine, the machine may suddenly move off by itself, and this may lead to serious personal injury or death. Always do the following.

- When leaving the machine, always lower the work equipment completely to the ground, set work equipment lock lever (1) and steering lock lever (2) to the lock position (L), turn parking brake switch (3) ON, and stop the engine. In addition, lock all parts, always take the key with you and leave it in the specified place.



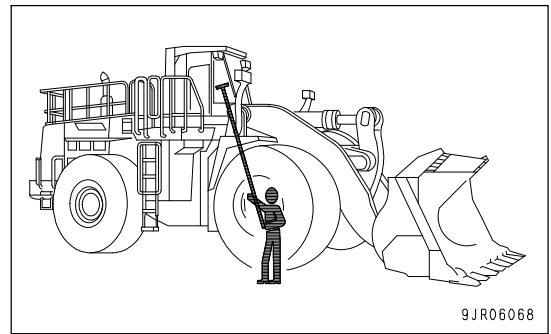
EMERGENCY EXIT FROM OPERATOR'S CAB

Machines equipped with a cab have doors on the left and right sides. If the door on the one side does not open, escape from the door on the other side.

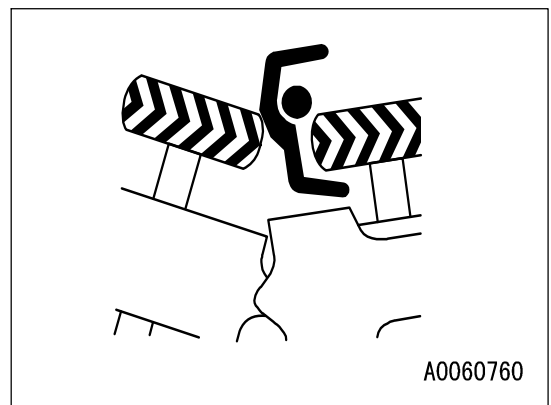
PRECAUTIONS WHEN CLEANING CAB GLASS

Always keep the cab glass clean to ensure good visibility when operating.

When cleaning the front glass of the cab, use commercially available window cleaning tools and carry out the cleaning operation from the ground.

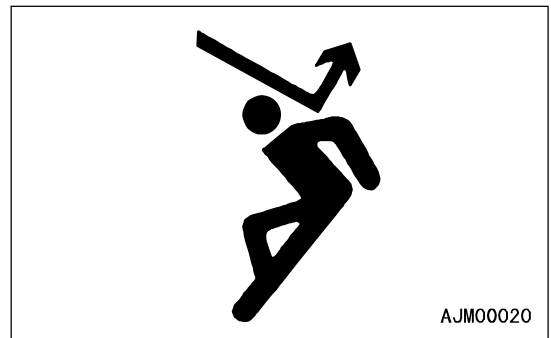
**DO NOT GET CAUGHT IN ARTICULATING PORTION**

- If the clearance at the articulating portion changes and you get caught in it, you will suffer serious personal injury or death. Do not allow anyone to come inside the articulation range.
- The clearance in the area around the work equipment changes according to the movement of the link. If you get caught, you will suffer serious personal injury or death. Do not allow anyone to come close to any rotating or extending/retracting portion.

**PRECAUTIONS RELATED TO PROTECTIVE STRUCTURES**

The operator's compartment is equipped with a structure (such as ROPS, FOPS) to protect the operator by absorbing the impact energy. As for the machine equipped with ROPS, if the machine weight (mass) exceeds the certified value (shown on the ROLL-OVER PROTECTIVE STRUCTURE (ROPS) CERTIFICATION plate), ROPS will not be able to fulfill its function. Do not increase machine weight beyond the certified value by modifying the machine or by installing attachments to the machine. Also, if the function of the protective equipment is impeded, the protective equipment will not be able to protect the operator, and the operator may suffer injury or death. Always observe the following.

- If the machine is equipped with a protective structure, do not remove the protective structure and carry out operations without it.
- If the protective structure is welded, or holes are drilled in it, or it is modified in any other way, its strength may drop. Consult your Komatsu distributor before carrying out any modifications.
- If the protective structure is damaged or deformed by falling objects or by rolling over, its strength will be reduced and it will not be able to fulfill its function properly. In such cases, always contact your Komatsu distributor for advice on the method of repair.
- Even if the protective structure is installed, always fasten your seat belt properly when operating the machine. If you do not fasten your seat belt properly, it cannot display its effect.



- ROPS proof load is 1126490 N (114870 kg).

In the case of WA900-3E0, this ROPS proof load can be overrun depending on the machine specifications, if a tire protector (mesh chain type) is fitted to four wheels. For this reason, do not fit a tire protector (mesh chain type) to the rear wheels.

UNAUTHORIZED MODIFICATION

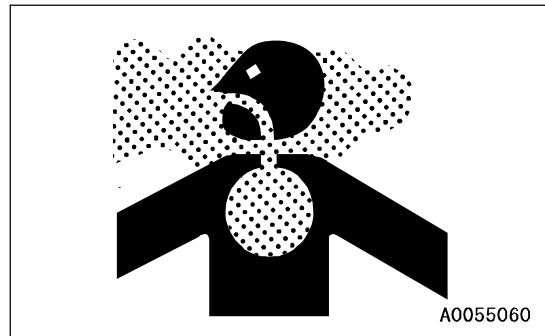
- Komatsu will not be responsible for any injuries, accidents, product failures or other property damages resulting from modifications made without authorization from Komatsu.
- Any modification made without authorization from Komatsu can create hazards. Before making a modification, consult your Komatsu distributor.

PRECAUTIONS RELATED TO ATTACHMENTS AND OPTIONS

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

PRECAUTIONS WHEN RUNNING ENGINE INSIDE BUILDING

The engine exhaust gas contains substances that may damage your health or even cause death. Start or operate the engine in a place where there is good ventilation. If the engine or machine must be operated inside a building or under ground, where the ventilation is poor, take steps to ensure that the engine exhaust gas is removed and that ample fresh air is brought in.



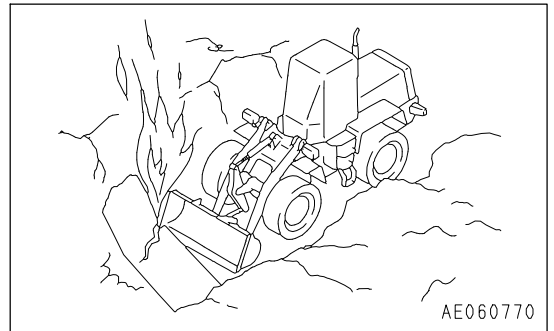
PRECAUTIONS FOR OPERATION

PRECAUTIONS FOR JOBSITE

INVESTIGATE AND CONFIRM JOBSITE CONDITIONS

On the jobsite, there are various hidden dangers that may lead to personal injury or death. Before starting operations, always check the following to confirm that there is no danger on the jobsite.

- When carrying out operations near combustible materials such as thatched roofs, dry leaves or dry grass, there is a hazard of fire, so be careful when operating.
- 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.
- If water lines, gas lines, or high-voltage electrical lines may be buried under the worksite, contact each utility and identify their locations. Be careful not to sever or damage any of these lines.
- Take necessary measures to prevent any unauthorized person from entering the operating area.
- In particular, if you need to operate on a road, protect pedestrian and cars by designating a person for worksite traffic duty or by installing fences around the worksite.
- When traveling or operating in water or on soft ground, check the water depth, speed of the current, bedrock, and shape of the ground beforehand and avoid any place that will obstruct travel.
- Maintain the travel path on the jobsite so that there is no obstruction to travel operations.



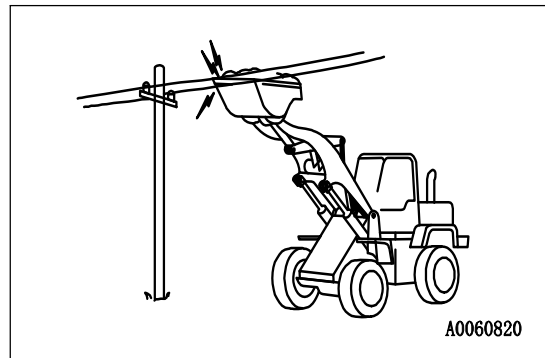
WORKING ON LOOSE GROUND

- 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 personal injury or death. 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
100V - 200V	Over 2 m (7 ft)
6,600V	Over 2 m (7 ft)
22,000V	Over 3 m (10 ft)
66,000V	Over 4 m (14 ft)
154,000V	Over 5 m (17 ft)
187,000V	Over 6 m (20 ft)
275,000V	Over 7 m (23 ft)
500,000V	Over 11 m (36 ft)

ENSURE GOOD VISIBILITY

This machine is equipped with mirrors to ensure good visibility, but even then there are places that cannot be seen from the operator’s seat, so be careful when operating.

When traveling or carrying out operations in places with poor visibility, it is impossible to check for obstacles in the area around the machine and to check the condition of the jobsite. This leads to danger of serious personal injury or death. When traveling or carrying out operations in places with poor visibility, always observe the following.

- Position a signalman if there are areas where the visibility is not good.
- Only one signalman should give signals.
- 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.
- When checking the mirrors installed to the machine, remove all dirt and adjust the angle of the mirror to ensure good visibility.

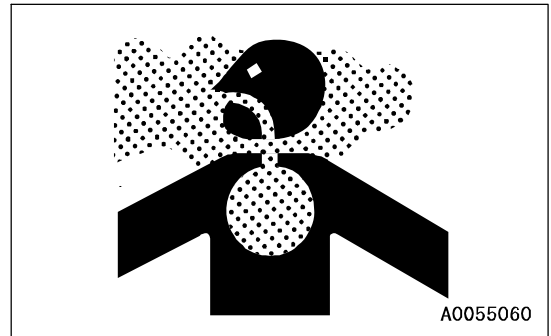
CHECKING SIGNS AND SIGNALMAN'S SIGNALS

- 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.

BEWARE OF ASBESTOS DUST

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.
- Do not use compressed air.
- If there is danger that there may be asbestos dust in the air, always operate the machine from an upwind position, and make sure that all workers operate on the upwind side.
- All workers should use anti-dust masks.
- Do not allow other persons to approach during the operation.
- Always observe the rules and regulations for the work site and environmental standards.

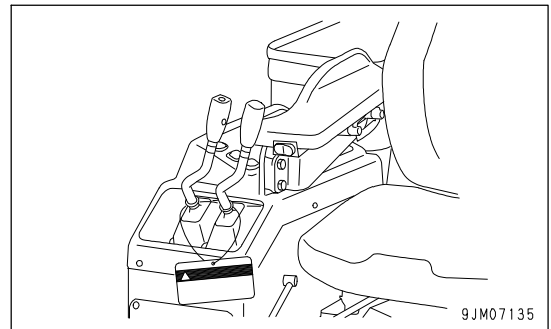


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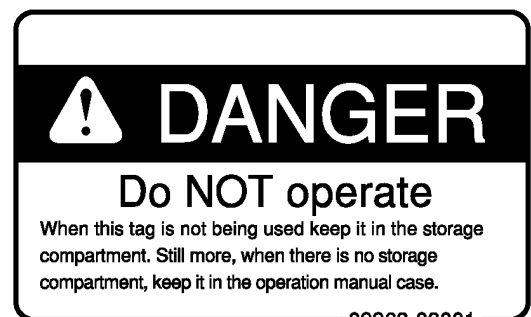
This machine does not use asbestos, but there is a danger that imitation parts may contain asbestos, so always use genuine Komatsu parts.

STARTING ENGINE**WARNING TAG**

If there is any "DANGER! Do NOT operate!" warning tag displayed, it means that someone is carrying out inspection and maintenance of the machine. If the warning sign is ignored and the machine is operated, there is danger that the person carrying out inspection or maintenance may be caught in the rotating parts or moving parts and suffer serious personal injury or death. Do not start the engine or touch the levers.



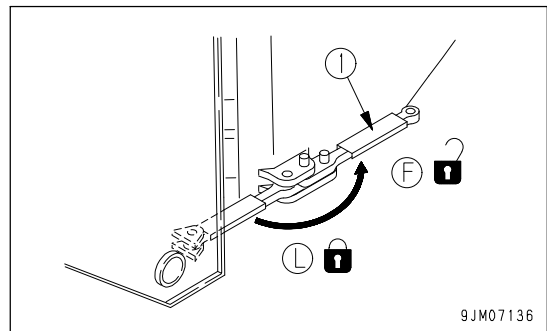
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INSPECTION AND MAINTENANCE BEFORE STARTING ENGINE

Carry out the following checks before starting the engine at the beginning of the day's work to ensure that there is no problem with the operation of the machine. If this inspection is not carried out properly problems may occur with the operation of the machine, and there is danger that this may lead to serious personal injury or death.

- Remove all dirt from the surface of the window glass to ensure a good view.
- "WALK-AROUND CHECK (PAGE 3-72)" is surely executed.
- 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 that the gauges work properly, check the angle of the mirror, and check that the control levers are all at the Neutral position.
- Before starting up the engine, check that the work equipment 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. See "ADJUSTING MIRRORS (PAGE 3-88)".
- Check that there are no persons or obstacles above, below, or in the area around the machine.
- Check that the parking brake switch is at the ON position.
- Check that frame lock lever (1) is securely fixed at FREE position(F).

**PRECAUTIONS WHEN STARTING ENGINE**

- Start and operate the machine only while seated.
- When starting the engine, sound the horn as a warning.
- Do not allow anyone apart from the operator to ride on the machine.
- Do not attempt to start the engine by short-circuiting the engine starting circuit. This may cause fire, serious personal injury or death.
- Check that the backup alarm (alarm buzzer when machine travels in reverse) works properly.

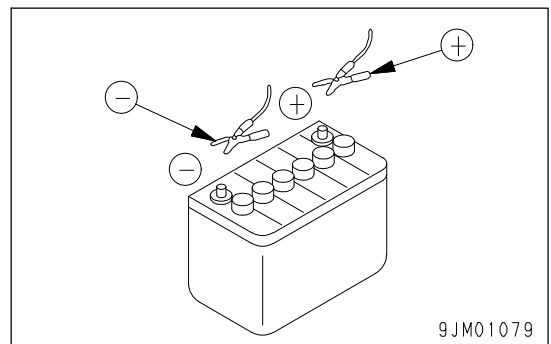
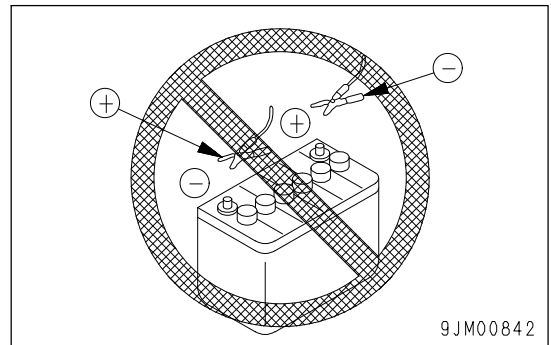
PRECAUTIONS IN COLD AREAS

- 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.

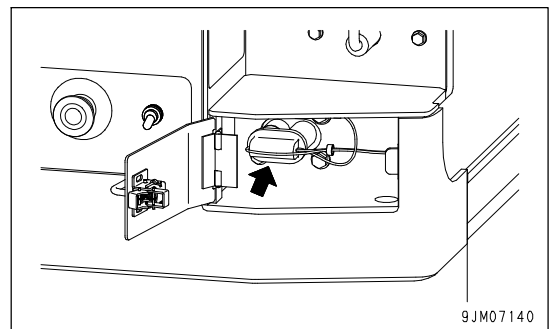
STARTING WITH BOOSTER CABLES

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.

- Always wear safety goggles and rubber gloves when starting the engine with booster cable.
- 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.
- 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 to the 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.
- For details of the starting procedure when using booster cables, see "STARTING ENGINE WITH BOOSTER CABLE (PAGE 3-167)" in the OPERATION section.

**STARTING WITH STARTING AID CONNECTOR (IF EQUIPPED)**

- When using the starting aid connector (if equipped) to start the engine, see "HANDLING STARTING AID CONNECTOR (PAGE 6-32)" in the ATTACHMENT AND OPTION Section.



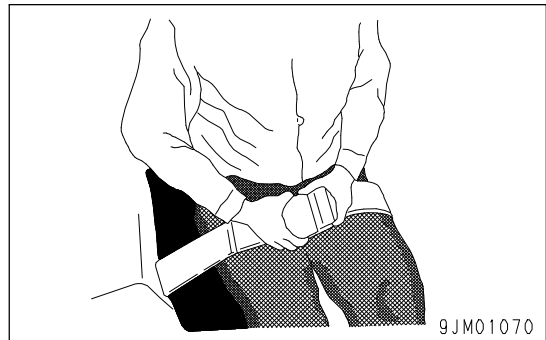
OPERATION

CHECKS BEFORE OPERATION

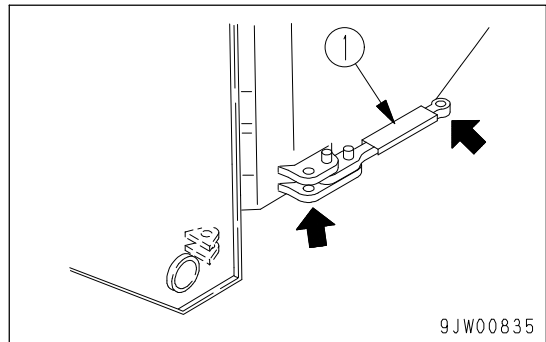
If the checks before starting are not carried out properly, the machine will be unable to display its full performance, and there is also danger that it may lead to serious personal injury or death.

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

- Always wear the seat belt. There is danger that you may be thrown out of the operator's seat and suffer serious injury when the brakes are applied suddenly.
- Check the operation of travel, steering and brake systems, and work equipment 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.

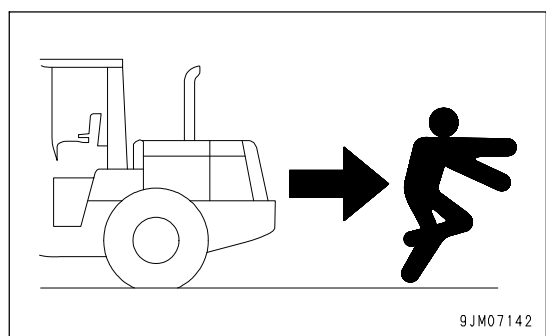


- Before driving the machine or starting operations, check that frame lock bar (1) is securely fixed at the FREE position.



PRECAUTIONS WHEN TRAVELING IN FORWARD OR REVERSE

- Lock the cab door and windows securely, both when they are open and when they are closed.
- Do not allow anyone apart from the operator to ride on the machine.
- If there are any persons in the area around the machine, there is danger that they may be hit or caught by the machine, and this may lead to serious personal injury or death. Always observe the following before traveling.
 - Always operate the machine only when seated.
 - Before moving off, check again that there is no person or obstruction in the surrounding area.
 - Before moving, sound the horn to warn people in the surrounding area.
 - Check that the backup alarm (alarm buzzer when machine travels in reverse) works properly.
 - If there is an area to the rear of the machine which cannot be seen, position a signalman.



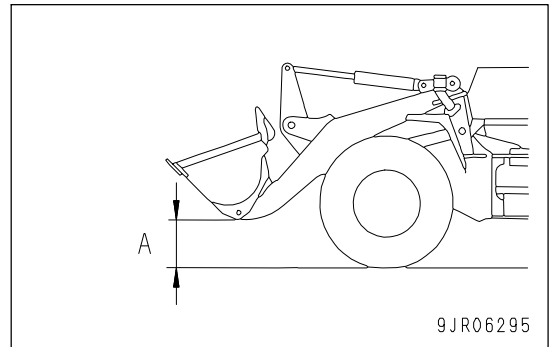
Always be sure to carry out the above precautions even when the machine is equipped with mirrors.

PRECAUTIONS WHEN TRAVELING

- 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. There is danger that this will cause misoperation of the steering wheel and may lead to serious personal injury or death. If the engine stops, depress the brake pedal immediately to stop the machine.
- 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 traveling on flat ground, keep the work equipment at height (A) of 70 - 90 cm (2ft 4in - 2ft 11in) above the ground. If the work equipment is too close to the ground surface, the work equipment may contact the ground and cause the machine to tip over.

It is necessary to operate the work equipment control lever, stop the machine first, then operate the control lever.

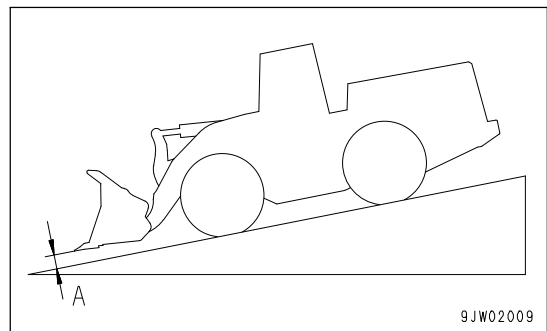
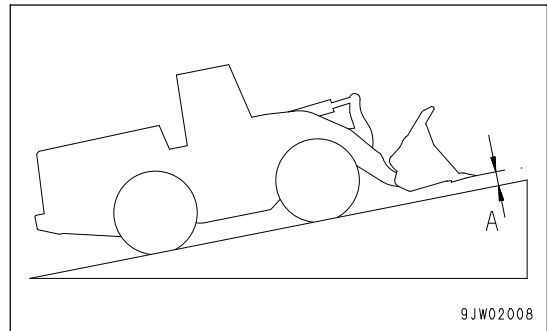
- Avoid traveling over obstacles when possible. If the machine has to travel over an obstacle, keep the work equipment close to the ground and travel at low speed. There is more danger of the machine tipping over to the left or right than tipping over to the front or rear, so do not travel over obstacles which make the machine tilt strongly to the left or right sides.
- When traveling on rough ground, travel at low speed and do not operate the steering suddenly. There is danger that the machine may turn over. The work equipment may hit the ground surface and cause the machine to lose its balance, or may damage the machine or structures in the area.
- When using the machine, to prevent personal injury caused by damage to the work equipment or by the machine overturning due to overloading, do not exceed the permitted performance of the machine or the maximum permitted load for the structure of the machine.
- 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, under bridges, under electric wires, or other places where the height is limited, operate slowly and be extremely careful not to let the machine body or work equipment hit anything.
- If you drive the machine at high speed continuously for a long time, the tires will overheat and the internal pressure will become abnormally high. This may cause the tires to burst. If a tire bursts, it produces a large destructive force, and this may cause serious injury or death.
If you are going to travel continuously, please consult your Komatsu distributor.
- When the machine is traveling on flat ground or down a slope, NEVER set the direction selector switch to the Neutral position. Always set it to a transmission speed range.
 - If the transmission is at neutral, the engine brakes will not work, and this creates a dangerous situation.
 - It may also cause damage to the transmission or other parts of the power train, and this may lead to serious personal injury or death.



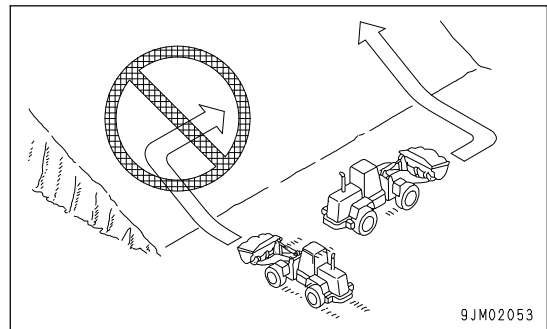
TRAVELING ON SLOPES

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

- Keep the work equipment at height (A) 20 to 30 cm {8 to 12 in} above the ground so that it can be lowered immediately to the ground to stop the machine in case of emergency.



- Always travel straight up or down a slope. Traveling at an angle or across the slope is extremely dangerous.
- Do not turn on slopes or travel across slopes. Always go down to a flat place to change the position of the machine, then travel on to the slope again.



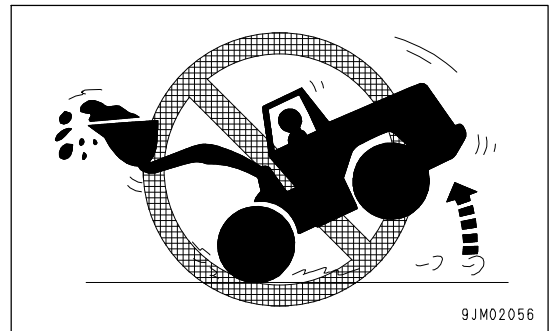
- Travel on grass, fallen leaves, or wet steel plates with low speed. Even with slight slopes there is a hazard that the machine may slip.
- If the engine stops, depress the brake pedal immediately, lower the bucket to the ground, and apply the parking brake to stop the machine.
- When traveling downhill, never shift gear or place the transmission at neutral. It is dangerous not to use the braking force of the engine. Always place the transmission in a low gear before starting to travel downhill.
- When traveling downhill, travel slowly. If necessary, use the braking force of the engine together with the brake pedal to control the travel speed.
- When traveling up or down hills with a loaded bucket, always travel with the bucket facing uphill. If the machine travels with the bucket facing downhill, there is danger that the machine may tip over.

METHOD OF USING BRAKES

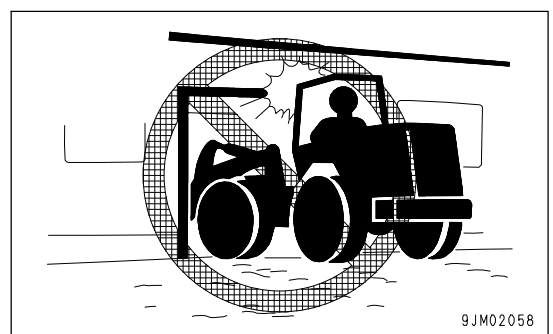
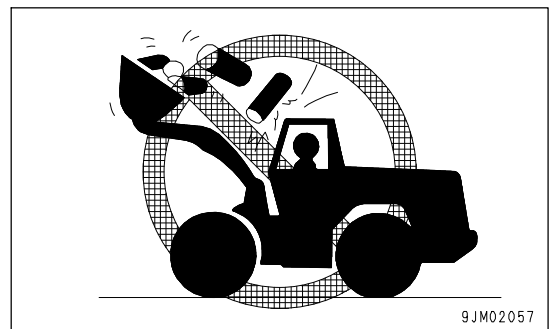
- When the machine is traveling, do not rest your foot on the brake pedal. If you travel with your foot resting on the pedal, the brake will always be applied, and this will cause the brakes to overheat and fail.
- Do not depress the brake pedal repeatedly if not necessary.
- When traveling downhill, use the braking force of the engine, and always use the right brake pedal at the same time.

PRECAUTIONS WHEN OPERATING

- When using the machine, to prevent personal injury caused by damage to the work equipment or by the machine overturning due to overloading, do not exceed the permitted performance of the machine or the maximum permitted load for the structure of the machine.
- If the engine cannot be started again after it has stopped, immediately operate the work equipment control levers to lower the work equipment to the ground. (After the engine stops, the accumulator allows the work equipment to be operated for a limited time.)
- Be careful not to approach too close to the edge of cliffs. When making embankments or landfills, or when dropping soil over a cliff, dump one pile, then use the next pile of soil to push the first pile.
- The load suddenly becomes lighter when the soil is pushed over a cliff or when the machine reaches the top of a slope. When this happens, there is danger that the travel speed will suddenly increase, so be sure to reduce the speed.
- When the bucket is fully loaded, never start, turn, or stop the machine suddenly. There is danger of the machine turning



- When handling unstable loads, such as round or cylindrical objects, or piled sheets, if the work equipment is raised high, there is danger that the load may fall on top of the operator compartment and cause serious injury or death.
- When handling unstable loads, be careful not to raise the work equipment too high or tip the bucket back too much.
- If the work equipment is suddenly lowered or suddenly stopped, the reaction may cause the machine to tip over. Particularly when carrying a load, be sure to operate the work equipment carefully.
- When operating in tunnels, under bridges, under electric wires, or other places where the height is limited, be extremely careful not to let the machine body or work equipment hit 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.

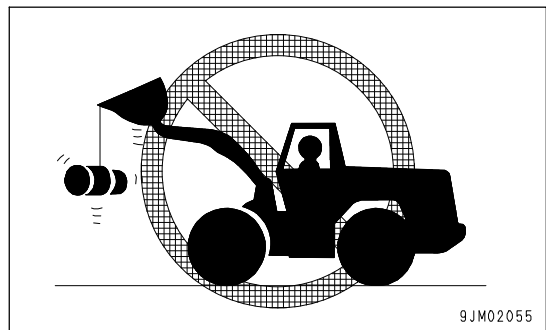
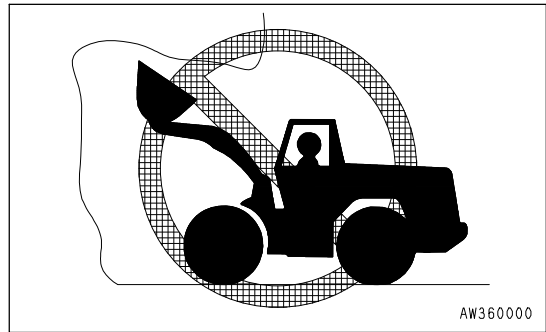


PROHIBITED OPERATIONS

If the machine rolls over or falls, or the ground at the working point collapses, it may lead to serious personal injury or death. Always observe the following precautions.

- Do not excavate the work face under an overhangs. There is danger that the work face will collapse.
- When digging, never thrust the bucket into a load at an angle. This will bring an excessive load to bear on the machine and will reduce the service life of the machine.
- It is dangerous to apply drive force when excavating a rock face. In addition, an excessive load will be brought to bear on the machine and this will cause damage to the machine.
- Never carry out digging operations on a downhill slope. An excessive load will be brought to bear on the machine and this will cause damage to the machine.
- Do not use the bucket or lift arm for crane operations. There is danger that the machine will tip over and that the load will fall.

- Do not pass the bucket over the head of other workers or over the operator's seat of dump trucks or other hauling equipment. The load may spill or the bucket may hit the dump truck and cause serious personal injury or death.

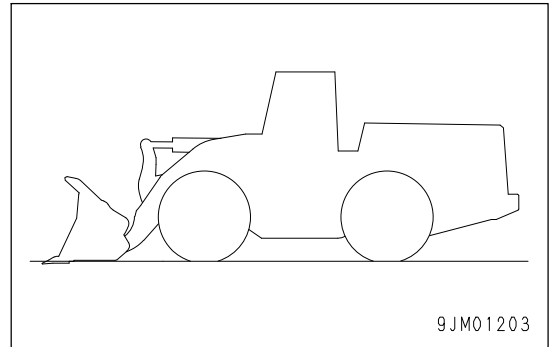


TRAVELING ON SNOW-COVERED OR FROZEN SURFACES

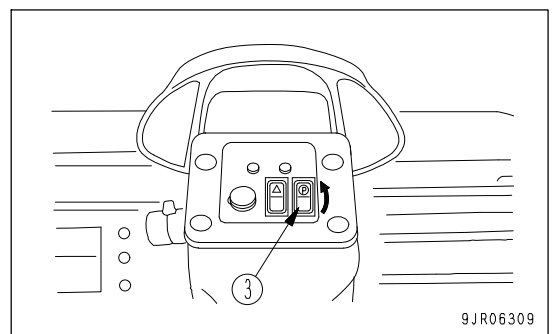
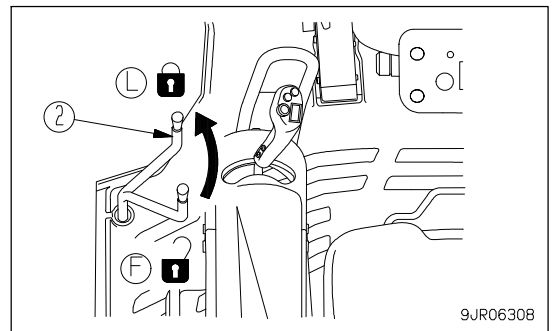
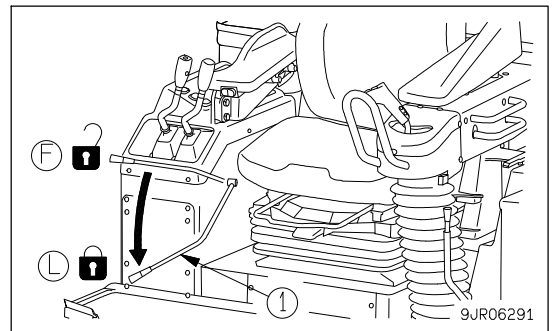
- Snow-covered or frozen surfaces are slippery, so be extremely careful when traveling or operating the machine, and do not operate the levers suddenly. Even a slight slope may cause the machine to slip, so be particularly careful when working on slopes.
- With frozen ground surfaces, the ground becomes soft when the temperature rises, and this may cause the machine to tip over or make it impossible for the machine to escape.
- When traveling on snow-covered roads, always fit tire chains.
- 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 clearing snow, the road shoulder and objects placed beside the road are buried in the snow and cannot be seen. There is a hazard of the machine tipping over or hitting covered objects, so always carry out operations carefully.
- 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 work equipment to the ground to stop the machine.

PARKING MACHINE

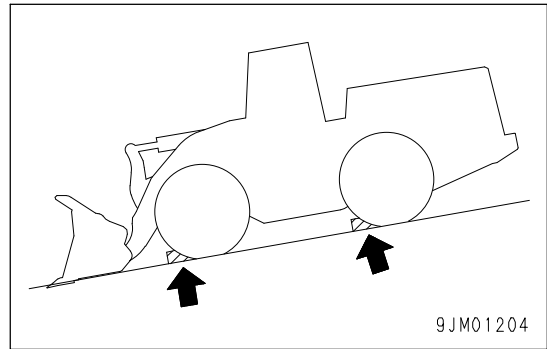
- Park the machine on firm, level ground.
- Select a place where there is no hazard of landslides, falling rocks, or flooding.
- Lower the work equipment completely to the ground.



- When leaving the machine, set work equipment lock lever (1) and steering lock lever (2) to LOCK position (L), turn parking brake switch (3) ON, and 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.



TRANSPORTATION

When the machine is transported on a trailer, there is danger of serious personal injury or death during transportation. Always do as follows.

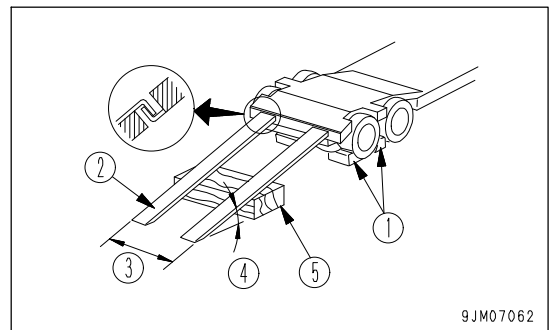
- Always check the machine dimensions carefully. Depending on the work equipment installed, the machine weight, transportation height, and overall length may differ.
- Check beforehand that all bridges and other structures on the transportation route are strong enough to withstand the combined weight of the transporter and the machine being transported.
- The machine can be divided into parts for transportation, so when transporting the machine, please contact your Komatsu distributor to have the work carried out.
- Lock the frame with the frame lock bar to prevent the machine from articulating.
- Fit chains to the front frame and the rear frame to hold the machine securely in position.
- For details of the procedure for transporting the machine, see "TRANSPORTATION (PAGE 3-148)".

LOADING AND UNLOADING

When loading or unloading the machine, mistaken operation may bring the hazard of the machine tipping over or falling, so particular care is necessary. Always do as follows.

- Perform loading and unloading on firm, level ground only. Maintain a safe distance from the edge of the road or cliff.
- Always use ramps of adequate strength. Be sure that the ramps are wide, long, and thick enough to provide a safe loading slope. Take suitable steps to prevent the ramps from moving out of position or coming off.
- Be sure the ramp surface is clean and free of grease, oil, ice and loose materials. Remove dirt from the tire of the machine. On a rainy day, in particular, be extremely careful since the ramp surface is slippery.
- Run the engine at low idling and drive the machine slowly at low speed.
- Never correct your steering on the ramps. If necessary, drive off the ramps, correct the direction, then enter the ramps again.
- When loading or unloading to an embankment or platform, make sure that it has suitable width, strength, and grade.
- For machines equipped with a cab, always lock the door after boarding the machine. If this is not done, the door may suddenly open during transportation.

Refer to "TRANSPORTATION (PAGE 3-148)".



- (1) Blocks
- (2) Ramp
- (3) Width of ramps: Same width as tiers
- (4) Angle of ramps: Max. 15°
- (5) Block

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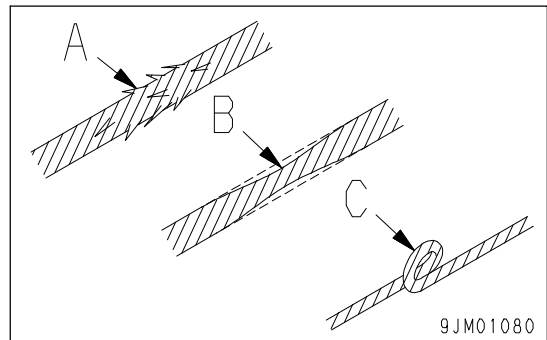
TOWING

PRECAUTIONS WHEN TOWING

Always use the correct towing equipment and towing method. Any mistake in the selection of the wire rope or towing bar or in the method of towing a disabled machine may lead to serious personal injury or death.

For details of the procedure for towing, see the "METHOD OF TOWING MACHINE (PAGE 3-160)"

- 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.



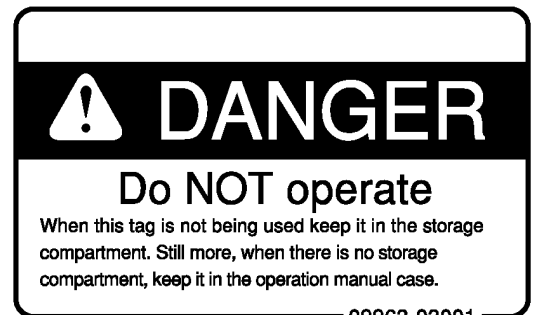
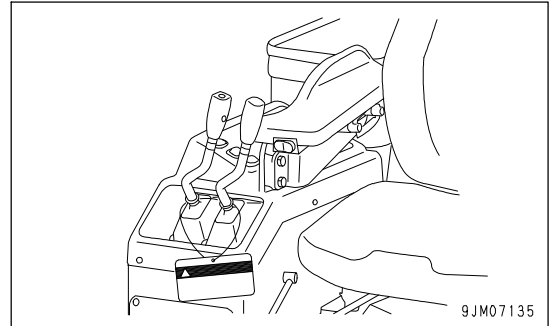
PRECAUTIONS FOR MAINTENANCE

PRECAUTIONS BEFORE STARTING INSPECTION AND MAINTENANCE

DISPLAY WARNING TAG DURING INSPECTION AND MAINTENANCE

If there is any "DANGER! Do NOT operate!" warning tag displayed, it means that someone is carrying out inspection and maintenance of the machine. If the warning sign is ignored and the machine is operated, there is danger that the person carrying out inspection or maintenance may be caught in the rotating parts or moving parts and suffer serious personal injury or death. Do not start the engine or touch the levers.

- If necessary, put up signs around the machine also.
Warning tag part number: 09963-03001
When not using this warning tag, keep it in the toolbox.
If there is no toolbox, keep it in the pocket for the Operation and Maintenance Manual



- To prevent the machine from being started by mistake, turn the battery disconnecter switch (if equipped) to the OFF position. For details, see "HANDLING BATTERY DISCONNECTOR SWITCH AND STARTING MOTOR DISCONNECTOR SWITCH (PAGE 6-30)".

KEEP WORKPLACE 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.

SELECT SUITABLE PLACE FOR INSPECTION AND MAINTENANCE

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

ONLY AUTHORIZED PERSONNEL

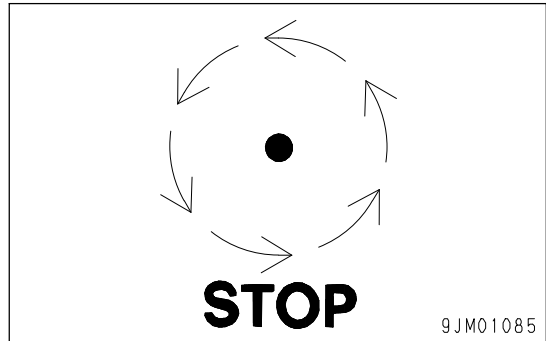
Do not allow any unauthorized personnel into the area when servicing the machine. If necessary, employ a guard.

APPOINT LEADER WHEN WORKING WITH OTHERS

- When repairing the machine or when removing and installing the work equipment, appoint a leader and follow his instructions during the operation.

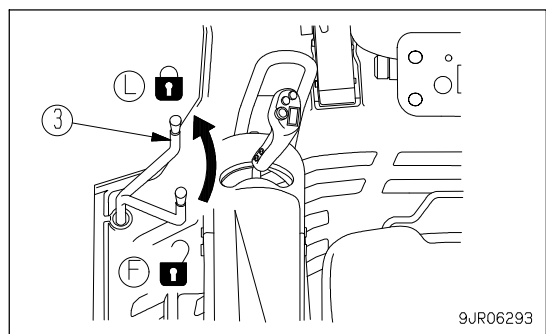
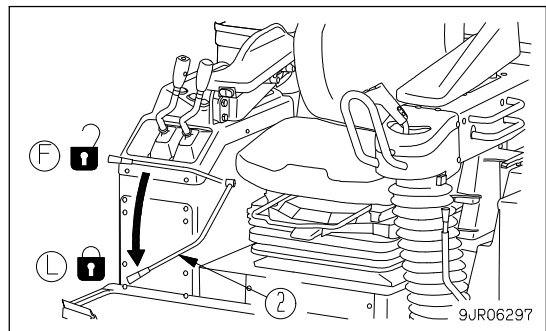
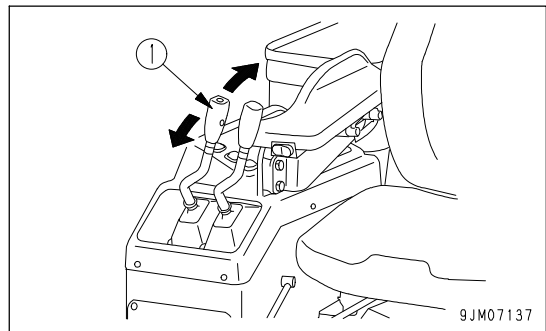
STOP ENGINE BEFORE CARRYING OUT INSPECTION AND MAINTENANCE

- Lower the work equipment completely to the ground and stop the engine before performing any inspection and maintenance.

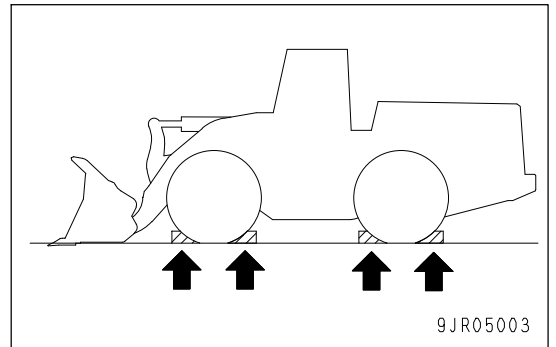
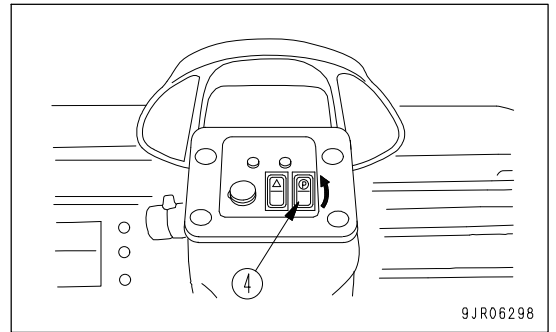


- After stopping the engine, turn the starting switch to the ON position, operate work equipment control lever (1) fully in the RAISE and LOWER directions 2 - 3 times to release the remaining pressure in the hydraulic circuit, then set work equipment lock lever (2) and steering lock lever (3) to LOCK position (L).

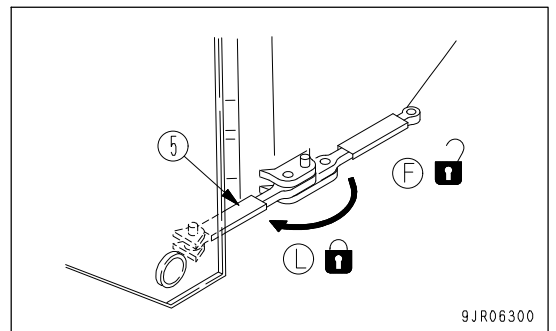
After releasing the remaining pressure in the hydraulic circuit, turn the starting switch to the OFF position.



- Turn parking brake switch (4) ON to apply the parking brake, then put blocks in front of and behind the tires to prevent the machine from moving.



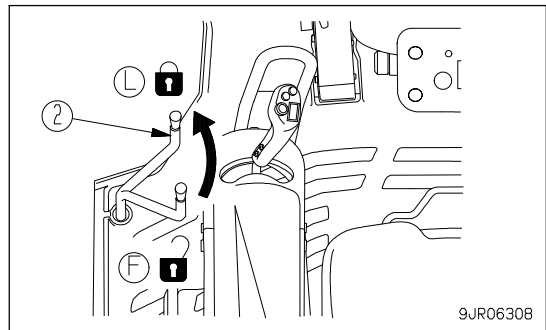
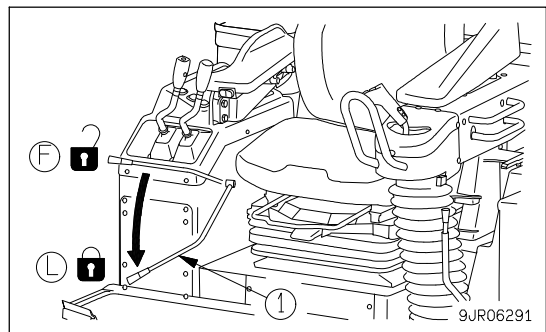
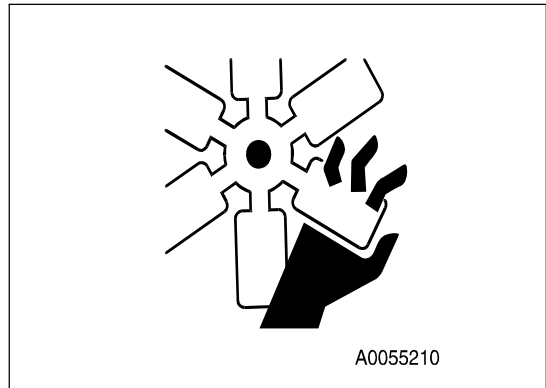
- Set frame lock bar (5) to lock position (L) to lock the front and rear frames.



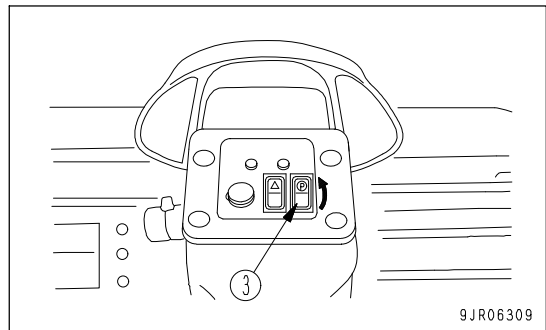
TWO WORKERS FOR MAINTENANCE WHEN ENGINE IS RUNNING

To prevent personal 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.
- 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.
- Never drop or insert tools or other objects into the fan, fan belt, or other rotating parts. There is danger that they may contact the rotating parts and break or be sent flying.
- Lower the work equipment completely to the ground, then set work equipment lock lever (1) and steering lock lever (2) to lock position (L) to prevent the machine from moving.

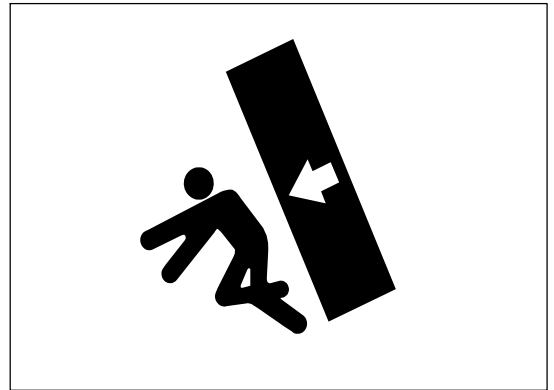


- Turn parking brake switch (3) ON to apply the parking brake, then put blocks in front of and behind the tires to prevent the machine from moving.
- Be careful not to touch the control levers or steering equipment. If the control levers must be operated, always give a signal to your partner and have your partner withdraw to a safe place.



INSTALLING, REMOVING, OR STORING ATTACHMENTS

- Appoint a leader before starting removal or installation operations for attachments.
- Place attachments that have been removed from the machine in a stable condition so that they do not fall. And take steps to prevent unauthorized persons from entering the storage area.

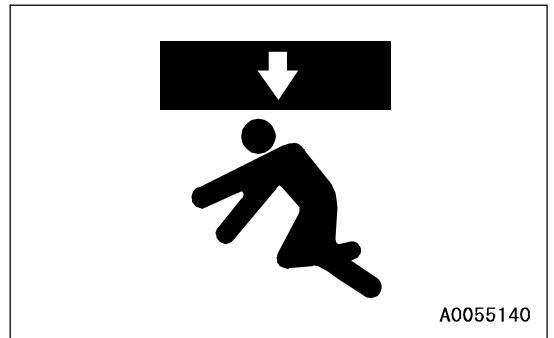


PRECAUTIONS WHEN WORKING AT HIGH PLACES

When working at high places, use a step ladder or other stand to ensure that the work can be carried out safely.

PRECAUTIONS WHEN WORKING UNDER MACHINE OR WORK EQUIPMENT

- Make sure the hoists or jacks you use are in good repair and strong enough to handle the weight of the component. Never use jacks at places where the machine is damaged, bent, or twisted. Never use frayed, twisted or pinched wire rope. Never use bent or distorted hooks.

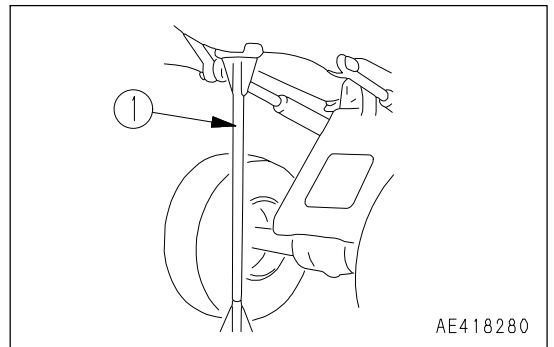


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- If it is necessary to raise the work equipment or a component and then go under it to carry out inspection or maintenance, support the work equipment or component securely with blocks and stands (1) strong enough to support the weight of the work equipment or component.

If the work equipment or component are not supported, there is a hazard that they may come down and that this may lead to serious personal injury or death.

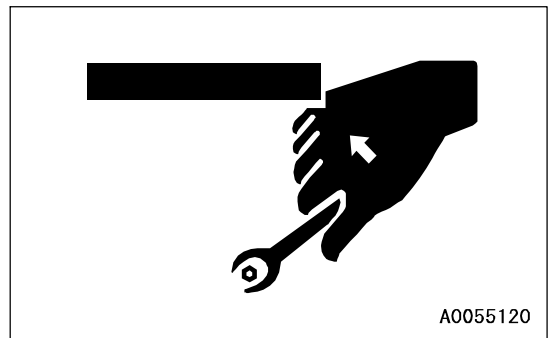
- Never use concrete blocks for supports. They can collapse under even light loads.



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PROPER TOOLS

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



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PRECAUTIONS FOR INSPECTION AND MAINTENANCE

PRECAUTIONS WHEN 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.

HANDLING BATTERY

Before inspecting or handling the battery, turn the key in the starting switch to the OFF position.

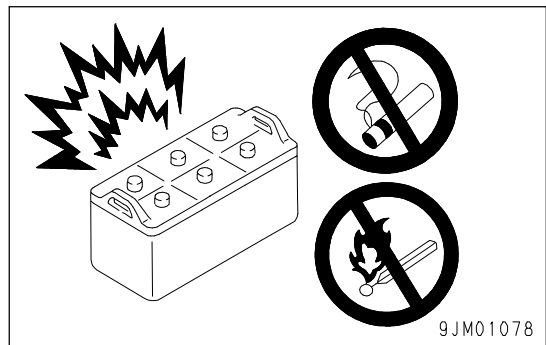
- When installing the optional battery disconnecter switch, turn the battery disconnecter switch to the OFF position.

For details, see "HANDLING BATTERY DISCONNECTOR SWITCH AND STARTING MOTOR

- **Danger of battery exploding**

When the battery is being charged, flammable hydrogen gas is generated and may explode. In addition, the battery electrolyte includes dilute sulphuric acid. Any mistake in handling may cause serious personal injury, explosion, or fire, so always observe the following.

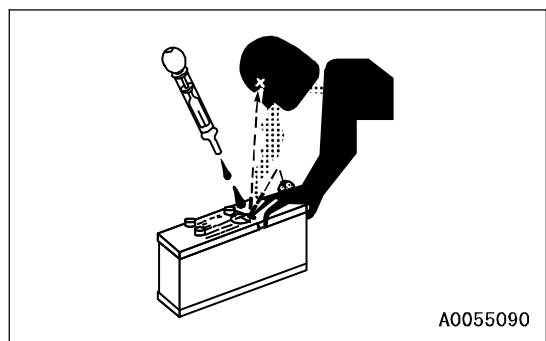
- Do not use or charge the battery if the battery electrolyte is below the LOWER LEVEL mark. This will cause explosion. Always carry out periodic inspection of the battery electrolyte level, and add distilled water (or commercially available battery filler solution) to the UPPER LEVEL mark.
- Do not smoke or bring any flame close to the battery.
- Hydrogen gas is generated when the battery is being charged, so remove the battery from the machine, take it to a well-ventilated place, remove the battery caps, then carry out the charging.
- After charging, tighten the battery caps securely.



- **Danger from dilute sulphuric acid**

When the battery is being charged, flammable hydrogen gas is generated and may explode. In addition, the battery electrolyte includes dilute sulphuric acid. Any mistake in handling may cause serious personal injury, explosion, or fire, so always observe the following.

- When handling the battery, always wear protective goggles and rubber gloves.
- If battery electrolyte gets into your eyes, immediately wash your eyes with large amounts of fresh water. After that, get medical attention immediately.
- If battery electrolyte gets on your clothes or skin, wash it off immediately with large amounts of water.



- **Removing battery cables**

Before repairing the electrical system or carrying out electrical welding, turn the starting switch OFF. Wait for approx. 1 minute, then remove the negative (-) battery cable to stop the flow of electricity.

- For machines equipped with a battery disconnect switch, set the battery disconnect switch to the OFF position.

For details, see "HANDLING BATTERY DISCONNECTOR SWITCH AND STARTING MOTOR DISCONNECTOR SWITCH (PAGE 6-30)".

- **Danger of sparks**

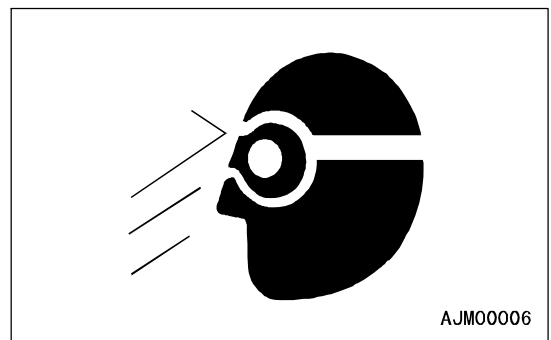
There is hazard that sparks will be generated, so always observe the following.

- Do not let tools or other metal objects make any contact between the battery cables. Do not leave tools lying around near the battery.
- When removing the battery cables, remove the ground cable (negative (-) cable) first. When installing, connect the positive (+) cable first, then connect the ground. Tighten the battery cable terminals securely.
- Secure the battery firmly in the specified position.

PRECAUTIONS WHEN USING HAMMER

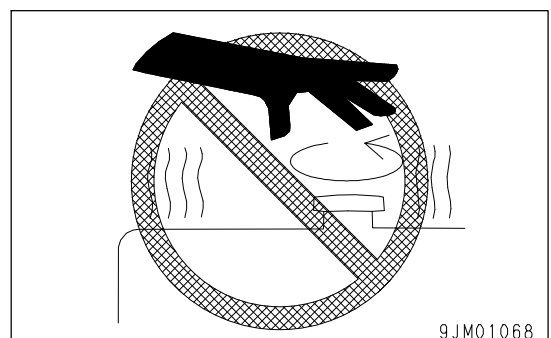
When using a hammer, pins may fly out or metal particles may be scattered. This may lead to serious personal injury or death. Always do as follows.

- When hitting pins or bucket teeth, there is a hazard that broken pieces might be sent flying and injure people in the surrounding area. Always check that there is no one in the surrounding area.
- If hard metal parts such as pins, bucket teeth, cutting edges, or bearings are hit with a hammer, there is a hazard that pieces might be scattered and cause serious personal injury or death. Always wear safety glasses and gloves.
- If the pin is hit with strong force, there is a hazard that it may fly out and injure people in the surrounding area. Do not allow anyone to enter the surrounding area.



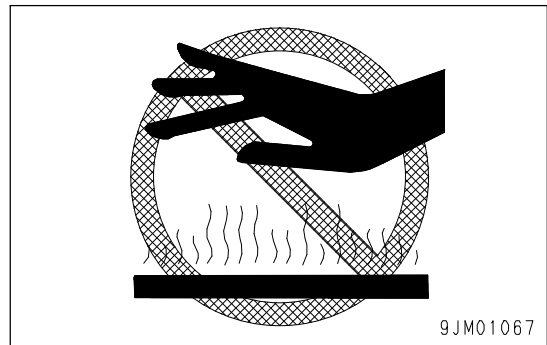
PRECAUTIONS WITH HIGH-TEMPERATURE COOLANT

To prevent burns from boiling water or steam spurting out when checking or draining the coolant, wait for the coolant to cool down to a temperature where the radiator cap can be touched by hand. Then loosen the cap slowly to release the pressure inside the radiator, and remove the cap.



PRECAUTIONS WITH HIGH-TEMPERATURE OIL

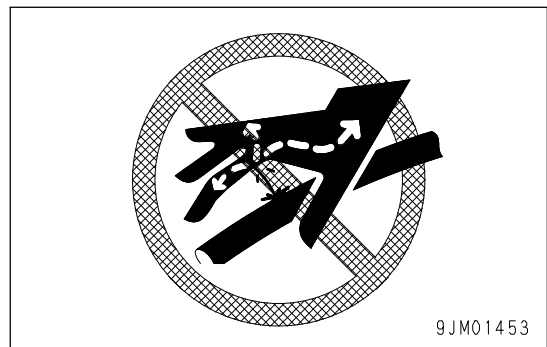
To prevent burns from hot oil spurting out or from touching high-temperature parts when checking or draining the oil, wait for the oil to cool down to a temperature where the cap or plug can be touched by hand. Then loosen the cap or plug slowly to release the internal pressure and remove the cap or plug.



PRECAUTIONS WITH HIGH-PRESSURE OIL

The hydraulic system is always under internal pressure. In addition, the fuel piping is also under internal pressure when the engine is running and immediately after the engine is stopped. When carrying out inspection or replacement of the piping or hoses, check that the internal pressure in the circuit has been released. If this is not done, it may lead to serious personal injury or death. Always do as follows.

- Do not carry out inspection or replacement work with the circuit under pressure.
Always release the pressure before starting. For details, see "STOP ENGINE BEFORE CARRYING OUT INSPECTION AND MAINTENANCE (PAGE 2-36)".
- 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 loss of sight if it contacts your skin or 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



PRECAUTIONS WITH HIGH-PRESSURE FUEL

When the engine is running, high-pressure is generated in the engine fuel piping. When carrying out inspection or maintenance of the fuel piping system, stop the engine and wait for at least 30 seconds to allow the internal pressure to go down before starting the operation.

HANDLING HIGH-PRESSURE HOSES AND PIPING

- If oil or fuel leaks from high-pressure hoses or piping, it may cause fire or misoperation, and lead to serious personal injury, or death. If the hose or piping mounts are loose or oil or fuel is found to be leaking from the mount, stop operations and tighten to the specified torque.
If any damaged or deformed hoses or piping are found, please consult your Komatsu distributor.

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

- Damaged hose or deformed 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.

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.

HANDLING ACCUMULATOR AND GAS SPRING

This machine is equipped with an accumulator. Even after the engine stops, the work equipment control levers can be operated for a short time in the LOWER direction to allow the work equipment to go down under its own weight. After stopping the engine, set the work equipment lock lever and steering lock lever to the LOCK position and turn the parking brake switch ON.

The accumulator and gas spring are charged with high-pressure nitrogen gas. If the accumulator is handled mistakenly, it may cause an explosion that could lead to serious personal injury or death. For this reason, always observe the following precautions.

- Do not disassemble the accumulator.
- 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 hit or roll the accumulator, or subject it to any impact.
- When disposing of the accumulator, the gas must be released. Please contact your Komatsu distributor to have this work performed.



PRECAUTIONS WITH COMPRESSED AIR

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

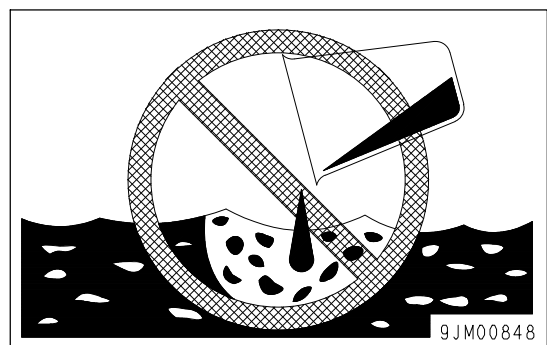
MAINTENANCE OF AIR CONDITIONER

If air conditioner refrigerant gets into your eyes, it may cause loss of sight; if it contacts your skin, it may cause frostbite. Never loosen any parts of the cooling circuit.

DISPOSING OF 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.



MERCURY CONTAINING COMPONENT(S)

The machine may be equipped with optional High Intensity Discharge lighting lamps which may contain mercury. These components must be reused, recycled or properly disposed of in accordance with applicable Local, State and Federal Laws.

METHOD OF SELECTING WINDOW WASHER FLUID

Use an ethyl alcohol base washer liquid.

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

PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS

- For using the machine safely for an extended period of time, replace safety-critical parts like hoses and seat belts periodically.
Replacement of safety-critical parts: See "PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS (PAGE 4-16)".
- 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 personal 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 specified replacement time.

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 personal injury or death.

To maintain safety, always do as follows.

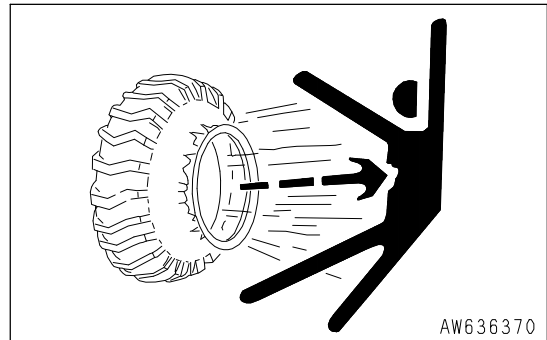
- Maintenance, disassembly, repair, and assembly of the tires and rims requires special equipment and special technology, so always ask your Komatsu distributor to carry out these operations.
- Always use the tires specified by Komatsu and maintain the specified inflation pressure.

Suitable tire inflation pressure: see "HANDLING THE TIRES (PAGE 3-145)"

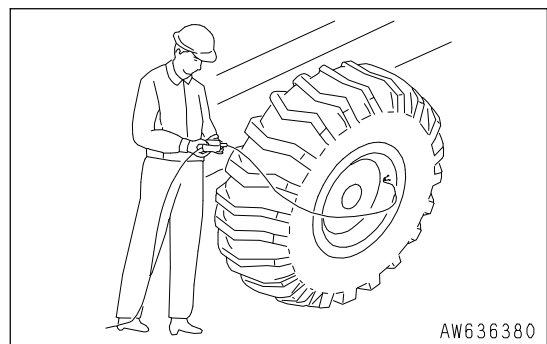
- When pumping up the tires, check that no other person is standing near the tire, and install an air chuck with a clip that can be secured to the air valve.

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.
- Always release all pressure from a single tire or from both tires of a dual assembly prior to removing any rim components.
- Before removing the tire from the machine for repairs, remove the valve partially to release the air from the tire, then remove the tire.



AW636370

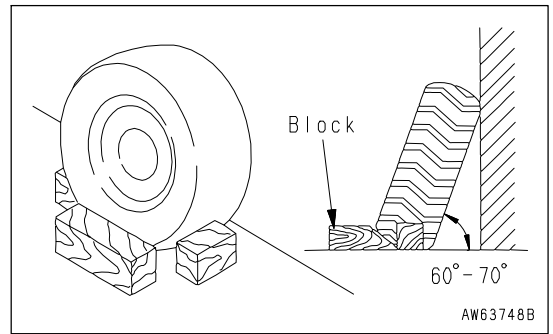


AW636380

PRECAUTIONS WHEN STORING TIRES

Tires for construction equipment are extremely heavy, it may lead to serious personal injury or death. To maintain safety, always do as follows.

- 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.



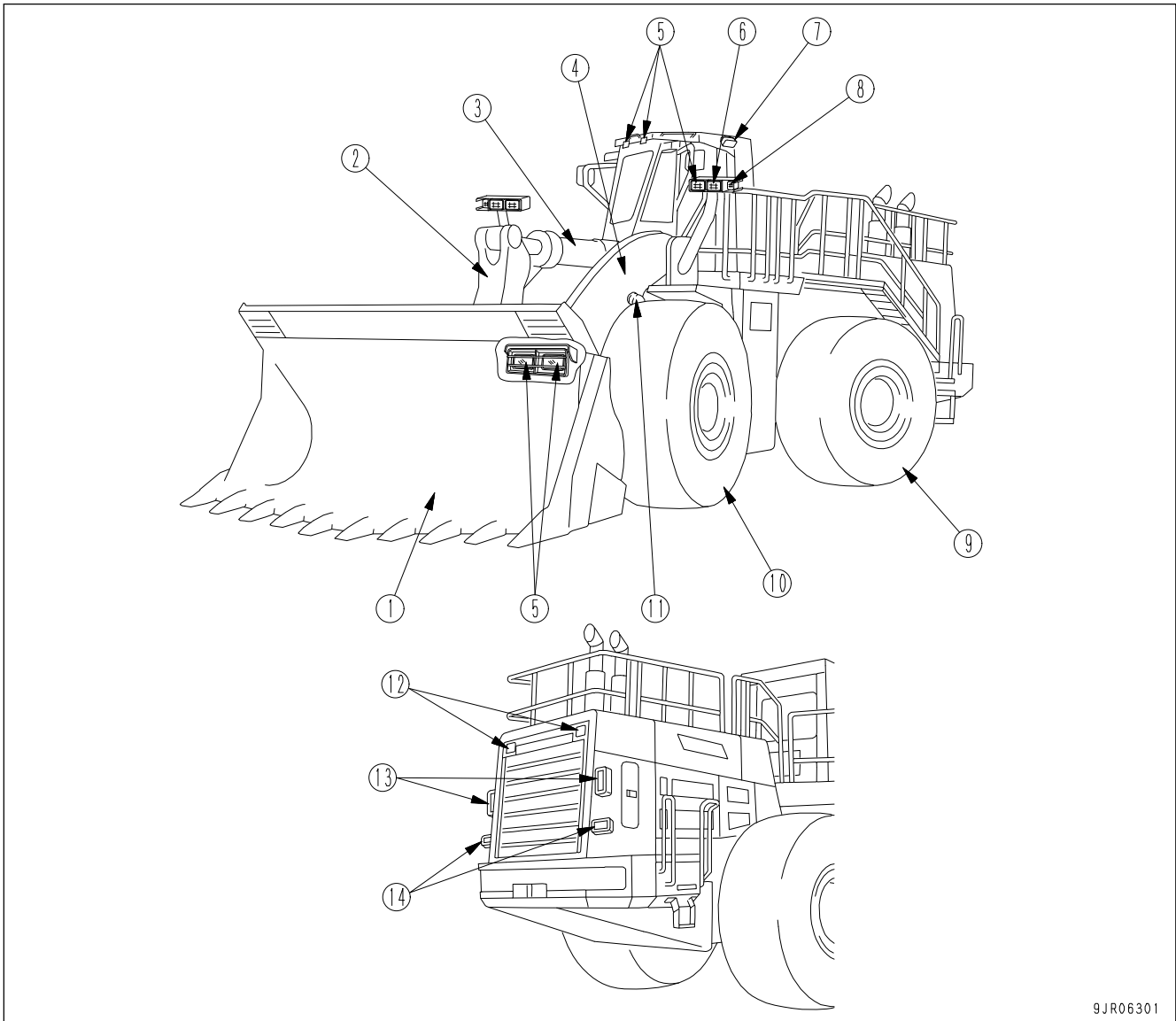
OPERATION

WARNING

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

GENERAL VIEW

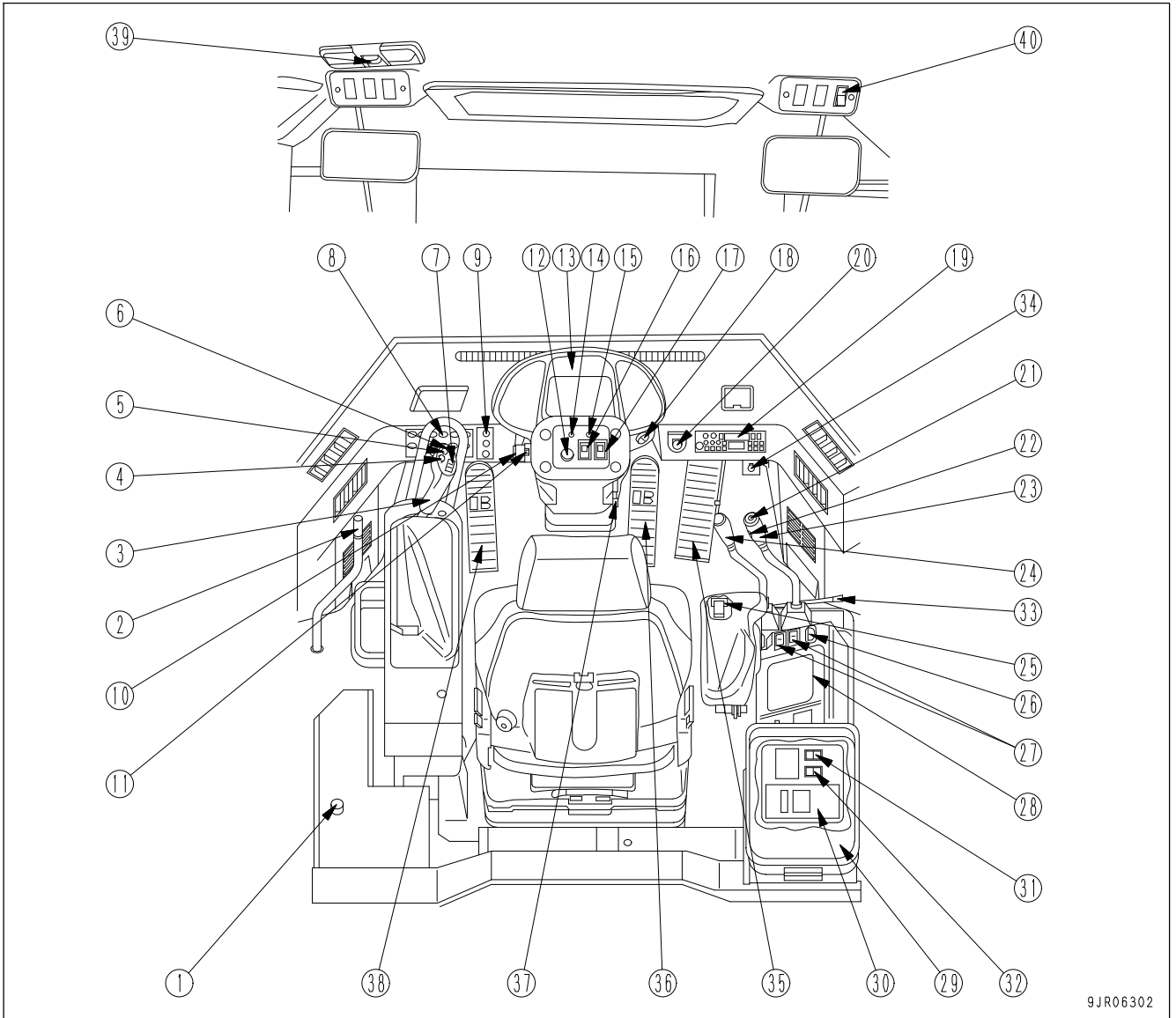
GENERAL VIEW OF MACHINE



9JR06301

- | | |
|------------------------|----------------------------|
| (1) Bucket | (8) Turn signal lamp |
| (2) Bell crank | (9) Rear wheel |
| (3) Bucket cylinder | (10) Front wheel |
| (4) Lift arm | (11) Lift cylinder |
| (5) Front working lamp | (12) Rear working lamp |
| (6) Head lamp | (13) Rear combination lamp |
| (7) Side working lamp | (14) Rear working lamp |

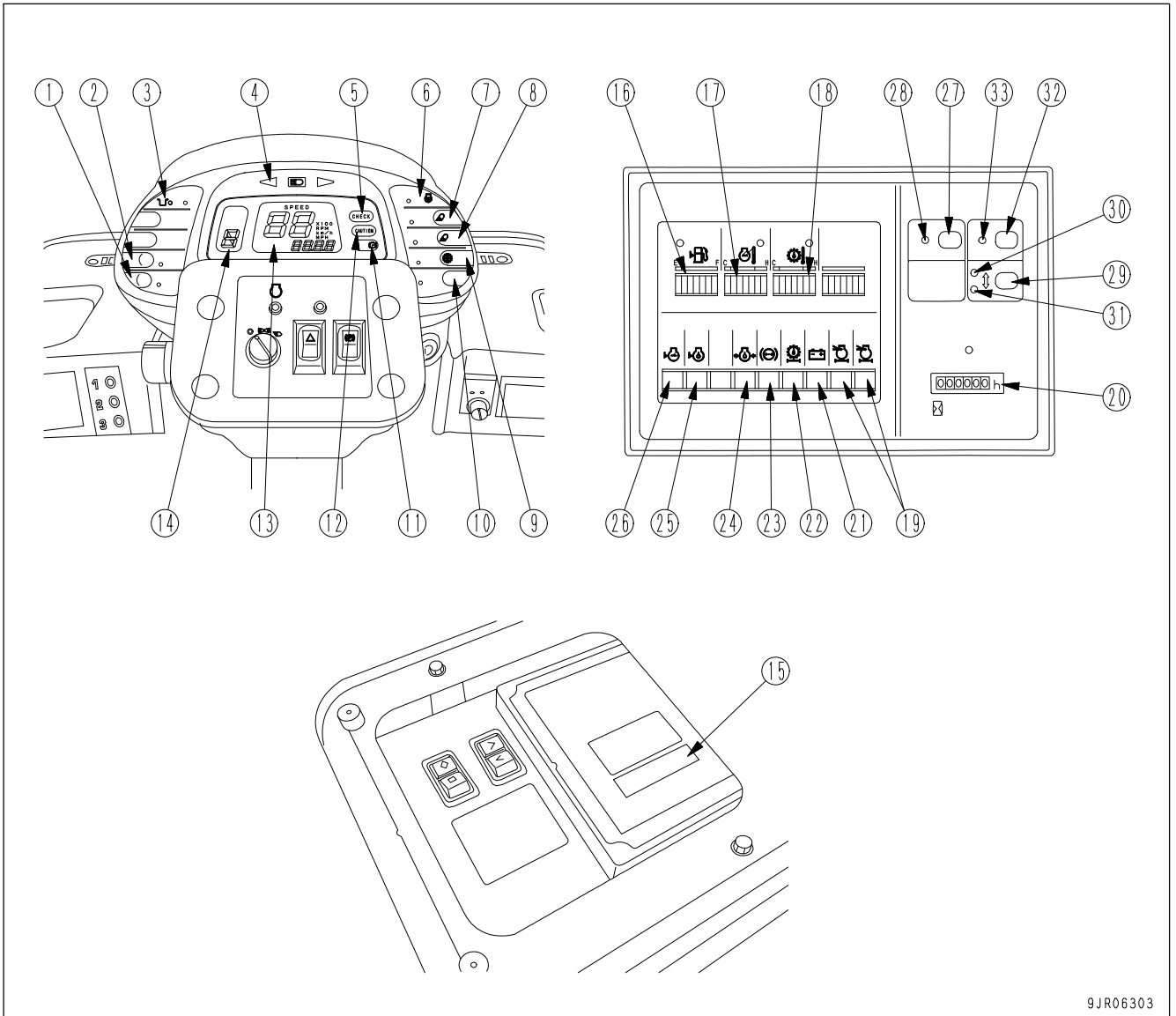
GENERAL VIEW OF CONTROLS AND GAUGES



9JR06302

- | | |
|---|---|
| (1) Step lamp switch | (21) Kickdown switch |
| (2) Steering lock lever | (22) Hold switch |
| (3) AJSS lever (*) | (23) Lift arm control lever |
| (4) Horn switch | (24) Bucket control lever |
| (5) Shift down switch | (25) Turn signal switch |
| (6) Shift up switch | (26) Transmission cut-off switch |
| (7) Directional selector switch | (27) Power window switch |
| (8) Air conditioner panel | (28) Maintenance monitor |
| (9) 1st, 2nd, 3rd speed indicator lamp (for auto shift) | (29) Lunch box tray |
| (10) Front wiper switch | (30) Engine service monitor |
| (11) Rear wiper switch | (31) Machine monitor mode selector switch 1 |
| (12) Lamp switch | (32) Machine monitor mode selector switch 2 |
| (13) Main monitor | (33) Work equipment lock lever |
| (14) Engine warning lamp | (34) Cigarette lighter |
| (15) Prelube indicator lamp | (35) Accelerator pedal |
| (16) Hazard lamp switch | (36) Right brake pedal |
| (17) Parking brake switch | (37) Main moniotr tilt lever |
| (18) Starting switch | (38) Left brake pedal |
| (19) Car radio | (39) Room lamp switch |
| (20) Active working switch | (40) Rear heated wire glass switch |

(*)AJSS: Advanced Joystick Steering System



9JR06303

Main monitor

- (1) Engine low idling selector switch
- (2) Auto-greasing (switch, pilot lamp)
- (3) Emergency steering pilot lamp
- (4) Turn signal pilot lamp
- (5) Central check lamp (CHECK)
- (6) Engine pre-heating pilot lamp
- (7) Front and side working lamp (switch, pilot lamp)
- (8) Rear working lamp (switch, pilot lamp)
- (9) Transmission cut-off (switch, pilot lamp)
- (10) Transmission auto shift/manual selection (switch, pilot lamp)
- (11) Parking brake pilot lamp
- (12) Central caution lamp (CAUTION)
- (13) Speedometer
- (14) Transmission shift indicator

Engine service monitor

- (15) Character display

Maintenance monitor

- (16) Fuel gauge
- (17) Engine water temperature gauge
- (18) Torque converter oil temperature gauge
- (19) Air cleaner clogging caution pilot lamp (left, right)
- (20) Service meter
- (21) Battery charge caution pilot lamp
- (22) Transmission oil filter pilot lamp
- (23) Brake oil pressure caution pilot lamp
- (24) Engine oil pressure caution pilot lamp
- (25) Engine oil level caution pilot lamp
- (26) Engine water level caution pilot lamp
- (27) Remote positioner LOWER position set switch
- (28) Remote positioner LOWER set pilot lamp
- (29) Remote positioner RAISE/LOWER selector switch
- (30) Remote positioner RAISE stop display lamp
- (31) Remote positioner LOWER stop display lamp
- (32) Remote positioner RAISE position set switch
- (33) Remote positioner RAISE set pilot lamp

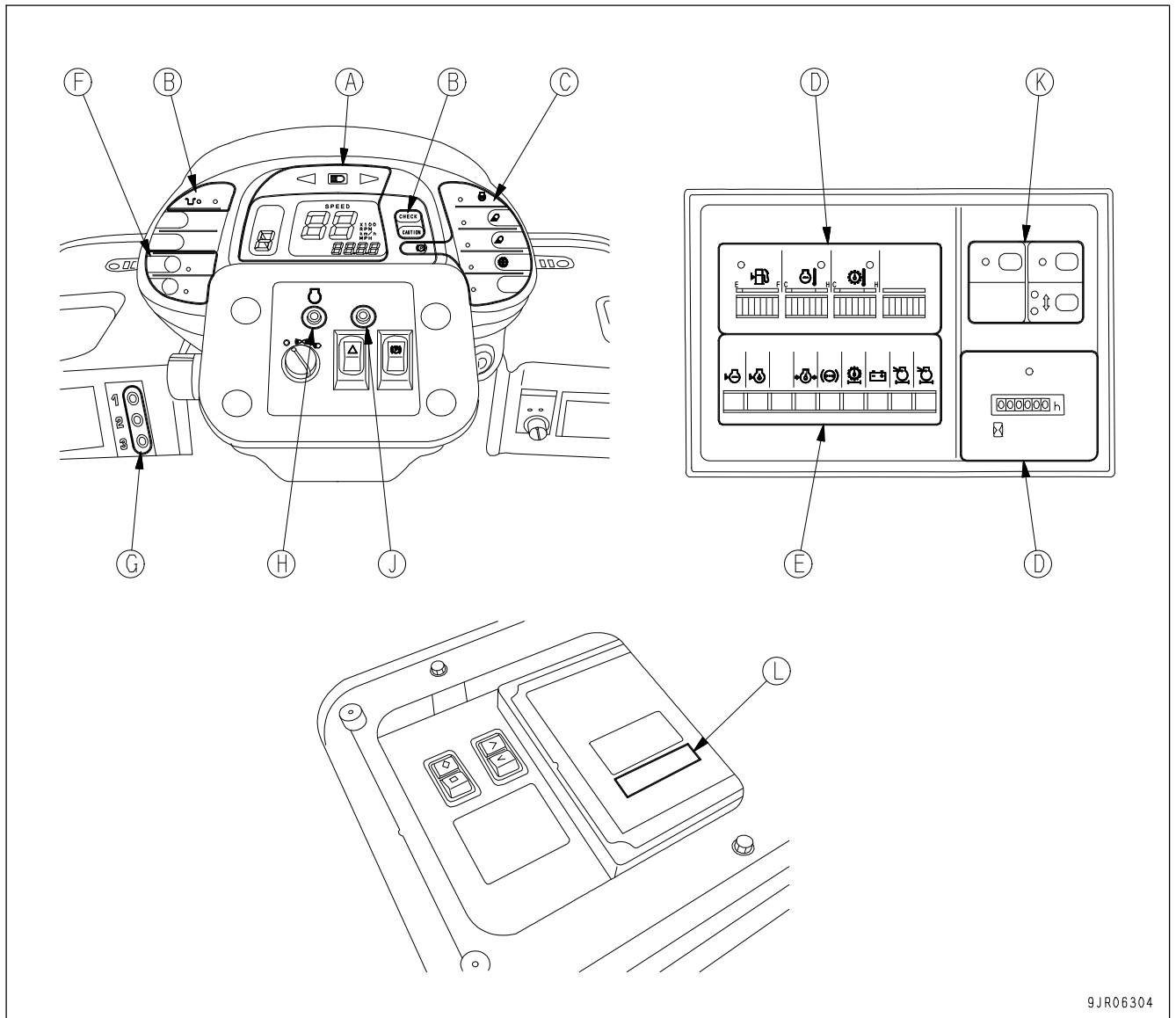
EXPLANATION OF COMPONENTS

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

MONITOR SYSTEM



9JR06304

- A: Meter display portion
- B: Warning display portion
- C: Meter display portion
- D: Meter display portion
- E: Warning display portion
- F: Meter display portion

- G: Meter display portion
- H: Warning display portion
- J: Meter display portion
- K: Meter display portion
- L: Character display portion

The machine monitor system consists of the main monitor (in front of the operator's seat) maintenance monitor (on the right side of the operator's seat), 1st, 2nd, 3rd speed indicator lamps, engine service monitor, engine warning lamp, and prelube indicator lamp.

These are divided according to function into warning display portions (B, E, H), meter display portions (A, C, D, F, G, J, K), and character display portion (L).



CAUTION

These monitors do not guarantee the condition of the machine.

Do not simply rely on the monitor when carrying out checks before starting (daily inspection). Always get off the machine and check each item directly.

WARNING DISPLAYS

Warning display portions (B, E, H) consist of the following.

(For details, see "WARNING DISPLAY (PAGE 3-10)".)

- Central check lamp (CHECK)
- Central caution lamp (CAUTION)
- Warning pilot lamp
 - Engine water level
 - Engine oil level
 - Brake oil pressure
 - Engine oil pressure
 - Battery charge
 - Air cleaner clogging
 - Transimission oil filter
 - Emergency steering
 - Engine warning lamp

METER DISPLAY PORTION

Meter display portions (A, C, D, F, G, J, K) consist of the following.

(For details, see "METER DISPLAY PORTION (PAGE 3-16)".)

- | | |
|---|---|
| <ul style="list-style-type: none"> • Meter <ul style="list-style-type: none"> • Speedometer • Fuel gauge • Engine water temperature gauge • Torque converter oil temperature gauge • Service meter • Transmission shift indicator | <ul style="list-style-type: none"> • Pilot lamp <ul style="list-style-type: none"> • Turn signal lamp • Preheating • Front and side working lamps • Rear working lamp • Transmission cut-off • Parking brake • Transimssion auto shift/manual selector • 1st, 2nd, 3rd speed indicators • Prelube indicator • Remote positioner RAISE stop • Remote positioner LOWER stop • Remote positioner RAISE set • Remote positioner LOWER set • Auto greasing • Engine low idling selector |
|---|---|

CHARACTOR DISPLAY PORTION

For details of (L), see "RELATIONSHIP OF ELECTRONIC CONTROL SYSTEM (PAGE 3-176)".

TESTING ACTUATION OF MACHINE MONITOR SYSTEM

Before starting the engine, turn the starting switch to the ON position. All monitors, gauges, and warning lamps will light up for approx. 3 seconds, and the alarm buzzer will sound for approx. 1 second.

If the buzzer does not sound, there is probably a failure or disconnection.

Ask your Komatsu distributor to carry out the inspection.

When this happens, the speedometer displays 88.

The transmission shift indicator displays 8.

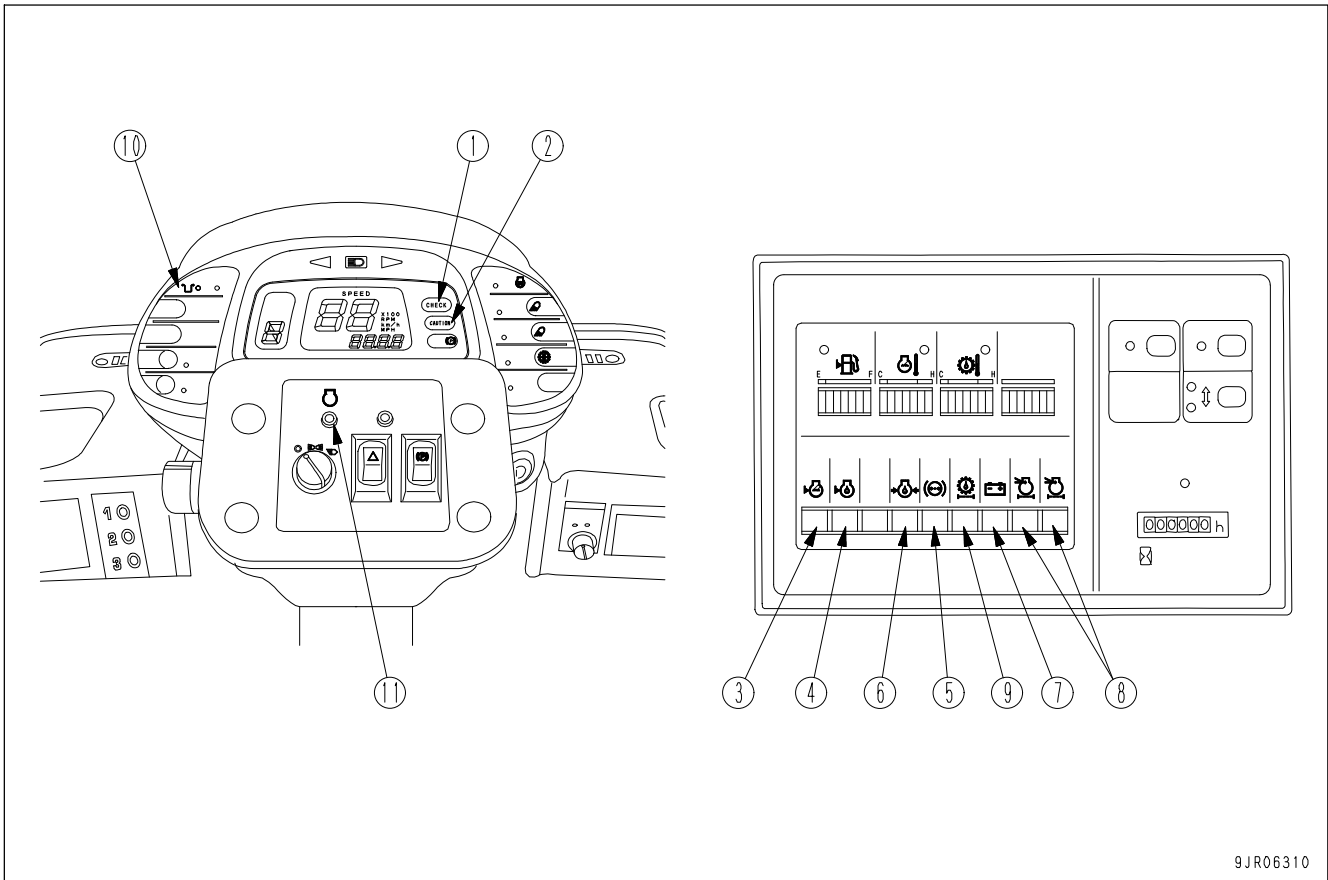
Finally, the buzzer sounds twice intermittently (beep, beep) to show that the monitor check is completed.

If any monitor does not light up, there is probably a failure or disconnection. Contact your Komatsu distributor for inspection.

When the starting switch is turned to the ON position, if the directional selector switch is not at the Neutral position, the central warning lamp (CAUTION) flashes and the alarm buzzer sounds intermittently. If this happens, set the directional selector switch to the Neutral position. The lamp will go out and the buzzer will stop.

Immediately after the engine is stopped, the monitor check cannot be carried out until at least 30 seconds has passed.

WARNING DISPLAY



9JR06310

- (1) Central check lamp (CHECK)
- (2) Central caution lamp (CAUTION)
- (3) Engine water level caution pilot lamp
- (4) Engine oil level caution pilot lamp
- (5) Brake oil pressure caution pilot lamp
- (6) Engine oil pressure caution pilot lamp
- (7) Battery charge caution pilot lamp
- (8) Air cleaner clogging caution pilot lamp (Left, Right)
- (9) Transmission oil filter pilot lamp
- (10) Emergency steering pilot lamp (Red)
- (11) Engine warning lamp

CENTRAL CHECK LAMP (CHECK)**WARNING**

If this monitor flashes, carry out inspection and maintenance of the appropriate location as soon as possible.

- If any abnormality is found in the CHECK items before starting the engine (engine oil level, engine water level), the monitor lamp for the abnormal location will flash and central check lamp (CHECK) (1) will also flash.

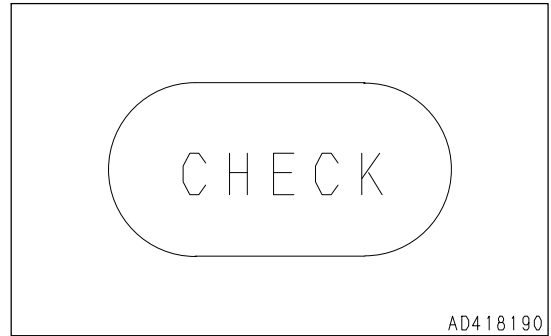
Check the location where the monitor lamp is flashing and carry out the check before starting.

When carrying out the checks before starting, do not rely simply on the monitor. Always carry out the specified check before starting items "CHECK BEFORE STARTING (PAGE 3-76)".

When carrying out checks before starting, if the engine oil level is abnormal, the engine oil level will change when the engine is started, so even if there is any abnormality, the central check lamp and monitor lamp will stop flashing.

If there is any abnormality in the engine water level, the central check lamp will go out when the engine is started, but instead of this, the central caution lamp will flash and the alarm buzzer will sound intermittently.

- If there is any abnormality in the battery charging system when the engine is running, the battery charge caution pilot lamp will flash and the central CHECK lamp (1) will also flash at the same time. If the lamps flash, check the charging circuit.

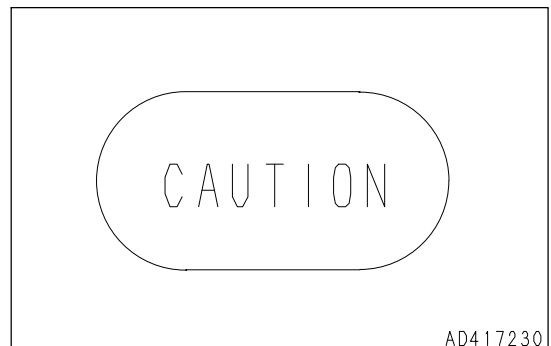


AD418190

CENTRAL CAUTION LAMP (CAUTION)**WARNING**

If this monitor flashes, stop the engine immediately or run it at low idling and do as follows.

- If there is an abnormality in any CAUTION item when the engine is running (engine water temperature, torque converter oil temperature, engine water level, brake oil pressure, engine oil pressure), the alarm buzzer will sound intermittently and the monitor lamp for the location of the abnormality will flash and the central CAUTION lamp (2) will also flash.
- If the fuel gauge enters the red range when the engine is running, the fuel gauge will flash and the central CAUTION lamp (2) will also flash. If they flash, check the fuel level and add



AD417230

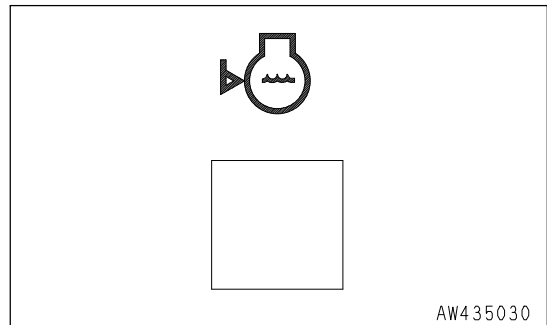
ENGINE WATER LEVEL CAUTION PILOT LAMP

This lamp (3) warns that the coolant level in the radiator has dropped.

When carrying out the checks before starting (starting switch ON, engine stopped):

If the level of the coolant in the radiator is low, the caution pilot lamp and central CHECK lamp will flash.

If the monitor lamps flash, check the coolant level in the radiator sub-tank and add water.



When operating (engine running):

If the condition is normal, the caution pilot lamp should be off. If the level of the coolant in the radiator is too low, the warning pilot lamp and central CAUTION lamp will flash, and the alarm buzzer will sound intermittently.

If the monitor lamps flash, stop the engine, check the level of the coolant in the radiator, and add water.

Stop the machine on level ground before carrying out this check.

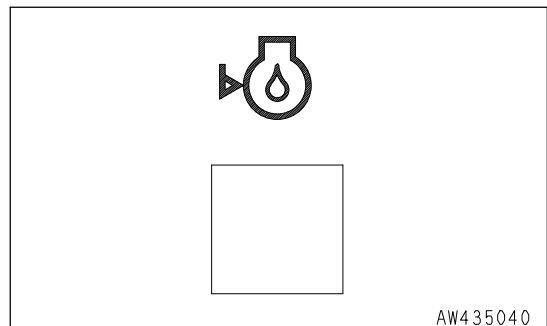
ENGINE OIL LEVEL CAUTION PILOT LAMP

This lamp (4) warns the operator that the level of the oil in the engine oil pan has dropped.

When carrying out checks before starting:

If the oil level in the engine oil pan is low, the caution pilot lamp and central CHECK lamp will flash.

If the monitor lamps flash, check the oil level in the engine oil pan and add oil.



When operating:

Even if the engine oil level caution pilot lamp is flashing during check before starting, it will go out when the engine is started.

BRAKE OIL PRESSURE CAUTION PILOT LAMP

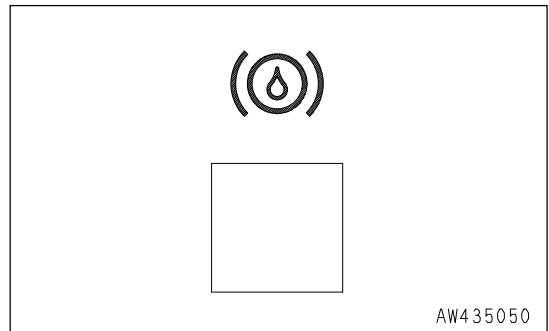
This lamp (5) warns the operator that the brake oil pressure has dropped.

When carrying out checks before starting:

When the engine is stopped, the brake oil pressure circuit is not actuated, so the caution pilot lamp and central CHECK lamp are also off.

When operating:

If the brake oil pressure goes down, the caution pilot lamp and central CAUTION lamp will flash, and the alarm buzzer will sound intermittently. If the monitor lamps flash, stop the engine immediately and check the brake oil pressure circuit.



REMARK

The monitor lamp may flash and go out after approx. 30 seconds immediately after the engine is started. This is because pressure is being stored in the brake accumulator. It does not indicate any abnormality.

ENGINE OIL PRESSURE CAUTION PILOT LAMP

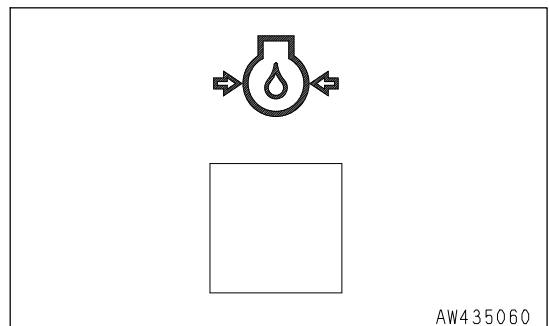
This lamp (6) warns the operator that the engine lubricating oil pressure has dropped.

If it flashes, stop the engine and check.

Check before starting: Lights up

Engine started or running:

When the engine is started, the lubrication pressure is formed and the lamps go out. If the engine lubrication pressure drops, the warning pilot lamp and central CAUTION lamp will flash, and the buzzer will sound intermittently.



BATTERY CHARGE CAUTION PILOT LAMP

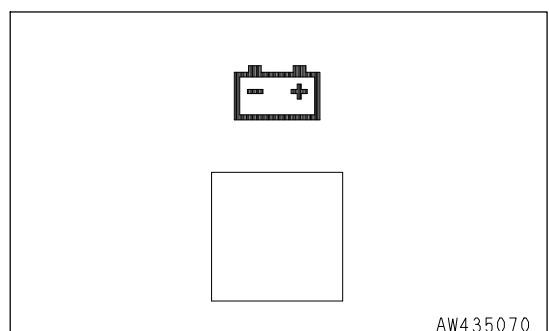
This lamp (7) warns the operator that there is an abnormality in the charging system when the engine is running.

Check before starting: Lights up

Engine started or running:

When the engine is started, the alternator generates electricity and the lamp goes out.

If any abnormality occurs in the charging system, the caution pilot lamp and central CHECK lamp will flash. If they flash, check the charging circuit.



AIR CLEANER CLOGGING CAUTION PILOT LAMP

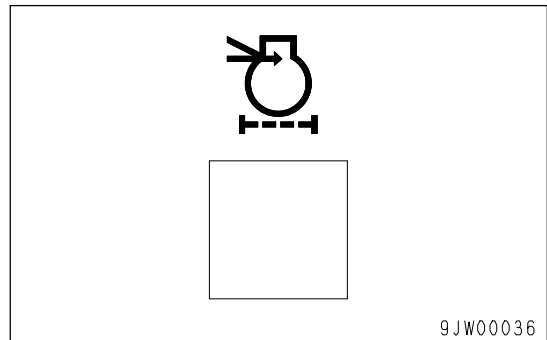
When the engine is running, this lamp (8) warns the operator that the left and right air cleaner elements are clogged.

Check before starting: OFF

When operating:

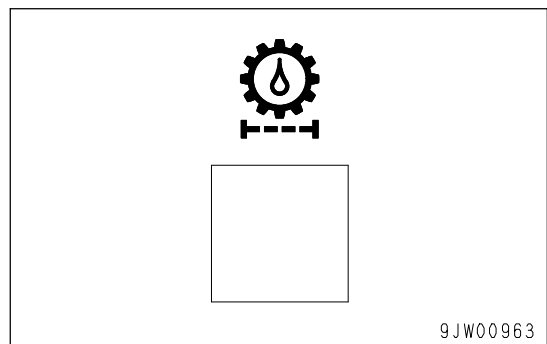
If the air cleaner becomes clogged, the caution pilot lamp and central CHECK lamp will flash.

If they flash, clean or replace the element.

**TRANSMISSION OIL FILTER PILOT LAMP**

This lamp (9) warns the operator that the transmission oil filter is clogged.

If this lamp flashes, replace the filter element.

**EMERGENCY STEERING PILOT LAMP**

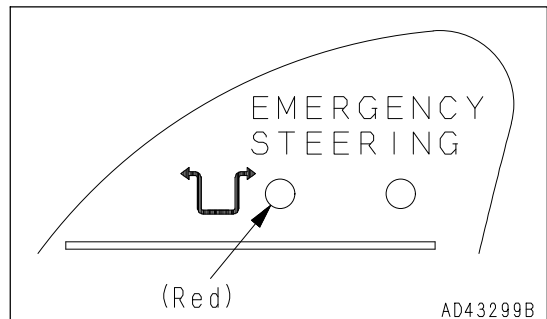
This lamp (10) indicates that the engine has stopped when the machine is traveling, or there is any abnormality in the pump circuit. The monitor flashes (red) to indicate that the emergency steering system has been actuated. If the monitor flashes, stop the engine immediately.

The emergency steering does not work when the machine is stopped.

When the starting switch is turned ON, the emergency steering pilot lamp (red) flashes.

If the pilot lamp does not flash, it indicates that there is an abnormality, so please ask your Komatsu distributor to carry out repairs.

Do not operate the machine until the problem has been removed.



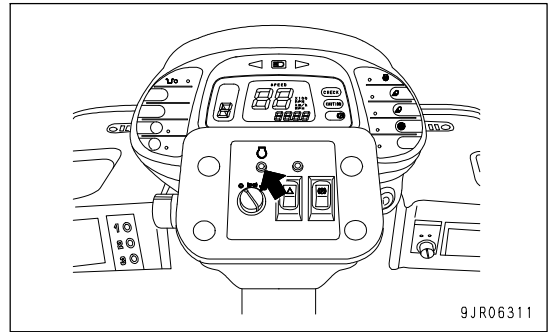
ENGINE WARNING LAMP

This lamp (11) warns the operator that there is an abnormality with the engine.

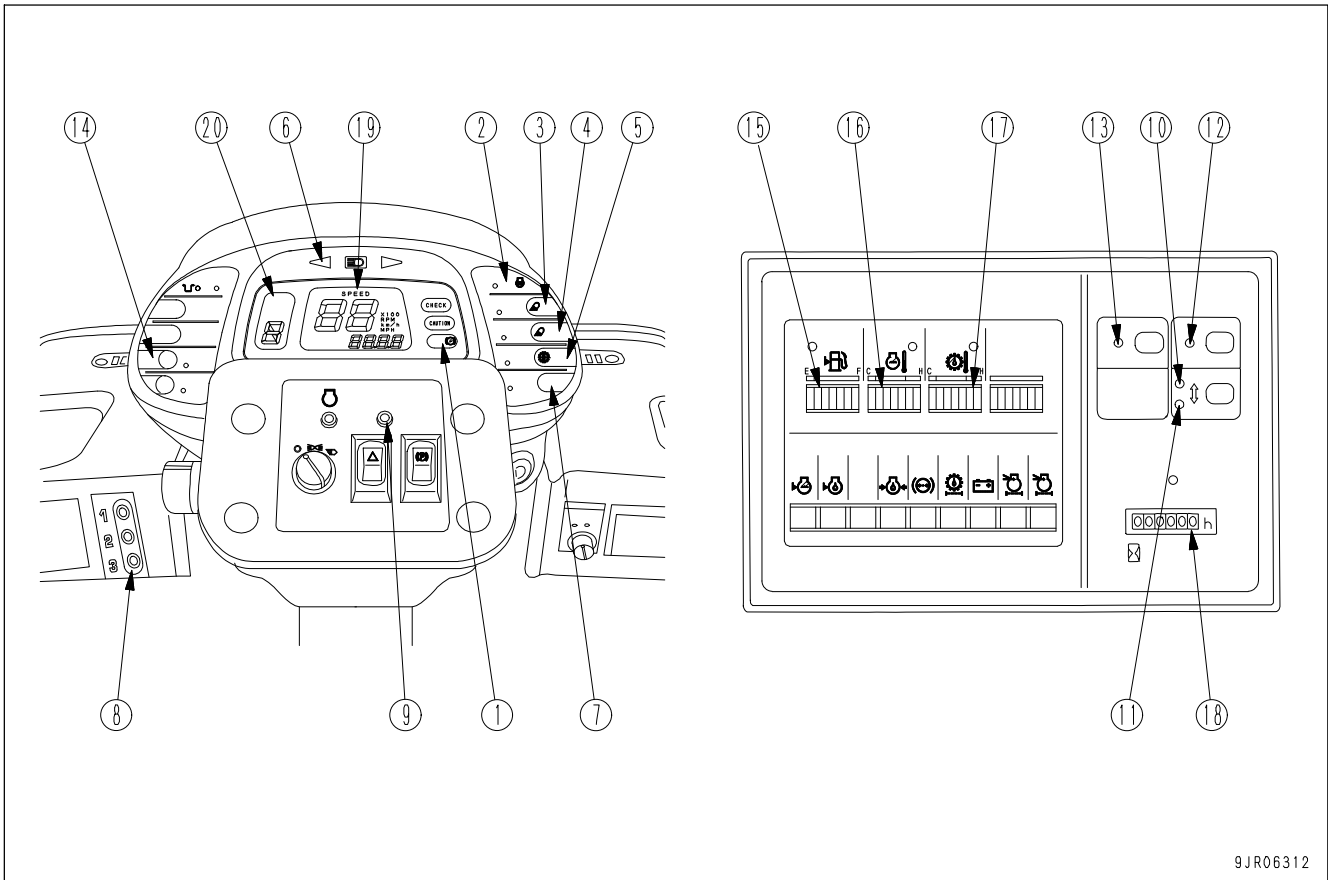
During the check before starting (when the starting switch is at the ON position), this lamp should light up for approx. 2 seconds, and then go out.

If there is any abnormality with the engine, the lamp lights up or flashes.

If the lamp lights up or flashes, stop the machine and check the content of the display on the character display of the engine service monitor. (For details, see "RELATIONSHIP OF ELECTRONIC CONTROL SYSTEM (PAGE 3-176)".)



METER DISPLAY PORTION



9JR06312

- | | |
|--|--|
| (1) Parking brake pilot lamp | (11) Remote positioner LOWER stop display lamp |
| (2) Engine pre-heating pilot lamp | (12) Remote positioner RAISE set pilot lamp |
| (3) Front and side working lamp pilot lamp | (13) Remote positioner LOWER set pilot lamp |
| (4) Rear working lamp pilot lamp | (14) Auto greasing pilot lamp |
| (5) Transmission cut-off pilot lamp | (15) Fuel gauge |
| (6) Turn signal pilot lamp | (16) Engine water temperature gauge |
| (7) transmission auto shift/manual selector pilot lamp | (17) Torque converter oil temperature gauge |
| (8) 1st, 2nd, 3rd speed indicator lamp | (18) Service meter |
| (9) Prelube indicator lamp | (19) Speedometer |
| (10) Remote positioner RAISE stop display lamp | (20) Transmission shift indicator |

PILOT DISPLAY

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

PARKING BRAKE PILOT LAMP

This lamp (1) lights up when the parking brake is applied.

**ENGINE PRE-HEATING PILOT LAMP**

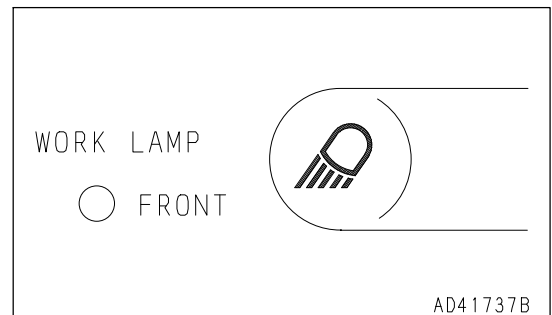
This lamp (2) informs the operator of the pre-heating status of the electrical intake air heater.

This lamp lights up when the starting switch is turned to the ON position, and goes out when the pre-heating is completed.

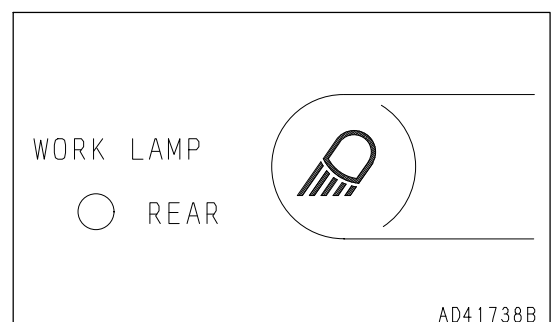
The time that it remains lighted up differs according to the water temperature when the engine is started.

**FRONT AND SIDE WORKING LAMP PILOT LAMP**

This lamp (3) lights up when the front and the side working lamps are switched on.

**REAR WORKING LAMP PILOT LAMP**

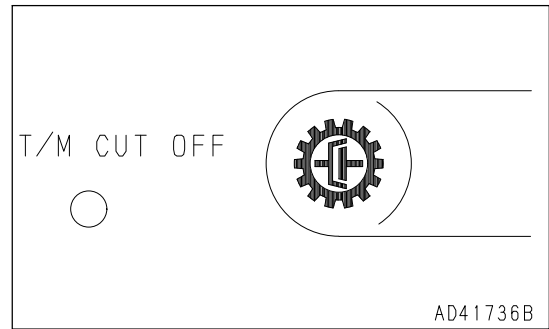
This lamp (4) lights up when the rear working lamp is switched on.



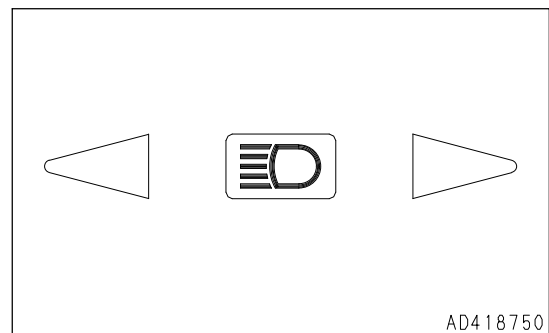
TRANSMISSION CUT-OFF PILOT LAMP

This lamp (5) lights up when the transmission cut-off switch is turned to ON.

If the monitor lamp is ON and the left brake pedal is depressed, the transmission will be returned to neutral.

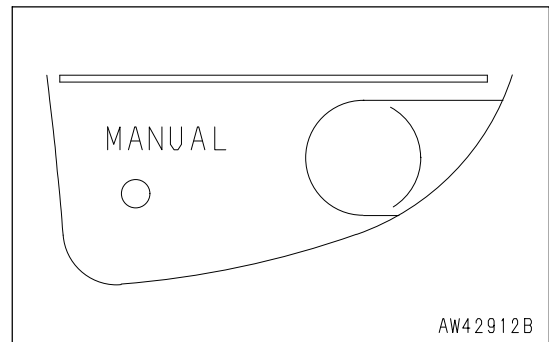
**TURN SIGNAL PILOT LAMP**

When the turn signal lamp flashes, this lamp (6) also flashes.

**TRANSMISSION AUTO SHIFT/MANUAL SELECTOR PILOT LAMP**

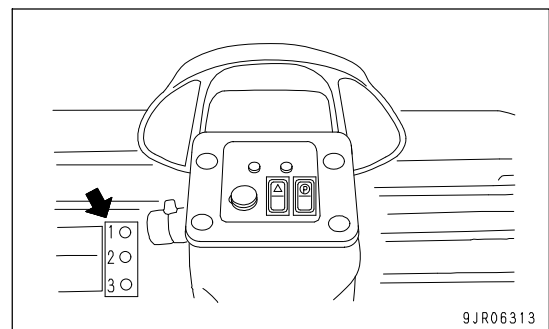
This lamp (7) lights up when the transmission auto shift/manual selector switch is operated and the transmission shift is changed to manual mode.

When the lamp is lighted up, the speed range can be changed by operating the shift up/shift down switch.

**1ST, 2ND, 3RD SPEED INDICATOR LAMP**

This lamp (8) lights up during auto shift and displays the maximum speed range for automatic shifting of the transmission. The maximum speed range can be selected with the shift up switch and the shift down switch.

- 1 lights up: Transmission speed range is fixed at 1st
- 2 lights up: Transmission speed range is fixed at 2nd
- 3 lights up: Transmission speed range is shifted automatically between 2nd and 3rd



PRELUBE INDICATOR LAMP

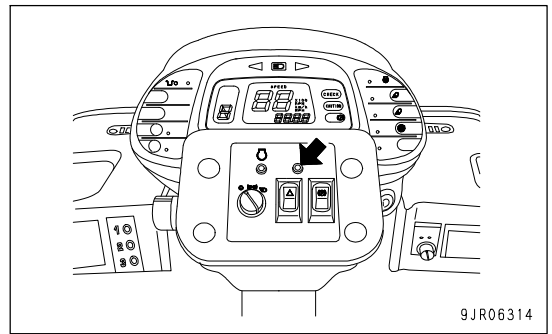
This lamp (9) flashes, lights up, or goes out according to the status of the prelube system.

Flashes: Prelube is needed

Lights up: Prelube now taking place

OFF: Prelube completed or prelube not needed

For details, see "STARTING ENGINE (PAGE 3-91)".



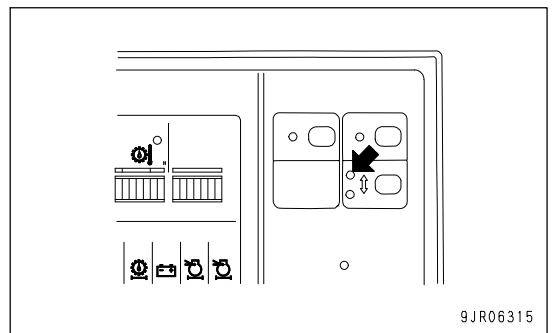
REMARK

This system is designed to reduce wear and prevent seizure by preventing operation if oil is not carrying out lubrication of parts after periodic maintenance has been carried out or after the machine has been out of use for a long period.

REMOTE POSITIONER RAISE STOP DISPLAY LAMP

This lamp (10) lights up or goes out when the remote positioner RAISE stop position is set.

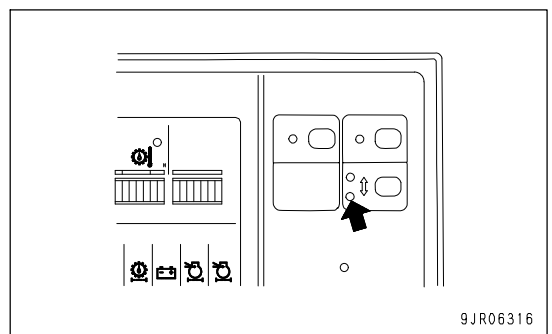
For details, see "REMOTE POSITIONER (PAGE 3-112)".



REMOTE POSITIONER LOWER STOP DISPLAY LAMP

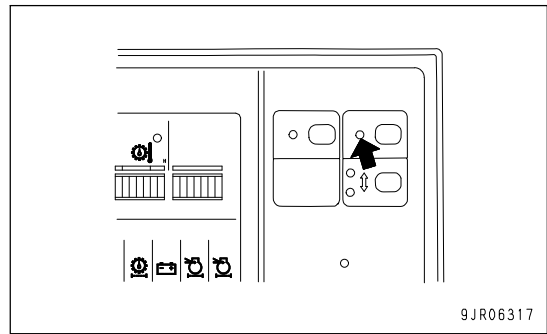
This lamp (11) lights up or goes out when the remote positioner LOWER stop position is set.

For details, see "REMOTE POSITIONER (PAGE 3-112)".

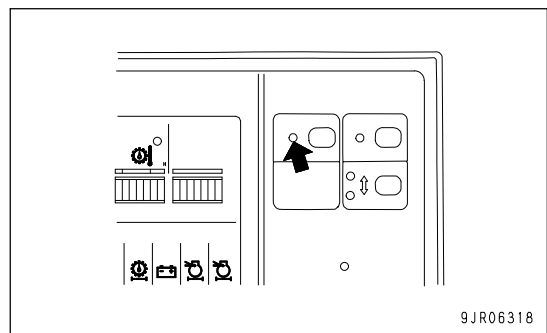


REMOTE POSITIONER RAISE SET PILOT LAMP

This lamp (12) lights up, flashes, or goes out when the remote positioner RAISE stop position is set or the sensor is adjusted.
For details, see "REMOTE POSITIONER (PAGE 3-112)".

**REMOTE POSITIONER LOWER SET PILOT LAMP**

This lamp (13) lights up, flashes, or goes out when the remote positioner LOWER stop position is set or the sensor is adjusted.
For details, see "REMOTE POSITIONER (PAGE 3-112)".

**AUTO-GREASING PILOT LAMP**

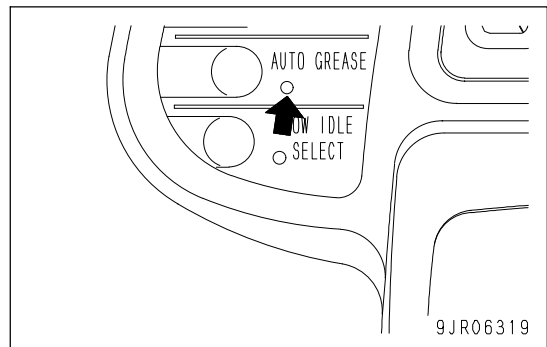
This lamp (14) shows that auto greasing is being carried out.
The lamp should be lighted up.

If the lamp is flashing, it means that there is lack of grease inside the grease pump.

For details, see "HANDLING AUTO-GREASING SYSTEM (PAGE 6-3)".

If the lamp flashes, charge with grease.

For details, see "METHOD OF CHARGING WITH GREASE (PAGE 6-16)".



METERS

FUEL GAUGE

This meter (15) shows the level of fuel in the fuel tank.

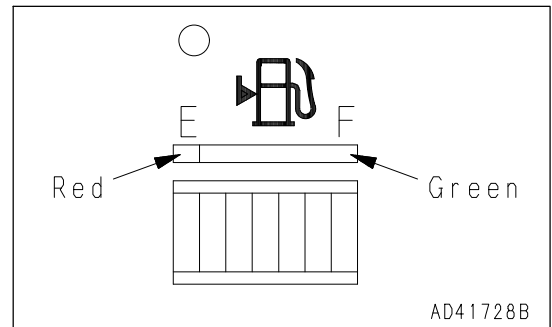
E indicates that there is no fuel.

F indicates that the tank is full.

During operations, the green range should be lighted up.

If the gauge enters the red range during operations, the central warning lamp (CAUTION) and fuel gauge lamp flash.

If only the red range lights up during operations, it means that there is less than 250 liters (66.05 US gal) of fuel remaining, so check and add fuel.



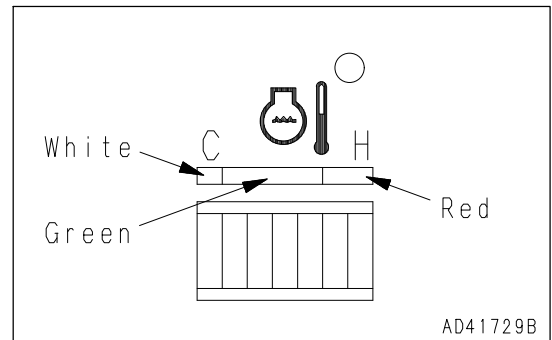
ENGINE WATER TEMPERATURE GAUGE

This meter (16) shows the engine water temperature.

During operations, the green range should be lighted up.

If the red range lights up during operations, stop the machine, run the engine under no load at a mid-range speed, and wait for the green range to light up again.

If the first segment of the red range lights up, the central warning lamp (CAUTION) and engine water temperature gauge lamp flash; if the second segment of the red range also lights up, the lamps flash and the alarm buzzer sounds intermittently.



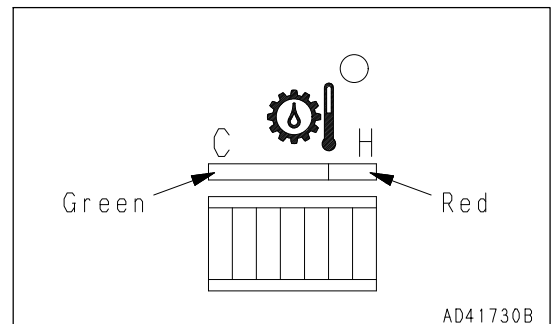
TORQUE CONVERTER OIL TEMPERATURE GAUGE

This meter (17) shows the torque converter oil temperature.

During operations, the green range should be lighted up.

If the red range lights up during operations, stop the machine, run the engine under no load at a mid-range speed, and wait for the green range to light up again.

If the first segment of the red range lights up, the central warning lamp (CAUTION) and torque converter oil temperature gauge lamp flash; if the second segment of the red range also lights up, the lamps flash and the alarm buzzer sounds intermittently.



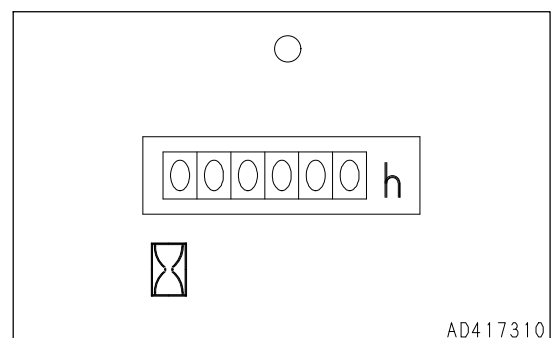
SERVICE METER

This meter (18) shows the total number of hours that the machine has been operated.

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

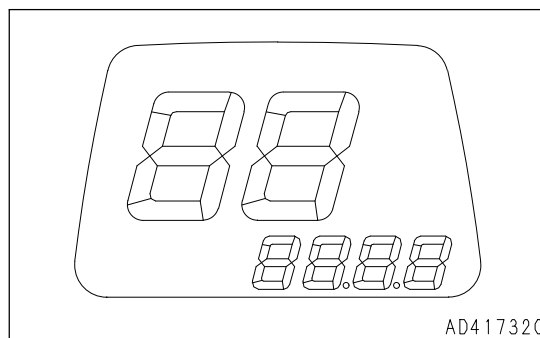
When the engine is running, the green operating display above the meter flashes to show that the meter is advancing.

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



SPEEDOMETER

This meter (19) shows the travel speed of the machine.



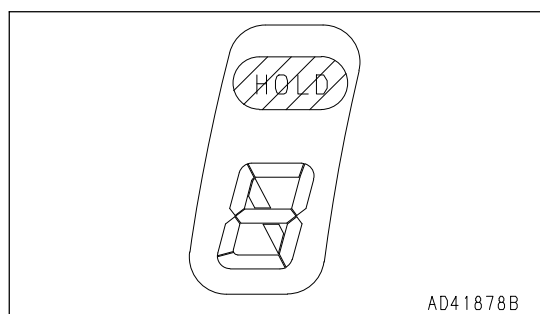
AD417320

TRANSMISSION SHIFT INDICATOR

This indicator (20) shows the transmission speed range.

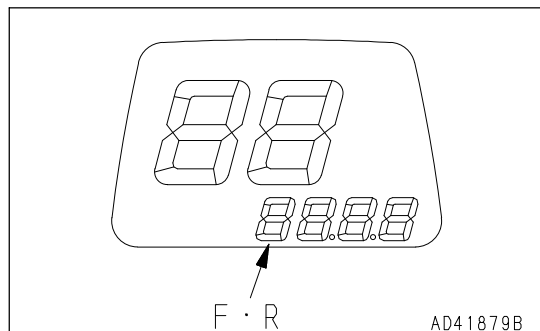
If the forward-reverse selector switch is at the Neutral position, the indicator displays N.

If the forward-reverse selector switch is at the FORWARD or REVERSE position, the transmission speed range number is displayed.



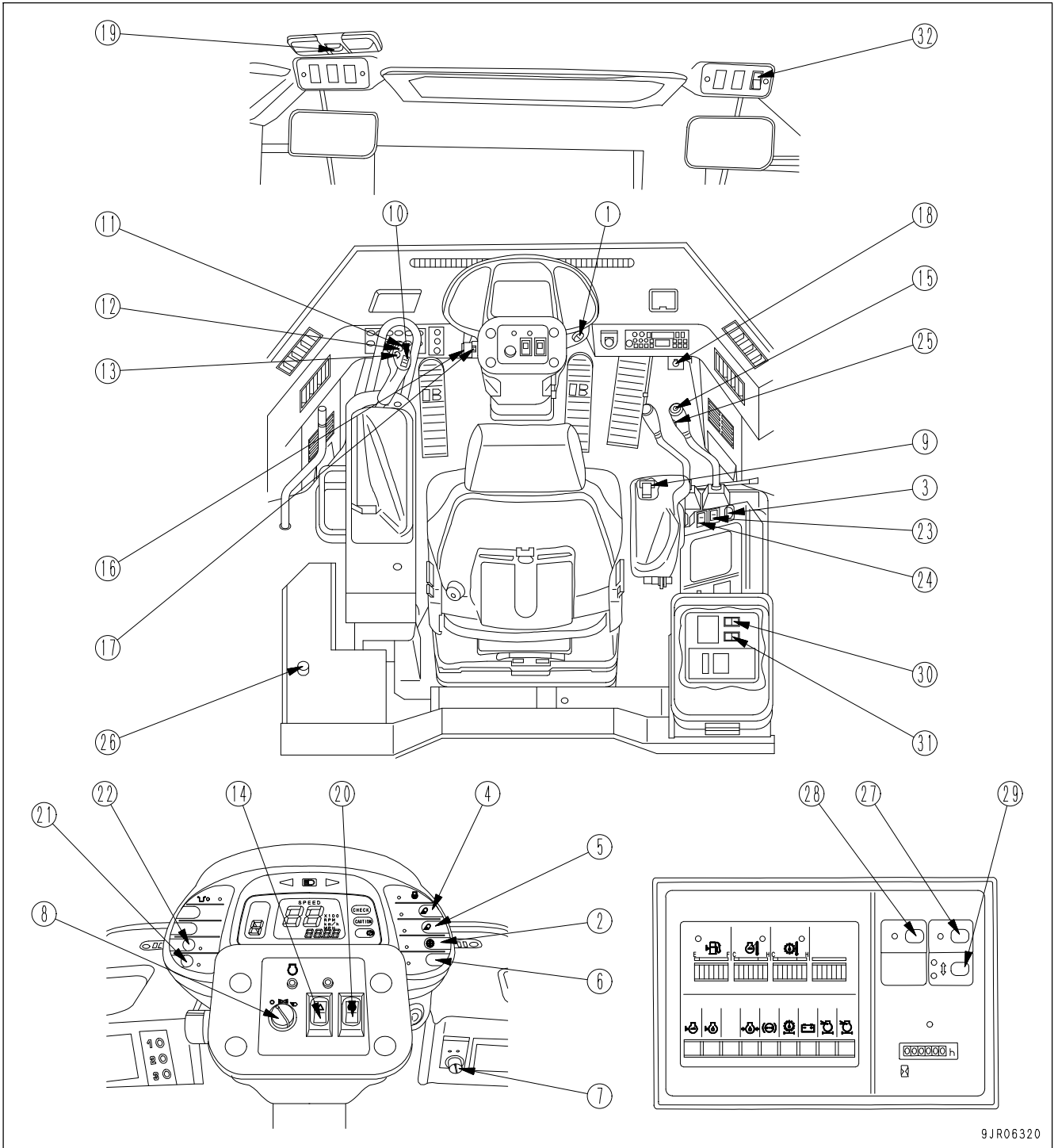
AD41878B

If the AJSS lever at the head of the directional selector switch is at the FORWARD or REVERSE position, the small window below the speedometer displays F or R.



AD41879B

SWITCHES



-
- | | |
|--|--|
| (1) Starting switch | (17) Rear wiper switch |
| (2) Transmission cut-off switch | (18) Cigarette lighter |
| (3) Transmission cut-off set switch | (19) Room lamp switch |
| (4) Front and side working lamp switch | (20) Parking brake switch |
| (5) Rear working lamp switch | (21) Engine low idling selector switch |
| (6) Transmission auto shift/manual selector switch | (22) Auto-greasing switch |
| (7) Active working switch | (23) Right power window switch |
| (8) Lamp switch | (24) Left power window switch |
| (9) Turn signal switch | (25) Hold switch |
| (10) Directional selector switch | (26) Step lamp switch |
| (11) Shift up switch | (27) Remote positioner RAISE position set switch |
| (12) Shift down switch | (28) Remote positioner LOWER position set switch |
| (13) Horn button | (29) Remote positioner RAISE/LOWER selector switch |
| (14) Hazard lamp switch | (30) Machine monitor mode selector switch 1 |
| (15) Kickdown switch | (31) Machine monitor mode selector switch 2 |
| (16) Front wiper switch | (32) Rear heated wire glass switch |

STARTING SWITCH

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

OFF position

The key can be inserted and removed at this position. When the key is turned to this position, all electrical circuits are turned off and the engine stops.

In addition, the parking brake is automatically applied.

ON position

In this position, electric current flows to the charging circuit, lamp circuit, and accessory circuit.

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

For machines equipped with a prelube system

The engine prelube system is actuated. For details, see "STARTING ENGINE (PAGE 3-91)".

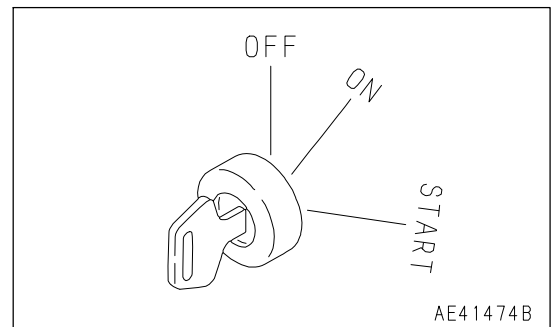
If the engine water temperature is below -5°C (23°F) when the engine is started, the preheating pilot lamp will light up automatically and preheating will start.

The preheating time differs according to the temperature of the water when the engine is started.

If the preheating pilot lamp lights up, wait for it to go out, then turn the key to the START position.

START position

This is the engine-start position. Keep the key at this position during cranking. Immediately after starting the engine, release the key. It will automatically return to the ON position.



TRANSMISSION CUT-OFF SWITCH

**WARNING**

When starting the machine off up a hill, turn the transmission cut-off switch to the OFF position, depress the brake pedal, then gradually depress the accelerator pedal and release the brake slowly to allow the machine to start off. This makes it possible to prevent the machine from rolling back.

Press push button switch (2) to turn it ON or OFF.

If the switch is pressed once, the pilot lamp lights up to show that the system is ON, and the transmission is returned to Neutral when the brake pedal is depressed to the set position.

If the switch is pressed again, the pilot lamp goes OFF and the system is turned OFF.

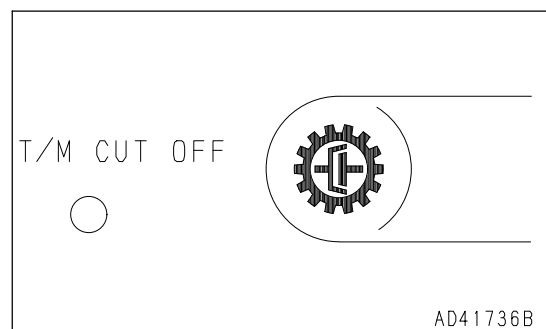
Normally, keep the switch at the ON position.

For details of setting the depression position of the brake pedal, see "ADJUSTING TRANSMISSION CUT-OFF POSITION (PAGE 3-108)".

OFF: Left brake pedal acts as normal brake (like right brake pedal).

ON: Left brake pedal acts as normal brake, but also switches transmission to NEUTRAL.

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

**REMARK**

- With normal operations, if the transmission cut-off function is used, the rise in the brake oil temperature and torque converter oil temperature is reduced.
- The transmission cut-off set switch on the right console can be used to set the position of the brake pedal to be used for cutting off the transmission.

TRANSMISSION CUT-OFF SET SWITCH

**CAUTION**

Apply the parking brake before adjusting the transmission cut-off position.

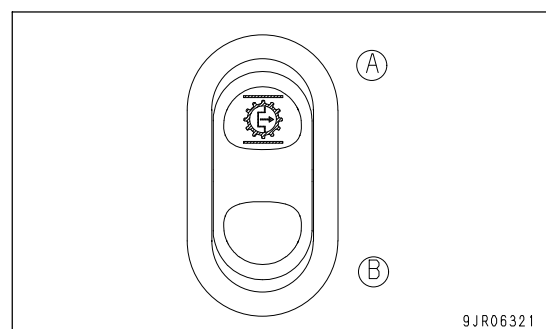
When this switch (3) is pressed to turn it ON, the transmission cut-off function can be used to set the position of the brake pedal for returning the transmission to Neutral.

Position (A): ON

The cut-off position can be set.

When the switch is released, it automatically returns to its original position.

For details of setting the depression position of the brake pedal, see "ADJUSTING TRANSMISSION CUT-OFF POSITION (PAGE 3-108)".



FRONT AND SIDE WORKING LAMP SWITCH

Use this push button switch (4) to turn the front working lamp (A) and side working lamp (B) lamp ON and OFF.

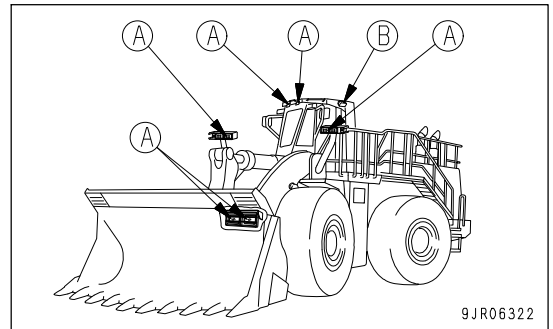
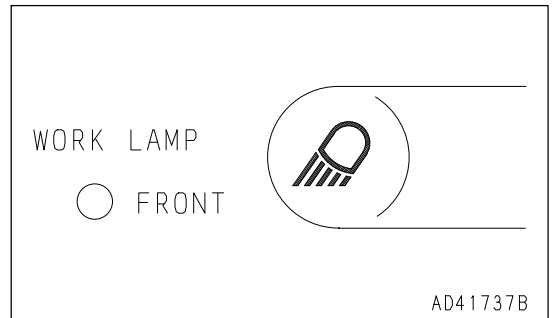
When the switch is pressed once, the pilot lamp lights up and the lamp is turned ON; when the switch is pressed again, the pilot lamp goes out and the lamp is turned OFF.

ON: Lights up

OFF: Goes out

When turning the front working lamp and side working lamp ON, first turn the side clearance lamp or head lamp to the ON position, then operate the switch for the working lamp. If the side clearance lamp or head lamp are not at the ON position, the working lamps will not light up.

For details, see "LAMP SWITCH (PAGE 3-29)".



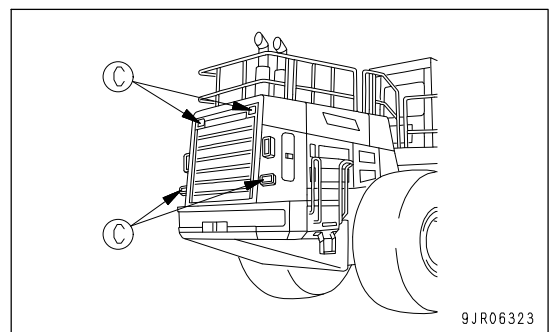
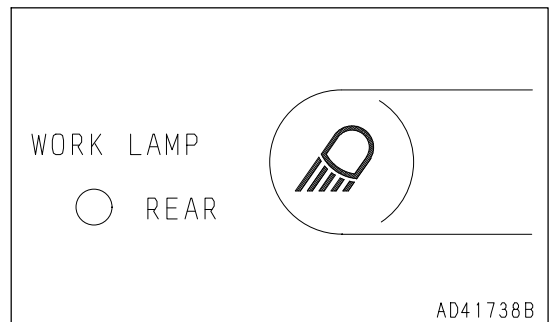
REAR WORKING LAMP SWITCH

When turning rear working lamp (C) ON, first turn the side clearance lamp switch or head lamp switch to the ON position, then operate this switch (5).

When the switch is pressed once, the pilot lamp lights up and the lamp is turned ON; when the switch is pressed again, the pilot lamp goes out and the lamp is turned OFF.

If the side clearance lamp or head lamp are not at the ON position, the working lamp will not light up.

For details, see "LAMP SWITCH (PAGE 3-29)".



TRANSMISSION AUTO SHIFT/MANUAL SELECTOR SWITCH

Press push button switch (6) to turn the switch ON or OFF.

When the switch is pressed once, the pilot lamp lights up and the lamp is turned ON; when the switch is pressed again, the pilot lamp goes out and the lamp is turned OFF.

Normally, keep the switch at the OFF position.

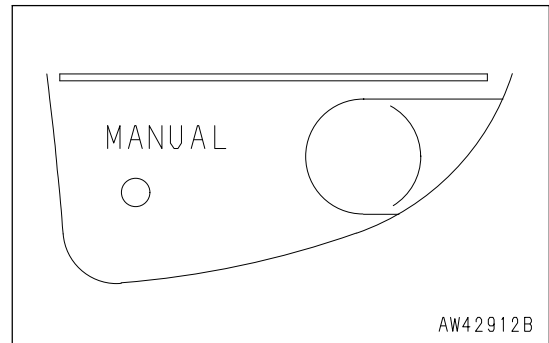
OFF: System is set to auto shift

The transmission shifts automatically according to the travel speed. The maximum speed range selected for automatic shifting is displayed by the 1st, 2nd, 3rd speed indicator lamp at the bottom of the main monitor.

ON: System is set to manual shift

Use the shift up and shift down switches to select the speed range when traveling.

The 1st, 2nd, 3rd speed indicator lamp go out.



When the switch is set to the ON position, the transmission auto shift/manual selector pilot lamp lights up.

REMARK

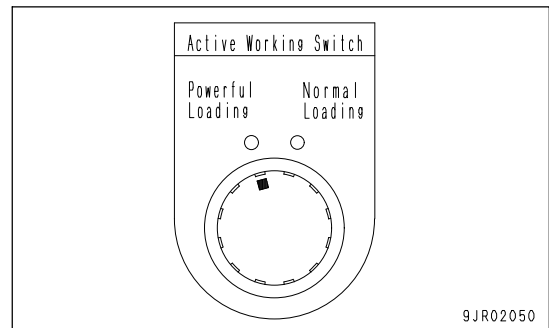
- The speed range after turning the starting switch to the ON position is the final speed range selected by the previous operation.
- If the system is shifted from auto shift to manual shift, or from manual shift to auto shift when the machine is stopped, the speed range is automatically set to 2nd.

ACTIVE WORKING SWITCH

Use this switch (7) to switch the condition of the machine to match the purpose of operation.

Powerful Loading position: The drive force when digging becomes larger. When the drive force is large, the work equipment speed is slow, so this is suitable only for

Normal Loading position: The work equipment speed is fast, so this is suitable only for loading products.



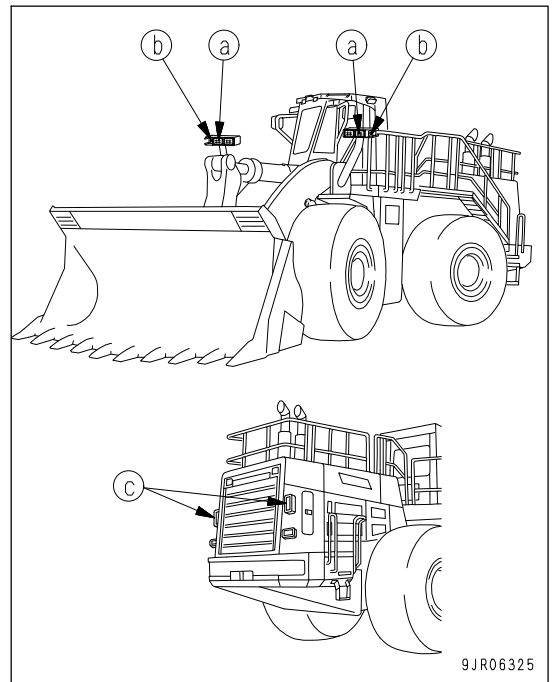
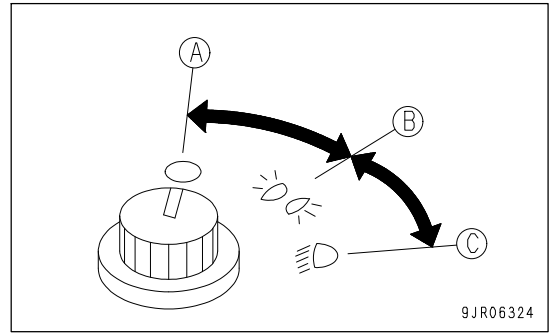
LAMP SWITCH

Use this switch (8) to light up head lamps (a), side clearance lamps (b), tail lamps (c) and the instrument panel lighting.

Position (A): OFF

Position (B): Side clearance lamps, tail lamps, and panel lighting light up

Position (C): head lamps light up in addition to lamps at position (B)



TURN SIGNAL SWITCH

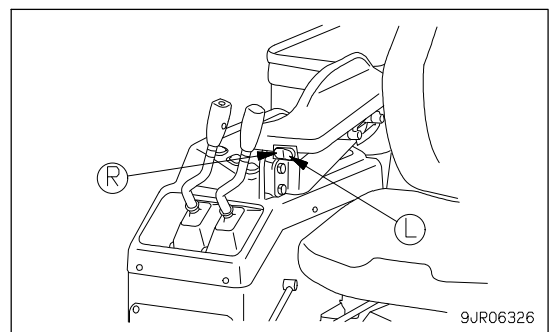
Use this switch (9) to operate the turn signal lamp.

Position (L): Left turn (switch is operated to left)

Position (R): Right turn (switch is operated to right)

REMARK

- When this switch is operated, the turn signal lamps and turn signal lamp pilot lamp also light up.
- The turn signal switch does not automatically return to the Neutral position even when the AJSS lever is returned. Return it to the Neutral position by hand.

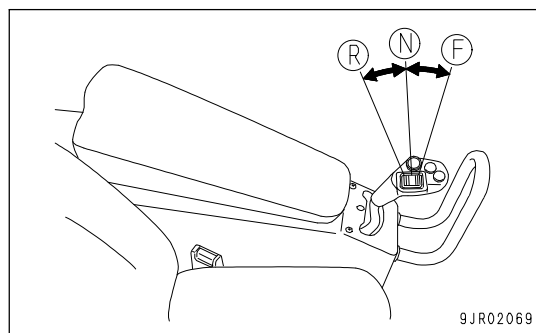


DIRECTIONAL SELECTOR SWITCH

Use FNR switch (9) on the head of the joystick steering lever to switch the direction of travel for the transmission.

- (F) position: FORWARD
- (N) position: Neutral
- (R) position: REVERSE

Use the shift up and shift down switches on the head of the joystick steering lever to select the speed range.

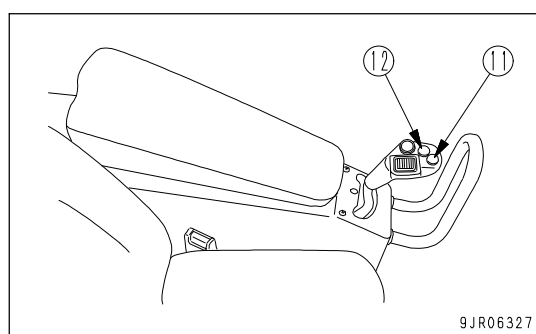


SHIFT UP, SHIFT DOWN SWITCHES

Use these switches (11) and (12) to change the speed range used for machine travel or to change the maximum speed range for automatic shifting.

Manual shift

Is possible to shift gear in 3 stages for FORWARD and REVERSE simply by pressing shift up switch (11) or shift down switch (12). Use 1st or 2nd speed for operations, and 3rd speed when traveling.



Auto shift

Of the 3 gear speeds in FORWARD and REVERSE, automatic shifting can be carried out according to the travel conditions from 2nd to 3rd speed range.

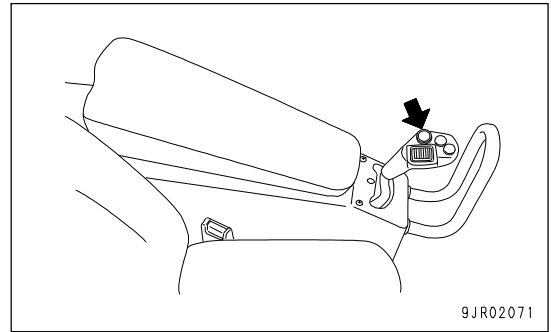
When shift up switch (11) or shift down switch (12) is pressed, the location of lighting up of the 1st-2nd-3rd gear indicator lamp changes, and it is possible to use automatic gear shifting to select the range for the travel speed. In addition, it is possible to start the machine off in 2nd gear automatically when shifting between FORWARD and REVERSE.

The ranges of speeds for automatic shifting are as shown in the following table.

Lighting up of 1st, 2nd, 3rd indicator lamps	Automatic gear shifting range
1	1
2	2
3	2 - 3

HORN BUTTON

Press this switch (13) at the head of the AJSS lever to sound the horn.

**HAZARD LAMP SWITCH****WARNING**

Use the hazard lamp only in emergencies. Using the hazard lamp when traveling may cause confusion for other machine operators.

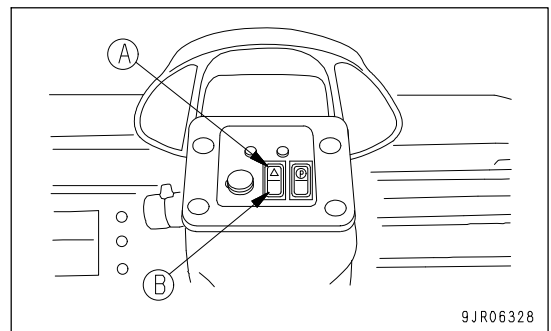
Use this switch (14) in emergencies, such as when the machine has broken down and has to be parked on the road.

Position (A): All turn signal lamps flash.

Position (B): OFF

REMARK

When this switch is turned to the ON position, the turn signal lamp and turn signal pilot lamp flash.

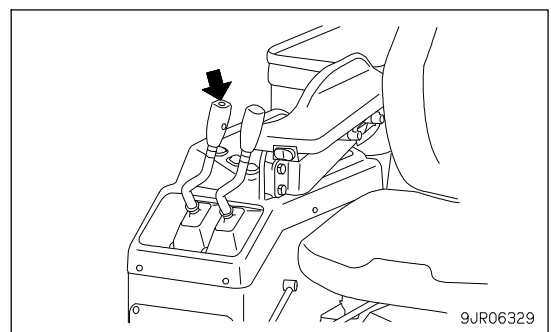
**KICKDOWN SWITCH**

When the speed range is 2nd, press this switch (15) on the head of the lift arm control lever to shift down one speed.

Use this when you need to increase the drawbar pull in digging operations.

REMARK

To cancel the kickdown switch, move the directional selector switch to REVERSE or NEUTRAL, or move the shift up switch to any position except 2nd. It is also possible to cancel the kickdown switch by operating the parking brake switch or by turning the starting switch OFF.

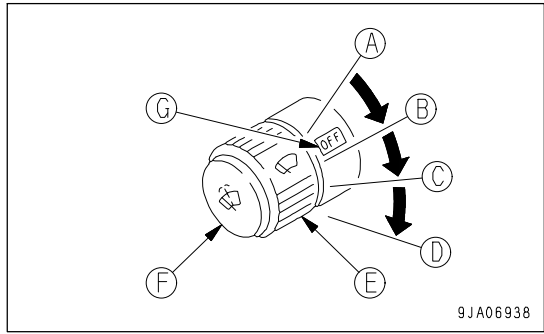


FRONT WIPER SWITCH

When rotary switch (E) of this switch (16) is turned, the front wiper will move.

If push button (F) is pressed, washer liquid will be sprayed out onto the front glass while the button is being pressed.

It is possible to check the position of the switch in display window (G).



Position (A): (OFF) Stop

Position (B): (INT) Intermittent wiper

Position (C): Low-speed wiper

Position (D): High-speed wiper

REAR WIPER SWITCH

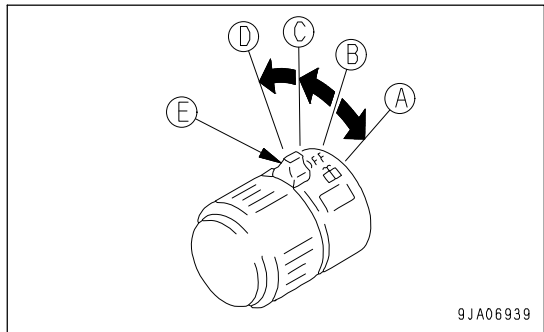
When lever (E) of this switch (17) is turned, the rear wiper will move.

Position (A): Washer liquid is sprayed out

Position (B): OFF

Position (C): Wiper is operated

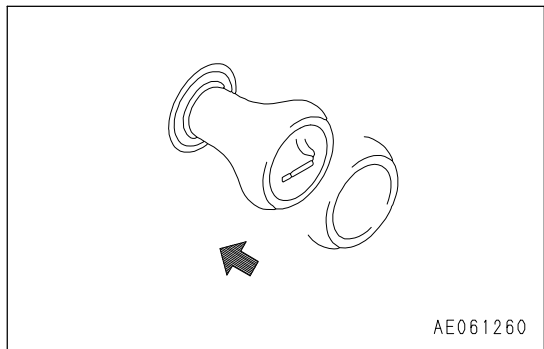
Position (D): Washer liquid is sprayed out, wiper is operated



CIGARETTE LIGHTER

This is used to light cigarettes.

After cigarette lighter (18) is pushed in, it will return to its original position after a few seconds, then you may pull it out and light a cigarette.



ROOM LAMP SWITCH

This switch (19) is used to light up the room lamp.

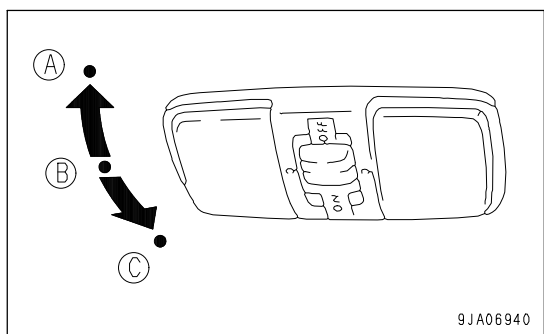
Position (A): OFF

Position (B): Lights up when cab door is opened

Position (C): ON

REMARK

- The room lamp lights up even when the starting switch is at the OFF position, so when leaving the operator's compartment, be sure to set the switch to position (A) (OFF) or position (B).
- When operating with the cab door fully opened, set this switch to position (A) (OFF).



PARKING BRAKE SWITCH

**WARNING**

Always apply the parking brake when leaving the machine or when parking it.

Even if the parking brake switch is turned ON, there is danger until the parking brake pilot lamp lights up, so keep the brake pedal depressed.

NOTICE

- Never use the parking brake switch to apply the brakes when traveling, except in an emergency. Apply the parking brake only after the machine has stopped.
- If the parking brake has been used as an emergency brake when traveling at high speed (near the maximum speed), contact your Komatsu distributor to have the parking brake checked for any abnormality.

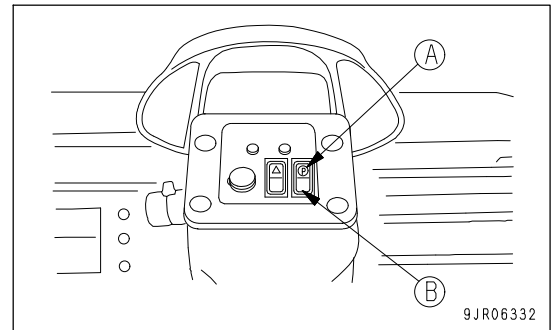
Use this switch (20) to apply the parking brake.

Position (A): ON

The parking brake is applied, and the parking brake pilot lamp lights up.

Position (B): OFF

The parking brake is released.



REMARK

- If the directional selector switch is placed at F or R when the parking brake is still applied, the central warning lamp flashes and the alarm buzzer sounds.
- If the machine is left with the engine stopped but the parking brake switch is at the "OFF" position, or if the starting switch is at the "OFF" position and the parking brake switch is set to the "OFF" position, when the starting switch is turned to the "ON" position, the parking brake is applied even if the parking brake switch is at the "OFF" position. If this happens, after starting the engine, turn the parking brake switch to the "ON" position, then to the "OFF" position to release the parking brake.
- If the parking brake is still applied, the machine will not move off even if the directional selector switch is

ENGINE LOW IDLING SELECTOR SWITCH

Use this switch (21) to switch the engine low idling speed between two stages.

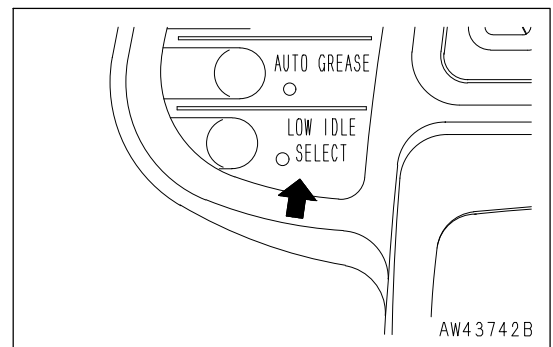
Press the push button to turn ON or OFF. If the switch is pressed once, the pilot lamp lights up and the system is switched ON. If it is pressed again, the pilot lamp goes out and the system is switched OFF.

OFF: This sets the engine low idling speed to approx. 650 rpm.

This is used for normal operations at low idling, such as when waiting for dump trucks.

ON: The engine low idling speed is set to approx. 850 rpm.

This is used on busy jobsites where it is necessary to reduce the cycle time.

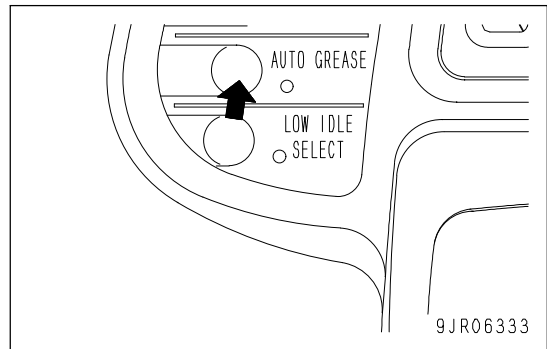


AUTO-GREASING SWITCH

It is possible to use this switch (22) to actuate the auto greasing system when desired, regardless of the setting of the timer in the auto greasing system.

Simply press the switch to actuate the greasing. Release the switch to stop greasing.

For details, see "HANDLING AUTO-GREASING SYSTEM (PAGE 6-3)".



POWER WINDOW SWITCH

! WARNING

When closing the window glass, be careful not to get anyone's hands or head caught. There is danger of serious injury if anyone is caught in the window glass.

! CAUTION

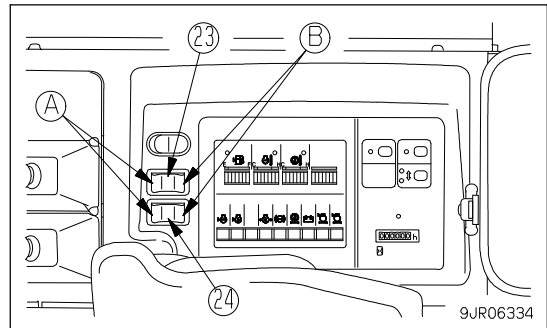
After fully opening or fully closing the window glass, do not keep the switch operated in the same direction. This may cause failure of the power window.

These switches (23) and (24) can be used when the starting switch is ON.

When portion (A) is pressed, the side window goes down.

When portion (B) is pressed, the side window goes up.

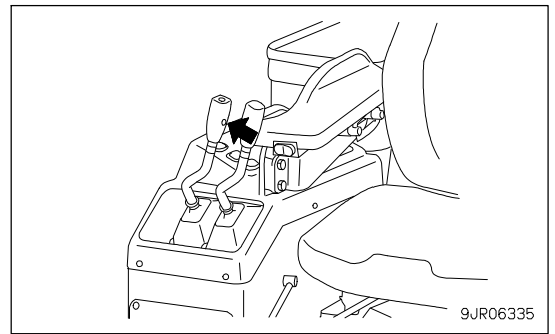
When the window reaches the top or bottom and the window stops moving, release the switch immediately.



HOLD SWITCH

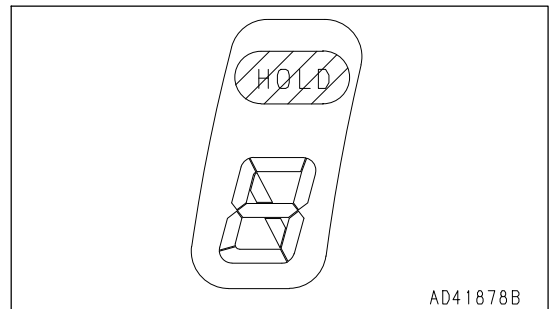
When holding the speed range in position for the automatic transmission, press switch (25) on the side of the lift arm control lever knob. The speed range displayed on the transmission indicator on the main monitor is then fixed and the HOLD display portion lights up. When the switch is pressed again, the hold condition is cancelled and the display goes out.

When traveling up or down hills, or when carrying out grading, use this to set the travel speed to the desired position.



REMARK

It is possible to shift up or down from the fixed speed range by operating the shift up or shift down switch.

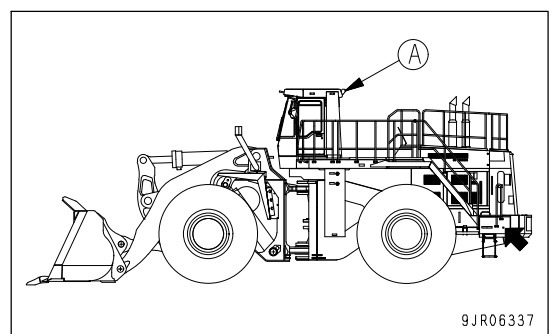
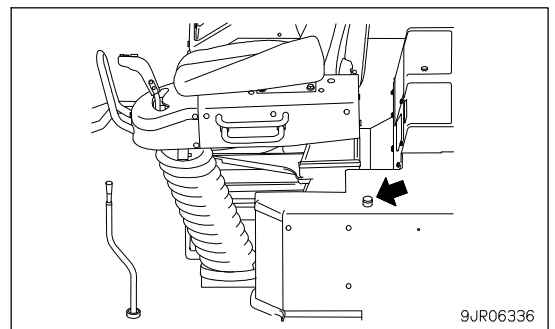


STEP LAMP SWITCH

Use this switch (24) to light up and turn off step lamp (A) when getting on or off the machine. When getting off the machine, press the switch. It will automatically go out approx. 1 minute later.

REMARK

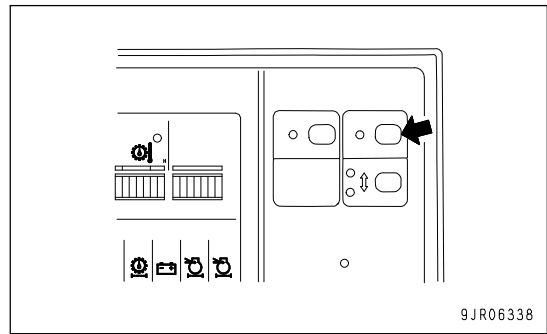
There is a step lamp switch on the battery box and the left console next to the operator's seat. It is possible to turn the lamp ON or OFF with either of these switches.



REMOTE POSITIONER RAISE POSITION SET SWITCH

Use this switch (27) to when deciding the stopping position of the lift arm at a height above horizontal. Use this switch also when setting to the sensor adjustment mode.

For details, see "REMOTE POSITIONER (PAGE 3-112)".

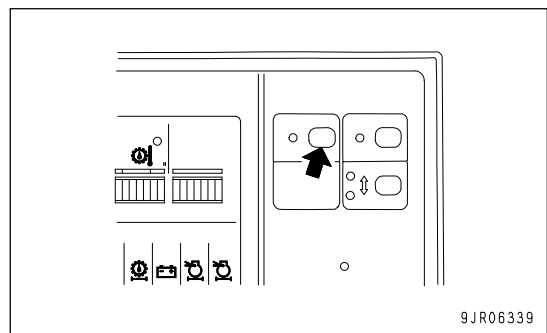


9JR06338

REMOTE POSITIONER LOWER POSITION SET SWITCH

Use this switch (28) to when deciding the stopping position of the lift arm at a height below horizontal. Use this switch also when setting to the sensor adjustment mode.

For details, see "REMOTE POSITIONER (PAGE 3-112)".



9JR06339

REMOTE POSITIONER RAISE/LOWER SELECTOR SWITCH

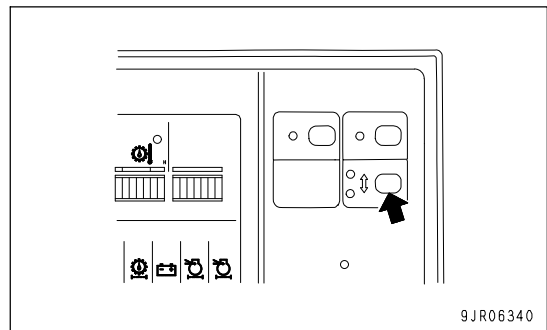
Use this switch (29) to actuate the remote positioner.

Each time the switch is pressed, the remote positioner RAISE stop display lamp or LOWER stop display lamp changes as follows.

RAISE stop display lamp: ON→OFF→ON...

Lower stop display lamp: OFF→ON→OFF...

For details, see "REMOTE POSITIONER (PAGE 3-112)".



9JR06340

MACHINE MONITOR MODE SELECTOR SWITCH 1

This switch (30) is used to switch the function of the character display.

When the switch is released, it automatically returns to its original position.

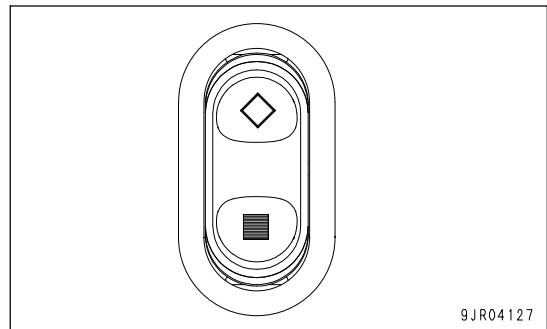
The basic operation is as follows.

Position (◇):

Press here to select (confirm) each mode or operation

Position (■):

Press here to cancel each mode or operation



9JR04127

MACHINE MONITOR MODE SELECTOR SWITCH 2

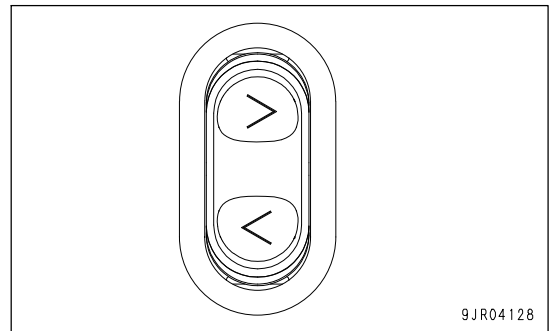
This switch (31) is used to switch the function of the character display.

When the switch is released, it automatically returns to its original position.

The basic operation is as follows.

Position (>): Press here to go on to the next screen, or to move the cursor forward, or to increase the number when entering numerals

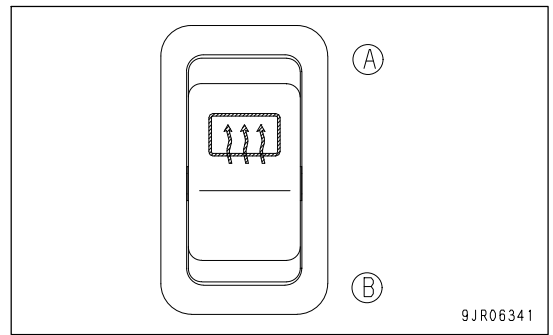
Position (<): Press here to go back to the previous screen, or to move the cursor back, or to reduce the number when entering numerals

**REAR HEATED WIRE GLASS SWITCH**

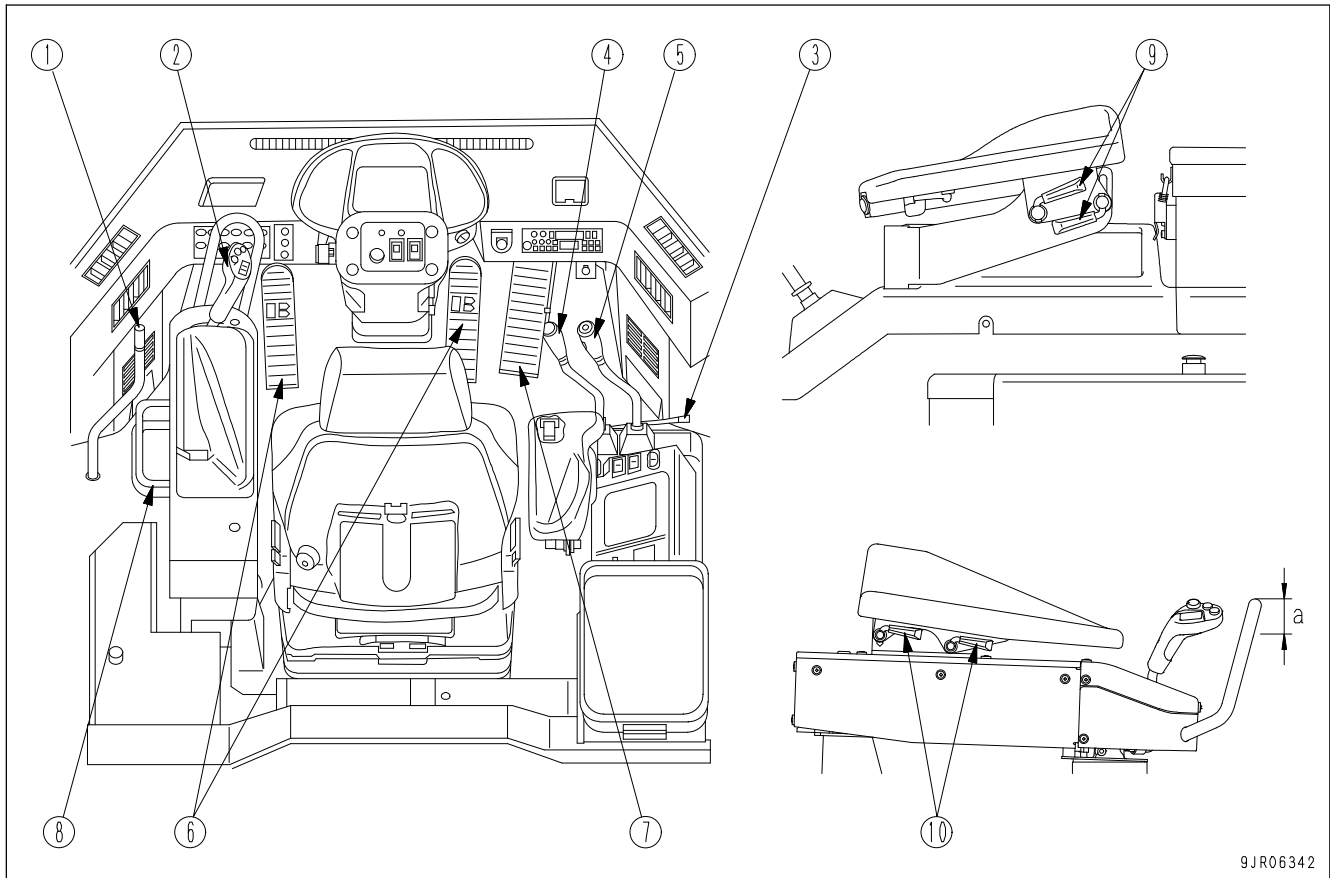
When this switch (32) is pressed, electric current flows in the heated wire glass in the rear window and removes the mist from the glass.

Position (A): ON (removes mist from glass)

Position (B): OFF



CONTROL LEVERS, PEDALS



9JR06342

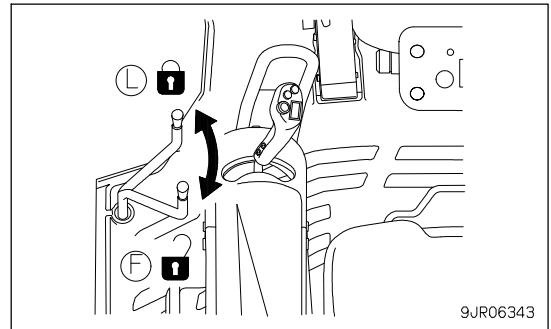
- | | |
|-------------------------------|---|
| (1) Steering lock lever | (6) Brake pedal |
| (2) AJSS lever | (7) Accelerator pedal |
| (3) Work equipment lock lever | (8) AJSS lever front-rear adjustment knob |
| (4) Bucket control lever | (9) Right armrest adjustment lever |
| (5) Lift arm control lever | (10) Left armrest adjustment lever |

STEERING LOCK LEVER

**WARNING**

- Regardless of whether the engine is running or stopped, always set the steering lock lever securely to the LOCK position when standing up from the operator's seat.
In particular, when the engine is running, if the AJSS lever is not locked and it is touched by mistake, it may cause serious personal injury.
- If the steering lock lever is not set securely to LOCK position (L), the lever may not be locked.
- When parking the machine or carrying out maintenance, always set the steering lock lever to LOCK position (L).

This lever (1) is the lock device for the AJSS lever. Push the steering lock lever to the left to lock it.



AJSS LEVER

**WARNING**

When the engine is running, always set the steering lock lever to the LOCK position when leaving the operator's seat.

Use this lever (2) to steer the machine.

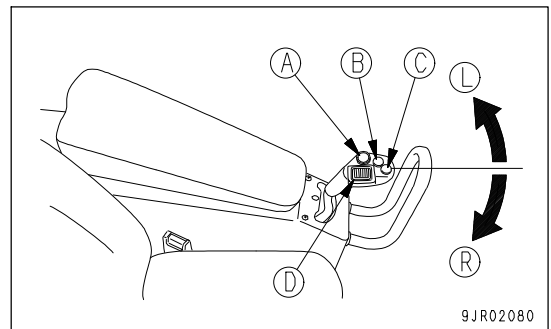
When traveling, move the lever in the direction of turning to turn the machine.

Position (L): Left turn

Position (R): Right turn

REMARK

In addition to the above functions, the following functions are also installed: Horn switch (A), shift down switch (B) and shift up switch (C) to shift gear on the machine, and directional selector switch (D) to switch between FORWARD and REVERSE. For details, see "SWITCHES (PAGE 3-23)".



WORK EQUIPMENT LOCK LEVER

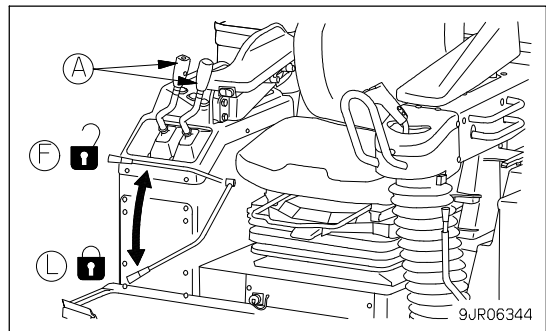
! WARNING

- Always set the work equipment lock lever securely to the LOCK position when standing up from the operator's seat. If the work equipment lock lever is not securely in the LOCK condition, and work equipment control lever (A) is touched by mistake, it may cause serious personal injury.
- If the work equipment lock lever is not set securely to LOCK position (L), the work equipment may move and cause serious personal injury. Check that the work equipment lock lever is at LOCK position (L).
- When operating the work equipment lock lever, be careful not to touch work equipment control lever (A).

This lever (3) is the lock device for the work equipment control levers. Push the work equipment lock lever down to lock it.

REMARK

When work equipment control lever (A) is in any other position than HOLD, the work equipment lock lever cannot be moved to the LOCK position (L).



BUCKET CONTROL LEVER

This lever (4) operates the bucket.

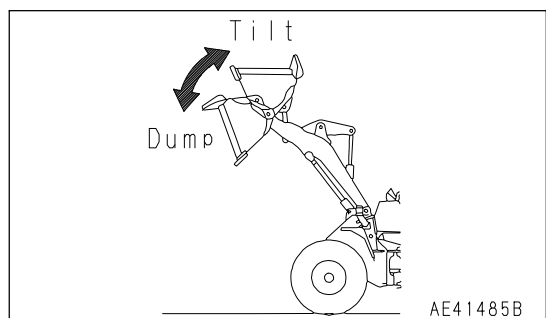
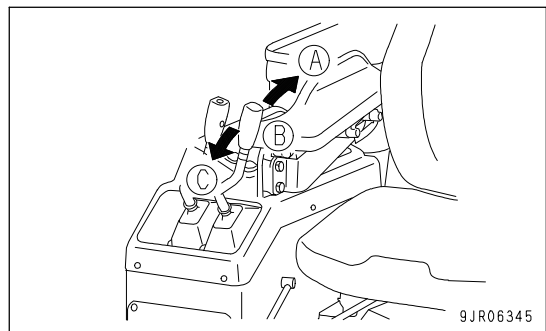
Position (A): TILT

When the lever is pulled further from the TILT position, the lever stays at that position (detent position), and returns to the HOLD position when the bucket reaches the position set for the bucket positioner.

Position (B): HOLD

The bucket is stopped and held in position.

Position (C): DUMP



LIFT ARM CONTROL LEVER

This lever (5) is used to operate the lift arm.

Position (A): RAISE

When the lever is pulled further from the RAISE position, the lever stops at that position (detent position). When the lift arm reaches the maximum height, the lever returns to the HOLD position.

Position (B): HOLD

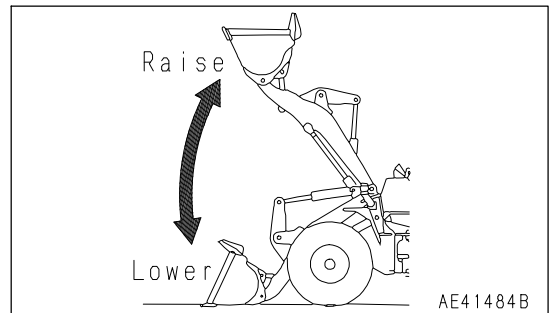
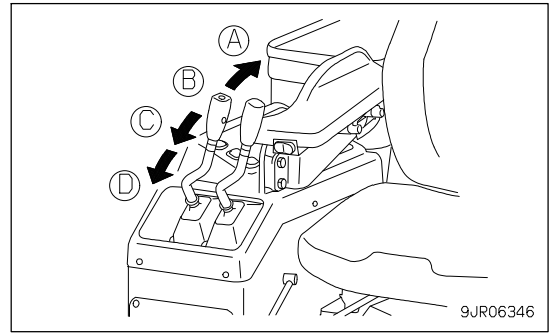
The lift arm is stopped and held in position.

Position (C): LOWER

Position (D): FLOAT

The lift arm moves freely under external force.

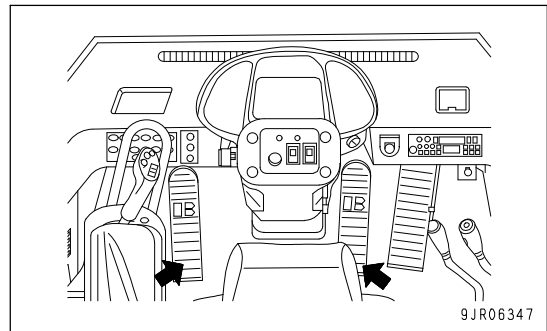
For details of the method of operation when using the remote position, see "REMOTE POSITIONER (PAGE 3-112)".



BRAKE PEDAL**WARNING**

- When traveling downhill, always use the right brake pedal, and use the braking force of the engine together with the brake.
- Do not use the brake pedal repeatedly more than necessary. If the brake is used too frequently, the brake will overheat. If this happens, the brakes will not work, so this may lead to a serious accident.
- Do not put your foot on this pedal unless necessary.

These pedals (6) operate the brakes.

**RIGHT BRAKE PEDAL**

The brake pedal operates the wheel brakes.

Use the brake pedal for normal braking operations.

LEFT BRAKE PEDAL

The left brake pedal operates the wheel brakes.

When the transmission cut-off switch is in the ON position, and if this brake pedal is depressed, wheel brakes are applied and the transmission is set to the neutral position at the same time. If the transmission cut-off switch is at OFF, the left brake pedal acts in the same way as the right brake pedal.

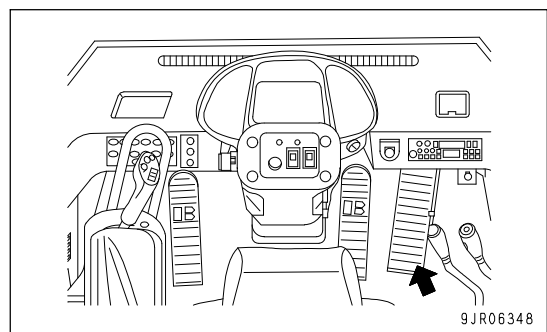
REMARK

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

ACCELERATOR PEDAL

This pedal (7) controls the engine speed and output.

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

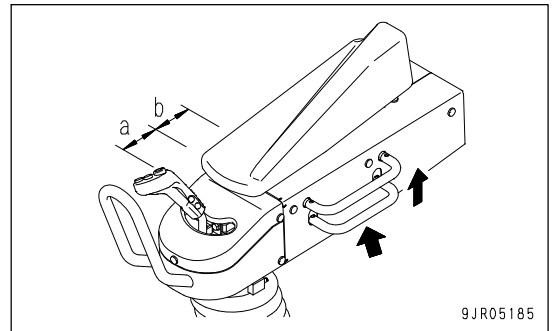


AJSS LEVER FRONT-REAR ADJUSTMENT KNOB**WARNING**

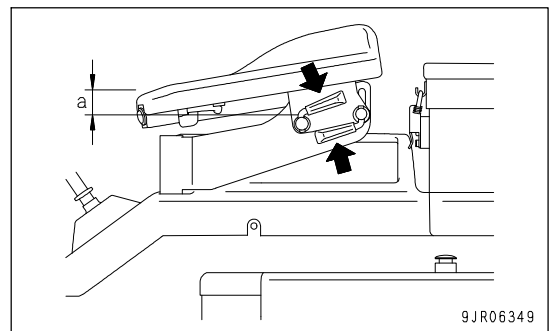
Carry out front-rear of adjustment of the AJSS lever with the machine is stopped. If the machine is moving and the lever is operated (adjusted), it may lead to serious personal injury.

Pull up this lever (8). It is possible to move the AJSS lever within a range (a) to the front and rear of 160 mm (6.3 in) (16 mm (0.6 in) x 10 stages).

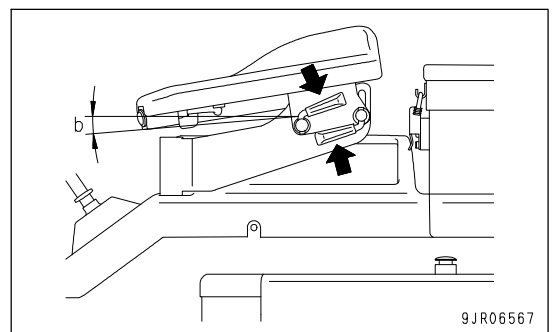
In addition, when getting on or off the machine, it is also possible to move the AJSS lever 150 mm (5.9 in) to the rear. (range (b))

**RIGHT ARMREST ADJUSTMENT LEVER**

Pull this lever (9) to adjust the height of the armrest within range (a) of 30 mm (1.2 in).

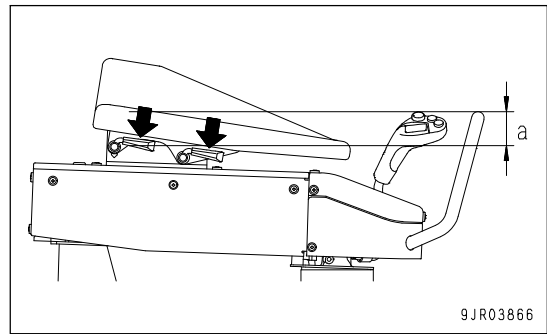


It is possible to adjust the angle within range (b) of approx. 9°.

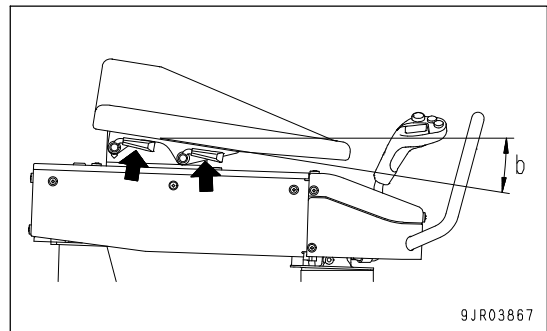


LEFT ARMREST ADJUSTMENT LEVER

Pull this lever (10) to adjust the height of the armrest within range (a) of 30 mm (1.2 in).



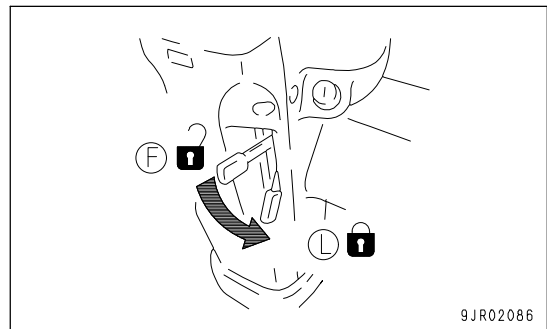
It is possible to adjust the angle within range (b) of approx. 7°.

**MAIN MONITOR TILT LEVER****WARNING**

Apply the parking brake and set the work equipment lock lever to the LOCK position before adjusting the tilt of the main monitor. If this operation (adjustment) is performed while the machine is moving, serious personal injuries can result.

This lever allows the main monitor to be tilted forward or backward.

Raise the lever to FREE position (F), set the monitor to the desired position, then push the lever down to LOCK position (L) to lock the monitor securely in position.



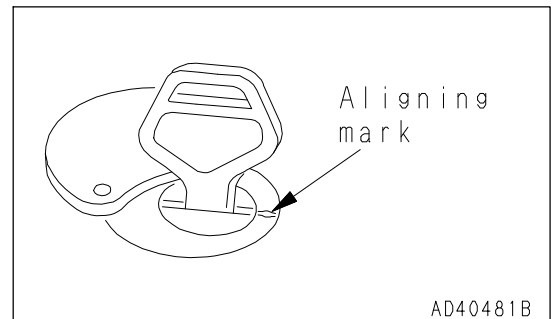
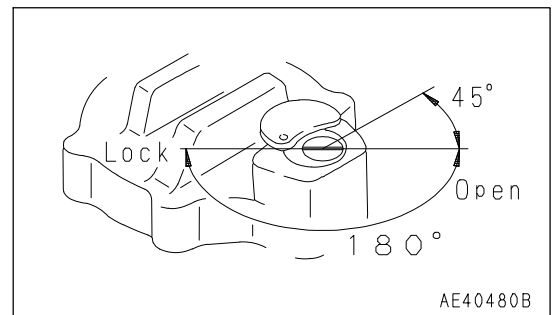
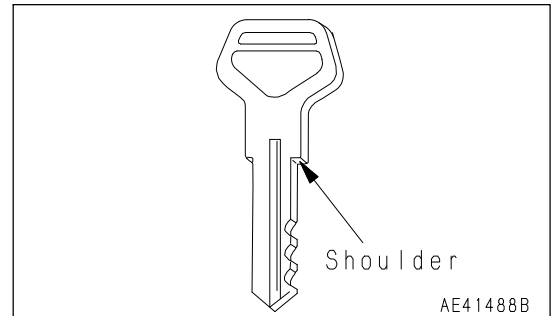
CAP WITH LOCK

If the machine is equipped with a cap with lock for the fuel tank filler and hydraulic tank filler, open and close the cap as follows. Use the starting switch key to open and close the cap.

METHOD OF OPENING AND CLOSING CAP WITH LOCK

TO OPEN THE CAP

1. Insert the starting switch key in the keyhole securely until the shoulder contacts the keyhole.
If the key is not inserted fully into the keyhole and is turned, the key may break.
2. Turn the starting switch key counterclockwise and bring the rotor groove in line with the aligning mark on the cap. Turn the cap slowly until a "clicking" sound is made. This releases the lock and allows the cap to be opened.



TO LOCK THE CAP

1. Screw the cap into place.
2. Insert the starting switch key in the keyhole securely until the shoulder contacts the keyhole.
If the key is not inserted fully into the keyhole and is turned, the key may break.
3. Turn the starting switch key counterclockwise and take the key out.

FRAME LOCK BAR



WARNING

If the machine is transported or lifted when the frame lock bar is not locking the frame, the machine may suddenly articulate. If the machine articulates, it may cause serious personal injury to people in the surrounding area.

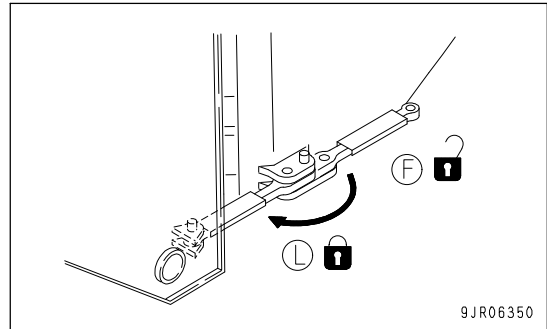
- Always lock the frame lock bar when transporting or lifting the machine.
- During maintenance, lock the frame lock bar if necessary.

The frame lock bar is a device to lock the front frame and rear frame so that machine does not articulate.

LOCK position (L): Always set to this position when transporting or lifting the machine.

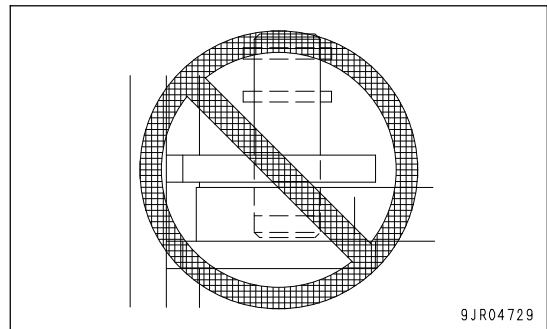
For maintenance, set to this position if necessary.

FREE position (F): Always set to this position when traveling.



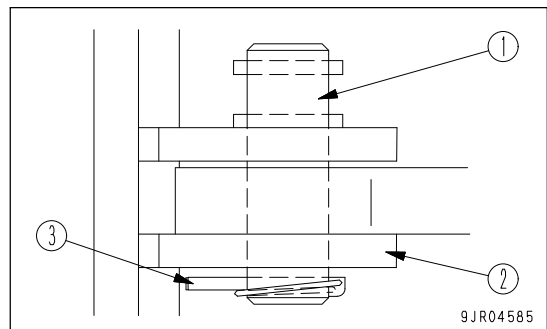
WARNING

Insert the lock pin of the frame lock bar securely, then fit the linchpin. If it is not inserted fully and a load is applied, there is danger that it might come out and that the frame lock bar may be deformed.



When locking the frame lock bar, lock it as follows.

1. Insert frame lock bar lock pin (1) securely into hinge (2) at the bottom of the front frame.
2. Always secure it with supplied linchpin (3).

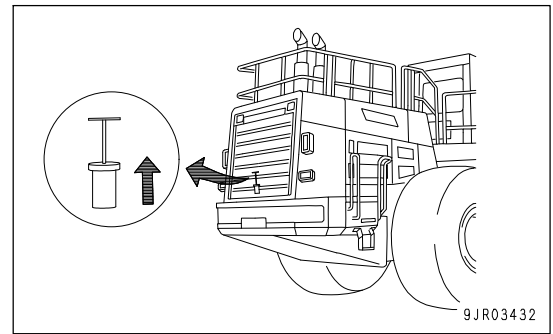


TOWING PIN

The towing pin is in the counterweight.

Pull the towing pin up to remove it.

When installing the towing pin, insert it securely to prevent it from coming out.

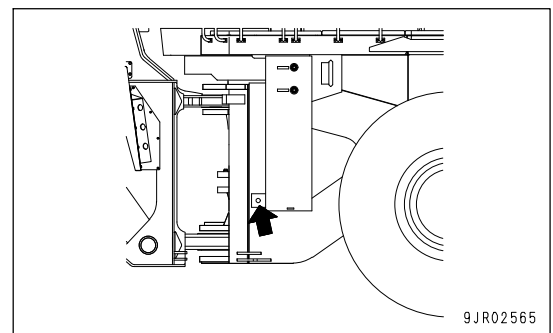


ENGINE SHUT-DOWN SWITCH

When the engine is running, if the engine shut-down switch is turned to the OFF position, the engine will stop. Use this when carrying out inspection or maintenance.

When starting the engine again, turn the engine shut-down switch to the ON position, then turn the starting switch inside the cab to the START position to start the engine.

If the engine shut-down switch is not set to the ON position, the engine will not start.



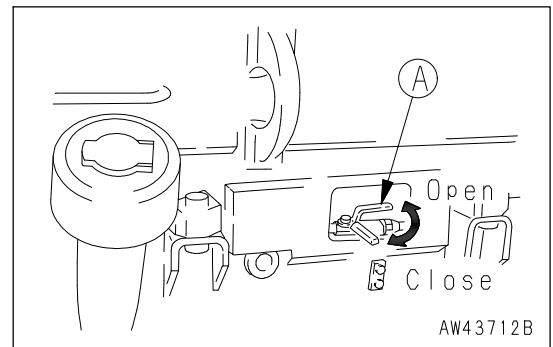
FUEL STOP LEVER

This is used when there is any abnormality, such as when the engine cannot be stopped even if the starting switch is turned to the OFF position. Use normally in the fully open condition.

If any abnormality occurs, turn fuel stop lever (A) to the front to stop the supply of fuel.

If any abnormality occurs and it is necessary to use the fuel stop lever, please contact your Komatsu distributor.

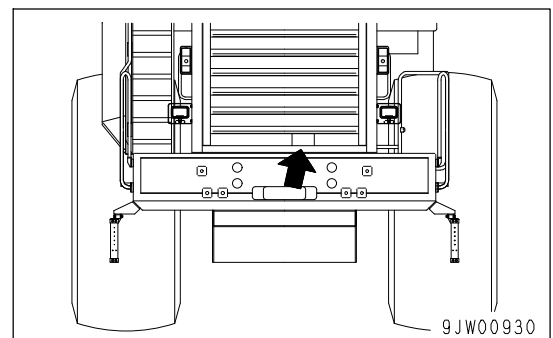
When starting the engine again, bleed the air from the fuel circuit. For details, see "PROCEDURE FOR BLEEDING AIR (PAGE 3-158)".



BACKUP ALARM

When the machine travels in reverse, the alarm sounds to warn people in the area that the machine is traveling in reverse.

When the directional selector switch on the head of the AJSS lever is set to the R position, the alarm sounds.

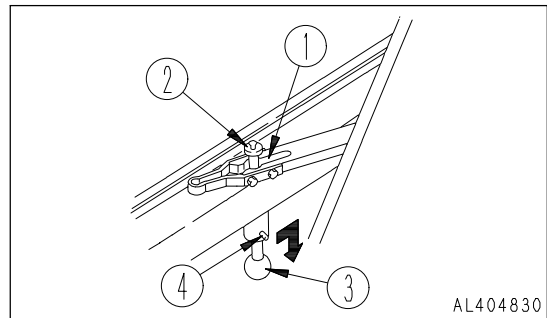


CAB DOOR OPEN LOCK

This can be used to hold the door open.

Open the door so that tip (2) of the lever is aligned with groove (1) of the lock, then pull down knob (3) as shown in the diagram.

When using the door-open lock, be sure to apply the lock securely. When releasing the lock and closing the door, push up knob (3) and insert pin (4) securely into the groove.



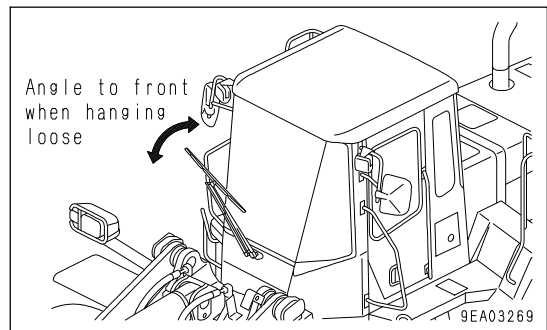
HANDLING CAB WIPER

PREVENTING DAMAGE TO WIPER ARM BRACKET

NOTICE

When angling the wiper arm to the front, check that the wiper blade is hanging free.

When angling the wiper arm to the front, such as when wiping the glass clean, if the wiper arm is angled with the wiper blade locked to the arm (the bottom of the blade is caught on the arm), abnormal force is brought to bear on the mounting bracket and the bracket may break.



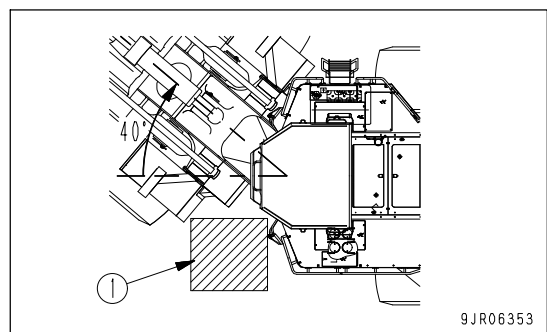
REPLACING CAB WIPER



WARNING

Do not attempt to replace the cab wiper, standing on the front frame. It is very dangerous to climb on the front frame.

When replacing the cab wiper, articulate the machine 40° to the right, place stand (1) in position, then stand on it and replace the wiper. Be careful not to fall off the stand.



DUST INDICATOR

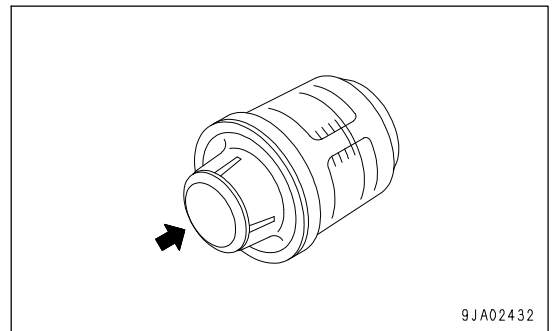
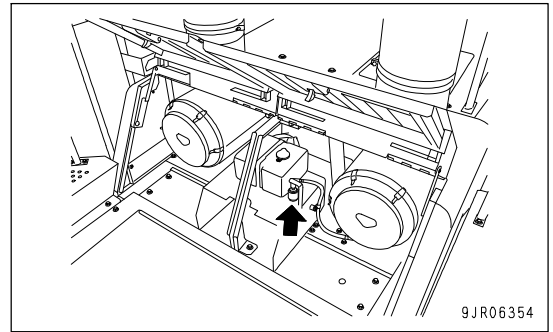
The dust indicator is at the front of the engine hood at the rear of the operator's compartment.

The display is given in five stages according to the degree of clogging of the element.

If the air cleaner is clogged, the air cleaner clogging caution pilot lamp on the maintenance monitor lights up to inform the operator that the air cleaner needs to be cleaned.

After cleaning, press the reset button to cancel the lamp.

For details of the method of cleaning, see "CLEANING OR REPLACING OUTER ELEMENT (PAGE 4-23)".



FUSE

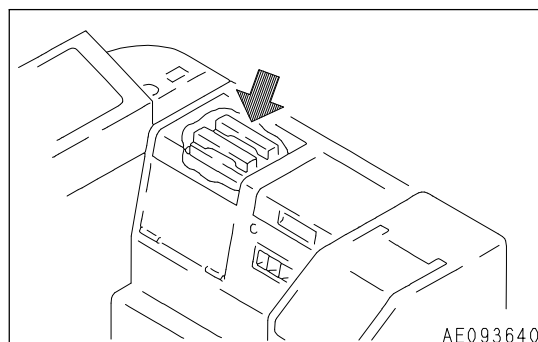
NOTICE

Before replacing a fuse, be sure to turn off the starting switch.

The fuses acts to protect the electrical components and wiring from burning out.

Replace any fuse if it is corroded or covered in white powder, or if there is any play between the fuse and the fuse holder.

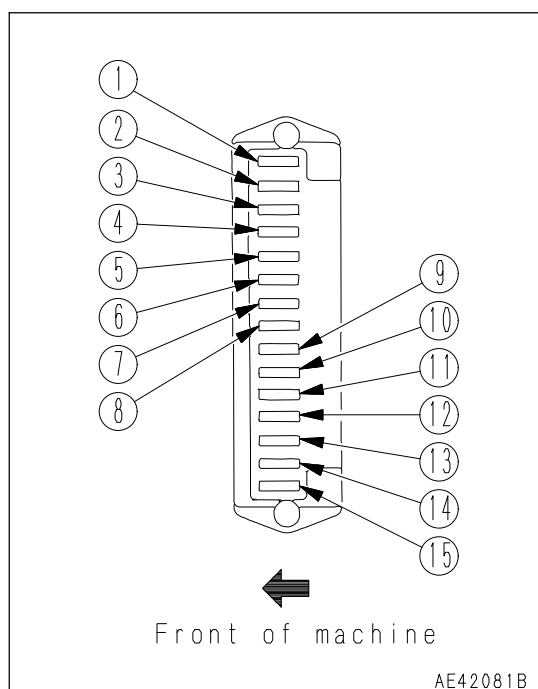
Replace the fuse with another of the same capacity.



FUSE CAPACITY AND NAME OF CIRCUIT

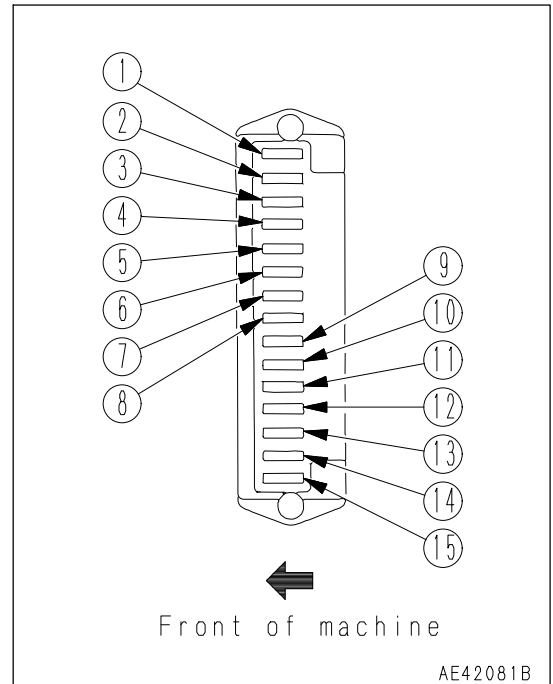
FUSE BOX 1

No.	Fuse capacity	Name of circuit
(1)	20A	Main lamp circuit
(2)	20A	Backup lamp, Brake lamp
(3)	10A	Turn signal lamp
(4)	10A	Head lamp (R.H.)
(5)	10A	Head lamp (L.H.)
(6)	10A	Side clearance lamp (R.H.)
(7)	10A	Side clearance lamp (L.H.)
(8)	10A	Parking brake
(9)	10A	Rotating lamp (if equipped)
(10)	10A	Instrument panel
(11)	10A	Work equipment positioner
(12)	20A	Starting switch
(13)	20A	Hazard lamp
(14)	10A	Spare
(15)	10A	Auto-greasing A



FUSE BOX 2

No.	Fuse capacity	Name of circuit
(1)	20A	Front working lamp
(2)	20A	Rear working lamp
(3)	30A	Air conditioner condenser
(4)	20A	Air conditioner blower
(5)	20A	Wiper, Washer
(6)	10A	Transmission controller
(7)	10A	Cigarette lighter, Radio
(8)	30A	Heated wire glass
(9)	20A	Side working lamp
(10)	10A	Auto-greasing B
(11)	20A	Power window (L.H.)
(12)	20A	Power window (R.H.)
(13)	10A	Air suspension seat, Active working
(14)	10A	DC converter
(15)	5A	Engine controller



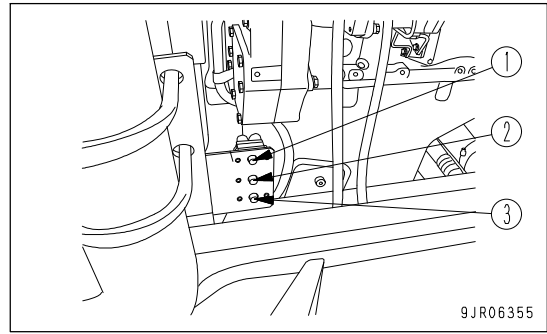
CIRCUIT BREAKER

NOTICE

- When resetting the circuit breaker, always turn the starting switch OFF first.
- Do not keep the circuit breaker reset button pressed.

If the electric power does not come on when the starting switch is turned ON, the circuit breaker has probably been tripped, so check.

The circuit breaker is at the side of the engine on the right side of the machine.



REMARK

- The circuit breaker is a circuit protection device installed to circuits where a large capacity electric current is flowing. In the same way as a normal fuse, it protects the electrical equipment and wiring from damage if there is an abnormal flow of electricity. However, after the problem point recovers, there is no need to replace any parts. It can simply be reset.
- When resetting the electric circuit after it has been cut off, wait for 5-10 minutes after the circuit was cut off, then press the reset button. When resetting the electric circuit after it has been cut off, the operating effort of the reset button may be heavier than when operating it in normal conditions. There is no difference in the height of the reset button between the condition when that the circuit is cut off or the condition when it has been reset. Check that the circuit has been reset by the effort needed to operate the button. If the circuit reset operation is carried out but the operating effort for the reset button is heavy, it is necessary to inspect the electric circuit.
- If the starting motor does not start even when the starting switch is turned to the START position, circuit breakers (1), (2), or (3) have probably cut off the circuit, so check and reset circuit breakers (1), (2), and (3).
- If the electrical equipment does not work even when the fuse has been replaced, circuit breaker (1) has probably cut off the circuit, so check and reset circuit breaker (1).

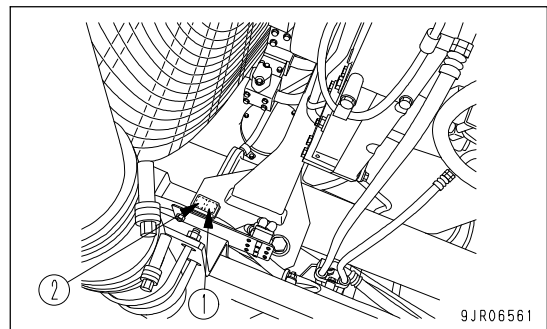
No.	Fuse capacity	Name of circuit
(1)	30A	Battery power source (Starting switch, Hazard)
(2)	20A	Engine controller 1 power supply
(3)	20A	Engine controller 2 power supply

SLOW BLOW FUSE

If the power does not come on when the starting switch is turned ON, the slow-blow fuse may be blown, so check and replace it. The slow blow fuse is beside the engine on the right side of the machine.

SLOW BLOW FUSE

- (1) 120A: Alternator power supply
- (2) 80A: Main power



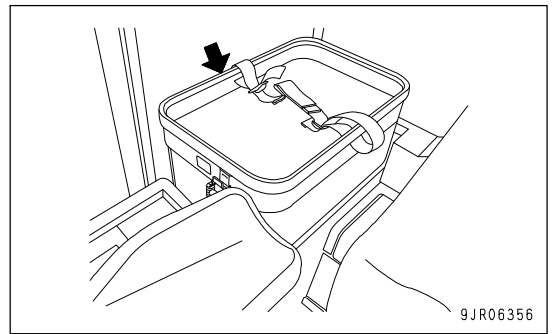
LUNCH BOX TRAY

There is a space for a lunch box at the right rear of the cab. Even a large lunch box 35 cm (13.8 in) long, 22 cm (8.7 in) wide and 18 cm (7.1 in) high can be placed easily and fixed with a band.

NOTICE

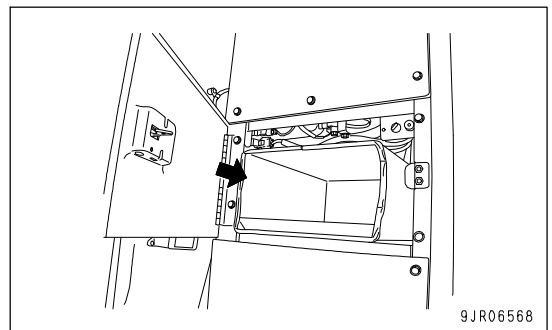
The engine service monitor is installed under the lunchbox, so do not place any wireless device on top of the lunchbox.

For the way of installing the wireless set, see "HANDLING WIRELESS (PAGE 3-71)".



TOOL BOX

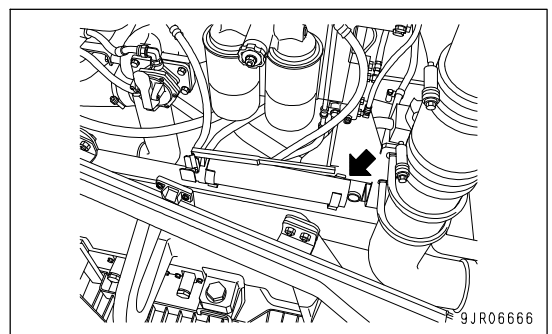
The tool box is installed in the brake component box of the left side of the machine. Use it to store tools, etc.



GREASE PUMP

A grease pump is stored inside the engine side panel on the left side of the machine.

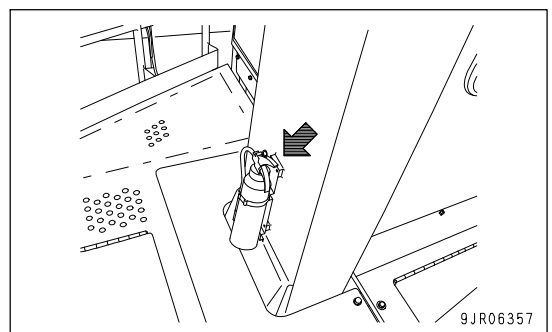
After using it, wipe off all grease stuck to its outside of the pump, then store it.



LOCATION OF FIRE EXTINGUISHER

(If equipped)

Fire extinguisher (1) is on the left side of the ROPS.



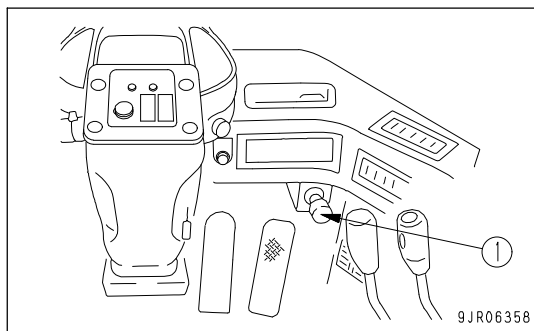
POWER OUTLET

NOTICE

- There are two power sources: 12V and 24V
Check the voltage of the electrical equipment and select the appropriate power source.
Mistaken use, such as using 24V as the power source for 12V equipment, will cause failure of the equipment.
- When using the electric power source, do not install any equipment which will exceed the maximum amperage.

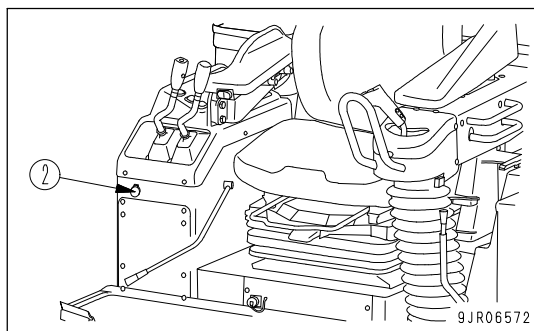
When cigarette lighter (1) is removed, the lighter socket can be used as a 24V power source.

Maximum amperage: 5A (120W)



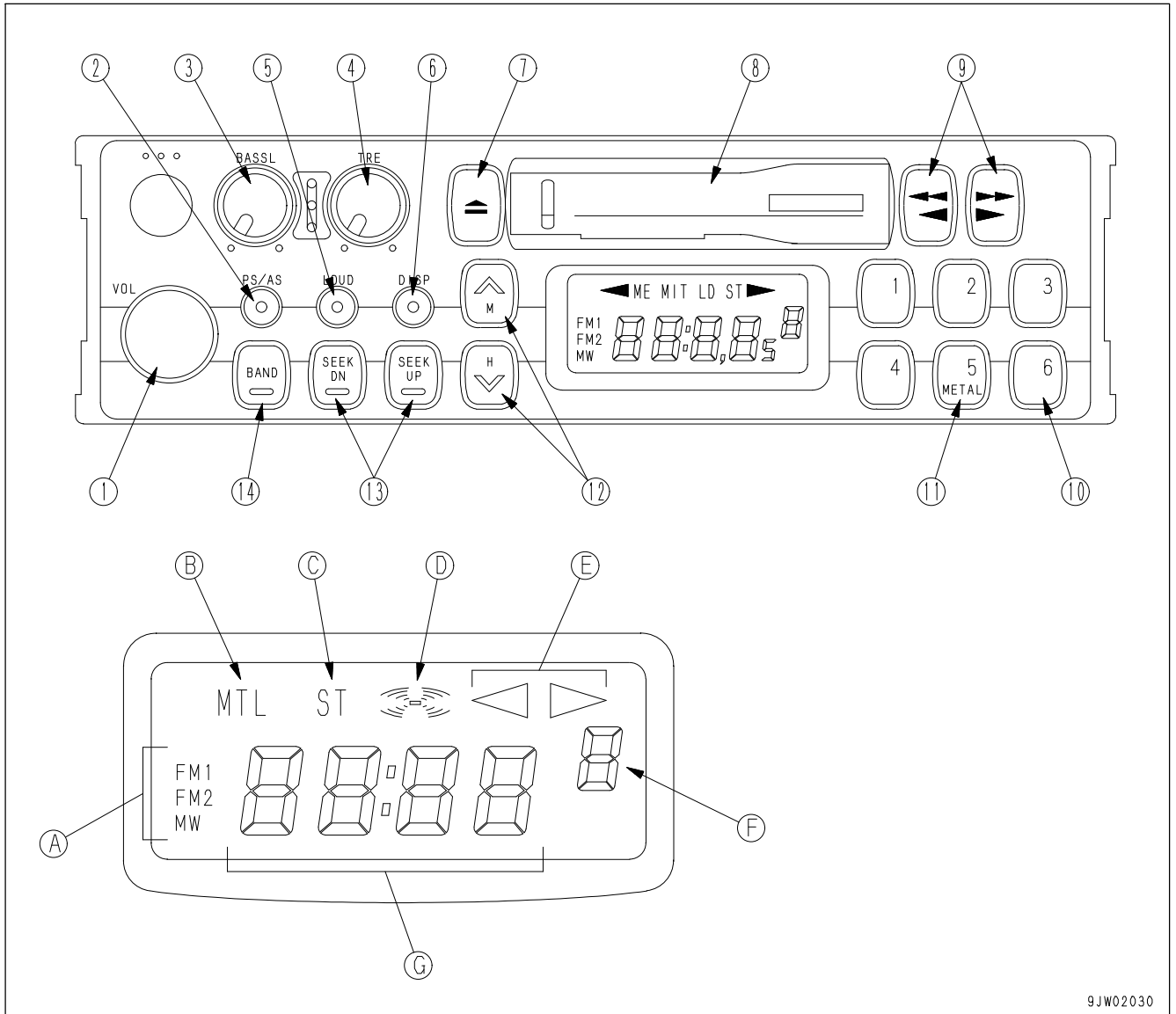
Electric power source (2) can be used as a 12V power source.

Maximum amperage: 10A (120W)



AM/FM RADIO-CASSETTE STEREO

EXPLANATION OF COMPONENTS

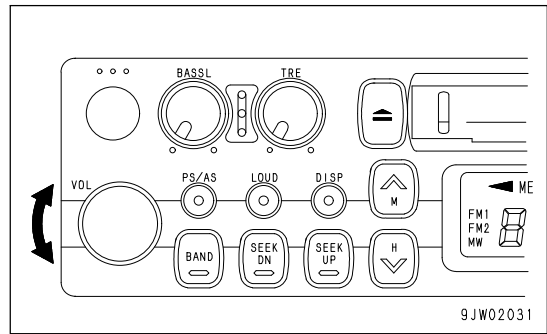


9JW02030

- | | |
|--|----------------------------------|
| (1) Power switch/volume | (8) Cassette door |
| (2) Auto-store/preset scan button | (9) Fast forward, rewind buttons |
| (3) Bass control knob | (10) Preset buttons |
| (4) Treble control knob | (11) Metal tape button |
| (5) Loudness button | (12) Manual tuning buttons |
| (6) Time/radio display selector button | (13) Seek tuning buttons |
| (7) Tape eject button | (14) Band selector button |
| (A) Band display | (E) Tape direction display |
| (B) Metal tape display | (F) Preset channel display |
| (C) FM stereo reception display | (G) Time/frequency display |
| (D) Loudness display | |

POWER SWITCH/VOLUME

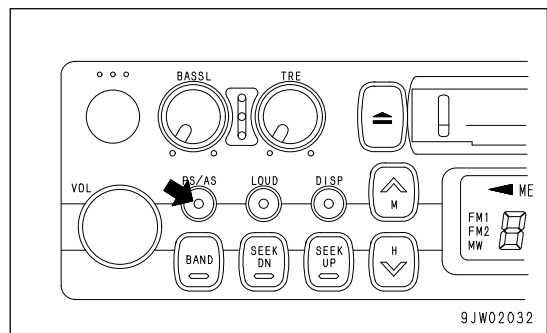
Turn this knob (1) to the right until it clicks to turn the power on.
Turn it further to increase the volume.



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.

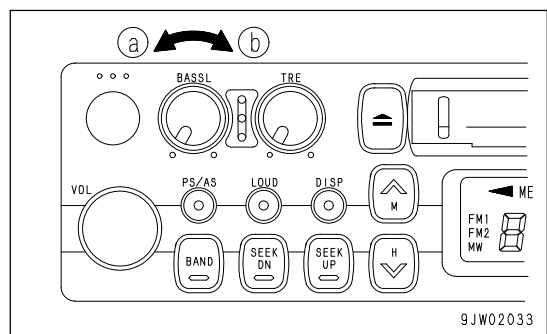
When the display is flashing, the preset scan function is being used.

- 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

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

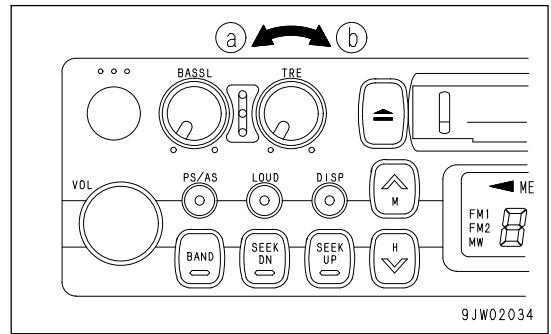


TREBLE CONTROL KNOB

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

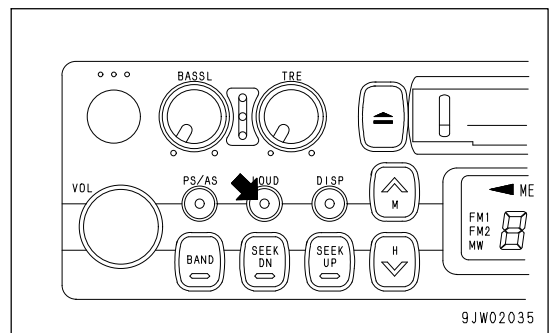


LOUDNESS BUTTON

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.

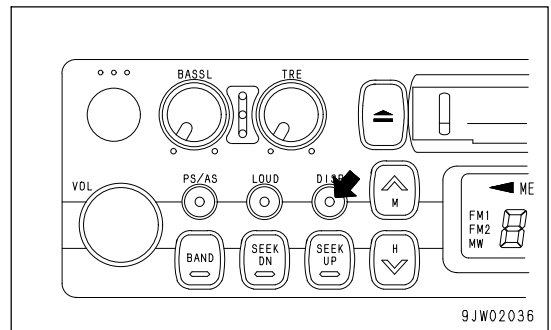
Push button: Actuated (ON)

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

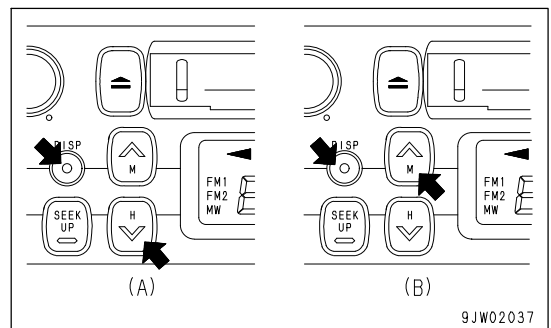
Press the button to set the time display.

(A) Correcting hour:

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

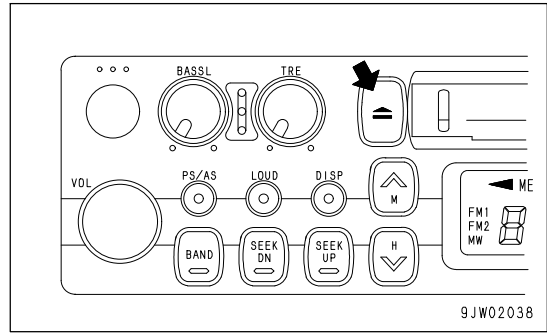
(B) Correcting minute:

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



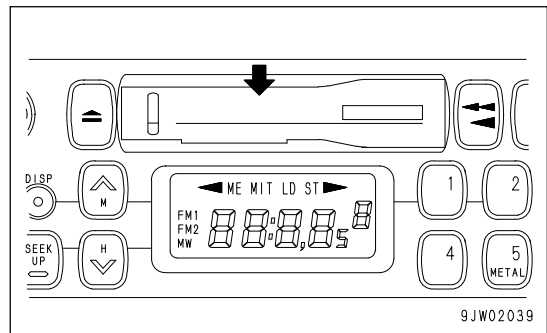
TAPE EJECT BUTTON

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

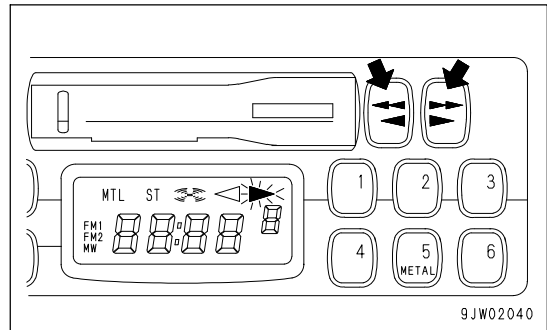
These buttons (9) are used to fast-forward or rewind the tape.

- 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.

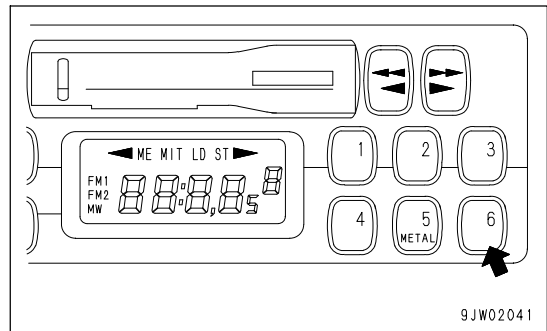
To stop the tape, lightly press the button that is not locked. The fast-forward or rewind operation will be canceled.

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



PRESET BUTTONS

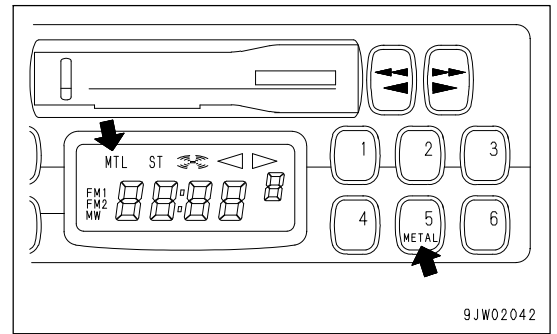
These buttons (10) are used to call up the broadcast station frequencies preset in memory for each of buttons No. 1 to No. 6. It is possible to preset 18 stations (FM: 12; AM: 6) with these buttons.



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.

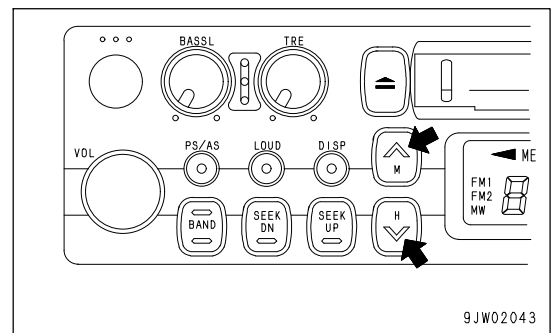


MANUAL TUNING BUTTONS

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.

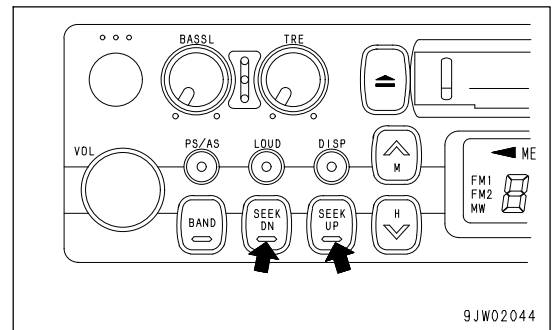


SEEK TUNING BUTTONS

These buttons (13) are used to seek tuning.

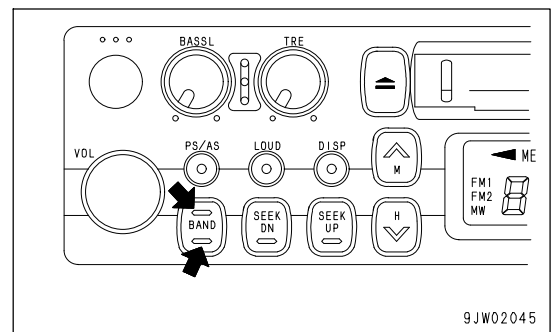
When the "SEEK UP" button is pressed, the search automatically goes up; when the "SEEK DN" button is pressed, the search automatically goes down.

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



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.



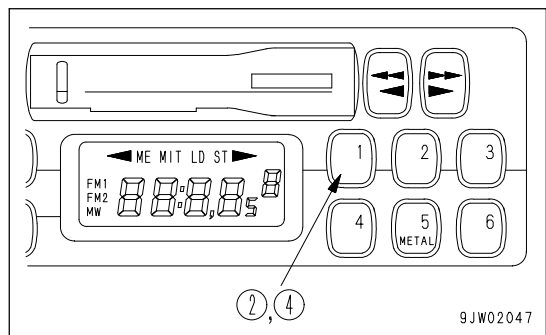
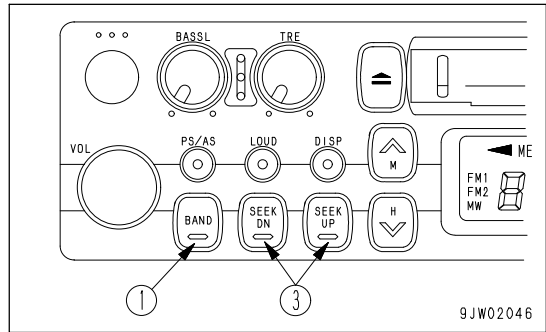
METHOD OF OPERATION

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.

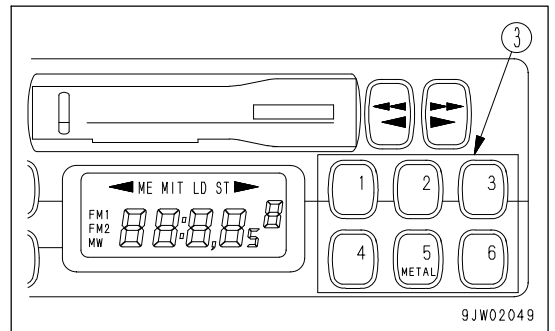
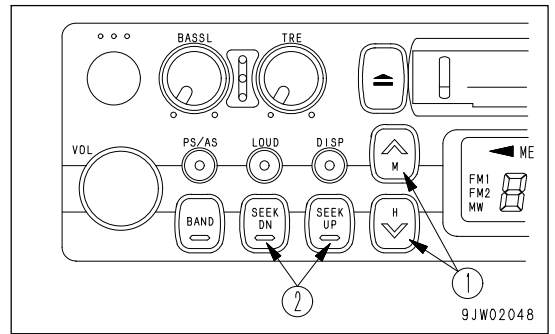


REMARK

- 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.

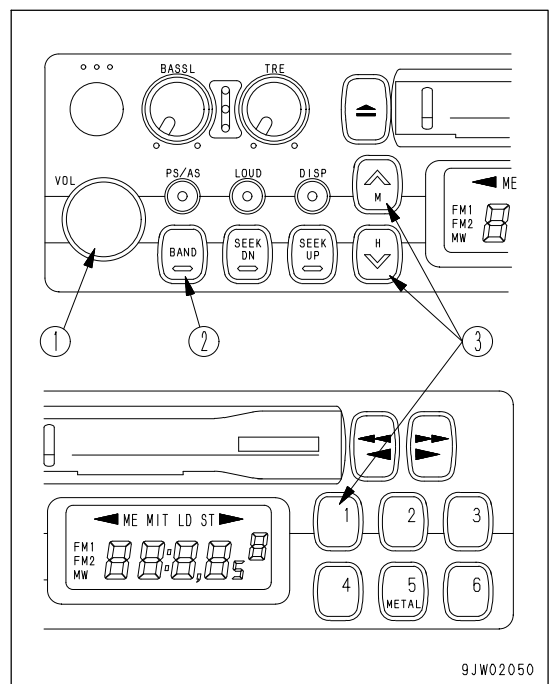
MANUAL MEMORY BUTTONS

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.

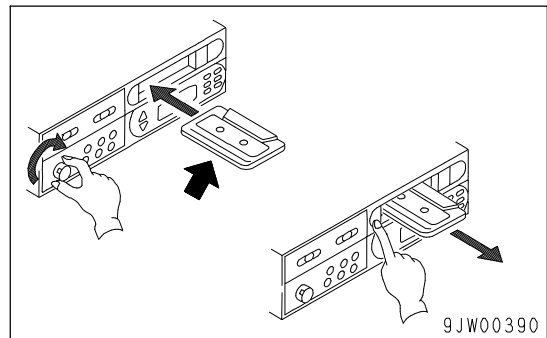
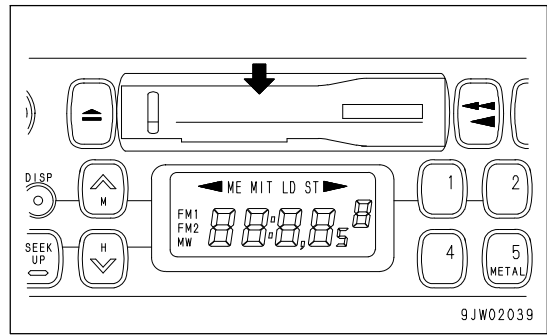


REMARK

- 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.

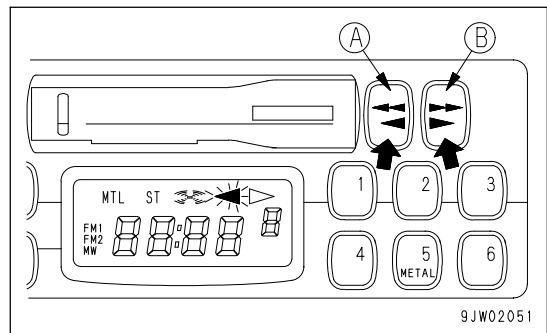
LISTENING TO CASSETTE TAPE

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 WHEN USING**WARNING**

- If a voltage greater than the specified voltage is input, it may cause fire, electrocution, or other failure. Never input any voltage other than the specified voltage.
- Places inside the radio are under high voltage. Do not remove the cover.
- Do not carry out any modifications. This may cause fire, electrocution, or other failure.
- If the sound cannot be heard, nothing is displayed, or any other problem occurs, turn off the power switch and ask your Komatsu distributor to make repairs without delay.

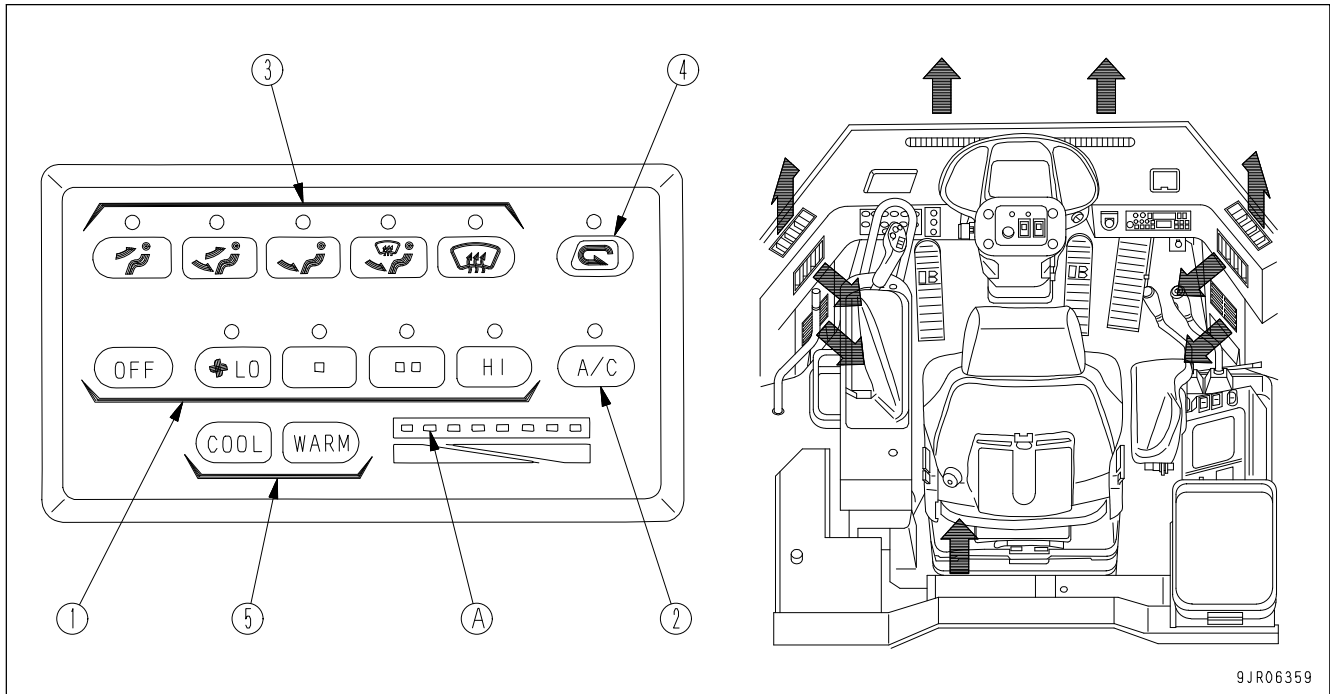
- Stow the antenna when traveling in places with low overhead clearance.
- To ensure safety during operations, keep the volume at a level where it is possible to hear other machines.
- If water gets inside the speaker case or radio (auto tuning), it may cause a serious problem, take care not to let water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

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

GENERAL LOCATIONS AND FUNCTION OF CONTROL PANEL



9JR06359

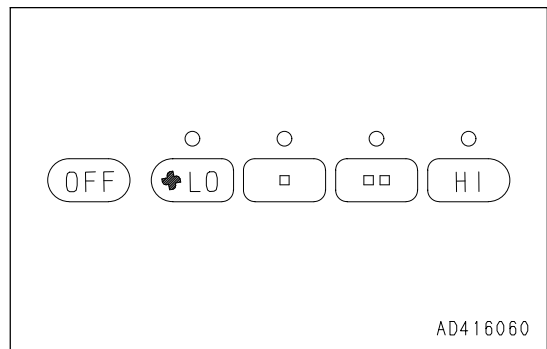
- (1) Fan switch
- (2) Air conditioner switch
- (3) Mode selector switch

- (4) FRESH/RECIRC selector switch
- (5) Temperature control switch
- (A) Temperature level indicator lamp

FAN SWITCH

This switch (1) can be used to adjust the airflow in four stages. It also acts as the main switch for the air conditioner. When the OFF switch is pressed, the fan stops.

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

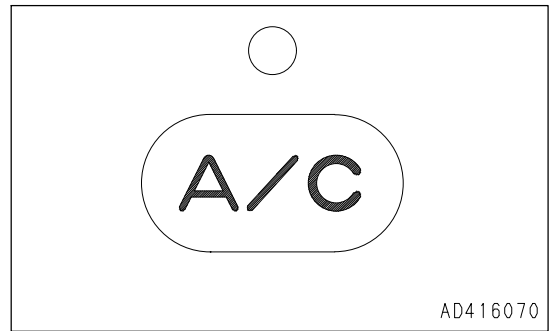


AD416060

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.

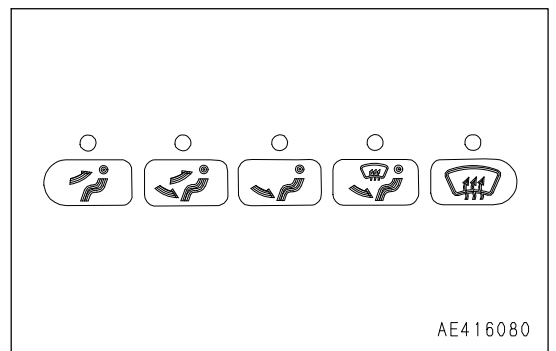


MODE SELECTOR SWITCH

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.

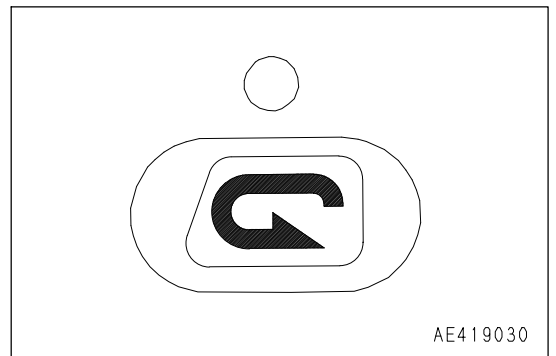


FRESH/RECIRC SELECTOR SWITCH

This switch (4) is used to select between recirculating the air inside the cab or taking in fresh air from outside.

When the RECIRC position is selected, the indicator lamp above the switch lights up.

When the switch is pressed again, the indicator lamp goes out, and fresh air is taken in.



TEMPERATURE CONTROL SWITCH

The temperature can be adjusted with this switch (5) by pressing and holding the up or down button.

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

The more the blue 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.

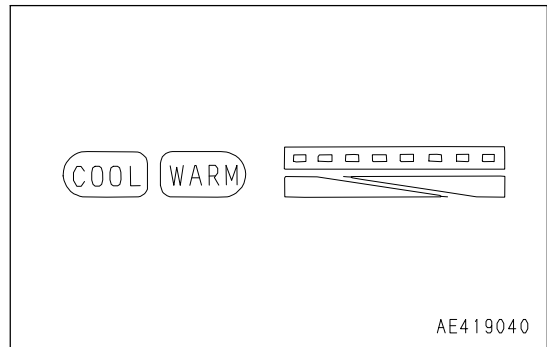
The settings for each mode are retained in memory even when the starting switch is turned OFF.

However, in the following cases, the settings must be reset.

- 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 in 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

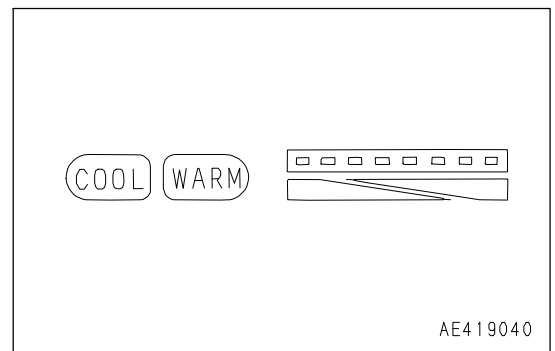
Condition of use		Switch				
		Fan switch	Air conditioner switch	Temperature control switch	FRESH/RECIRC selector switch	Mode selector switch
Cooling	Rapid	HI	ON	All blue	RECIRC	FACE
	Normal	HI - LO	ON	More than half are blue	FRESH	FACE
Dehumidifying, heating		HI - LO	ON	More than half are red	FRESH	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 blue	FRESH	FACE

When defrosting, set the temperature control switch so that all lamps are red. This will improve defrosting and demisting.

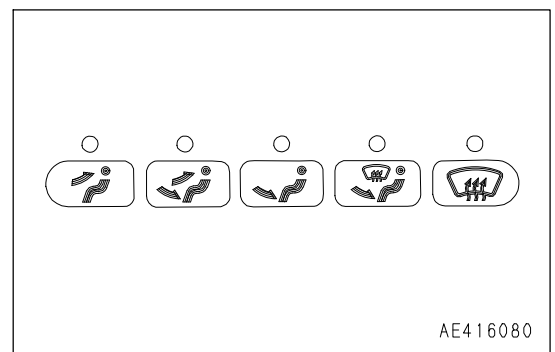
Set the vent mode selector switch to the intermediate position to give the desired condition.

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.



AE419040



AE416080

WHEN NOT USING THE AIR CONDITIONER REGULARLY

Run the air conditioner in cooling or dehumidification + heating mode for several minutes from time to time to prevent the loss of the oil film in various parts of the compressor.

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.

USE AIR CONDITIONER WITH CARE

NOTICE

- When running the air conditioner, always start with the engine running at low speed. Never start the air conditioner when the engine is running at high speed. It will cause failure of the air conditioner.
- If water gets into the control panel or sunlight sensor, it may lead to unexpected failure, be careful not to let water get on these parts. In addition, never bring any flame near these parts.

VENTILATION

- If you smoke when the air conditioner is on, the smoke may start to hurt your eyes, so open the window and turn the lever to FRESH for a while to remove the smoke while continuing the cooling.
- When using the air conditioner for a long time, carry out ventilation and cooling once every hour.

TEMPERATURE CONTROL

When the cooler is on, set the temperature so that it feels slightly cool when entering the cab (5 or 6 °C (9 or 10.8 °F) lower than the outside temperature). This temperature difference is considered to be the most suitable for your health, so always be careful to adjust the temperature properly.

AIR CONDITIONER MAINTENANCE

When carrying out inspection and maintenance of a machine equipped with an air conditioner, carry out the inspection and maintenance in accordance with the maintenance schedule chart. For details, see "MAINTENANCE SCHEDULE CHART (PAGE 4-19)".

COOL BOX

When the cooling is being used, this can be used for keeping drinks and other things cool.

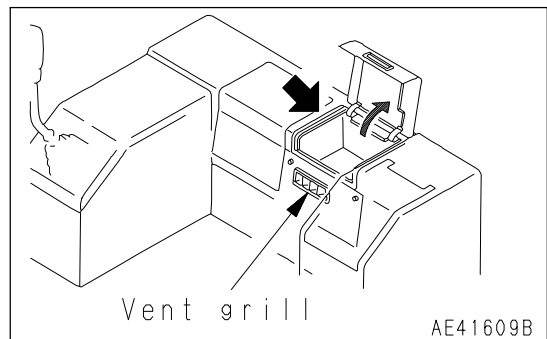
When the heating is being used, it can be used to keep things warm.

When using the box, open the vent grill.

When not using the box, close the grill.

Do not use the cool box for things which smell or leak water or break easily.

Do not use it as a holder for tools or other small objects.



HANDLING MACHINES EQUIPPED WITH KOMTRAX Plus

- KOMTRAX Plus is a machine management system. When a communications terminal is installed, it is possible to transmit data.
- A contract is necessary before the KOMTRAX Plus communications terminal can be used. Any customers desiring to use the KOMTRAX Plus system should consult their Komatsu distributor.

KOMTRAX Plus INSTALLED, COMMUNICATIONS TERMINAL NOT INSTALLED

BASIC PRECAUTIONS



WARNING

- Never disassemble, repair, modify, or move the KOMTRAX Plus or cables. This may cause failure or fire on the KOMTRAX Plus equipment or the machine itself. (Your Komatsu distributor will carry out removal and installation of KOMTRAX Plus.)
- Do not allow cables or cords to become caught; do not damage or pull cables or cords by force. Short circuits or disconnected wires may cause failure or fire on the KOMTRAX Plus equipment or the machine itself.

REMARK

There is absolutely no need to inspect or operate the KOMTRAX Plus, but if any abnormality is found, please contact your Komatsu distributor.

KOMTRAX Plus AND COMMUNICATIONS TERMINAL INSTALLED

- The KOMTRAX Plus communications terminal is a wireless device using radio waves, so it is necessary to obtain authorization and conform to the laws of the country or territory where the machine equipped with the KOMTRAX Plus communications terminal is being used. Always contact your Komatsu distributor before selling or exporting any machine equipped with the KOMTRAX Plus communications terminal.
- When selling or exporting the machine or at other times when your Komatsu distributor considers it necessary, it may be necessary for your Komatsu distributor to remove the KOMTRAX Plus communications terminal or to carry out action to stop communications.
- If you do not obey the above precautions, neither Komatsu nor your Komatsu distributor can take any responsibility for any problem that is caused or for any loss that results.

BASIC PRECAUTIONS



WARNING

- Never disassemble, repair, modify, or move the KOMTRAX Plus, communications terminal, antenna, or cables. This may cause failure or fire on the KOMTRAX Plus communications terminal or the machine itself. (Your Komatsu distributor will carry out removal and installation of the KOMTRAX Plus and communications terminal.)
- Do not allow cables or cords to become caught; do not damage or pull cables or cords by force. Short circuits or disconnected wires may cause failure or fire on the KOMTRAX Plus communications terminal or the machine itself.
- For anyone wearing a pacemaker, make sure that the communications antenna is at least 22 cm (8.7 in) from the pacemaker. The radio waves may have an adverse effect on the operation of the pacemaker.
- Near the blasting jobsite, there may be a danger of unexpected explosion due to use of interactive wireless communication device of KOMTRAX Plus and resulting serious personal injury. Make sure to operate the machine away from the blasting jobsite. If you have to operate the machine within 12 m (39 ft 4 in) from the blasting jobsite or the remote blasting device, ask your Komatsu distributor to disconnect power source cable of KOMTRAX Plus in advance.

If there are any restriction or law of the territory or country where the machine equipped with this device is used, such restriction or law has a priority than this warning.

KOMTRAX Plus specifications are as follows.

Rated horsepower: 5 - 10 W

Operating frequency: 148 - 150 MHz

NOTICE

- Please contact your Komatsu distributor before installing a top guard or other attachment that covers the antenna.
- Be careful not to get water on the communications terminal or wiring.

REMARK

- The communications terminal uses wireless communications, so it cannot be used inside tunnels, underground, inside buildings, or in mountain areas where radio waves cannot be received. Even when the machine is outside, it cannot be used in areas where the radio signal is weak or in areas outside the wireless communication service area.
- There is absolutely no need to inspect or operate the KOMTRAX Plus or communications terminal, but if any abnormality is found, please contact your Komatsu distributor.

HANDLING WIRELESS

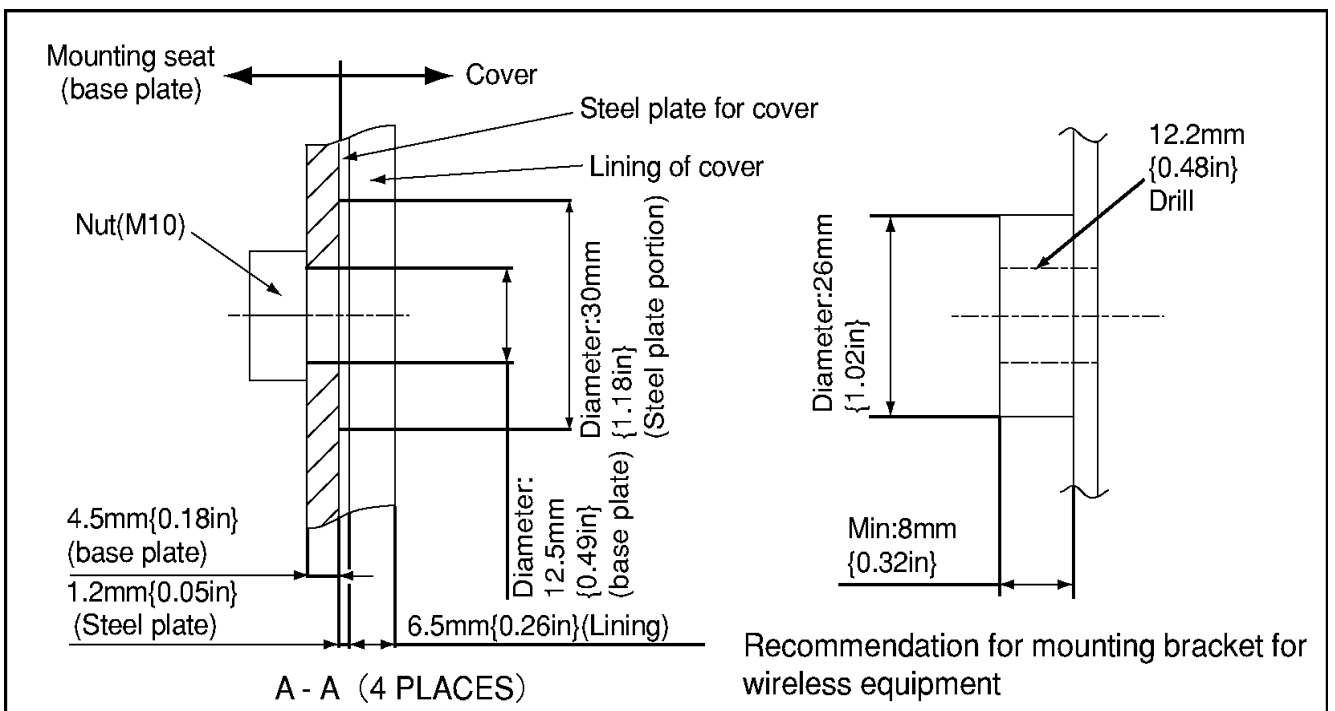
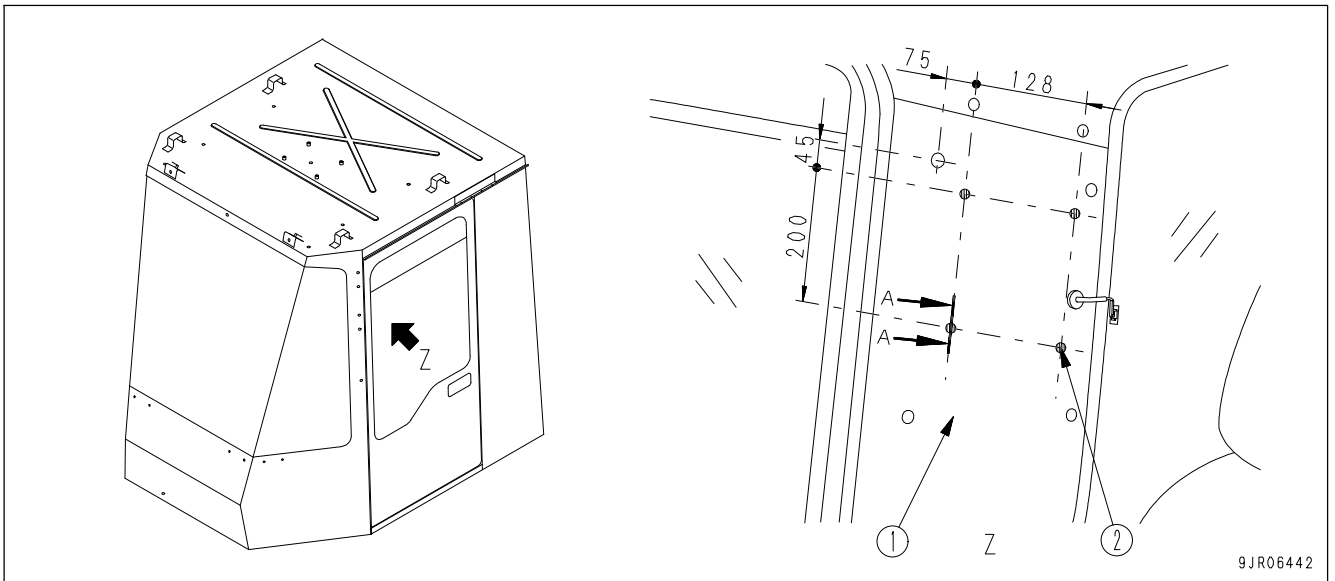
NOTICE

The engine service monitor is installed under the lunchbox, so do not place any wireless device on top of the lunchbox.

METHOD OF INSTALLING WIRELESS

When installing the wireless, there is mounting seat (2) under cover (1) at the rear right of the cab. (M10 x 4)
 There are 30mm (1.2in) holes at 4 places in the steel plate inside the mounting cover. Press with your finger to find the open place.

Make 30mm (1.2in) holes at 4 places in the interior lining stuck to the cover, then install the wireless.
 Make the mounting bracket for the wireless locally.



OPERATION

CHECK BEFORE STARTING ENGINE, ADJUST

WALK-AROUND CHECK

Before starting the engine, walk around the machine and look at the underside of chassis for anything unusual like loose bolts and nuts, leakage of fuel, oil and coolant. Also check the condition of the work equipment and the hydraulic system.

Also check for loose wiring, play, and collection of dust at places that reach high temperature.



WARNING

- Always hang a warning sign on the work equipment control levers.
- Spilled fuel or oil or accumulation of flammable materials around the battery or other high-temperature parts of the engine, such as the engine muffler or turbocharger will cause fire on the machine. Always check thoroughly and repair any problems or contact your Komatsu distributor.
- Always repair any damage to the handrails and steps, and tighten any loose bolts. Failure to do this may cause workers to fall and suffer serious personal injury.

If the machine is at an angle, reposition it level before checking.

Perform the following inspections and cleaning every day before starting engine for the day's work.

1. Check for damage, wear, play in work equipment, cylinders, linkage and hoses.
Check that there are no cracks, excessive wear, or play in the work equipment, cylinders, linkage, or hoses. If any abnormality is found, repair it.
2. Remove dirt and dust from around engine, battery and radiator.
Check that there is no dirt accumulated in the radiator or around the engine. Check also that there are no flammable materials (dry leaves, twigs, etc) accumulated around the battery or other high-temperature parts of the engine, such as the engine muffler or turbocharger. If any dirt or flammable materials are found, remove them immediately.
3. Check for coolant or oil leakage around the 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 leakage from fuel line.
Check that there is no leakage of fuel or damage to the hoses and tubes. If any problem is found, carry out repairs.
5. Check for leakage of oil from transmission case, axle, hydraulic tank, hoses, joints.
Check that there is no oil leakage. If any abnormality is found, repair the leakage.
6. Check for oil leakage from the brake line.
Check that there is no oil leakage. If any abnormality is found, repair the leakage.

7. Check for damaged or worn tires, wheels, and wheel hub bolts and nuts, check for loose wheel hub bolts and nuts.
Check for cracks or peeling of the tires and for cracks or wear to the wheels (side rim, rim base, lock ring). Tighten any loose wheel hub bolts or nuts. If any abnormality is found, repair or replace the part.
If any valve caps are missing, install new caps.
8. Check for damage and loose bolts on the handrail and steps.
Repair any damage and tighten any loose bolts.
9. 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.

NOTICE

- **Before starting operations, clean all dirt from the surface of the lamps. If the lamps are used with mud stuck to the surface, the lamp may overheat and suffer damage.**
 - **If the lamp is cleaned when it is overheated, the sudden change in temperature may cause the lens to crack. Turn the lamp off and wait for the temperature to go down before cleaning the lamp.**
10. Check for loose air cleaner mounting bolts.
Check for the loose bolts. If loose, tighten them.
 11. Check for loose battery terminals.
Tighten any loose terminal.

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

! WARNING

- Even if there are no signs of damage, replace belts in accordance with the following schedule:
5 years after the date of seat belt manufacture, or every 3 years after the start of actual usage, whichever date comes first.

REMARK

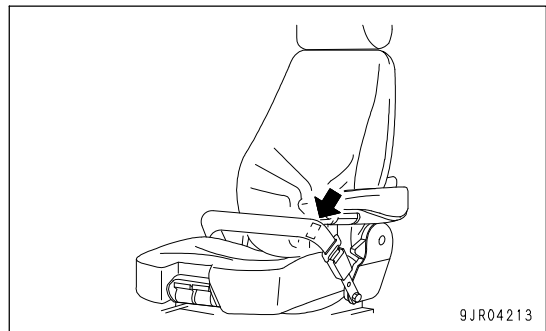
The date of seat belt manufacture attached to the seat belt is the start of the 5-year period. It is not the start of the 3-year period of actual usage.

REMARK

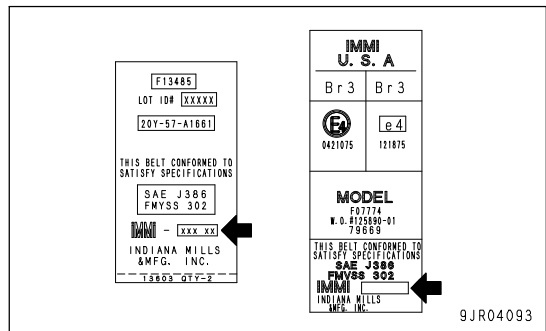
The date of manufacture of the seat belt is marked on the belt at the place indicated by the arrow in the diagram on the right.

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

Tightening torque: 19.6 to 29.4 Nm (2.0 to 3.0 kgm, 14.5 to 21.7 lbft)



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



13. Check for loose bolts on ROPS

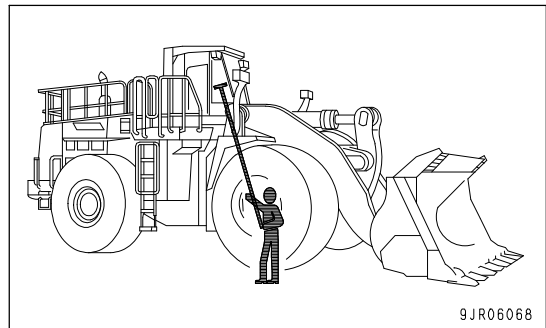
Check for any loose or damaged bolts. If any loose bolts are found tighten them to 2452 to 3050 Nm (250 to 310 kgm, 1808.3 to 2242.2 lbft).

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

14. Clean cab window.

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

When cleaning the front glass, use commercially available cleaning equipment and carry out the cleaning operation from the ground.



15. Check rear view mirror, under view mirror

Check that the mirrors are not damaged. Replace them if they are damaged. Clean the surface of the mirrors and adjust the angle so that the operator can see the area to the rear and under the machine from the operator's seat.

When cleaning the mirrors, use a mop with a long handle.

16. Inspect tires.

! WARNING

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

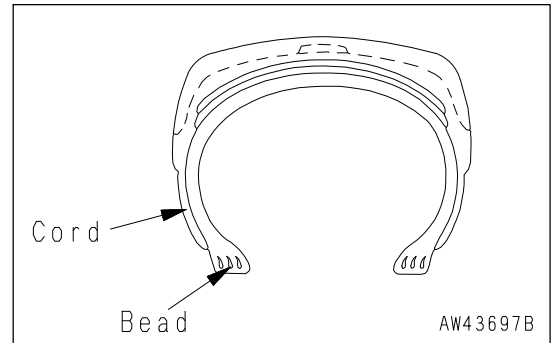
To ensure safety, do not use the following tires.

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



17. Inspect rims.

! WARNING

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

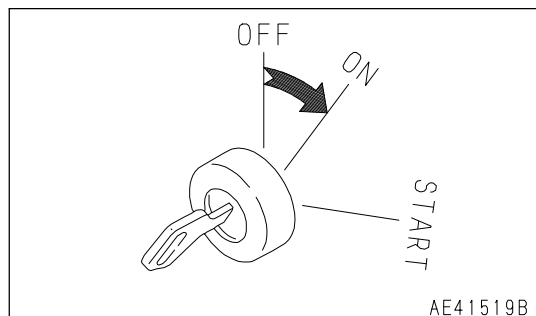
In particular, check the side rings, lock rings and rim flanges thoroughly.

CHECK BEFORE STARTING

Perform the contents of this section before starting the work of each day.

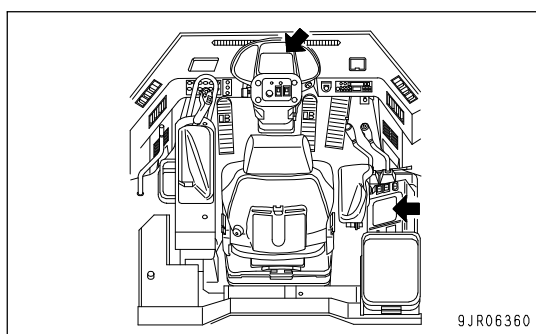
CHECK MACHINE MONITOR

1. Turn the starting switch ON.



2. Check that all the monitors, gauges, and the central warning lamp light up for approx. 3 seconds and the alarm buzzer sounds for approx. 1 sec.

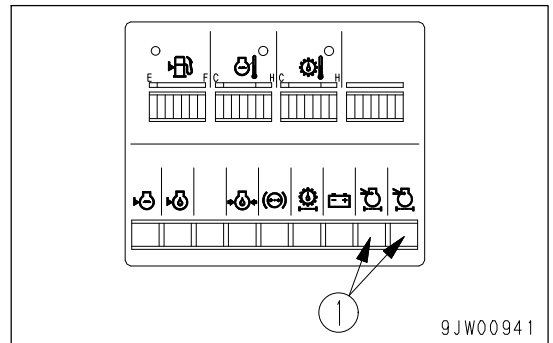
If the lamps do not light up, there is probably a failure or disconnection. Contact your Komatsu distributor for inspection.



CHECK DUST INDICATOR

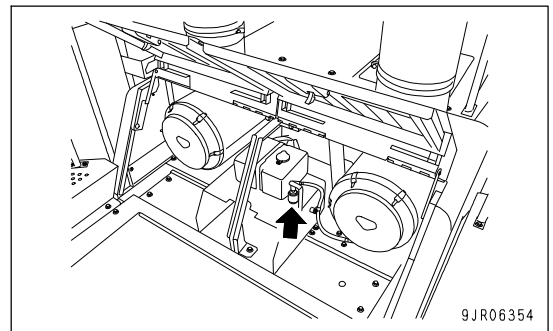
1. If air cleaner clogging warning pilot lamps (left, right) (1) on the maintenance monitor flash, clean the air cleaner element.

For details of the method of cleaning, see "CLEANING OR REPLACING OUTER ELEMENT (PAGE 4-23)".

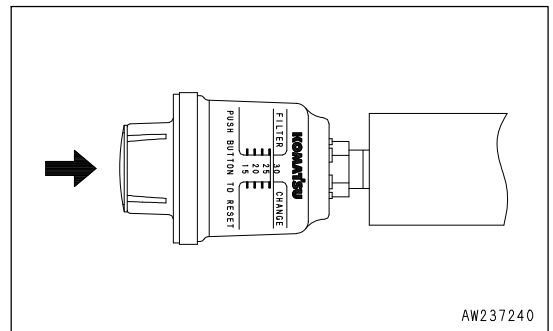


REMARK

A dust indicator is installed inside the engine hood on the left side of the machine. The dust indicator shows the condition of clogging of the air cleaner in 5 stages. This makes it possible to check how clean the element is and when it should be replaced.

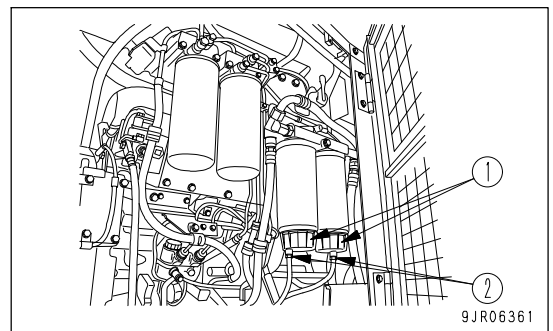


2. After cleaning and replacing the element, push the dust indicator button to return the red display to its original position.



DRAIN WATER FROM FUEL PRE-FILTER

1. Check if any water is accumulated in cap (1) at the bottom of the filter.
2. If there is water accumulated in the cap (1), loosen drain plug (2) and drain the water.
3. Tighten drain plug (2).
Tightening torque: 0.2 to 0.45 Nm {0.02 to 0.046 kgm, 0.1 to 0.3 lbft}



CHECK COOLANT LEVEL, ADD COOLANT

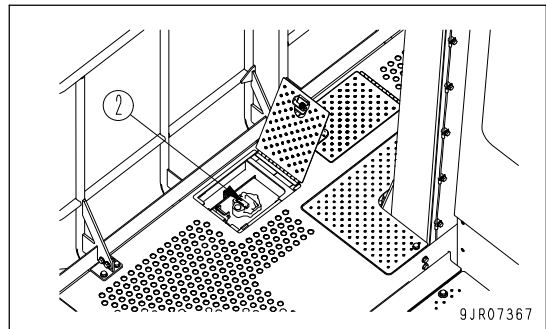
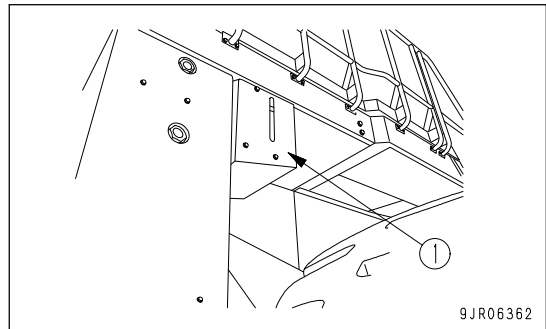
**WARNING**

- Do not open the radiator cap unless necessary. When checking the coolant, always wait for the engine to cool down and check 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 and remove it carefully.

1. Check that the coolant is between the FULL and LOW marks on the sight gauge of sub tank (1). If the level is low, open the cap of sub tank (1) and add water through water filler (2) to the FULL level.
2. After adding coolant, tighten the cap securely.
3. If the sub-tank becomes empty, there is probably coolant leakage. After checking, repair any abnormality immediately. If no abnormality is found, check the level of the water in the radiator. If it is low, add COOLANT of the same density in radiator according to the COOLANT density table in "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-25)", then add COOLANT to the sub-tank.

If the volume of coolant added is more than usual, check for possible leakage.

Confirm that there is no oil in the coolant.



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. Stop the engine and wait for the temperature at all parts to go down.

REMARK

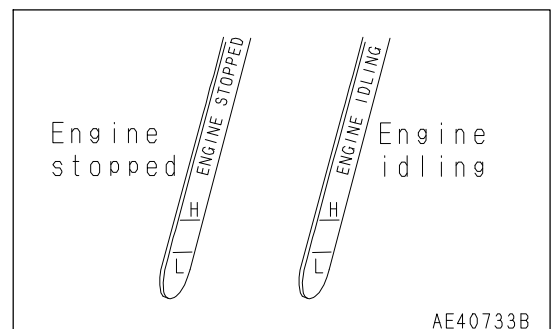
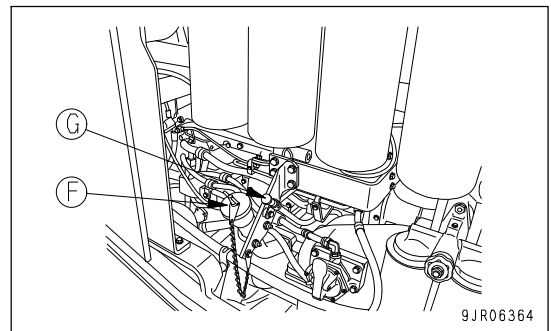
- When checking the oil level after the engine has been operated, wait for at least 15 minutes after stopping the engine before checking.
 - o Checking the oil level with the engine idling may be allowed, if the following precautions are thoroughly satisfied:
 - o Check that the engine water temperature gauge shows green range.
 - o Use the side of the dipstick marked "ENGINE IDLING".
 - o Remove the oil filler cap.
- If the machine is at an angle, make it horizontal before checking.

2. Open the engine side cover at the rear left of the machine.
3. Take out the dipstick (G) and wipe off the oil with cloth.
4. Fully insert dipstick (G) into filler pipe, then remove it.
5. The oil level should be between the H and L marks on dipstick (G).

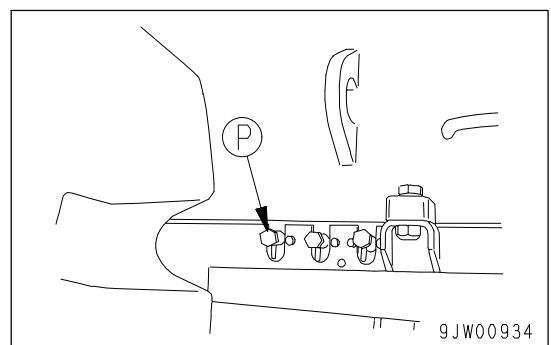
If the oil level is below the L mark, add oil through oil filler port (F).

The dipstick has level markings on both sides. One side gives the levels for measuring when the engine is stopped (ENGINE STOPPED) and the other side gives the levels for when the engine is idling (ENGINE IDLING).

When measuring the oil level, measure with the engine stopped and use the side of the dipstick marked "ENGINE STOPPED".



6. If the oil is above the H line, install a hose to the oil drain port of drain plug (P), drain the excess oil, then check the oil level again.
7. If the oil level is correct, tighten oil filler cap (F) securely, then remove the hose and close the engine side cover.



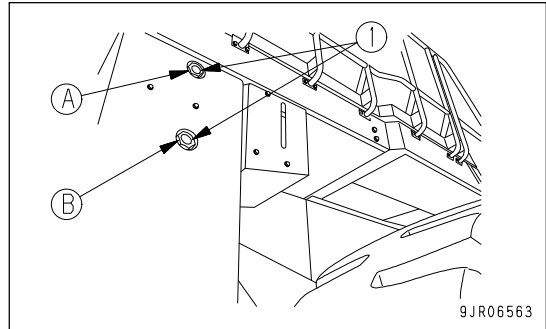
CHECK BRAKE OIL TANK LEVEL, ADD OIL

CAUTION

When adding oil to the brake oil tank, always use the recommended oil given in "USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE (PAGE 4-11)".

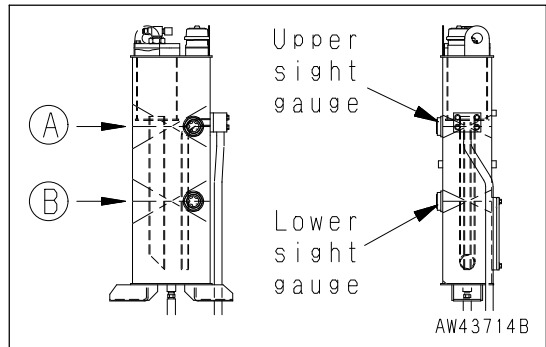
1. Check from the ground that the brake oil level in the brake oil tank on the left side of the machine is within sight gauge (1) installed to the side of the brake tank.

There are two sight gauges (top and bottom).



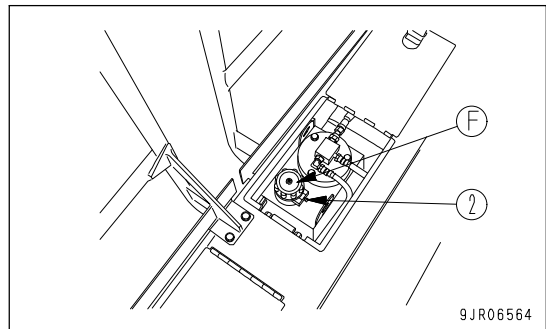
(A): When checking 10 hours or more after the engine is stopped, use the upper level gauge in the figure at right.

(B): When checking 5 minutes or more after the engine is started, use the lower level gauge in the figure at right.



2. If the oil level is low, open the cover at the top of the platform, then open cap (F) and add engine oil.

Keep grip (2) pulled, turn cap (F) counterclockwise, and remove it.



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.

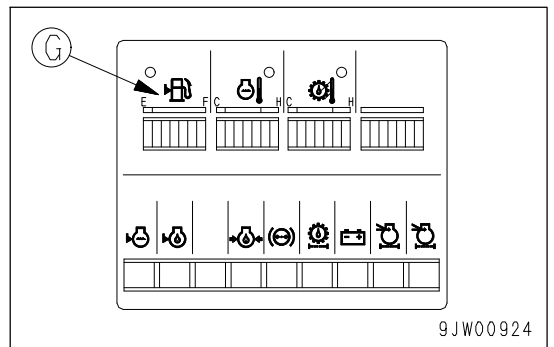
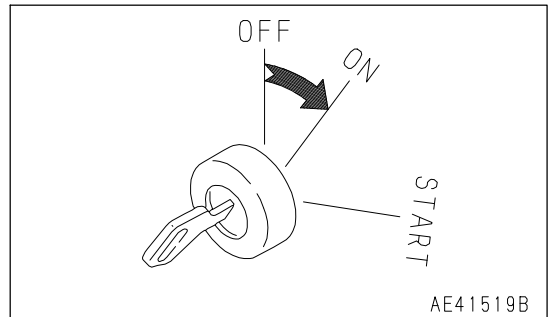
NOTICE

If the engine has stopped after running out of fuel, it is necessary to use the priming pump to bleed all the air from the fuel circuit before starting the engine again. For details of the procedure for bleeding the air from the fuel circuit, see "PROCEDURE FOR BLEEDING AIR (PAGE 3-158)".

Be careful not to let the engine run out of fuel and stop.

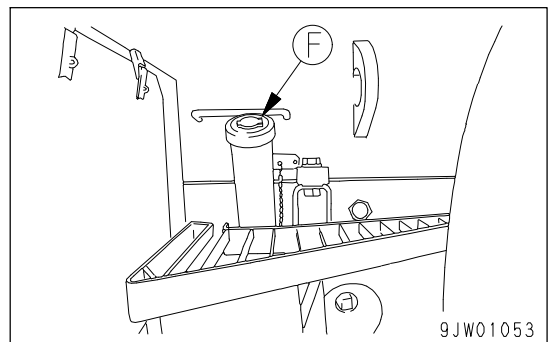
If the engine runs out of fuel, fill the fuel tank before bleeding the air. This will reduce the time taken to bleed the air.

1. Turn the engine starting switch to the ON position and check the fuel level with fuel level gauge (G).
After checking, turn the switch back to the OFF position.



2. If the fuel level is low, add fuel through fuel filler port (F) to fill the tank.
For details of the method for opening and closing the cap, see "CAP WITH LOCK (PAGE 3-45)".
3. After adding fuel, tighten the cap securely.

Fuel capacity: 1555 liters (410.83 US gal)



CHECK ELECTRIC WIRING



- 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, wrong fuse capacity, and any sign of disconnection or short circuit in the electric wiring. Also, check and tighten any loose terminals.

Particularly, check the wiring of the "battery", "starting motor" and "alternator" carefully.

When checking around the battery, make sure there is no accumulation of flammable material. Remove all flammable material.

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

CHECK PARKING BRAKE

Check that the parking brake works properly.

If there is any abnormality in the operation of the parking brake or the brake does not provide the proper braking effect, please contact your Komatsu distributor for adjustment.

CHECK BRAKE PEDAL

Drive the machine forward and check the effect of the brakes.

If there is any problem in the actuation of the brakes, please contact your Komatsu distributor to have the brakes adjusted.

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.

WA800-3E0

Tire size	Standard inflation pressure
45/65-45-46PR (L5) (Standard)	Front tire: 0.52MPa {5.25kg/cm ² , 74.55 PSI} Rear tire: 0.52MPa {5.25kg/cm ² , 74.55 PSI}
45/65-45-50PR (L5) (if equipped)	Front tire: 0.52MPa {5.25kg/cm ² , 74.55 PSI} Rear tire: 0.52MPa {5.25kg/cm ² , 74.55 PSI}

WA900-3E0

Tire size	Standard inflation pressure
45/65-45-58PR (L5) (Standard)	Front tire: 0.67MPa {6.8kg/cm ² , 96.56 PSI} Rear tire: 0.67MPa {6.8kg/cm ² , 96.56 PSI}
45/65R45☆☆ (L5) (if equipped)	Front tire: 0.64MPa {6.5kg/cm ² , 92.3 PSI} Rear tire: 0.64MPa {6.5kg/cm ² , 92.3 PSI}

NOTICE

The optimum inflation pressure differs according to the type of work. For details, see "HANDLING THE TIRES (PAGE 3-145)".

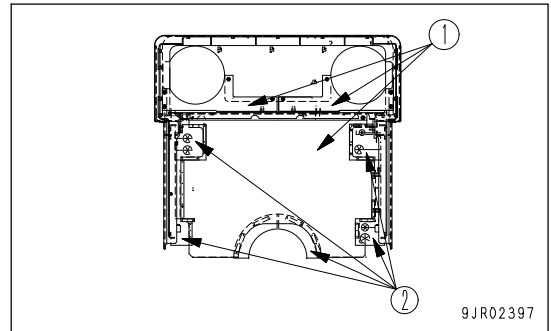
CHECK WATERPROOF/FIREPROOF DIVIDING WALLS**WARNING**

If the wall between the engine room and hydraulic pump or the rubber sheet are damaged or have come off, and the hydraulic hose breaks, oil will spray onto the high-temperature parts of the engine, and this will lead to fire or other secondary damage.

If the wall or rubber sheet are damaged or have come off, please contact your Komatsu distributor for repairs.

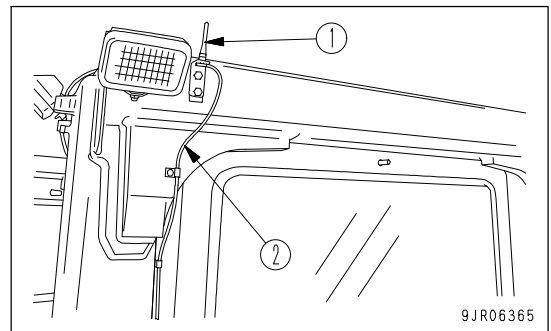
Check that there is no damage or missing parts of rubber sheet (2) or wall (1) between the engine room and hydraulic pump.

If any damage or missing parts are found, please contact your Komatsu distributor for repairs.

**CHECK KOMTRAX Plus ANTENNA AND CABLE**

(If equipped)

- There is no need to check or operate the KOMTRAX Plus controller.
- To ensure proper communications performance, check the following items daily. If any problem is found, please consult your Komatsu distributor.
 - Is communications antenna (1) missing, disconnected, or damaged?
 - Is antenna cable (2), missing, disconnected, or damaged?



ADJUSTMENT

SEAT ADJUSTMENT



WARNING

- Park the machine in a safe place and stop the engine when carrying out adjustment of the operator's seat.
- 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 down with the operator's back against the backrest.

An air compressor built into the seat is used for adjustment (C) and (D), so turn the engine starting switch to the ON position before starting the adjustment.

NOTICE

There is danger of damage to the air compressor, so do not keep lever (3) operated continuously for more than 1 minute.

(A) Fore-and-aft adjustment

Move lever (1) up and move the seat to the desired position and release the lever.

Fore-and-aft adjustment: 210 mm (10 mm x 21 stages)
(8.3 in (0.4 in) x 21 stages)

(B) Adjusting seat angle

Move lever (2) up, move the seat cushion at the front up or down to set to the desired position, then release the lever.

Amount of adjustment
Forward tilt: 3 degrees
Rear tilt: 11 degrees

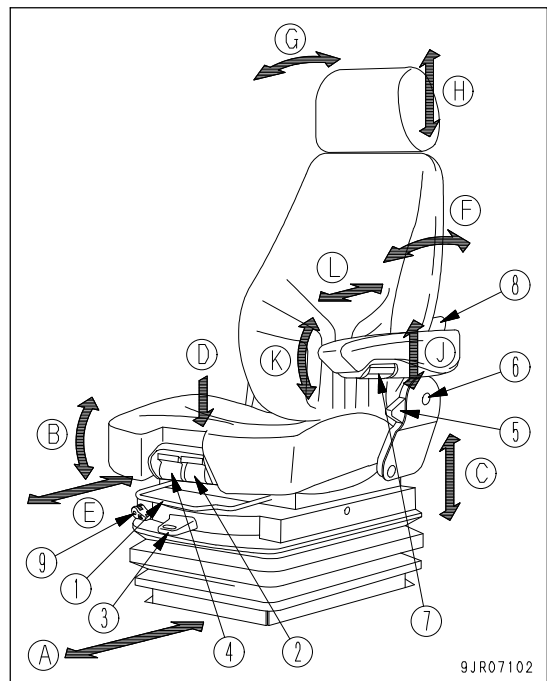
(C) Adjusting seat height

The seat height adjustment uses an air system, and it can be adjusted steplessly.

When adjusting the height, pull lever (3) up fully or push it down fully (when pulling it up, pull it until a click is felt). When the seat is set at the desired height, release the lever. If the lever is kept pulled up, the position where the seat does not rise any further is the maximum height. When the seat reaches the maximum height, the suspension automatically goes down slightly to secure the amount of movement of the lever.

If the operator raises his body from the seat or changes the amount of weight applied to the seat during adjustment, the air in the suspension may be discharged.

Amount of adjustment: 80 mm (3.2 in)



9JR07102

REMARK

If lever (3) is pulled up further from the maximum height, the air compressor may make a sound of actuation but the seat may not rise. This does not indicate any abnormality.

If this happens, the air compressor will stop automatically after approx. 8 seconds. It will also stop if lever (3) is pushed down.

(D) Setting seat for weight

To protect the operator, it is necessary to adjust the suspension to match the operator's weight.

Push lever (3) down to lower the seat to the lowest position, then pull lever (3) up fully (pull it until a click can be felt). When the lever is released, the weight adjustment is carried out automatically.

To ensure that the weight adjustment is carried out correctly, the operator should sit in the normal operating position when operating the lever. If the operator raises his body from the seat or changes the amount of weight applied to the seat during adjustment, the air in the suspension may be discharged.

When operators change shifts, the new operator should push lever (3) down to lower the seat to the lowest position, then pull lever (3) up fully (pull it until a click is felt). When the lever is released, the weight adjustment is carried out automatically.

If lever (3) is pulled lightly, the weight adjustment starts, but always pull the lever up fully (pull it until a click is felt) before releasing it.

REMARK

- When making initial adjustment or when adjusting the weight settings when operators change shifts, set the damping force of the suspension damper to the soft setting (for details, see "Adjusting hardness of suspension damper"), then adjust it to match the operator's weight. If the damping force of the suspension damper is left set to the hard setting and the height of the seat is adjusted, even if the height is raised, the seat may go down. If the seat goes down, set the damping force of the suspension damper to the soft setting, lower the seat, then adjust the weight again. After completing adjustment of the weight and height, set the damping force of the suspension damper to the desired strength.
- To protect the operator, the suspension must be adjusted to match the operator's weight. Adjust the weight before starting operations.
- When adjusting, do not remove your weight from the seat or change the load in any other way. If this is done, the air may be released from the suspension's seat.

(E) Fore-and-aft adjustment of seat cushion

Operate lever (4) up, set the seat cushion to the desired position, then release the lever.

Fore-and-aft adjustment: 60 mm (2.4 in)

(F) Adjusting reclining angle

Operate lever (5) up and move the back cushion to the front or rear.

But your back firmly against the seat back when carrying out this adjustment. If you move your back away from the seat back, the seat back may suddenly spring forward.

Amount of adjustment

Forward tilt: 20 degrees (over 20 degrees is free)

Rear tilt: 60 degrees

NOTICE

If the seat back is reclined too far, the seat back may hit the rear glass, so use it in a position where it does not contact the glass.

(G) Adjusting headrest angle

Rotate the backrest to the front or rear and set to the desired angle.

Amount of adjustment: 38 degrees

(H) Adjusting headrest height

Move the headrest up or down and set to the desired height.

Amount of adjustment: 100 mm (3.9 in)

(J) Adjusting height of armrest (steering wheel specification machines only)

Remove cap (6), then loosen the nut. Set to the desired height, then tighten the nut and install the cap.

Amount of adjustment: Up: 16 mm (0.6 in)

Down: 24 mm (0.9 in)

It is also possible to make the armrest spring up.

(K) Adjusting angle of armrest (steering wheel specification machines only)

Turn knob (7) to adjust the angle of the armrest.

Amount of adjustment: 40 degrees (front: 30 degrees; rear: 10 degrees)

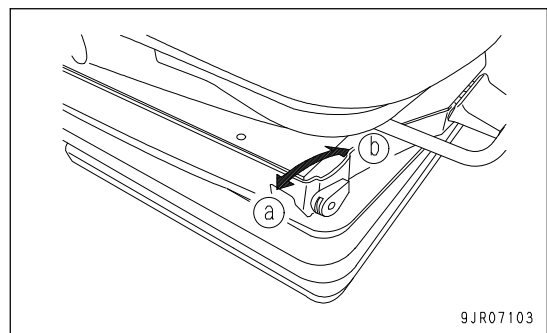
(L) Lumbar support

Turn knob (8) to the right or left to give suitable tension to the lumbar region.

(M) Adjusting hardness of suspension damper

Operate knob (9) to adjust the damping force of the suspension damper. If knob (9) is moved to face the outside of the seat (a), the damping force becomes stronger; if the knob is moved to face the inside of the seat (b), the damping force becomes weaker.

Amount of adjustment: 5 stages



ADJUST SEAT BELT**WARNING**

- Before fitting the seat belt, check that there is no problem in the belt mount bracket or mounting belt. If it is worn or damaged, replace the seat belt.
- Even if there are no signs of damage, replace belts in accordance with the following schedule:
5 years after the date of seat belt manufacture, or every 3 years after the start of actual usage, whichever date comes first.
- Always wear the seat belt during operations.
- Fit the seat belt so that it is not twisted.

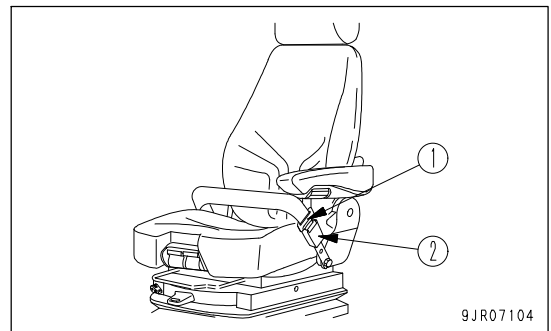
REMARK

The date of seat belt manufacture attached to the seat belt is the start of the 5-year period. It is not the start of the 3-year period of actual usage.

FASTENING AND REMOVING BELT

Fasten the belt so that it is tight without being too tight.

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, pull the right belt, then insert tongue (1) securely into buckle (2) until a click is heard. Pull the belt to check that it is firmly locked.
 3. When removing the belt, press the red button in buckle (2) to free the belt.
- Fit the belt so that it follows your body and is not twisted.



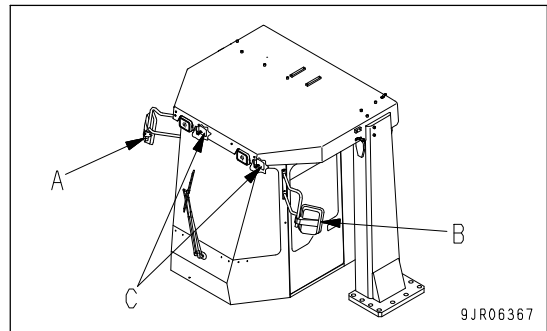
ADJUSTING MIRRORS

! WARNING

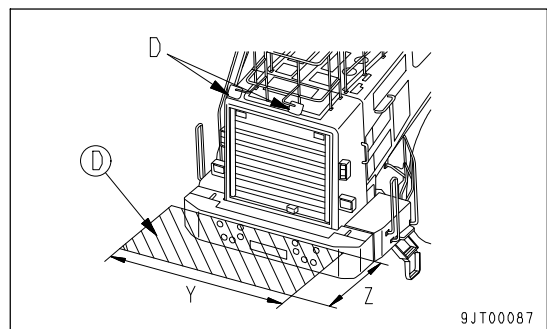
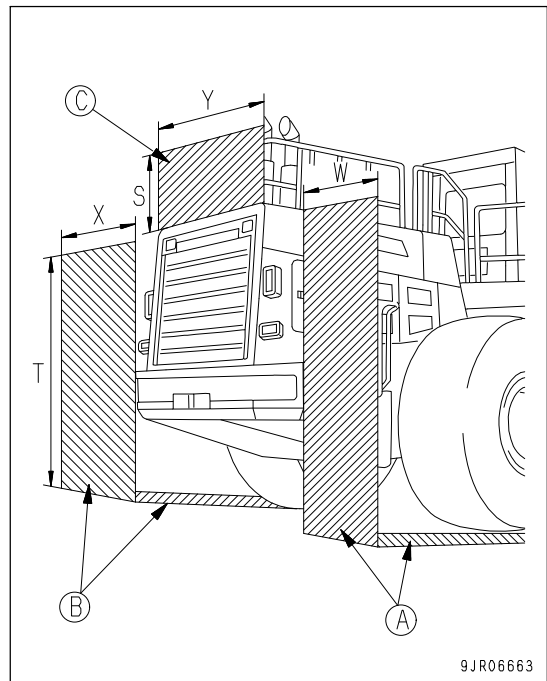
Be sure to adjust the mirrors before starting work. If they are not adjusted properly, you cannot secure the visibility and may be injured or may injure someone seriously.

Adjust the position so that the mirror gives a good view from the operator's seat. In particular, be careful to adjust so that it is possible to see people on the left and right sides at the rear of the machine.

	WA800-3E0	WA900-3E0
Range of view W (right)	1500mm (4ft 11in)	1500mm (4ft 11in)
Range of view X (left)	1500mm (4ft 11in)	1500mm (4ft 11in)
Range of view T (left, right)	3500mm (11ft 6in)	
Range of view Y (room)	2000mm (6ft 7in)	
Range of view S (room)	1700mm (5ft 7in)	
Range of view Y (rear)	3300mm (10ft 10in)	
Range of view X (rear)	1000mm (3ft 3in)	



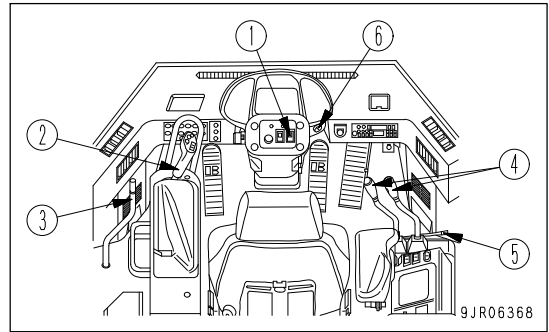
- Nirror A: Must be possible to see hatched portion (A)
- Nirror B: Must be possible to see hatched portion (B)
- Nirror C: Must be possible to see hatched portion (C)
- Nirror D: Must be possible to see hatched portion (D)



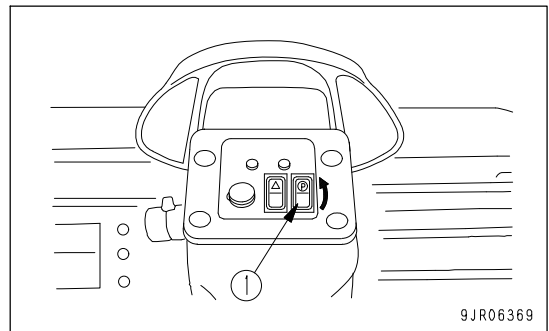
OPERATIONS AND CHECKS BEFORE STARTING ENGINE

WARNING

Before starting the engine, check that steering lock lever (3) and work equipment lock lever (5) are securely at the LOCK position. If work equipment control lever (4) or AJSS lever (2) are touched by mistake when the engine starts, the work equipment or machine may move unexpectedly, leading to serious personal injury.



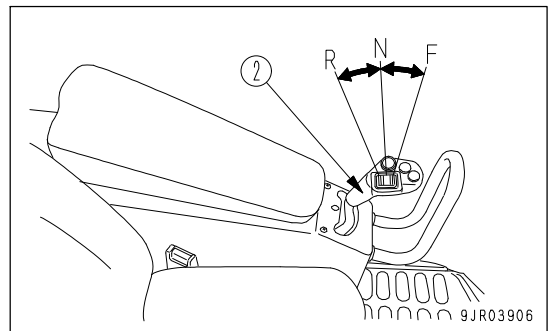
1. Check that parking brake switch (1) is at the ON position.



2. Check that the directional selector switch of AJSS lever (2) is at the N position and that the AJSS lever is at the Neutral position.

When starting the engine, if the directional selector switch is not at the N position and the AJSS lever is not at the Neutral position, the engine will not start.

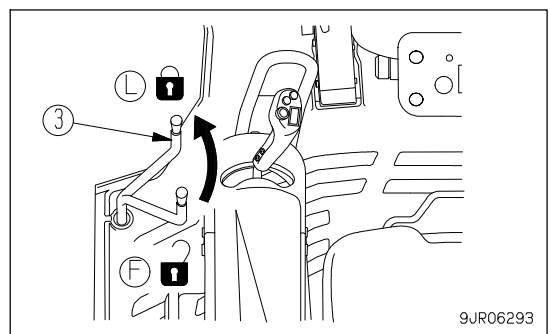
If the engine does not start, check that steering lock lever (3) is at LOCK position (L).



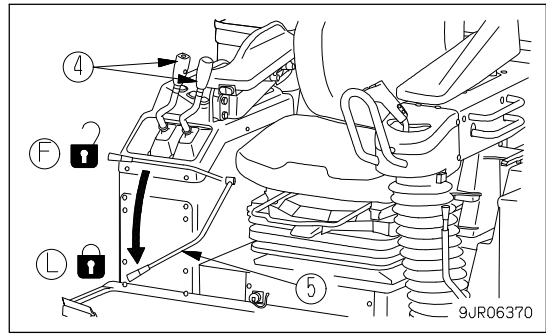
REMARK

- If the directional selector switch is not at the N position, the warning buzzer sounds (in a 0.25 second cycle).
- If the AJSS lever is not at the Neutral position and the starting switch is turned ON, the alarm buzzer sounds (in a 0.25 second cycle).

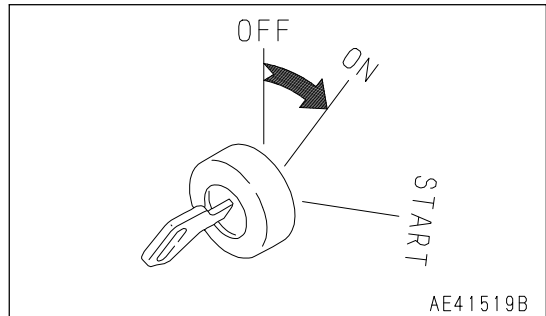
If this happens, return the AJSS lever to the Neutral position.



3. Lower the bucket to the ground and check that work equipment lock lever (5) of work equipment control lever (4) is at LOCK position (L). If it is not at LOCK position (L), move it from FREE position (F) to LOCK position (L).



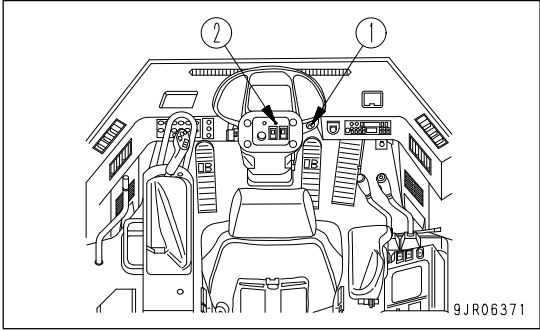
4. Insert the key in starting switch (6), turn the key to the ON position, and check that the machine monitor system works. When the starting switch is turned to the ON position before starting the engine, all monitor lamps, gauges, and central warning lamps will light up for approx. 3 seconds, the central warning lamp will light up and the alarm buzzer will sound for approx. 1 second. When this happens, 88 is displayed on the speedometer, and 8 is displayed on the transmission shift indicator. If the monitor lamps do not light up, there is probably a failure or disconnection, so please contact your Komatsu distributor for inspection.



STARTING ENGINE

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.

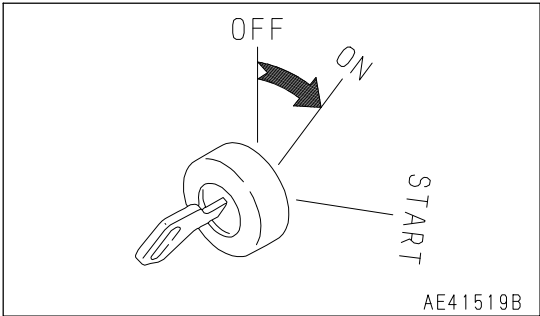


NOTICE

- 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.
- Avoid the sudden acceleration of the engine until it is warmed up.

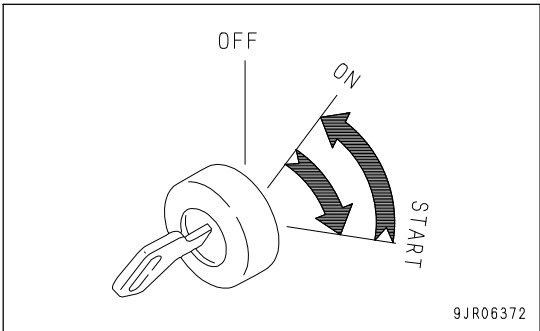
1. Turn the key in starting switch (1) to the ON position.

For machines not equipped with a prelude system, go on to Step 2.



For machines equipped with a prelude system

- 1) If prelude indicator lamp (2) is flashing, it is necessary to carry out prelude.
If prelude indicator lamp (2) is not flashing, go on to Step 2.
- 2) Turn the key in starting switch (1) to the START position, then return it to the ON position.
(When the key is released, it will automatically return to the ON position.)
Prelude indicator lamp (2) will light up and the prelude will start.



- 3) The prelude is completed after approx. 5 - 60 seconds, and the prelude indicator lamp (2) goes out.
(The prelude actuation time differs according to the ambient temperature and the engine oil temperature.)

REMARK

When the prelude is completed in Step 3), leave for at least 70 seconds (including the preheating time). The condition will return to the condition in Step 1).

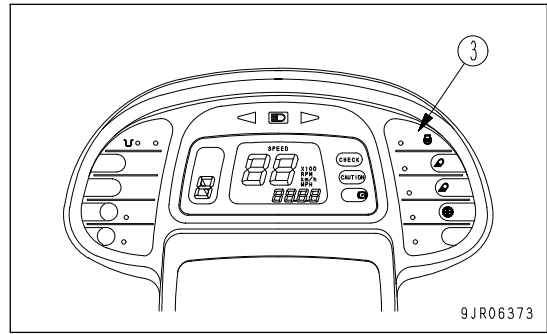
In cold weather, the oil viscosity is high, so there may be cases where the prelude is not completed in one step. In this case, operate it for 60 seconds, then return to the condition in Step 1), wait for approx. 60 seconds, then repeat the procedure from Step 2.

If the prelude is not completed even when it is carried out 3 times, there is probably an abnormality in the prelude system, so contact your Komatsu distributor for inspection and repair.

(For details of the method of starting the engine in emergencies, see "PRELUDE SKIP FUNCTION WHEN STARTING IN EMERGENCY (PAGE 3-170)").

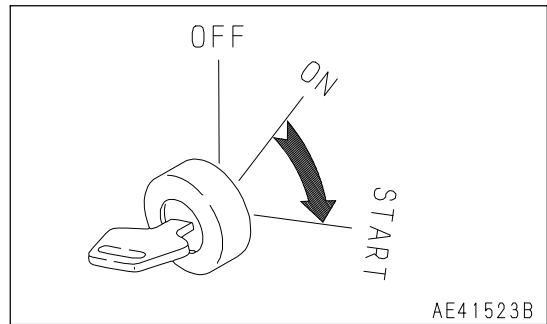
- Check if preheating pilot lamp (3) on the main monitor is lighted up.
 If preheating pilot lamp (3) is not lighted up, go to Step 3.
 If preheating pilot lamp (3) is lighted up, leave in this condition until it goes out.

The guideline for the preheating time is as follows.
 In cold areas, it varies according to the temperature of the coolant when the engine is started.

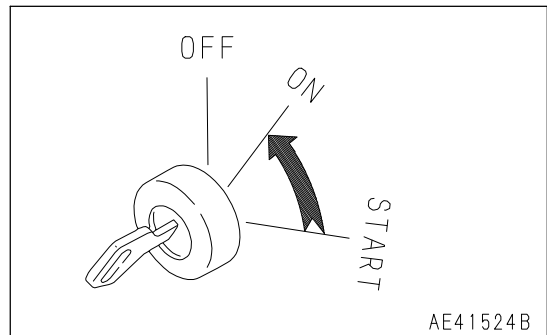


Cooling water temperature	Pre-heating time
above -5 to -15°C (5 to 23°F)	20 - 30 second
-15 to -25°C (5 to -13°F)	30 - 45 second
below -25°C (-13°F)	45 second

- When preheating pilot lamp (3) goes out, turn the key in starting switch (1) to the START position. The engine will start.



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



REMARK

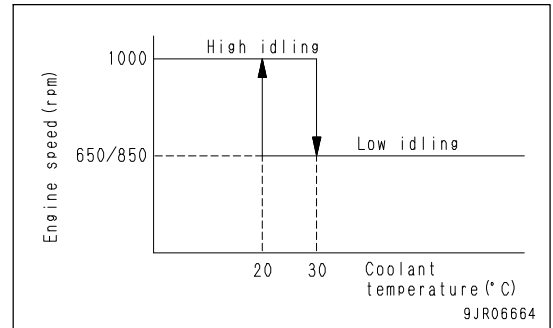
- Immediately after the engine starts, the turbocharger protect function prevents the engine speed from going above 1000 rpm for a maximum of 20 seconds, even if the accelerator pedal is depressed.
- If the accelerator pedal is kept depressed, the engine speed will suddenly rise after the turbo protect time. To prevent this, release the accelerator pedal.
- The turbocharger rotates at extremely high speed. Immediately after the engine is started, the pressure of the lubricating oil has not risen sufficiently, so if the engine speed is suddenly raised, it may lead to damage or seizure of the turbocharger bearing. The turbo protect function acts to prevent this problem. It uses electronic control to prevent the engine speed from rising above a certain speed for the first few seconds after the engine

AUTOMATIC WARMING-UP OPERATION

When the engine cooling water temperature is low after the engine starts up, warming-up run automatically begins and stops 30 minutes after the engine startup, or after the engine cooling water temperature rises above 30°C.

REMARK

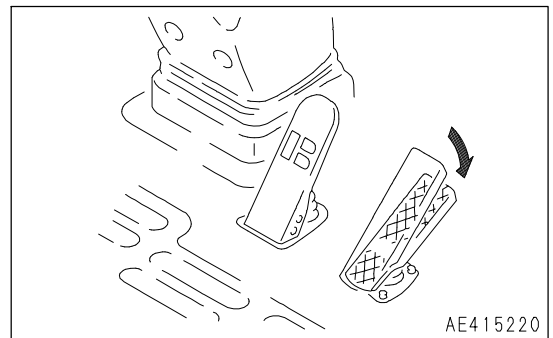
The automatic warming-up operation changes as shown in the diagram on the right according to the engine water temperature.



Canceling automatic warming-up operation

If it is necessary to lower the engine speed during the automatic warming-up operation, use the following procedure to cancel the operation.

1. Depress the accelerator pedal fully and run at full throttle for 3 seconds.



OPERATIONS AND CHECKS AFTER STARTING ENGINE



WARNING

- **Emergency stop**
If the operation is abnormal or any other trouble occurs, turn the key in the starting switch to the OFF position.
 - If the work equipment is operated without warming up the machine sufficiently, the response of the work equipment to the movement of the control lever will be slow. The work equipment may not move as the operator desires. Follow all warm-up procedures. Particularly in cold areas, make sure to warm up the machine properly.
-

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.

NORMAL OPERATION

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

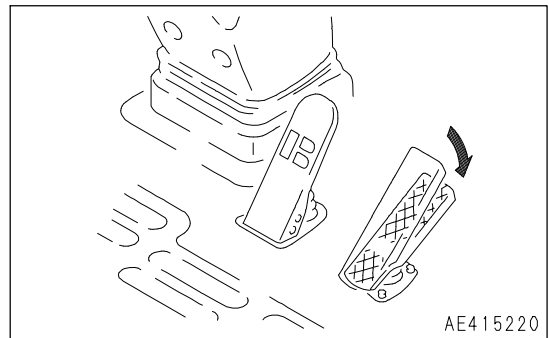
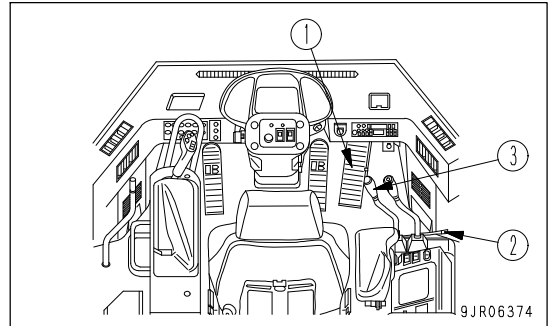
NOTICE

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

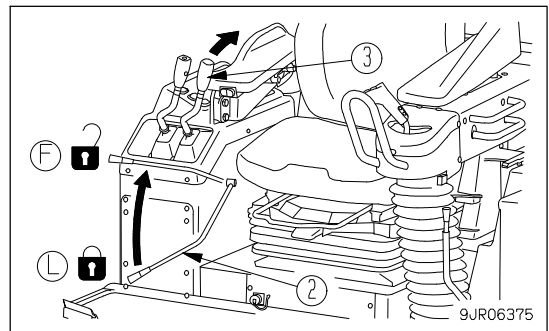
Do not run the engine at low idle or high idle continuously for more than 20 minutes.

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

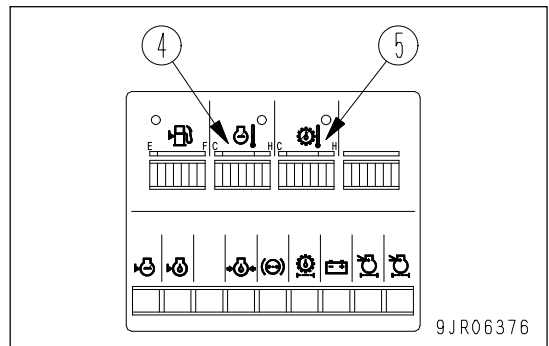
1. Immediately after starting the engine, without depressing the accelerator pedal (1), run the engine at idle for at least 10 seconds during the warm weather and for at least 15 seconds during the cold weather.
2. Depress accelerator pedal (1) lightly and run the engine with no load at midrange speed for about 5 minutes.



3. In cold weather only, carry out the following operation to warm up the hydraulic oil.
 - During the warming-up operation, check that the engine rotation is smooth, then set work equipment lock lever (2) to FREE position (F).
 - Move bucket control lever (3) in and out of the TILT position to warm up the hydraulic oil.
 - Keep the relief time at the TILT position to a maximum of 10 seconds. If this is done, the hydraulic oil reaches the relief pressure, so the oil is warmed up more quickly.



4. After carrying out the warming-up operation, check that the gauges and pilot lamps are normal.
 - If any abnormality is found, carry out maintenance or repair.
 - Run the engine under a light load until the engine water temperature gauge (4) and torque converter oil temperature gauge (5) enter the green range.
5. Check for abnormal exhaust gas color, noise, or vibration. If any problem is found, contact your Komatsu distributor.



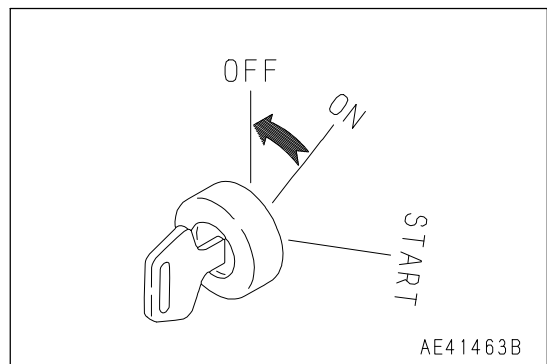
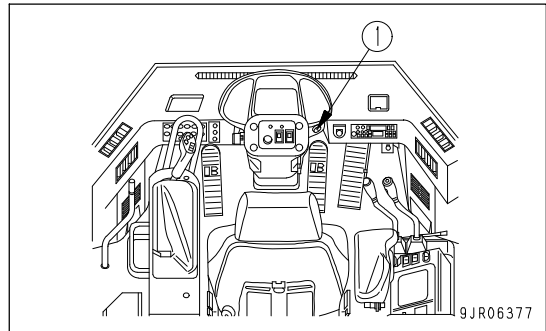
STOPPING ENGINE

NOTICE

If the engine is abruptly stopped before it has cooled down, engine life may be greatly shortened. Consequently, do not abruptly stop the engine apart from an emergency.

In particular, if the engine has overheated, do not abruptly stop it but run it at medium speed to allow it to cool gradually, then stop 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).



CHECK AFTER STOPPING ENGINE

1. Walk around the machine and check the work equipment, bodywork, and undercarriage, and check also for oil and water leakage.
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 THE MACHINE (DIRECTIONAL, SPEED), STOPPING THE MACHINE

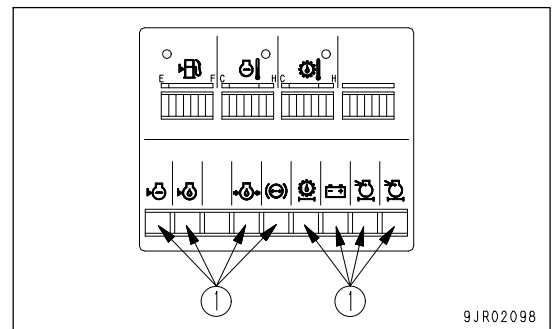
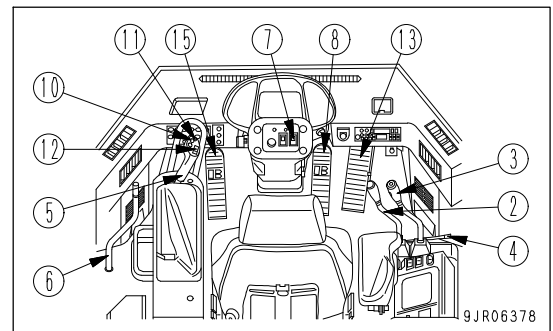


WARNING

- Always remove the frame lock bar before traveling. If it is not removed, the steering will not work and this may lead to serious personal injury.
- When moving the machine off, check that the surrounding area is safe, then sound the horn and start the machine.
- Do not let any person enter the area around the machine.
- Remove any obstacles from the travel path.
- The rear of the machine is a blind spot, so when traveling in reverse, be particularly careful to check that it is safe.
- When starting the machine off on a slope, depress the left brake pedal, then depress the accelerator pedal and slowly let the left brake pedal back to allow the machine to move off. This will prevent the machine from running back down the slope.
- While keeping the engine running at a high speed, do not shift the transmission to the FORWARD or REVERSE position to start up the machine.

PREPARATIONS FOR MOVING MACHINE

1. Check that warning pilot lamp (1) is not lighted up.

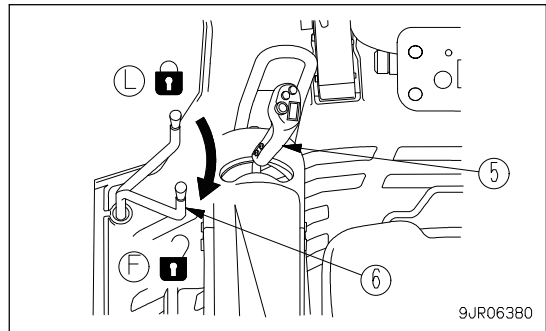
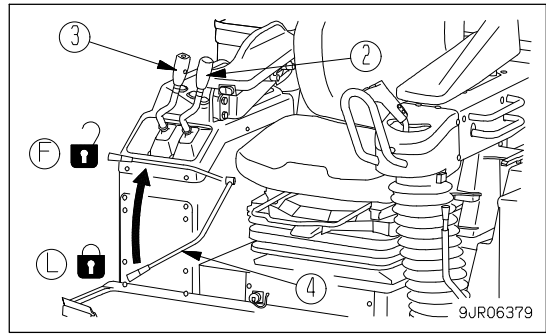


- 2. Set work equipment lock lever (4) (for bucket control lever (2) and lift arm control lever (3)) and steering lock lever (6) (for AJSS lever (5)) to FREE position (F).

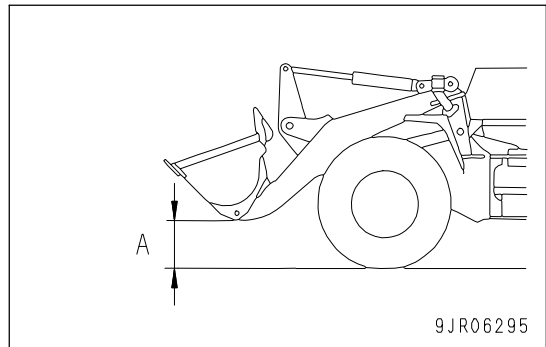
REMARK

If the steering lock lever is not set to FREE position (F), the directional selector switch will remain at the N position even if the switch is operated.

In addition, the speed display on the front machine monitor will show N and will not change, so always set the steering lock lever to FREE position (F).



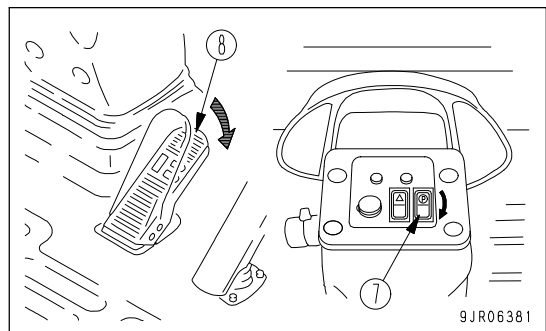
- 3. Operate lift arm control lever (3) to set the work equipment to the travel posture shown in the diagram on the right. (A): 70 - 90 cm (2ft 4in - 2ft 11in)



- 4. Depress right brake pedal (8) and turn parking brake switch (7) to the OFF (RELEASE) position to release the parking brake. Keep right brake pedal (8) depressed.

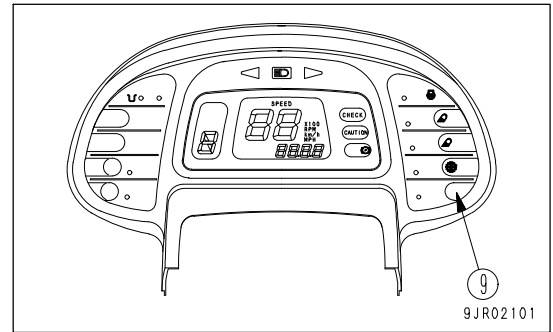
REMARK

If the parking brake is still actuated when parking brake switch (7) is at the OFF (RELEASE) position, turn the parking brake switch ON, then turn it OFF again.



5. Set to the desired speed range position.
Set the speed range position as follows.

- 1) Use transmission auto shift/manual selector switch (9) to select auto shift or manual shift.



Auto shift: Transmission auto shift/manual selector pilot lamp goes out

The transmission automatically shifts gear according to the travel speed. The maximum speed range selected for automatic transmission is displayed on the 1st, 2nd, 3rd indicator lamps at the bottom of the main monitor.

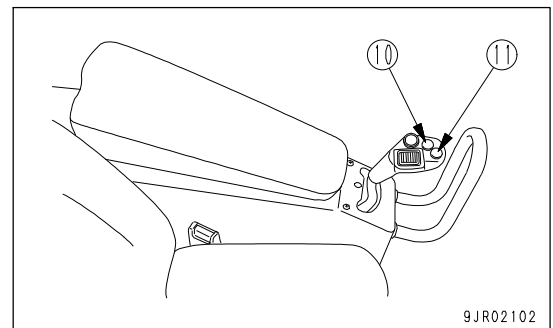
Manual shift: Transmission auto shift/manual selector pilot lamp lights up

The machine travels in the speed range is selected by the shift up, shift down switch. The 1st, 2nd, 3rd indicator lamps go out.

REMARK

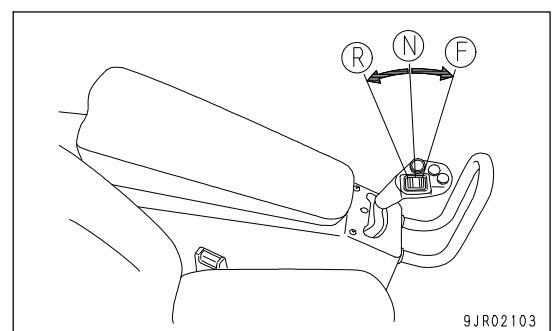
- The speed range after turning the starting switch to the ON position is the final speed range selected by the previous operation.
- If the system is shifted from auto shift to manual shift, or from manual shift to auto shift when the machine is stopped, the speed range is automatically set to 2nd.

- 2) To set to a speed range other than the speed range set in Step 1), shift the speed range using shift-up switch (11) or shift-down switch (10) at the head of AJSS lever (5).

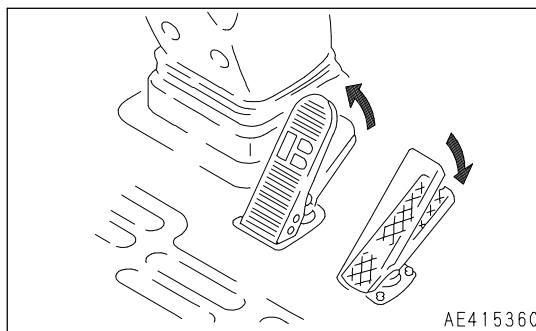


6. Press directional selector switch (12) at the head of the AJSS lever (5) to the desired position.

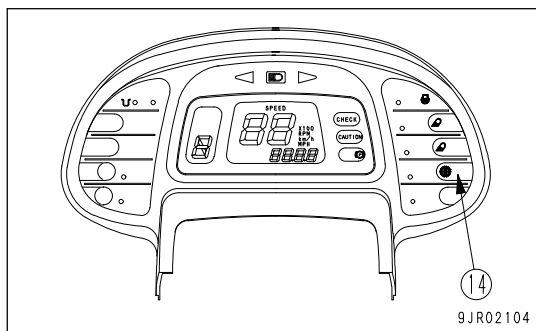
- Position (F): FORWARD
- Position (N): Neutral
- Position (R): REVERSE



7. Release right brake pedal (8), then depress accelerator pedal (13) to move the machine off.

**REMARK**

When moving the machine off on a hill, turn the transmission cut-off switch (14) OFF, depress left brake pedal (15), set directional selector switch (12) to F, then depress the accelerator pedal (3) and gradually release left brake pedal (15) to let the machine move off. This makes it possible to prevent the machine from rolling back.



CHANGING GEAR SPEED

**WARNING**

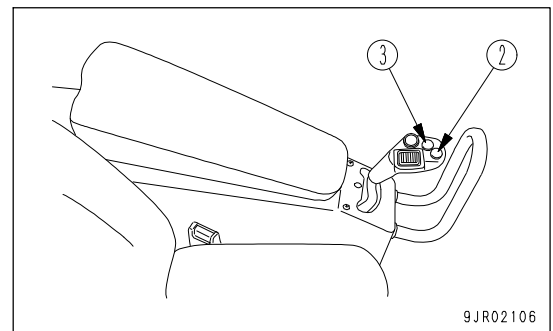
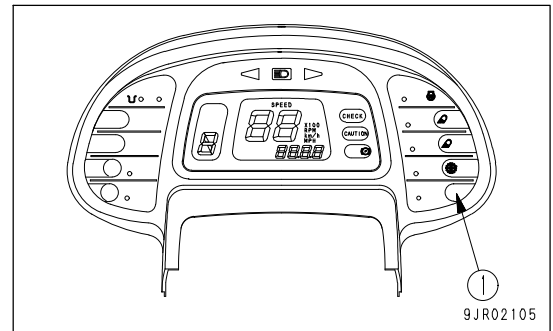
When traveling at high speed, do not shift gear suddenly. Use the brake to reduce the travel speed before shifting gear.

Shift gear as follows.

When shifting gear, select with transmission auto shift/manual selector switch (1) and shift with shift-up switch (2) or shift-down switch (3) at the head of the AJSS lever.

For details, see "PREPARATIONS FOR MOVING MACHINE (PAGE 3-97)".

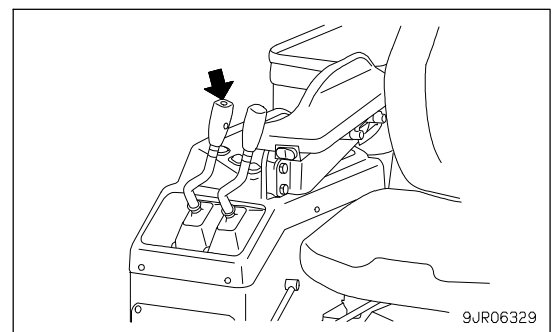
When carrying out digging or loading operations, use 1st or 2nd speed.

**REMARK**

This machine is equipped with a kick-down switch. When traveling in 2nd, if the button at the tip of the lift arm control lever is pressed, the speed range shifts down to 1st.

We recommend use of the kick-down switch when using 1st or 2nd speed for digging or loading operations.

For details of the method of use, see Section "KICKDOWN SWITCH (PAGE 3-31)".

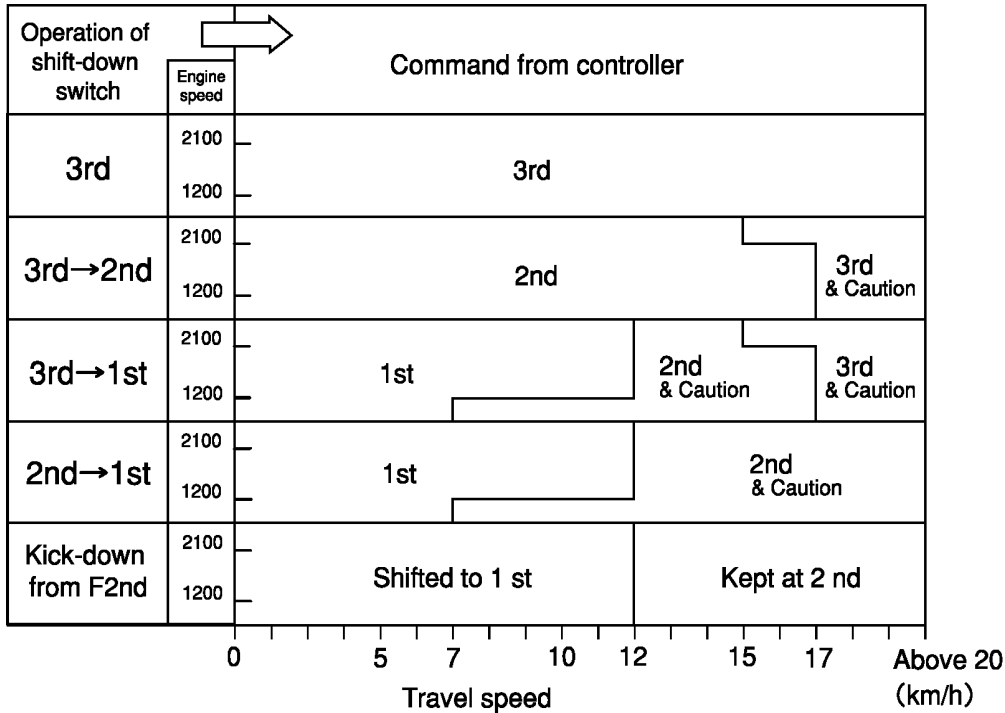


CONTROL WHEN SHIFTING DOWN AT HIGH SPEED

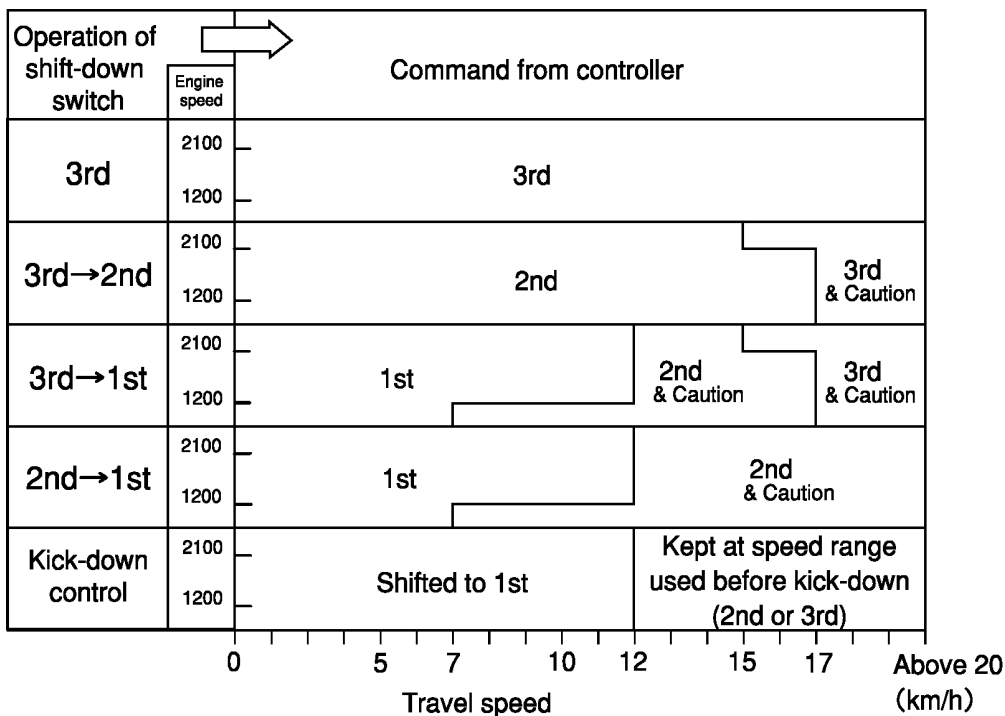
Shifting down at high speed has an adverse effect on the durability of the torque converter.

Based on the table below, when shifting down at high speed, the alarm buzzer sounds for 3 seconds (repeated short beeps). At the same time, the controller automatically controls the shift down operation to ensure durability, but note that the deceleration of the machine becomes weaker.

Control when shifting down (manual shift)



Control when shifting down (auto-shift)



CHANGING DIRECTION

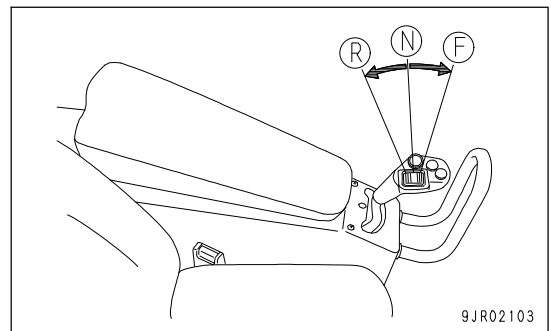
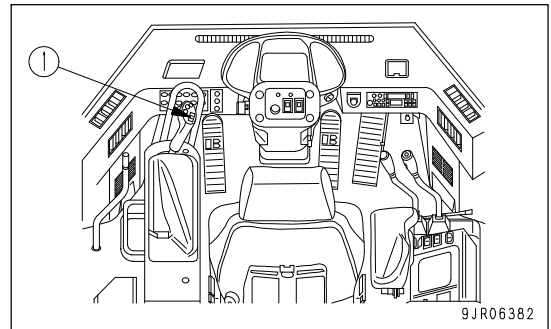
**WARNING**

- When changing direction between FORWARD and REVERSE, check that the new direction of travel is safe. There is a blind spot behind the machine, so be particularly careful when changing direction to travel in reverse.
- Do not switch between FORWARD and REVERSE when traveling at high speed.
When switching between FORWARD and REVERSE, depress the brake to reduce the travel speed sufficiently, then change the direction of travel. (Max.speed for changing direction: 12 km/h (7.5 MPH))

When switching between FORWARD and REVERSE, it is possible to change direction without stopping the machine. Set directional selector switch (1) to the desired position.

Position (F): Forward
Position (N): Neutral
Position (R): Reverse

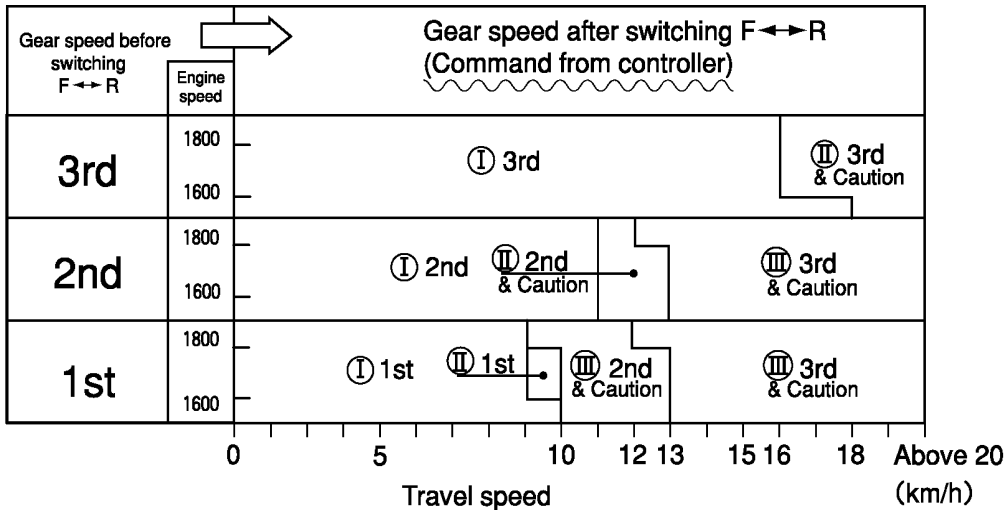
- Check that the backup alarm sounds when the directional selector switch is set to REVERSE. If the backup alarm does not sound, please ask your Komatsu distributor to carry out



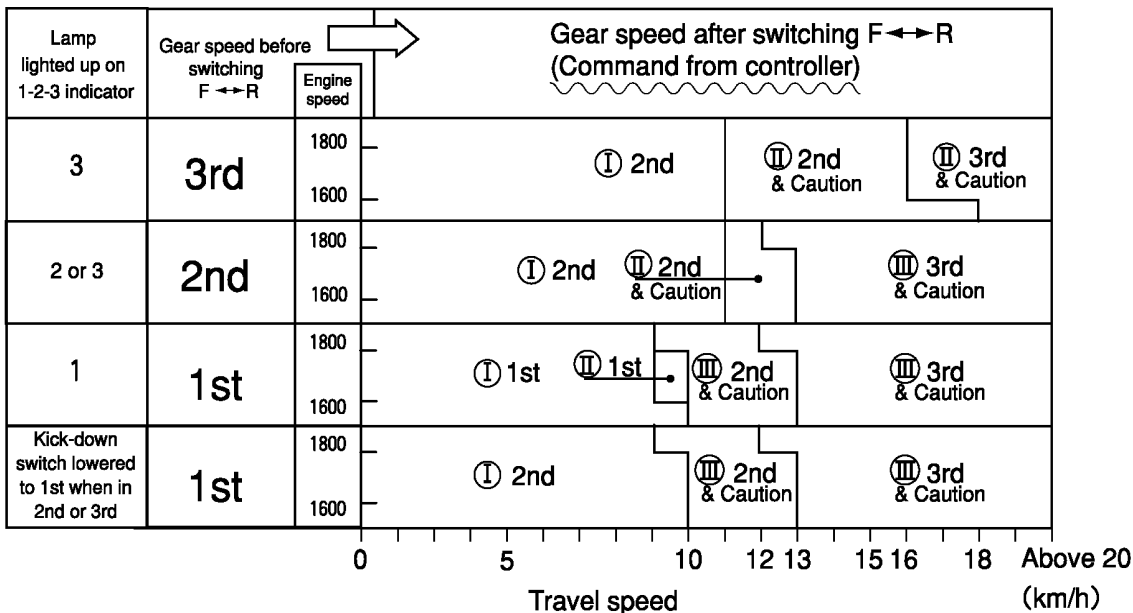
CONTROL FOR CHANGE OF TRAVEL DIRECTION AT HIGH SPEED

Switching between forward and reverse at high speed has a bad effect on the durability of the transmission. In range (II) shown in the chart below, the alarm buzzer sounds for 3 seconds (rapid intermittent sound), so if it sounds, depress the brake immediately to fully reduce the travel speed, then switch between forward and reverse. In addition, if it is attempted to switch between forward and reverse in range (III) shown in the chart below, the alarm buzzer sounds, and at the same time, the controller automatically controls the speed range. This maintains the durability, but the deceleration of the machine becomes weaker than in areas (I) and (II) .

Control when shifting between F<-> R (manual shift)



Control when shifting between F<-> R (auto-shift)

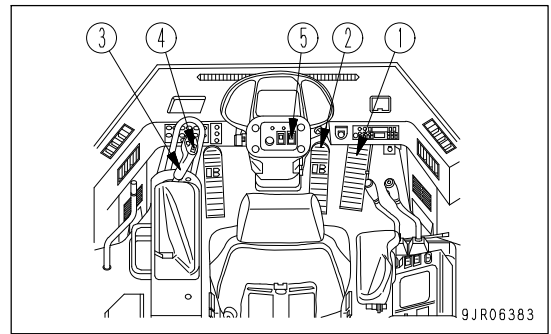


- (I): Gearshifting according to operation of lever
- (II): Gearshifting according to operation of lever + CAUTION emitted
- (III): Gearshifting different from gear shift lever command + CAUTION (controller controls speed range according to travel speed)

STOPPING THE MACHINE

**WARNING**

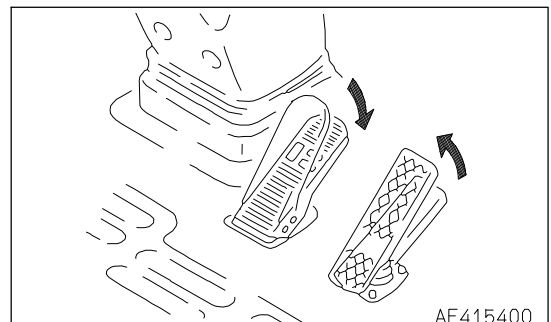
- Avoid sudden stopping. As far as possible, always leave a margin when stopping the machine.
- Avoid parking the machine on a slope. If it is necessary to park the machine on a slope, stop the machine facing directly down the slope, fit blocks under the tires and lower the bucket to the ground to prevent the machine from moving.
- If the work equipment control lever is touched by mistake, there is danger that the work equipment or machine may move suddenly and cause a serious accident. Before standing up from the operator's seat, always set the lock levers (for the work equipment control levers and AJSS lever) securely to the LOCK position.
- When the parking brake switch is turned ON, it is dangerous to release the brake pedal immediately. Always keep the brake pedal depressed until the parking brake pilot lamp lights up.



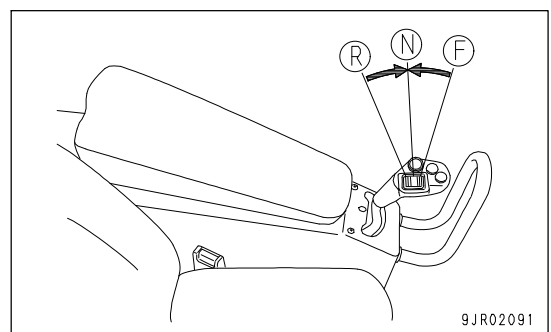
NOTICE

Never use the parking brake switch to brake the machine when traveling except in an emergency. Apply the parking brake only after the machine has stopped.

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



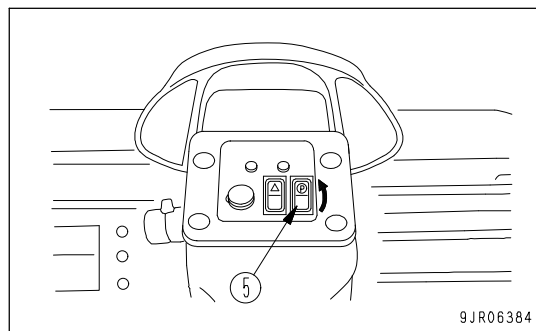
2. Set directional selector switch (4) on the head of AJSS lever (3) to the N position.



3. Push parking brake switch (5) to apply the parking brake.

REMARK

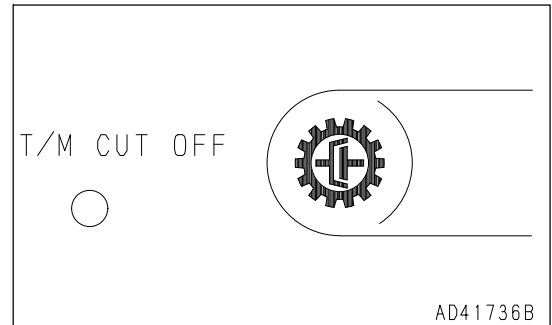
When the parking brake is applied, the transmission is automatically returned to neutral.



TRANSMISSION CUT-OFF FUNCTION

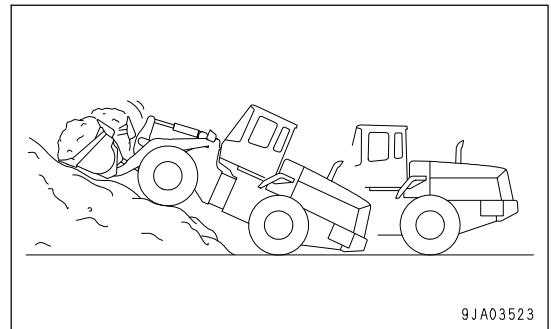
When the transmission cut-off switch is turned ON, the pilot lamp lights up and the following transmission cut-off function is

When the left brake pedal is depressed, the brake is actuated, and in addition, the transmission is shifted to neutral at the pre-selected brake pedal depression position.

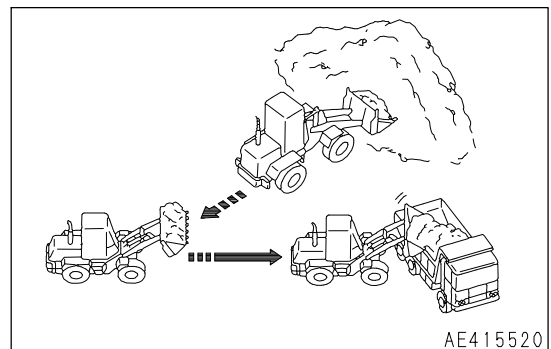


REMARK

- The cut-off function is actuated only with the left brake pedal.
- When the transmission cut-off switch is at the OFF position, the left brake pedal works in the same way as the right brake pedal.
- For details of adjusting the brake pedal depression position, see "ADJUSTING TRANSMISSION CUT-OFF POSITION (PAGE 3-108)".
- Raise or lower the pre-selected brake pedal depression position to adjust the cut-off to match the type of work shown below.
- When carrying out scooping-up work, lower the brake pedal depression position for the cut-off (transmission shifted to neutral). In this setting, the transmission driving force is cut at a point where there is ample braking force, so this prevents the machine from slipping down.



- When approaching dump trucks during loading operations, raise the brake pedal depression position for the cut-off (transmission shifted to neutral). In this setting, the fine control of the braking immediately before dumping the load can be carried out with the brake only, so this makes it easy to control and allows the machine to be brought to a soft stop.



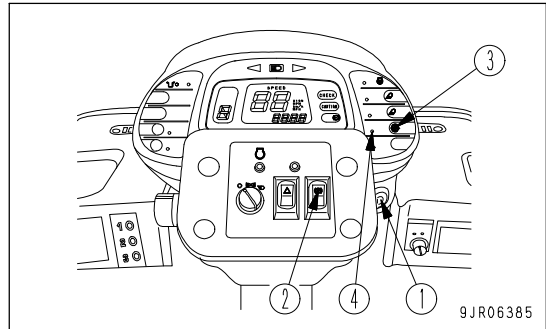
ADJUSTING TRANSMISSION CUT-OFF POSITION



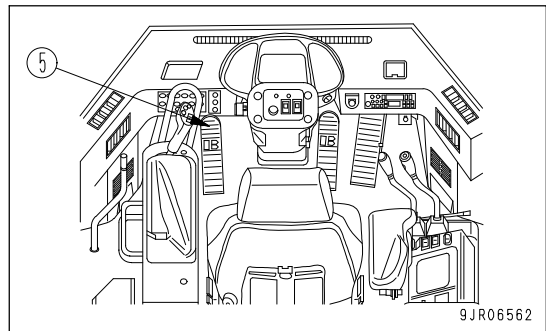
Apply the parking brake before adjusting the transmission cut-off position.

Adjust the depression position of the left brake pedal used to shift the transmission to neutral at the position to match the operation.

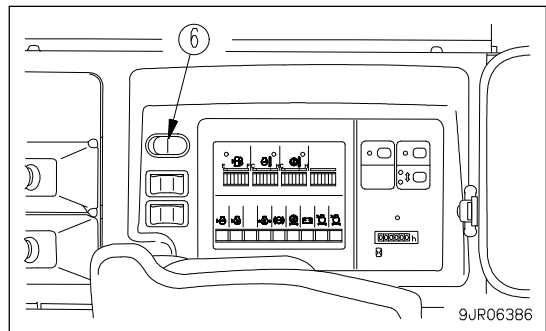
1. Start the engine with starting switch (1), then set parking brake switch (2) to the ON position.
2. Turn transmission cut-off switch (3) ON.
Transmission cut-off pilot lamp (4) will light up.



3. Depress left brake pedal (5) and adjust it to the position where it is desired to shift the transmission to Neutral.



4. Press transmission cut-off set switch (6), then release it. At the point where the switch is released, the buzzer will sound (beep beep) and the cut-off position is set.



Method of returning to default setting

5. After the buzzer sounds in Step 4 of the adjustment procedure, press transmission cut-off set switch (6) again within 2 seconds, and release it.
6. The buzzer will sound with a long sound and the adjusted cut-off position is canceled.
The cut-off position is returned to the default setting.

Transmission cut-off function

When the transmission cut-off switch is ON, if the brake pedal is depressed, the transmission is returned to Neutral when the brake pedal is depressed to the set position.

REMARK

- When the transmission cut-off switch is OFF, the transmission does not return to Neutral.
- Even if the left brake pedal is not depressed, it is possible to set the transmission cut-off position, but in that case, it is set to the default position (the position where the brake pedal is depressed least).

TURNING

**WARNING**

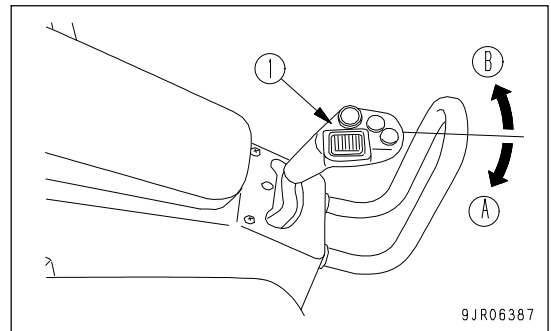
- Never operate the steering suddenly when traveling at high speed; never operate the steering on steep slopes. These operations are extremely dangerous.
- If the engine stops when the machine is traveling, the emergency steering is actuated, but this device is only for use in emergencies, so never stop the engine.
It is particularly dangerous if the engine stops on hills, so never under any circumstances stop the engine when traveling on slopes.
If the engine stops, move the machine immediately to a safe place and stop it there.
- After articulating the machine to the desired angle, hold the AJSS lever in position. The machine will maintain the angle. While the angle of turning is being maintained, do not operate the AJSS lever in the opposite direction. The machine will shake and create a dangerous condition. In addition, if the AJSS lever is operated in the opposite direction when the machine is turning, there will tend to be a shock, and this will create a dangerous situation.

When traveling, angle AJSS lever (1) in the direction of turning, and the machine will turn.

If it is angled to the right (A), the machine will turn to the right; if it is angled to the left (B), the machine will turn to the left. The more the lever is angled, the greater the angle of articulation will become.

With this machine, the front and rear frames articulate around the connecting pin (center pin) connecting the front and rear frames. The rear wheels follow the same path as the front wheels when the machine turns.

When operating the AJSS lever, angle the AJSS lever lightly to match the turning angle of the machine.

**NOTICE**

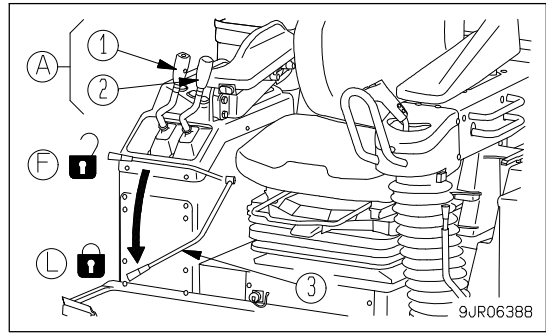
When making a full turn, operate the AJSS lever to the end of its travel. Do not try to operate it any further.

In addition, check that the actuation of the steering is normal. If any abnormality is found, please ask your Komatsu distributor to carry out inspection.

OPERATION OF WORK EQUIPMENT

WARNING

- When standing up from the operator's seat, always set the work equipment lock lever securely to the LOCK position. If the work equipment lock lever is not locked, and work equipment control lever (A) is touched by mistake, this may lead to serious personal injury.
- If the work equipment lock lever is not set securely to LOCK position (L), the work equipment may move and cause serious personal injury. Check that the work equipment lock lever is at the position shown in the diagram.
- When pulling the work equipment lock lever up or pushing it down, be careful not to touch work equipment control lever (1).



Work equipment control lock lever (3) is the locking device for work equipment control lever (A). Lower the work equipment lock lever to set it to the LOCK position.

Lift arm control lever (1) and bucket control lever (2) can be used to operate the lift arm and bucket as follows.

LIFT ARM CONTROL LEVER

Set the work equipment lock lever to the FREE position before operating the control lever.

Position (A): RAISE

Position (B): HOLD

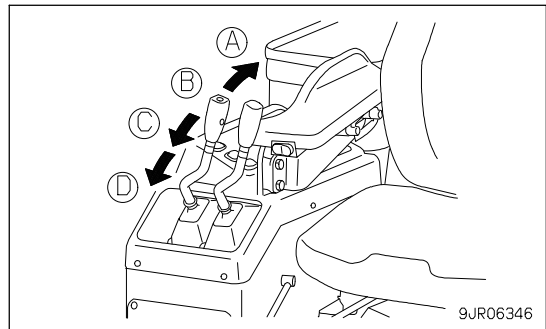
The lift arm is stopped and held in position.

Position (C): LOWER

Position (D): FLOAT

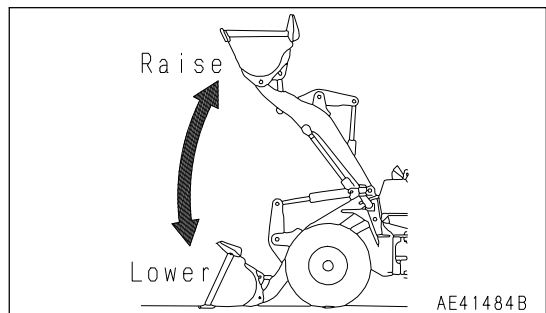
The lift arm moves freely under external force.

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



NOTICE

Do not use the FLOAT position when lowering the bucket. Use the FLOAT position when leveling, see "LEVELING OPERATIONS (PAGE 3-118)".



BUCKET CONTROL LEVER

Set the work equipment lock lever to the FREE position before operating the control lever.

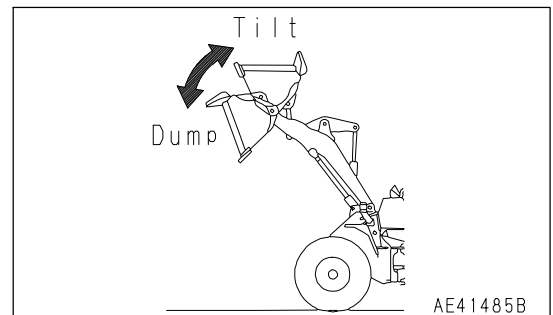
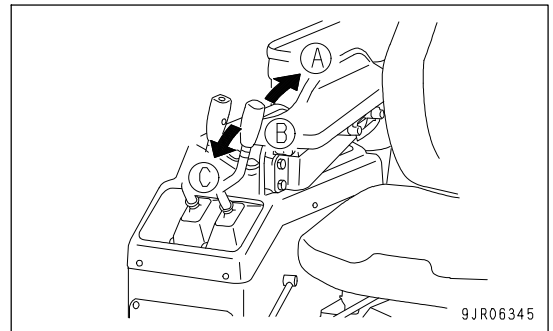
Position (A): TILT

Position (B): HOLD

The bucket is stopped and held in position.

Position (C): DUMP

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



REMOTE POSITIONER

This machine is equipped with a remote positioner function.

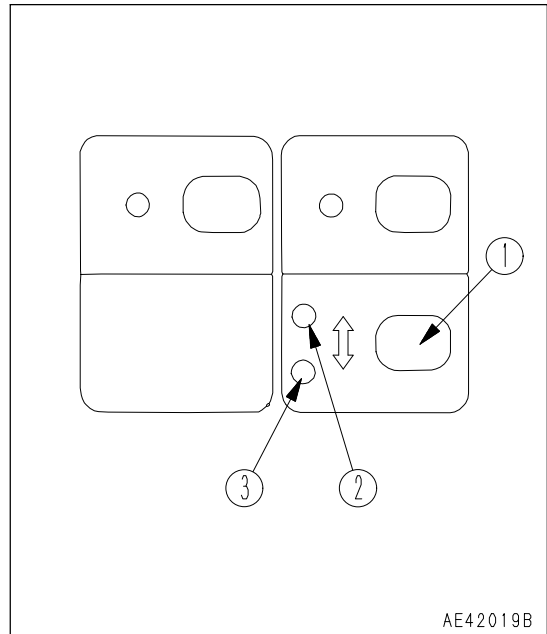
METHOD OF OPERATING REMOTE POSITIONER

1. When remote positioner RAISE/LOWER selector switch (1) is pressed, the system is turned ON, the remote positioner stop display lamp lights up, and the remote positioner is set to the actuation condition.

REMARK

Each time the remote positioner RAISE/LOWER selector switch is pressed, the lighting of the display lamp changes as follows.

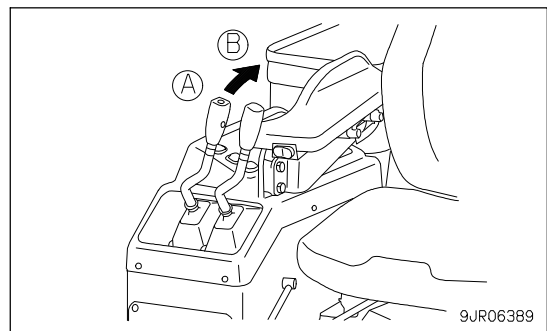
- 1: RAISE ON/LOWER OFF
- ↓
- 2: RAISE OFF/LOWER ON
- ↓
- 3: RAISE ON/LOWER ON
- ↓
- 4: RAISE OFF/LOWER OFF



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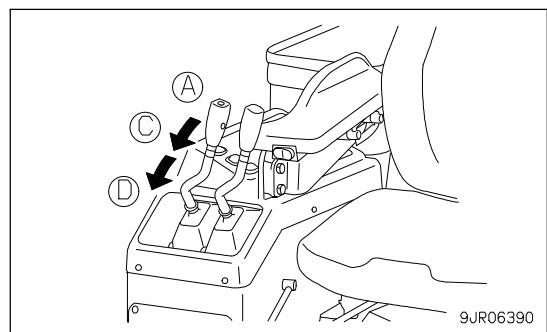
2. When the remote positioner RAISE stop display lamp (2) is lighted up, if the lift arm control lever is moved from HOLD position (A) to RAISE position (B), the lever will stay in that position.

When the lift arm rises to the RAISE stop set position, it will reduce speed and stop, and at the same time, the lift arm control lever will return to HOLD position (A).



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3. When remote positioner LOWER stop display lamp (3) is lighted up, if the lift arm control lever is moved from HOLD position (A) to FLOAT position (C) or maximum LOWER position (D), and the lift arm goes down to the LOWER stop set position, it reduces speed and stops. If the lever is held in position, the lift arm is set to the STOP condition.



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METHOD OF SETTING REMOTE POSITIONER STOP POSITION

1. When remote positioner RAISE stop display lamp (1) is lighted up, operate the lift arm control lever to raise the lift arm to the desired height (a position above horizontal).

Then return the lift arm control lever to the HOLD position and press remote positioner RAISE position set switch (2).

Remote positioner RAISE stop display lamp (1) will go out, and remote positioner RAISE set pilot lamp (3) will flash for 2.5 seconds.

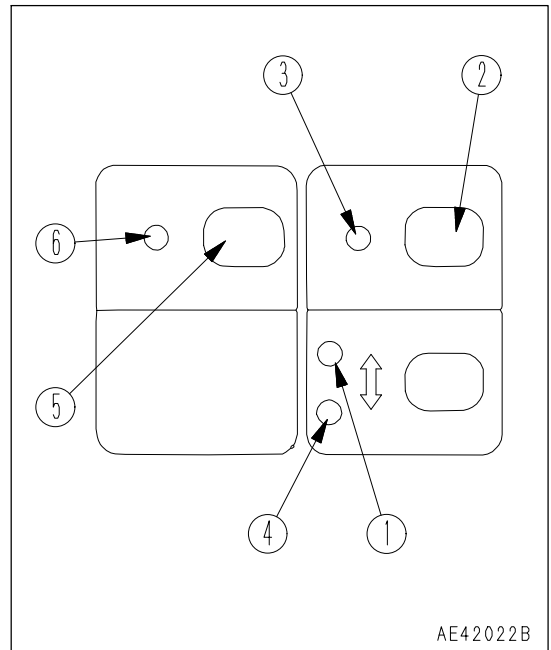
When remote positioner RAISE set pilot lamp (3) goes out and remote positioner RAISE stop display lamp (1) also goes out, the RAISE stop position is saved to memory and the setting operation is completed.

2. When remote positioner LOWER stop display lamp (4) is lighted up, operate the lift arm control lever to lower the lift arm to the desired height (a position below horizontal).

Then return the lift arm control lever to the HOLD position and press remote positioner LOWER position set switch (5).

Remote positioner LOWER stop display lamp (4) will go out, and remote positioner LOWER set pilot lamp (6) will flash for 2.5 seconds.

When remote positioner LOWER set pilot lamp (6) goes out and remote positioner LOWER stop display lamp (4) also goes out, the LOWER stop position is saved to memory and the setting operation is completed.

**SENSOR ADJUSTMENT FUNCTION**

This function offsets the error caused by the mounting of the potentiometer and makes it possible to detect the correct position data for the work equipment.

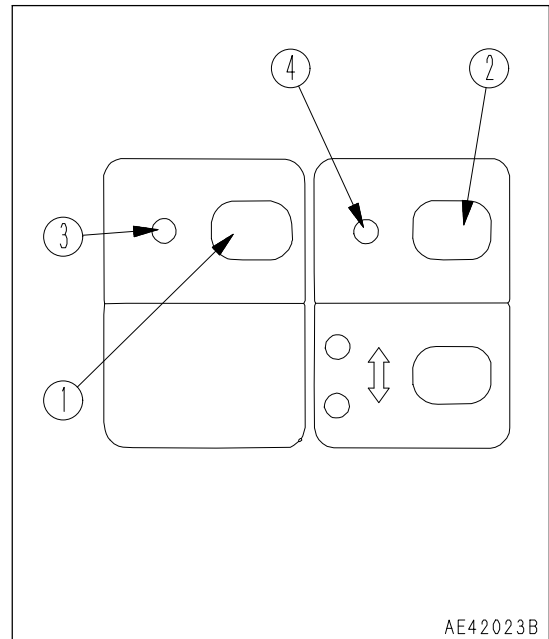
Always carry out this function when replacing the controller potentiometer or work equipment.

SENSOR ADJUSTMENT METHOD

1. Set the work equipment to the lift arm top end position.
2. Keep remote positioner LOWER position set switch (1) and remote positioner RAISE position set switch (2) pressed at the same time for at least 3 seconds.

When remote positioner LOWER set pilot lamp (3) and remote positioner RAISE set pilot lamp (4) light up, release the switches and set to the sensor adjustment mode.

3. The remote positioner LOWER set pilot lamp (3) and remote positioner RAISE set pilot lamp (4) light up for 2 seconds, and when both lamps go out, the offset is recorded in memory.
4. If the lamps flash in Step 3, the potentiometer output is not within the offset range, so adjust the potentiometer mount. Adjustment can be carried out at the posture in Step 1.



AE42023B

REMARK

After adjustment each potentiometer, always carry out Steps 1 and 2 again, and check that the condition in Step 3 is correct (the set lamps light up for 2 seconds and then go out).

ADJUSTING REMOTE POSITIONER

When the lift arm has been removed or the setting does not work efficiently, please contact your Komatsu distributor for adjustment.

WORK POSSIBLE USING WHEEL LOADER

This section explains about general operations. Be sure to operate the machine correctly. For details, see "PRECAUTIONS WHEN HANDLING BLASTED ROCK (PAGE 3-121)".

In addition to the following, it is possible to further increase the range of applications by using various attachments.

DIGGING OPERATIONS



WARNING

Always set the machine facing directly to the front when carrying out digging or scooping operations. Never carry out these operations with the machine articulated.

NOTICE

If the tires slip, the tire life will be reduced, so do not allow the tires to slip during operation.

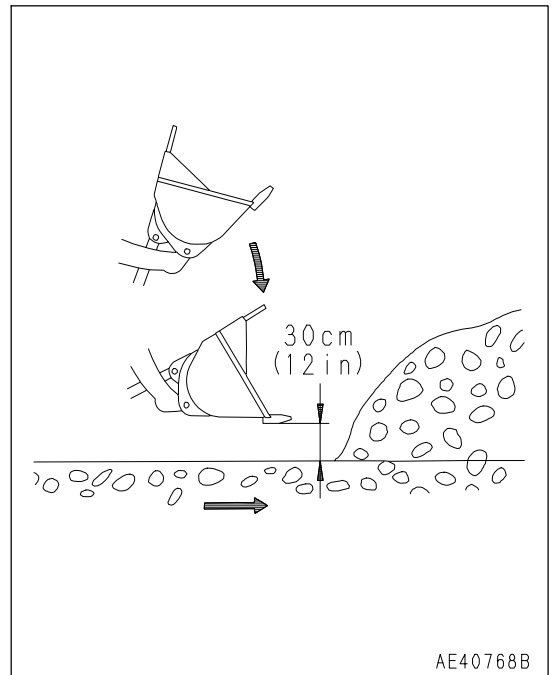
LOADING PILED SOIL OR BLASTED ROCK

- When loading piled soil or blasted rock, drive the machine forward as follows to load. To prevent cutting of the tires caused by the tires slipping, be careful of the following points during the operation.
 - Always keep the operating jobsite flat, and remove any fallen rocks.
 - When working with stockpiles, operate the machine in 1st or 2nd gear; when loading blasted rock operate the machine in 1st gear.

1. When driving the machine forward and lowering the bucket, stop the bucket about 30 cm (12 in) from the ground, then lower it slowly.

REMARK

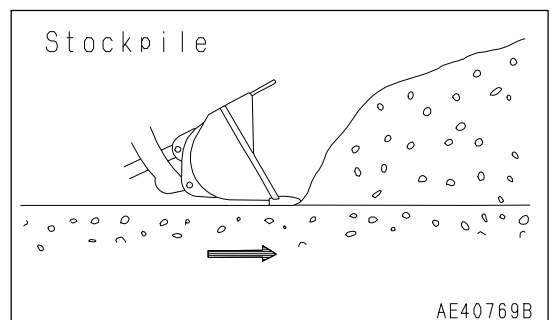
If the bucket hits the ground, the front tires will come off the ground, and the tires will slip.



2. Shift down immediately in front of the material to be loaded. When completing the shift down, depress the accelerator pedal at the same time and thrust the bucket into the material.

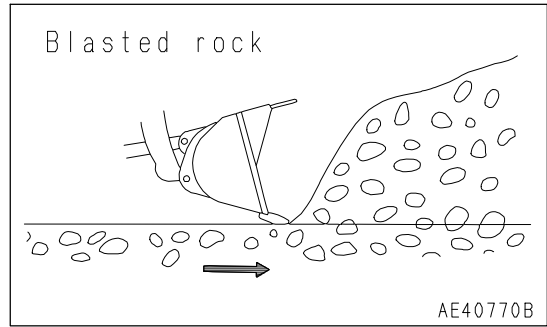
REMARK

To reduce fuel consumption, depress the accelerator pedal the minimum possible amount. If it is depressed fully, the fuel consumption will increase, but there will be no increase in the amount loaded.



- When the material is in a stockpile, keep the cutting edge of the bucket horizontal; when loading blasted rock, have the bucket tilting slightly down.

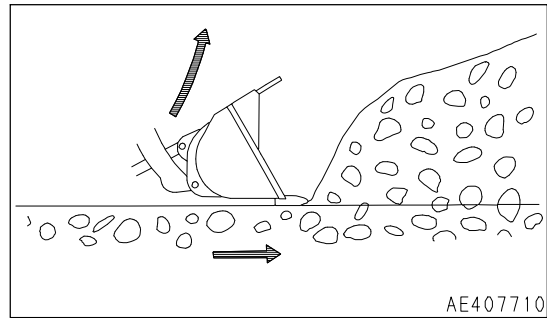
Be careful not to get blasted rock under the bucket. This will make the front tires come off the ground and slip. Try to keep the load in the center of the bucket; if the load is on one side of the bucket, the load will be unbalanced.



- At the same time as thrusting the bucket into the material, raise the lift arm to prevent the bucket from going in too far. By raising the lift arm, ample traction will be produced by the front tires.

REMARK

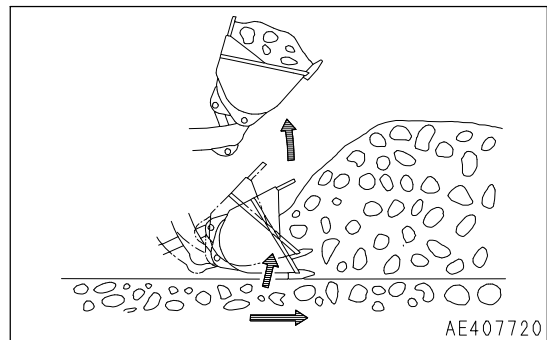
If the bucket is thrust too much and the lift arm stops rising or the machine stops moving forward, release the accelerator pedal a little. Proper operation of the accelerator pedal for each type of the soil is effective for saving of fuel and prevention of wear of the tires.



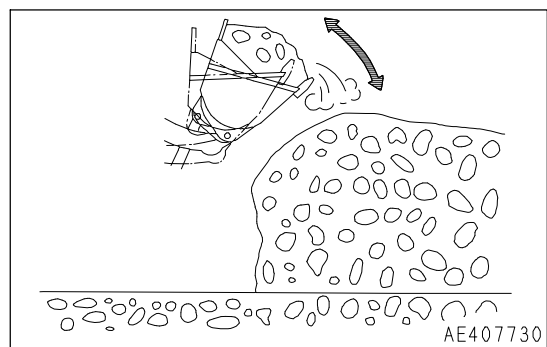
- Check that there is enough material loaded into the bucket, then operate the bucket control lever to tilt the bucket and load the bucket fully.

REMARK

If the bucket edge is moved up and down while pushing in the bucket and digging, the front tires will come off the ground and this will cause the tires to slip.



- If there is too much material loaded in the bucket, dump and tilt the bucket quickly to remove the excessive load. This prevents spillage of the load during hauling.



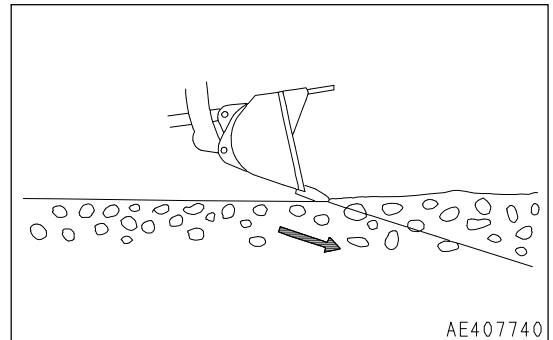
DIGGING AND LOADING ON LEVEL GROUND

- When digging and loading on level ground, set the bucket edge facing down slightly as follows and drive the machine forward. Always be careful not to load the bucket on one side and cause an unbalanced load. This operation should be carried out in 1st gear.

**CAUTION**

Do not set the bucket facing down more than 8 degrees.

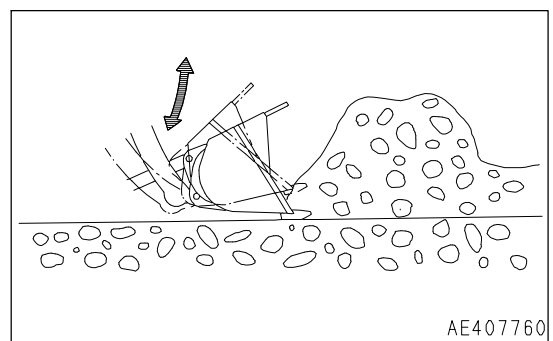
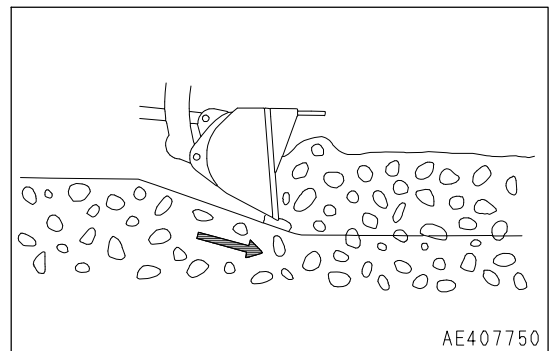
1. Set the edge of the bucket facing slightly down.

**CAUTION**

If the bucket hits the rocks in the ground first, a large shock is generated and this may damage the machine.

2. Drive the machine slowly forward, push the lift arm control lever slightly to the front, and dig in to scoop up the load a little at a time.
3. Operate the lift arm control lever slightly up and down to reduce the resistance when driving the machine forward.

When digging with the bucket, avoid imposing the digging force on one side of the bucket.



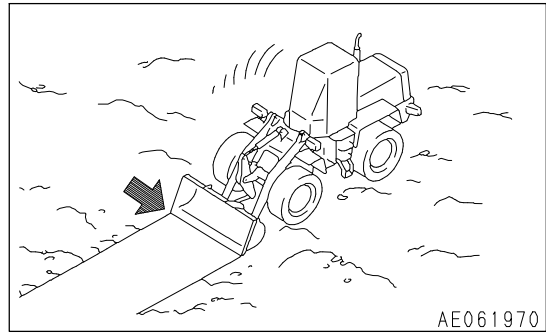
LEVELING OPERATIONS

NOTICE

Always operate the machine in reverse when carrying out leveling operations.

If it is necessary to carry out leveling operations when traveling forward, do not set the bucket dumping angle to more than 8 degrees.

1. Scoop soil into the bucket. Move the machine backward while spreading soil from the bucket little by little.
2. Go over the spread soil with the bucket teeth touching the ground and level the ground by back-dragging.
3. Scoop some more soil into the bucket, put the lift arm control lever in FLOAT position, level the bucket at ground level, and smooth the ground by moving backward.



PUSHING OPERATION



CAUTION

Never set the bucket to the DUMP position when carrying out pushing operation.

When carrying out pushing operations, set the bottom of the bucket parallel to the ground surface.

LOAD AND CARRY OPERATIONS



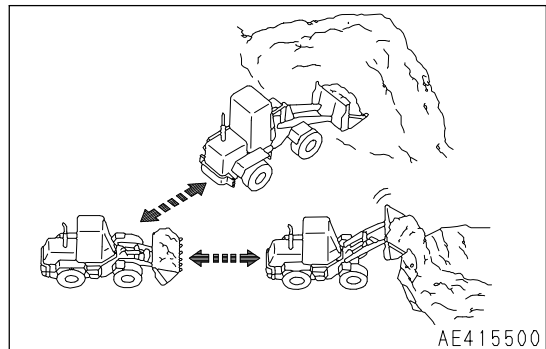
WARNING

When carrying a load, lower the bucket to lower the center of gravity when traveling.

The load and carry method for wheel loaders consists of a cycle of scooping -> hauling -> loading (into a hopper, truck, etc.).

Always keep the travel path properly maintained.

When using the load and carry method, see "PRECAUTIONS FOR USING LOAD AND CARRY METHOD (PAGE 3-147)".



LOADING OPERATIONS

Select the method of operation which will give the minimum amount of turning and travel in order to provide the most efficient method for the jobsite.



WARNING

- Always keep the job site level. When the lift arm is raised with the bucket loaded, it is dangerous to operate the steering suddenly or apply the brakes suddenly. Do not carry out such operations.
- It is dangerous to thrust the bucket into the material to be loaded (borrow pit, crushed rock, etc.) at high speed. Do not carry out such digging operations.

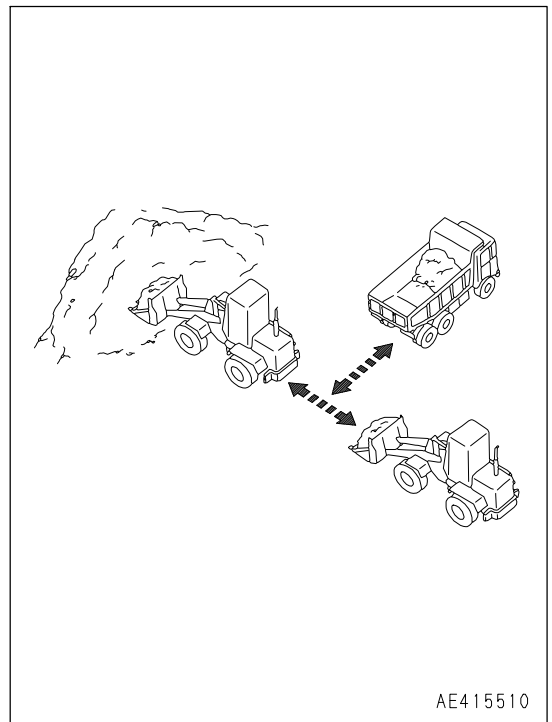
NOTICE

- If the tires slip, the tire life will be reduced, so do not allow the tires to slip during operation.
- Avoid excessive bucket shaking.

CROSS DRIVE LOADING

Always set the wheel loader facing at a right angle to the stockpile. After digging in and scooping up the load, drive the machine straight back in reverse, then bring the dump truck in between the stock pile and the wheel loader.

This method requires the least time for loading, and is extremely effective in reducing the cycle time.

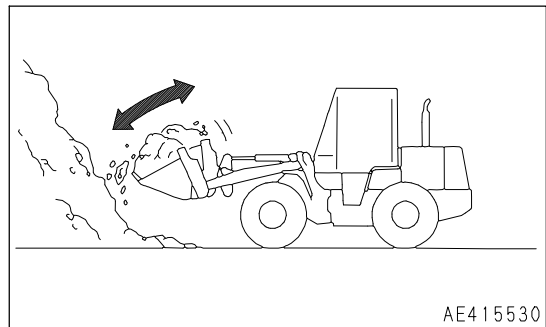
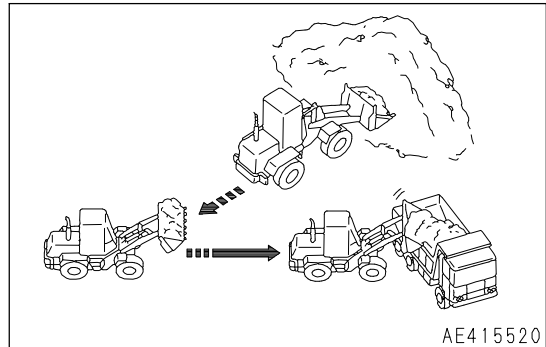


V-SHAPE LOADING

Position the dump truck so that the direction of approach of the wheel loader is approx. 60 degrees from the direction of approach to the stockpile. After loading the bucket, drive the wheel loader in reverse, then turn it to face the dump truck and travel forward to load the dump truck.

The smaller the turning angle of the wheel loader is, the more efficient the operation becomes.

When loading a full bucket and raising it to the maximum height, first shake the bucket to stabilize the load before raising the bucket. This will prevent the load from spilling to the rear.

**PRECAUTIONS WHEN PILING UP LOADS**

When forming products into a pile, be careful not to let the rear counterweight come into contact with the ground. Do not set the bucket to the DUMP position when piling-up loads.

REMARK

As far as possible, do not use the transmission cut-off function during scraping-up operation. This will prevent the machine from rolling back.

PRECAUTIONS WHEN HANDLING BLASTED ROCK

If the target load is blasted rock, pay careful attention to the following items when carrying out the operation in order to extend the service life of the machine.

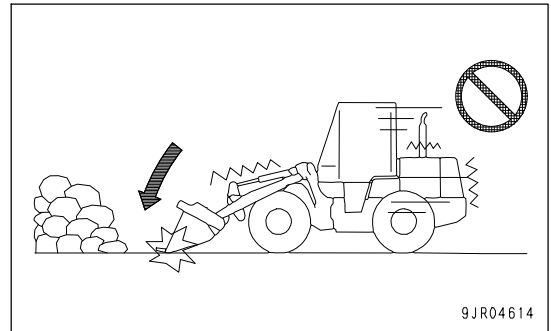
OPERATING PROCEDURE TO PREVENT DAMAGE TO MACHINE

HANDLING BUCKET

When approaching the facing and lowering the bucket to the ground, do not drop the bucket suddenly into contact with the ground. If the bucket is dropped suddenly, the bucket, work equipment, area around the pins, and the machine frame will be subjected to excessive shock, and this will lead to damage or deformation of various parts of the machine.

In addition, the front wheels will come off the ground, so this will cause the machine to slip.

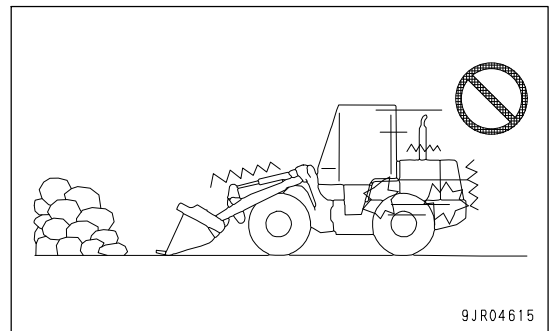
When lowering the bucket to the ground, reduce the lowering speed of the bucket when it is close to the ground and bring it slowly into contact with the ground.



SHIFTING TRANSMISSION WHEN THRUSTING BUCKET IN

When thrusting the bucket into the facing to carry out excavation, do not shift down with the accelerator pedal depressed (with the engine speed raised). If the transmission shifts down when the engine speed is high, there will be an excessive load on the engine, torque converter, transmission, axles, final drive, and the whole power train.

When shifting down to 1st and thrusting the bucket into the facing, release the accelerator pedal to reduce the engine speed before shifting down. Then gradually depress the accelerator pedal. If the accelerator is operated suddenly after shifting down, there will be excessive load brought to bear on the engine and power train.

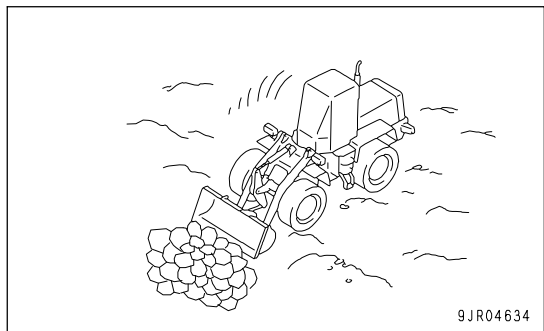
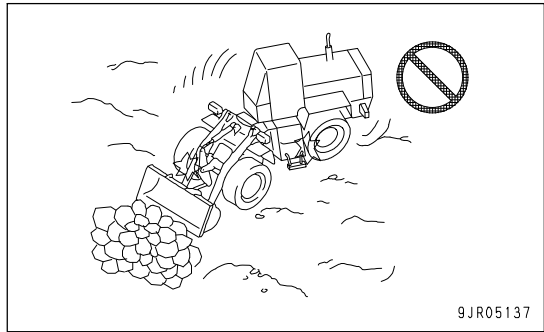


ARTICULATING MACHINE DURING DIGGING OPERATIONS

Do not carry out operations with the machine articulated. If the machine is articulated, the direction of force will be different for the front wheels and rear wheels. As a result, the power when traveling will not be transmitted fully to the front wheels, so this will reduce the digging force and bring an excessive load to bear on the center hinge pin. In addition, even with the front wheels, the power will not be transmitted uniformly to the left and right wheels. The load will be brought to bear on one wheel, so this will reduce the service life of the tire on one side.

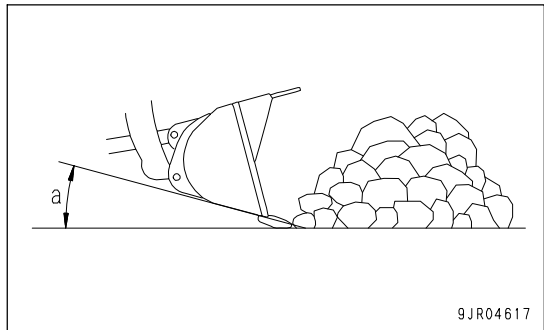
If digging work is carried out with the machine articulated, the overall stability of the machine will be poor and there is danger of the machine tipping over.

When carrying out operations, do not articulate the machine. Drive straight forward and thrust the bucket in. If this is done, the load on the bucket will be uniform, so this makes it possible to avoid load on one side and makes it easier to load the bucket.



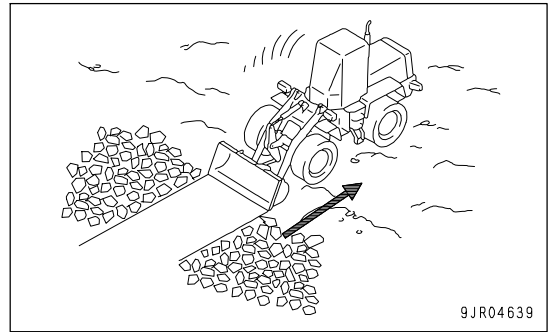
BUCKET DUMP ANGLE WHEN DIGGING OR LOWERING ROADBED

Do not set the cutting edge of the bucket at a large angle to the ground surface when digging or lowering the roadbed. Keep angle (a) between the bucket and the ground surface to a maximum of 8°. If angle (a) between the cutting edge of the bucket and the ground surface is more than 8° when digging or lowering the roadbed, there is danger of damage to the work equipment.

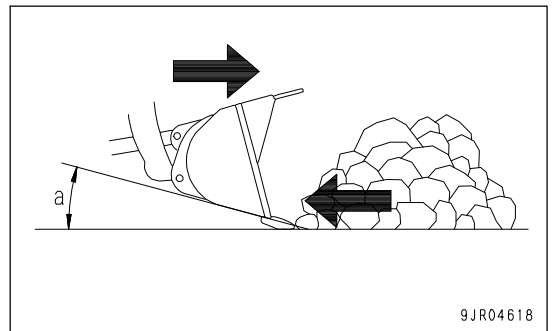


BUCKET DUMP ANGLE WHEN LEVELLING

Drive the machine in reverse when carrying out leveling operations.

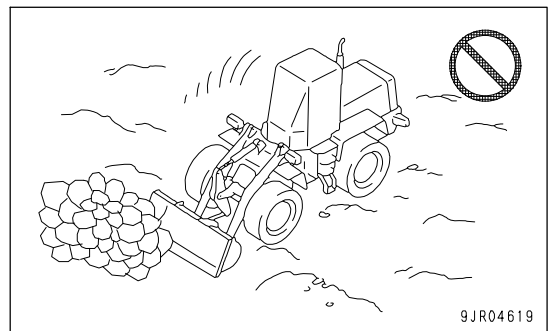


If leveling operations are carried out with the machine traveling forward, do not make angle (a) between the cutting edge of the bucket and the ground surface facing down more than 8°. If leveling operations are carried out when driving forward with angle (a) between the cutting edge of the bucket and the ground surface facing down more than 8°, the bucket cylinder will be pushed by the pushing force of the machine. This will cause the cylinder to retract and the bucket will face down at a greater angle, so there is danger of the work equipment breaking.

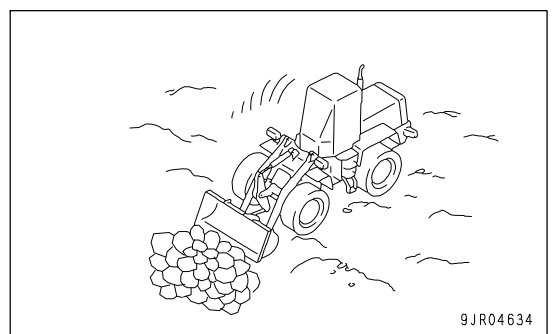


LOADING BUCKET

Do not load the bucket or scoop up the load with the load on the corner of the bucket or the load on one side of the bucket. This will cause the machine to twist and will reduce the service life of the work equipment and the frame.



When carrying out digging or scooping-up operations, thrust the center of the bucket into the load.



BUCKET DUMP OPERATION WHEN DIGGING

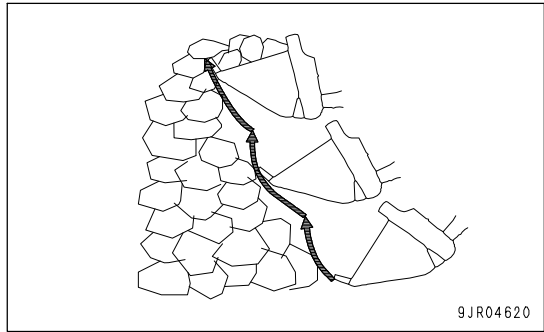
Do not operate the bucket in the DUMP direction when digging. If the bucket control lever is operated to the DUMP position during digging, the machine will not be able to travel forward, the tires will slip, and an excessive load will be brought to bear on the work equipment.

Carry out the scooping-up operations as follows.

1. When thrusting the bucket in, raise the lift arm slightly at the same time. Ample driving force will work on the front wheels.
2. To fill the bucket, operate the bucket tilt and lift 2 - 3 times repeatedly when thrusting the bucket in.
Operate the control lever slowly near the end of the bucket tilt.
3. When the bucket reaches the end of the tilt stroke, depress the brake pedal to stop the machine.

When doing this, do not push the bottom of the bucket against the dilution. If the bucket is pushed against the dilution, the bucket, cylinders, and work equipment will be damaged.

4. When the scooping-up operation is completed, operate the bucket tilt and dump, and apply the brakes when traveling in reverse to stabilize the load inside the bucket and prevent spillage of the load.

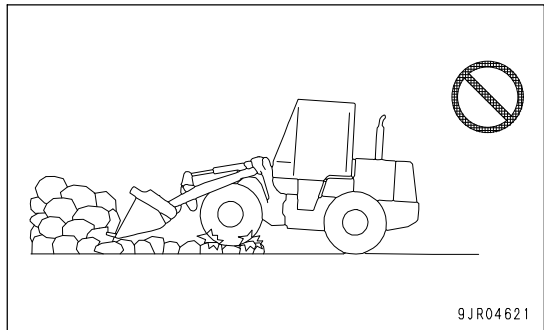


REMARK

- To reduce the generation of heat by the torque converter, keep the target time for the digging operation within 10 seconds from the start of thrusting in to the completion of scooping up.
- The fuel consumption increases while digging working. Fuel cost is saved by shortening the digging time.

FRONT WHEELS GOING ON BLASTED ROCK

Do not carry out operations that make the front wheels ride up on blasted rock. If the front wheels go on top of blasted rock, there is danger that the sharp parts of the blasted rock will cut the tires. In particular, avoid pushing the bucket in too far, and when operating near natural rock after blasting (roots), do not let the front wheels ride up on the natural rock (roots). For scooping-up operations near natural rock (roots), do not use a wheel loader. Use a bulldozer or hydraulic excavator.

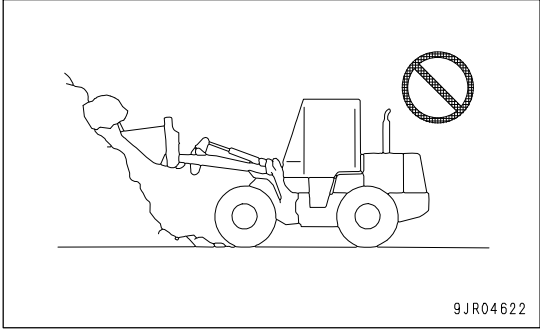


TREATMENT OF LOOSENED BOULDERS

 **WARNING**

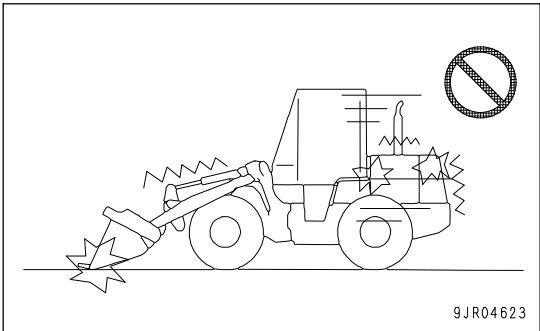
Do not use this machine to deal with loosened boulders. If the boulder is dropped by mistake when handling it, there is danger that it may fall on top of the operator's compartment and cause serious personal injury.

Do not use this machine to handle hanging rocks. There is danger that the rock will fall during the operation to move it and hit the machine or operator's cab. If dropped boulders hit the work equipment cylinders, there is danger that the cylinder will bend and be unable to move. If the boulder is dropped on the operator's compartment, there is danger of serious personal injury.



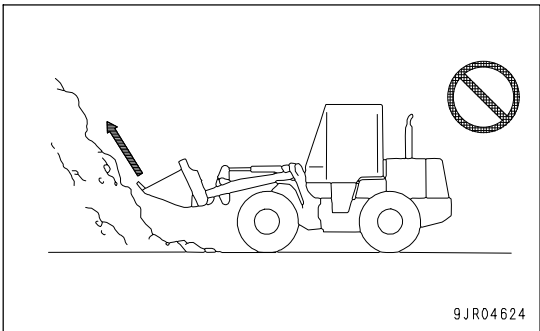
PIT EXCAVATION

Do not try to shave off natural rock (roots) remaining from blasting. Excessive force will be applied to the machine, and there is danger that this may damage the work equipment or frame. For pit excavation operations, do not use a wheel loader. Use a bulldozer or hydraulic excavator.



CUTTING FACE OPERATIONS

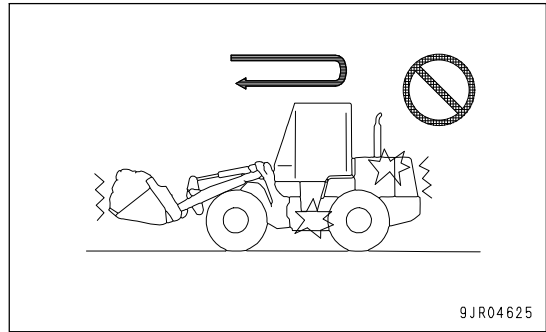
Do not excavate cutting faces. If the cutting face is excavated, excessive force will be applied to the machine, and there is danger that this may damage the bucket, work equipment, or frame. In particular, do not excavate with the bucket raised to a height above the travel posture. For excavation of cutting faces, use a hydraulic excavator.



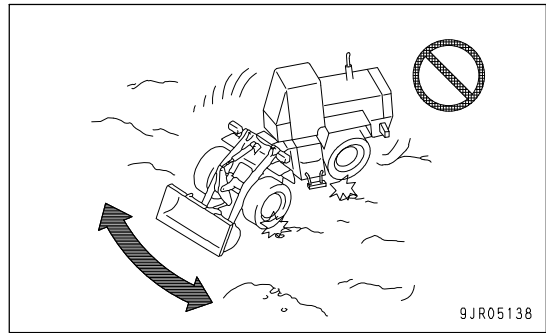
SWITCHING BETWEEN FORWARD AND REVERSE

Do not switch the direction of travel of the machine between forward and reverse when traveling at high speed or when the accelerator pedal is depressed. When the machine is traveling at high speed or when the accelerator pedal is depressed, the engine speed is high, and if the direction of travel is switched between forward and reverse, an excessive load will be applied to the engine, torque converter, transmission, and other parts of the power train, and this will reduce the service life of the machine.

When switching between forward and reverse, travel at low speed, reduce the engine speed, then stop the machine and switch the direction of travel.

**TURNING WHEN TIRES ARE STATIONARY**

Do not operate the steering when the machine is stationary. If the steering is operated when the machine is stationary, it will cause wear or cuts in the tires. In addition, it will reduce the durability of the frame and the undercarriage.



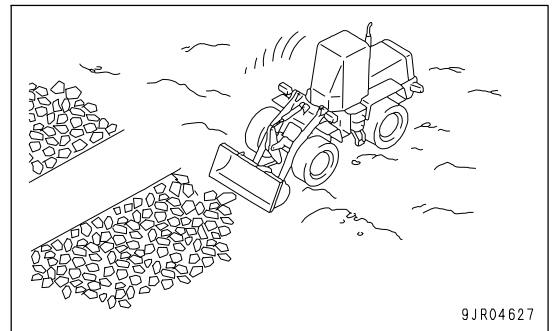
PROCEDURE FOR OPERATIONS USING V-SHAPE LOADING OF DUMP TRUCKS**PREPARATIONS FOR LOADING, GATHERING ROCKS**

Always keep the job area level and remove any rocks or boulders.

NOTICE

- When gathering rocks, if the operation is carried out over an area longer than the length of the machine, there is danger that the machine will ride up on boulders and suffer cuts to the tires. When gathering rocks, always carry out the operation in an area shorter than the length of the machine.
- When carrying out operations with the bucket in contact with the ground, do not articulate the machine. This will cause tire slippage and damage to the machine.

1. Put the bucket horizontally in contact with the ground, drive forward, and gather the rocks that have been scattered after loading and after splitting or blasting.
2. After collecting the rocks in an area the length of the machine, change the direction of the machine to gather rocks and increase the area of level ground.



APPROACHING FACING

NOTICE

- When approaching the facing and lowering the bucket to the ground, do not drop the bucket suddenly into contact with the ground. If the bucket is dropped suddenly, the bucket, work equipment, area around the pins, and the machine frame will be subjected to excessive shock, and this will lead to damage or deformation of various parts of the machine. In addition, the front wheels will come off the ground, so this will cause the machine to slip. When lowering the bucket to the ground, reduce the lowering speed of the bucket when it is close to the ground and bring it slowly into contact with the ground.
- Do not set the cutting edge of the bucket at a large angle to the ground surface when digging or lowering the roadbed. Keep angle between the bucket and the ground surface to a maximum of 8° . If angle between the cutting edge of the bucket and the ground surface is more than 8° when digging or lowering the roadbed, there is danger of damage to the work equipment.
- Do not load the bucket or scoop up the load with the load on the corner of the bucket or the load on one side of the bucket. This will cause the machine to twist and will reduce the service life of the work equipment and the frame.

1. Set the machine to the travel posture.

2. Set the shift position to F2, then gradually depress the accelerator pedal and raise the travel speed.

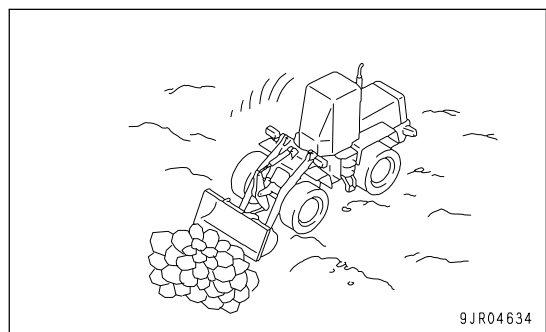
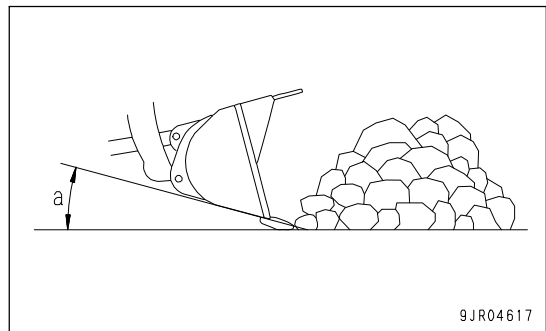
3. When lowering the bucket to the ground, reduce the lowering speed of the bucket when it is close to the ground and bring it slowly into contact with the ground.

4. Make angle (a) between the bucket and the ground surface a maximum of 8° , and operate the tilt and dump so that only the cutting edge comes in contact with the ground.

5. Drive forward at right angles to the rock and change the direction that the machine is facing.

6. Operate the accelerator to match the condition of the road surface so that the tires do not slip.

7. Scoop up the gathered rock. Load hard cutting face rock or boulders in the middle of the bucket.



DIGGING

NOTICE

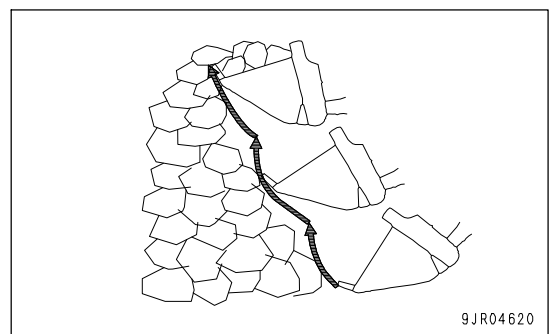
- Do not shift down with the accelerator pedal depressed (with the engine speed raised). If the transmission is shifted down when the engine speed is high, there will be an excessive load on the engine, torque converter, transmission, axles, final drive, and the whole power train.
- When thrusting the bucket in, shift down to 1st. If the bucket is thrust in at high speed, there will be an impact load on the machine and this will reduce the service life of the machine.
- When shifting down, release the accelerator pedal to reduce the engine speed before shifting down. Then gradually depress the accelerator pedal. If the accelerator is operated suddenly after shifting down, there will be excessive load brought to bear on the engine and power train.
- Do not carry out operations with the machine articulated. If the machine is articulated, the direction of force will be different on the front wheels and rear wheels. As a result, the power when traveling will not be transmitted fully to the front wheels, so this will reduce the digging force and bring an excessive load to bear on the center hinge pin. In addition, even with the front wheels, the power will not be transmitted uniformly to the left and right wheels. The load will be brought to bear on one wheel, so this will reduce the service life of the tire on one side.
- Do not push the machine in too far. If it is pushed in too far, a high load will be brought to bear on the machine and this will reduce the service life of the work equipment and frame.
- Operate the control lever slowly near the end of the bucket tilt operation. If the control lever is operated suddenly, an impact load will be brought to bear on the tilt cylinder, and there is danger that the cylinder may be damaged.
- When close to pit excavation, do not let the front wheels rise up on the cutting face. This will cause cuts to the tires.

1. Immediately in front of the rock, let the accelerator pedal back and shift down from 2nd to 1st.
2. After shifting down, depress the accelerator pedal gradually and push the rock.
3. Raise the lift arm slightly and increase the driving force of the front wheels. When doing this, do not push in too far.

REMARK

When digging up large rocks, in some cases it may be better not to raise the lift arm too high. If the lift arm is raised too high, the rear wheels may come off the ground.

4. After loading the rock completely into the bucket, operate the bucket tilt and lift 2 - 3 times repeatedly to fill the bucket.
5. Let back the accelerator pedal, operate the control levers slowly, and tilt the bucket back fully.
6. To prevent the load from falling out of the bucket, after completing the scooping-up operation, operate in the dump and tilt direction when the bucket is near the full tilt to stabilize the load.



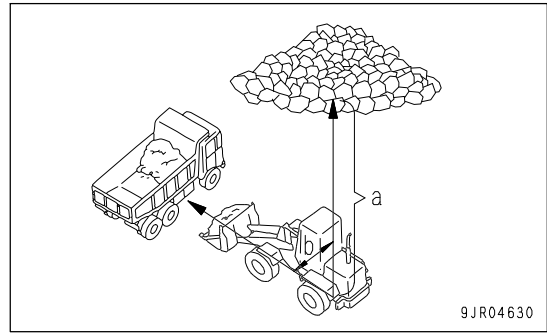
REMARK

- If the brakes are operated lightly before traveling in reverse, it is possible to stabilize the load in the bucket.
- To prevent generation of heat in the torque converter, keep the standard time for digging to within 10 seconds from the start of pushing in to the completion of scooping up.

TRAVELING IN REVERSE AFTER EXCAVATING

NOTICE

- Do not operate the steering immediately after starting to travel in reverse. The bucket is still thrust into the rocks, so if the steering is operated, excessive force will be brought to bear on the bucket or frame, and there is danger of damage to the frame.
- After shifting the transmission, operate the accelerator pedal slowly. If the accelerator pedal is operated suddenly, the tires will slip and this will cause wear or cutting of the tires.

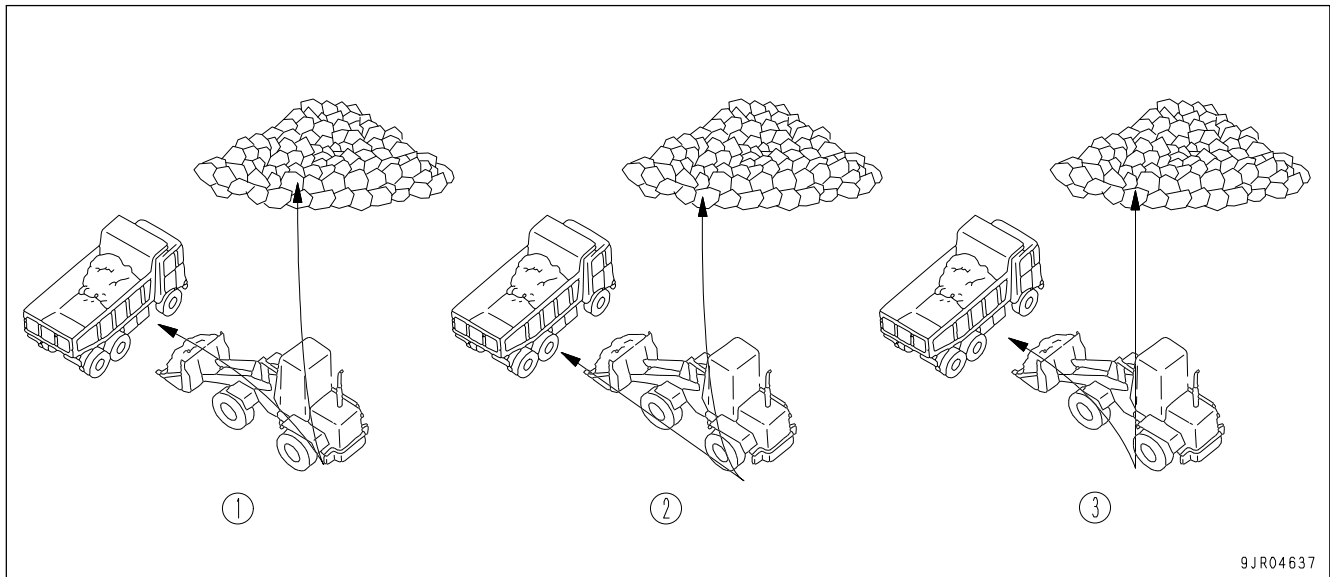


9JR04630

1. After completing the excavation, shift to R2 and travel in reverse without operating the steering.
2. As a guideline, reverse travel distance (a) should be 1.2 -1.5 times the length of the machine. At this distance, the rolling of the tires can prevent wear to the tires. In addition, keep an angle (b) of 60° at the intersection between the straight line from the dilution and the straight line from the dump truck.

REMARK

Decide the steering procedure to match the stopping point of the dump truck and the condition of the dilution. When doing this, decide the stopping point for the dump truck so that the operating angle for the steering is less than 20°.



9JR04637

- (1) Gradual steering to left or right
- (2) Gradual steering to dilution
- (3) Direct line to dilution

3. When driving in reverse, do not raise the bucket more than necessary. Consider the position of the dump truck, the condition of the road surface, the travel speed, and the speed of the work equipment when deciding the height of the bucket. However, do not raise the bucket so that the top of the load is higher than the horizontal line of sight from the operator.

APPROACHING DUMP TRUCK

**WARNING**

Do not operate the steering suddenly when the bucket is raised. If the steering is operated when the bucket is raised, there is danger that the machine may tip over and cause serious personal injury.

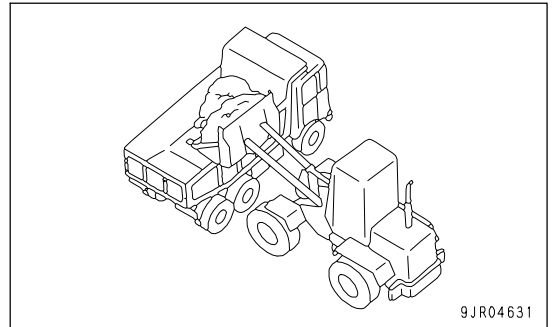
NOTICE

- Do not shift down with the accelerator pedal depressed (with the engine speed raised). If the transmission is shifted down when the engine speed is high, there will be an excessive load on the engine, torque converter, transmission, axles, final drive, and the whole power train. In addition, the tires will slip and this will cause wear of the tires.
- Do not operate the steering immediately after switching between forward and reverse (when the machine is stationary). If the steering is operated when the machine is stationary, it will cause wear or cuts to the tires.
- If a transmission cut-off system is installed, turn the transmission cut-off switch to the OFF position and depress the brake, but do not raise the bucket. In this condition, the brake is operated, so heat is generated in the brake chamber and this will cause heat fatigue to parts inside the axle.

1. Let the accelerator pedal back to reduce the engine speed, then depress the parking brake pedal to stop the machine.
2. Shift gear from R2 to F2.
3. Operate the steering to set the load that at right angles to the dump truck, then drive forward.

REMARK

Operate the steering in the following order: let accelerator pedal back → switch between forward and reverse → depress accelerator pedal to drive forward → approach dump truck. If these operations are carried out at the same time, the engine acceleration will be poor and this will result in poor fuel consumption.



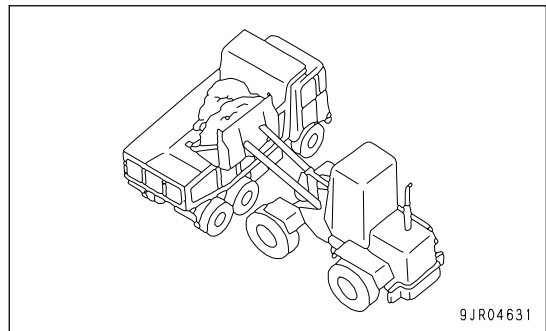
4. Raise the bucket to adjust the bucket height so that when the bucket is tilted down, the cutting edge of the bucket does not hit the bottom face of the dump body or the dilution.

LOADING DUMP TRUCK

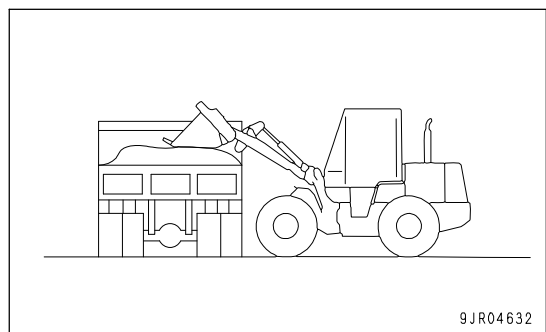
NOTICE

- Do not load the dump truck suddenly from a high position. If the dump truck is loaded like this, the dump truck will suffer impact load and there is danger that this may damage the body.
- Do not operate the dump or stop operations when the engine is running at high speed. There is danger of impact pressure being generated in the hydraulic equipment and causing damage to the hydraulic equipment.
- Do not shake the bucket violently to dump the load inside the bucket. The machine will sway greatly and there is danger of damage to the machine. In addition, there is danger of impact pressure being generated in the hydraulic equipment and causing damage to the hydraulic equipment.
- When loading the dump truck, do not pushed forcibly with the bucket. This machine and the dump truck will suffer impact shock, and this will cause damage. When pushing the load with the bucket to prevent rocks from falling, carry out the operation softly.
- When loading large rocks, first load with sand or soil to act as a cushion. Then load the large rocks on top. If large rocks are loaded directly, they will cause deformation or damage to the dump body.

1. When loading the dump truck, load at a low point that does not hit with the dump truck or dilution.



2. After completing the loading, if there is danger of rocks falling off, push the load softly with the bucket.



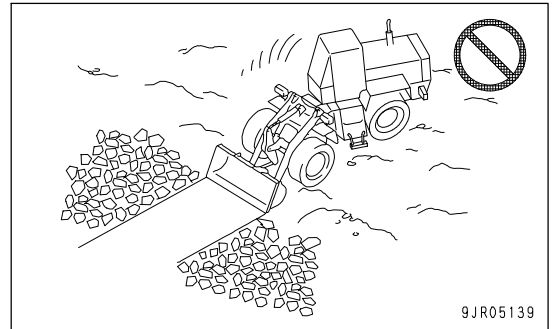
REVERSING AWAY FROM DUMP TRUCK

NOTICE

- Do not shift down with the accelerator pedal depressed (with the engine speed raised). If the transmission is shifted down when the engine speed is high, there will be an excessive load on the engine, torque converter, transmission, axles, final drive, and the whole power train. In addition, the tires will slip and this will cause wear of the tires.
- Do not operate the steering immediately after switching between forward and reverse (when the machine is stationary). If the steering is operated when the machine is stationary, it will cause wear or cuts to the tires.

1. Switch to R2 and drive in reverse.
2. While driving in reverse, lower the lift arm and operate the steering to face the position for scooping up.
3. Depress the brake pedal and stop the machine.
4. Let back the accelerator pedal to reduce the engine speed, then switch from R2 to F2.
5. Lower the bucket to the ground and drive forward to clear the surface (remove all boulders).

Do not operate the steering when carrying out the leveling operation. Travel forward with the machine facing directly to the front.

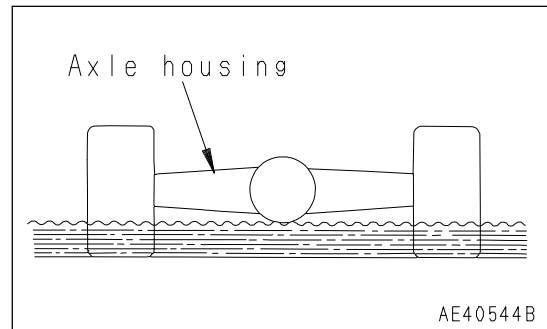


PRECAUTIONS FOR OPERATION

PERMISSIBLE WATER DEPTH

When working in water or on swampy ground, do not let the water come above the bottom of the axle housing.

After finishing the operation, wash and check the lubricating



IF WHEEL BRAKE DOES NOT WORK

If the machine is not stopped by depressing the brake pedal, use the parking brake to stop the machine.

NOTICE

If the parking brake has been used as an emergency brake, contact your Komatsu distributor to have the parking brake checked for any abnormality.

PRECAUTIONS WHEN DRIVING UP OR DOWN SLOPES

LOWER CENTER OF GRAVITY WHEN TURNING

When turning on slopes, lower the work equipment to lower the center of gravity before turning. It is dangerous to turn the machine suddenly on slopes.

BRAKING ON DOWNHILL SLOPE

If the foot brake is used too frequently on downhill slopes, there is danger that the brake will overheat and be damaged. To prevent this, use the shift down switch to reduce the gear speed and make full use of the braking force of the engine when traveling downhill.

Normally, the gear speed when traveling down any hill should be set to the same gear speed used when traveling up that hill.

When using the brake, depress the right brake pedal.

If the gear speed is not correct, the torque converter oil may overheat. If this happens, shift the transmission down to one speed lower to reduce the oil temperature.

If the indicator does not enter the green range even when traveling in 1st, stop the machine, set the forward-reverse selector switch to N, and run at the engine at a mid-range speed until the gauge enters the green range.

IF ENGINE STOPS

If the engine stops on a slope, apply the parking brake immediately, and lower the work equipment to the ground and stop the machine. Then put the directional selector switch in N (neutral) position, and start the engine again.

PRECAUTIONS WHEN DRIVING MACHINE

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

- Follow the regulations related to this machine, and drive carefully.
- Before driving the machine, carry out the checks before starting.
- The most suitable tire pressure, travel speed, or tire type differ according to the condition of the travel surface. Contact your Komatsu distributor or tire dealer for information.

WA800-3E0

Ambient temperature(°C)	Max.travel speed(km/h)	Traveling time breaking time
50	20	Travel 13 km or 40' Break (3H) Repeat
	25	Travel 13 km or 35' Break (3H) Repeat
	28	Travel 13 km or 25' Break (3H) Repeat
30	25	Travel 13 km or 35' Break (3H) Repeat
	28	Travel 15 km or 30' Break (3H) Repeat
0	28	Travel 18 km or 40' Break (3H) Repeat

(Air pressure: 0.52MPa {5.25 kgf/cm², 74.5 PSI})

WA900-3E0

Ambient temperature(°C)	Max.travel speed(km/h)	Traveling time breaking time
50	20	Travel 13 km or 40' Break (3H) Repeat
	25	Travel 13 km or 35' Break (3H) Repeat
	28	Travel 13 km or 25' Break (3H) Repeat
30	25	Travel 13 km or 35' Break (3H) Repeat
	28	Travel 15 km or 30' Break (3H) Repeat
0	28	Travel 18 km or 40' Break (3H) Repeat

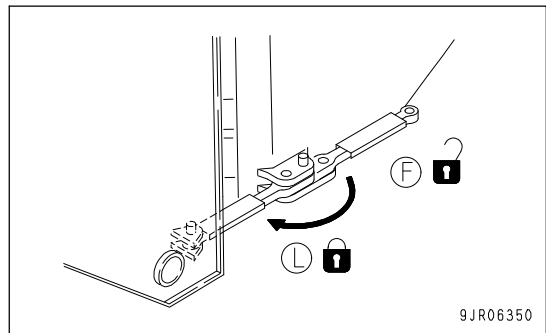
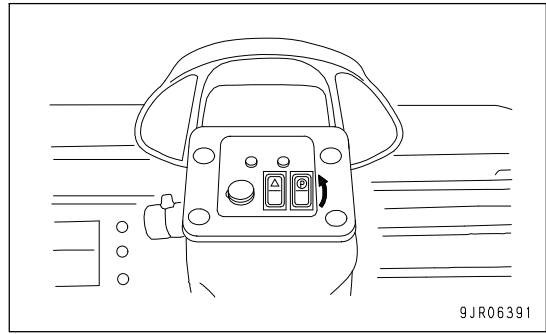
(Air pressure: 0.67MPa {6.8kgf/cm², 96.56 PSI})

- When driving the machine continuously, use the following as a guideline for one day's travel:
Travel distance: within 20 km; travel time: Max. 1 hour
- When the machine is stopped, check the tires and all other parts for abnormalities, and check the oil and coolant levels.
- Check the tire pressure before starting, when the tire is cool.
- After traveling for 1 hour, stop for 30 minutes. Check the tires and other parts for damage; also check the oil and coolant levels.
- Always travel with the bucket empty.
- Never put "calcium chloride" or "dry ballast" in the tires when traveling.

ADJUSTING WORK EQUIPMENT POSTURE

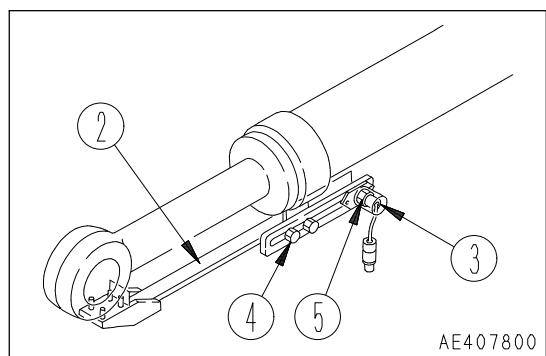
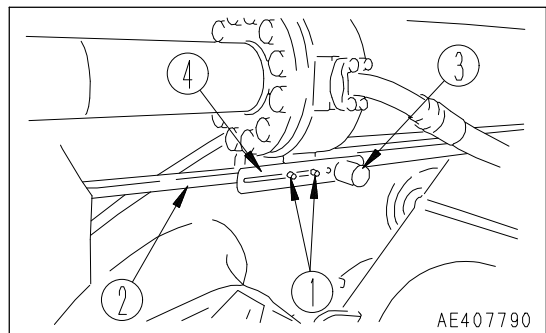
WARNING

- Stop the machine on level ground and put blocks in front of and behind the tires.
- Turn the parking brake switch ON.
- Lock the front and rear frames with the frame lock bar.
- Always hang a warning tag on the work equipment control levers.
- Do not go under the work equipment when the arm is raised.



ADJUSTING BUCKET POSITIONER

1. Lower the bucket to the ground, set it to the desired digging angle, return the bucket control lever to the HOLD position, set the work equipment lock lever to the LOCK position, then stop the engine.
2. Loosen two bolts (1) and adjust mounting bracket (4) of the proximity switch so that the rear tip of angle (2) is in line with the center of the sensing surface of proximity switch (3). Then tighten the bolts to hold the bracket in position.
3. Loosen two nuts (5) and adjust to make a clearance of 3 to 5 mm (0.12 to 0.20 in) between bar (2) and the sensing surface of proximity switch (3). Then tighten the nuts to hold in position. Tightening torque: 14.75 to 19.65 Nm (1.5 to 2.0 kgm, 10.8 to 14.5 lbft)
4. After adjusting, start the engine and raise the lift arm. Operate the bucket control lever to the DUMP position, then operate it to the TILT BACK position and check that the lever is automatically returned to the HOLD position when the bucket reaches the desired digging angle.

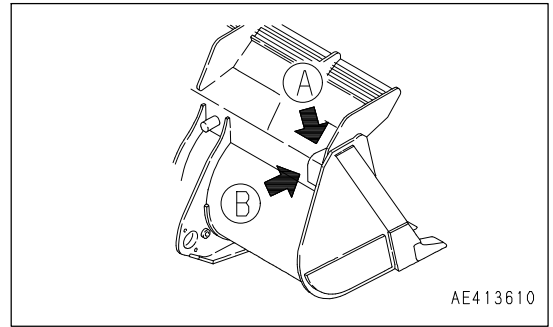


BUCKET LEVEL INDICATOR

(A) and (B) at the top rear of the bucket are the level indicators. They check the bucket angle during operations.

(A): Parallel with cutting edge

(B): 90 degrees to cutting edge



REMOVAL AND INSTALLATION OF THE BUCKET



WARNING

- When pins are knocked in with a hammer, pieces of metal may fly and cause serious injury. When carrying out this operation, always wear goggles, hard hat, gloves, and other protective equipment.
- When the bucket is removed, place it in a stable condition.
- If pins are hit with a strong force, there is a hazard that the pin may fly out and injure people in the surrounding area. Make sure that there is no one in the surrounding area before starting the operation.
- When removing the pins, do not stand behind the bucket. In addition, be extremely careful not to put your foot under the bucket while standing at the side for the work.
- When removing or inserting pins, be extremely careful not to get your fingers caught.
- Never insert your fingers into the pin holes when aligning the holes.

Remove or install the bucket in the following manner, if so required for the convenience of transportation.

NOTICE

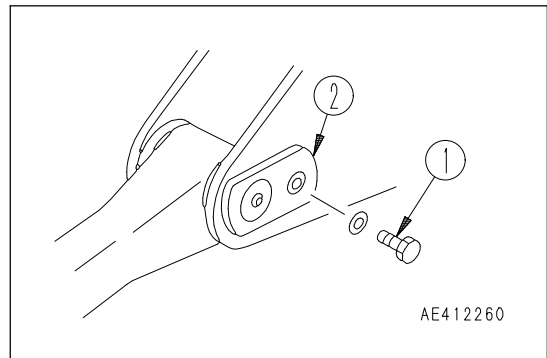
This method of removal and installation is applicable to the standard specification machine.

The method of removal and installation will differ according to the attachments and options that are installed.

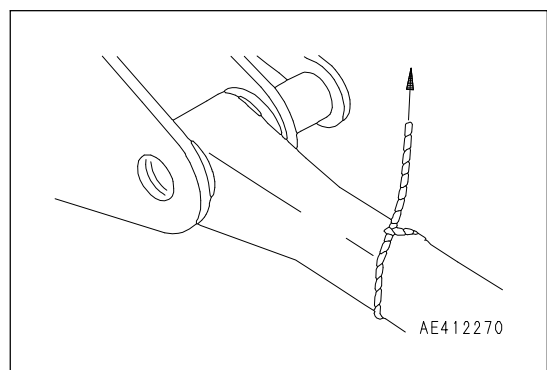
For details of the procedure for machines that are not the standard specification, please consult your Komatsu distributor.

REMOVING THE BUCKET

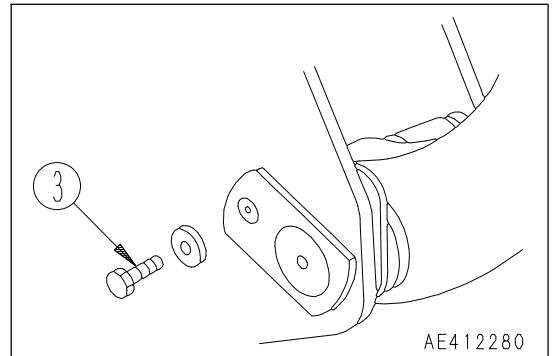
1. Remove mounting bolt (1).



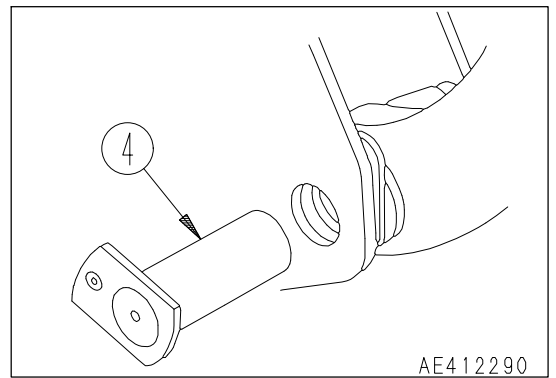
2. Sling the bucket link, then pull out bucket link pin (2).
Secure the bucket link to the bell crank with wires.



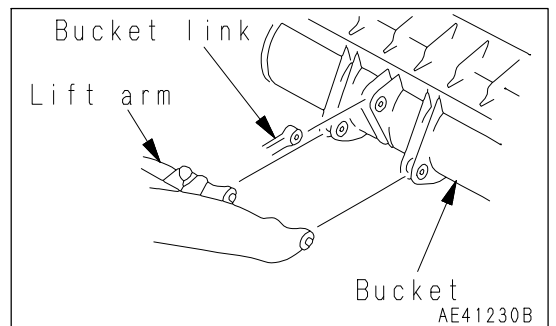
3. Remove mounting bolt (3).



4. Pull out and remove bucket hinge pin (4) on both sides of the bucket.



5. Disconnect the lift arm and bucket.



INSTALLING THE BUCKET

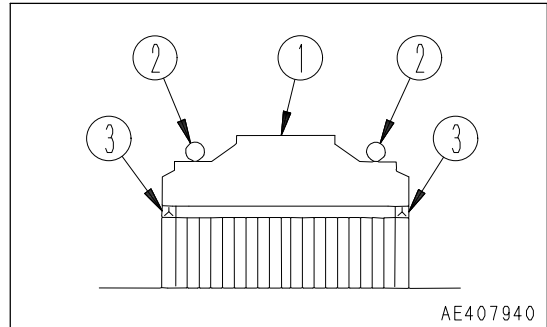
Before installing the bucket, remove all grease, mud, or sand and clean the pin, pin hole, and area around the boss. (If there is any rust or dirt on the inside surface of the pin hole, use sandpaper and remove it carefully.)

After cleaning, coat the pin and inside surface of the pin hole with fresh grease.

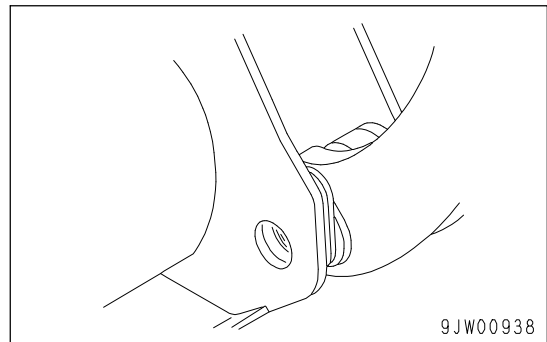
1. Set cord ring (2) on top of lift arm boss (1) as shown in the diagram.

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

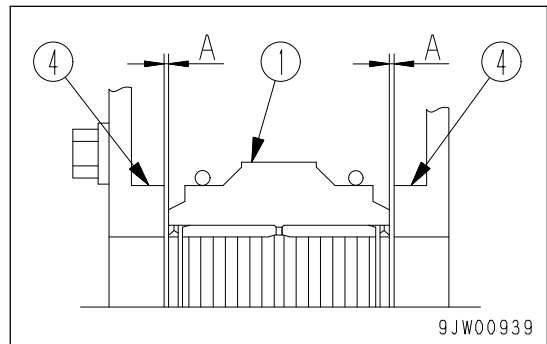
2. Coat dust seal lip portion (3) with grease.



3. Align the left and right bucket pin holes.



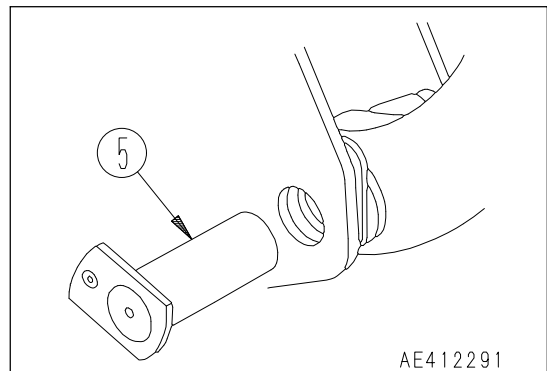
4. Select the number of shims so that clearance A between bucket hinge boss (4) and lift arm boss (1) are less than 1.0 to 1.5 mm (0.04 to 0.06 in).



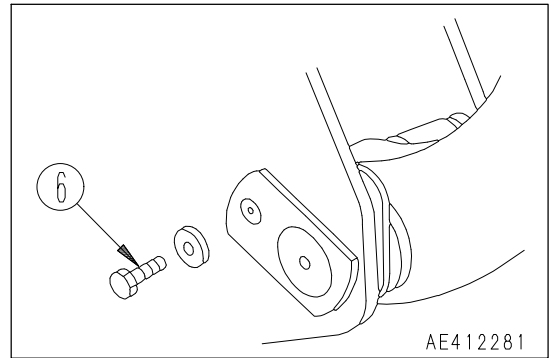
5. Assemble the shims selected in Step 4, align the pin holes, then insert bucket hinge pin (5).

Coat with grease to prevent damage to the dust seal when inserting the bucket hinge pin.

Use a bucket hinge pin that has a grease hole.



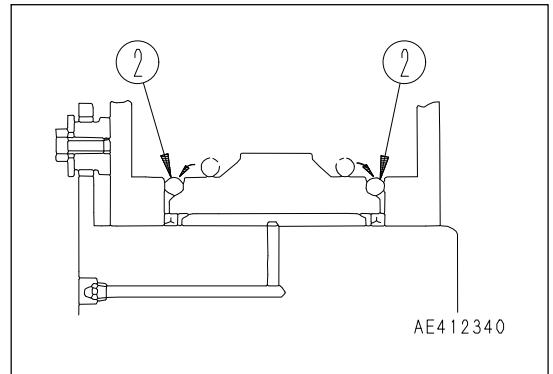
6. Install mounting bolt (6).



7. Move cord ring (2) down to the groove.

NOTICE

Coat the groove of the cord ring with grease before installing it. If the cord ring is installed while the groove is dry, force will be applied to the cord ring when the bucket is operated and this will cause damage to the cord ring.

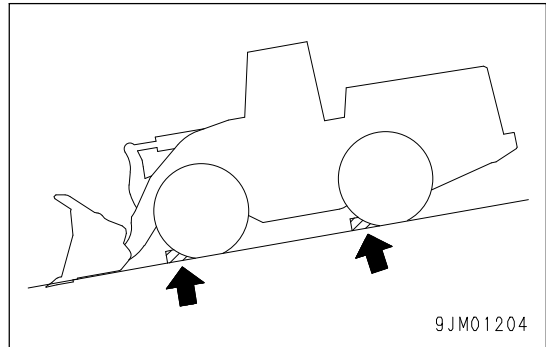


8. Use the same procedure as in steps 1 to 7 to install the bucket link pin.
Assemble a pin that has no grease hole at the bucket link.
9. Coat the bucket hinge pin and bucket link pin with grease. For details, see "LUBRICATING (PAGE 4-46)".
For details of removing and installing the bucket, please contact your Komatsu distributor.

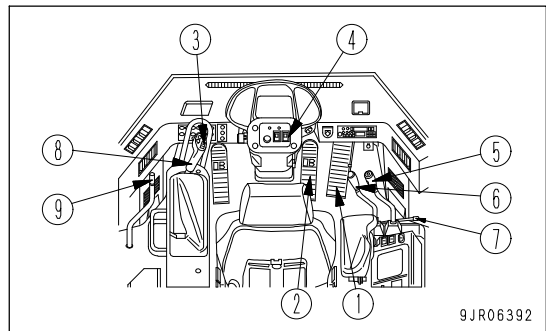
PARKING MACHINE

! WARNING

- Avoid sudden stopping. As far as possible, always leave a margin when stopping the machine.
- Avoid parking the machine on a slope. If it is necessary to park the machine on a slope, stop the machine facing directly down the slope, fit blocks under the tires and lower the bucket to the ground to prevent the machine from moving.
- If the work equipment control lever is touched by mistake, there is danger that the work equipment or machine may move suddenly and cause a serious accident. Before standing up from the operator's seat, always set the lock levers (for the work equipment control levers and AJSS lever) securely to the LOCK position.
- When the parking brake switch is turned ON, it is dangerous to release the brake pedal immediately. Always keep the brake pedal depressed until the parking brake pilot lamp lights up.
- To prevent the machine from obstructing passing traffic when it is parked, set up a flame or fire, or other warning devices to inform people in the surrounding area.



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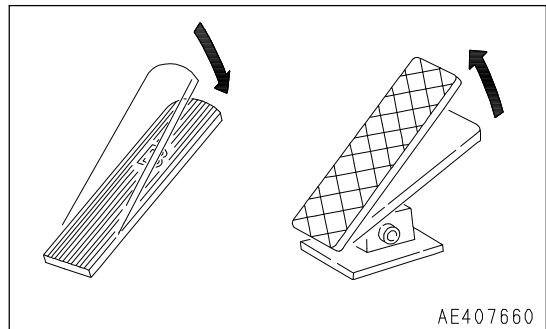


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NOTICE

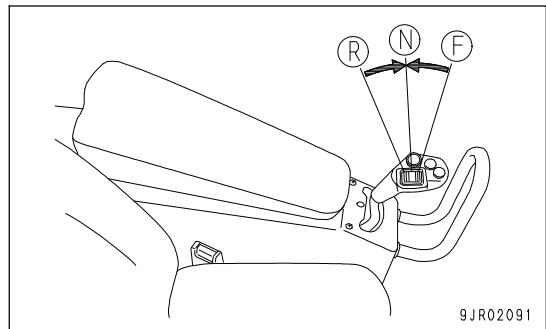
Never use the parking brake switch to brake the machine when traveling except in an emergency. Apply the parking brake only after the machine has stopped.

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



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2. Set directional selector switch (3) to the N position.

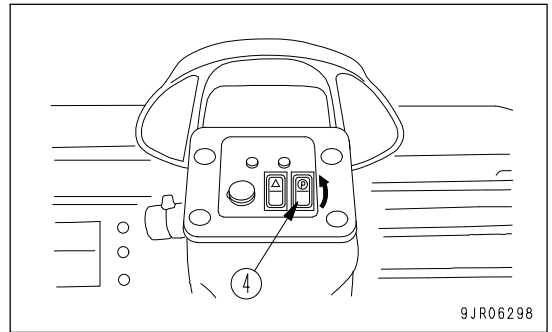


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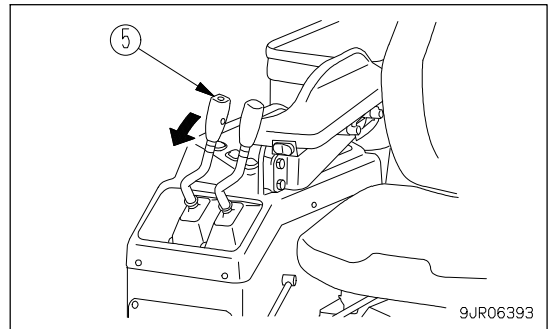
- Turn parking brake switch (4) ON to apply the parking brake.

NOTICE

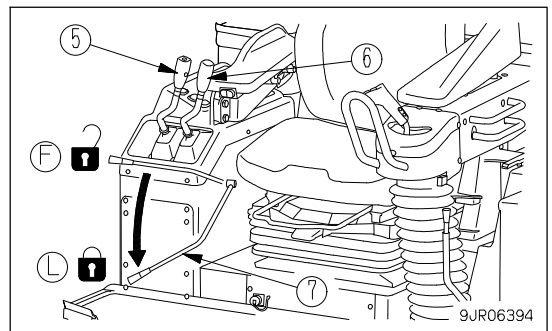
When the parking brake is applied, the transmission is automatically returned to neutral.



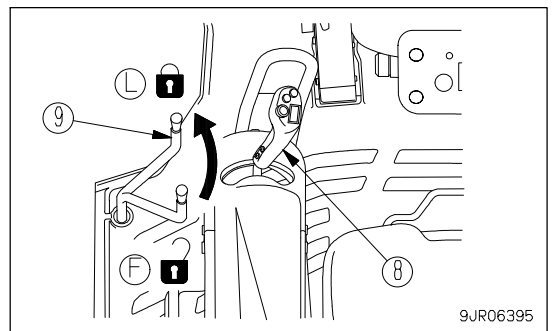
- Operate lift arm control lever (5) to lower the bucket to the ground.



- Set work equipment lock lever (7) of lift arm control lever (5) and bucket control lever (6) to LOCK position (L).



- Set AJSS lever (8) to the Neutral position, then move steering lock lever (9) from FREE position (F) to LOCK position (L).



CHECKS AFTER COMPLETION OF OPERATION

Check the engine water temperature, engine oil pressure, torque converter oil temperature, and fuel level with the machine monitor.

If the engine has overheated, do not stop it suddenly. Run the engine at a midrange speed to allow the engine to cool down before stopping it.

Check that there are no loose bodywork mounting bolts.

Check that there are no cracks in the work equipment or bucket.

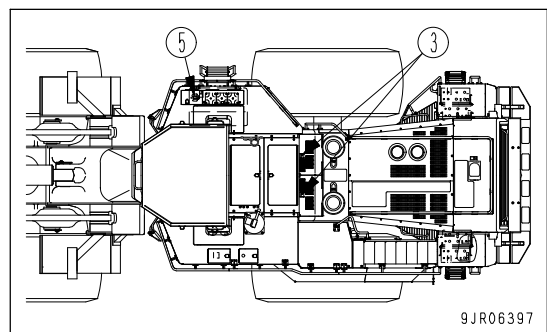
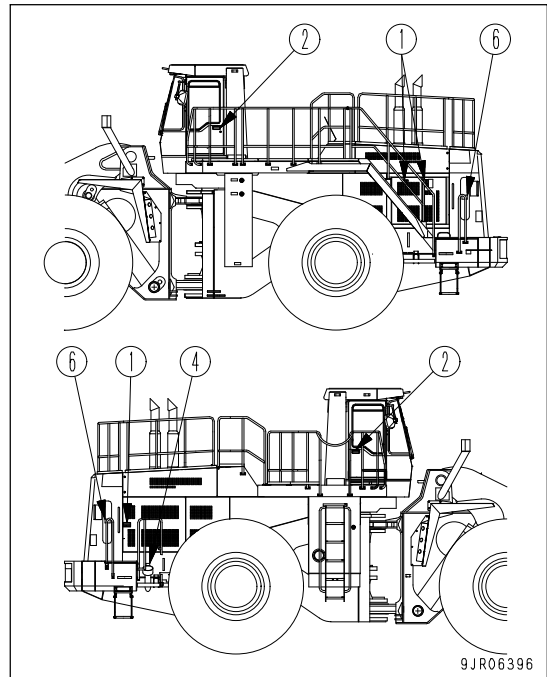
LOCKING

Always lock the following parts.

- (1) Engine side panel (left, right)
- (2) Cab door (left, right)
- (3) Engine hood at rear of cab (2 places)
- (4) Fuel tank filler cap (1 place)
- (5) Hydraulic tank filler cap (1 place)
- (6) Radiator guard (left, right)

REMARK

The starting switch key is used also for locks (1) to (6).



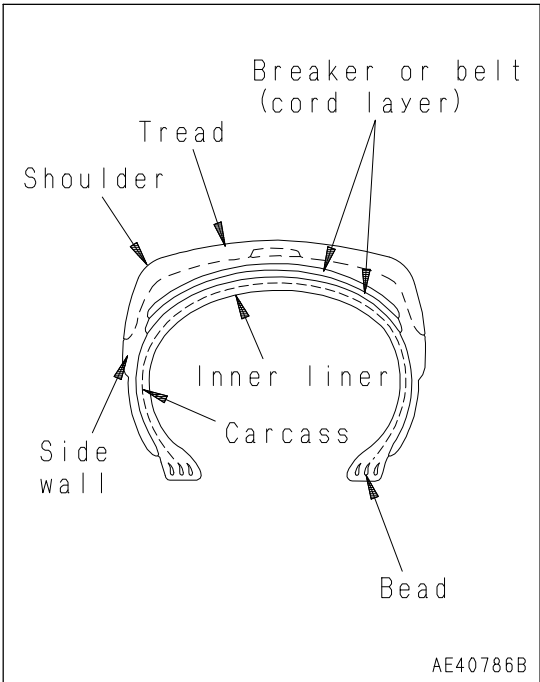
HANDLING THE TIRES

PRECAUTIONS WHEN HANDLING TIRES

 **CAUTION**

If a tire has reached any of the following service limits, there is danger that the tire may burst or cause an accident, so to ensure safety, replace it with a new tire.

- **Service limits for wear**
 - When the remaining depth of the grooves on construction equipment tires (at a point approx. 1/4 of the tread width) is 15% of the groove depth on a new tire.
 - When the tire shows marked uneven wear, stepped wear or other abnormal wear, or when the cord layer is exposed.
- **Service limits for damage**
 - When there is external damage extending to the cord or when the cord is broken
 - When the cord is cut or there is dragging
 - When the tire is peeling (there is separation)
 - When the bead is damaged
 - For tubeless tires, when there is air leakage or improper repair

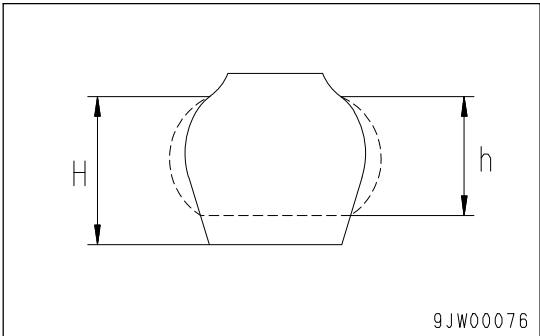


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Please contact your Komatsu distributor when replacing the tires. It is dangerous to jack up the machine without taking due care.

TIRE PRESSURE

Measure the tire pressure before starting operations, when the tires are cool. If the tire inflation pressure is too low, there will be overload; if it is too high, it will cause tire cuts and shock burst. To prevent these problems, adjust the tire inflation pressure according to the table on the next page. Deflection ratio = $H - h / H \times 100$



9JW00076

As a guideline that can be checked visibly, the deflection ratio of the front tire (deflection/free height) is as follows.

- When carrying normal load (lift arm horizontal): Approx. 10 to 15 %
- When digging (rear wheels off ground): Approx. 20 to 25 %

When checking the tire inflation pressure, check also for small scratches or peeling of the tire, for nails or pieces of metal which may cause punctures, and for any abnormal wear.

Clearing fallen stones and rocks from the operating area and maintaining the surface will extend the tire life and give improved economy.

- For operations on normal road surfaces, rock digging operations: High end of range in air pressure chart
- Stockpile operations on soft ground: Average pressure in air pressure chart
- Operations on sand (operations not using much digging force): Low end of range in air pressure chart

If the deflection of the tire is excessive, raise the inflation pressure within the limits given in the table to give a suitable deflection (see deflection ratio).

WA800-3E0

- When equipped with 11.0 m³ (14.4 cu.yd) bucket

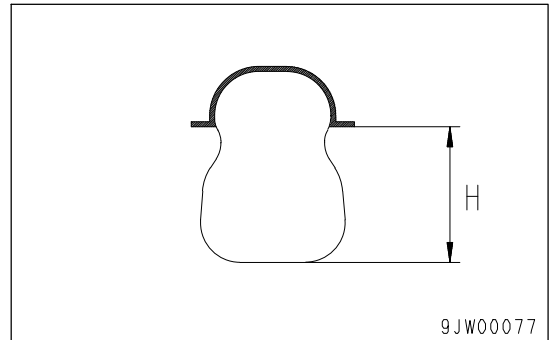
Tire size (Pattern)	H Free Height (mm)	Inflation pressure MPa {kg/cm ² , PSI}				When shipped from factory
		Soft ground (sandy ground)		Normal road		
		Stockpile	Digging	Stockpile	Digging	
45/65-45-46PR (L5Rock) (Standard) 45/65-45-46PR (L4Rock) (if equipped)	679	0.42 - 0.47 {4.25 - 4.75, 60.35 - 67.45}	0.47 - 0.52 {4.75 - 5.25, 67.45 - 74.55 }	0.47 - 0.52 {4.75 - 5.25, 67.45 - 74.55 }	0.47 - 0.52 {4.75 - 5.25, 67.45 - 74.55 }	Front tire: 0.52 {5.25, 74.55}
45/65-45-50PR (L4Rock) (if equipped) 45/65-45-50PR (L5Rock) (if equipped)	679	0.42 - 0.47 {4.25 - 4.75, 60.35 - 67.45}	0.47 - 0.52 {4.75 - 5.25, 67.45 - 74.55 }	0.47 - 0.52 {4.75 - 5.25, 67.45 - 74.55 }	0.47 - 0.52 {4.75 - 5.25, 67.45 - 74.55 }	Rear tire: 0.52 {5.25, 74.55}

WA900-3E0

- When equipped with 13.0 m³ (17.0 cu.yd) bucket

Tire size (Pattern)	H Free Height (mm)	Inflation pressure MPa {kg/cm ² , PSI}				When shipped from factory
		Soft ground (sandy ground)		Normal road		
		Stockpile	Digging	Stockpile	Digging	
45/65-45-58PR (L5Rock) (Standard)	679	0.62 - 0.67 {6.3 - 6.8, 89.46 - 96.56}	0.62 - 0.67 {6.3 - 6.8, 89.46 - 96.56}	0.62 - 0.67 {6.3 - 6.8, 89.46 - 96.56}	0.62 - 0.67 {6.3 - 6.8, 89.46 - 96.56}	Front tire: 0.67 {6.8, 96.56} Rear tire: 0.67 {6.8, 96.56}
45/65R45 ☆ ☆ (L5Rock) (if equipped)	679	0.64 - 0.69 {6.5 - 7.0, 92.3 - 99.4}	0.64 - 0.69 {6.5 - 7.0, 92.3 - 99.4}	0.64 - 0.69 {6.5 - 7.0, 92.3 - 99.4}	0.64 - 0.69 {6.5 - 7.0, 92.3 - 99.4}	Front tire: 0.64 {6.5, 92.3} Rear tire: 0.64 {6.5, 92.3}

Stockpile operations mean the loading of sand and other loose materials.



PRECAUTIONS FOR USING LOAD AND CARRY METHOD

When traveling continuously with load and carry operations, choose the correct tires to match the operating conditions, or choose the operating conditions to match the tires. If this is not done, the tires will be damaged, so contact your Komatsu distributor or tire dealer when selecting tires.

TRANSPORTATION

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

TRANSPORTATION PROCEDURE

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

When selecting the trailer, see the weights and dimensions given in Section "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 bucket.

LOADING, UNLOADING WORK



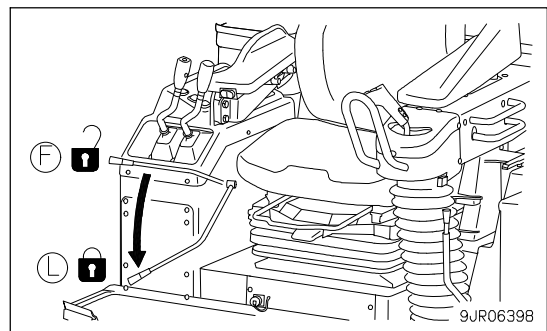
WARNING

When transporting this machine, observe all related laws and regulations. Disassembling for transportation is needed. Consult your Komatsu distributor for transporting the machine.

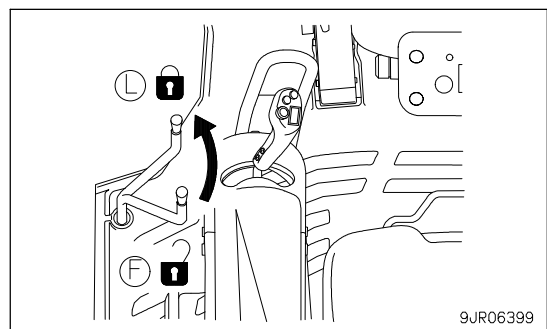
METHOD OF SECURING MACHINE

Load the machine onto a trailer as follows:

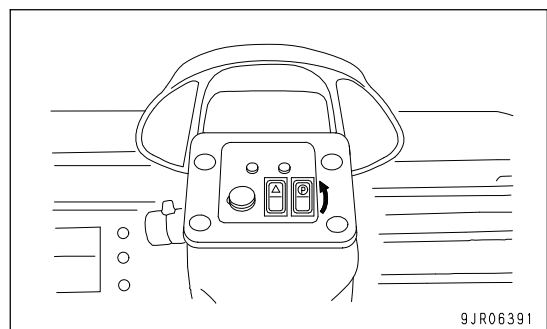
1. Lower the work equipment slowly.
2. Set the work equipment lock lever for the work equipment control lever to LOCK position (L).



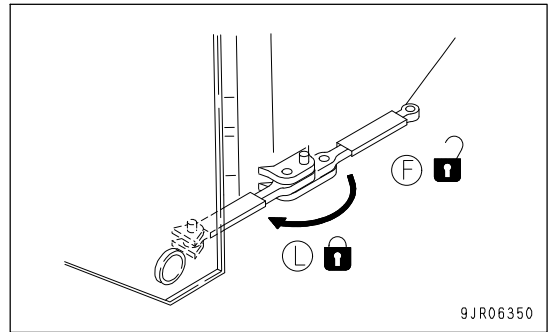
3. Set the steering lock lever to LOCK position (L).



4. Turn the parking brake switch to the ON position to apply the parking brake.
5. Turn the starting switch to the OFF position to stop the engine, and pull out the starting switch key.



- Set the frame lock bar to LOCK position (L) to prevent the front frame and rear frame from articulating.



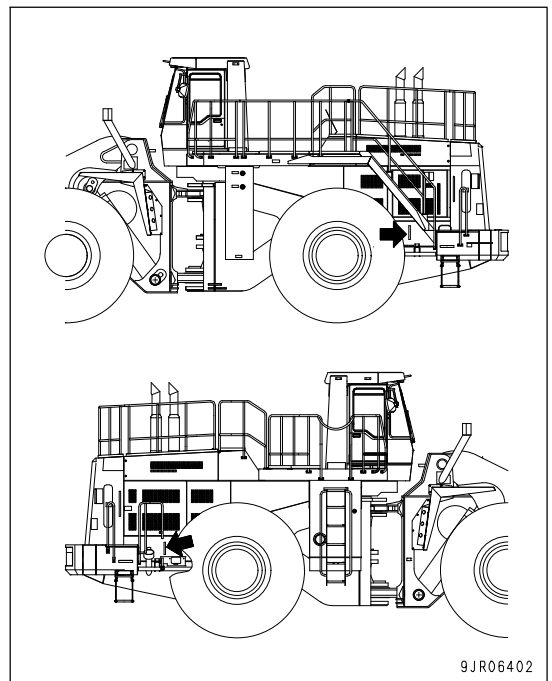
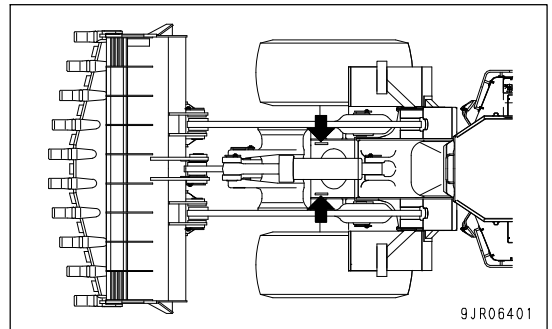
- Put blocks in front of and behind the wheels and secure the machine with chains or wire rope of a suitable strength to prevent the machine from moving during transportation.

NOTICE

Always rotate the antenna or remove it.

(Fit a seal to prevent dust or dirt from entering the connector portion.)

In addition, reassemble the mirrors so that they are stowed inside the machine width.



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.
- When lifting the machine, always stop the engine, apply the parking brake, and set the safety lock lever to the LOCK position. Lock with the safety bar to prevent the front frame from articulating, and take steps to prevent the machine from moving unexpectedly.
- 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.

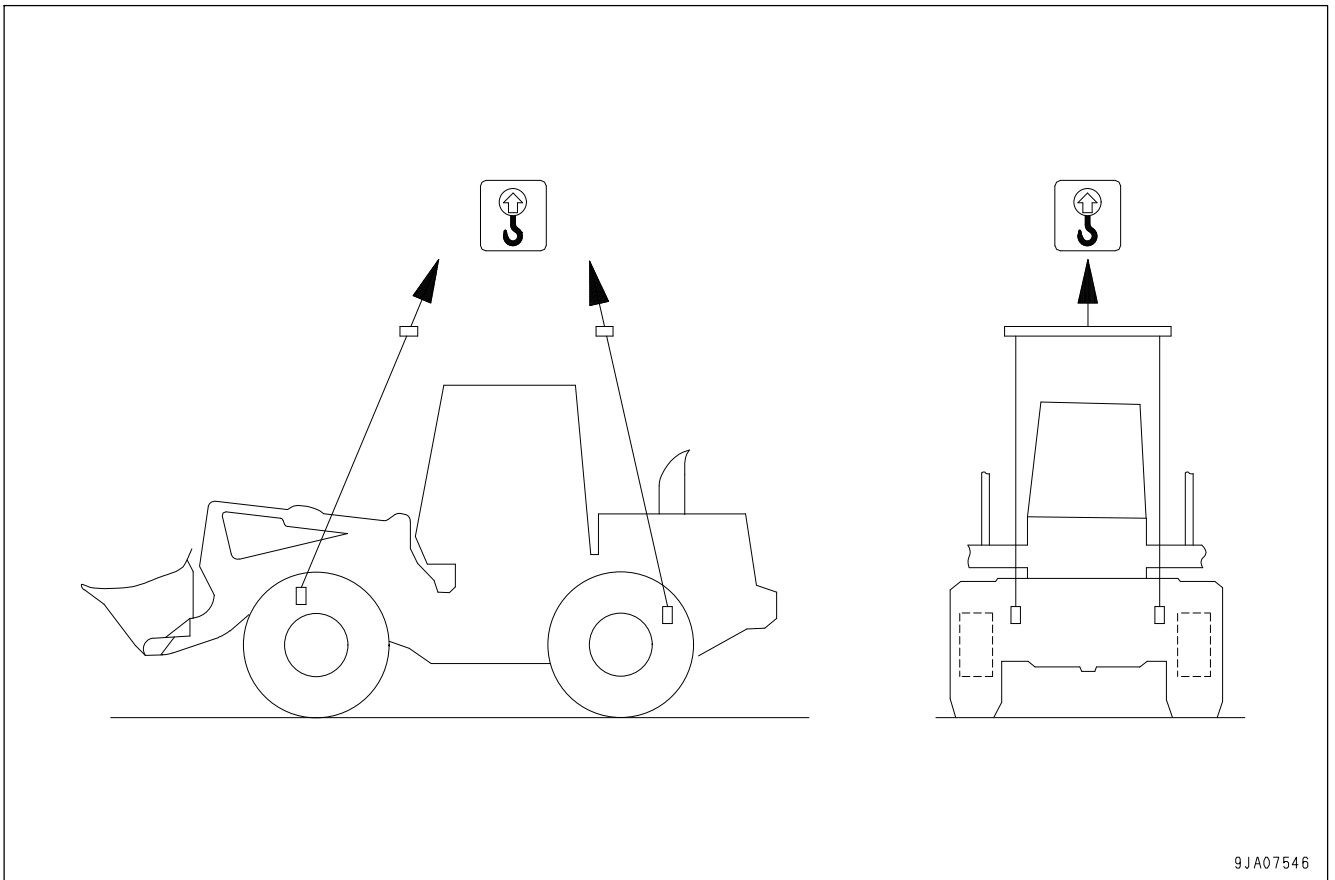
For the weight of the standard specification machine, see "WEIGHT TABLE (PAGE 3-151)".

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.

LOCATION OF LIFTING POSITION MARK



9JA07546

WEIGHT TABLE

		Operating weight	Front wheel load	Rear wheel load	Center of gravity (from front axle)
WA800-3E0	For North America	104125 kg (229388 lb)	58385 kg (128623 lb)	45740 kg (10766 lb)	2390 mm (7 ft 10 in)
	For areas other than North America	101825 kg (224322 lb)	58935 kg (129834 lb)	42890 kg (94487 lb)	2300 mm (7 ft 7 in)
WA900-3E0	For North America	108025 kg (237980 lb)	60235 kg (132698 lb)	47790 kg (105282 lb)	2410 mm (7 ft 11 in)
	For areas other than North America	107125 kg (235998 lb)	59735 kg (131597 lb)	47390 kg (104401 lb)	2410 mm (7 ft 11 in)

LIFTING PROCEDURE

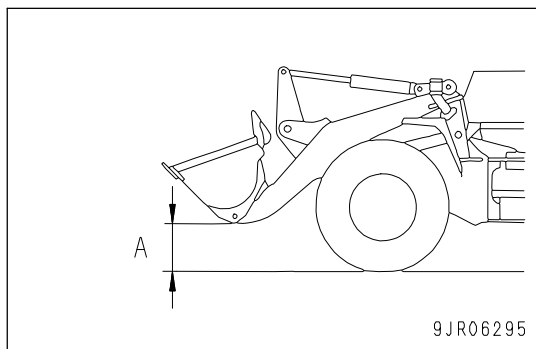
The machine can be lifted only if it has hook mark labels.

When lifting the machine, stop the machine on level ground and do as follows.

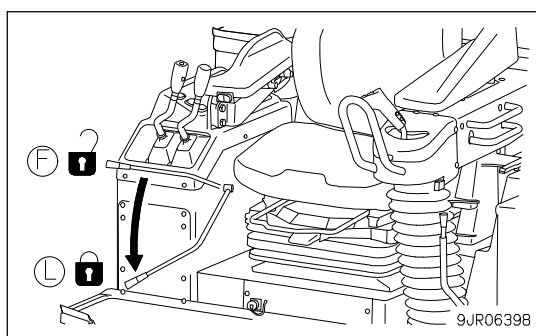
1. Start the engine, make sure that the machine is horizontal, then set the work equipment to the travel posture.

For details, see "PREPARATIONS FOR MOVING MACHINE (PAGE 3-97)".

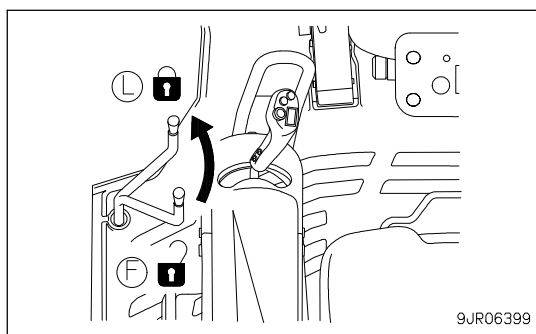
(A): 70 - 90 cm (2ft 4in - 2ft 11in)



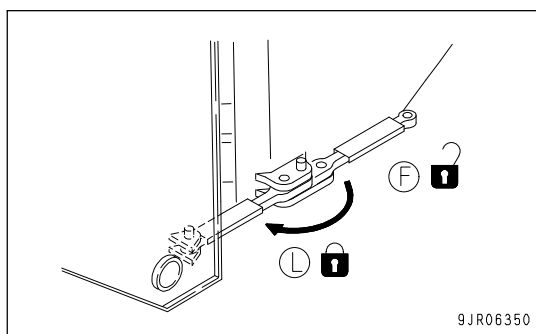
2. Set the work equipment lock lever for the work equipment control lever to LOCK position (L).



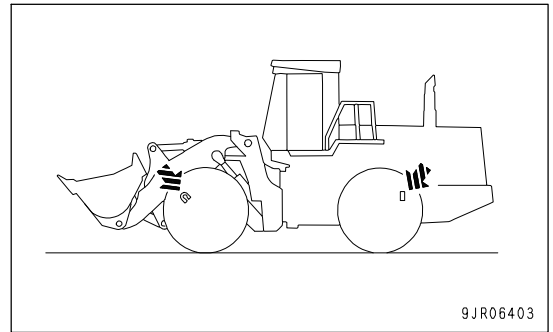
3. Set the steering lock lever to LOCK position (L).



4. Stop the engine, check that the area around the operator's compartment is safe, then set the frame lock bar to the LOCK position (L) to prevent the front frame and rear frame from articulating.



5. 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 hooks at the front of the front frame and the rear of the rear frame (lifting hook marks).
6. 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.



9JR06403

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

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 4-10)".

COOLANT



WARNING

- COOLANT 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 the coolant containing COOLANT that has been drained during repair of radiator, please contact your Komatsu distributor or request a specialist company to carry out the operation. COOLANT is toxic. Do not let it flow into drainage ditches or spray it onto the ground surface.

NOTICE

Please use Komatsu genuine SUPERCOOLANT (AF-NAC) for the COOLANT. As a basic rule, we do not recommend the use of any COOLANT other than SUPERCOOLANT (AF-NAC).

COOLANT is already diluted with distilled water, so it is not flammable.

For details of the density of COOLANT and the interval for changing the coolant, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-25)".

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.

REMARK

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

Charging Rate (%)	Electrolyte Temperature	20°C (68°F)	0°C (32°F)	-10°C (14°F)	-20°C (-4°F)
	100		1.28	1.29	1.30
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

- As the battery capacity drastically drops in low temperatures, cover or remove the battery from the machine, store the battery 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.

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.

- Remove all the mud and water from the machine body. In particular, wipe the hydraulic cylinder rods clean to prevent damage to the seal caused by mud, dirt, or drops of water on the rod from getting inside the seal.
- Park the machine on hard, dry ground.

If this is impossible, park the machine on boards.

The boards prevent the tracks from freezing to the ground, and allow the machine to be moved the next morning.

- Open the drain valve and drain any water collected in the fuel system to prevent it from freezing.
- Fill the fuel tank to capacity. This minimizes moisture condensation in the tank when the temperature drops.

AFTER COLD WEATHER

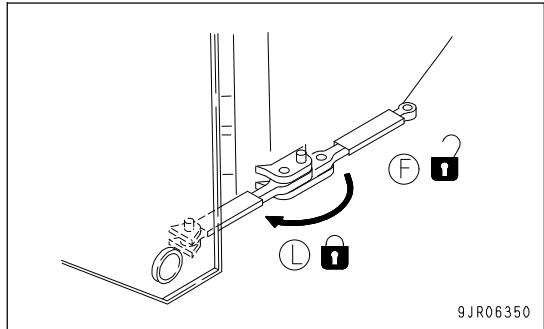
When the season changes and the weather becomes warmer, do as follows.

- Replace all fuel and oil with fuel and oil of the specified viscosity. For details, see "RECOMMENDED FUEL, COOLANT, AND LUBRICANT (PAGE 4-10)".

WARMING-UP OPERATION FOR STEERING HYDRAULIC CIRCUIT IN COLD WEATHER

WARNING

When the oil temperature is low, if the AJSS lever is operated or any operation to stop in a certain position is carried out, there may be a time lag before the machine turns and stops.
 In this case, to ensure safety, use the frame lock lever and carry out the warming-up operation in a wide space.
 When doing this, do not relieve the pressure in the hydraulic circuit continuously for more than 5 seconds.



When the temperature is low, do not start the operation of the machine immediately after starting the engine.

Warming up steering hydraulic circuit

Slowly operate the AJSS lever to the left and right to warm up the oil in the steering valve.
 (Repeat this operation for about 10 minutes to warm up the oil.)

NOTICE

Operate the AJSS lever a little and stop in that position. Then confirm that the machine is being steered by an angle equivalent to the amount that the AJSS lever is operated.

RECOMMENDED OIL

Select the oil from the table below according to the ambient temperature.

RESERVOIR	KIND OF FLUID	Ambient Temperature, degrees Celsius									Recommended Komatsu Fluids
		-22 -30	-4 -20	14 -10	32 0	50 10	68 20	86 30	104 40	122 °F 50 °C	
Hydraulic system	Hydraulic oil										HO46-HM
											HO-MVK

LONG-TERM STORAGE

BEFORE STORAGE

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

- Clean and wash all parts, then store the machine indoors. If the machine has to be stored outdoors, select level ground and cover the machine with a sheet.
- 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
- Lock each control lever with the lock lever.
- To prevent rust, fill with COOLANT to give a density of at least 30% for the engine coolant.

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.

- During storage, operate and move the machine for a short distance once a month so that a new film of oil will coat moving parts. At the same time, also charge the battery.
- When operating the work equipment, wipe off all the grease from the hydraulic cylinder rods.
- If the machine is equipped with an air conditioner, operate the air conditioner for 3 to 5 minutes once a month to lubricate all parts of the air conditioner compressor. Always run the engine at low idle when doing this. In addition, check the refrigerant level twice a year.

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.

TROUBLESHOOTING

WHEN MACHINE RUNS OUT OF FUEL

When starting the engine again after running out of fuel, fill with fuel, then bleed the air from the fuel system before starting the engine.

Always watch the fuel level and be careful not to run out of fuel.

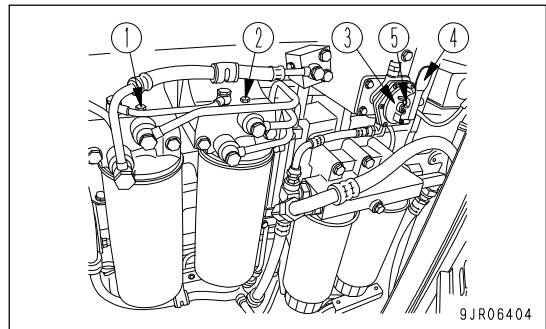
If the engine has stopped because of lack of fuel, it is necessary to use the priming pump to bleed the air completely from the fuel circuit.

PROCEDURE FOR BLEEDING AIR

CAUTION

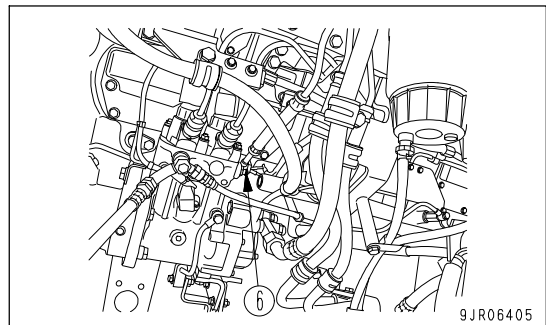
- The fuel injection pump and nozzle of this engine consist of more precise parts than the conventional ones. If foreign matter enters them, it can cause a trouble. Accordingly, if dust sticks to the fuel system, wash it off with clean fuel.
- When opening the air bleeding plug at the fuel filter head, take care. Fuel may spout because of residual pressure.

1. Loosen air bleed plug (1) and (2) at the fuel main filter head.
2. Loosen wing nut (5) holding lever (4) of priming pump (3).
3. Pump lever (4) to pump out fuel from air bleed plug (1) on the left side of the fuel main filter head until no more bubbles come out with the fuel.
4. Tighten air bleed plug (1) on the left side of the fuel main filter head.
Tightening torque: 7.8 - 9.8Nm {0.8 - 1.0kgm, 5.8 - 7.2lbf}

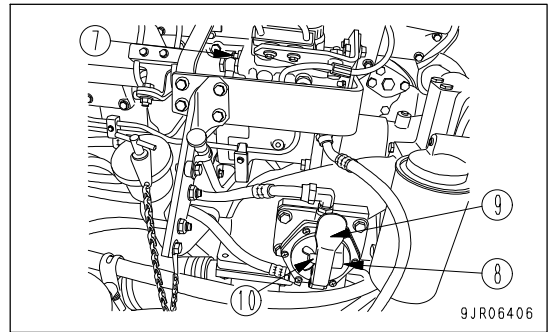


5. Continue to pump lever (4) and pump out fuel from air bleed plug (2) on the right side of the fuel main filter head until no more bubbles come out with the fuel.
6. Tighten air bleed plug (2) on the right side of the fuel main filter head.
Tightening torque: 7.8 - 9.8Nm {0.8 - 1.0kgm, 5.8 - 7.2lbf}

7. Loosen air bleeder (6) at the side of supply pump on the side where the fuel main filter is mounted.
8. Pump lever (4) to pump out fuel from air bleeder (6) until no more bubbles come out with the fuel.
9. Tighten air bleeder (6).
Tightening torque: 4.9 - 6.9Nm {0.5 - 0.7kgm, 3.6 - 5.1lbf}
10. Tighten wing nut (5) of priming pump (3) securely to lock lever (4) in position.



11. Loosen air bleeder (7) at the side of the supply pump on the opposite side.
12. Loosen wing nut (10) holding lever (9) of priming pump (8).
13. Pump lever (9) to pump out fuel from air bleeder (7) until no more bubbles come out with the fuel.
14. Tighten air bleeder (7).
- Tightening torque: 4.9 - 6.9Nm {0.5 - 0.7kgm, 3.6 - 5.1lbft}
15. Tighten wing nut (10) of priming pump (8) securely to lock lever (9) in position.
16. If the engine does not start, repeat the operation from Step 1.



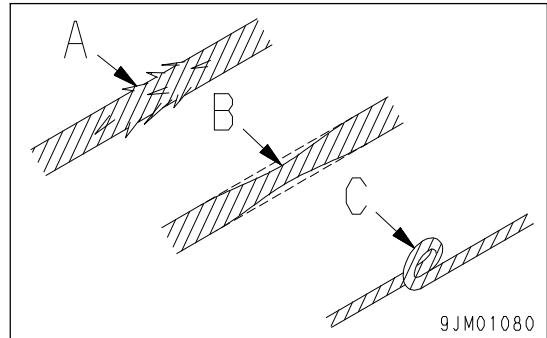
METHOD OF TOWING MACHINE



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 rope 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.

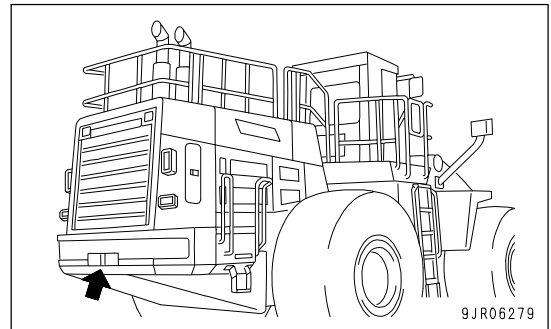


NOTICE

- The permissible towing capacity for this machine is as shown below. Do not tow any load greater than this.
WA800: 498940N (50910kg)
WA900: 524910N (53560kg)
- The machine should be towed only to a position where it is possible to carry out inspection and maintenance. This operation is only for towing short distances. Do not tow the machine 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.

- Before releasing the brakes, put blocks under the wheels to prevent the machine from moving. If the wheels are not blocked, the machine may suddenly move.
- 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 rim pull to allow it to control both machines on slopes or on the tow road.
- Use the specified towing pin 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.
- 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.
- 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.
- 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 rim pull, while towing on slopes or on uneven road surfaces will require the maximum rim pull.
- Connect a wire rope to the part indicated with the arrow in the diagram at right.



WHEN ENGINE RUNS

- If the transmission and AJSS lever can be operated, and the engine is running, it is possible to tow the machine out of mud or to move it for a short distance to the edge of the road.
- The operator should sit on the machine being towed and operate the steering lever in the direction that the machine is towed.

WHEN ENGINE DOES NOT RUNS

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

1. The transmission oil does not lubricate the system, so remove the front and rear drive shafts. If necessary, block the tires to prevent the machine from moving.
2. The steering cannot be operated, so remove the steering cylinder.
Even if the brakes are in good condition, the brakes can only be used a limited number of times. There is no change in the operating force for the brake pedal, but the braking force is reduced each time the pedal is depressed.
3. Connect the towing equipment securely. When carrying out towing operations, use two machines of at least the same class as the machine being towed. Connect one machine each to the front and rear of the machine being towed, then remove the blocks from the tires and tow the machine.
4. Parking brake
The parking brake cannot be turned OFF. To release the parking brake, do as follows.

RELEASING PARKING BRAKE

Please ask your Komatsu distributor to release the parking brake.



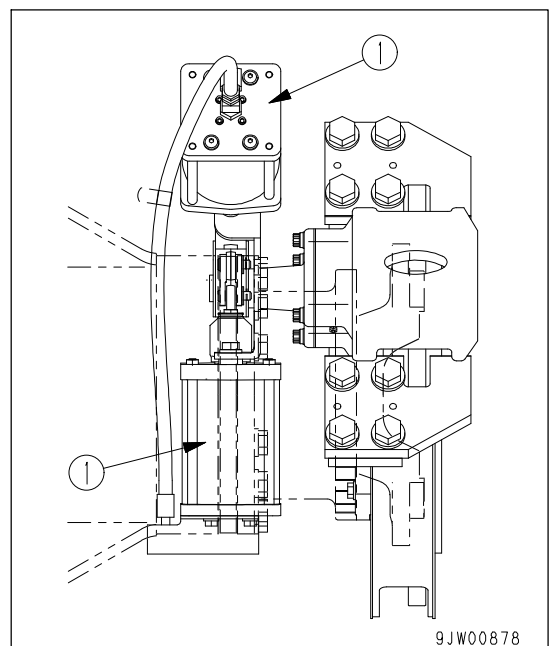
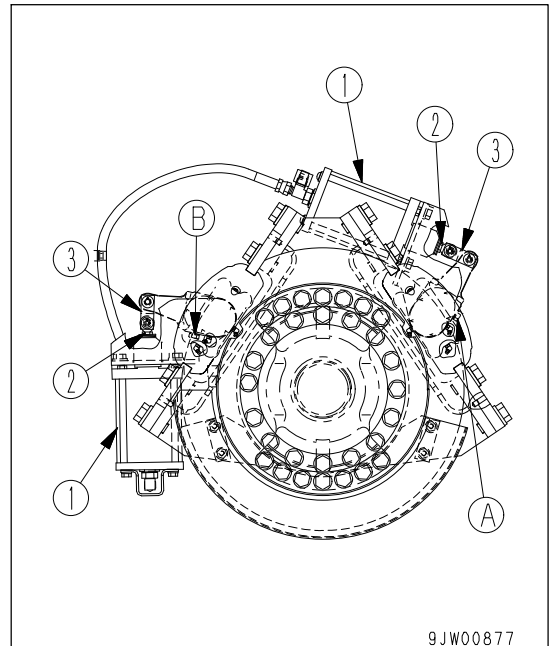
WARNING

- When releasing the parking brake, stop the machine on level ground and check that the surrounding area is safe. If it is necessary to release the brake on a slope in an emergency, block the tires before starting the operation.
- If the parking brake is released, the brake cannot be used, so check the safety carefully when moving the machine.

The parking brake is released by the accumulator oil pressure of the brake.

If the accumulator pressure is lowered for some trouble, however, release the parking brake mechanically, then tow the machine.

1. Turn adjustment screws on the side of the slack adjuster (Turn (A) clockwise and (B) counterclockwise) to retract rod (2) of spring cylinder (1) fully into spring cylinder (1) to loosen plate (3).
2. Turn adjustment screws further (Turn (A) clockwise and (B) counterclockwise) by 1/2 turn.
In this condition the parking brake is completely released.



EMERGENCY TRAVEL OPERATION

The normal gear shifting operation is carried out by electric signals. If there should be a failure in the electrical system and the machine does not move, please contact your Komatsu distributor to have the machine moved.

NOTICE

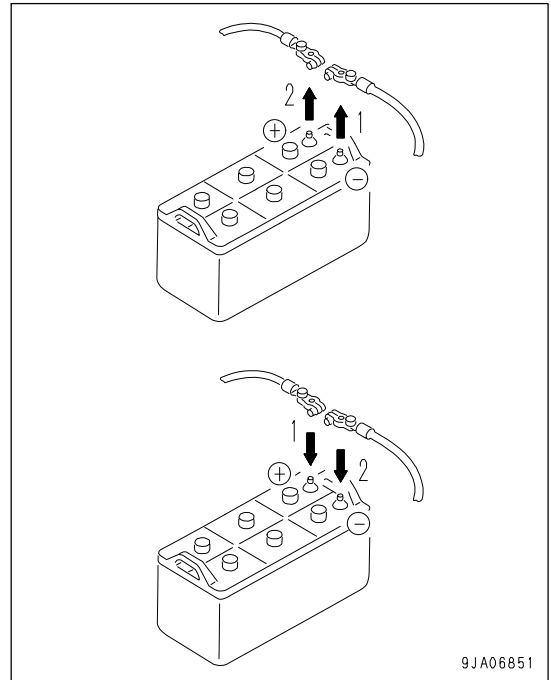
Always request your Komatsu distributor to carry out the emergency travel operation.

IF BATTERY IS DISCHARGED



WARNING

- It is dangerous to charge a battery when installed on a machine. Make sure that it is removed 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.



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REMOVAL AND INSTALLATION OF BATTERY

1. Before removing battery, remove the ground cable (normally connected to the negative (-) terminal). If any tool touches between the positive terminal and the chassis, there is danger of sparks being generated. Loosen the nuts of the terminal and remove the wires from the battery.
2. After installing the battery, fix it with the battery hold down.
Tightening torque: 2 to 2.9 Nm {0.2 to 0.3 kgm, 1.4 to 2.2 lbft}
3. When installing the battery, connect the ground cable last.
Insert the hole of the terminal on the battery and tighten the nut.
Tightening torque: 5.9 to 9.8 Nm {0.6 to 1.0 kgm, 4.3 to 7.2 lbft}

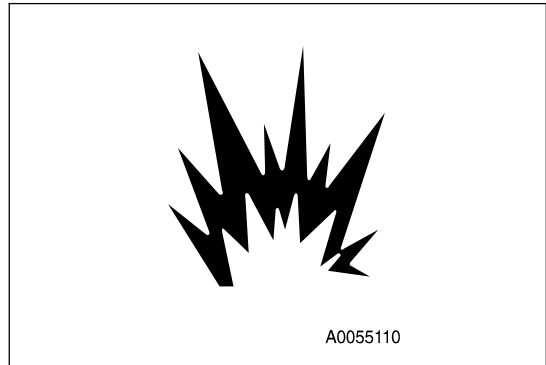
REMARK

There are two batteries each (total: 4) on both sides at the rear of the machine. There is also one battery each for the ground (total: 2) on both sides of the machine.

PRECAUTIONS FOR CHARGING BATTERY

When charging the battery, if the battery is not handled correctly, there is danger that the battery may explode. Always follow the instructions in "BATTERY (PAGE 3-155)" and the instruction manual accompanying the charger, and do as follows.

- Do not use or charge the battery if the level of the battery electrolyte is below the lower level. This may cause an explosion. Always inspect the battery electrolyte level periodically and add distilled water to the upper level.
- 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.



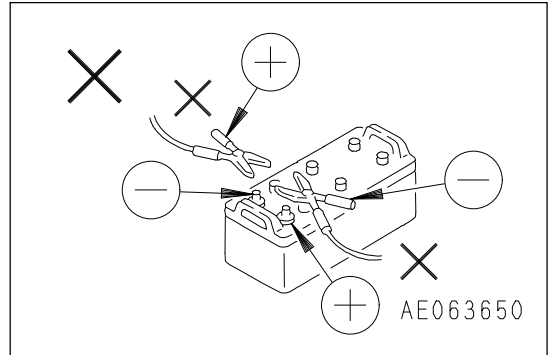
STARTING ENGINE WITH BOOSTER CABLE

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

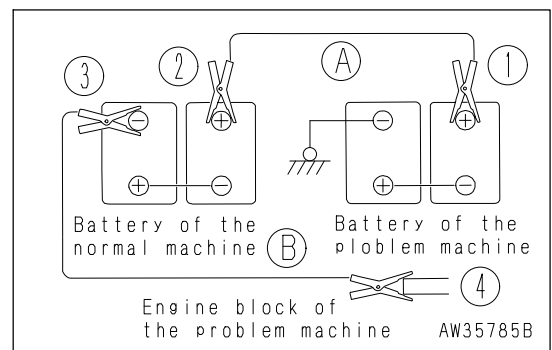
- For the battery on the normal machine, use a battery with the same capacity as the problem machine.
- Check that the cable and clips are not damaged or corroded.
- Connect the clips securely.
- Check that the lock levers (work equipment, steering) and parking brakes of both machines are at the LOCK position.
- Check that all levers are at the neutral position.

CONNECTING THE BOOSTER CABLE

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 ENGINE

**WARNING**

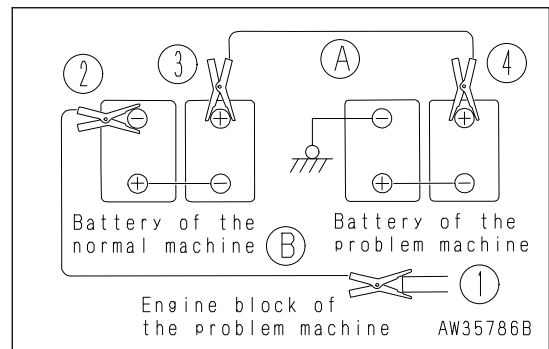
Check that the lock levers (work equipment, steering) and parking brake levers of both the normal machine and the problem machine are at the LOCK position. Check also that all control levers are at the HOLD position.

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, wait for at least 2 minutes before trying again.

DISCONNECTING THE BOOSTER CABLE

After the engine has started, disconnect the booster cables in the reverse of the order in which they were

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.

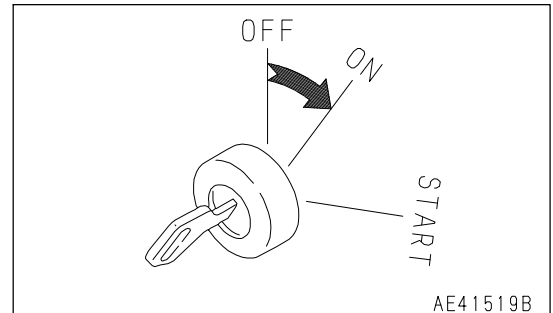


METHOD FOR LOWERING WORK EQUIPMENT WHEN ENGINE HAS STOPPED

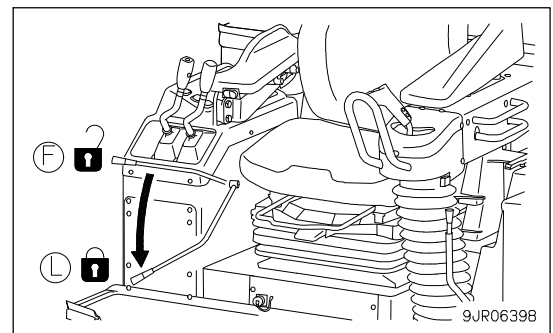
**WARNING**

If there is some pressure remaining in the accumulator after the engine stops, the work equipment can be lowered. Check that the surrounding area is safe, then lower the work equipment.

1. Turn starting switch key to the ON position.

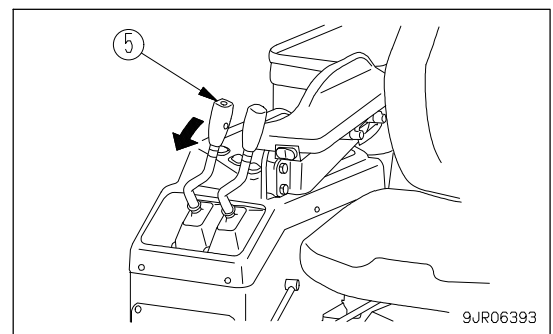


2. Turn the work equipment lock lever to FREE position (F).



3. Operate the lift arm control lever to lower the bucket to the ground.

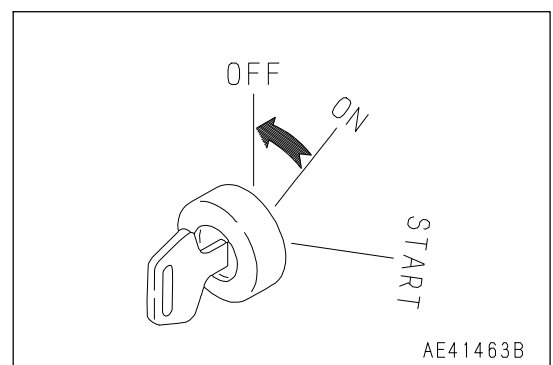
4. Set the work equipment lock lever to the LOCK position (L) securely.



5. Turn the key of starting switch to the OFF position.

REMARK

Carry out this operation within two minutes after the engine is stopped. If the machine is left after the engine has stopped, the pressure in the accumulator will go down and it will be impossible to lower the work equipment.



PRELUBE SKIP FUNCTION WHEN STARTING IN EMERGENCY

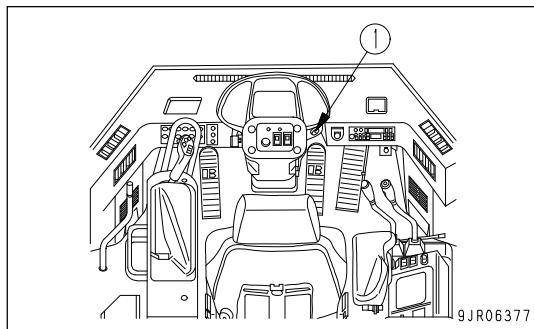
If an abnormality occurs in the prelube system and the prelube does not work properly, it may be impossible to start the engine.

If this happens, change the connection of the emergency start connector to start the engine without carrying out the prelube operation.



WARNING

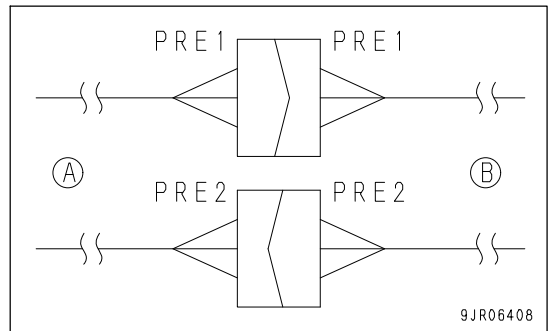
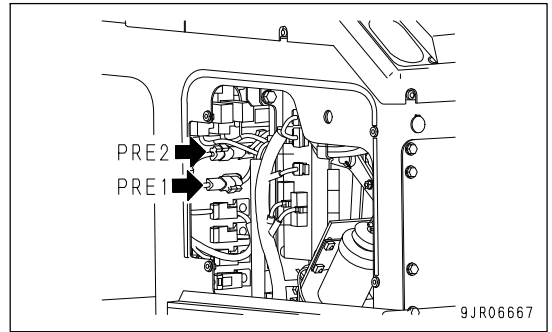
- Always turn the key in starting switch (1) to the OFF position before handling the emergency start connector.
- Change the emergency start connector only if the prelube does not work properly because of some abnormality in the system. Do not use this system to start the engine if the prelube system is normal.
- When using the emergency start connector to start the engine without carrying out the prelube operation, first move the machine to a safe place, stop the machine, turn the parking brake switch ON, then ask your Komatsu distributor to carry out repairs.



PROCEDURE FOR CONNECTING EMERGENCY START CONNECTOR

1. Inside the right console box around the prelube controller, there are 3-pole connectors (2 each) with tags saying "PRE1" and "PRE2". The two "PRE1" connectors are connected to each other (the two "PRE2" connectors are also connected to each other).

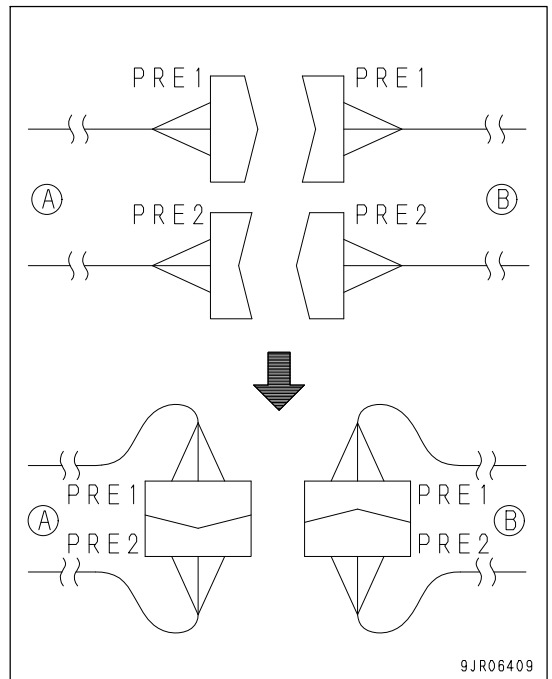
- (A) Wiring harness at machine end
- (B) Wiring harness at controller end



2. When starting the engine without carrying out the prelube operation, remove the two sets of connectors and connect the PRE1 and PRE2 connectors in their place.
 3. Turn the key in starting switch (1) to the START position to crank the starting motor without carrying out the prelube operation.

REMARK

- Even when starting the engine without carrying out the prelube operation, when starting in cold areas, turn the key in starting switch (1) to the ON position and carry out preheating.
- When the preheating pilot lamp goes out, turn the key in starting switch (1) to the START position and start the engine.



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 the engine runs at high speed	<ul style="list-style-type: none"> • Defective wiring • Defective adjustment of alternator best tension 	<ul style="list-style-type: none"> (• Check, repair loose terminals, disconnections) • Adjust alternator belt tension For details, see EVERY 250 HOURS SERVICE
Lamp flickers while engine is running		
Battery charge caution pilot lamp does not go out even when engine is running	<ul style="list-style-type: none"> • Defective alternator • Defective wiring 	<ul style="list-style-type: none"> (• Replace) (• Check, repair)
Abnormal noise is generated from alternator	<ul style="list-style-type: none"> • Defective alternator 	<ul style="list-style-type: none"> (• Replace)
Starting motor does not turn when starting switch is turned to ON	<ul style="list-style-type: none"> • Defective wiring • Insufficient battery charge 	<ul style="list-style-type: none"> (• Check, repair) • Charge
Pinion of starting motor keeps going in and out	<ul style="list-style-type: none"> • Insufficient battery charge 	<ul style="list-style-type: none"> • Charge
Starting motor turns engine sluggishly	<ul style="list-style-type: none"> • Insufficient battery charge • Defective starting motor 	<ul style="list-style-type: none"> • Charge (• Replace)
Starting motor disengages before engine starts	<ul style="list-style-type: none"> • Defective wiring • Insufficient battery charge 	<ul style="list-style-type: none"> (• Check, repair) • Charge
Pre-heating monitor does not light	<ul style="list-style-type: none"> • Defective wiring • Defective heater relay • Defective monitor pilot lamp 	<ul style="list-style-type: none"> (• Check, repair) (• Replace) (• Replace)
Engine oil pressure monitor lamp does not light up when engine is stopped (starting switch at ON position)	<ul style="list-style-type: none"> • Defective wiring • Defective wiring, defective sensor 	<ul style="list-style-type: none"> (• Replace) (• Check, repair, replace)
Battery charge caution pilot lamp does not light up when engine is stopped (starting switch at ON position)	<ul style="list-style-type: none"> • Defective wiring • Defective monitor 	<ul style="list-style-type: none"> (• Check, repair) (• Replace)
Outside of electrical heater is not warm when touched by hand	<ul style="list-style-type: none"> • Defective wiring • Disconnection in electrical heater • Defective operation of heater relay switch 	<ul style="list-style-type: none"> (• Check, repair) (• Replace) (• Replace heater switch)

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- (): 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
Transmission		
Engine is running but machine does not move	<ul style="list-style-type: none"> • Parking brake is applied • Directional selector switch not completely switched to travel direction position • Lack of oil in transmission case 	<ul style="list-style-type: none"> • Release parking brake • Operate switch fully • Add oil to specified level. See WHEN REQUIRED
Even when engine is run at full throttle, machine only move slowly and lacks power	<ul style="list-style-type: none"> • Lack of oil in transmission case • Transmission strainer is clogged 	<ul style="list-style-type: none"> • Add oil to specified level. See WHEN REQUIRED (• Disassemble, clean)
Oil overheats	<ul style="list-style-type: none"> • Too much oil or too little oil • Machine is not traveling in correct speed range • Torque converter is stalled for long periods • Engine is overheating 	<ul style="list-style-type: none"> • Add or drain oil to specified level. See WHEN REQUIRED • Place in correct speed range correct speed range • Reduce stall time (• Check engine)
Noise generated	<ul style="list-style-type: none"> • Lack of oil 	<ul style="list-style-type: none"> • Add oil to specified level. See WHEN REQUIRED
Axle		
Noise generated	<ul style="list-style-type: none"> • Lack of oil 	<ul style="list-style-type: none"> • Add oil to specified level. See WHEN REQUIRED
Disc brake		
Brake has no effect even when pedal is depressed	<ul style="list-style-type: none"> • Disc has reached wear limit • Defective in hydraulic system • Lack of oil • Air in brake system 	<ul style="list-style-type: none"> (• Replace disc) (• Check, repair) • Add oil to specified level. See CHECK BEFORE STARTING • Bleed air. See WHEN REQUIRED
Brake drags or remains applied	<ul style="list-style-type: none"> • Exhaust hole in brake valve • Defective operation of brake valve • Defective operation of slack adjuster 	<ul style="list-style-type: none"> • Clean (• Check, repair) (• Check, repair)
Brakes slip	<ul style="list-style-type: none"> • Worn disc 	<ul style="list-style-type: none"> (• Replace)
Parking brake		
Braking effect is poor	<ul style="list-style-type: none"> • Linkage is loose • Pad is wet • Deteriorated hydraulic cylinder spring • Worn pad 	<ul style="list-style-type: none"> • Adjust • Clean (• Replace spring) • Adjust or replace
Steering		
Steering lever heavy	<ul style="list-style-type: none"> • Defective in hydraulic system • Lack of oil 	<ul style="list-style-type: none"> (• Check, repair) • Add oil to specified level. See EVERY 100 HOURS SERVICE

Problem	Main causes	Remedy
Hydraulic system		
Lack of lifting power for bucket Bucket takes time to rise	<ul style="list-style-type: none"> • Lack of oil • Clogged hydraulic tank filter 	<ul style="list-style-type: none"> • Add oil to specified level. See EVERY 100 HOURS SERVICE • Replace filter. See EVERY 2000 HOURS SERVICE
Excessive bubbles in oil	<ul style="list-style-type: none"> • Low quality oil being used • Oil level is low • Air in oil line 	<ul style="list-style-type: none"> • Replace with good quality oil • Add oil to specified level. See EVERY 100 HOURS SERVICE • Bleed air. See WHEN REQUIRD
Hydraulic pressure is low	<ul style="list-style-type: none"> • Oil level is low and pump is sucking in air 	<ul style="list-style-type: none"> • Add oil to specified level. See EVERY 100 HOURS SERVICE Then bleed air. See WHEN REQUIRD
Movement of cylinder is irregular	<ul style="list-style-type: none"> • Oil level is low • Oil leakage the inside cylinder 	<ul style="list-style-type: none"> • Add oil to specified level. See EVERY 100 HOURS SERVICE (• Check, repair)

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 caution pilot lamp lights up	<ul style="list-style-type: none"> • Engine oil pan oil level is low (sucking in air) • Clogged oil filter cartridge • Defective tightening of oil pipe or pipe joint, oil leakage from damaged part • Defective pilot lamp 	<ul style="list-style-type: none"> • Add oil to specified level, see CHECK BEFORE STARTING • Replace cartridge, see EVERY 250 HOURS SERVICE (• Check, repair) (• Replace)
Steam is emitted from top part of radiator (pressure valve)	<ul style="list-style-type: none"> • Lack of cooling water • Loosen fan belt • Dirt or scale accumulated in cooling system • Clogged radiator fin or damaged fin • Defective thermostat • Loose radiator filler cap (high altitude operation) • Defective pilot lamp 	<ul style="list-style-type: none"> • Check, add and repair, cooling water, see CHECK BEFORE STARTING • Adjust fan belt tension, see EVERY 500 HOURS SERVICE • Change cooling water, see WHEN REQUIRED <ul style="list-style-type: none"> • Clean inside of cooling system • Clean or repair, see WHEN REQUIRED (• Replace thermostat) • Tighten cap or replace packing (• Replace)
Coolant temperature pilot lamp lights up		
Engine does not start when starting motor is turned	<ul style="list-style-type: none"> • Lack of fuel • Air in fuel system • Defective fuel injection pump or nozzle • Starting motor cranks engine sluggishly • Preheating pilot lamp does not light up • Defective compression • Defective valve clearance 	<ul style="list-style-type: none"> • Add fuel, see CHECK BEFORE STARTING • Repair place where air is sucked in (• Replace pump or nozzle) • See ELECTRICAL SYSTEM • See ELECTRICAL SYSTEM (• Check, repair) (• Adjust valve clearance)
Exhaust gas is white or blue	<ul style="list-style-type: none"> • Too much oil in oil pan • Lack of fuel 	<ul style="list-style-type: none"> • Add oil to specified level, see CHECK BEFORE STARTING • Add oil, see CHECK BEFORE STARTING
Exhaust gas occasionally turns black	<ul style="list-style-type: none"> • Clogged air cleaner element • Defective nozzle • Defective compression • Defective turbocharger 	<ul style="list-style-type: none"> • Clean or replace, see WHEN REQUIRED (• Replace nozzle) (• See defective compression above) (• Clean or replace turbocharger)
Combustion noise occasionally makes breathing sound	<ul style="list-style-type: none"> • Defective nozzle 	<ul style="list-style-type: none"> (• Replace nozzle)
Abnormal noise generated (combustion or mechanical)	<ul style="list-style-type: none"> • Low grade fuel being used • Overheating • Damage inside muffler • Excessive valve clearance 	<ul style="list-style-type: none"> • Change to specified fuel • Refer to "Coolant temperature monitor lights up" as above • Replace muffler (• Adjust valve clearance)

RELATIONSHIP OF ELECTRONIC CONTROL SYSTEM

If an action code is displayed on the main monitor portion of the machine monitor (usually, the speedometer display) and the character display portion of the engine service monitor, follow the action code table given below.

ACTION CODE DISPLAY (MAIN MONITOR PORTION)

1.CALL



WARNING

If action code "CALL" is displayed, stop the machine immediately, turn the starting switch OFF, then ask your Komatsu distributor to carry out repairs.

2.E00

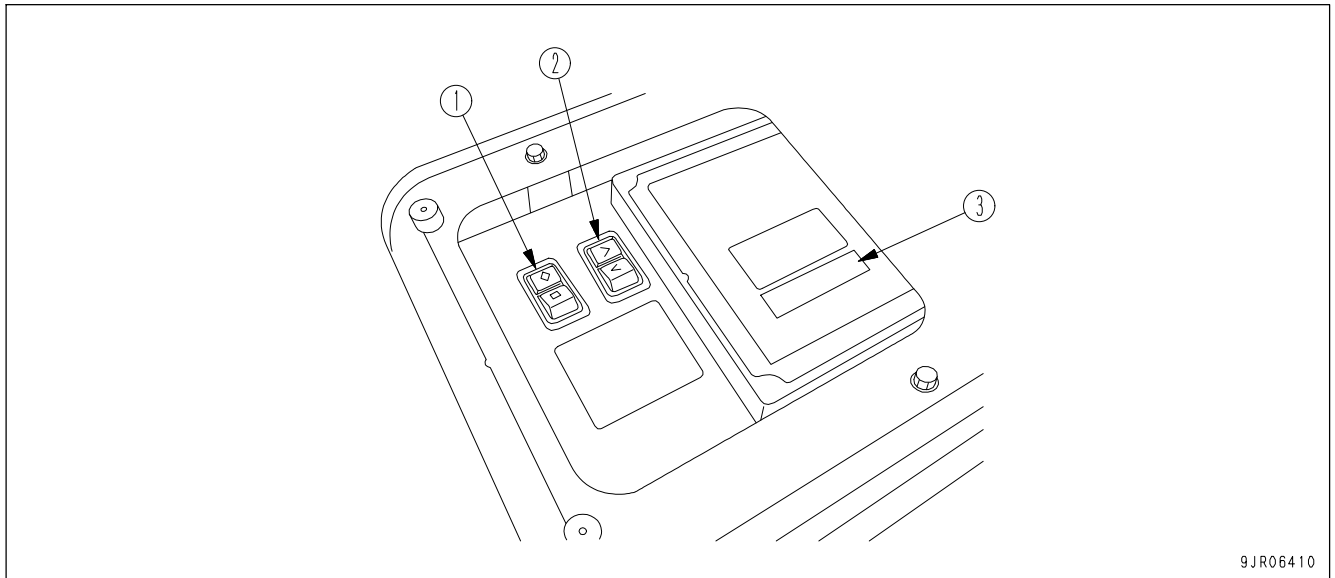
Normal operations are possible using the manual shift mode.

However, if this problem is left without any action being taken, it may lead to serious failure, so after completing the day's operations, ask your Komatsu distributor to carry out inspection and maintenance.

ACTION CODE DISPLAY (ENGINE SERVICE MONITOR PORTION)

! WARNING

If action code E03 is displayed, stop the machine immediately, look at the failure code display, and check the failure code. Contact your Komatsu distributor and ask for repairs to be carried out.



- (1) Machine monitor mode selector switch 1
- (2) Machine monitor mode selector switch 2
- (3) Character display

With this display portion, if there is any failure on the machine, and it is necessary to change the method of operation, or inspection and maintenance must be carried out, codes E01, E02, and E03 recommending action are displayed on the character display.

If more than one failure has occurred, the action code with the highest level of seriousness is displayed.

The order of seriousness for the codes is as follows: E03, E02, E01.

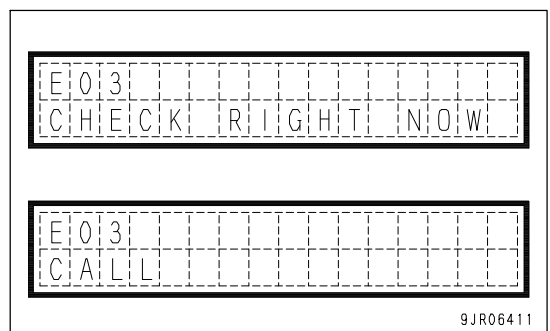
In the case of action codes E02 and E03, the alarm buzzer sounds intermittently and the central warning lamp lights up.

If action codes E01, E02, or E03 are displayed on the character display, stop operations, check the content of the display, and take the following action.

E03: When this code is displayed, stop the machine immediately, check the failure code, and contact your Komatsu distributor for repairs.

REMARK

"E03" is displayed on the top line of the character display and "CHECK RIGHT NOW" and "CALL" are displayed on the bottom line for 3 seconds each in turn.



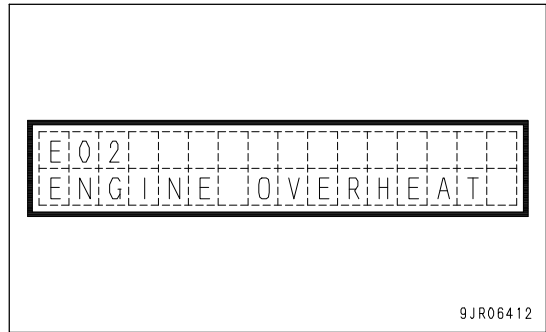
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E02: When this code is displayed, stop the machine and run at the engine under no load at a mid-range speed.

If the action code is still displayed even after the necessary action has been taken, check the failure code and ask your Komatsu distributor to carry out repairs.

REMARK

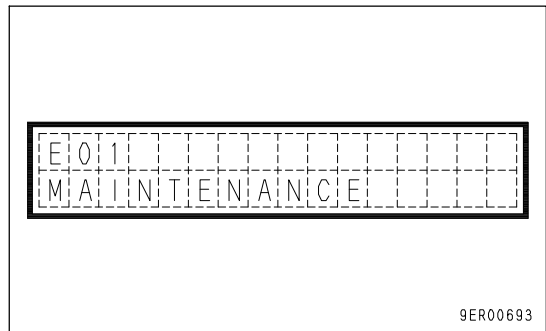
"E02" is displayed on the top line of the character display and the condition of the machine related to overheating or overrunning is displayed on the bottom line.



E01: If this code is displayed, check the failure code when the day's operations are completed or when the operators change shifts, and ask for repairs to be carried out.

REMARK

"E01" is displayed on the top line of the character display and "MAINTENANCE" is displayed on the bottom line.



FAILURE CODE DISPLAY

If an action code is displayed on the character display, check the failure code according to the following method of displaying the failure code.

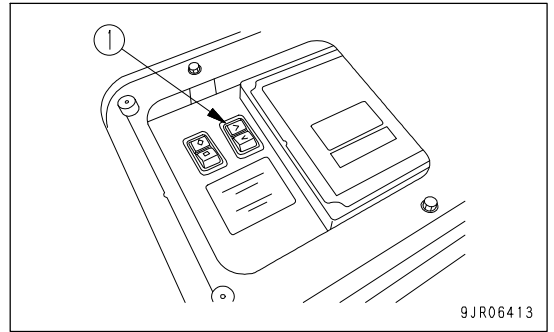
When asking your Komatsu distributor to carry out repairs, please inform the failure code.

Method of displaying failure code

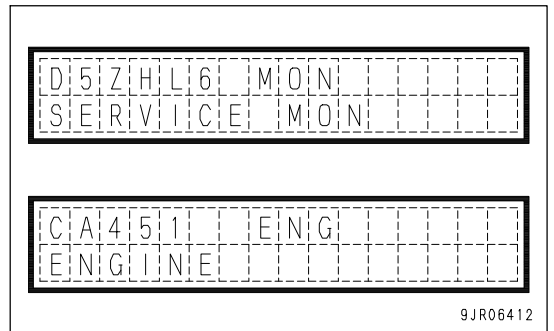
1. With this display portion, if an action code is displayed on the character display, press the top portion (>) of machine monitor mode selector switch 2 (1).

The screen switches from the action code to the failure code.

- The failure code is the 6-digit or 5-digit display given on the top line of the character display.
- The code displayed in the area to the right of the failure code shows the controller that detected the failure code.
- The bottom line of the character display shows the component where the failure occurred.



Top right code	Controller detecting failure code
ENG	Engine controller
MON	Engine service monitor
EPL	Prelube controller (if equipped)



2. Press the top portion (>) of machine monitor mode selector switch 2 (1) again.

If there is no other failure, "KOMATSU" is displayed for several seconds, then the display returns to the action code. If more than one failure has occurred, the next failure code is displayed.

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:

For lubrication of the machine, use the Komatsu genuine lubricants. Moreover use oil of the specified viscosity according to the 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 FOR 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.

FUEL STRAINER:

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 work equipment pins or the hydraulic cylinders as the grounding point.
- Remove the negative (-) terminal of the battery to stop the flow of electric current.

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:

- Check the air cleaner clogging caution pilot lamp more frequently to check the degree of clogging of the air cleaner.
Clean the air cleaner element more frequently.
- 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 OIL:

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.

OPENING AND CLOSING OF INSPECTION COVER

When opening and closing the inspection cover, take care not to get a hand or finger pinched.

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:

After repairing or replacing the parts of hydraulic circuit, or removing the piping of hydraulic circuit, it is necessary to bleed the air from inside of the circuit. See "BLEEDING AIR FROM HYDRAULIC TANK (PAGE 4-38)" for bleeding the air.

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 2-38)" in the section on safety for checking when the engine is running. Pay attention to safety.
 - Check if the inspected and maintenance area is operating normally.
 - Increase the engine speed to check for fuel and oil leakage.

OUTLINES 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)
Hydraulic system	Power train oil TO10 (Komatsu genuine parts)
Brake oil tank	Power train oil TO10 (Komatsu genuine parts)
Axle	Axle oil AXO80 (Komatsu genuine parts)
Radiator	SUPERCOOLANT (AF-NAC) (Komatsu genuine parts) (Density: 30% or above)

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 for the temperature in the Operation and Maintenance Manual.
 - If the fuel is used at temperatures lower than the specified temperature (particularly at temperatures below -15°C (5°F), the fuel will solidify.
 - If the fuel is used at temperatures higher than the specified temperature, the viscosity will drop, and this may result in problems such as a drop in output.
- 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.

NOTICE

Always use diesel fuel. Never use any other fuel.

The engine on this machine uses electronic control and high-pressure fuel injection equipment to enable it to provide good fuel consumption and good exhaust gas characteristics. For this reason, high-precision parts and lubricating ability are demanded. Using low-viscosity fuel with poor lubricating ability will cause a marked reduction in the durability of the engine.

COOLANT AND WATER FOR DILUTION

- Komatsu genuine SUPERCOOLANT (AF-NAC) 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). SUPERCOOLANT (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for two years or 4000 hours.

As a basic rule, we do not recommend the use of any COOLANT other than SUPERCOOLANT (AF-NAC). If you use another COOLANT, it may cause serious problems, such as corrosion of the engine and aluminum parts of the cooling system.
- When using antifreeze, always observe the precautions given in the Operation and Maintenance Manual.
- COOLANT is already diluted with distilled water, so it is not flammable.
- The density used for the COOLANT differs according to the ambient temperature.

For details of the density of the COOLANT, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-25)".
Even in the areas where it is not considered necessary to prevent freezing, always use COOLANT with a density of over 30% in order to prevent corrosion of the cooling system.
COOLANT is diluted with distilled water that does not contain any ions or water-hardening substances. Never dilute the COOLANT with ordinary 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.
- Grease fittings not listed in the inspection and maintenance section are grease fittings that are used at the time of overhaul, so there is no need to grease these points.
When using the machine after it has been in storage for a long time, carry out greasing if there is any stiffness or screeching.
- 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.

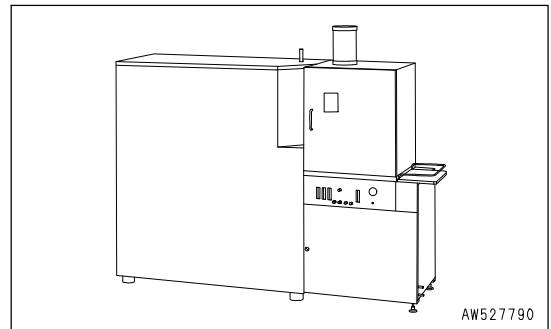
CARRYING OUT KOWA (Komatsu Oil Wear Analysis)

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.

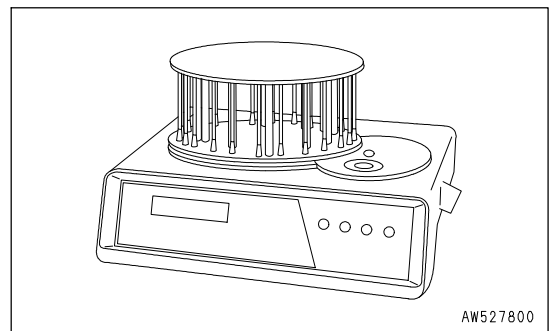
We strongly recommend you to use this service. The oil analysis is carried out at actual cost, so the cost is low, and the results of the analysis are reported together with recommendations which will reduce repair costs and machine downtime.

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 PQI (Particle Quantifier Index) measurer to measure the quantity of iron particles of 5µm 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 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.
- Do not open packs of spare filters until just before they are to be used.
- Always use Komatsu genuine filters.

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.
- The optional power source must never be connected to the fuse, starting switch, or battery relay.

WEAR PARTS

Wear parts such as the filter element, air cleaner element, bucket tooth, etc. are to be replaced at the time of periodic maintenance or before their abrasion limits.

The wear parts should be changed correctly in order to use the machine economically.

For part change, Komatsu genuine parts of excellent quality should be used.

When ordering parts, please check the part number in the parts book.

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		600-211-1340	Cartridge	4	EVERY 500 HOURS	
Fuel prefilter		600-319-4500	Cartridge	2		
Transmission oil filter		424-16-11140 (07000-12125) (07000-12014)	Element (O-ring) (O-ring)	6 (6) (6)		
Fuel main filter		600-319-3550	Cartridge	2	EVERY 1000 HOURS	
Hydraulic filter		20Y-60-21510 (07000-15175)	Element (O-ring)	3 (3)	EVERY 2000 HOURS	
Hydraulic tank breather		285-62-17320	Element	3		
Brake oil tank filter		201-60-71180 (07000-12115)	Element (O-ring)	1 (1)		
Brake oil tank breather		417-60-15380	Element	1		
Air cleaner		600-185-6100	Element Ass'y	2	-	
		600-185-6110	Outer element	2		
Air conditioner air filter		421-07-12312	Element	2	-	
(WA800-3E0) Tip tooth (11.0m ³ {14.4cu.yd} bucket)	General rock	Long life	427-70-13941 (427-70-13890)	Tooth (Pin)	10 (10)	-
		Semi-long life	427-70-13830 (427-70-13890)	Tooth (Pin)	10 (10)	
	Lime- stone	Long life	427-842-1130 (427-70-13890)	Tooth (Pin)	10 (10)	
		Sharp	427-842-1140 (427-70-13890)	Tooth (Pin)	10 (10)	
Soft rock	Sharp	427-842-1220 (427-70-13890)	Tooth (Pin)	10 (10)		
(WA900-3E0) Tip tooth (13.0m ³ {17.0cu.yd} bucket)	General rock	Long life	427-70-13941 (427-70-13890)	Tooth (Pin)	10 (10)	-
		Semi-long life	427-70-13830 (427-70-13890)	Tooth (Pin)	10 (10)	
	Lime- stone	Long life	427-842-1130 (427-70-13890)	Tooth (Pin)	10 (10)	
		Sharp	427-842-1140 (427-70-13890)	Tooth (Pin)	10 (10)	
	Soft rock	Sharp	427-842-1220 (427-72-13890)	Tooth (Pin)	10 (10)	

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.

Sulfur content (%)	Oil change interval
Less than 0.5	500 hours
0.5 - 1.0	250 hours
1.0 and up	Not recommendable (*)

* If these fuels are used, there is danger that serious trouble may occur because of early deterioration of the engine oil or early wear of the internal parts of the engine. If the local situation makes it necessary to use these fuels, always remember the following.

- 1) Be sure to check Total Basic Number (TBN) of oil frequently by TBN handy checker etc., and change oil based on the result.
- 2) Always be aware that oil change interval is extremely shorter than standard.
- 3) Be sure to carry out periodic engine inspection by distributor's expert since change interval of periodic replacement parts and overhaul interval are also shorter.

USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE

Reservoir	Fluid Type	Ambient Temperature, degrees Celsius										Recommended Komatsu Fluids
		-22 -30	-4 -20	14 -10	32 0	50 10	68 20	86 30	104 40	122 °F 50 °C		
Engine oil pan	Engine oil	(Note.1)										Komatsu EOS0W30
		(Note.1)										Komatsu EOS5W40
		(Note.1)										Komatsu EO10W30-DH
		(Note.1)										Komatsu EO15W40-DH
		(Note.1)										Komatsu EO30-DH
Transmission case	Power train oil (Note.2)	(Note.1)										TO30
		(Note.1)										TO10
Hydraulic system	Power train oil	(Note.1)										TO10
	Hydraulic oil	(Note.1)										HO46-HM
		(Note.1)										HO-MVK
	Engine oil	(Note.1)										Komatsu EO10W30-DH
(Note.1)										Komatsu EO15W40-DH		
Brake oil tank	Power train oil	(Note.1)										TO10
Axle	Axle oil (Note.3)	(Note.1)										AXO80
	Power train oil (Note.4)	(Note.1)										EO50-CD
Pin/Bushing Grease fitting (Note.5)	Hyper grease (Note.6)	(Note.1)										G2-T, G2-TE
	Lithium EP grease	(Note.1)										G2-LI
	Lubricants with molybdenum disulfide	(Note.1)										LM-G, LM-P
Cooling system	SUPERCOOLANT (AF-NAC) (Note.7)	(Note.1)										AF-NAC
Fuel tank	Diesel fuel	(Note.1)										ASTM Grade No.1-D S15 ASTM Grade No.1-D S500
		(Note.1)										ASTM Grade No.2-D S15 ASTM Grade No.2-D S500

• ASTM: American Society of Testing and Material

Capacity \ Reservoir		Engine oil pan	Transmission case	Hydraulic system	Brake oil tank	Front axle
		Liters	US gal	Liters	US gal	Liters
Specified	Liters	140	164	1065	42	360
	US gal	36.96	43.3	281.16	11.09	95.0
Refill	Liters	130	140	725	31	360
	US gal	34.35	36.96	191.4	8.18	95.0

Capacity \ Reservoir		Rear axle	Pins	Fuel tank	Cooling system
		Liters	US gal	Liters	US gal
Specified	Liters	360	-	1555	337
	US gal	95.0	-	410.83	89.0
Refill	Liters	360	-	-	-
	US gal	95.0	-	-	-

NOTICE

Use only diesel fuel.

The engine mounted on this machine employs electronic control and a high-pressure fuel injection device to obtain good fuel consumption and good exhaust gas characteristics. For this reason, it requires high precision for the parts and good lubrication. If kerosene or other fuel with low lubricating ability is used, there will be a big drop in durability.

Always use the fuel specified for the temperature in the Operation and Maintenance Manual.

- If the fuel is used at temperatures lower than the specified temperature (particularly at temperatures below -15 °C (5°F)), the fuel will solidify.
- If the fuel is used at temperatures higher than the specified temperature, the viscosity will drop, and this may result in problems such as a drop in output.

Note 1: HTHS (High-Temperature High-Shear Viscosity 150°C (302°F)), specified by ASTM D4741 must be equal to or higher than 3.5 mPa·S. Komatsu EOS0W30 and EOS5W40 are the most suitable oils.

Note 2: Powertrain oil has different properties from engine oil. Be sure to use the recommended oils.

Note .3: Axle oil AXO80 has the function of preventing squealing from the brakes and LSD (Limited Slip Differential).

Note .4: When the ambient temperature is higher than 45°C (113°F) and the machine operation hour is longer than 12 hours/day, then the use of EO50-CD instead of AXO80 is recommended.

Squealing of the brakes may occur with EO50-CD, but there is no problem with the brake performance or durability.

Note. 5: If the machine is equipped with automatic greasing system, see "HANDLING AUTO-GREASING SYSTEM (PAGE 6-3)".

Note .6: 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 7: COOLANT

- 1) Komatsu genuine SUPERCOOLANT (AF-NAC) 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 SUPERCOOLANT (AF-NAC). SUPERCOOLANT (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for two years or 4000 hours. SUPERCOOLANT (AF-NAC) is strongly recommended wherever available.

- 2) For details of the density of the COOLANT, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-25)". COOLANT is supplied already diluted. In this case, add the pre-diluted fluid to keep the tank full. (Never dilute the COOLANT with ordinary water.)
- 3) To maintain the anticorrosion properties of COOLANT, always keep the density of COOLANT 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, consult your Komatsu distributor.

STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS

TORQUE LIST

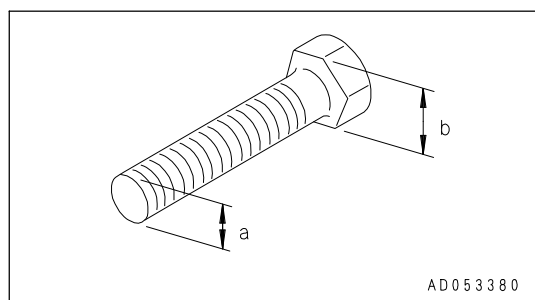


If nuts, bolts, or other parts are not tightened to the specified torque, it will cause looseness or damage to the tightened parts, and this will cause failure of the machine or problems with operation.

Always pay careful attention when tightening parts.

Unless otherwise specified, tighten the metric nuts and bolts to the torque shown in the table below. 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.

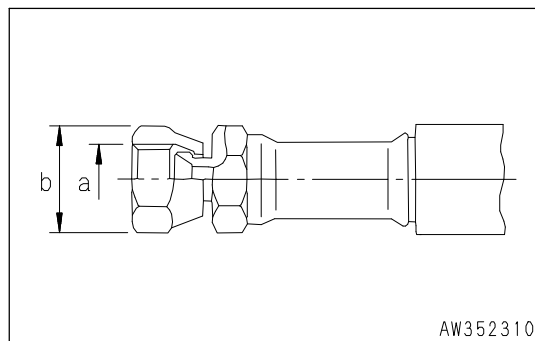
Thread diameter of bolt (a)(mm)	Width across flats (b)(mm)	Tightening torque					
		Target value			Service limit		
		Nm	kgm	lbft	Nm	kgm	lbft
6	10	13.2	1.35	9.8	11.8-14.7	1.2-1.5	8.7-10.8
8	13	31	3.2	23.1	27-34	2.8-3.5	20.3-25.3
10	17	66	6.7	48.5	59-74	6.0-7.5	43.4-54.2
12	19	113	11.5	83.2	98-123	10.0-12.5	72.3-90.4
14	22	177	18	130.2	157-196	16.0-20.0	115.7-144.7
16	24	279	28.5	206.1	245-309	25.0-31.5	180.8-227.8
18	27	382	39	282.1	343-425	35.0-43.5	253.2-314.6
20	30	549	56	405.0	490-608	50.0-62.0	361.7-448.4
22	32	745	76	549.7	662-829	67.5-84.5	488.2-611.2
24	36	927	94.5	683.5	824-1030	84.0-105.0	607.6-759.5
27	41	1320	135.0	976.5	1180-1470	120.0-150.0	868.0-1085.0
30	46	1720	175.0	1265.8	1520-1910	155.0-195.0	1121.1-1410.4
33	50	2210	225.0	1627.4	1960-2450	200.0-250.0	1446.6-1808.3
36	55	2750	280.0	2025.2	2450-3040	250.0-310.0	1808.3-2242.2
39	60	3280	335.0	2423.1	2890-3630	295.0-370.0	2133.7-2676.2



Apply the following table for Hydraulic Hose.

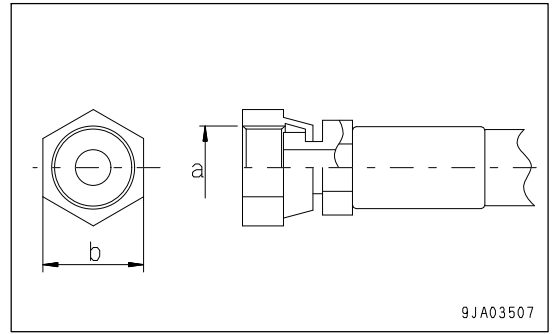
• Taper seal

Thread diameter a (mm)	Width across flats b (mm)	Tightening torque					
		Target value			Permissible range		
		Nm	kgm	lbft	Nm	kgm	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



• Face seal

Nominal - No. of threads (a)	Width across flats (b) (mm)	Tightening torque					
		Target value			Permissible range		
		Nm	kgm	lbft	Nm	kgm	lbft
9/16 -18UNF	19	44	4.5	32.5	35 - 63	3.5 - 6.5	25.3 - 47.0
11/16 -16UN	22	74	7.5	54.2	54 - 93	5.5 - 9.5	39.8 - 68.7
13/16 -16UN	27	103	10.5	75.9	84 - 132	8.5 - 13.5	61.5 - 97.6
1 -14UNS	32	157	16.0	115.7	128 - 186	13.0 - 19.0	94.0 - 137.4
13/16 -12UN	36	216	22.0	159.1	177 - 245	18.0 - 25.0	130.2 - 180.8



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 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 critical parts for periodic replacement	Q'ty	Replacement interval
1	Fuel hose (fuel cut off valve - fuel pre-filter)	2	Every 2 years or every 4000 hours, whichever comes first
2	Fuel hose (fuel pre-filter - right priming pump)	1	
3	Fuel hose (right priming pump - right feed pump)	1	
4	Fuel hose (fuel pre-filter - left priming pump)	2	
5	Fuel hose (left priming pump - left feed pump)	1	
6	Fuel hose (fuel filter - right feed pump)	2	
7	Fuel hose (fuel filter - left feed pump)	4	
8	Fuel hose (right feed pump - right supply pump)	1	
9	Fuel hose (right feed pump - fuel tank)	1	
10	Fuel hose (left feed pump - fuel tank)	1	
11	Spill hose (between nozzles)	2	
12	Turbocharger lubricating hose	2	
13	Work equipment hose (hydraulic pump - main control valve)	5	
14	Work equipment hose (main control valve - lift cylinder)	6	
15	Work equipment hose (main control valve - dump cylinder)	6	
16	Work equipment hose (main control valve - hydraulic tank)	1	
17	Work equipment hose (hydraulic tank - hydraulic pump)	1	
18	Main suction hose	1	
19	Steering hose (steering pump - steering valve)	3	
20	Steering hose (steering valve - steering cylinder)	4	
21	Steering hose (steering valve - hydraulic tank)	5	
22	Steering hose (hydraulic tank - steering pump)	1	
23	Suction hoses of switch pump	2	
24	Outlet hoses of switch pump	3	
25	Brake hose (pump - accumulator charge valve)	2	
26	Brake hose (accumulator - single valve)	3	
27	Brake hose (accumulator - tandem valve)	4	
28	Brake hose (charge valve - accumulator)	4	
29	Brake hose (tandem valve - front brake)	7	
30	Brake hose (tandem valve - rear brake)	5	
31	Brake hose (single valve - tandem valve)	1	
32	Brake hose (tandem valve - drain block)	1	
33	Brake hose (tandem valve - drain block)	1	
34	Brake hose (drain block - brake tank)	1	

No.	Safety critical parts for periodic replacement	Q'ty	Replacement interval
35	Brake hose (accumulator - parking brake solenoid valve)	2	Every 2 years or every 4000 hours, whichever comes first
36	Brake hose (parking brake solenoid valve - parking brake cylinder)	2	
37	Brake hose (parking brake solenoid valve - brake tank)	2	
38	Brake hose (charge valve drain - brake tank)	2	
39	Brake hose (brake tank - brake pump)	2	
40	Brake hose (charge valve P.P port - accumulator)	1	
41	Packings, seals, O-rings of steering cylinder	1 set	
42	Rubber parts for treadle valve	1 set	
43	Rubber parts for parking brake hydraulic cylinder	1 set	
44	Rubber parts for slack adjuster	1 set	
45	Engine high-pressure piping clamp	1 set	Every 8000 hours
46	Fuel spray prevention cap	1 set	
47	Seat belt	1	Every 3 years after beginning to use or 5 years after manufacturing of seat belt, whichever comes sooner

MAINTENANCE SCHEDULE CHART

MAINTENANCE SCHEDULE CHART

INITIAL 10 HOURS SERVICE (SERVICE FOR FIRST 50 HOURS ON NEW MACHINE)

LUBRICATING ----- 4- 46

INITIAL 250 HOURS SERVICE (ONLY AFTER THE FIRST 250 HOURS)

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CHECK WINDOW WASHING FLUID LEVEL, ADD FLUID ----- 4- 31

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LUBRICATING ----- 4- 34

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EVERY 100 HOURS SERVICE

LUBRICATING ----- 4- 46

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EVERY 250 HOURS SERVICE

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EVERY 500 HOURS SERVICE

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EVERY 2000 HOURS SERVICE

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*: The interval of 2000 hours for changing the axle oil is for standard operations. If the brake is used frequently or the brakes make a sound, change the oil after a shorter interval.

EVERY 4000 HOURS SERVICE

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SERVICE PROCEDURE

INITIAL 10 HOURS SERVICE (SERVICE FOR FIRST 50 HOURS ON NEW MACHINE)

Carry out the following maintenance every 10 hours for the first 50 hours of operation of a new machine.

- Lubricating

For details of the service procedure, see the section on EVERY 100 HOURS SERVICE.

INITIAL 250 HOURS SERVICE

Perform the following maintenance only after the first 250 hours.

- Replace transmission oil filter element

For details of the method of replacing or maintaining, see the section on EVERY 500 HOURS SERVICE.

WHEN REQUIRED

CHECK, CLEAN, OR REPLACE AIR CLEANER ELEMENT

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

If air cleaner clogging caution pilot lamps (left, right) (1) on the maintenance monitor flash, clean the air cleaner element.

NOTICE

Do not clean the air cleaner element before the air cleaner clogging caution lamp flashes.

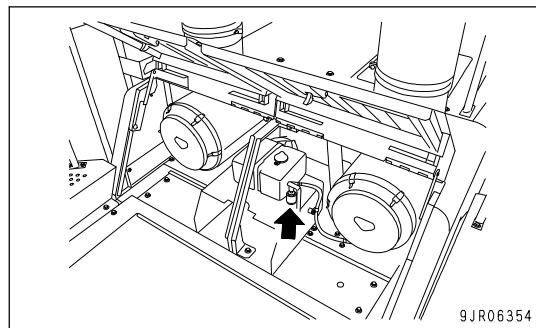
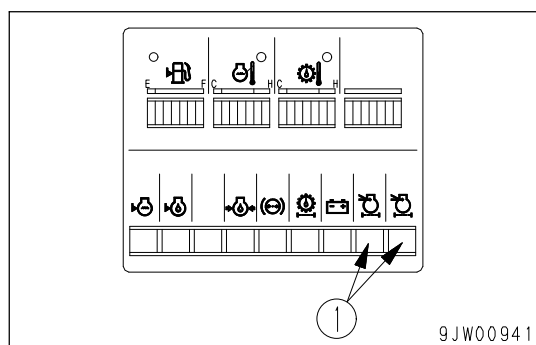
If the air cleaner element is cleaned frequently before the air cleaner clogging caution lamp flashes, the proper performance of the air cleaner is not provided and the cleaning efficiency is lowered.

In addition, dust sticking to the cleaner element falls on the inner element side while cleaning the element.

REMARK

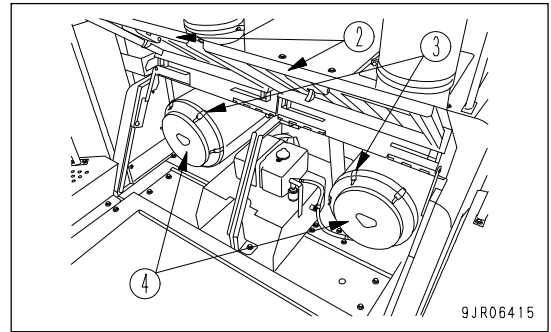
A dust indicator (with 5-stage display) is installed to the side of the air cleaner. This displays the condition of the clogging of the air cleaner.

This makes it possible to check the clean status of the element and the replacement time.

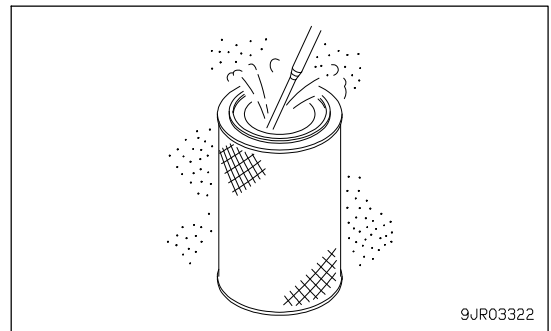


CLEANING OR REPLACING OUTER ELEMENT

1. Open cover (2) at the rear of the operator's compartment.
2. Remove lock (3) of the cover, then remove cover (4).
3. Remove outer element.
4. Clean the inside and the cover of the air cleaner body.



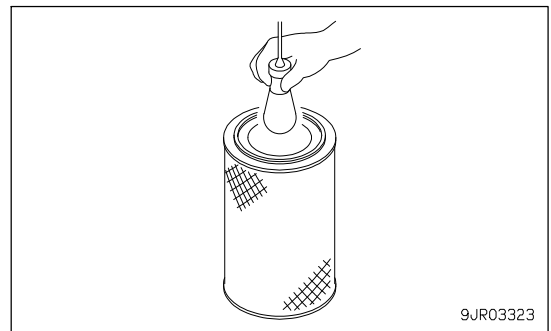
5. Direct dry compressed air (less than 0.2 MPa {2.1 kg/cm², 30.0 PSI}) to the outer element from inside along its folds, then direct it from outside along its folds and again from inside.
 - 1) If the air cleaner clogging caution pilot lamp flashes immediately after the outer element has been cleaned, replace both the inner and outer elements.



NOTICE

After cleaning and drying the element, check it by shining a light through it. If any small holes or thin cracks are found, replace the element. When cleaning the element, do not hit it or beat it against anything. Do not use an element that has damaged folds, gaskets, or seals.

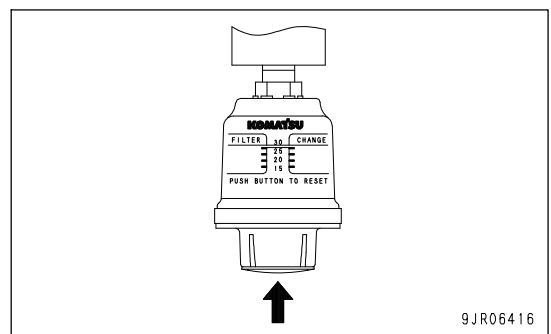
6. After cleaning the element, install it, then install cover (4).



7. After cleaning and replacing the element, push the dust indicator button to return the red display to its original position.

REMARK

- After cleaning the element, press the button of the dust indicator. If the dust indicator shows the 5th stage even when the button is pressed, replace the element.
- After the element is cleaned or replaced with a new element, the dust indicator may show the 3rd stage.



REPLACING INNER ELEMENT

1. First remove 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 inside of the air cleaner body, then remove the cover installed in Step 2.
4. Install a new inner element to the connector.

NOTICE

The inner element must not be used again even after cleaning. When replacing the outer element, replace the inner element at the same time.

5. Install the outer element and the cover.
6. After replacing the element, return the red display of the dust indicator to its original position.

CLEAN INSIDE OF COOLING SYSTEM

 **WARNING**

- Immediately after the engine is stopped, the coolant is at high temperature and the radiator is under high internal pressure. If the cap is removed in this condition and the water is drained, it will cause burns. Wait for the temperature to go down, then turn the cap slowly to release the pressure.
- The engine is run during the flushing operation. Before standing up from or leaving the operator's seat, always set the lock lever (work equipment, steering) to the LOCK position.
- For details of the procedure when starting the engine, see "CHECK BEFORE STARTING ENGINE, ADJUST (PAGE 3-72)" and "STARTING ENGINE (PAGE 3-91)".
- When the engine is running, never go inside the rear of the machine.

Stop the machine on level ground when cleaning or changing the coolant.

Clean the inside of the cooling system, change the coolant according to the table below.

Coolant	Interval for cleaning inside of cooling system and changing antifreeze coolant
Komatsu genuine SUPERCOOLANT (AF-NAC)	Every two years or every 4000 hours whichever comes first

Komatsu genuine SUPERCOOLANT (AF-NAC) 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 SUPERCOOLANT (AF-NAC). SUPERCOOLANT (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for two years or 4000 hours. As a basic rule, we do not recommend the use of any COOLANT other than SUPERCOOLANT (AF-NAC). If you use another COOLANT, it may cause serious problems, such as corrosion of the engine and aluminum parts of the cooling system.

To maintain the anticorrosion properties of COOLANT, always keep the density of COOLANT between 30% and 64%.

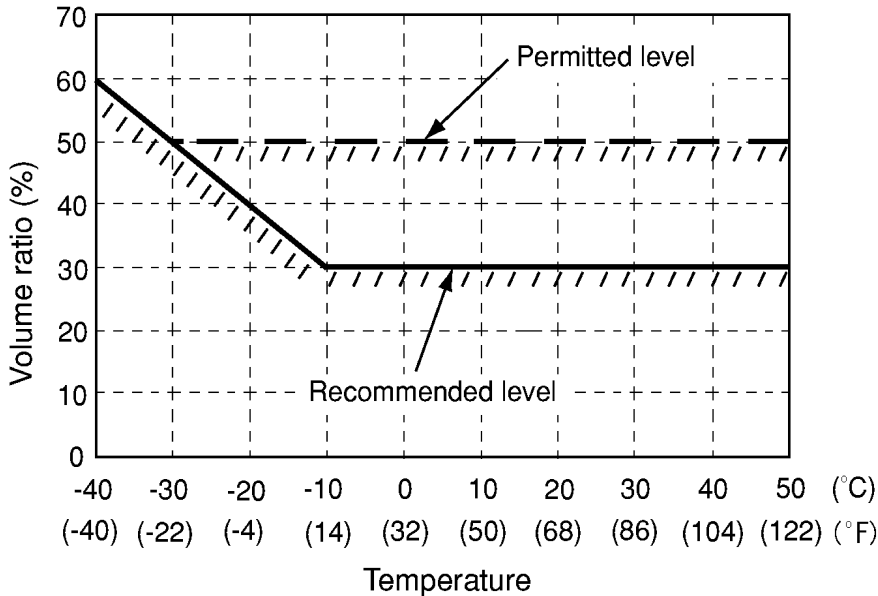
When selecting COOLANT, investigate the lowest temperature in the past and decide the density for the COOLANT from the COOLANT density table below. When actually deciding the density for the COOLANT, set it about 10°C (18°F) below lowest temperature. The density must be over 30% at least. If the density of obtained COOLANT is higher than the necessary density for lowest temperature, dilute it with adequate distilled water, and then fill it into the tank.

If there is any unclear point, please contact your Komatsu distributor.

Coolant density table

Minimum Temp	°C	Above -10	-15	-20	-25	-30	-35	-40	-45	-50
	°F	Above 14	5	-4	-13	-22	-31	-40	-49	-58
Concentration (%)		30	36	41	46	50	54	58	61	64

If the jobsite changes frequently and it is difficult to manage the density of the coolant, a density of up to 50% can be permitted.

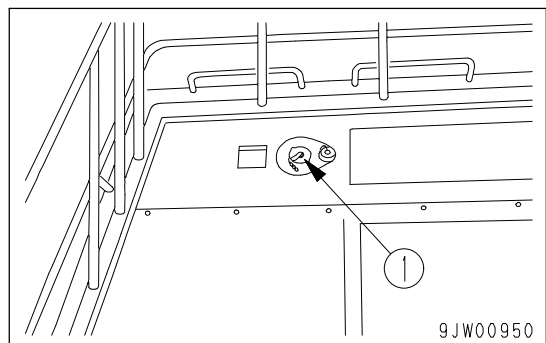


! WARNING

- COOLANT is toxic. When open the drain valve, be careful not to get coolant on you. If it gets in your eyes, flush your eyes with large amount of fresh water and see a doctor at once.
- When changing the coolant or when handling the coolant containing COOLANT that has been drained during repair of radiator, please contact your Komatsu distributor or request a specialist company to carry out the operation. COOLANT is toxic. Do not let it flow into drainage ditches or spray it onto the ground surface.

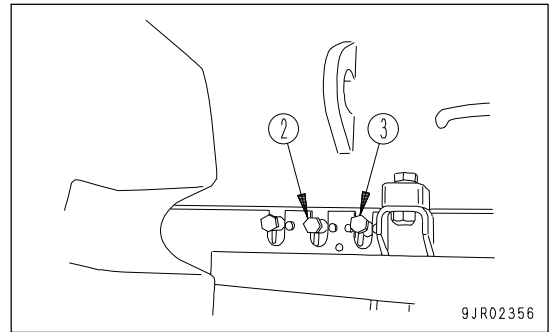
COOLANT is already diluted with distilled water, so it is not flammable. (For details of the distilled water, see "COOLANT AND WATER FOR DILUTION (PAGE 4-5)"). Check the density with a COOLANT tester. Prepare a container whose capacity is larger than the specified coolant volume to catch drained coolant. Prepare a hose to use when filling with coolant.

1. Stop the machine in a horizontal place.
2. Stop the engine.
3. Loosen radiator cap (1) slightly to release the air, then remove the cap.



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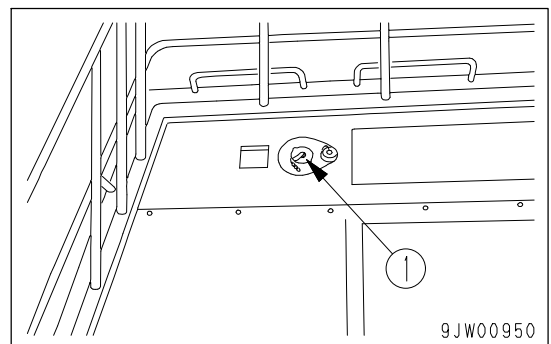
4. Prepare a container to catch the coolant.
5. Install hoses to the coolant drain port of radiator drain plugs (2) and (3), then open drain plugs (2) and (3), and drain the coolant.



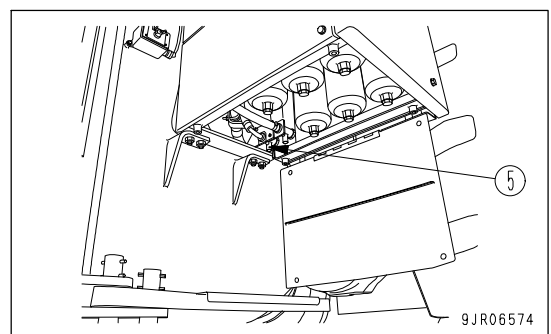
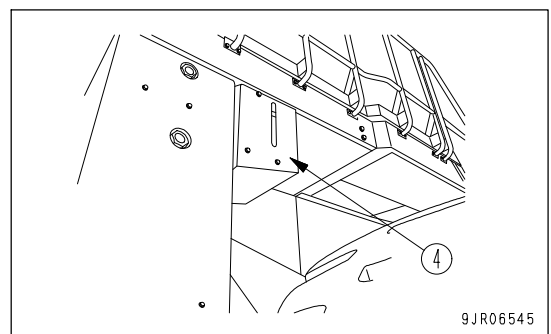
REMARK

Use the supplied hose to prevent coolant from spraying out into the surrounding area.

6. After draining the coolant, close drain plugs (2) and (3).
7. Add tap water through radiator water filler (1).
8. 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 coolant temperature reaches more than 90°C (194 °F).
9. Stop the engine.
10. Open drain plugs (2) and (3), and drain the water.
11. After draining the water, close drain plugs (2) and (3), and remove the hoses.
12. Add coolant through radiator water filler (1) up to the bottom of the filler port.
For details of the coolant density, see the COOLANT DENSITY TABLE.
13. To bleed the air from the cooling system, run the engine at low idle for 5 minutes, and for a further 5 minutes at high idle.
(When doing this, leave the radiator cap off.)



14. Open drain plug (5) and drain the coolant from inside sub tank (4). Flush the inside of the sub tank, then add coolant up to a point midway between the FULL and LOW marks.
15. Stop the engine, wait for approximately 3 minutes, add coolant up to the mouth of the filler port, and tighten the cap.



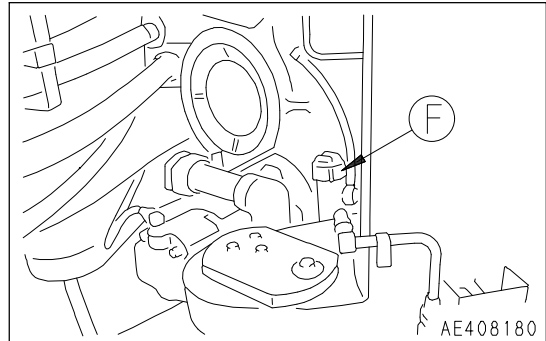
CHECK TRANSMISSION OIL LEVEL, ADD OIL


WARNING

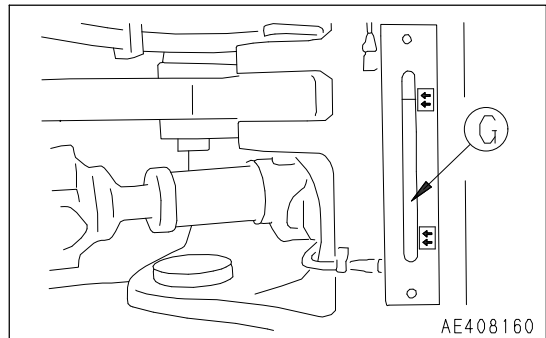
The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.

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

1. Stop the engine and remove the cap from oil filler (F).



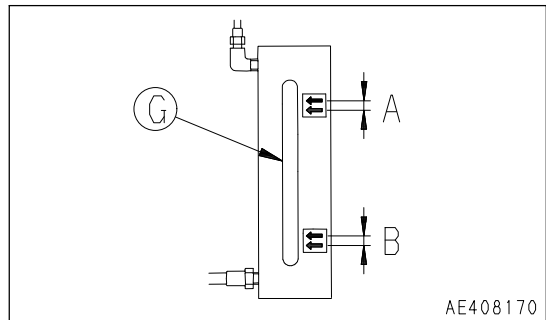
2. Use sight gauge (G) to check the oil level.



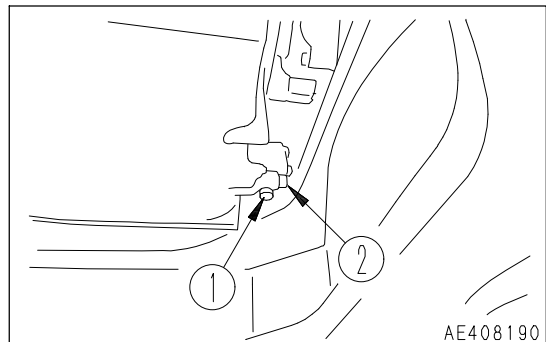
3. If the oil level is not within the range at upper area "A" of the sight gauge, add oil through oil filler (F).

When adding oil, it is possible to use the frame lock bar as a step.

For details of the oil to use, see "USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE (PAGE 4-11)".



4. If the oil level is above the A mark on sight gauge (G), remove drain plug (1), loosen drain plug (2), drain the excess oil, then check the oil level again.
5. If the oil level is correct, tighten the cap of oil filler port (F) securely.



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

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

CHECK AXLE OIL LEVEL, ADD OIL

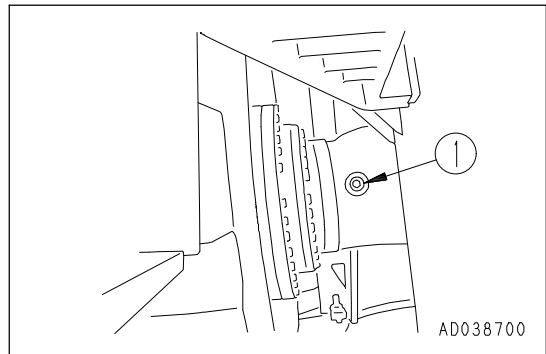
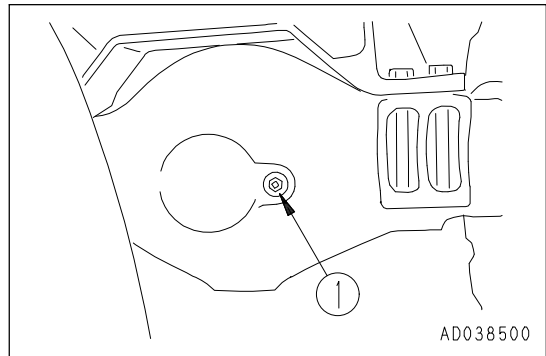
! WARNING

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.

Perform this procedure if there is any sign of oil on the axle case. Inspect the machine on a horizontal surface. (If the road surface is at an angle, the oil level cannot be checked correctly.)

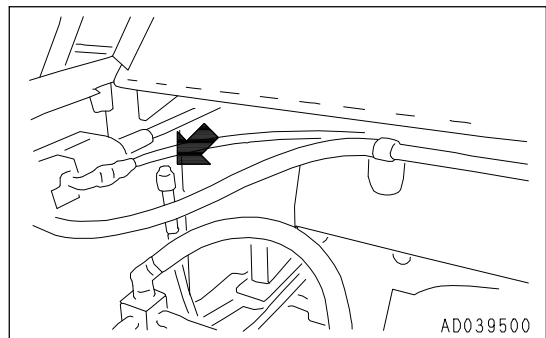
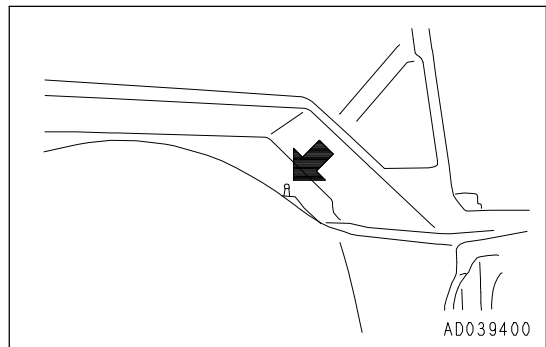
1. Stop the machine in a horizontal place.
2. Stop the engine, then wait for the oil temperature to go down.
3. Remove level plug (1).
4. Check that the oil level is near the bottom of the plug hole.
5. If the oil is not near the bottom edge of the hole, add oil through oil filler (F).
6. If the oil level is correct, install level plug (1)

Tightening torque: 127 to 177 Nm (13.0 to 18.0 kgm, 94.0 to 130.2 lbft)



CLEAN AXLE CASE BREATHER

1. Stop the machine in a horizontal place.
2. Stop the engine.
3. Use a brush to clean off any mud or dirt from around the breather.
4. After removing all the mud or dirt from around the breather, remove the breather, and soak it in flushing liquid to clean it. When cleaning the breather, clean the breathers at two places (front and rear). After removing the breather, take steps to prevent dirt or dust from entering the mount.
5. Install the breather. When cleaning the breather, clean the breathers at two places (front and rear).

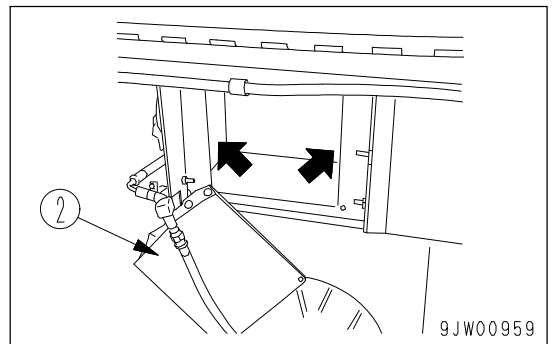
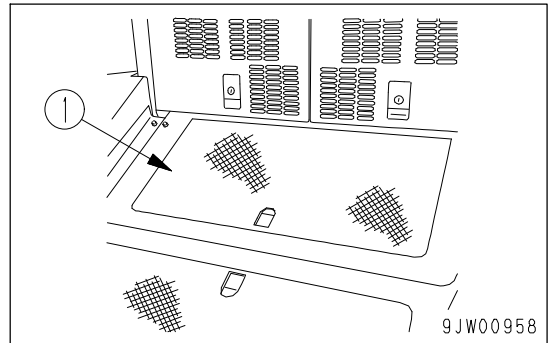


CLEAN AIR CONDITIONER CONDENSER

! WARNING

- Do not wash the condenser with a steam cleaner. There is danger that the condenser could overheat.
- If high-pressure water hits your body directly or dirt is sent flying, there is danger of personal injury. Always wear protective glasses, dust mask, and other protective equipment.

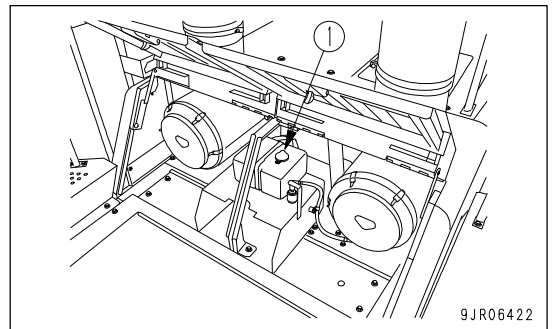
1. Open inspection cover (1) on the floor surface, then remove 3 bolts from cover (2) at the air conditioner condenser portion.
2. Remove any mud or dirt stuck to the condenser, then wash with water.
If the water pressure is too high, it may deform the fins, so when using high-pressure water, keep a good distance away when cleaning.
3. Tighten the bolts of cover (2) and close inspection cover (1).



CHECK WINDOW WASHING FLUID LEVEL, ADD FLUID

Check the fluid level in washer tank (1). If the level is low, add automobile window washer fluid.

When adding fluid, be careful not to let any dirt or dust get in.



CLEAN RADIATOR, OIL COOLER, AFTERCOOLER FINS

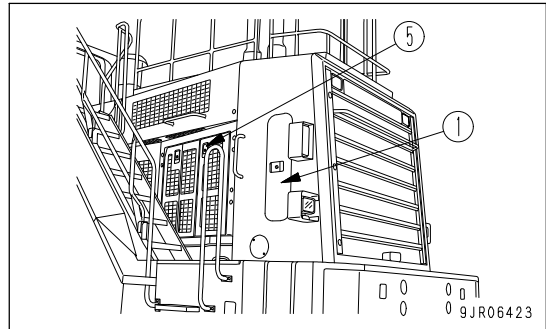


WARNING

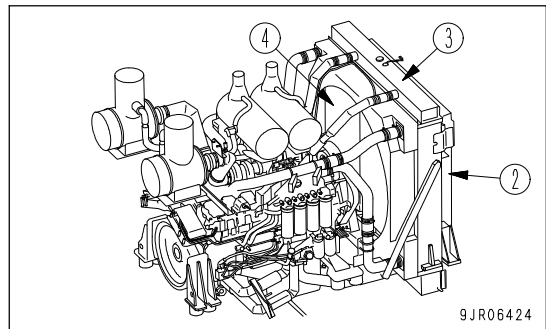
If compressed air, high-pressure water, or steam hits your body directly or dirt is sent flying by the compressed air, high-pressure water, or steam, there is danger of personal injury. Always wear protective glasses, dust mask, and other protective equipment.

Carry out cleaning if any dirt or mud is seen stuck to the radiator, oil cooler, or aftercooler fins.

1. Stop the machine on horizontal ground and turn the parking brake switch ON.
2. Stop the engine.
3. Open door (1) at the side of the radiator guard, insert the nozzle between oil cooler (2) and radiator assembly (3), and use compressed air to blow out the mud or dirt out to the front and rear of the machine.
4. If the mud or dirt cannot be removed from aftercooler (4), open door (5) of the engine hood and use compressed air to blow the mud and dirt off.
5. Finally, use water to flush out the mud or dirt collected inside radiator assembly (3).



Steam or water can be used instead of compressed air. But, make sure to keep a reasonable distance when performing washing with powerful steam (high-pressure washing) to heat exchange devices (radiator, oil cooler and after cooler). If steam washing (high pressure washing) is performed from point-blank distance, fins inside the heat exchange device may deform which will cause clogging or damage on early



REPLACE BUCKET TEETH



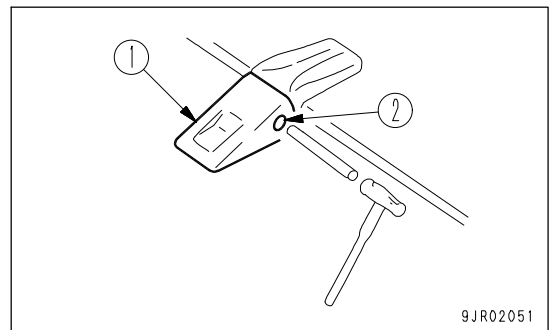
WARNING

- It is dangerous if the work equipment moves by mistake when the teeth are being replaced.
Set the work equipment in a stable condition, stop the engine, and lock the work equipment control levers securely with the work equipment lock lever.
- If the pins are hit with a strong force, there is danger that the pin may fly. Make sure that there is no person in the surrounding area.
- Pieces may fly during the replacement operation, so always wear protective glasses, gloves, and other protective equipment.

BUCKET WITH TIP TOOTH

Replace the teeth before they wear down as far as the adapter.

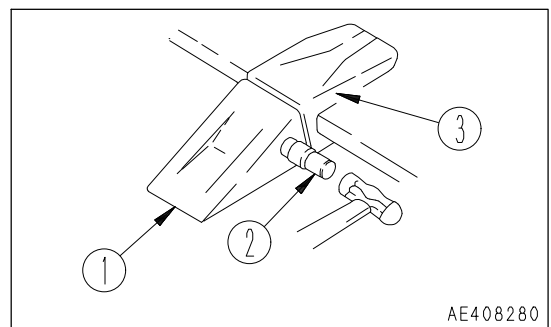
1. Raise the bucket to a suitable height, then put blocks under the bucket to keep the bottom of the bucket horizontal.
2. Stop the engine.
3. Remove pin (2), then remove tooth (1).
When knocking out the pin, use a bar of a diameter slightly smaller than the pin, and knock out from the opposite side.



REMARK

If it cannot be removed by this method, for safety reasons, always contact your Komatsu distributor to have the replacement carried out.

4. Clean bucket and adapter (3).
5. Fit new tooth (1) in adapter (3), push in pin (2) partially by hand, then knock it in with a hammer.
6. After operating the machine for a few hours, check that the pin does not come out.

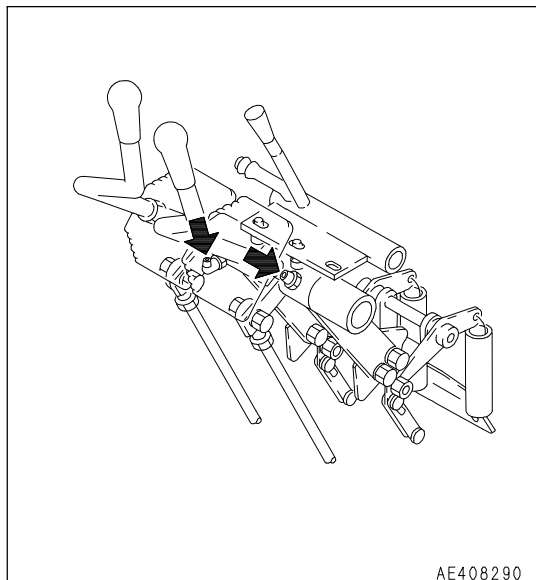


LUBRICATING

1. Using a grease pump, pump in grease through the grease fittings shown by arrows.
2. After greasing, wipe off any old grease that was pushed out.

(1) Work equipment control valve linkage (2 places)

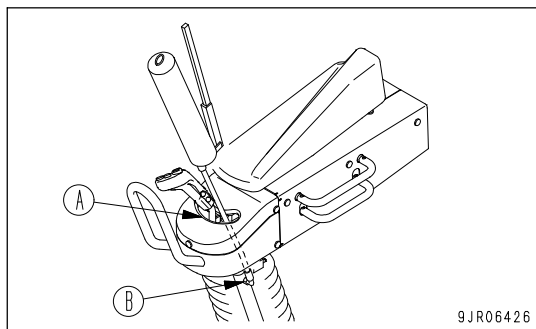
If the work equipment control lever is heavy or does not move smoothly, apply grease.



If the AJSS lever is heavy or stiff when adjusted to the front or rear, lubricate the U-joint.

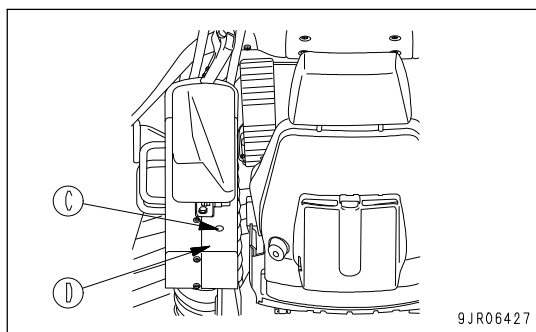
(2) AJSS lever U-joint

Carry out greasing of grease fitting (B) through gap (A) of the cover. When doing this, be careful not to damage the grease fitting inside the cover.



(3) AJSS lever fore-and-aft slide rail

Remove grommet (C) and pump in grease through the grease fitting on the inside of cover (D).



CHECK AIR CONDITIONER

CHECK LEVEL OF REFRIGERANT (GAS)

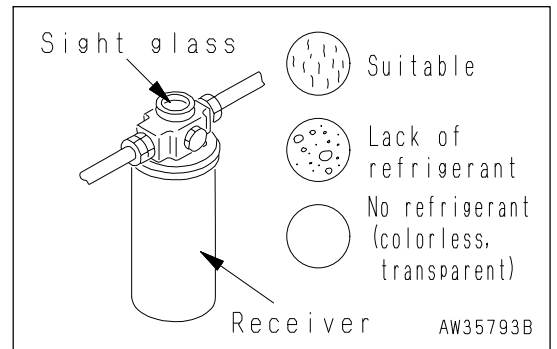
 **WARNING**

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 there is a lack of refrigerant (gas), the cooling performance will be poor. When operating the air conditioner at high speed with the engine at full throttle, use the receiver sight glass (inspection window) to check the condition of the refrigerant gas (R134a) flowing in the refrigerant circuit.

1. Start the engine.
2. Run the air conditioner at maximum cooling.
3. Open the cover at the rear of the operator's compartment.
4. Look at the sight glass (inspection window) of the receiver to check the condition of the refrigerant gas (Freon R134a) flowing through the refrigerant circuit.

- No bubbles in refrigerant flow: Suitable
- Some bubbles in flow (bubbles pass continuously): Lack of refrigerant
- Colorless, transparent: No refrigerant



REMARK

When there are bubbles, the refrigerant gas level is low, so contact your Komatsu distributors to have refrigerant added. If the air conditioner is run with the refrigerant gas level low, it will cause damage to the compressor.

OPERATING THE AIR CONDITIONER OFF-SEASON

Even during the off-season, operate the air conditioner for 3 to 5 minutes once a month to maintain the oil film at all parts of the compressor.

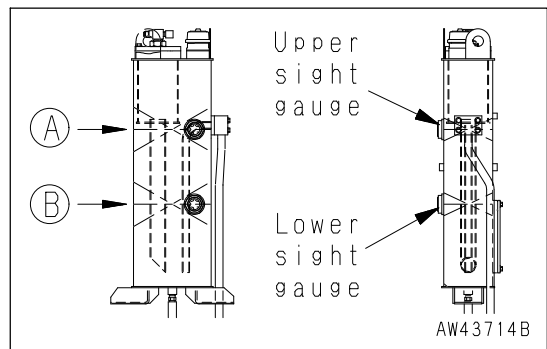
BLEEDING AIR FROM BRAKE HYDRAULIC CIRCUIT

CAUTION

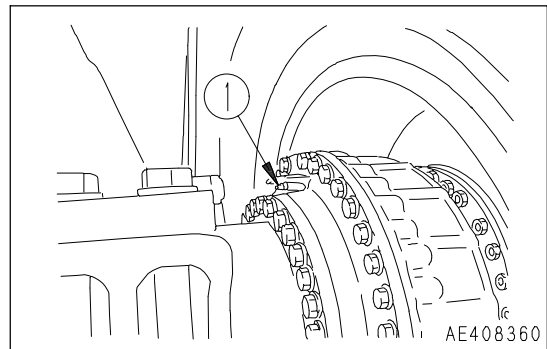
When adding oil to the brake oil tank, always use the recommended oil given in "USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE (PAGE 4-11)".

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

1. After assembling the piping, be sure to check that the connectors are not loose.
2. Put blocks under the wheels.
3. Check that the brake oil level is within the sight gauge on the side of the brake oil tank.
 - While the engine is stopped, the oil must be at level (A) (10 hours or more after the engine is stopped).
 - While the engine is running, the oil must be at level (B) (5 minutes or more after the engine is started).



4. Stop the engine.
5. Remove the air bleeder cap from the brake housing and insert one end of a vinyl hose in the brake housing and put the other end in a container.
6. Depress the brake pedal and loosen bleeder screw (1) to bleed air. After tightening bleeder screw (1), release the brake pedal slowly.
 - This work are to be performed by two persons. One depresses the brake pedal, and the other bleeds air through the bleeder screw (1).
 - Use the left-hand brake pedal.
 - Supply brake oil periodically to keep the level sufficiently high.
7. Repeat this operation until air bubbles stop coming out of the hose. Then, depress the pedal to the end and tighten bleeder screw (1) while the oil is flowing out.



NOTICE

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

For details, contact your Komatsu distributor.

BLEEDING AIR FROM PPC CIRCUIT

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

1. Put bucket control lever in TILT position and lift arm control lever in FLOAT position, and after cylinder reaches stroke end, keep in that position for one minute.
2. Put bucket control lever in DUMP position and lift arm control lever in RAISE position, and after cylinder reaches stroke end, keep in that position for one minute.

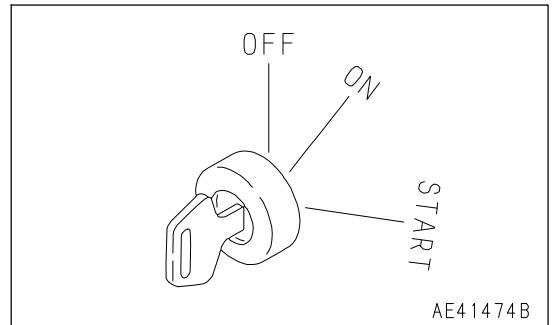
For details, contact your Komatsu distributor.

REPLACE SLOW BLOW FUSE

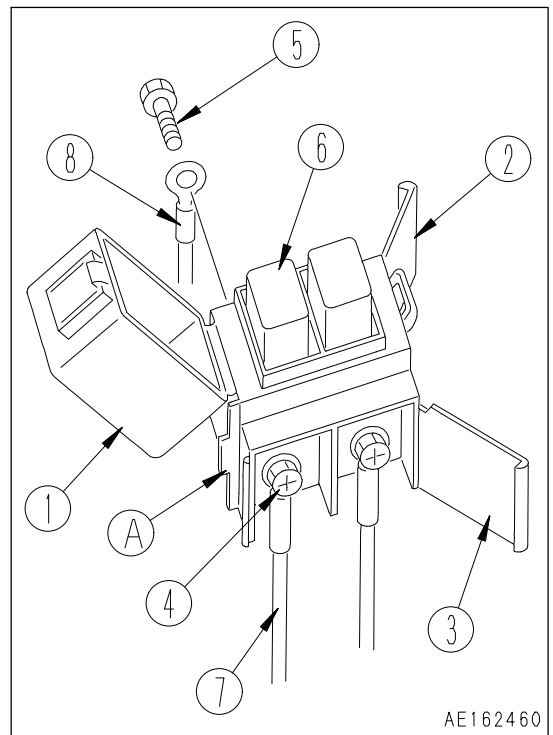
NOTICE

- Always turn the power OFF when replacing the slow blow fuse (turn the starting switch to the OFF position).
- Always replace the slow blow fuse with a fuse of the same capacity.

1. Turn the starting switch to the OFF position.
2. Remove the slow blow fuse box from the chassis.



3. Open covers (1), (2), and (3) of the slow blow fuse box. Covers (2) and (3) can be removed easily by using protrusion (A) on the body as a fulcrum and levering the catch of the cover with a flat-headed screwdriver to release it.
4. Loosen screws (4) and (5), and remove. When screws (4) and (5) are removed, slow blow fuse (6) will also come off together with electric wiring (7) and (8).
5. Using screws (4) and (5), install a new slow blow fuse together with electric wiring (7) and (8) to the slow blow fuse box, then close covers (1), (2), and (3).
6. Install the slow blow fuse box to the chassis.



BLEEDING AIR FROM HYDRAULIC TANK

After replacing oil and filter element or cleaning strainer, bleed the air from the circuit.

When changing the oil in the hydraulic tank, or removing the piston pump, or removing the piping of the piston pump, bleed the air in the following way after assembling.

After bleeding air from piston pump, bleed air from hydraulic circuit.

BLEEDING AIR FROM PISTON PUMP

NOTICE

If the air is not bleed completely, the piston pump may be damaged, so always carry out the air bleeding operation correctly.

Before bleeding the air from the piston pump, check that the hydraulic is filled with oil up to the top of the sight gauge. (If the oil level is low, add oil.) The cap of the hydraulic tank remains removing, until the air bleeding of the piston pump finishes.

Leave the hydraulic tank cap off until the air is completely bled from the piston pump.

1. Before starting up the engine, loosen plug (1) installed above the tube on the suction side of the piston pump.

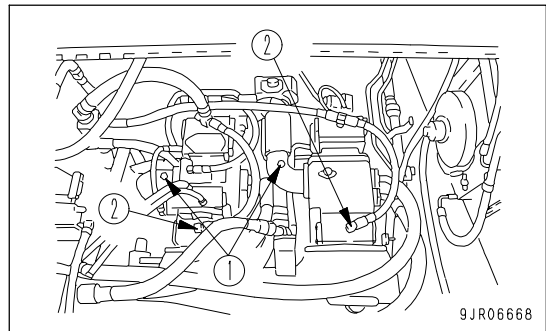
There is a plug on each pump, so loosen all 3 plugs.

2. Tighten plug (1) after confirming that air has been completely bled and oil begins to run out of plug (1).
3. Keep plug (1) tightened for 10 minutes to allow the pump to be filled with oil.
4. Loosen plug (2) installed on the elbow in the upper part of the piston pump.

There is a plug on each pump, so loosen all 3 plugs.

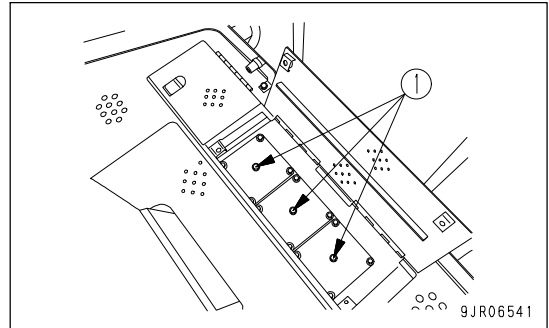
5. Tighten plug (2) after confirming that air has been completely bled and oil begins to run out of plug (2).
6. Start the engine and run for approx. 5 minutes at low idling.
7. Loosen plug (2) installed on the elbow in the upper part of the piston pump.
8. Tighten plug (2) after confirming that air has been completely bled and oil begins to run out of plug (2).
9. Stop the engine.

10. Check the oil level. If the oil level is low, add oil to the specified level. For details, see "CHECK OIL LEVEL IN HYDRAULIC TANK, ADD OIL (PAGE 4-48)".



BLEEDING AIR FROM HYDRAULIC CIRCUIT

1. Check that the hydraulic oil in the hydraulic tank is at the specified level.
2. Run the engine at low idle, and extend and retract the steering, bucket, and lift arm cylinders 4 to 5 times. Be careful not to operate the cylinder to the end of its stroke (stop approx. 100 mm (3.9 in) before the end of stroke).
3. Next, operate the steering, bucket, and lift arm cylinders to the end of their stroke 3 to 4 times, then stop the engine and loosen air bleed plug (1) to bleed the air from the hydraulic tank. After bleeding the air, tighten plug (1) again.
4. Check the hydraulic oil level and ensure that is correct, Refer to "CHECK OIL LEVEL IN HYDRAULIC TANK, ADD OIL (PAGE 4-48)".
5. Increase the engine speed, and repeat step 3 to bleed the air until no more bubbles come out from plug.
If the engine is run at high speed at first, or if the cylinder is moved to the end of its stroke, the air in the cylinder may damage the piston packing, etc.
6. After completing the air bleed operation, tighten plug (1).
Tightening torque: 9.83 to 12.77 Nm (1.0 to 1.3 kgm, 7.2 to 9.4 lbft)
7. Check the hydraulic oil level and ensure that is correct, Refer to "CHECK OIL LEVEL IN HYDRAULIC TANK, ADD OIL (PAGE 4-48)".



REPLACE FAN BELT, ADJUST AUTO-TENSIONER

Replace the V-belts if they contact the bottom of the pulley grooves, if they are lower than the outside diameter of the pulleys, or if they are cracked or flaking.

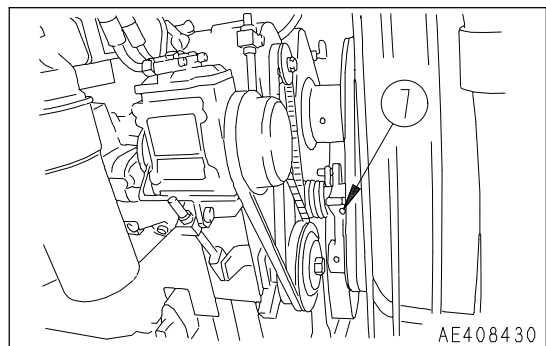
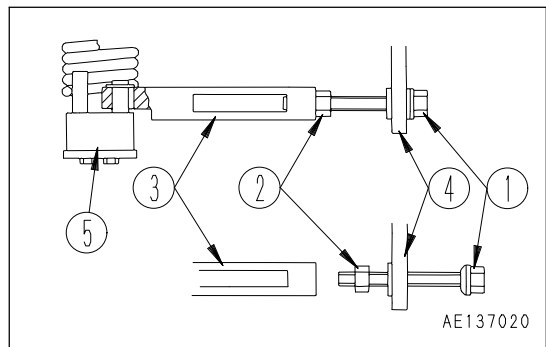
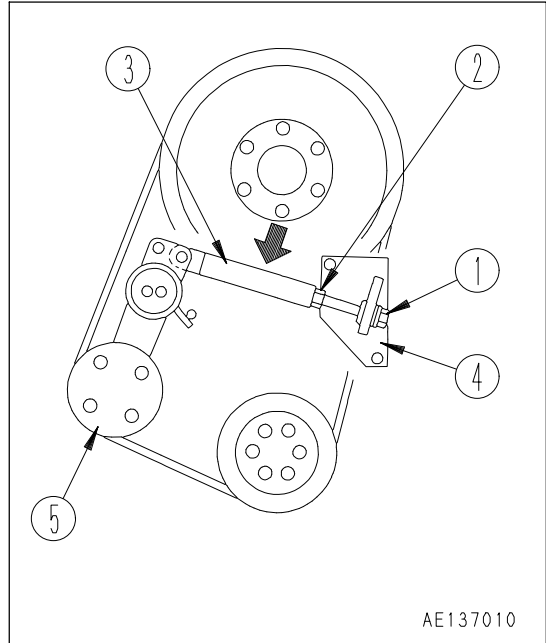
REPLACEMENT

1. Loosen locknut (2), then loosen the adjustment bolt (1), and remove it from yoke (3) with locknut (2) still fitted.

There is danger of losing parts, so do not remove bolt (1) from bracket (4).

2. Use an adjustable wrench when the length of lever (7) of the tension pulley bracket is approx. 50cm (1ft 8in), and pull the lever 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-belts as a set (5 belts).



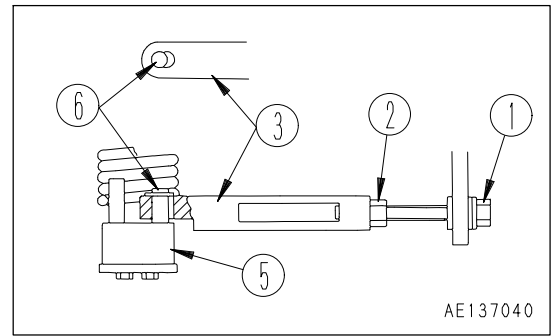
ADJUSTMENT

1. Install adjustment bolt (1) and locknut (2) to yoke (3).
2. Tighten adjustment bolt (1) until the clearance between pin (6) of the tension pulley (5) and the end face of the oblong hole of yoke (3) is 0 mm, then tighten a further 6 turns.

Lock securely with locknut (2).

After operating for 1 hour, if there is a gap between pin (6) of tension pulley (5) and the oblong hole of yoke (3), repeat the procedure in Step 2 to adjust again.

If there is any squealing from the fan belt, adjust in the same way.

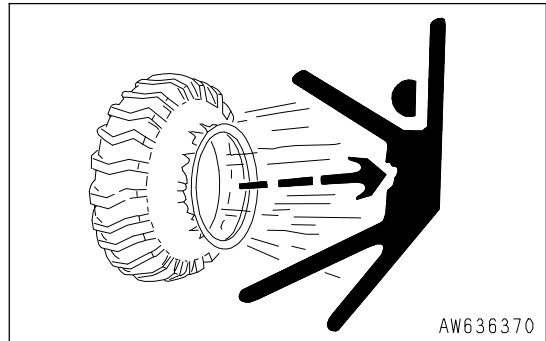


SELECTION AND INSPECTION OF TIRES

! 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.



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.

WA800-3E0

	Maximum load [kg (lb)]	Tire size	Remarks
Front wheel	42865 (94517)	45/65-45-46PR (L5) (standard)	Type 3 for construction equipment
	45210 (99688)	45/65-45-50PR (L5) (if equipped)	
Rear wheel	42865 (94517)	45/65-45-46PR (L5) (standard)	
	45210 (99688)	45/65-45-50PR (L5) (if equipped)	

WA900-3E0

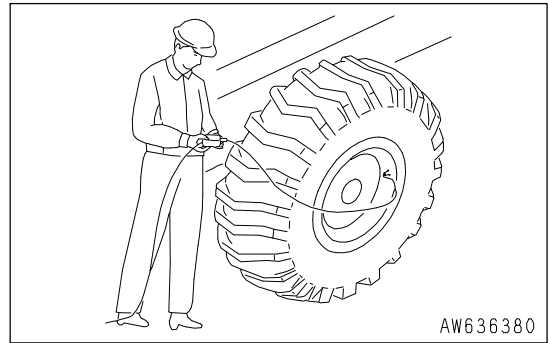
	Maximum load [kg (lb)]	Tire size	Remarks
Front wheel	49900 (110030)	45/65-45-58-PR (L5) (Standard)	Type 3 for construction equipment
	47500 (104737)	45/65R45☆☆ (L5) (if equipped)	
Rear wheel	49900 (110030)	45/65-45-58-PR (L5) (Standard)	
	47500 (104737)	45/65R45☆☆ (L5) (if equipped)	

CHECK INFLATION PRESSURE OF TIRES

! WARNING

When inflating a tire, check that no one will enter the working area. 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. To ensure safety, 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 trouble in the tire or rim. In this case, be sure to ask a tire repair shop to carry out repairs.
- Be sure to observe the specified inflation pressure.
- Do not adjust the inflation pressure of the tires just after high-speed travel or heavy-duty 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.

WA800-3E0

Tire size	Standard inflation pressure
45/65-45-46PR (L5) (standard)	0.52MPa {5.25kg/cm ² , 74.55 PSI}
45/65-45-50PR (L5) (if equipped)	0.52MPa {5.25kg/cm ² , 74.55 PSI}

WA900-3E0

Tire size	Standard inflation pressure
45/65-45-58PR (L5) (Standard)	0.67MPa{6.8kg/cm ² , 96.56PSI}
45/65R45☆☆ (L5) (if equipped)	0.64MPa{6.5kg/cm ² , 92.3PSI}

NOTICE

The optimum inflation pressure differs according to the type of work. For details, see "HANDLING THE TIRES (PAGE 3-145)".

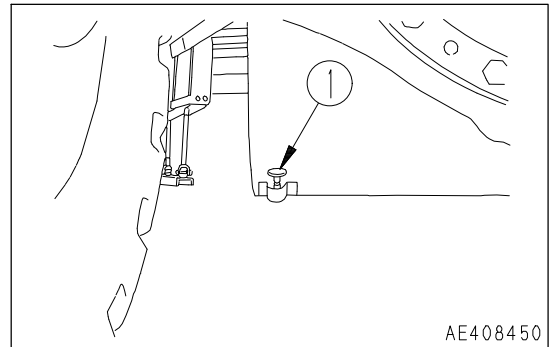
CHECK BEFORE STARTING

For the following items, see "CHECK BEFORE STARTING (PAGE 3-76)".

- Checking with machine monitor
- Check dust indicator
- Drain water from fuel pre-filter
- Check coolant level, add coolant
- Check oil level in engine oil pan, add oil
- Check brake oil tank level, add oil
- Check fuel level, add fuel
- Check electric wiring
- Check parking brake
- Check brake pedal
- Check inflation pressure of tires
- Check waterproof/fireproof dividing walls
- Check KOMTRAX Plus antenna and cable (if equipped)

EVERY 50 HOURS SERVICE**DRAIN WATER, SEDIMENT FROM FUEL TANK**

1. Prepare a container to catch the fuel and place it under the fuel tank.
2. Open the drain valve (1) on the right side of the fuel tank and drain out all the water and sediment collected at the bottom of the tank.
3. When all the water and sediment has drained out, close the drain valve.



EVERY 100 HOURS SERVICE

Maintenance for every 50 hours service should be carried out at the same time.

LUBRICATING

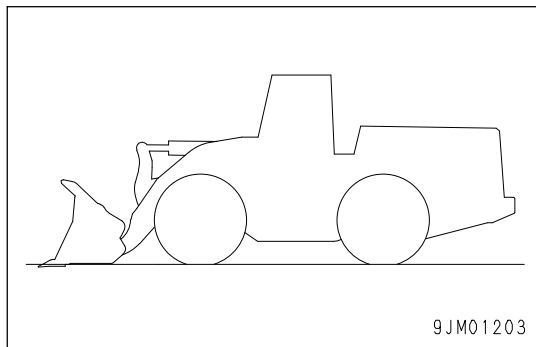
(Applicable for machines with no auto greasing system installed.)

NOTICE

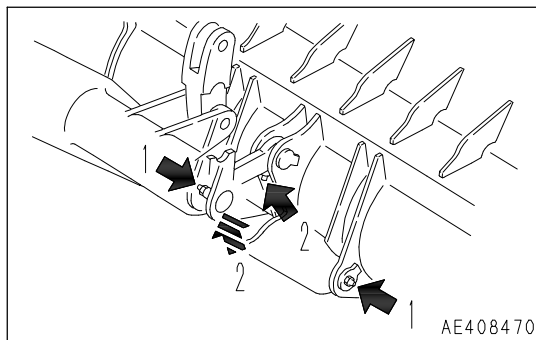
- In the extremely hard working conditions, grease the following pins (1) through (6) every 10 hours of operation or daily, whichever way is deemed appropriate.
- During the initial breaking in for a new machine, carry out lubrication every 10 hours for the first 50 hours of operation.

1. Using a grease pump, pump in grease through the grease fittings marked by the arrows.
2. After greasing, wipe off any old grease that was pushed out.

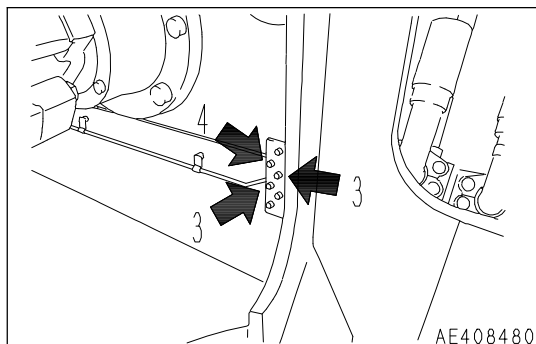
Lower the bucket to the ground and set it horizontally.



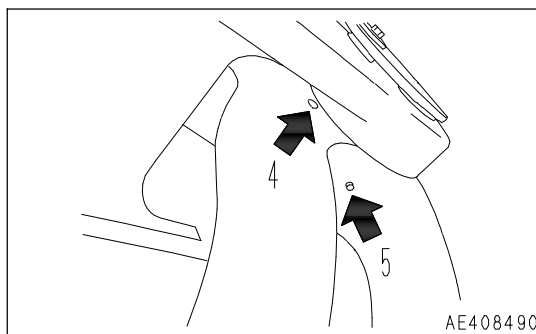
- (1) Bucket pin (2 places)
- (2) Bucket link pin (2 places)



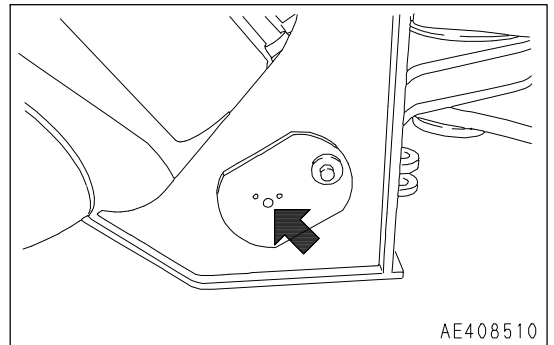
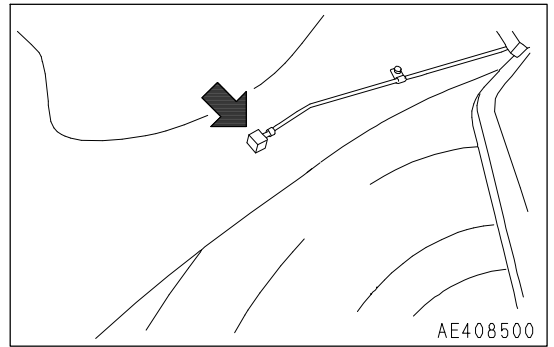
- (3) Lift arm hinge pin (2 places)



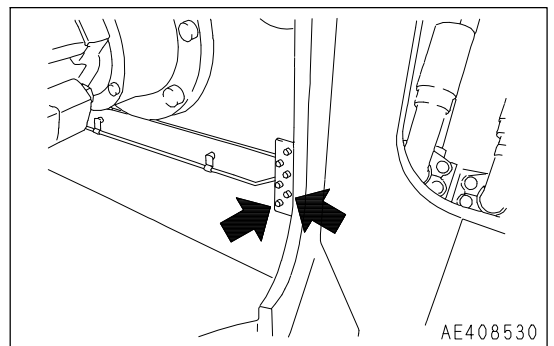
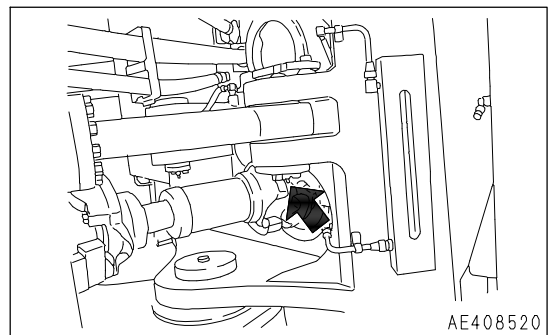
- (4) Bucket cylinder pin (2 places)
- (5) Bellcrank pin (1 place)



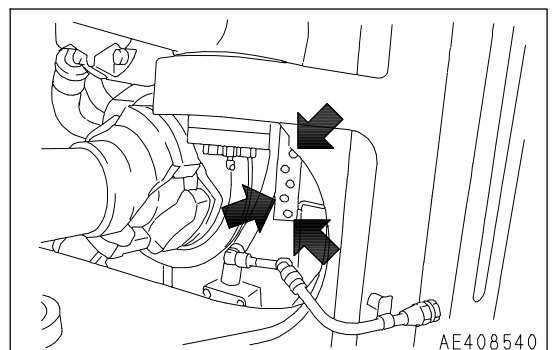
(6) Lift cylinder pin (4 places)



(7) Steering cylinder pin (4 places)



(8) Rear axle pivot pin (3 places)



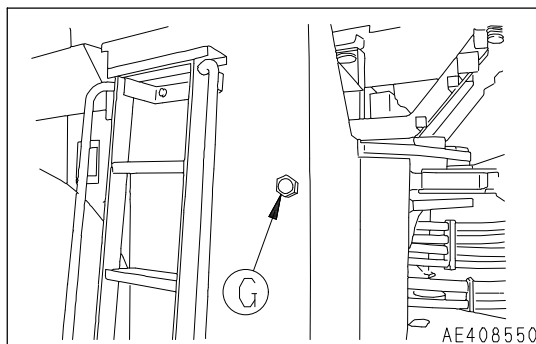
CHECK OIL LEVEL IN HYDRAULIC TANK, ADD OIL**WARNING**

- 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.

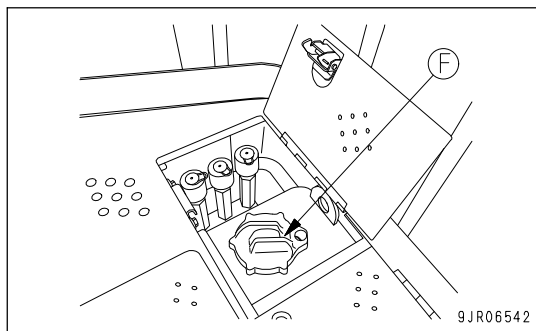
1. Lower the bucket to the ground, stop the engine, and wait for approx. 5 minutes.
2. Check the oil level with sight gauge (G) of the hydraulic tank.
The oil level should be near the top of sight gauge (G).

NOTICE

If the oil level is above the top of sight gauge (G), stop the engine, wait for the hydraulic oil to cool down, then drain the excess oil from the drain plug. Using the machine with excess oil in the circuit will cause damage to the hydraulic circuit or cause the oil to spurt out.



3. If the oil is not up to the top of the sight gauge, open the inspection cover above the step and add oil through oil filler port (F).



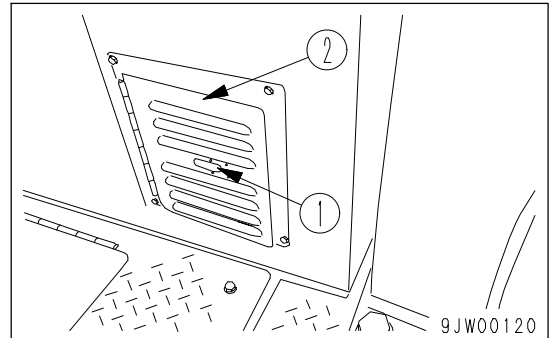
CLEAN ELEMENT IN AIR CONDITIONER FRESH AIR FILTER

! WARNING

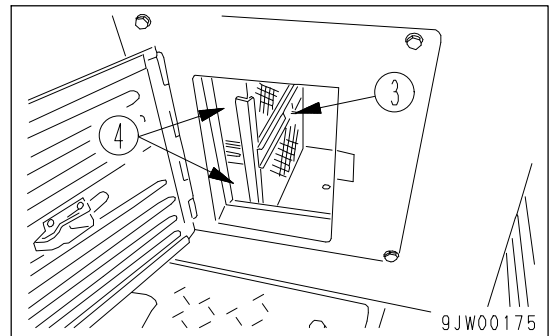
If compressed air scattered around dust and debris, there is danger of injury. Always wear protective equipment such as protective glasses and mask.

If the air conditioner has been used, the air filter should be cleaned.
 Stop the air conditioner before cleaning the element.

1. Stop the engine.
2. Grip the handle (1) and open the cover (2).



3. Loosen screw (3), then take out element (4) and clean it.
4. Blow dry compressed air (Max. 0.20 MPa (2 kg/cm², 28.4 PSI)) from the inside of the element along its folds. Then blow the compressed air from the outside along the folds, and again from the inside.
5. Install element (4).
6. Then close cover (2).



REMARK

When assembling the element again, install so that the arrow at the top of the element faces the inside of the cab.

EVERY 250 HOURS SERVICE

Maintenance for every 50 and 100 hours service should be carried out at the same time.

CHECK BATTERY ELECTROLYTE LEVEL

Carry out this procedure 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

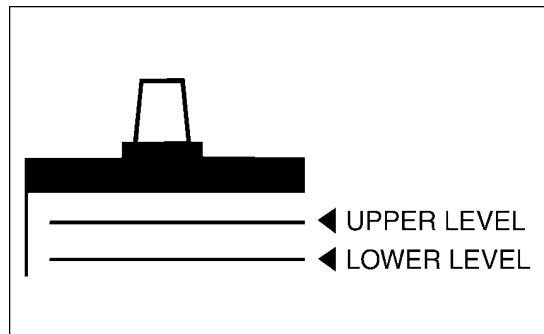
If there is danger of the electrolyte freezing if distilled water is added, add the distilled water before starting operations on the next day.

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.

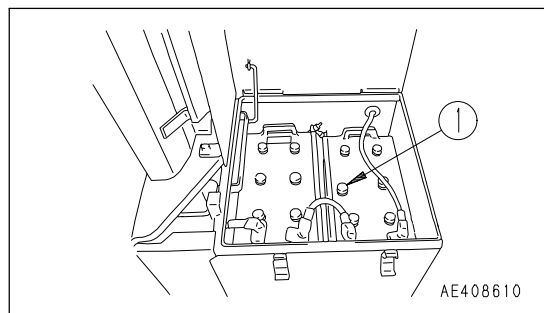
1. Use a wet cloth to clean the area around the electrolyte level lines and check that the electrolyte level is between the UPPER LEVEL (U.L.) and LOWER LEVEL (L.L.) lines.
If the battery is wiped with a dry cloth, static electricity may cause a fire or explosion.



2. If the electrolyte level is below the mid point of U.L and L.L marks, remove the cap (1) immediately and add the distilled water.
3. After adding distilled water, tighten cap (1) securely.

REMARK

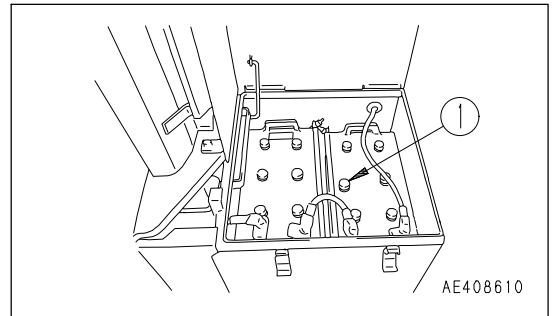
If distilled water is added to above the U.L. line, use a syringe to lower the level to the U.L. line. Neutralize the removed fluid with baking soda (sodium bicarbonate), then flush it away with a large amount of water or consult your Komatsu distributor or battery maker.



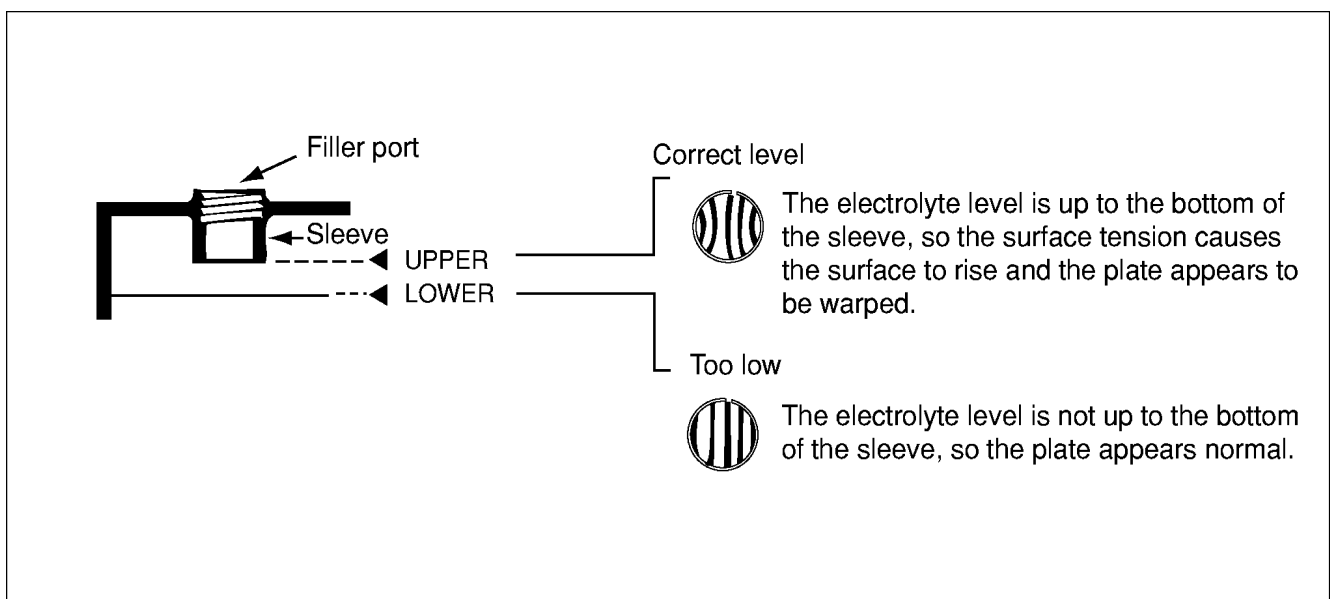
WHEN IT IS IMPOSSIBLE TO CHECK ELECTROLYTE LEVEL FROM SIDE OF BATTERY

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 cap (1) from the top surface of the battery, look into the filler port, and check the electrolyte level. If the electrolyte level does not reach the sleeve, add distilled water immediately to the bottom of the sleeve (max. electrolyte level: UPPER LEVEL).



Use the diagram below for reference, and check if the electrolyte reaches the bottom of the sleeve.



2. After adding distilled water, tighten cap (1) securely.

REMARK

If water is added to above the bottom tip of the sleeve, use a pipette to remove electrolyte. Neutralize the removed electrolyte with sodium bicarbonate, then flush it away with a large amount of water. If necessary, contact your Komatsu distributor or your battery maker.

WHEN IT IS POSSIBLE TO USE INDICATOR TO CHECK ELECTROLYTE LEVEL

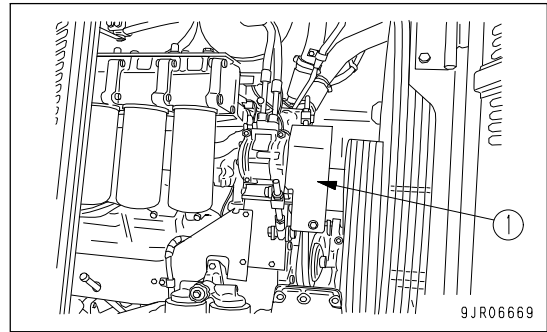
If it is possible to use an indicator to check the electrolyte level, follow the instructions given.

CHECK PARKING BRAKE

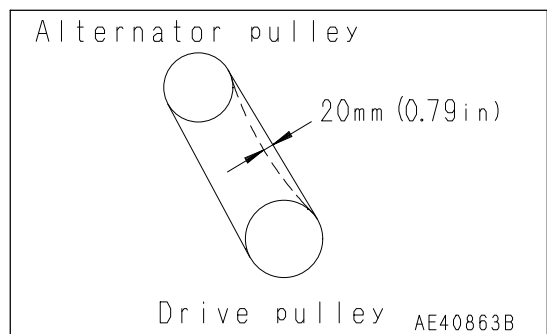
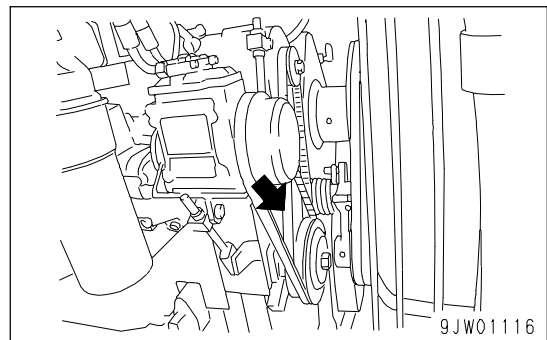
1. Set the machine on a dry downhill slope, press the parking brake switch to the ON position, and check if the parking brake hold the machine in position.
2. If any problem is found, please contact your Komatsu distributor.

CHECK ALTERNATOR BELT TENSION, ADJUST

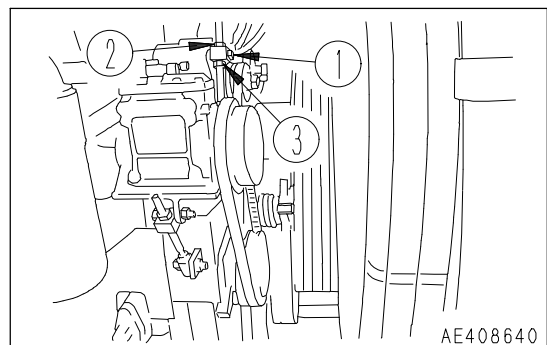
Carry out the inspection and adjustment work after removing cover (1).

**CHECKING**

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

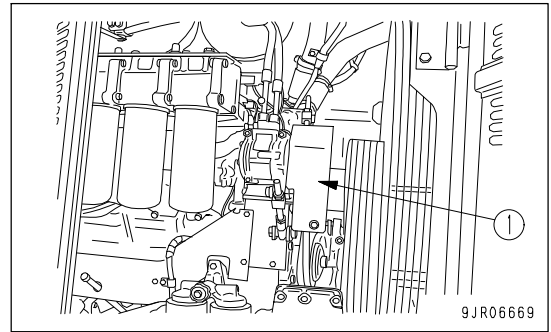
**ADJUSTING**

1. Loosen bolt (1) and lock nut (2).
2. Turn adjustment nut (3) to adjust the belt tension so that the deflection is approx. 20mm (0.8 in) when pressed with a finger force of approx. 58.8 N {6 kg}.
3. After adjusting, tighten locknut (2) and bolt (1).
4. Check each pulley for damage, wear of the V-groove, and wear of the 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 belt has elongated and there is no more allowance for adjustment, or if the belt is cut or cracked, replace the belt. 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

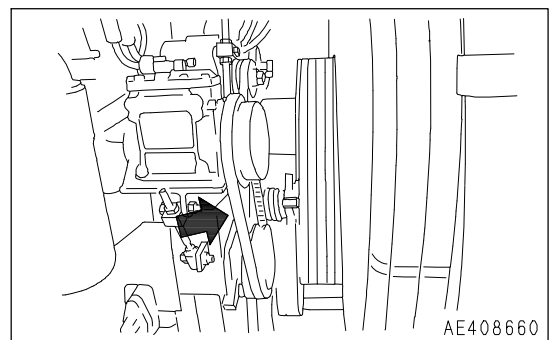
Carry out the inspection and adjustment work after removing cover (1).



CHECKING

The deflection should be approx. 12.5 to 16.5 mm (0.5 to 0.7 in) when pressed with a finger force of approx. 98.1 N (10 kg) at a point midway between the air conditioner compressor pulley and drive pulley.

When using a belt tension gauge, the tension should be in a range of 353 to 530 N (36 to 54 kg).



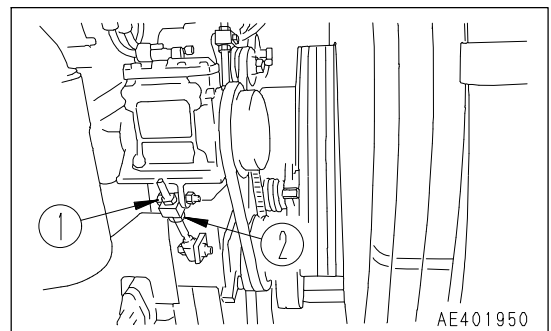
CHECK WHEN CHANGING THE V-BELT

The deflection should be approx. 9 to 12.5 mm (0.355 to 0.5 in) when pressed with a finger force of approx. 98.1 N (10 kg) at a point midway between the air conditioner compressor pulley and drive pulley.

When using a belt tension gauge, the tension should be in a range of 530 to 745 N (54 to 76 kg).

ADJUSTING

1. Loosen lock nut (1).
2. Turn adjustment nut (2) to adjust so that the belt tension is the specified value.
 Deflection when checking: [98.1 N (10 kg)] 12.5 to 16.5 mm (0.5 to 0.7 in)
 Deflection when replacing: [98.1 N (10 kg)] 9 to 12.5 mm (0.355 to 0.5 in)



3. After adjusting, tighten lock nut (1).
4. Check each pulley for damage, wear of the V-groove, and wear of the 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 belt has elongated and there is no more allowance for adjustment, or if the belt is cut or cracked, replace the belt.
 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 FOR LOOSE WHEEL HUB NUTS, TIGHTEN

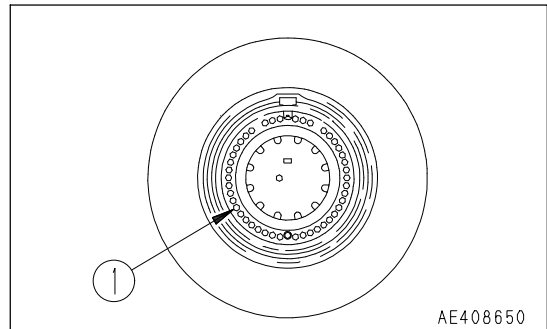
If wheel hub nuts (1) are loose, tire wear will be increased and accidents may be caused.

1. Check for loose nuts, and tighten if necessary.

When checking for loose nuts, always turn the nuts in the direction of tightening to check.

Tightening torque: 735.7 to 912.3 Nm (75 to 93 kgm, 542.5 to 672.7 lbf)

2. If any stud bolt is broken, replace all the stud bolts for that wheel.



CLEAN ELEMENT IN AIR CONDITIONER RECIRCULATION FILTER

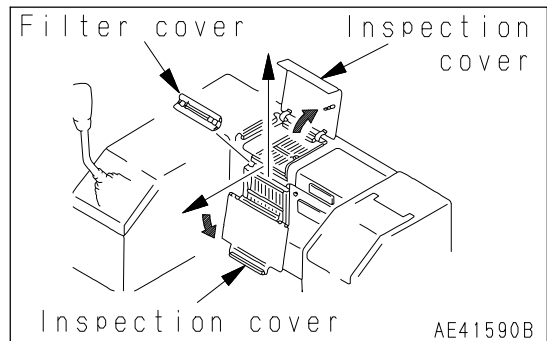
1. Open the filter inspection cover, remove the filter cover, then pull out the filter in the direction of the arrow.

Note: when removing the filter facing to the side, push the seat down fully first.

2. Clean with compressed air in the same way as for the fresh air filter.

If the filter is extremely dirty, rinse it in water.

After rinsing the filter, dry it completely before installing it



CHECKING FUNCTION OF ACCUMULATOR

For details of handling the accumulator, see Section "HANDLING ACCUMULATOR AND GAS SPRING (PAGE 2-44)".

BRAKE ACCUMULATOR

If the engine stops when the machine is traveling, the oil pressure in the accumulator can be used to apply the brake as an emergency measure.

1. Stop the machine on level ground and lower the work equipment completely to the ground.
2. Apply the parking brake.
3. Start the engine, run it at a mid-range speed for 1 minute, then stop the engine.
4. Turn starting switch key to OFF position and depress brake pedal until stroke end 5 times repeatedly.
5. Turn starting switch key to START position. Engine will start.

If brake oil pressure caution lamp lights up, the gas pressure in the accumulator has probably dropped. Please contact your Komatsu distributor to have them check.

REMARK

Carry out the check within 5 minutes after stopping the engine. If the machine is left with the engine stopped, the accumulator pressure will drop and it will be impossible to check the cause of the problem.

EVERY 500 HOURS SERVICE

Maintenance for every 50, 100 and 250 hours service should be carried out at the same time.

CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE

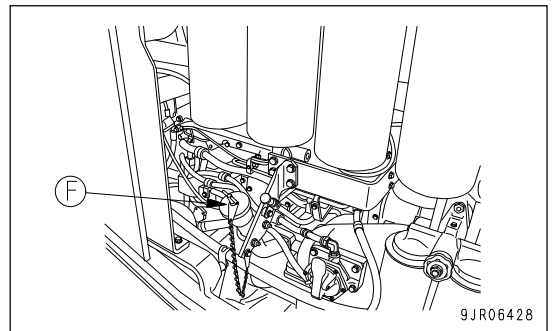
! WARNING

- 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.

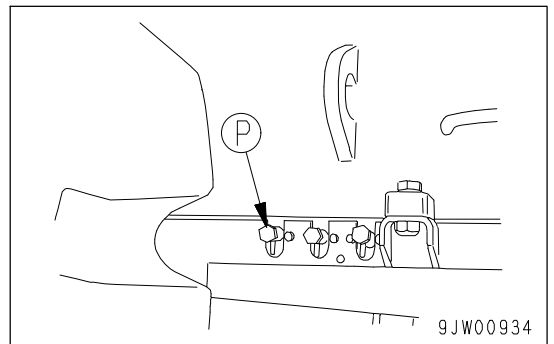
- Refill capacity: 130 liters (34.35 US gal)

- Prepare a container to catch drain oil.
- Prepare a filter wrench

1. Stop the engine and wait for the temperature at all parts to go down.
2. Open the engine side cover on the left side of the chassis.
3. Open oil filler (F).



4. Place a container to catch the oil under drain plug (P) on the left side of the machine.
5. Install a hose to the drain port of drain plug (P), then loosen drain plug (P) and drain the oil.



REMARK

Use the supplied hose to prevent oil from spraying out into the surrounding area.

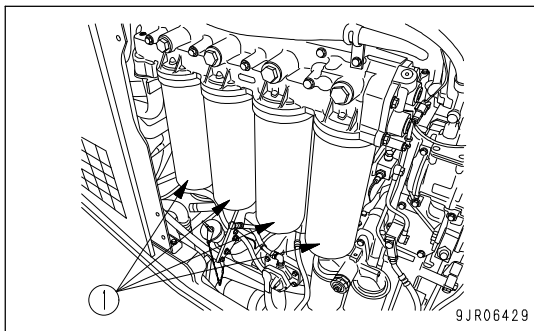
6. Check the drained oil, and if there are excessive metal particles or foreign material, please contact your Komatsu distributor.
7. Tighten drain plug (P), then remove the hose.

8. Using the filter wrench, turn filter cartridge (1) counterclockwise to remove it.

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.

9. Clean the filter holder of the filter head.

10. Fill a new filter cartridge with clean oil, coat the seal portion and the threaded portion of the new filter cartridge with oil, then install.

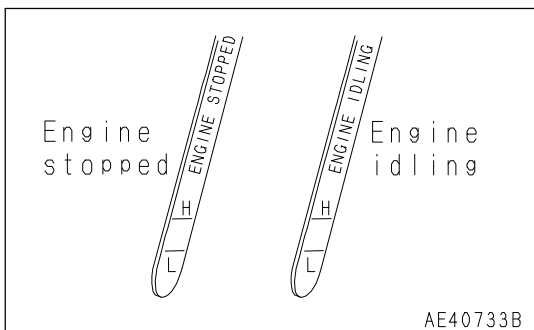


11. Install the new filter cartridge to the filter holder.

When installing, bring the seal surface into contact with the filter holder, then tighten a further 3/4-1 turns by hand.

12. After replacing the filter cartridge, add engine oil through oil filler (F) until the oil level is between the H and L marks on the dipstick.

13. Run the engine at idle for short time, then stop the engine, and check that the oil is between the H and L marks on the dipstick. For details, see "CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL (PAGE 3-79)".



REPLACE FUEL PRE-FILTER CARTRIDGE

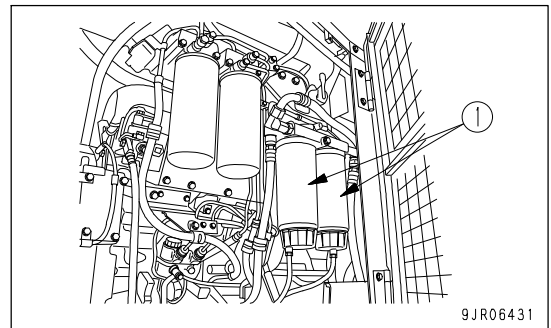


WARNING

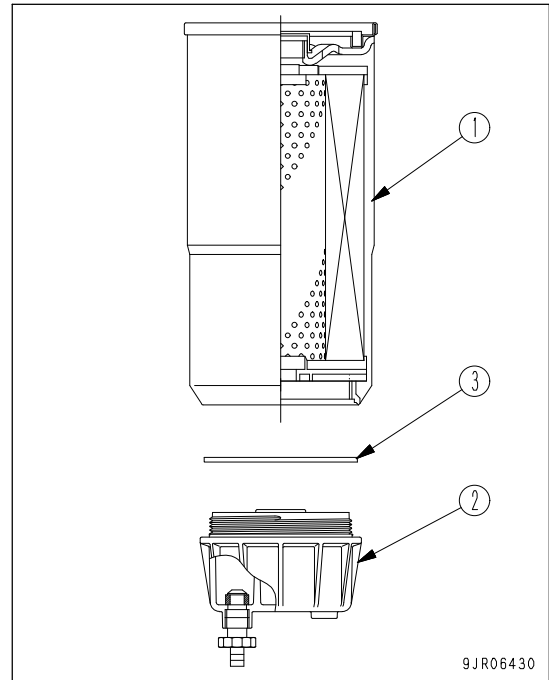
- After the engine has been operated, all parts are at high temperature, so do not replace the filter immediately. Wait for all parts to cool down before starting the operation.
- High pressure is generated inside the engine fuel piping system when the engine is running.
When replacing the filter, wait for at least 30 seconds after stopping the engine to let the internal pressure go down before replacing the filter.
- Do not bring any fire or flame close.
- Be careful when opening the air bleed plug in the fuel filter head. It is still under pressure, so fuel may spurt out.

NOTICE

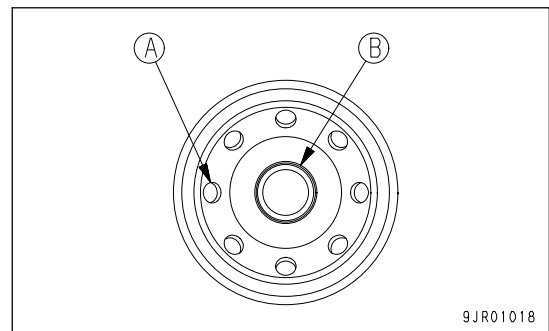
- Genuine Komatsu fuel filter cartridges use a special filter that has highly efficient filtering ability. When replacing the filter cartridge, always use a genuine Komatsu part.
 - The common rail fuel injection system used on this machine consists of more precise parts than the conventional injection pump and nozzle.
If any part other than a genuine Komatsu filter cartridge is used, dust or dirt may get in and cause problems with the injection system. Always avoid using substitute parts.
 - When carrying out inspection or maintenance of the fuel system, pay more attention than normal to the entry of dirt. If dirt is stuck to any part, use fuel to wash it off completely.
- Prepare a container to catch the fuel.
 - Prepare a filter wrench
1. Set a container under fuel pre-filter cartridge (1) to catch the fuel.



2. Remove transparent cup (2) from the filter and inspect it. If it is broken or damaged, replace it with a new part.
3. Clean transparent cup (2) and remove seal (3). Coat the new seal with clean fuel or oil.
4. Install transparent cup (2) to the new filter cartridge.
Tightening torque for cup: 10 Nm (1.0 kgm, 7.2 lbf)
5. Clean the filter holder, coat the seal surface of the new cartridge thinly with oil, then install the cartridge.

**NOTICE**

- When adding fuel, do not remove cap (B). Always add fuel from the 8 small holes (A) on the dirty side.
- After adding fuel, remove cap (B) and install the fuel filter.
- Always fill with clean fuel. Be careful not to let any dirt or dust get into the fuel. In particular, center portion is the clean side, so do not remove cap (B) when adding fuel. Be careful not to let dirt or dust get into center portion on the clean side.



6. When installing, tighten until the packing surface contacts the seal surface of the filter holder, then tighten it 3/4 of a turn.
If the filter cartridge is tightened too far, the packing will be damaged and this will lead to leakage of fuel. If the filter cartridge is too loose, fuel will also leak from the packing, so always tighten the correct amount.
 - When tightening with a filter wrench, be extremely careful not to dent or damage the filter.
7. Start the engine and run it at low idling for approx. 10 minutes until the engine speed stabilizes. Check for any sucking in of air or leakage of fuel from the transparent cup and seal surface of the filter cartridge.

NOTICE

When replacing the fuel main filter cartridge, bleed the air after replacing the filter cartridge.

For details, see "REPLACE FUEL MAIN FILTER CARTRIDGE (PAGE 4-63)".

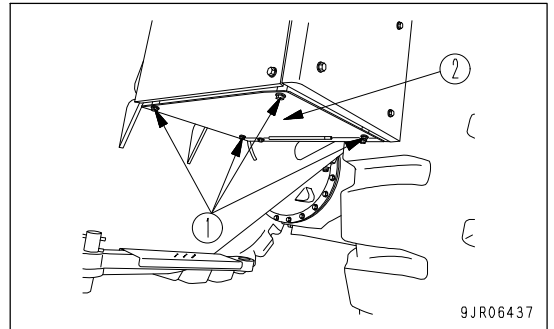
Do not fill the fuel main filter cartridge with fuel.

REPLACE TRANSMISSION OIL FILTER ELEMENT

! 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.

1. Stop the engine and wait for the temperature at all parts to go down.
2. Loosen bolt (1), then remove cover (2) under the brake component box.



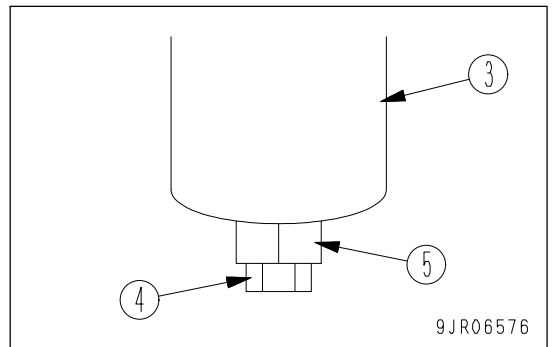
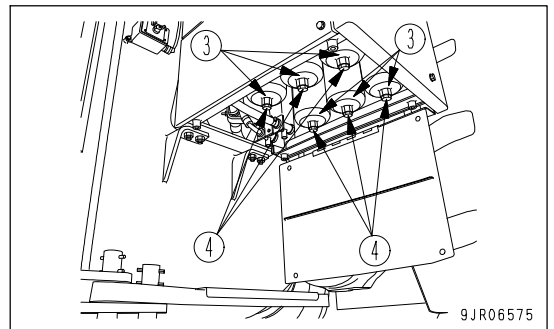
3. Set a container under filter case (3) to catch the oil.
4. Remove drain plug (4) at the bottom of the filter case, drain the oil, then tighten the plug again.

Drain plug tightening torque: 49 to 58.8 Nm
(5 to 6 kgm, 36.2 to 43.4 lbft)

5. Loosen hexagon part (5) of case (3), then remove case (3).
6. Remove the element and clean the inside of the case.
7. Replace the filter gasket and O-ring with new parts. Coat the new gasket and O-ring thinly with clean oil before installing.
8. Assemble the new element, then set the case in position and install it.

Case tightening torque: 58.8 to 78.5 Nm
(6 to 8 kgm, 43.4 to 57.9 lbft)

9. Run the engine at idle for a short time, then check that the oil is up to the specified level. For details, see "CHECK TRANSMISSION OIL LEVEL, ADD OIL (PAGE 4-28)".



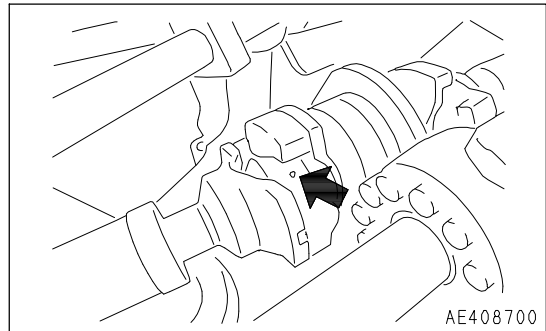
LUBRICATE CENTER DRIVE SHAFT

(3 places)

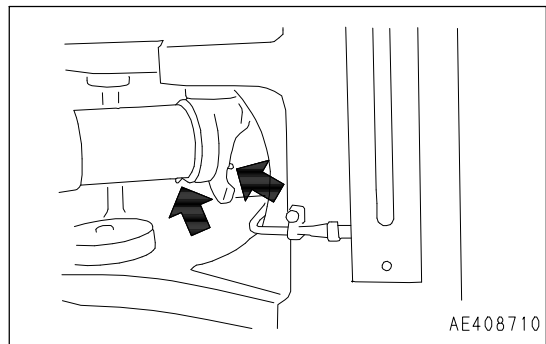
**CAUTION**

If you fail to grease the drive shaft, the shaft will break, and there is danger that the broken shaft will cause serious damage to the machine. To avoid this problem always maintain the specified greasing interval strictly.

1. Using a grease pump, pump in grease through the grease fittings marked by the arrows.



2. After greasing, wipe off any old grease that was pushed out.

**CHECK FAN BELT FOR WEAR**

Check the V-belt and when the following conditions exist, replace or adjust the V-belt.

- When there is a clearance between the tension pulley lever and tip of the adjustment screw.
- When the V-belt makes contact with the bottom of the groove in each pulley.
- When the V-belt is worn, and its surface is lower than the outer diameter of the pulley.
- When the V-belt is cracked or flaked.
- When the V-belt makes an abnormal noise.

A device is installed to maintain the tension constant regardless of any elongation of the V-belt, so there is no need to carry out adjustment until the V-belt is replaced.

For details of the replacement and adjustment procedure for V-belt, refer to "REPLACE FAN BELT, ADJUST AUTO-TENSIONER (PAGE 4-40)".

EVERY 1000 HOURS SERVICE

Maintenance for every 50, 100, 250 and 500 hours service should be carried out at the same time.

CHANGE OIL IN TRANSMISSION CASE, CLEAN STRAINER

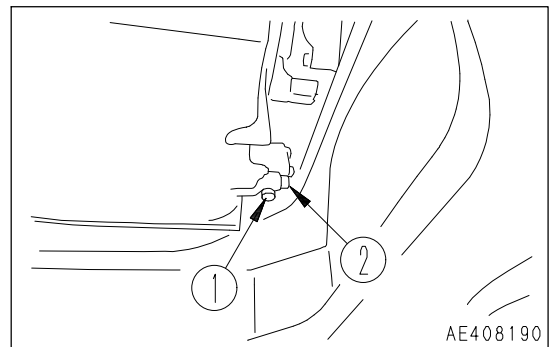


WARNING

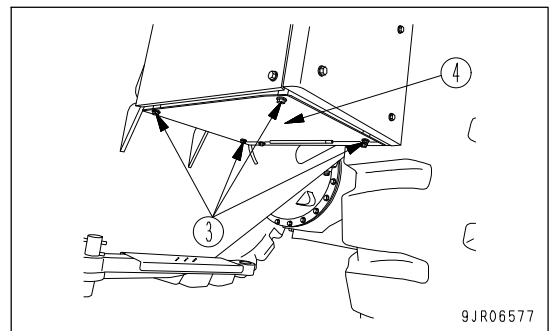
- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

- Refill capacity: 140 liters (37.0 US gal)

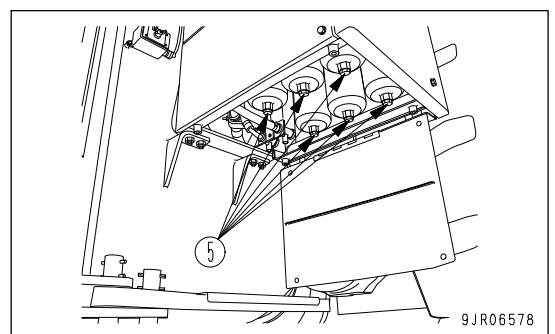
1. Stop the engine and wait for the temperature at all parts to go down.
2. Set a container to catch the oil under drain plugs (1) and (2), then remove drain plug (1) and loosen plug (2) to drain the oil. To prevent the oil from pouring out suddenly, loosen drain plug (2) and remove it gradually.
3. After draining the oil, install drain plugs (1) and (2).



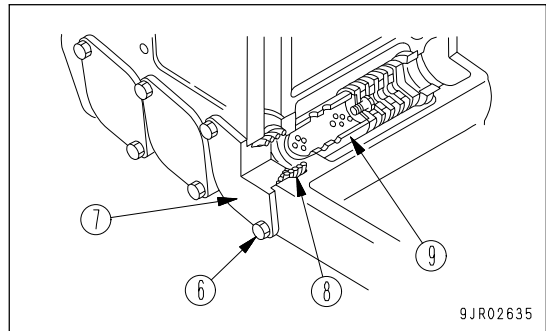
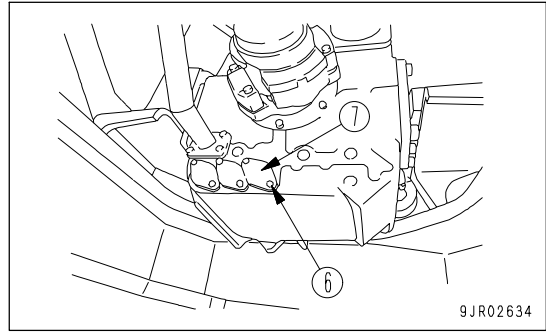
4. Loosen bolt (3), then remove cover (4) under the brake component box.
5. Set a container to catch the oil under the transmission filter.



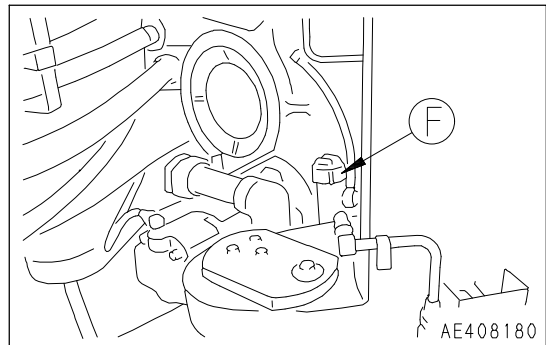
6. Remove transmission filter drain plugs (5) (6 places), drain the oil, then tighten the plug again.



7. Remove bolt (6), then remove cover (7) and take out strainer (9) together with spring (8).
8. Remove any dirt stuck to strainer (9), then wash it in clean diesel oil or flushing oil. If strainer (9) is damaged, replace it with a new part.
9. Install spring (8) and strainer (9) to cover (7) .
Replace the O-ring on the cover with a new part, then install the cover.

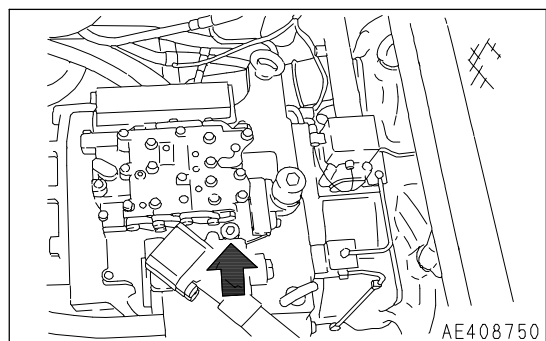


10. Add oil through oil filler port (F) to the specified level.
11. After filling with oil, check that the oil is at the specified level.
For details, see "CHECK TRANSMISSION OIL LEVEL, ADD OIL (PAGE 4-28)".
12. Check that there is no leakage of oil from the transmission case or oil filter.



CLEAN TRANSMISSION CASE BREATHER

1. Stop the engine and wait for the temperature at all parts to go down.
2. Remove all mud and dirt from around the breather.
3. Remove the breather and fit a cover to the breather mounting hole to prevent dirt from entering.
4. Soak the breather in flushing liquid and wash it.
5. Install the breather.



REPLACE FUEL MAIN FILTER CARTRIDGE

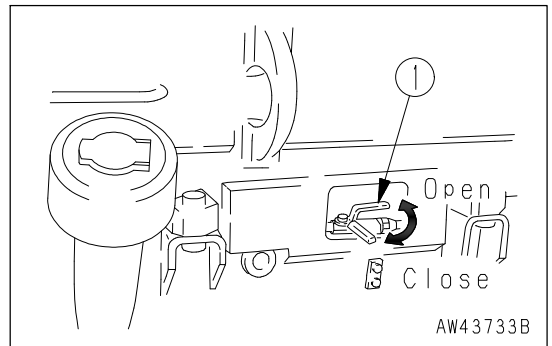
WARNING

- After the engine has been operated, all parts are at high temperature, so do not replace the filter immediately. Wait for all parts to cool down before starting the operation.
- High pressure is generated inside the engine fuel piping system when the engine is running. When replacing the filter, wait for at least 30 seconds after stopping the engine to let the internal pressure go down before replacing the filter.
- Do not bring any fire or flame close.

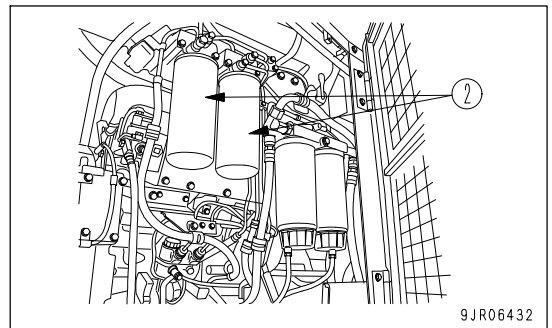
NOTICE

- Genuine Komatsu fuel filter cartridges use a special filter that has highly efficient filtering ability. When replacing the filter cartridge, always use a genuine Komatsu part.
 - The common rail fuel injection system used on this machine consists of more precise parts than the conventional injection pump and nozzle. If any part other than a genuine Komatsu filter cartridge is used, dust or dirt may get in and cause problems with the injection system. Always avoid using substitute parts.
 - When carrying out inspection or maintenance of the fuel system, pay more attention than normal to the entry of dirt. If dirt is stuck to any part, use fuel to wash it off completely.
- Prepare a container to catch the fuel.
 - Prepare a filter wrench

1. Open the side panel located on the right of the machine and lock the open lock.
2. Set a container under the fuel main filter cartridge to catch the fuel. Turn fuel stop lever (1) toward you to prevent the fuel from dripping.



3. Using a filter wrench, turn filter cartridge (2) counterclockwise to remove it.
4. Clean the filter holder.
5. Coat the packing surface of the filter cartridge with oil.

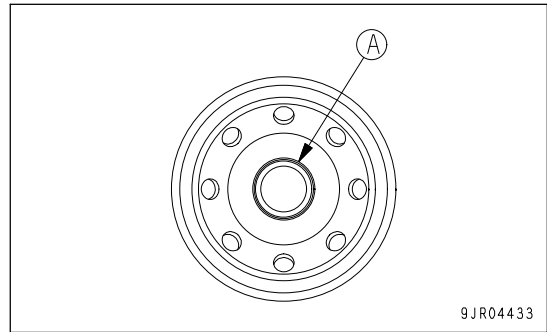


6. Remove filter cartridge cap (A) and install to the filter holder.

NOTICE

Do not fill the filter cartridge with fuel.

Cap (A) is installed to prevent dirt from entering the inside of the filter cartridge.



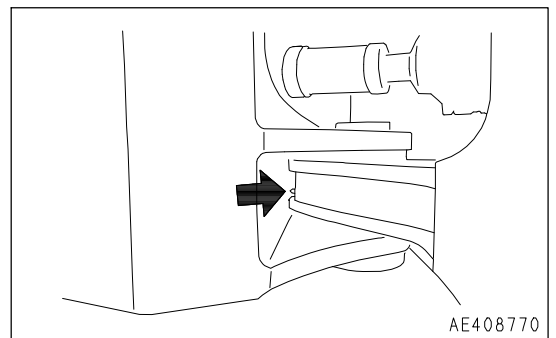
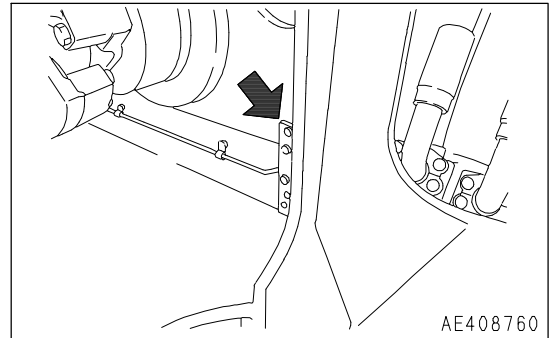
7. When installing, tighten until the packing surface contacts the seal surface of the filter holder, then tighten it 3/4 of a turn.
If the filter cartridge is tightened too far, the packing will be damaged and this will lead to leakage of fuel. If the filter cartridge is too loose, fuel will also leak from the packing, so always tighten the correct amount.
8. After replacing fuel filter cartridge (2), bleed the air. For details, see "PROCEDURE FOR BLEEDING AIR (PAGE 3-158)".
9. After bleeding the air, start the engine and check for any 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, repeat Steps 2 and 3 to remove the filter cartridge, then check the packing surface. If there is any damage or embedded material in the packing surface, replace the cartridge with a new part, then repeat the procedure from Step 4 to Step 9.

LUBRICATING

1. Using a grease pump, pump in grease through the grease fittings marked by the arrows.
2. After greasing, wipe off any old grease that was pushed out.

Applicable for machines with no auto greasing system installed to positions (1), (2), or (7).

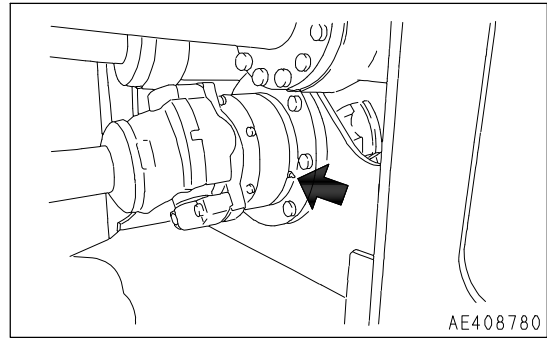
(1) Center hinge pin (2 places)



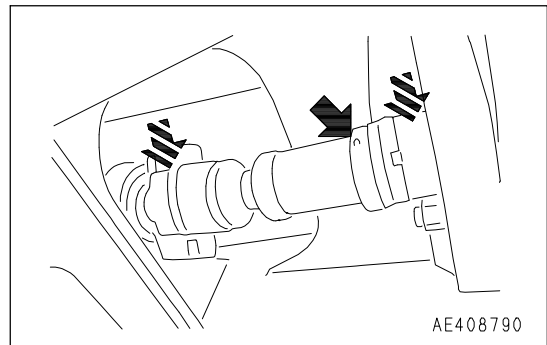
CAUTION

If you fail to grease the drive shaft, the shaft will break, and there is danger that the broken shaft will cause serious damage to the machine. To avoid this problem always maintain the specified greasing interval strictly.

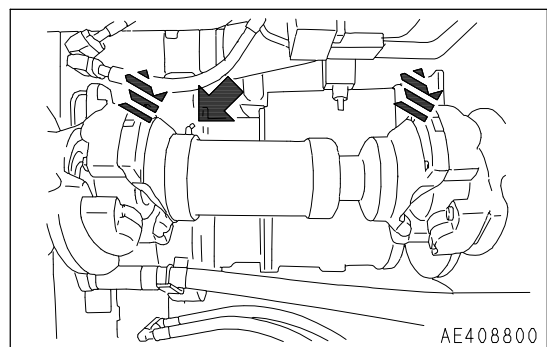
(2) Drive shaft center support (1 place)



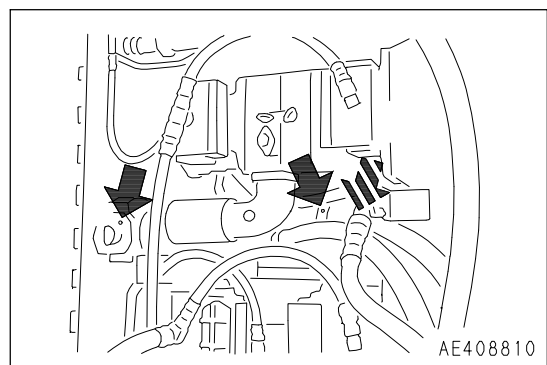
(3) Front drive shaft (3 places)



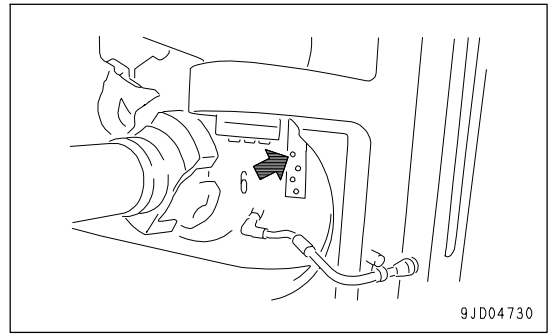
(4) Rear drive shaft (2 places)



(5) Upper drive shaft (3 places)



(6) Torque converter mount trunnion (1 place)

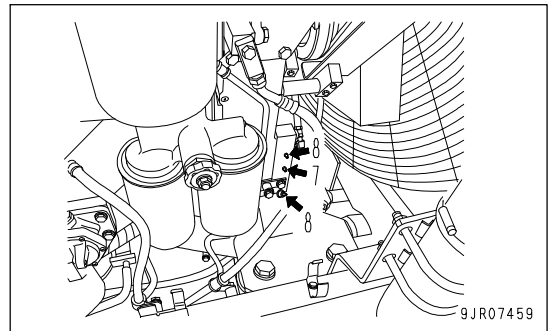


(7) Fan pulley bearing (1 place)

(8) Tension pulley bearing (2 places)

NOTICE

Do not use air pressure or oil pressure to carry out high-pressure greasing.



LUBRICATING PARKING BRAKE



WARNING

- When carrying out maintenance, raise the brake oil pressure sufficiently to prevent the parking brake from being automatically applied. In addition, hang a warning tag that can be seen clearly to prevent any other person from operating the parking brake switch.
- Do not get any oil or grease on the brake disc or pad surface.

1. Stop the machine on level ground and lower the bucket horizontally to the ground surface.
2. Set the work equipment lock lever and steering lock lever to the LOCK position.
3. Put blocks under the tires to prevent the machine from moving.

4. Before starting operations, raise the brake oil pressure sufficiently to prevent the parking brake from being automatically applied. Check also that the brake oil pressure warning pilot lamp and central caution lamp (CAUTION) are not flashing and that the alarm buzzer does not sound.
5. Release the parking brake and stop the engine.
6. Using the grease pump, pump in grease through fittings (1), (2), (4), and (5) (4 places) on the parking brake body and fittings (3) and (6) (2 places) on the slack adjuster.

NOTICE

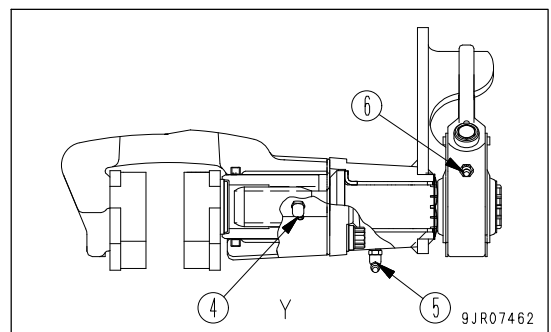
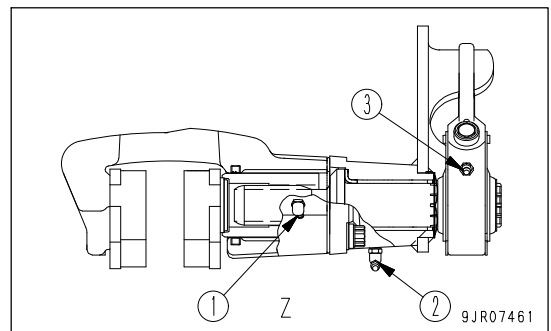
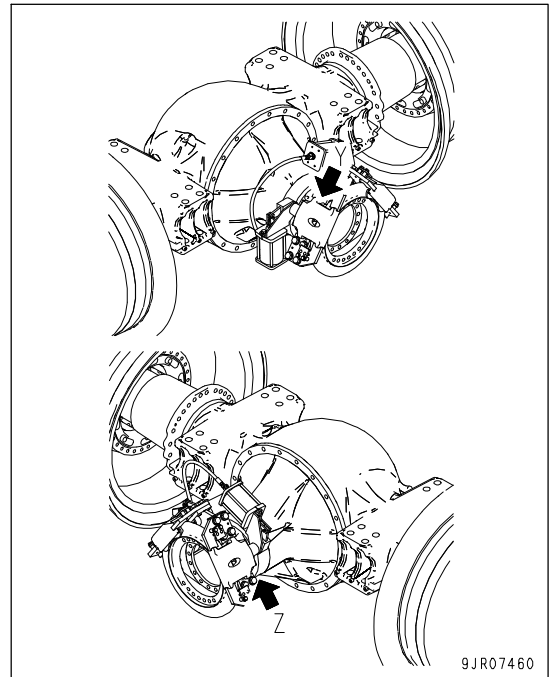
Do not use air pressure or oil pressure to carry out high-pressure greasing.

7. After completing the greasing, remove fittings (1) and (4).
If grease comes out, wipe it off.

REMARK

Removing fittings (1) and (4) makes it possible to release the abnormal internal pressure caused by over-supply of grease.

8. When no more grease comes out, install fittings (1) and (4).
9. Check the braking capacity. For details, see "CHECK PARKING BRAKE (PAGE 4-51)".
10. If the machine moves when checking the braking capacity, please ask your Komatsu distributor to adjust the parking brake.



IF BREATHER IS INSTALLED

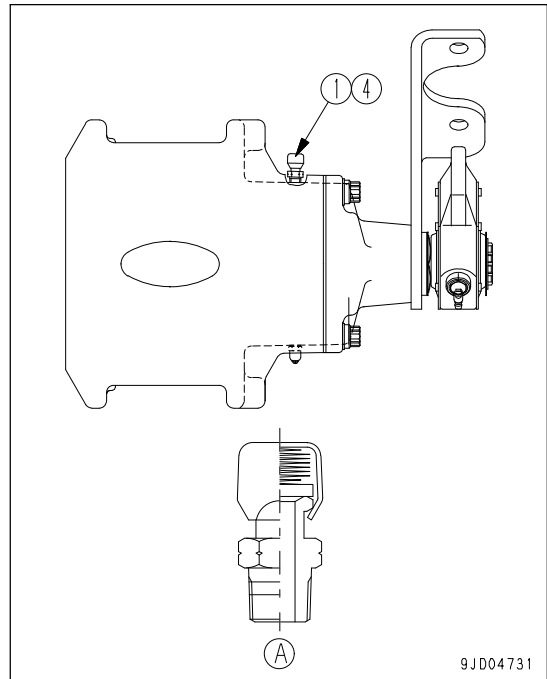
If the breather is installed at (1) and (4) instead of the relief valve, carry out the lubrication according to the following procedure.

1. Supply grease to the parking brake by carrying out steps 1 to 6 of "LUBRICATING PARKING BRAKE (PAGE 4-68)".
2. If the breather is installed at (1) and (4), supply grease until the grease is discharged from the breather.

REMARK

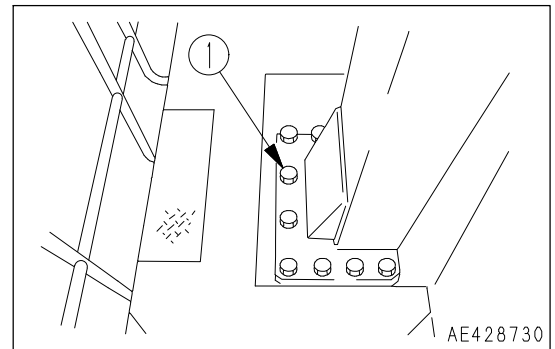
Removal of the grease fitting described in steps 7 and 8 of "LUBRICATING PARKING BRAKE (PAGE 4-68)" is not necessary because excessive grease is discharged

3. To discharge the excessive grease completely, repeat applying and releasing of the parking brake at least five times.



TIGHTEN ROPS CANOPY

1. Loosen the bolt, then remove the cover.
2. Check that there is no looseness in mounting bolts (1) of the ROPS canopy. If any bolt is loose, tighten it.
Tightening torque: 2452 to 3040 Nm (250 to 310 kgm, 1808.3 to 2242.2 lbft)
3. Install the cover.
The tightening torque is large, so a power wrench is needed when tightening. Please request your Komatsu distributor to carry out this work.



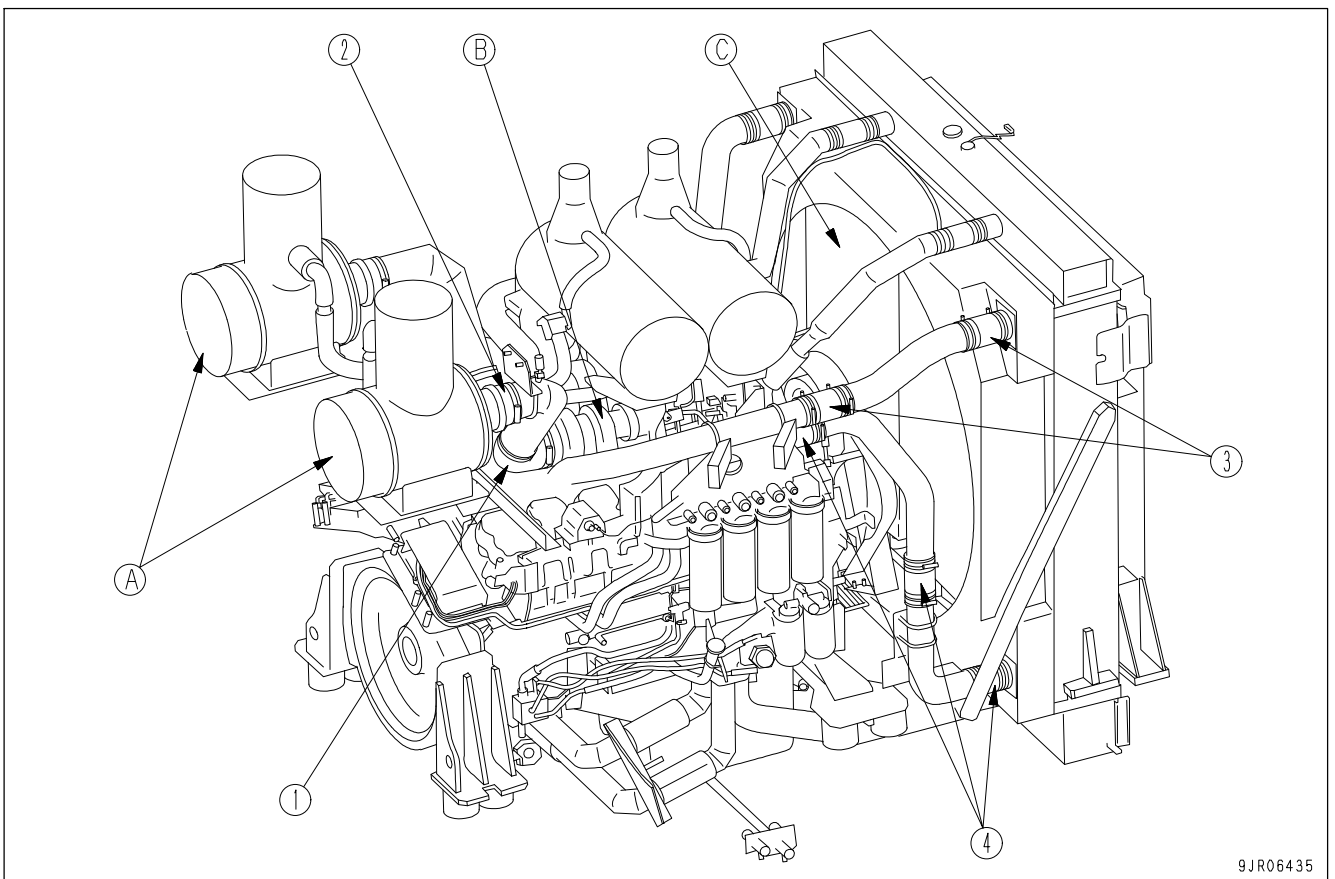
CHECK OF ENGINE AIR INTAKE PIPING CLAMPS FOR LOOSENESS

Check for any looseness in clamps (1) and (2) of the hoses between air cleaner (A) and turbocharger (B). Tighten any loose clamps.

Check for any looseness in clamps (3) and (4) of the hoses between turbocharger (B) and aftercooler (C) and the engine. Tighten any loose clamps.

Tightening torque: 10 to 11Nm {1.02 to 1.12kgm, 7.4 to 8.1 lbft}

- Locations for tightening: (1) 4 places; (2) 4 places; (3) 16 places; (4) 24 places



EVERY 2000 HOURS SERVICE

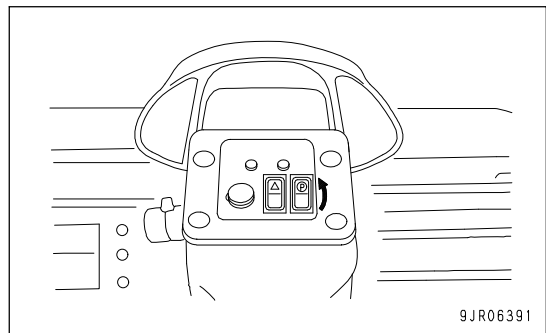
Maintenance for every 50, 100, 250, 500 and 1000 hours service should be carried out at the same time.

CHANGE OIL IN HYDRAULIC TANK, REPLACE HYDRAULIC FILTER ELEMENT**WARNING**

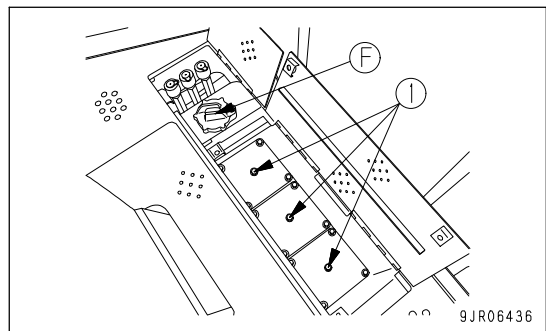
- The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.

- Refill capacity: 725 liters (191.55 US gal)

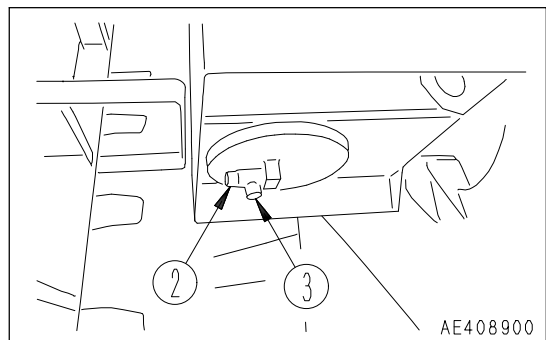
1. Set the bucket horizontally on the ground, then turn the parking brake ON.
2. Stop the engine and wait for the temperature at all parts to go down.



3. Open the cover on the right side of the operator's compartment.
4. Remove oil filler (F) and plug (1) from the filter case.

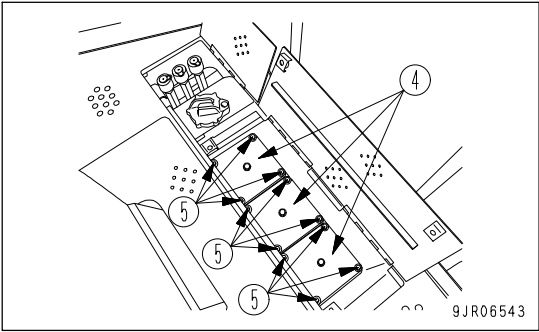


5. Set a container to catch the oil under drain plug (3).
6. Remove drain plug (3).
7. Open drain valve (2) gradually and drain the oil.
8. After draining the oil, close drain valve (2), then tighten drain plug (3).

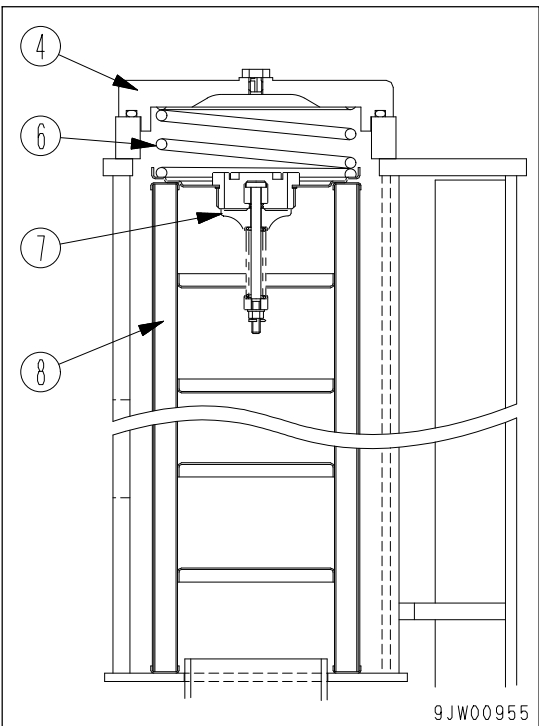


CAUTION

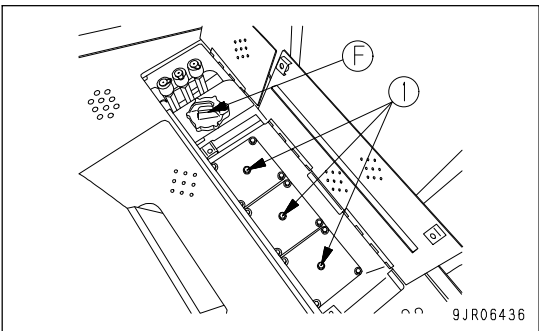
When removing the filter cover, keep the filter pressed down by hand. The filter cover is being pushed by a spring, so if the filter cover mounting bolts are removed carelessly, there is danger that the filter cover will spring out and cause injury.



9. Remove mounting bolts (5) of the 3 filter covers (4) at the top of the tank, then remove the covers.
When doing this, the cover may fly off because of the force of spring (6), so keep the cover pushed down while removing the bolts.
10. Remove spring (6) and bypass valve (7), then take out element (8).
11. Check that there is no foreign material inside the tank, then clean it.
12. Fit a new O-ring to filter cover (4).
13. Install the new element, then set bypass valve (7), spring (6), and cover (4) in the tank.
14. When installing the cover bolts, push down the cover and tighten the bolts evenly.



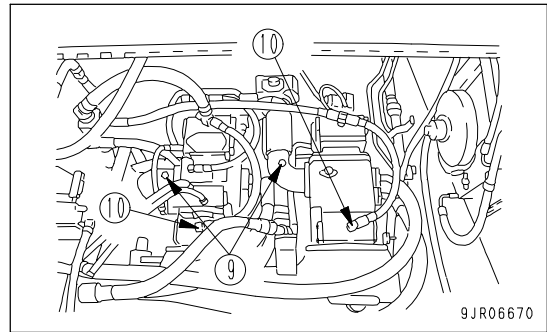
15. Add engine oil through oil filler port (F) to the specified level, then install air bleed plug (1) on filter case. The cap of the hydraulic tank remains removing, until the air bleeding of the piston pump finishes.
16. Check the oil level, then add oil to the specified level. For details, see "CHECK OIL LEVEL IN HYDRAULIC TANK, ADD OIL (PAGE 4-48)".
17. Check that there is no leakage of oil from the filter cover



18. Loosen plug (9) installed above the tube on the suction side of the piston pump, and also loosen plug (10) installed on the elbow in the upper part of the piston pump.

There is a plug on each pump, so loosen all 6 plugs.

19. Tighten plug (9) and (10) after air is so completely bled that oil begins to run out of both plugs.
 20. Check the oil level. If the oil level is low, add oil to the specified level. For details, see "CHECK OIL LEVEL IN HYDRAULIC TANK, ADD OIL (PAGE 4-48)".



21. Fix the cap of the hydraulic tank filler port (F).
 22. Run the engine at low idle, and extend and retract the steering, bucket, and lift arm cylinders 4 to 5 times. Be careful not to operate the cylinder to the end of its stroke (stop approx. 100 mm (3.9 in) before the end of stroke).

NOTICE

If the engine is run at high speed immediately after startup or a cylinder is pushed up to its stroke end, air taken inside the cylinder may cause damage to the piston packing.

23. Next, operate the steering, bucket, and lift arm cylinders to the end of their stroke 3 to 4 times, then stop the engine and loosen vent plug (1) to bleed the air from the hydraulic tank. After bleeding the air, tighten plug (1) again.

24. Check the hydraulic oil level and add oil to the specified level. For details, see "CHECK OIL LEVEL IN HYDRAULIC TANK, ADD OIL (PAGE 4-48)".

25. Next, increase the engine speed and repeat the procedure in Step 21 to bleed the air. Continue this operation until no more air comes out from plug (1).

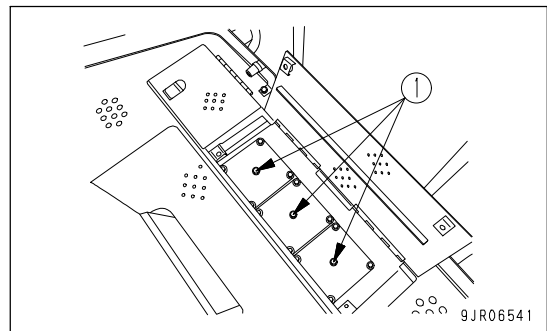
26. After completely bleeding the air, tighten plug (1).

Tightening torque: 9.83 to 12.77 Nm (1.0 to 1.3 kgm, 7.2 to 9.4 lbft)

27. Lower the bucket horizontally to the ground and stop the engine.

28. Check that the hydraulic oil is at the standard level. For details, see "CHECK OIL LEVEL IN HYDRAULIC TANK, ADD OIL (PAGE 4-48)".

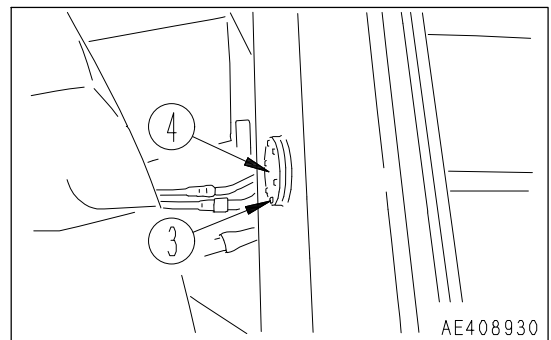
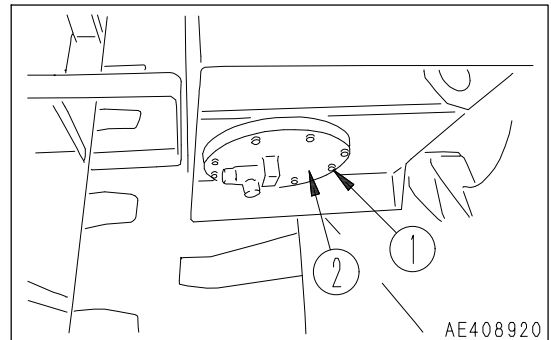
29. Check that there is no leakage of oil from the filter cover mount.



CLEAN HYDRAULIC TANK STRAINER

When changing the oil in the hydraulic tank, drain the oil from the tank and clean the strainer.

1. Loosen bolts (1) and (3), then remove covers (2) and (4).



2. Loosen bolt (5), remove strainer cover (6), then remove strainer (8) together with spring (7).
3. Remove any dirt from strainer (8), then wash in clean light oil or flushing oil.

If strainer (8) is broken, replace it with a new part.

4. Install spring (7), strainer (8), and cover (6). When doing this, look through the mounting hole of cover (4) to check that the strainer guide pin is fitted in the guide hole.

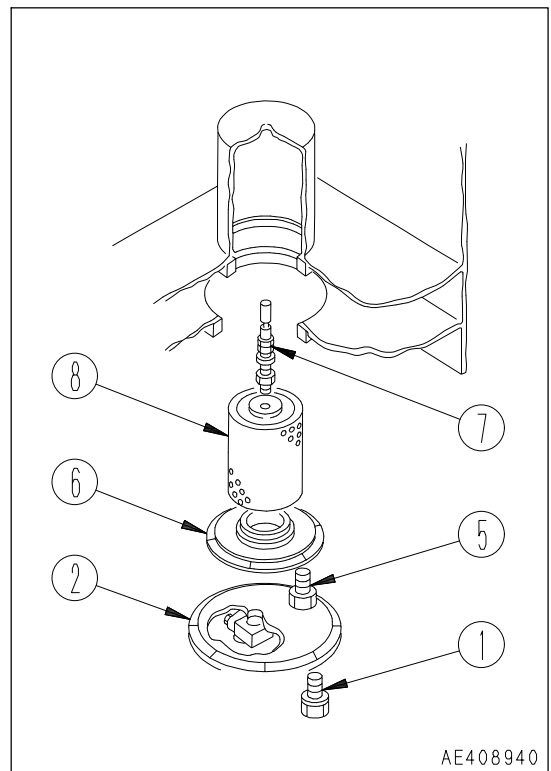
When installing cover (6), coat the thread of bolt (5) with thread tightener (LT-2) to prevent it from coming loose. If bolt (5) becomes loose and drops out, it will be sucked into the piston pump and will damage the pump.

Tightening torque of bolt (5):

53.7 to 122.3 Nm (5.5 to 12.5 kgm, 39.8 to 90.4 lbft)

5. Install covers (2) and (4).

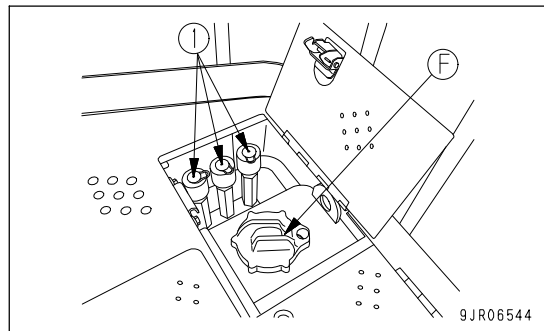
Replace the O-rings of the covers with new parts.



REPLACE HYDRAULIC TANK BREATHER 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 bucket horizontally on the ground, then turn the parking brake ON.
2. Stop the engine and wait for the temperature at all parts to go down.
3. Open the cover on the right side of the operator's compartment.
4. Remove the cap of oil filler (F).
5. Remove the snap ring from breather (1), then remove the breather cap.
6. Replace the filter element with a new part, then install the breather cap and snap ring.
7. Tighten the cap of oil filler (F).
8. Close the cover on the right side of the operator's compartment.

**REMARK**

It is possible to replace the element with the breather installed in the tank. However, if the breather is removed, do not wrap the taper thread of the breather with seal tape when assembling again, and be careful not to tighten too much.

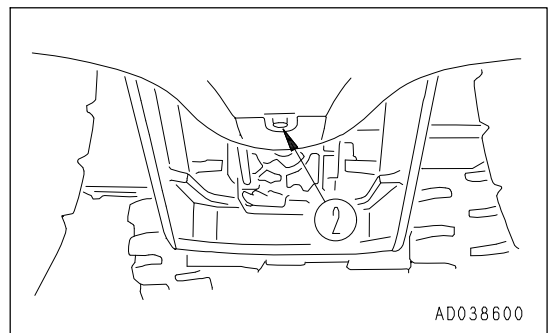
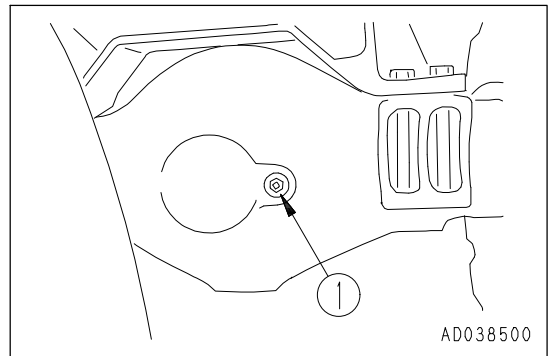
CHANGE AXLE OIL

! WARNING

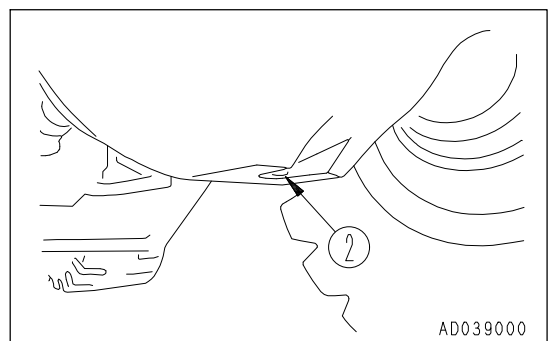
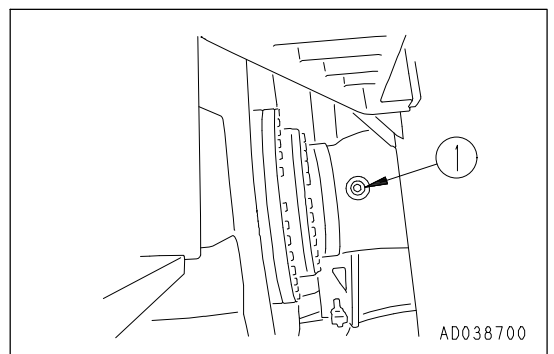
- The parts and oil are at high temperature after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the plug, oil may spurt out, so turn the plug slowly to release the internal pressure, then remove it carefully.

• Refill capacity (front and rear, each): 360 liters (95.1 US gal)

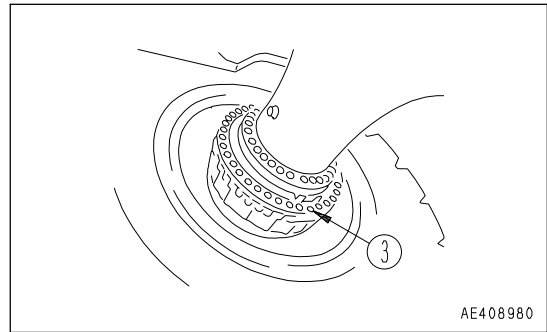
1. Remove front oil filler plug (1), then remove drain plug (2) to drain the oil.



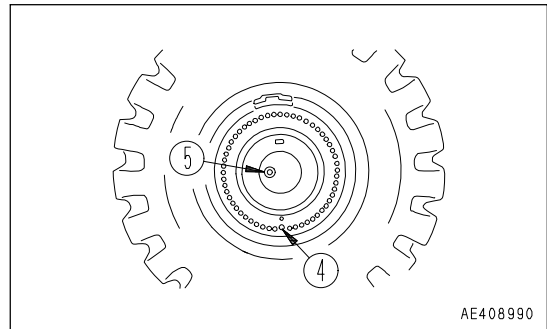
2. Remove rear oil filler plug (1), then remove drain plug (2) to drain the oil.



3. Remove drain plug (3) to drain the oil.



4. Stop the machine so that drain plug (4) of the final drive is at the bottom. Remove oil filler plug (5) and drain plug (4), and fit the tube of attached tool in hole of plug (4) and drain the oil.
5. After draining the oil, clean drain plugs (2), (3) and (4), then install them.
6. Add oil to the specified level through the oil filler ports (1) and (5) of the axle housing and left and right final drives.
7. After adding oil, check at level plug (1) that the oil is at the specified level. For details, see "CHECK AXLE OIL LEVEL, ADD OIL (PAGE 4-30)".

**REMARK**

For operations where the brake is used frequently, change the axle oil at shorter intervals.

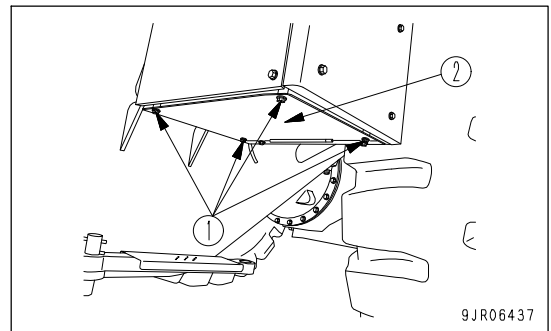
CHANGE BRAKE OIL



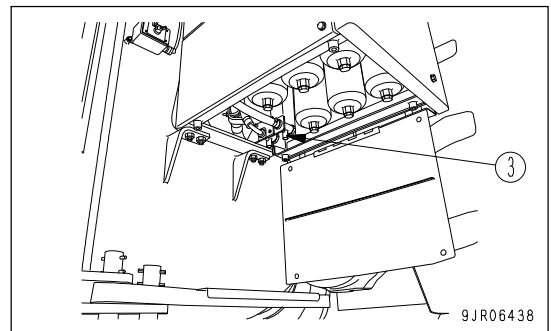
WARNING

- 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.

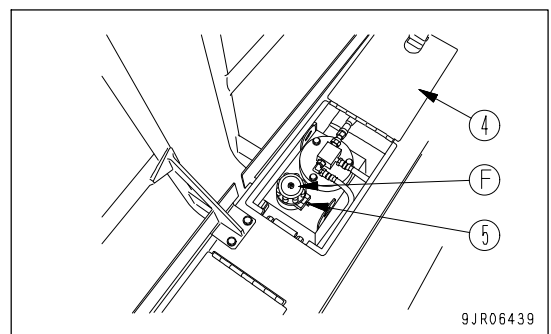
- Refill capacity: 31 liters (8.19 US gal)
 - Prepare a container to catch drain oil.
1. Loosen bolt (1), then remove cover (2) under the brake component box.



2. Insert the supplied hose into the oil drain port of drain valve (3) and set a container in position to catch the oil.



3. Open cover (4) on top of the platform on the left side of the cab, then remove the cap from oil filler (F). Pull knob (5) of the cap of oil filler (F), then turn the cap counterclockwise to remove it.
4. Loosen drain valve (3) slowly and drain the oil.
5. After draining the oil, tighten drain valve (3), and remove the hose.
6. Use bolt (1) to install cover (2) under the brake component



7. Replace the brake oil filter element. For details, see "REPLACE FILTER ELEMENT IN BRAKE OIL TANK (PAGE 4-80)".
8. Add oil through oil filler port (F) to the specified level, then install the oil filler cap.
9. Check that the oil is up to the top mark of the specified level. For details, see "CHECK BRAKE OIL TANK LEVEL, ADD OIL (PAGE 3-80)".
10. Start the engine and bleed the air from the hydraulic circuit. For details, see "BLEEDING AIR FROM BRAKE HYDRAULIC CIRCUIT (PAGE 4-36)".
11. Install the oil filler cap, then close cover (4).

REPLACE FILTER ELEMENT IN BRAKE 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.

1. Open the cover on top of the platform on the left side of the cab, then remove cap (F). Keep grip (1) pulled, turn cap (F) counterclockwise, and remove it.

2. Remove mounting bolts (3) of filter cover (2), then remove the cover.

When doing this, the cover may spring out under the force of spring (4), so hold the cover down when removing the bolts.

3. Remove spring (4) and bypass valve (5), then remove element (6).

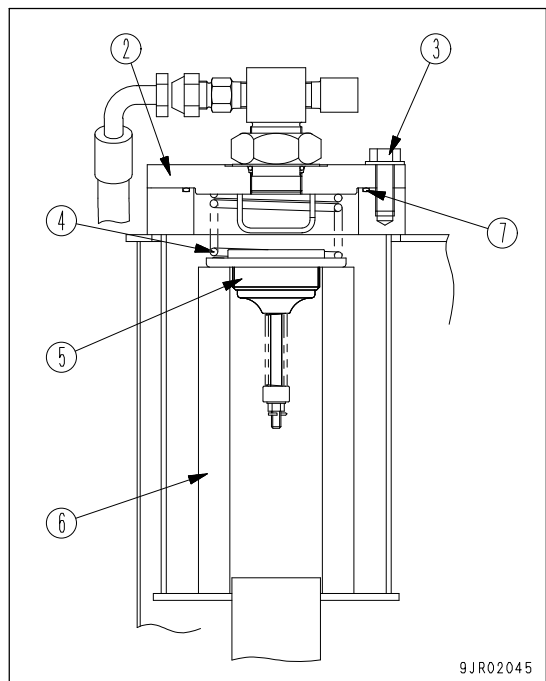
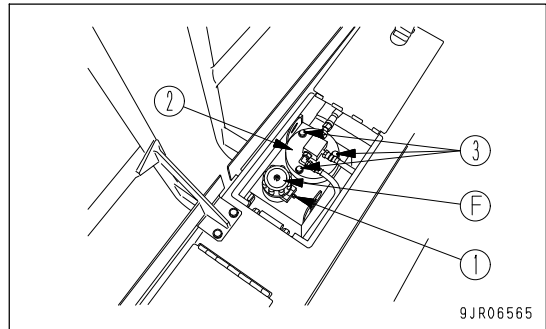
4. Check that there is no foreign material inside the tank, then clean it.

5. Install a new element, then place bypass valve (5), spring (4), and cover (2) into the tank.

Replace cover O-ring (7) with a new one.

6. When installing the cover bolts, push down the cover and tighten the bolts evenly.

7. Close the cover on top of the platform on the left side of the

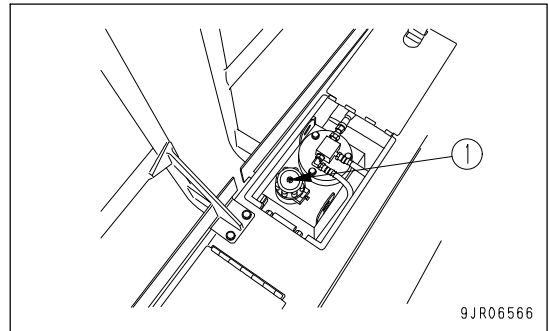


REPLACE BRAKE OIL TANK BREATHER

! 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. Open the cover on top of the platform on the left side of the
2. Loosen bolt (1) at the top of the cap.
3. Remove the cap and take out the element.
4. Coat O-ring of the new element with grease, then install.
5. Align the cap with indent or protrusion of the body, then tighten bolt (1).
6. Close the cover on top of the platform on the left side of the



REPLACE ELEMENT IN AIR CONDITIONER RECIRCULATION AIR FILTER, FRESH AIR FILTER

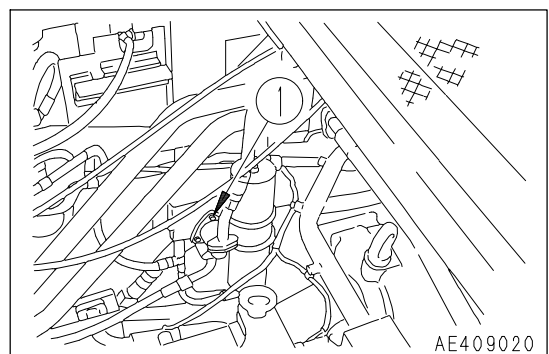
Remove both the recirculation air filter and fresh air filter in the same way as when cleaning, and replace them with new parts.

For details of cleaning the recirculation air filter, see "CLEAN ELEMENT IN AIR CONDITIONER RECIRCULATION FILTER (PAGE 4-54)".

For details of cleaning the fresh air filter, see "CLEAN ELEMENT IN AIR CONDITIONER FRESH AIR FILTER (PAGE 4-49)".

CLEAN PPC CIRCUIT STRAINER

1. Remove 3 bolts (1) of the PPC circuit strainer.
2. Remove the strainer case and pull out the strainer, then wash the strainer with clean diesel fuel.
3. Install the strainer in the strainer case, and install it with bolts (1).
4. Put bucket control lever in TILT position and lift arm control lever in FLOAT position, and after cylinder reaches stroke end, keep in that position for one minute.
5. Put bucket control lever in DUMP position and lift arm control lever in RAISE position, and after cylinder reaches stroke end, keep in that position for one minute.
6. Bleed the air from the hydraulic circuit. For details, see "BLEEDING AIR FROM PPC CIRCUIT (PAGE 4-36)".



CHECK ALTERNATOR, STARTING MOTOR

When carrying out the EVERY 2000 HOURS SERVICE or EVERY YEAR SERVICE, remove the belt and check that the alternator rotates smoothly. If it does not rotate smoothly, please ask your Komatsu distributor to carry out inspection and repair.

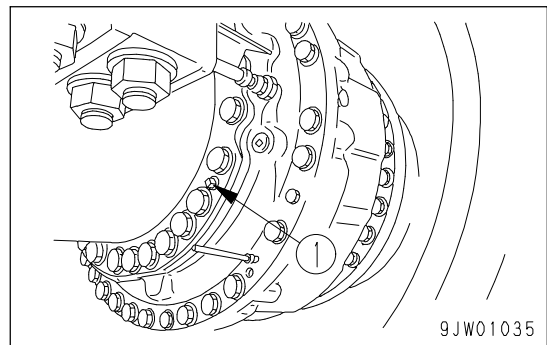
CHECK ENGINE VALVE CLEARANCE, ADJUST

As special tool is required for removing and adjusting the parts, request your Komatsu distributor for service.

CHECK BRAKE DISC WEAR

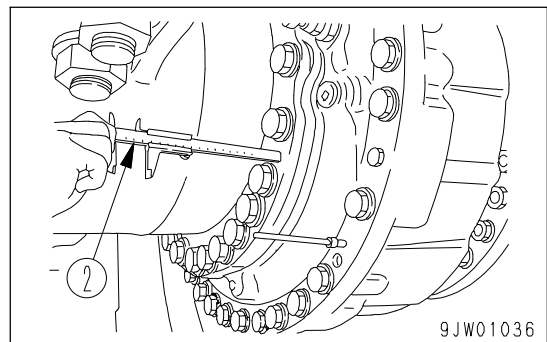
Check items

- Brake oil pressure: Start the engine, then check that the brake oil pressure caution pilot lamp and the central caution lamp (CAUTION) are flashing, but that the warning buzzer is not sounding intermittently.
1. Remove plug (1).
 2. Depress the brake pedal to the stroke end.



3. Measure depth a of the spring guide below the end of the housing with slide calipers (2).

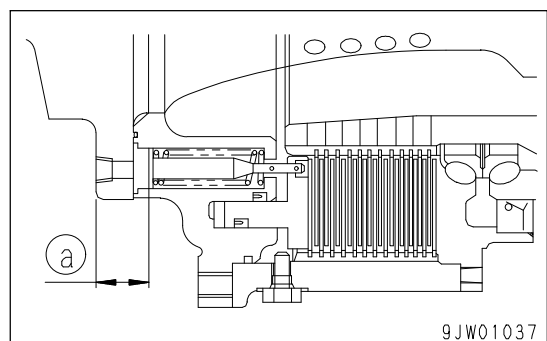
Keep the brake pedal depressed during measurement.



Wear limit (a) = 46.3 mm (1.8 in)

[Reference: Value (a) of new machine
= 40.7 ± 1.4 mm (1.6 ± 0.055 in)]

- If the disc is near the wear limit, carry out inspection at shorter intervals, regardless of the specified inspection interval.
- If the disc wear exceeds the wear limit, please contact your Komatsu distributor for check and maintenance.



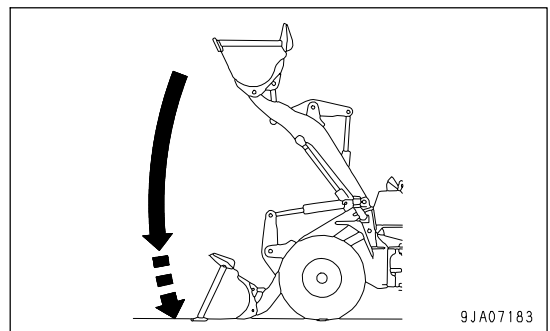
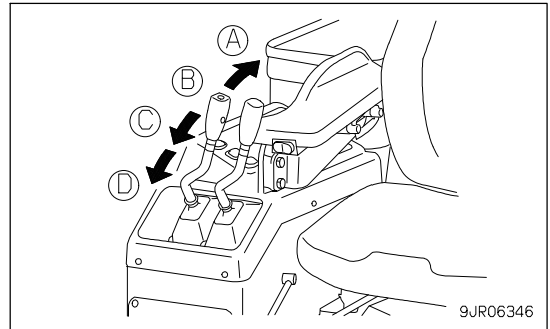
CHECKING FUNCTION OF ACCUMULATOR

For details of handling the accumulator, see Section "HANDLING ACCUMULATOR AND GAS SPRING (PAGE 2-44)".

PPC ACCUMULATOR

If the engine stops with the work equipment raised, and it is impossible to start the engine again, it is possible as an emergency measure to actuate the valve with the oil pressure stored in the accumulator and lower the work equipment to the ground.

1. Apply the parking brake.
2. Raise the work equipment to the maximum height, then operate the lift arm control lever to HOLD position (b).
3. Stop the engine.
4. Leave the work equipment lock lever in the FREE position.
5. Check that the area around the machine is safe, then turn the starting switch to the ON position, set the lift arm control lever to FLOAT position (d), and lower the work equipment to a point 1 m (3 ft 3 in) above the ground.
6. When the lift arm comes to the 1 m position, return the lift arm control lever to LOWER position (c), and lower the work equipment slowly to the ground.



REMARK

Carry out the check within 2 minutes after stopping the engine. If the machine is left with the engine stopped, the accumulator pressure will drop and it will be impossible to check the cause of the problem.

If the work equipment stops while it is moving, the gas pressure in the accumulator has probably dropped. Please contact your Komatsu distributor to have the accumulator inspected. Replace the accumulator every 4000 hours or every 2 years.

EVERY 4000 HOURS SERVICE

Maintenance for every 50, 100, 250, 500, 1000 and 2000 hours service should be carried out at the same time.

CHECK WATER PUMP

Check that there is no play in the pulley or any grease leakage, water leakage, or clogging of the drain hole. If any problem is found, contact your Komatsu distributor for disassembly and repair or replacement.

CHECK STARTING MOTOR

The brush may be worn or have no grease on the bearing, so contact your Komatsu distributor for inspection or repair.

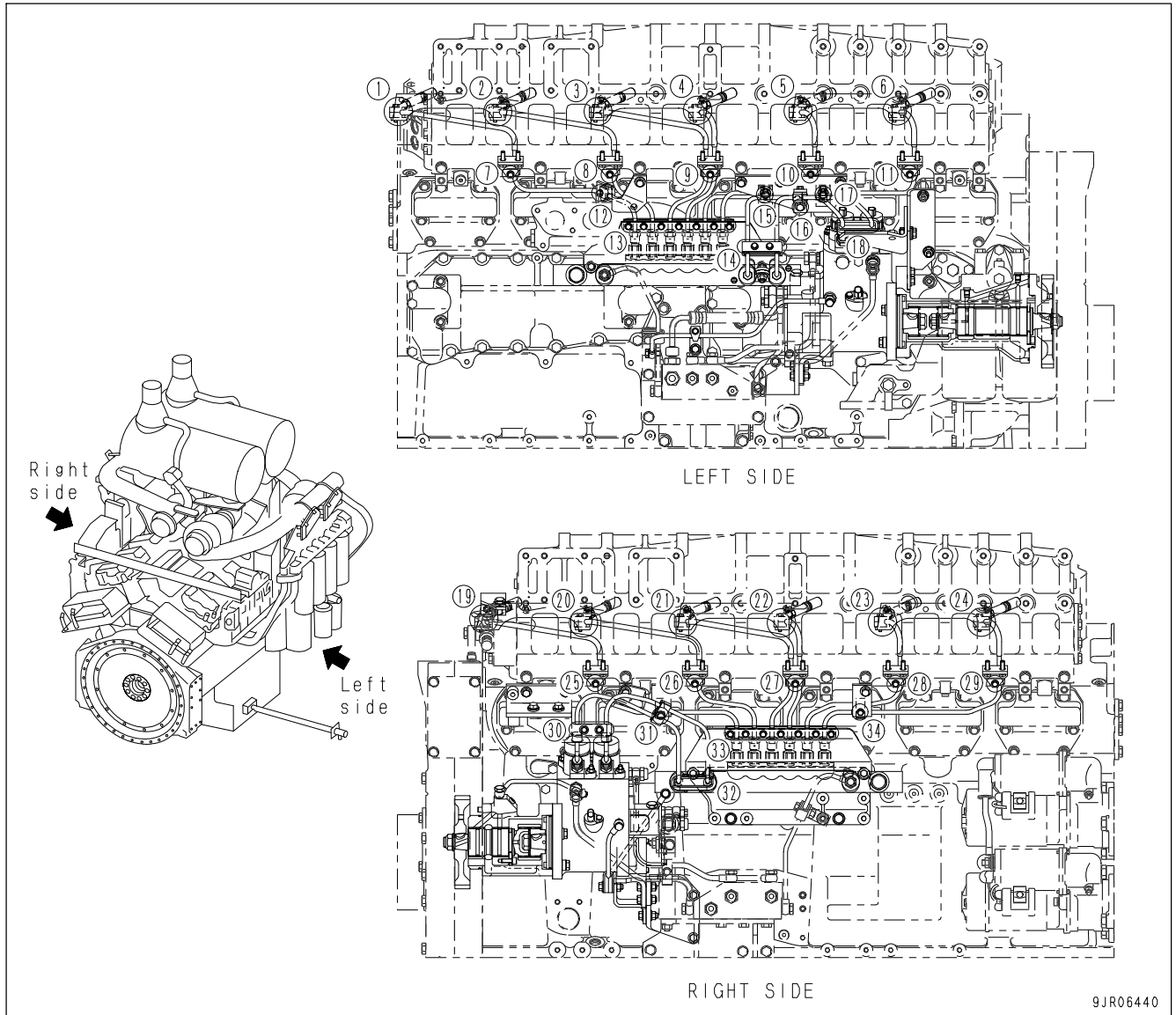
If the engine is started frequently, carry out inspection every 1000 hours.

CHECK FAN PULLEY AND TENSION PULLEY

Check the pulley for play and leakage of grease. If there is any abnormality, please contact your Komatsu distributor for disassembly and repair or replacement.

CHECK FOR LOOSE ENGINE HIGH-PRESSURE PIPING CLAMPS, HARDENING OF RUBBER

Check visually and touch by hand to check that there are no loose mounting bolts for high-pressure piping clamps (1) - (34) in the diagram and no hardening of any rubber parts. If any problem is found, the part must be replaced. In this case, please ask your Komatsu distributor to carry out the replacement.

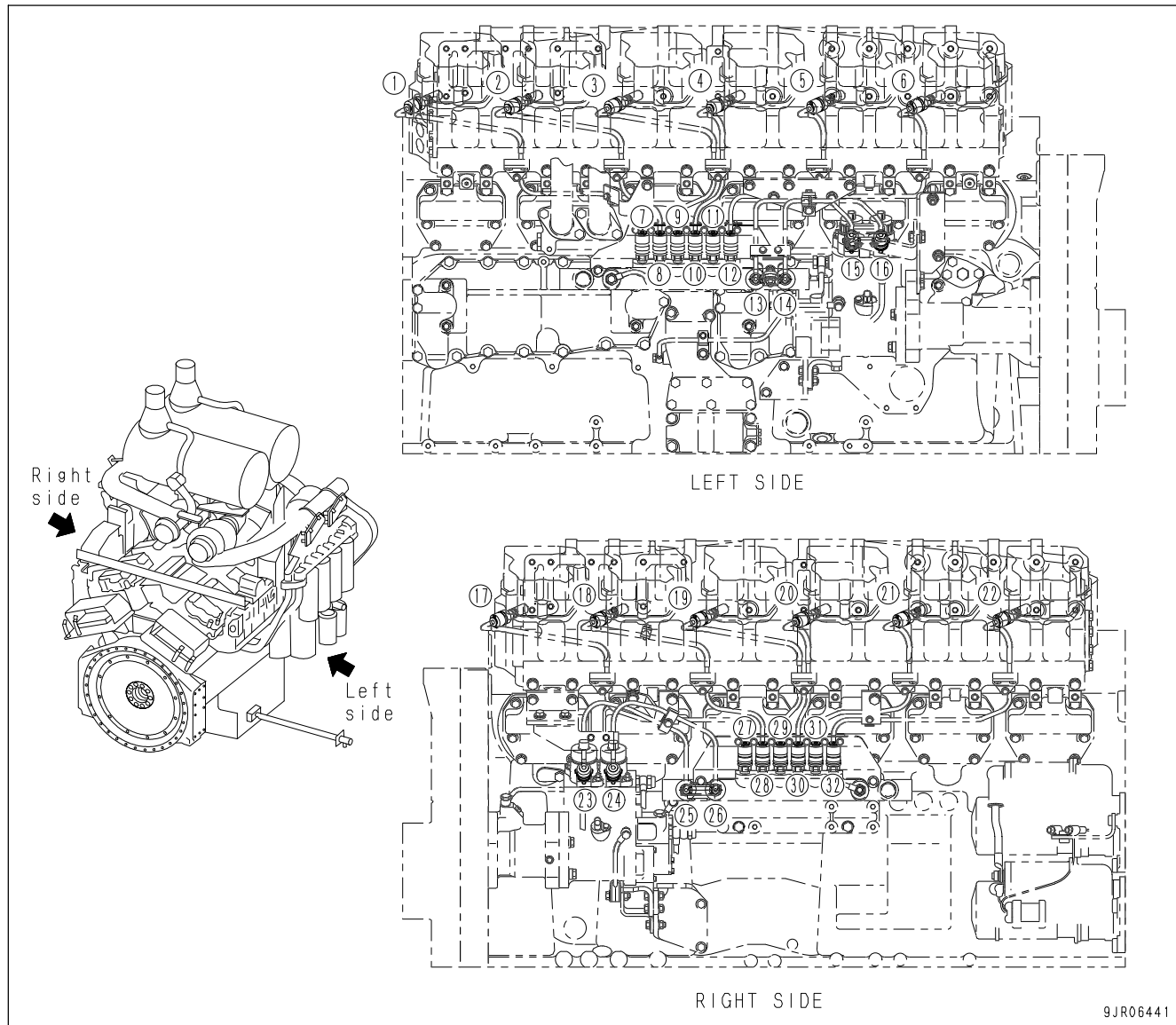


NOTICE

If the engine continues to be used when there are loose bolts, hardened rubber, or missing parts, there is danger of damage or breakage occurring due to vibration and wear at the connections of high-pressure piping. Always check that the proper high-pressure piping clamps are correctly installed.

CHECKING FOR MISSING FUEL SPRAY PREVENTION CAP, HARDENING OF RUBBER

Fuel spray prevention caps (1) - (32) are protective parts installed to prevent fire caused by fuel leaking and spraying out on to high temperature parts of the engine. Check visually that there are no missing caps or loose bolts, and feel with your finger to check that the rubber has not hardened. If there is any problem, the problem part must be replaced. Contact your Komatsu distributor for part replacement.



9JR06441

EVERY 8000 HOURS SERVICE

Maintenance for every 50, 100, 250, 500, 1000, 2000 and 4000 hours service should be carried out at the same

REPLACE ENGINE HIGH-PRESSURE PIPING CLAMPS

Contact your Komatsu distributor to have the engine high-pressure clamps replaced.

REPLACE FUEL SPRAY PREVENTION CAP

Contact your Komatsu distributor to have the fuel spray prevention cap replaced.

OVERHAUL STARTING MOTOR AND ALTERNATOR

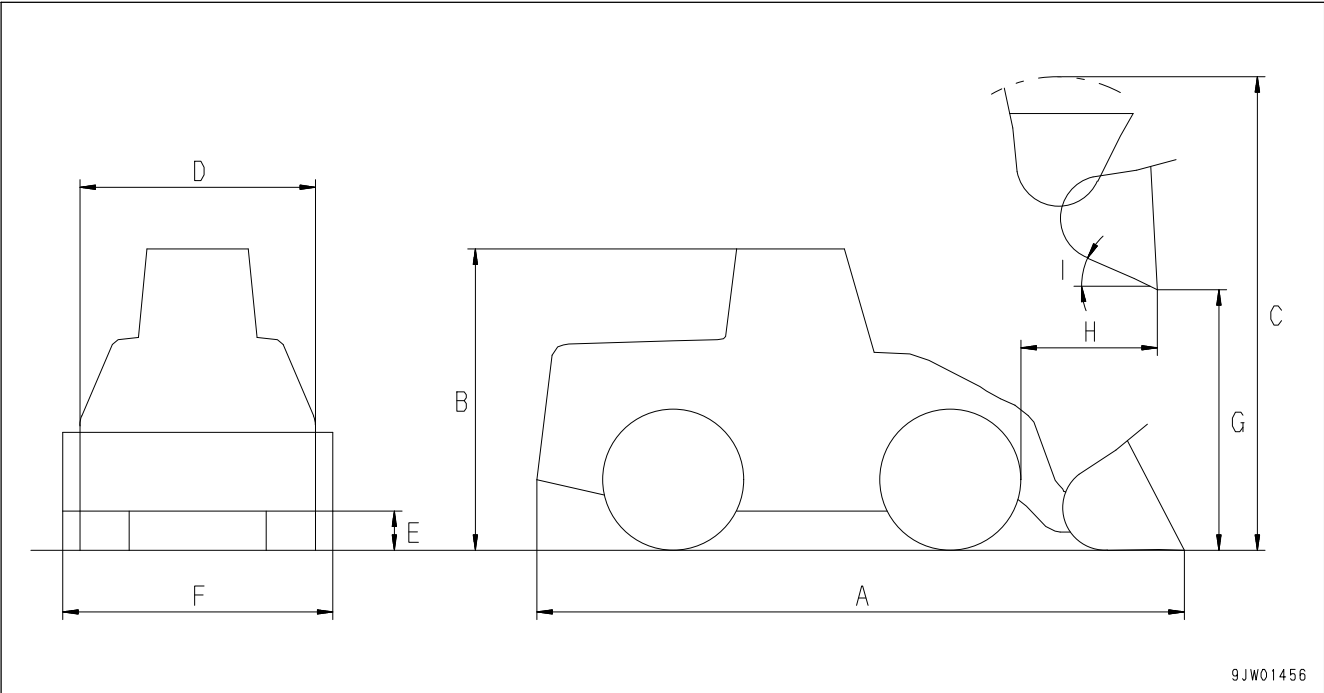
Ask your Komatsu distributor to carry out this work.

SPECIFICATIONS

SPECIFICATIONS

WA800-3E0

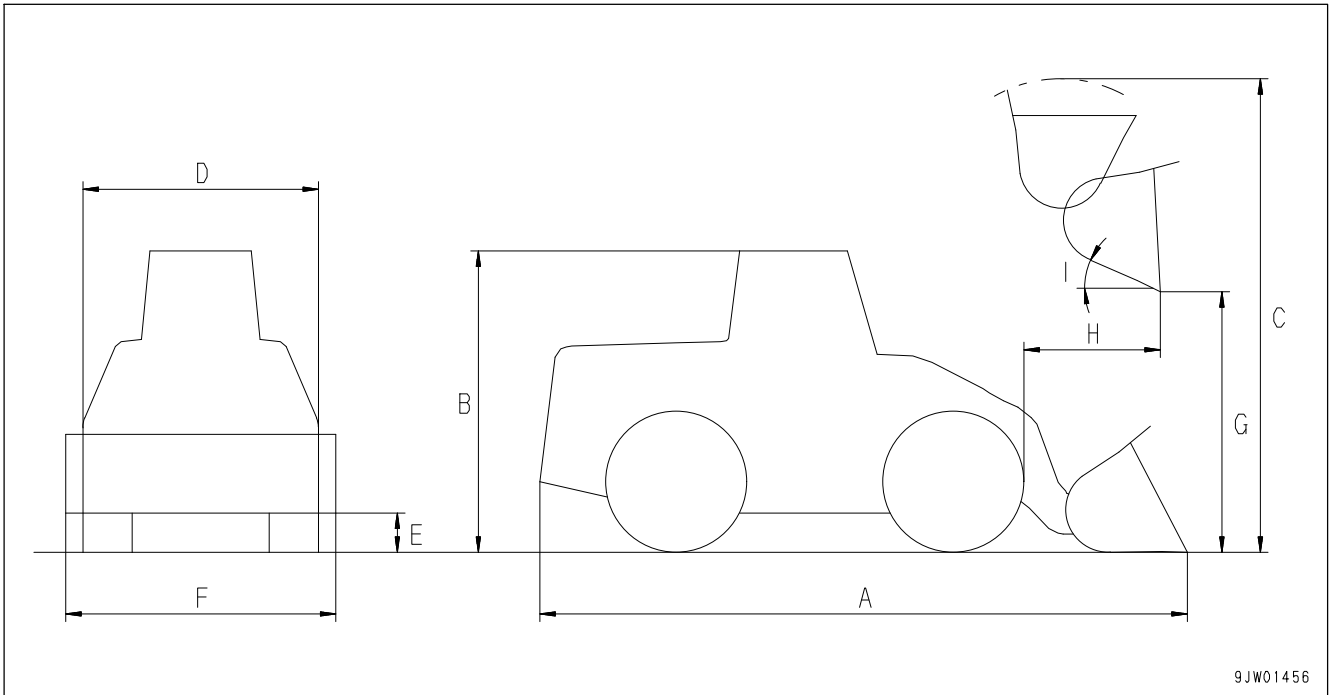
Item		Unit	For North America	For areas other than North America
Operating weight (including 1 operator: 80 kg (176 lb))		kg (lb)	104200 (229761)	101900 (224689)
Normal load		kg (lb)	19800 (43659)	
Bucket capacity		m ³ (cu.yd)	11 (14.4)	
Engine model		-	Komatsu SAA12V140E diesel engine	
Horsepower	Net (ISO 9249 / SAE J1349)	kW{HP}/rpm	603{808}/2000	
	Gross (SAE J1995)		636{853}/2000	
A	Overall length (including teeth)	mm (ft in)	14325 (46' 12")	13960 (45' 10")
B	Overall height	mm (ft in)	5275 (17' 4")	
C	Bucket overall height (When bucket lifted)	mm (ft in)	9300 (30' 6")	
D	Overall width	mm (ft in)	4585 (15' 1")	
E	Min. ground clearance	mm (ft in)	550 (1' 10")	
F	Bucket width	Tire guard {Tip of tooth}	mm (ft in)	5045 (16' 7") {4815 (15' 10")}
G	Clearance	Tip of bucket {Tip of tooth}	mm (ft in)	{4715 (15' 6")}
H	Reach	Tip of bucket {Tip of tooth}	mm (ft in)	2150 (7' 1") {2385 (7' 10")}
I	Dump angle	degrees	45	
Min. turning radius	Outside of chassis	mm (ft in)	10930 (35' 10")	10900 (35' 9")
	Center of outside tire	mm (ft in)	9200 (30' 2")	
Travel speed	Forward	1st	km/h (MPH)	7.0 (4.3)
		2nd		12.3 (7.6)
		3rd		28.0 (17.4)
	Reverse	1st	km/h (MPH)	7.1 (4.4)
		2nd		12.4 (7.7)
		3rd		28.3 (17.6)



9JW01456

WA900-3E0

Item		Unit	For North America	For areas other than North America
Operating weight (including 1 operator: 80 kg (176 lb))		kg (lb)	108100 (238360)	107200 (236376)
Normal load		kg (lb)	23400 (51597)	
Bucket capacity		m ³ (cu.yd)	13 (17)	
Engine model		-	Komatsu SAA12V140E diesel engine	
Horsepower	Net (ISO 9249 / SAE J1349)	kW{HP}/rpm	638{856}/2050	
	Gross (SAE J1995)		671{900}/2050	
A	Overall length (including teeth)	mm (ft in)	14430 (47' 4")	14485 (47' 6")
B	Overall height	mm (ft in)	5275 (17' 4")	
C	Bucket overall height (When bucket lifted)	mm (ft in)	9680 (31' 9")	
D	Overall width	mm (ft in)	4585 (15' 1")	
E	Min. ground clearance	mm (ft in)	550 (1' 10")	
F	Bucket width	Tire guard {Tip of tooth}	mm (ft in)	5045 (16' 7") {4815 (15' 10")}
G	Clearance	Tip of bucket {Tip of tooth}	mm (ft in)	{4715 (15' 6")}
H	Reach	Tip of bucket {Tip of tooth}	mm (ft in)	2215 (7' 3") {2450 (8' 0")}
I	Dump angle	degrees	45	
Min. turning radius	Outside of chassis	mm (ft in)	11065 (36' 4")	11000 (36' 5")
	Center of outside tire	mm (ft in)	9200 (30' 2")	
Travel speed	Forward	1st	km/h (MPH)	7.0 (4.3)
		2nd		12.3 (7.6)
		3rd		28.0 (17.4)
	Reverse	1st	km/h (MPH)	7.1 (4.4)
		2nd		12.4 (7.7)
		3rd		28.3 (17.6)



ATTACHMENTS, OPTIONS

 **WARNING**

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

SELECTING BUCKET AND TIRES

Select the most suitable bucket and tires for the type of work and the ground conditions on the jobsite.

WA800-3E0

(Only machines with standard 11.0m³ (14.4 cu.yd) specification)

Type of work	Bucket	Ground conditions	Tire
Loading materials and blasted rock	Straight edge rock bucket (11.0m ³ (14.39 cu.yd))	General ground conditions	45/65-45-46PR (L5) 45/65-45-50PR (L5)
		Hard ground	
Loading blasted rock	Spade nose bucket (11.0m ³ (14.39 cu.yd))	General ground conditions	45/65-45-46PR (L5)
		Hard ground	45/65-45-50PR (L5)
		Ground with many boulders	45/65-45-46PR (L5) 45/65-45-50PR (L5)
		Soft ground with many boulders	Use tire chains as a tire protector
Loading and carrying blasted rock	Spade nose bucket (11.0m ³ (14.39 cu.yd))	General ground conditions	45/65-45-46PR (L4 or L5) 45/65-45-50PR (L4 or L5)
		Hard ground	45/65R45 ☆ ☆ (L5)
		Ground with many rocks	45/65-45-46PR (L4 or L5) 45/65-45-50PR (L4 or L5)
		Soft ground with many rocks	45/65R45 ☆ ☆ (L5)
		Soft ground	Use tire chains as a tire protector

WA900-3E0

Type of work	Bucket	Ground conditions	Tire
Loading materials and blasted rock	Straight edge rock bucket (13.0m ³ , (17.0 cu.yd))	General ground conditions	45/65-45-58PR (L5)
		Hard ground	
Loading blasted rock	Spade nose bucket (13.0m ³ , (17.0 cu.yd))	General ground conditions	45/65-45-58PR (L5)
		Hard ground	
		Ground with many boulders	45/65-45-58PR (L5)
		Soft ground with many boulders	Use tire chains as a tire protector(*)
Loading and carrying blasted rock	Spade nose bucket (13.0m ³ , (17.0 cu.yd))	General ground conditions	45/65-45-58PR (L-5)
		Hard ground	45/65R45 ☆ ☆ (L5)
		Ground with many rocks	45/65-45-58PR (L-5)
		Soft ground with many rocks	45/65R45 ☆ ☆ (L5)
		Soft ground	Use tire chains as a tire protector(*)

The displayed travel speed changes according to the tire size, so when installing optional tires, please contact your Komatsu distributor.

On jobsites where there are boulders or sharp rocks, install tire protectors (mesh chain).

(*): In the case of WA900-3E0, do not fit a tire protector (mesh chain type) to the rear wheels.

(For further details, see "PRECAUTIONS RELATED TO PROTECTIVE STRUCTURES (PAGE 2-19)".)

Check the chain for cuts or sagging before starting operation.

Be careful not to let the tires and chain slip during operation.

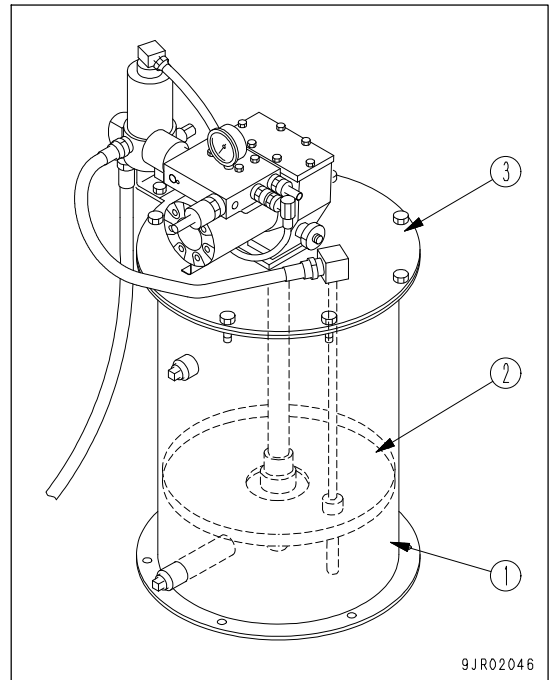
HANDLING AUTO-GREASING SYSTEM

With this system, the grease is automatically supplied through the computer controls.

1. Check that a can or grease is in the grease pump case. If the grease level is low, fill with grease.
2. Check that there is no leakage of grease between the grease can or grease pump case (1) and follower plate (2).

NOTICE

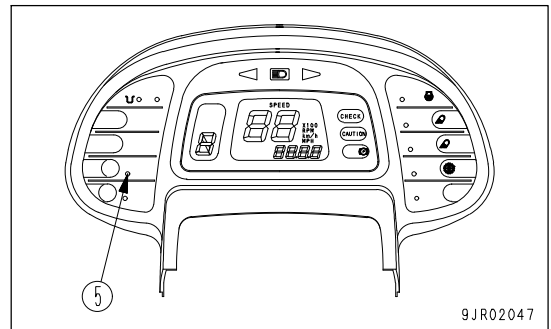
Do not remove follower plate (2). If follower plate (2) is not used, pump (3) will be unable to suck up the grease even if there is still a large quantity of grease in the can.



Both when using a grease can and when not using a grease can, use suitable follower plate (2).

	Follower plate part No.
When using grease can	42C-S95-1740
When not using grease can	42C-S95-1730

3. Turn the starting switch key to the ON position and check that auto greasing pilot lamp (5) on the main monitor lights up.



Lamp lights up: Normal

Electricity is supplied to the auto-greasing system, and when there is no abnormality and the grease pump is being actuated to supply grease, the indicator lamp lights up when the pressure of the grease and the supply line is above the specified pressure.

Lamp flashes: The indicator lamp flashes when grease inside the grease pump is short; the electric circuit is disconnected; and pressure in the supply line does not reach a specified pressure level while the grease pump is in operation.

The lamp keeps flashing until pressure in the supply line reaches a specified pressure level after the pump begins to work. Once the specified pressure level is reached, the lamp lights up. Therefore, flashing in this instance is nothing abnormal.

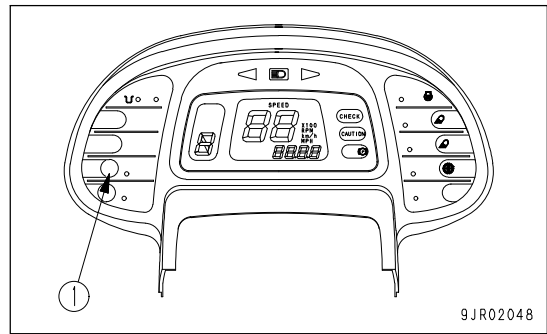
If on the other hand the lamp does not stop flashing (i.e. does not light up) even though grease has been sufficiently added, then there is something wrong with the machine. In that case, stop the machine at once and consult your Komatsu distributor.

METHOD OF OPERATING AUTO-GREASING SYSTEM

1. When the starting switch of the machine is turned ON, this system automatically starts operation.
2. Auto-greasing switch (1)

If auto-greasing switch (1) is pressed, the grease pump can be operated, regardless of the timer. The grease pump operates only while the auto-greasing switch is kept pressed. The grease pump stops immediately when the auto-greasing switch is released.

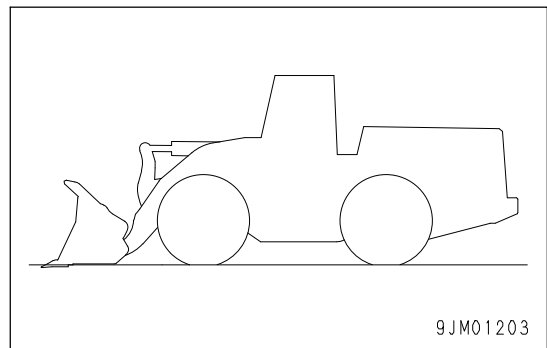
This switch is used mainly to check the operation of the grease pump or to supply additional grease.



9JR02048

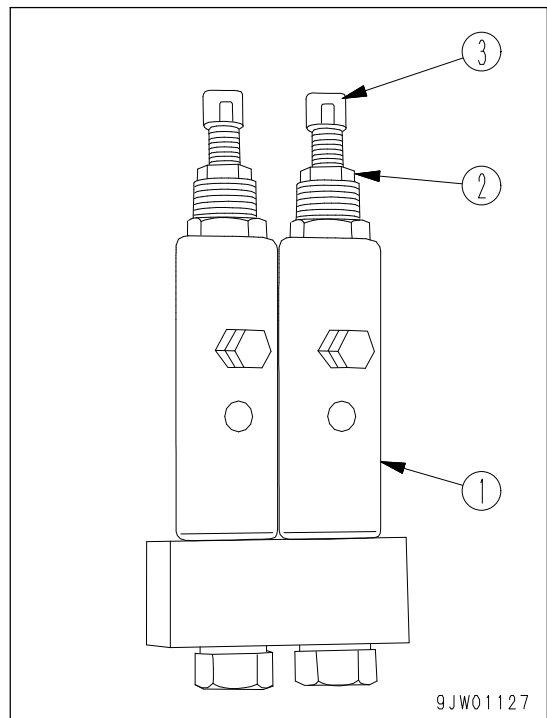
PRECAUTIONS WHEN HANDLING AUTO-GREASING SYSTEM

1. Lower the bucket horizontally to the ground.



9JM01203

2. Adjustment of discharge from injector (1)
Set the all injectors to the maximum discharge.
Loosen lock nut (2) and turn adjustment screw (3) counterclockwise.
3. Method of bleeding air from main line
Loosen the plug installed to each injector to bleed air from the main piping. This work shall be carry out by two persons. Start bleeding at the injector nearest the grease pump, then bleed at the other injectors in order (Rear frame -> Front frame -> Boom -> Bell crank).



9JW01127

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

This plug (4) is installed to the manifold end of each end injector.

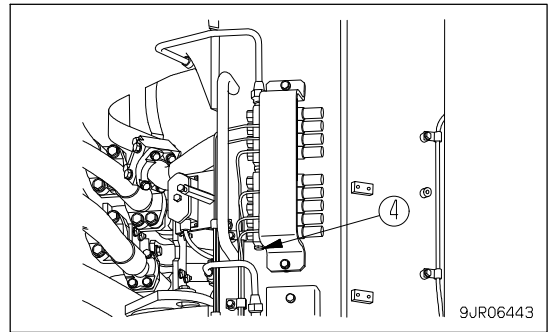
If air must be bled from the main piping, remove this plug.

- 2) The other person presses the auto-greasing switch to start the grease pump.
- 3) Discharge the grease containing air (milky white in many cases) from the injector. If normal grease comes out, stop the grease pump.

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

It is impossible to see if the air has been bled by simply checking the pressure gauge. Even if air is mixed in the grease, the auto-grease system operates since the discharge pressure of the grease pump is high.

To see if the greasing system is working normally, check that the grease pump is balanced and stopped in the specified (operating) time (60 seconds).



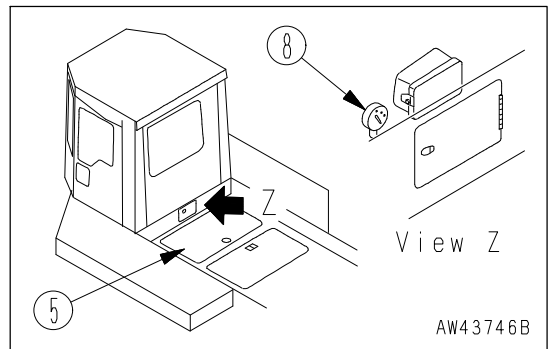
4. Method of bleeding air from pressure switch This work shall be performed by two persons.

- 1) Open transmission inspection cover (5) at the rear of the cab. One person removes pressure switch (7) from block (6), then stays there.

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

- 3) Discharge the grease containing air (milky white in many cases) from the block (6). If normal grease comes out, stop the grease pump.

- 4) Install pressure switch (7) to block (6). (Check that grease is not leaking.)



5. Method of bleeding air from supply line

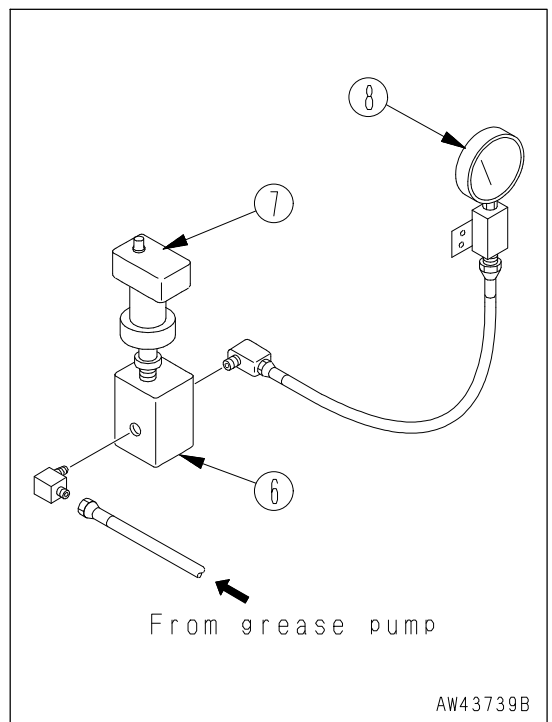
This work shall be performed by two persons.

- 1) One person removes supply line pressure gauge (8) from block (6), then stays there.

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

- 3) Discharge the grease containing air (milky white in many cases) from the block (6). If normal grease comes out, stop the grease pump.

- 4) Install pressure gauge (8) to block (6). (Check that grease is not leaking.)

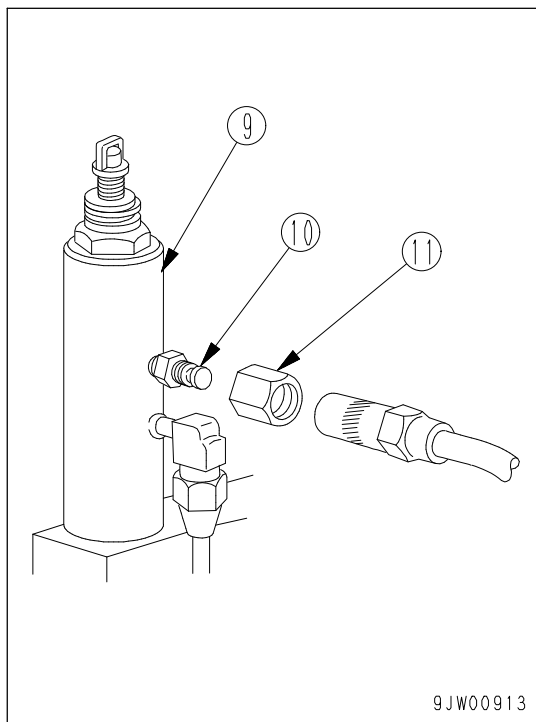


NOTICE

If air is left in the circuit, the grease pressure will not rise to the specified level or will take a long time to rise to the specified level, and the injector will not work normally.

6. Filling branch lines (Injector - Pin) with grease

Remove cap (11) of filler fitting (10) of injector (9), then fill the all branch lines with grease by using a hand grease gun.



9JW00913

7. Check of supply line pressure

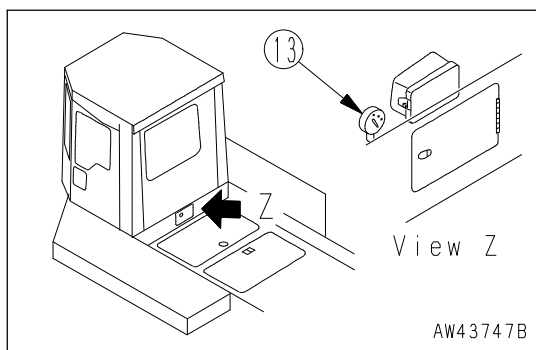
Check grease pump pressure gauge (12) and supply grease line pressure gauge (13).

Supply grease line pressure gauge

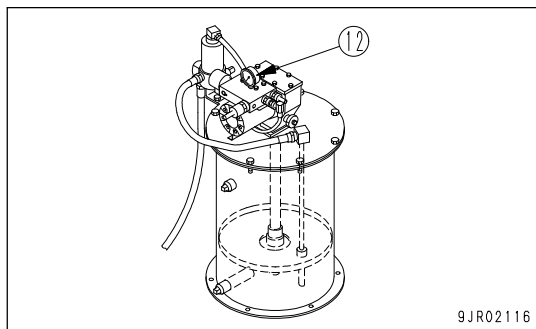
Normal value: 20.6 MPa (210 kg/cm², 2982 PSI)

Grease pump pressure gauge

Normal value: 2.06 MPa (21 kg/cm², 298.2 PSI)



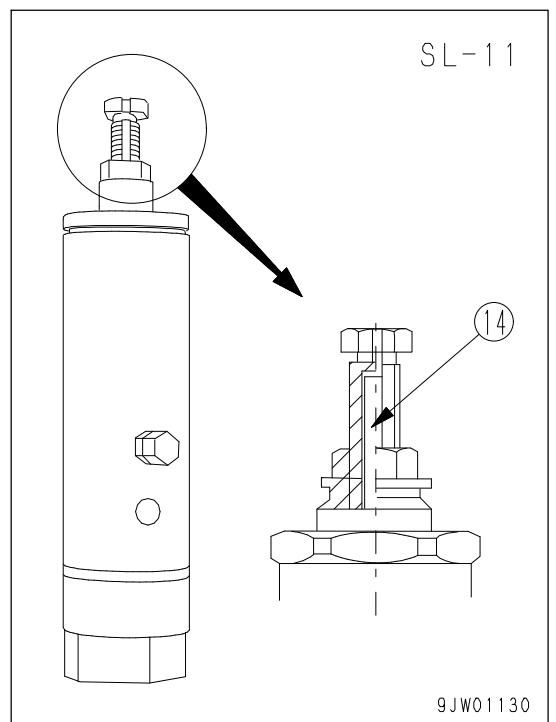
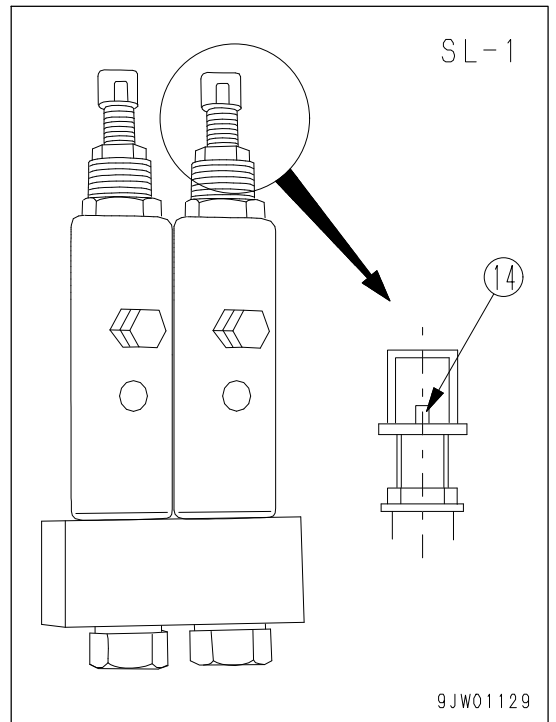
AW43747B



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8. Check of operation of injector

Turn ON the auto-greasing switch, and check that indicator pin (14) of injector (SL-1, SL-11) is operating normally.



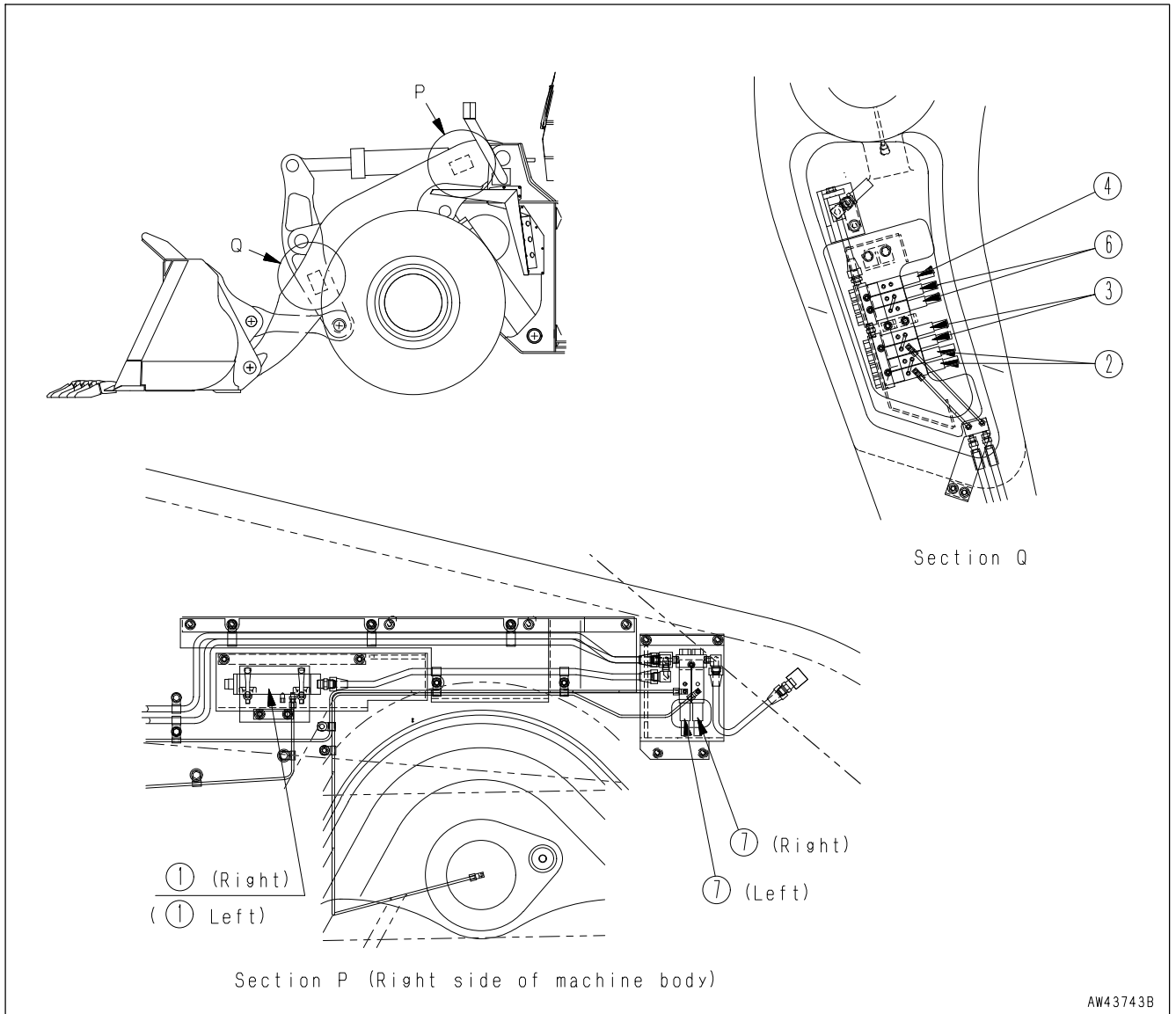
9. Adjustment of greasing rate and injector

- Adjust the injector to change the greasing rate for 0 - 30 hours (First step), 30 - 150 hours ((Second step) and after 150 hours after the auto-greasing system installed.
- Set the interval to 11.25 minutes.

		Up to 30Hr		Up to 150Hr		After 150Hr	
		First step		Second step		Third step	
Injector	Interval	11.25 min		11.25 min		11.25 min	
	Greasing point	cc/Hr	Adjustment of injector	cc/Hr	Adjustment of injector	cc/Hr	Adjustment of injector
SL-11	(1) Bucket hinge (Right and left)	49.2	Open fully	49.2	Keep at position for first step.	49.2	Keep at position for second step.
	(2) Front bucket link	15.6	Open fully	7.8	Open one fully. Close one to minimum.	3.9	Close one by 5 turns from full. Close one to minimum.
	(3) Rear bucket link	15.6	Open fully	15.6	Keep at position for first step.	15.6	Keep at position for second step.
	(4) Bucket cylinder rod	7.8	Open fully	3.9	Close by 5 turns from full.	1.95	Close by 2.5 turns from position for second step.
	(5) Bucket cylinder bottom	7.8	Open fully	3.9	Close by 5 turns from full.	1.95	Close by 2.5 turns from position for second step.
	(6) Bell crank center	15.6	Open fully	7.8	Open one fully. Close one to minimum.	3.9	Close one by 5 turns from full. Close one to minimum.
	(7) Boom cylinder rod (Right and left)	7.8	Open fully	3.9	Close by 5 turns from full.	3.9	Keep at position for second step.
	(8) Boom cylinder bottom (Right and left)	7.8	Open fully	3.9	Close by 5 turns from full.	3.9	Keep at position for second step.
	(9) Boom pivot (Right and left)	15.6	Open fully	15.6	Keep at position for first step.	15.6	Keep at position for second step.
	(10) Center hinge pin (Upper)	7.8	Open fully	3.9	Close by 5 turns from full.	1.95	Close by 2.5 turns from position for second step.
	(11) Steering cylinder bottom (Right and left)	7.8	Open fully	3.9	Close by 5 turns from full.	1.95	Close by 2.5 turns from position for second step.
	(12) Center support	7.8	Open fully	3.9	Close by 5 turns from full.	1.95	Close by 2.5 turns from position for second step.
	(13) Center hinge pin (Lower)	7.8	Open fully	3.9	Close by 5 turns from full.	1.95	Close by 2.5 turns from position for second step.
	(14) Rear axle support (Front)	15.6	Open fully	7.8	Open one fully. Close one to minimum.	3.9	Close one by 5 turns from full. Close one to minimum.
	(15) Transmission mount support	7.8	Open fully	3.9	Close by 5 turns from full.	1.56	Close by 3 turns from position for second step.
	(16) Rear axle support (Cover)	15.6	Open fully	7.8	Open one fully. Close one to minimum.	3.9	Close one by 5 turns from full. Close one to minimum.
	(17) Rear axle support (Top)	15.6	Open fully	7.8	Open one fully. Close one to minimum.	3.9	Close one by 5 turns from full. Close one to minimum.
	(18) Steering cylinder rod (Right and left)	7.8	Open fully	3.9	Close by 5 turns from full.	1.95	Close by 2.5 turns from position for second step.

The injector turns by 10 turns between the full minimum opening positions.

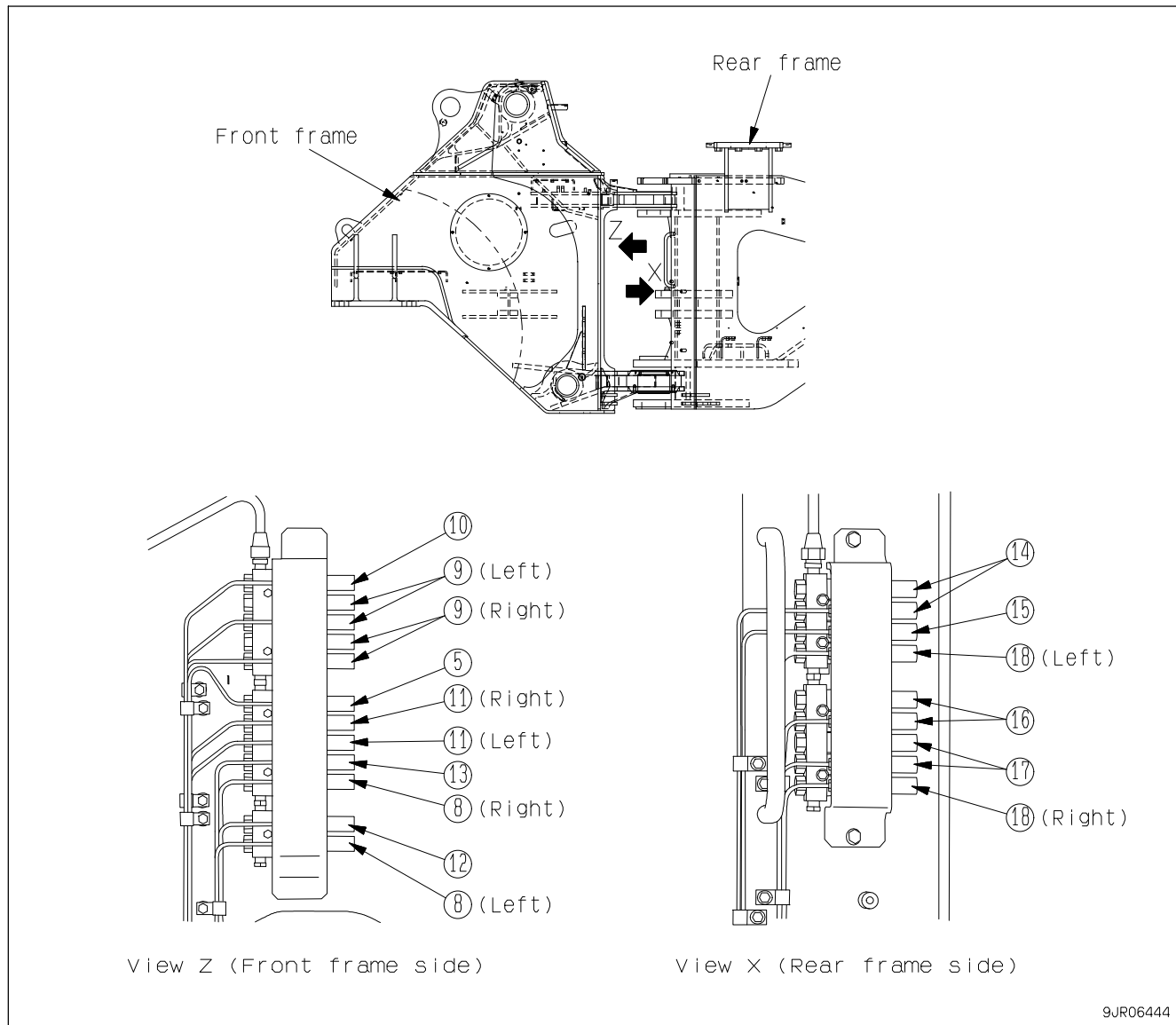
Greasing points (Loader linkage)



AW43743B

- | | |
|-------------------------|---------------------------|
| (1) Bucket hinge | (4) Bucket cylinder rod |
| (2) Bucket link (front) | (6) Bellcrank center |
| (3) Bucket link (rear) | (7) Lift arm cylinder rod |

Greasing points (Front frame and rear frame)



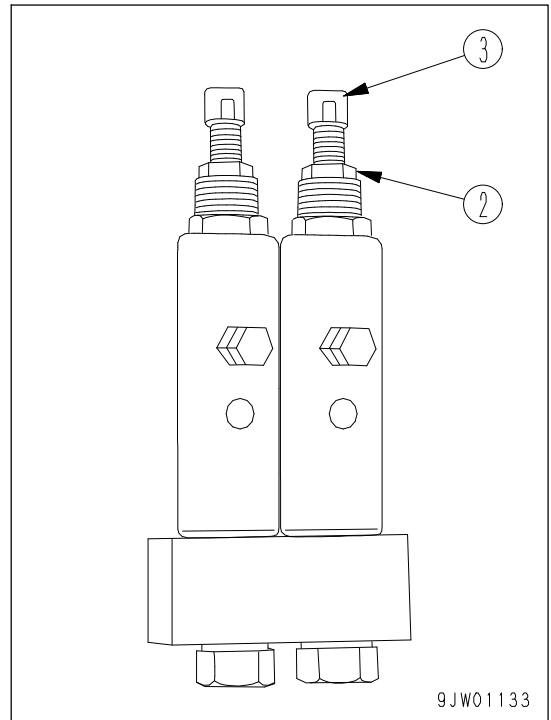
9JR06444

- | | |
|-------------------------------|--------------------------------|
| (5) Bucket cylinder bottom | (13) Center hinge pin (lower) |
| (8) Lift arm cylinder bottom | (14) Rear axle support (front) |
| (9) Lift arm pivot (right) | (15) Transmission support |
| (10) Center hinge pin (upper) | (16) Rear axle support (cover) |
| (11) Steering cylinder bottom | (17) Rear axle support (top) |
| (12) Center support | (18) Steering cylinder rod |

METHOD OF ADJUSTING DISCHARGE FROM INJECTOR

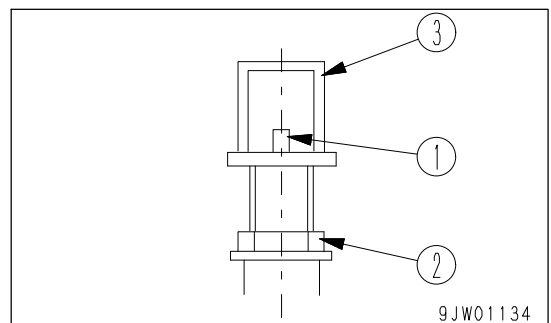
1. Injector (SL1)

- 1) The injector is operated by the pressure from the pump, and it feeds grease of the specified quantity to the bearing.
- 2) To see if the injector works normally, check the operation of indicator pin (1) on its head. If the injector is normal, the pin is retracted first. If the pump stops and the pressure is lost, the pin returns and it is reset for the next greasing.
- 3) Adjust the discharge from the injector with adjustment screw (3) on its head.
 - 1] To reduce the discharge, loosen lock nut (2) and turn adjustment screw (3) clockwise. If the adjustment screw stops (at the stopper), the discharge is minimized.
 - 2] If the adjustment screw is returned by 10 turns from the fully tightened position (minimum discharge) in 1) above, the discharge is maximized (1.3 cc/st). After adjusting the discharge from the injector, be sure to tighten lock nut (2).



- 4) Although the injector can be overhauled and repaired, replace it with a spare one, if possible, when it has any trouble.
 - Loosen lock nut (2) and turn adjustment screw (3) to adjust the discharge of grease made each time.

	Discharge/time
Turn clockwise to stopper	0.13 cc (Min)
Turn counterclockwise by 10 turns from above position	1.30 cc (Max)



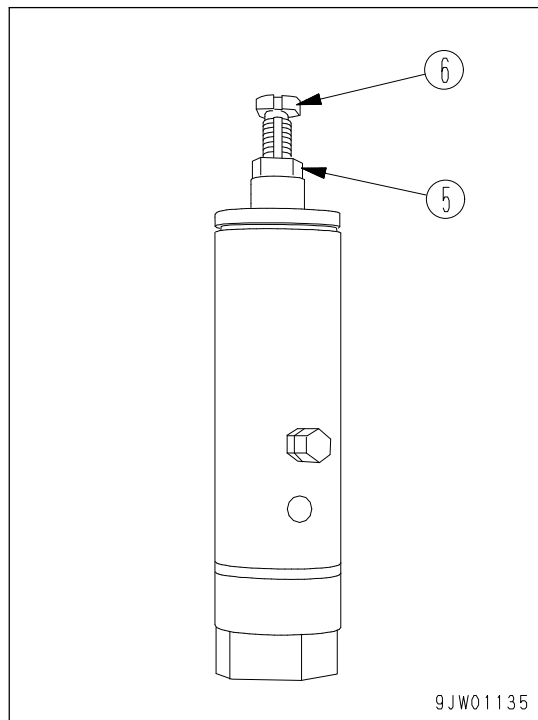
One turn between the maximum and minimum positions change the discharge by 0.13 cc. After adjusting the discharge, be sure to tighten the lock nut.

2. Injector (SL11)

- 1) The injector is operated by the pressure from the pump, and it feeds grease of the specified quantity to the bearing.
- 2) To see if the injector works normally, check the operation of indicator pin (4) on its head. If the injector is normal, the pin is retracted first. If the pump stops and the pressure is lost, the pin returns and it is reset for the next greasing.
- 3) Adjust the discharge from the injector with adjustment screw (6) on its head.

- 1] To reduce the discharge, loosen lock nut (5) and turn adjustment screw clockwise. If the adjustment screw stops (at the stopper), the discharge is minimized.
- 2] If the adjustment screw is returned by 10 turns from the fully tightened position (minimum discharge) in 1] above, the discharge is maximized (8.2 cc/st).

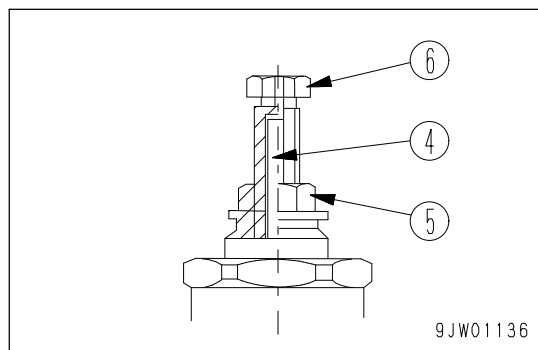
After adjusting the discharge from the injector, be sure to tighten lock nut.



- 4) Although the injector can be overhauled and repaired, replace it with a spare one, if possible, when it has any trouble.

- Discharge adjusting procedure for large-sized injector (SL-11) (Added to bucket pin)
Loosen lock nut (5) and turn adjustment screw (6) to adjust the discharge of grease made each time.

	Discharge (cc/cycle)
Turn clockwise to stopper (Min. discharge)	0.82
Turn counterclockwise by 10 turns from above position (Max. discharge)	8.2

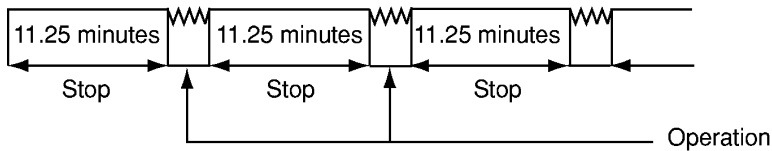


One turn between the maximum and minimum positions change the discharge by 0.82 cc.
After adjusting the discharge, be sure to tighten the lock nut.

METHOD OF SETTING TIMER

- The timer is installed to control the greasing interval of the auto-grease system.
- The timer is installed in box (1) at the rear of the operator's seat.
- The greasing interval can be changed freely according to the following table with the blue dial of the timer. The set interval has an error of about $\pm 15\%$, however (for both stopping and starting).

Examine: When timer is set to 11.25 minutes

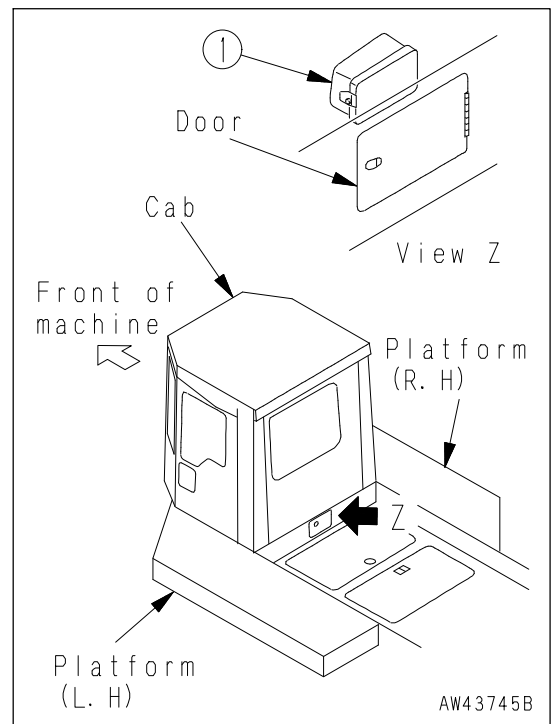


1. Adjustment of greasing interval

Timer box (1) is in the position shown at right.

- Power supply for timer

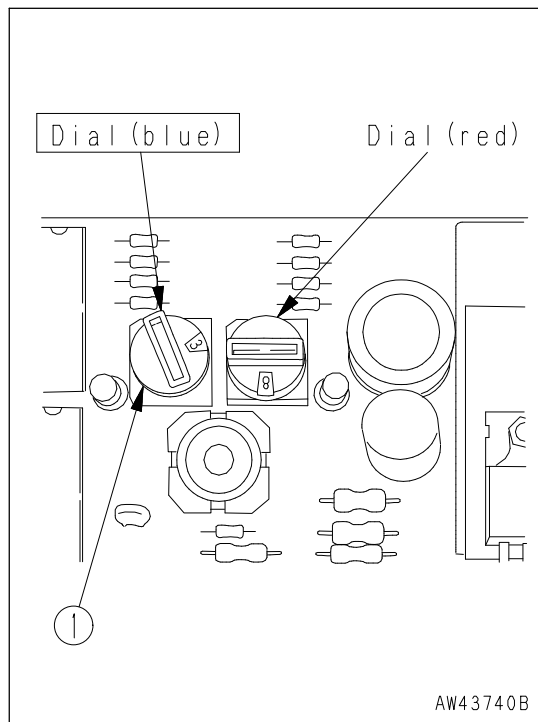
Even after the starting switch is turned off, both interval time and operating time are stored in this circuit board by the capacitor (Super Cap) for about five days, and the next operation starts under the condition when the power was turned off previous time. If the power is kept turned off for more than five days, however, the memory is canceled.



2. Method of adjusting interval time (Blue dial)

Open the door at the rear lower of the cab, then open the timer box. Turn the dial shown at right to adjust the interval time and operating time.

To adjust the interval time, turn blue rotary switch (1) in the figure at right according to the following table.

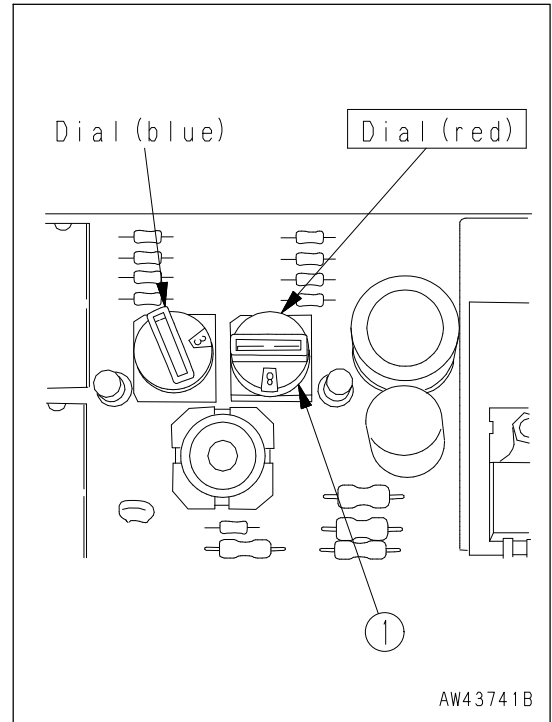


Position of switch	1	2	3	4	5	6	7	8	9
Greasing interval(min)	3.75	7.5	11.25	15	18.75	22.5	28.25	30	33.75
Position of switch	A	B	C	D	E	F			
Greasing interval(min)	37.5	41.25	45	48.75	52.5	56.25			

1) Set the blue dial to division 3 after the auto-grease system is installed.

3. Method of adjusting operating time (Red dial)

To adjust the operating time, turn red rotary switch 1 in the figure at right according to the following table. (Normally, fix this dial to position 8 (60 seconds).)



Position of switch	1	2	3	4	5	6	7	8	9
Operating time of pump(sec)	7.5	15	22.5	30	37.5	45	58.5	60	67.5
Position of switch	A	B	C	D	E	F			
Operating time of pump(sec)	75	82.5	90	97.5	105	112.5			

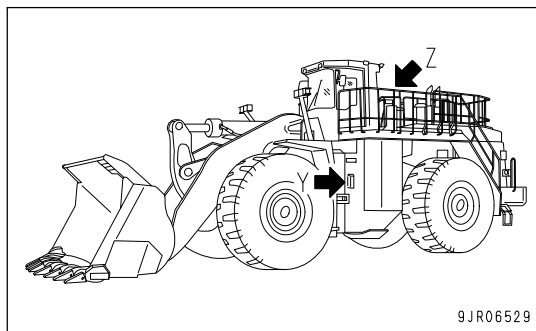
- 1) Set the red dial to division 8 (For normal operation)
- 2) When greasing is finished and the greasing pump is balanced, the greasing pump stops even if within the specified operating time (60 sec).

METHOD OF CHARGING WITH GREASE

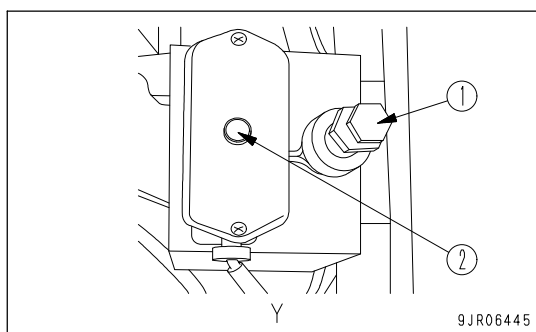


WARNING

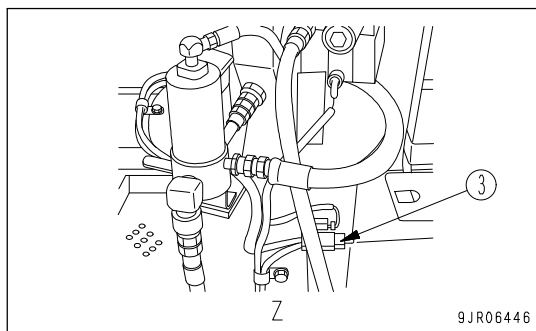
The charging point for the grease is at the center hinge. To prevent yourself from getting caught between the work equipment, stop the engine before charging with grease.



Charge with grease from coupler (1) at the center hinge portion. When it is fully charged with grease, red indicator (2) lights up. (Indicator (2) lights up even when the starting switch is at the OFF position.)



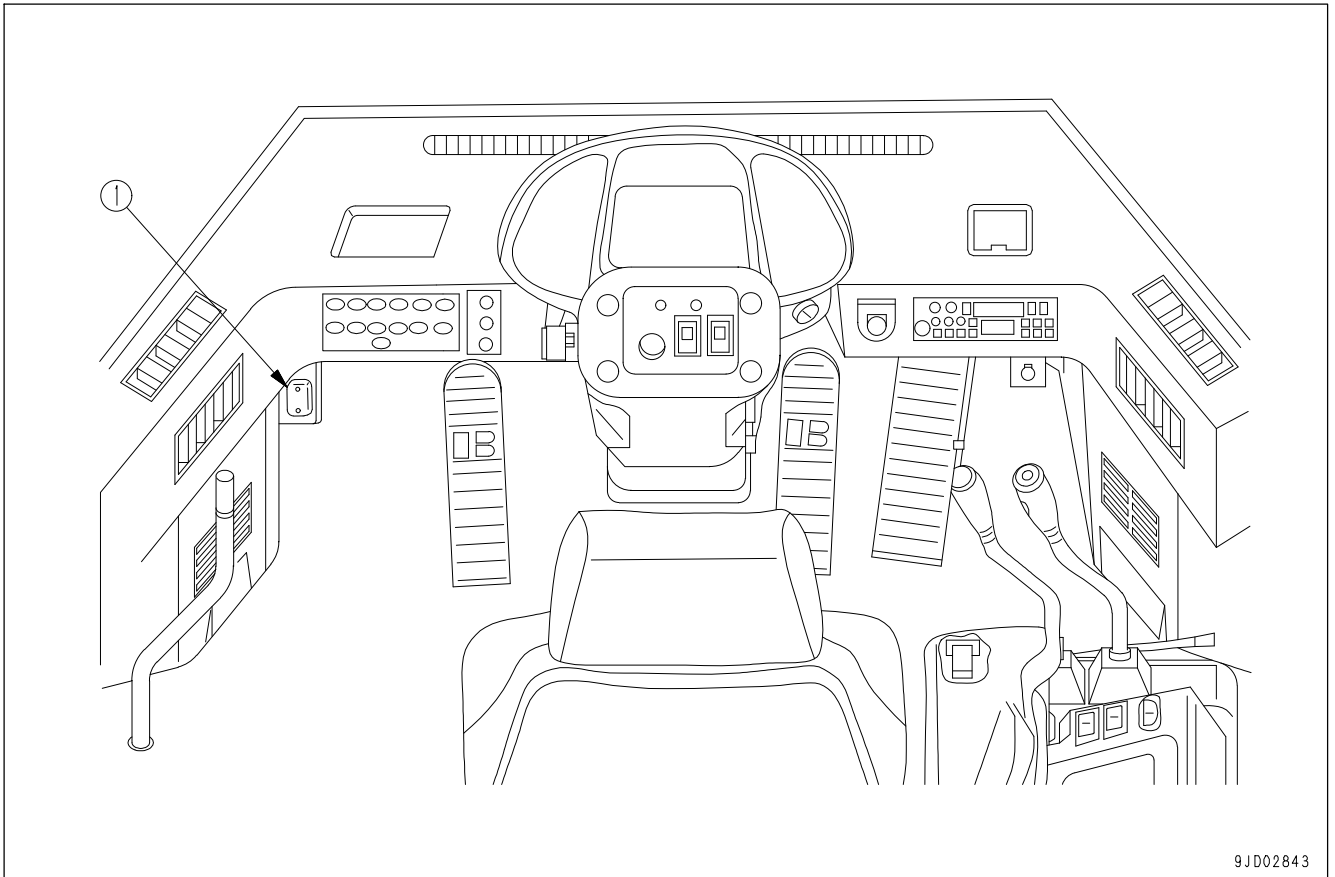
After charging fully with grease, if the machine is to be left for a long time with indicator (2) lighted up, remove connector (3) (CN-GFL) to prevent the battery from running down. When doing this, check that the indicator goes out.



HANDLING BRAKE COOLING SYSTEM

An air-cooled oil cooler is installed for the brake cooling oil (axle oil) to improve the cooling capacity. If the oil temperature goes above approx 105°C (221°F), the caution lamp flashes to warn the operator that the oil is overheated.

EXPLANATION OF COMPONENTS



BRAKE COOLING OIL TEMPERATURE CAUTION LAMP

If the temperature of the brake cooling oil goes above approx. 105°C (221°F), this caution lamp flashes to warn the operator that the oil is overheated.

If this caution lamp flashes during operations, stop operations, run the engine under no load at a mid-range speed, and wait for the caution lamp to go out.

SERVICE PROCEDURE

WHEN REQUIRED

CHECK AXLE OIL LEVEL, ADD OIL



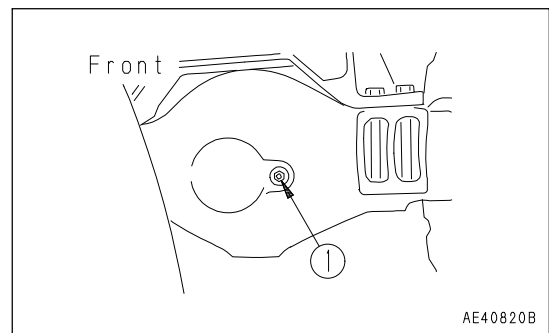
WARNING

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.

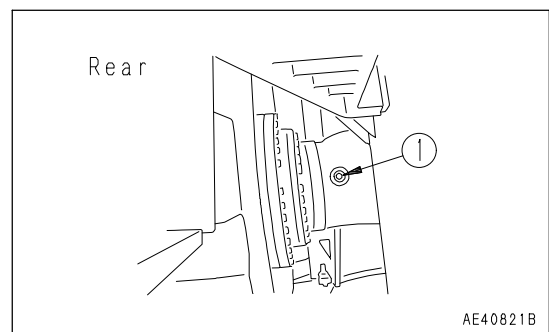
Carry out inspection if there is any sign of oil oozing out from the axle case or brake cooling circuit.

Inspect the machine on a horizontal surface.
(If the road surface is at an angle, the oil level cannot be checked correctly.)

1. Start the engine, then run at low idling to circulate the oil in the brake cooling circuit.



2. Continue to run the engine for at least 5 minutes, then remove oil level plug 1 and check that the oil level is at the bottom edge of the plug hole with the engine running at low idling.
3. If the oil is not close to the bottom edge, add axle oil through the hole of plug 1.



4. If the oil level is correct, install plug 1.
Tightening torque: 128 to 176 Nm
(13.0 to 17.9 kgm, 94.0 to 129.5 lbf)

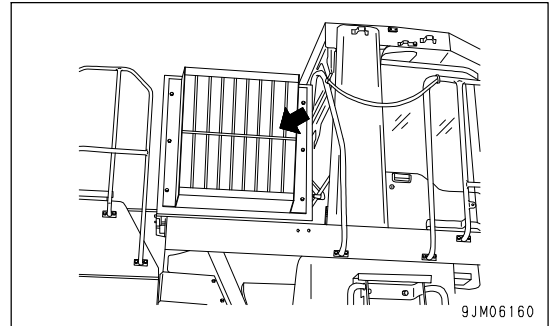
CLEAN BRAKE COOLING OIL COOLER FINE

Clean the fins if there is any mud or dirt stuck to the brakecooling oil cooler.

Blow off the dirt, dust or tree leaves clogging or sticking to the fins with compressed air. Pressurized steam or water may be used instead of compressed air.

NOTICE

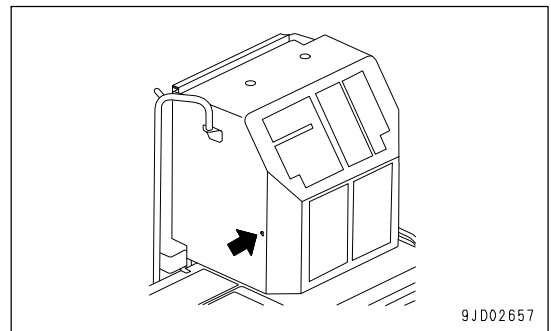
If the steam jet nozzle is brought too close to the oil cooler fins, it may damage the fins, so keep the nozzle a suitable distance away from the fins when cleaning.



EVERY 250 HOURS SERVICE

LUBRICATE OIL COOLER FIN BEARING

1. Using a grease pump, pump in grease through the grease fittings shown by arrows.
2. Pumping grease work must be operated over 25 times.
3. After greasing, wipe off any old grease that was pushed out.

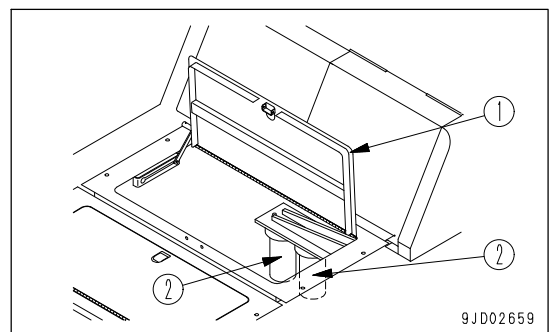


EVERY 500 HOURS SERVICE

REPLACE BRAKE COOLING OIL FILTER CARTRIDGE

1. Open inspection cover 1 in the top surface of the floor, then use a filter wrench to turn brake cooling oil filter cartridge 2 (2 places) to the left to remove.
2. Clean the filter holder, then tighten the new filter cartridge fully by hand.

Filter cartridge part No : 426-43-38760
Quantity : 2



EVERY 2000 HOURS SERVICE**REPLACE AXLE**

The replacement interval for the axle oil is 2000 hours for standard operations, but if the brakes are used frequently or the brakes squeal, reduce the oil change interval.

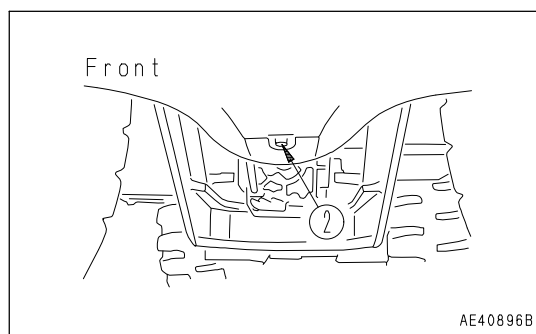
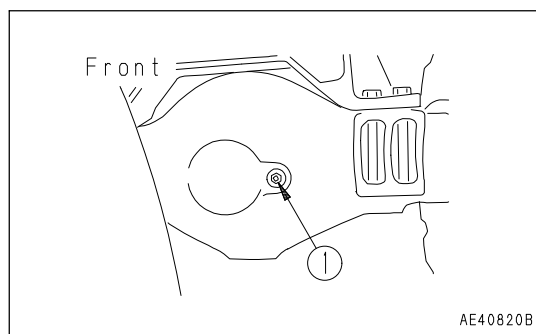
**WARNING**

- The parts and oil are at high temperature after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.
- When removing the plug, oil may spurt out, so turn the plug slowly to release the internal pressure, then remove it carefully.

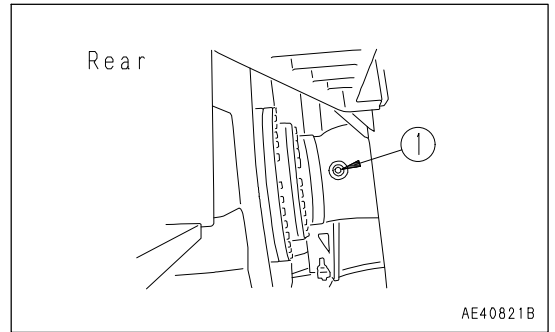
Prepare the following.

- Refill, capacity (front and rear, each): 360 liters (95.0 US gal)

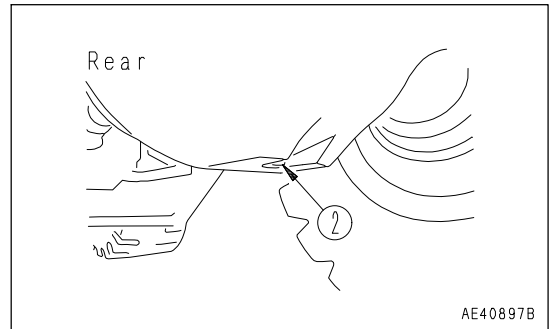
1. Remove front oil filler plug (1), then remove drain plug (2) to drain the oil.



- Remove rear oil filler plug (1), then remove drain plug (2) to drain the oil.

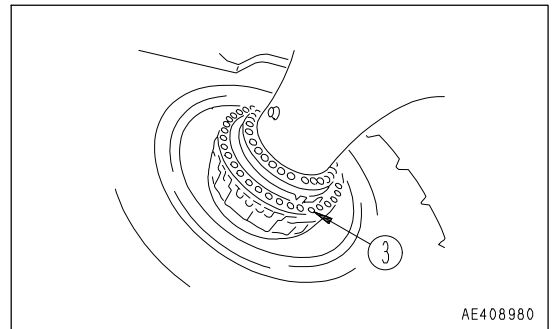


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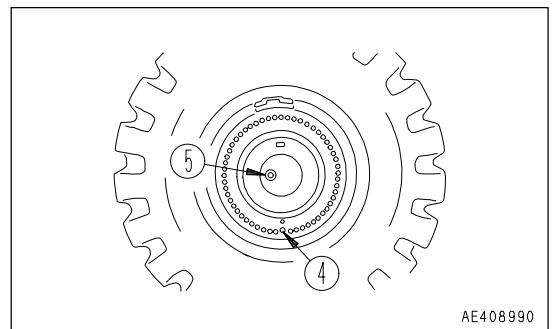


AE40897B

- Remove drain plug (3) to drain the oil.
- Stop the machine so that drain plug (4) of the final drive is at the bottom. Remove oil filler plug (5) and drain plug (4), and fit the tube of attached tool in hole of plug (4) and drain the oil.
- After draining the oil, clean drain plugs (2), (3) and (4), then install them.
- Add oil to the specified level through the oil filler ports (1) and (5) of the axle housing and left and right final drives.
- After adding oil, check at level plug (1) that the oil is at the specified level. For details, see "CHECK AXLE OIL LEVEL, ADD OIL (PAGE 4-30)".



AE408980



AE408990

REMARK

For operations where the brake is used frequently, change the axle oil at shorter intervals.

HANDLING 55 DEGREES C (131 DEGREES F) SPECIFICATION

WA900-3E0

In addition to the standard oil cooler, an air-cooled oil cooler is also installed to improve the cooling capacity for the hydraulic oil and torque converter oil.

SERVICE PROCEDURE

WHEN REQUIRED

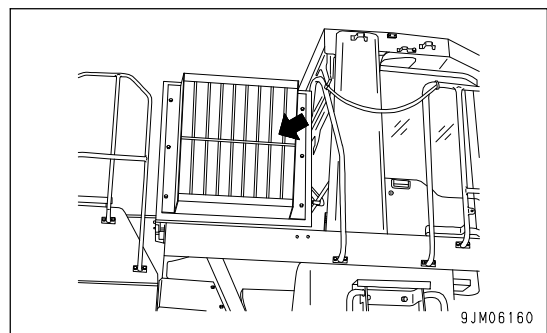
CLANE OIL COOLER FINE

Clean the oil cooler if mud or dirt is stuck to it.

Blow off the dirt, dust or tree leaves clogging or sticking to the fins with compressed air. Pressurized steam or water may be used instead of compressed air.

NOTICE

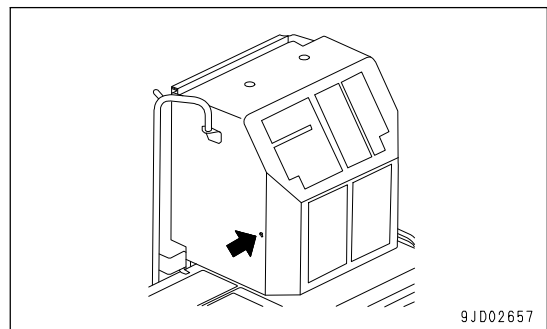
If the steam jet nozzle is brought too close to the oil cooler fins, it may damage the fins, so keep the nozzle a suitable distance away from the fins when cleaning.



EVERY 250 HOURS SERVICE

LUBRICATE OIL COOLER FIN BEARING

1. Using a grease pump, pump in grease through the grease fittings shown by arrows.
2. Pumping grease work must be operated over 25 times.
3. After greasing, wipe off any old grease that was pushed out.



SERVICE CENTER

WA900-3E0

Adding or draining oil or coolant, in addition to oil sampling can be carried out in a centralized manner at this service center.

REMARK

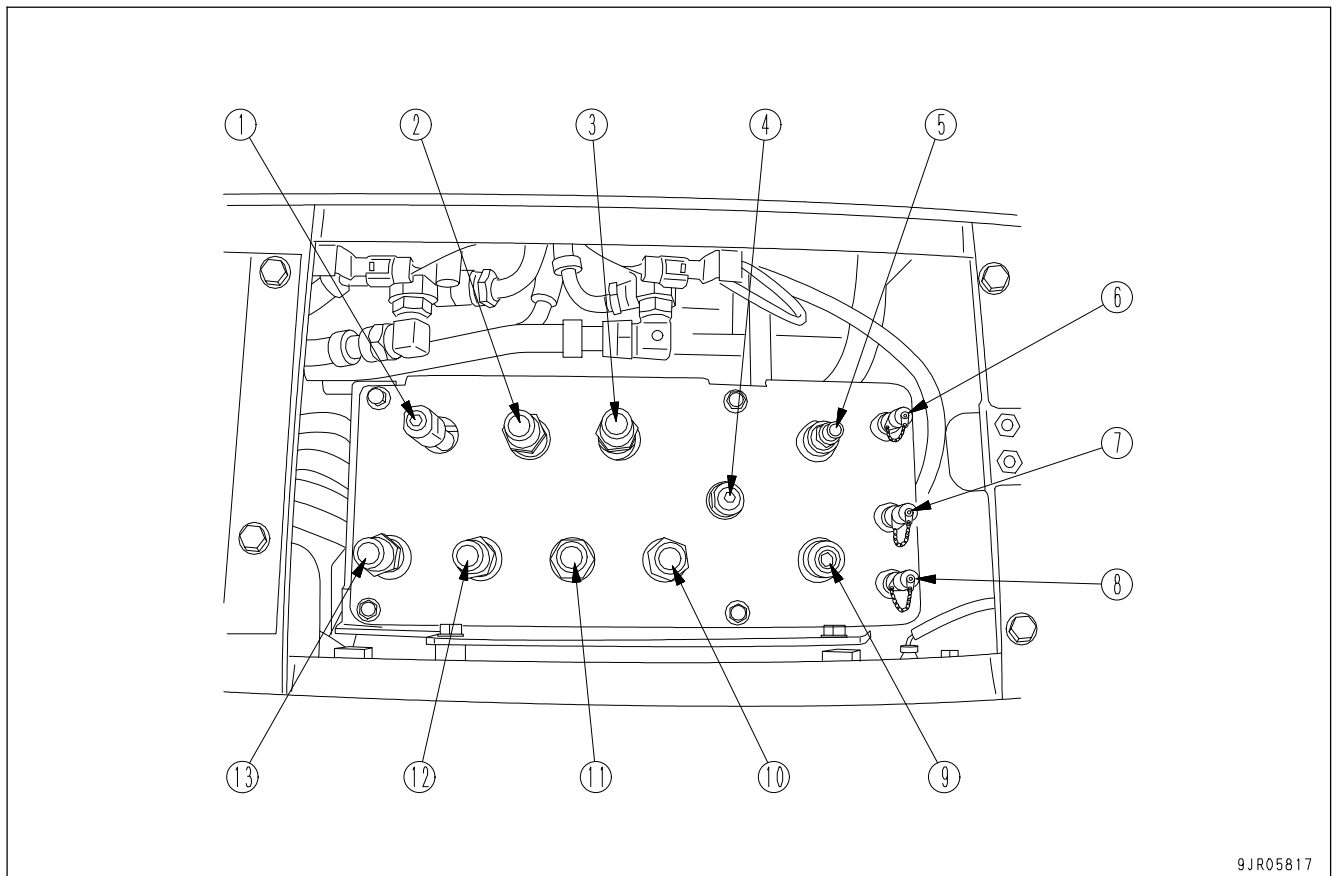
A pump for filling and draining is required to do the work in this service center.

1. Stop the engine.



Oil is still hot and highly pressurized right after the engine is stopped. If you start the work immediately, you may get a burn, so wait for oil pressure to go down and the coolant temperature to cool off.

The function of each plug is as follows:



9JR05817

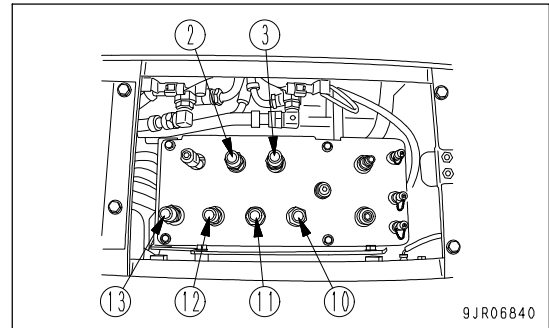
- | | |
|---|--|
| (1) Spare (1) | (8) Taking a sample of brake oil |
| (2) Filling transmission with oil and draining | (9) Spare (3) |
| (3) Filling brake oil tank with oil and draining | (10) Filling hydraulic tank with hydraulic oil and draining |
| (4) Spare (2) | (11) Filling radiator with coolant and draining |
| (5) Releasing remaining internal pressure in hydraulic tank | (12) Filling torque converter cooler with water and draining |
| (6) Taking a sample of transmission oil | (13) Filling engine oil pan with engine oil and draining |
| (7) Taking a sample of hydraulic oil | |

SIZE OF SCREWS USED IN SERVICE CENTER

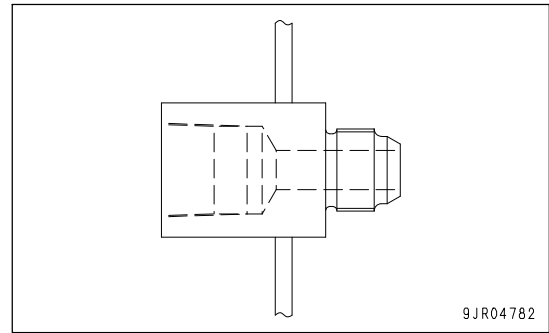
SIZE OF SCREWS USED AT PORTIONS FOR FILLING WITH OIL AND COOLANT AND DRAINING

The size of screws used at the connecting aperture to fill with oil and coolant and drain them is as shown below. Prepare for a connecting hose mouthpiece that fits each specific screw.

- (2) Filling transmission with oil and draining
- (3) Filling brake oil tank with oil and draining
- (10) Filling hydraulic tank with hydraulic oil and draining
- (11) Filling radiator with coolant and draining
- (12) Filling torque converter cooler with water and draining
- (13) Filling engine oil pan with engine oil and draining



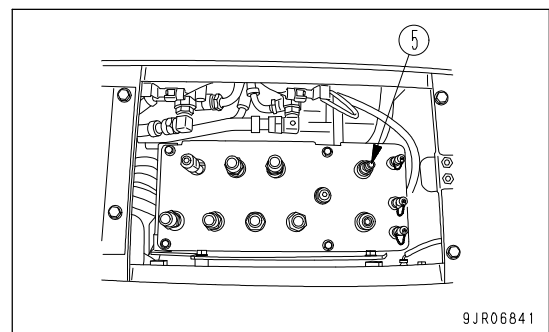
Size of connecting mouthpiece outside machine: 3/4 - 14 NPTF



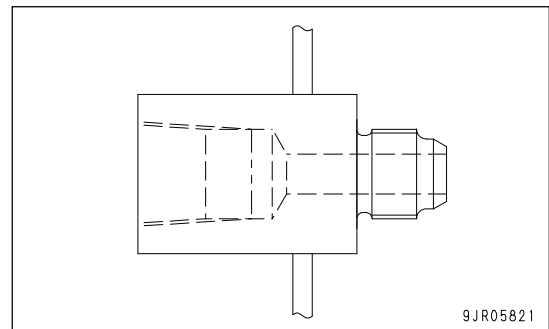
SIZE OF SCREW FOR PORTION FOR RELEASING INTERNAL PRESSURE

The size of the screws at the connecting port for the portion for releasing the internal pressure is as follows. Prepare for a connecting hose mouthpiece that fits each specific screw.

- (5) Releasing remaining internal pressure in hydraulic tank



Size of connecting mouthpiece outside machine: 1/2 - 14 NPTF

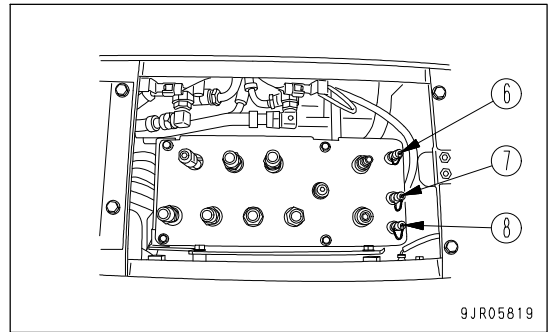


SIZE OF SCREWS FOR OIL SAMPLING PORTION

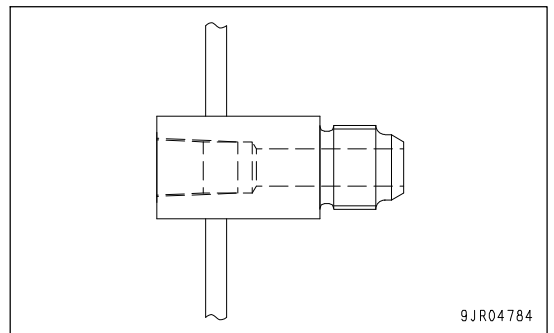
The size of screws for the oil sampling portion is as follows.

Prepare for a connecting hose mouthpiece that fits each specific screw.

- (6) Taking a sample of transmission oil
- (7) Taking a sample of hydraulic oil
- (8) Taking a sample of brake oil

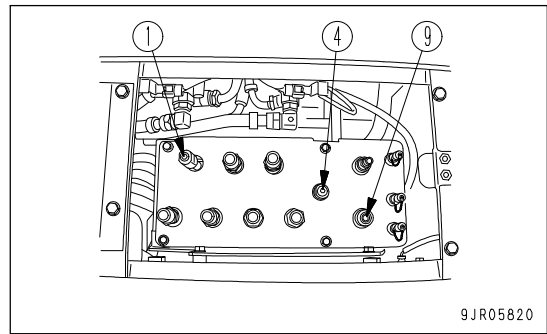


Size of connecting mouthpiece outside machine: 1/4 - 18 NPTF



SIZE OF SCREWS AT SPARE PIPING

Fittings for the piping are installed as a spare.

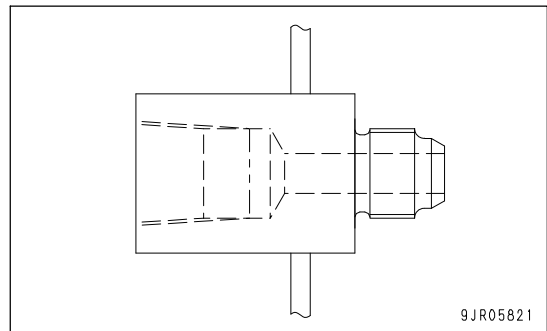


(1) Spare (1)

(4) Spare (2)

Size of fittings for piping inside machine: 22 mm x 1.5 mm

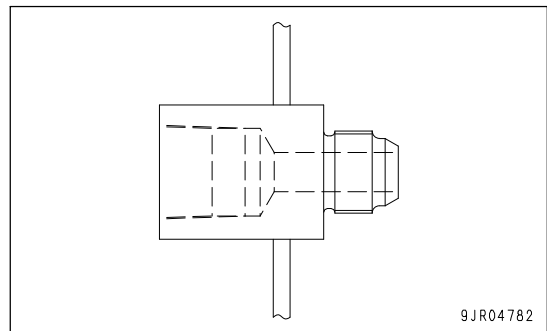
Size of fittings for piping outside machine: 1/2 - 14NPTF



(9) Spare (3)

Size of fittings for piping inside machine: 30 mm x 1.5 mm

Size of fittings for piping outside machine: 3/4 - 14NPTF

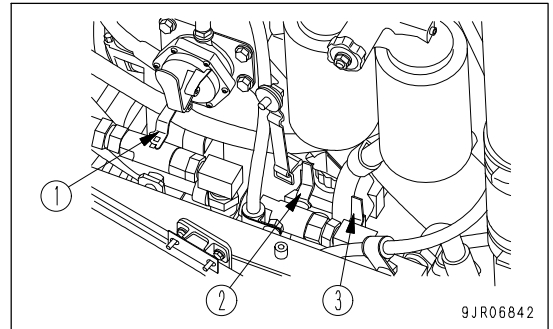


LOCATION OF SWITCHING VALVES FOR REFILLING WITH OIL AND COOLANT AND DRAINING

A switching valve is provided in the piping to fill with oil and coolant and drain them. Keep the switching valves open all the time, and close them when replacing the hoses.

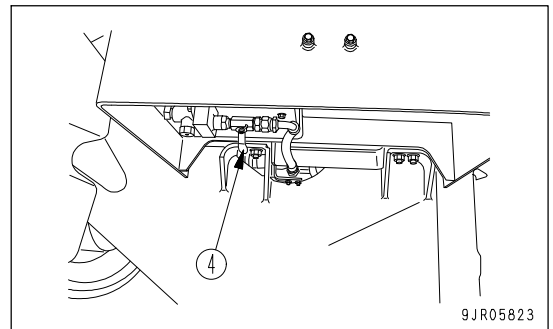
Open each valve before the work and close it after the work.

- (1) Switching valve in piping of engine oil pan
- (2) Switching valve in radiator piping
- (3) Switching valve in torque converter cooler piping



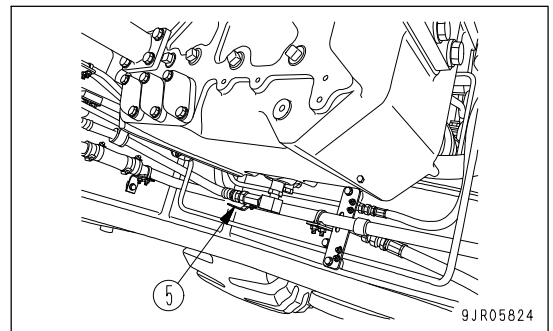
- (4) Switching valve in piping of hydraulic tank

This is under the hydraulic tank.
(On the right side of the machine)



- (5) Switching valve in transmission piping

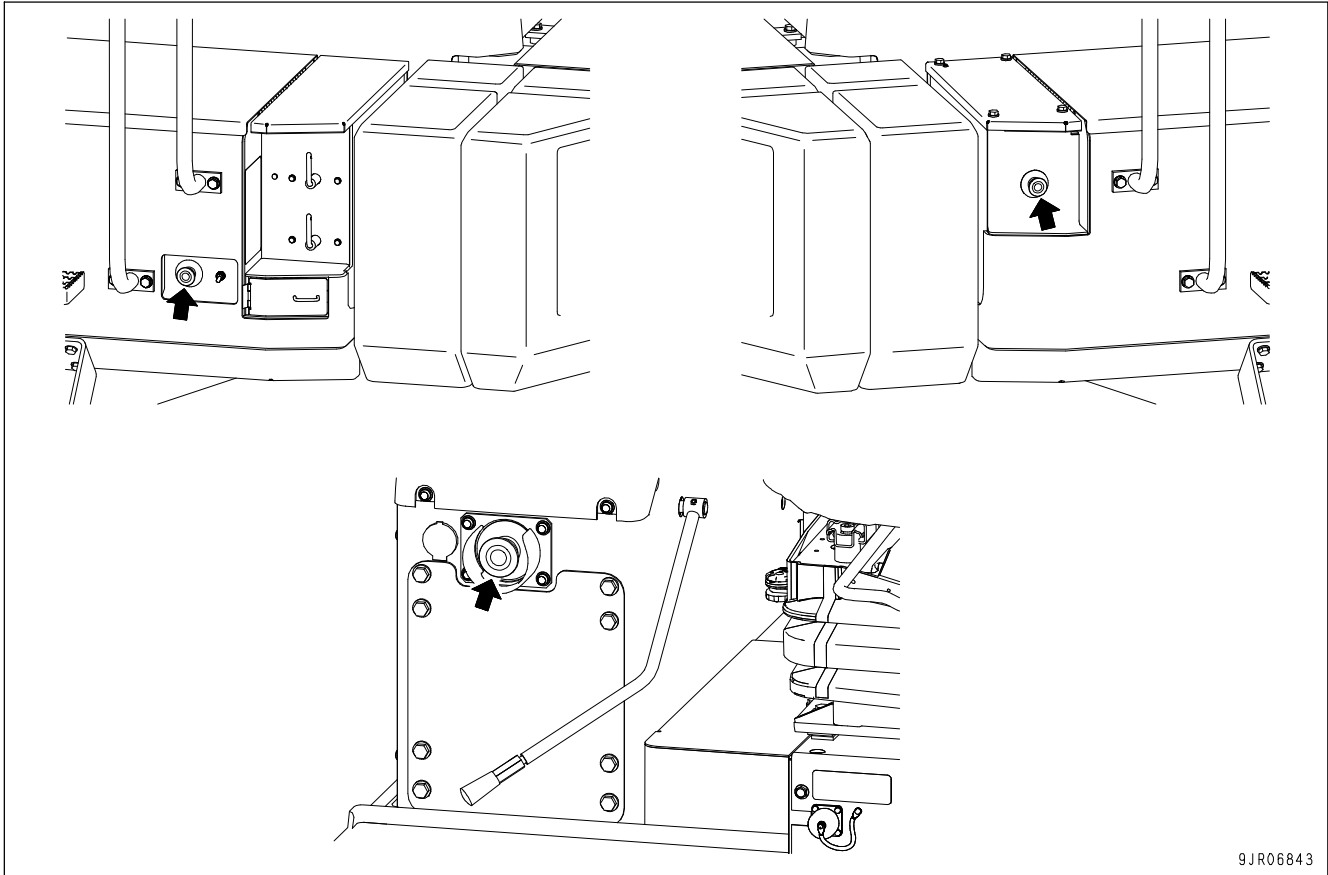
This valve is located at the transmission drain plug.



EMERGENCY ENGINE STOP SWITCH

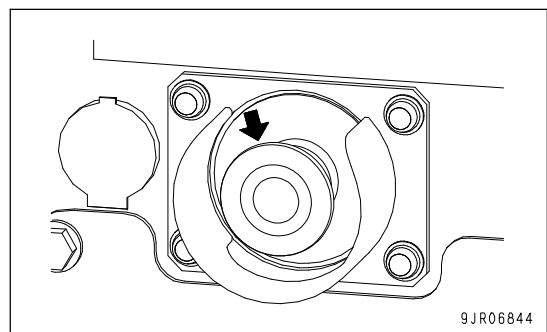
WA900-3E0

An emergency engine stop switch is provided in the operator's cab and two other spots on the machine's periphery (3 spots total). If any one of them is pressed, the engine stops. Use this switch only in emergency, and for normal starting and stopping of the engine, use the engine starting switch.



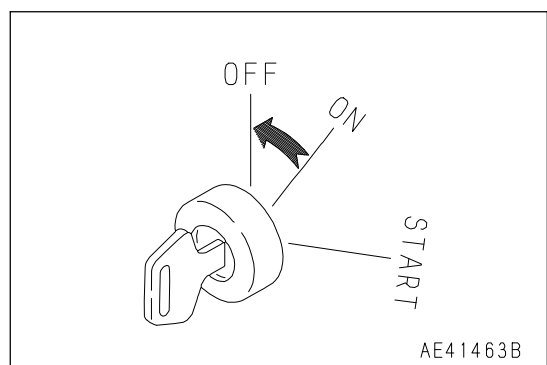
9JR06843

1. Press the nearest emergency engine stop switch, and the engine stops.



9JR06844

2. If the engine remains in a standstill for a while, turn off the engine starting switch in the operator's cab.
(If any of the lights is kept on, the battery can run down.)
3. Remove the cause that necessitated the engine to stop all of sudden.

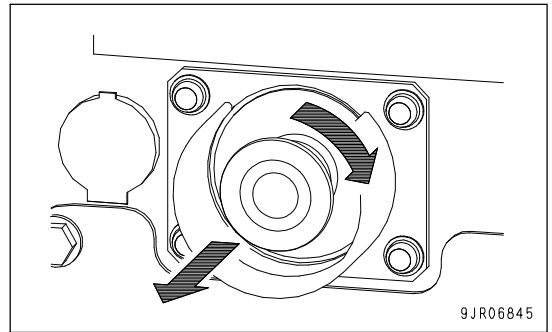


AE41463B

4. Reset the emergency engine stop switch by turning the button in the arrow direction (clockwise) until it comes out. Now the switch is in the emergency stop position again.
5. When starting up the engine again, use the engine starting switch.

REMARK

If the engine does not start even when this emergency engine stop switch is operated, stop the engine with the engine shut-down switch at the left side of the rear frame (top of frame lock bar). (For details, see "ENGINE SHUT-DOWN SWITCH (PAGE 3-47)".)



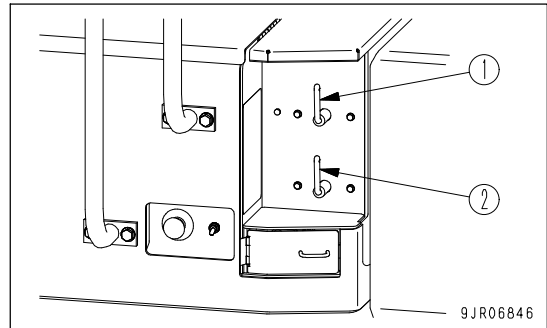
HANDLING BATTERY DISCONNECTOR SWITCH AND STARTING MOTOR DISCONNECTOR SWITCH

WA900-3E0

When battery disconnecter switch (1) is turned OFF, the battery ground circuit is shut off, and the electric circuit for the whole machine is shut off.

When starting motor disconnecter switch (2) is turned OFF, the power supply circuit (24V) to the starting motor is shut off.

Battery disconnecter switch (1) and starting motor disconnecter switch (2) are at the side of the battery box on the left side of the machine.



EXPLANATION OF COMPONENTS

BATTERY DISCONNECTOR SWITCH

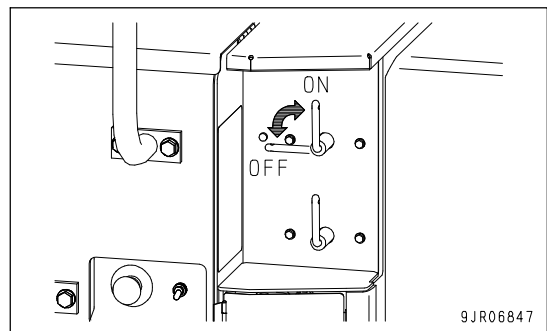
ON position

Electricity flows from the battery to the circuits.

Always set to this position before operating the machine.

OFF position

The flow of electricity from the battery is shut off.



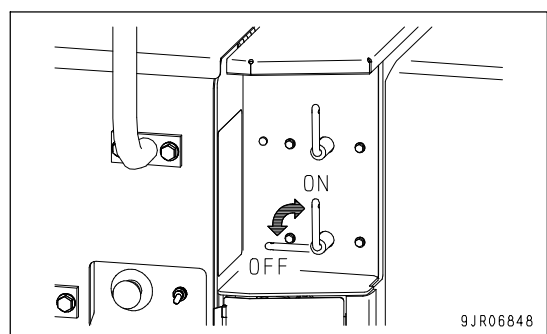
STARTING MOTOR DISCONNECTOR SWITCH

ON position

Electricity flows in the power supply circuit to the starting motor. Always set to this position before operating the machine.

OFF position

The flow of electricity in the power supply circuit to the starting motor is shut off.



HANDLING

**WARNING**

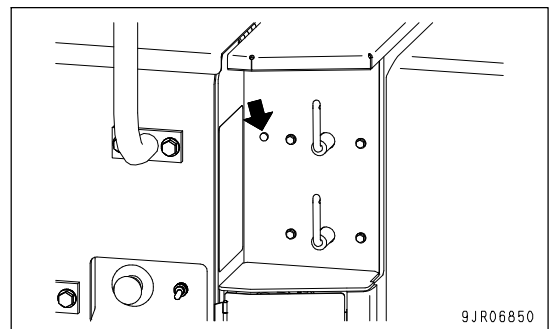
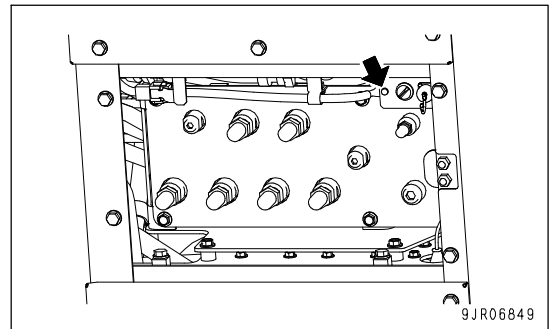
- Do not operate the battery disconnecter switch or starting motor disconnecter switch when the starting switch is at the ON position.
- Do not turn the battery disconnecter switch or starting motor disconnecter switch to the OFF position when the engine is running or immediately after stopping the engine. This may cause serious damage to the electrical system.
- When the battery disconnecter switch and starting motor disconnecter switch have been turned OFF, check that the engine does not start even when the starting switch is turned to the ON position before starting the inspection and maintenance operation.

In the following cases, turn the battery disconnecter switch and starting motor disconnecter switch to the OFF position.

- When machine is put into long-term storage (1 month or more)
- When electrical system is to be repaired
- When carrying out electric welding
- When inspecting or handling battery
- When replacing fuse or slow blow fuse

REMARK

- When the battery disconnecter switch is turned OFF, all of the electrical systems on the machine stop.
- The radio and monitor clock, together with the radio stations in the preset memory are deleted, so set them again when using.
- Immediately after the starting switch is turned OFF, the KOMTRAX Plus saves the data. When turning the battery disconnecter switch OFF, first check the KOMTRAX Plus at the side of the battery disconnect switch and the component box on the left side of the rear frame to confirm that the operation indicator lamp has gone out, then turn the switch OFF.



HANDLING STARTING AID CONNECTOR

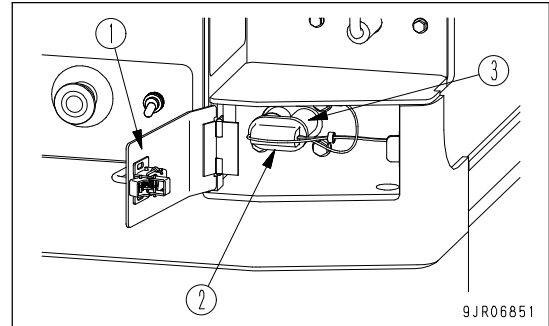
WA900-3E0

STARTING ENGINE WHEN USING STARTING AID CONNECTOR

A starting aid connector that conforms to SAE J1283 is available as an option for this machine.

The starting aid connector is at the side of the battery box on the left side of the machine.

Open cover (1), remove cap (2), then connect the cable to starting aid connector (3).



PRECAUTIONS WHEN CONNECTING OR REMOVING STARTING AID CONNECTOR



- Do not allow the normal machine and the problem machine to come into contact.
Hydrogen gas is generated from the battery, so there is danger of explosion from sparks around the battery.
- Be careful not to mistake the connection of the starting aid connector. In addition, when the final connection is made, it is connected to the problem machine, but there is danger of sparks being generated when this happens.

NOTICE

- The starting system on this machine is 24V. For the normal machine, use a machine that is also 24V.
- Always use a starting aid cable of a thickness that is suitable for the size of the battery.
- For the battery on the normal machine, use a battery with the same capacity as the problem machine.
- Check that the cable and connectors are not damaged or corroded.
- Connect the connectors securely.
- Check that the lock levers (work equipment, steering) of both machines are at the LOCK position and that the parking brake switches of both machines are ON (actuated).
- Check that all levers are at the neutral position.

CONNECTING STARTING AID CABLE

Turn the starting switches of both the normal machine and the problem machine to the OFF position and connect the starting aid cables in the order normal machine → problem machine.

STARTING ENGINE**WARNING**

Check that the lock levers (work equipment, steering) and parking brake levers of both the normal machine and the problem machine are at the **LOCK** position. Check also that all control levers are at the **HOLD** position.

1. Check that the connector is securely connected.
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, wait for at least 2 minutes before trying again.

REMOVING STARTING AID CABLE

When the engine starts, remove the starting aid cables in the order problem machine → normal machine.

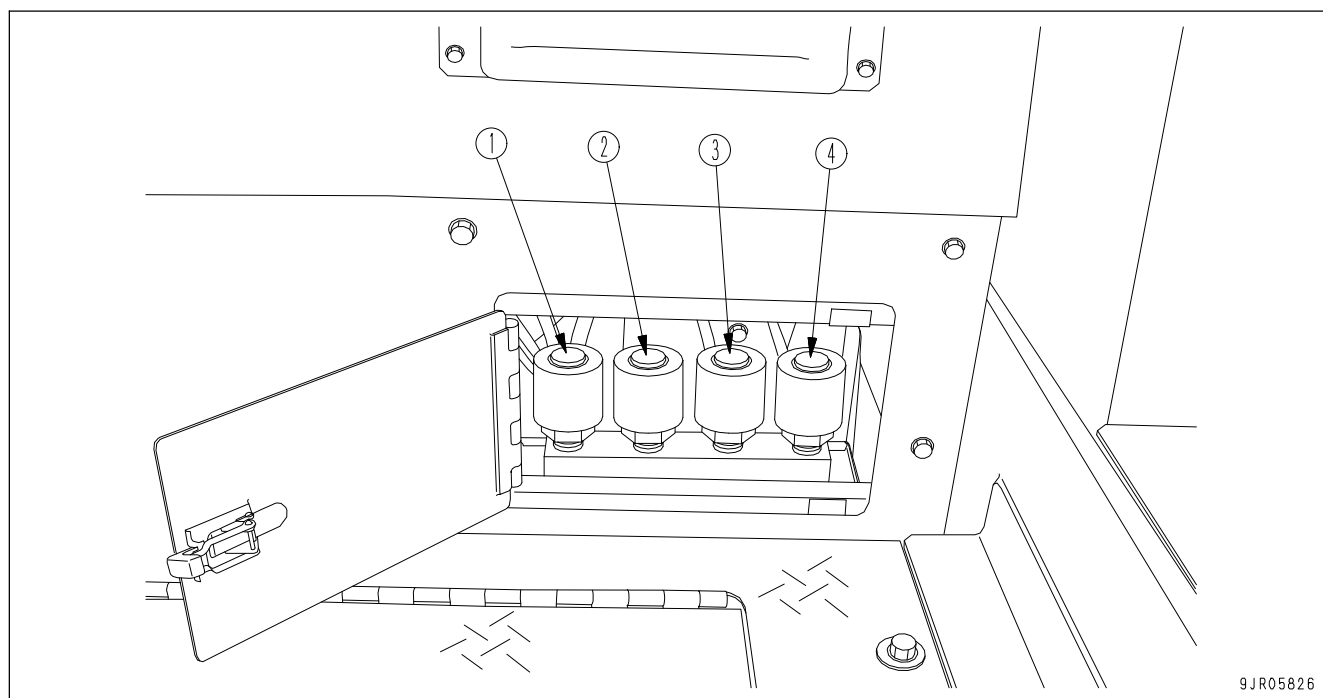
CENTRALIZED BREATHER

WA900-3E0

The breathers for the damper case, rear axle housing, front axle housing, and transmission are centralized and installed at the rear right under the cab floor.

REMARK

On the standard machine, they are installed to each component, but in this case, to make maintenance easier, they are centralized and installed at the rear right under the cab floor.



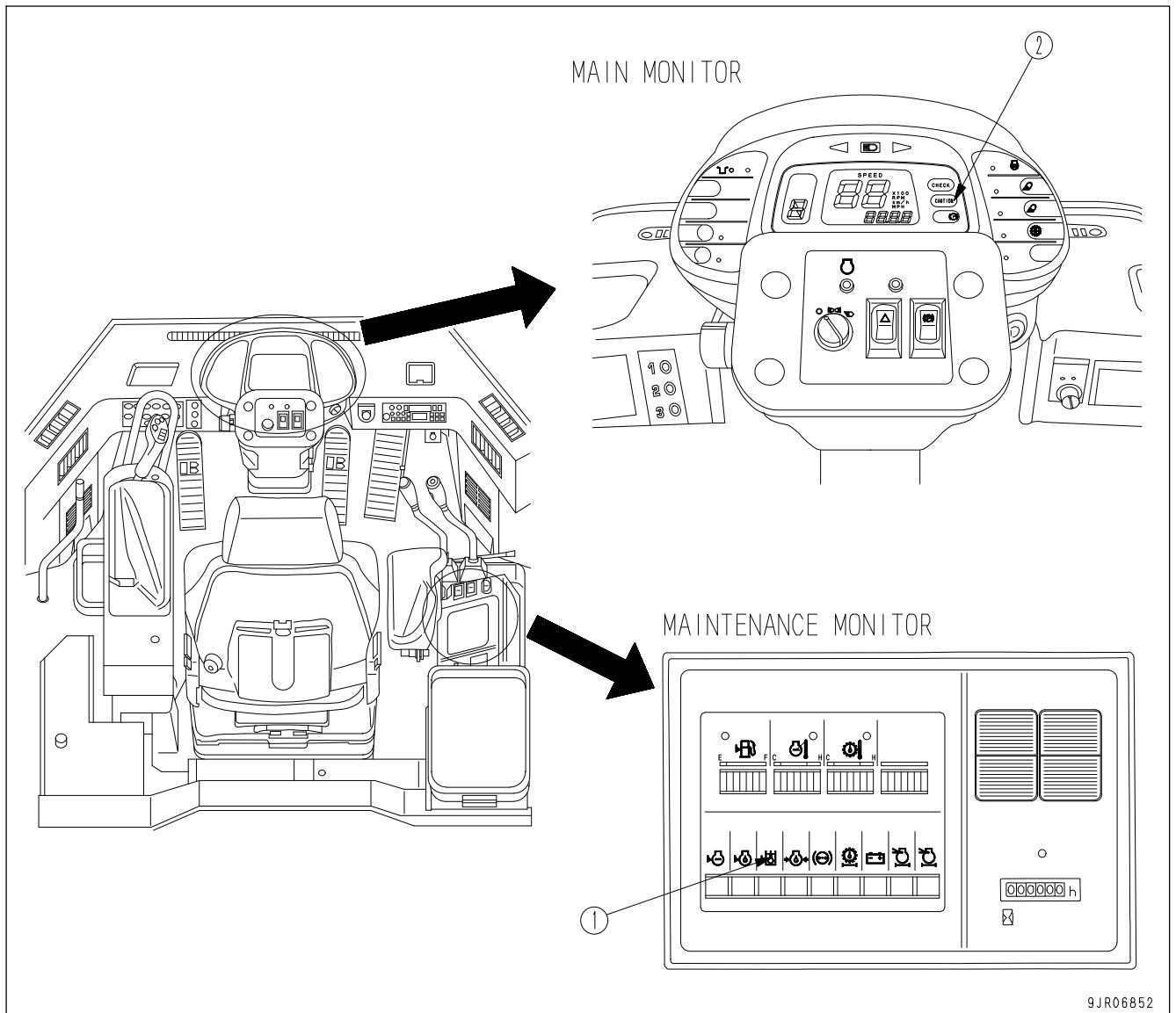
(1) Front Axle Housing
(2) Damper Case

(3) Rear Axle Housing
(4) Transmission

For a cleaning method of the breather, see "MAINTENANCE", and clean it according to the instructions.

HYDRAULIC OIL LEVEL WARNING DISPLAY

WA900-3E0



(1) Hydraulic oil level warning lamp

(2) Central warning lamp (CAUTION)

If the oil level in the hydraulic tank goes down when the machine is being operated, hydraulic oil level warning display lamp (1) on the maintenance monitor lights up, the central warning lamp (CAUTION) (2) on the main monitor flashes, and the alarm buzzer sounds intermittently.

If the lamp lights up, stop the machine, switch off the engine immediately, and check the machine for oil leakage. Repair the location of the oil leak, refill the tank with hydraulic oil, then check the oil level.

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WA800-3E0, WA900-3E0 WHEEL LOADER

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