SEAMU1340105

Operation & Maintenance Manual

D58E-1,1A,1B
D58P-1,1B

BULLDOZER

SERIAL NUMBERS
D58E-1 :80888
D58E-1A :80888
D58E-1B :81258 and up
D58P-1 :80588
D58P-1B :81261

KOMATSU

1. FOREWORD

This manual provides rules and guidelines which will help you use this machine safely and effectively. Keep this manual handy and have all personnel read it periodically. If this manual has been lost or has become dirty and can not be read, request a replacement manual from Komatsu or your Komatsu distributor.

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

Continuing improvements in the design of this machine can lead to changes in detail which may not be reflected in this manual. Consult Komatsu or your Komatsu distributor for the latest available information of your machine or for questions regarding information in this manual.

This manual may contain attachments and optional equipment that are not available in your area. Consult Komatsu or your Komatsu distributor for those items you may require.

⚠ WARNING

- **Improper operation and maintenance of this machine can be hazardous and could result in serious injury or death.**
- **Operators and maintenance personnel should read this manual thoroughly before beginning operation or maintenance.**
  Keep this manual in a readily available place near the machine (on machines with cab, there is a door pocket to hold the manual), and have all personnel involved in working on the machine read the manual periodically.
- **Some actions involved in operation and maintenance of the machine can cause a serious accident, if they are not done in a manner described in this manual.**
- **The procedures and precautions given in this manual apply only to intended uses of the machine. If you use your machine for any unintended uses that are not specifically prohibited, you must be sure that it is safe for you and others. In no event should you or others engage in prohibited uses or actions as described in this manual.**
- **Komatsu delivers machines that comply with all applicable regulations and standards of the country to which it has been shipped. If this machine has been purchased in another country or purchased from someone in another country, it may lack certain safety devices and specifications that are necessary for use in your country. If there is any question about whether your product complies with the applicable standards and regulations of your country, consult Komatsu or your Komatsu distributor before operating the machine.**
- **The description of safety is given in SAFETY INFORMATION on page 0-2 and in SAFETY from page 1-1.**

2. SAFETY INFORMATION

Most accidents are caused by the failure to follow fundamental safety rules for the operation and maintenance of machines. To avoid accidents, read, understand and follow all precautions and warnings in this manual and on the machine before performing operation and maintenance.

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

DANGER – **This word is used on safety messages and safety labels where there is a high probability of serious injury or death if the hazard is not avoided. These safety messages or labels usually describe precautions that must be taken to avoid the hazard. Failure to avoid this hazard may also result in serious damage to the machine.**

WARNING – **This word is used on safety messages and safety labels where there is a potentially dangerous situation which could result in serious injury or death if the hazard is not avoided. These safety messages or labels usually describe precautions that must be taken to avoid the hazard. Failure to avoid this hazard may also result in serious damage to the machine.**

CAUTION – **This word is used on safety messages and safety labels for hazards which could result in minor or moderate injury if the hazard is not avoided. This word might also be word for hazards where the only result could be damage to the machine.**

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

Safety precautions are described in SAFETY from page 1-1.

Komatsu cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore the safety messages in this manual and on the machine may not include all possible safety precautions. If any procedures or actions not specifically recommended or allowed in this manual are used, you must be sure that you and others can do such procedures and actions safely and without damaging the machine. If you are unsure about the safety of some procedures, contact your Komatsu distributor.

3. INTRODUCTION

3.1 INTENDED USE

This Komatsu BULLDOZER is designed to be used mainly for the following work.
- Dozing
- Smoothing
- Cutting into hard or frozen ground or ditching.

See the section "12.10 WORK POSSIBLE USING BULLDOZER" for further details.

3.2 FEATURES

- Wide versatility due to installation of power angle/power tilt blade (D58E-1B, D58P-1B).
- High torque rise, low fuel consumption engine installed
- Superb operator comfort, durability and stylish design
- Excellent fuel efficiency achieved through use of hydroshift power train

3.3 BREAKING IN THE MACHINE

NOTICE

Before operating the machine for the first time, check that there is coolant in the radiator. If the machine is delivered with no coolant in the radiator, flush the inside of the radiator thoroughly with tap water, then fill the radiator with coolant.

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 breaking in:
- Idle the engine for 5 minutes after starting it up.
- Avoid operation with heavy loads or at high speeds.
- Avoid sudden starts, sudden acceleration, sudden steering and sudden stops except in cases of emergency.

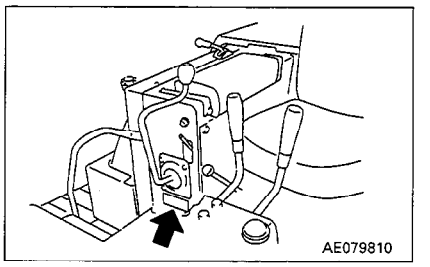
The precautions given in this manual for operating, maintenance, and safety procedures are only those that apply when this product is used for the specified purpose. If the machine is used for a purpose that is not listed in this manual, Komatsu cannot bear any responsibility for safety. All consideration of safety in such operations is the responsibility of the user.

Operations that are prohibited in this manual must never be carried out under any circumstances.

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

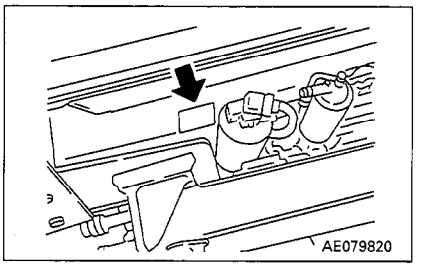
4.1 MACHINE SERIAL NO. PLATE POSITION

On the front lower side of the R.H. armrest



4.2 ENGINE SERIAL NO. PLATE POSITION

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



4.3 TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

Machine serial No.:
Engine serial No.:
Distributor name: Address: Phone: Service personnel for your machine:

REMARKS

5. CONTENTS

SAFETY

OPERATION

MAINTENANCE

SPECIFICATIONS

OPTIONS, ATTACHMENTS

SAFETY

⚠ WARNING

Read and follow all safety precautions. Failure to do so may result in serious injury or death.

This safety section also contains precautions for optional equipment and attachments.

6. GENERAL PRECAUTIONS

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

SAFETY RULES

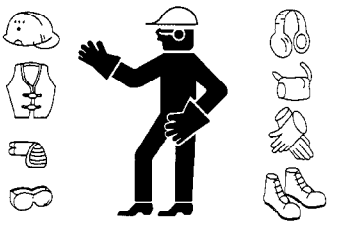
- ONLY trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
- When working with another operator or a person on worksite traffic duty, be sure all personnel understand all hand signals that are to be used.

SAFETY FEATURES

- Be sure all guards and covers are in their proper position. Have guards and covers repaired if damaged.
  Proper position → See "12.1.1 WALK-AROUND CHECK".
- Use safety features such as the safety lock and seat belts properly.
- NEVER remove any safety features. ALWAYS keep them in good operating condition.
  Safety lever → See "12.11 PARKING MACHINE".
  Seat belts → See "27. USING SEAT BELT".
- Improper use of safety features could result in serious bodily injury or death.

CLOTHING AND PERSONAL PROTECTIVE ITEMS

- Avoid loose clothing, jewelry, and loose long hair. They can catch on controls or in moving parts and cause serious injury or death. Also, do not wear oily clothes because they are flammable.
- Wear a hard hat, safety glasses, safety shoes, mask or gloves when operating or maintaining the machine. Always wear safety goggles, hard hat and heavy gloves if your job involves scattering metal chips or minute materials - this is so particularly when driving pins with a hammer and when cleaning the air cleaner element with compressed air.
  Check also that there is no one near the machine.
  Cleaning of air cleaner element → See "24.2 WHEN REQUIRED" in service procedure.



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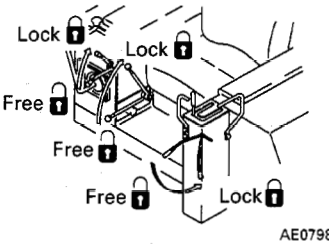
UNAUTHORIZED MODIFICATION

- Any modification made without authorization from Komatsu can create hazards.
- Before making a modification, consult your Komatsu distributor. Komatsu will not be responsible for any injury or damage caused by any unauthorized modification.

STANDING UP FROM THE SEAT

- ALWAYS move the SAFETY LEVER to the LOCK position before standing up from the operator's seat. If you don't, you could unintentionally hit the control levers, resulting in sudden machine movement and the possibility of damage, injury or death.
- Before leaving your machine, lower the blade to the ground, move the SAFETY LEVER to LOCK, and stop the engine.
  Machine posture → See "12.11 PARKING MACHINE".

Locking



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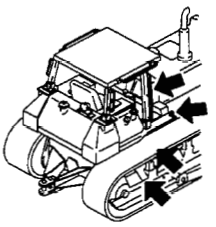
MOUNTING AND DISMOUNTING

- NEVER jump on or off the machine. NEVER get on or off a moving machine.
- When mounting and dismounting, face the machine and use the handholds, track frame and track shoes.
- Do not hold any control levers when getting on or off the machine.
- Maintain three-point contact to be sure that you do not fall from the machine.
- Repair any damaged handhold, and tighten any loose bolts. Handholds, track frame and track shoes must be free of oil, grease and excessive dirt.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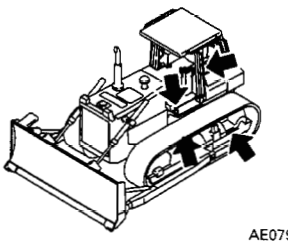
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FIRE PREVENTION FOR FUEL AND OIL

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

- Keep a flame away from flammable fluids.
- Stop the engine and do not smoke when refueling.
- Tighten all fuel and oil caps securely.
- Refueling and oiling should be made in well ventilated areas.
- Keep oil and fuel in the determined place and do not allow unauthorized persons to enter.

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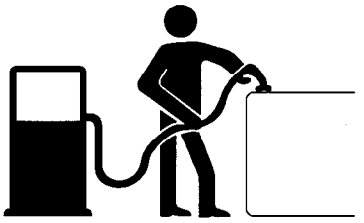

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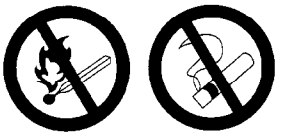

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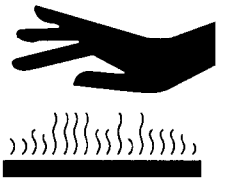
BURN HAZARD PREVENTION

- If the coolant, engine oil, power train oil or hydraulic oil is hot, use a heavy cloth, gloves, heavy clothing and safety glasses or goggles before checking or touching.

- To prevent hot water from spurting out:
  1) Turn engine off.
  2) Allow water to cool.
  3) Slowly loosen cap to relieve pressure before removing.

- To prevent hot oil from spurting out:
  1) Turn engine off.
  2) Allow oil to cool.
  3) Slowly loosen cap to relieve pressure before removing.



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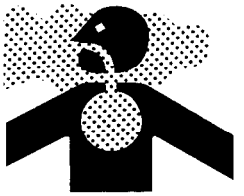
ASBESTOS DUST HAZARD PREVENTION

- Asbestos dust can be HAZARDOUS to your health if it is inhaled.
- If you handle materials containing asbestos fibers, follow these guidelines as given below:
  1) NEVER use compressed air for cleaning.
  2) Use water for cleaning to minimize dust cloud.
  3) Operate the machine with the wind to your back, whenever possible.
  4) Use an approved respirator if necessary.



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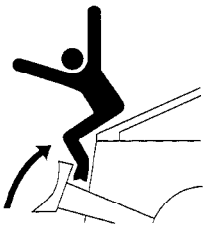
CRUSHING OR CUTTING PREVENTION

- Do not enter, or put your hand or arm or any other part of your body between movable parts such as between the work equipment and cylinders, or between the machine and the blade or ripper or any other attachment.
  If the work equipment is operated, the clearance will change and this may lead to serious damage or personal injury.



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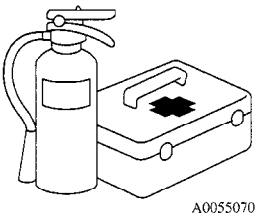
FIRE EXTINGUISHER AND FIRST AID KIT

- Be sure fire extinguishers have been provided and know how to use them.
- Know where a first aid kit is located.
- Know what to do in the event of a fire.
- Be sure you know the phone numbers of persons you should contact in case of an emergency.



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PRECAUTIONS FOR ROPS

- Do not operate machine with ROPS removed if equipped.
- The ROPS is installed to protect the operator if the machine should overturn. It is designed not only to take the load when the machine overturns, but also to absorb the impact energy.
- The Komatsu ROPS fulfills all worldwide regulations and standards, but if any unauthorized modification is carried out on it, or if it is damaged when the machine overturns, its strength will be reduced and it will not be able to provide its original capacity. It will be able to provide this capacity only if modifications and repairs are carried out in the specified way.
- When carrying out modification or repairs, always consult your Komatsu distributor first.
- Even when the ROPS is installed, if you do not fasten your seat belt securely, it cannot protect your properly. Always fasten your seat belt when operating the machine.
  Seat belts → See "27. USING SEAT BELT."

PRECAUTIONS FOR ATTACHMENTS

- When installing and using an optional attachment, read the instruction manual for the attachment and the information related to attachments in this manual.
- Do not use attachments that are not authorized by Komatsu or your Komatsu distributor. Use of unauthorized attachments could create a safety problem and adversely affect the proper operation and useful life of the machine.
- Any injuries, accidents, product failures resulting from the use of unauthorized attachments will not be the responsibility of Komatsu.

7. PRECAUTIONS DURING OPERATION

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

7.1 BEFORE STARTING ENGINE

SAFETY AT WORKSITE

- Before starting the engine, thoroughly check the area for any unusual conditions that could be dangerous.
- Before starting the engine, examine the terrain and soil conditions of the worksite. Determine the best and safest method of operation.
- If you need to operate on a street, protect pedestrians and cars by designating a person for worksite traffic duty or by installing fences around the worksite.
- If water lines, gas lines, and high-voltage electrical lines may be buried under the worksite, contact each utility and identify their locations. Be careful not to sever or cut any of these lines.
- Check the depth and flow of water before operating in water or crossing a river. NEVER be in water which is in excess of the permissible water depth.
  Permissible water depth → See "12.9.2 PERMISSIBLE WATER DEPTH".

FIRE PREVENTION

- Thoroughly remove wood chips, leaves, paper and other flammable things accumulated on the engine compartment. They could cause a fire.
- Check fuel, lubrication, and hydraulic systems for leaks. Have any leaks repaired. Wipe up any excess oil, fuel or other flammable fluids.
  Check point → See "12.1.1 WALK-AROUND CHECK".
- Be sure a fire extinguisher is present and working.

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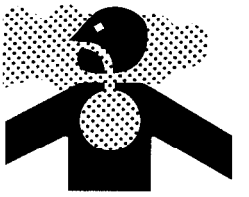
IN OPERATOR'S CAB

- Do not leave tools or machine parts around the operator's compartment. They may damage the control levers or switches and may even cause accidents. Always use the tool box inside the engine compartment (right side).
- Keep the cab floor, controls, steps and handholds free of oil, grease, snow, and excess dirt.
- Check the seat belt, buckle and hardware for damage or wear. Replace any worn or damaged parts. Always use seat belts when operating your machine.
  Seat belts → See "27. USING SEAT BELT".

VENTILATION FOR ENCLOSED AREAS

- If it is necessary to start the engine within an enclosed area, provide adequate ventilation. Exhaust fumes from the engine can KILL.



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PRECAUTIONS FOR MIRRORS, WINDOWS AND LIGHTS

- Remove all dirt from the surface of the windows and lights to ensure that you can see well.
- Adjust the rear view mirror so that you can see clearly from the operator's seat, and always keep the surface of the mirror clean. If any glass is broken, replace it with a new part.
- Check that the head lamps and rear lamps are installed to match the operating conditions. Check also that they light up properly.

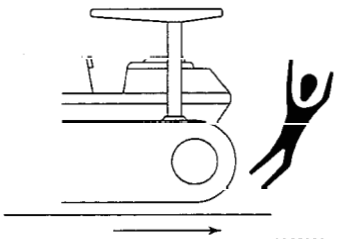
7.2 OPERATING MACHINE

WHEN STARTING ENGINE

- Walk around your machine again just before mounting it, checking for people and objects that might be in the way.
- NEVER start the engine if a warning tag has been attached to the control.
- When starting the engine, sound the horn as an alert.
- Start and operate the machine only while seated.
- Do not allow anyone other than the operator to ride in the cab or on the machine body.

PRECAUTIONS WHEN MOVING FORWARD OR BACKWARD

- When operating in areas that may be hazardous or have poor visibility, designate a person to direct worksite traffic.
- Be sure no one is around machine, particularly behind machine.
- Before starting machine motion, sound the horn to alert people.
- There is a blind spot behind the machine. Make sure that nobody is present behind it before driving the machine backward.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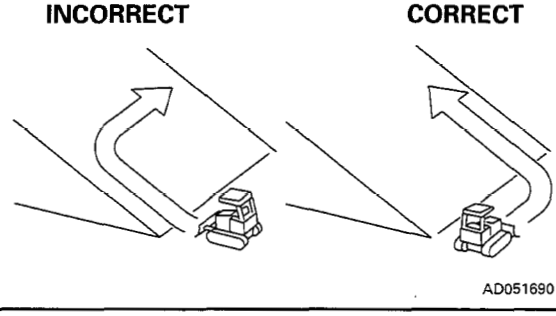
TRAVELING

- If any control lever must be operated during travel, avoid rapid operation.
- When traveling on uneven ground, slow down the machine and avoid quick movement of the steering lever.
- Avoid riding over obstacles as much as possible. If you must ride over obstacles, keep the work equipment close to the ground surface, and travel at a very slow speed. Riding over large obstacles could cause the machine to tip over on its side.

TRAVELING ON SLOPES

- Traveling on hills, banks or slopes that are steep could result in the machine tipping over or slipping.
- On hills, banks or slopes, carry the work equipment closer to the ground, approximately 20 to 30 cm (8 to 12 in) above the ground. In case of emergency, quickly lower the work equipment to the ground to help the machine stop and prevent it from tipping over.
- Do not change direction on slopes. Avoid sideways travel whenever possible: rather travel up and down the slopes.
- Do not travel up and down on grass, fallen leaves, and wet steel plates. These materials may allow the machine to slip, if it is traveling sideways. Keep travel speed very low.
- When traveling downhill, drive slowly and use the engine as a brake
  Reverse steering when traveling downhill → See "12.7.2 TURNING WHILE DESCENDING A SLOPE".



VISIBILITY

- Turn ON the head lamps and rear lamp, when working at night or at dark sites. Provide additional lights for the worksite if necessary.
- If visibility is diminished by fog, snow or rain, stop operation. Wait until there is adequate visibility for safe operation.

WORKING ON SNOWY SITE

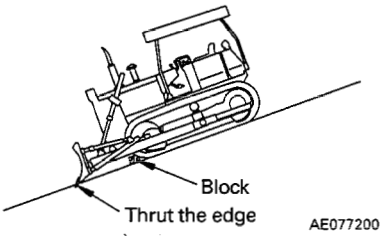
- Snow-covered and frozen ground may allow the machine to slip sideways, even if the grade is not steep. Slow down the machine when traveling on such ground. Avoid rapid starts, stops, and steering.
- In snow removal work, pay special attention to the edge of the road and to objects under the snow.

WORKING ON LOOSE GROUND

- Avoid operating your machine too close to the edge of cliffs, overhangs, and deep ditches. If these areas collapse, your machine could fall or tip over and result in serious injury or death. Remember that the soil after heavy rain or blasting is weakened in these areas.
- Earth laid on the ground and the soil near ditches are loose. They can collapse under the weight or vibration of your machine.
- Install the HEAD GUARD if working in areas where there is danger of falling rocks and dirt.
- When working in places where there is danger of falling rocks or danger of the machine turning over, install ROPS and a seat belt.

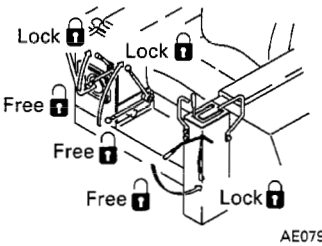
PARKING THE MACHINE

- Park on level ground whenever possible. If not possible, block the tracks, lower the blade to the ground and thrust the edge of the blade in the ground.



- When parking on public roads, provide fences and signs, such as flags or lights, on the machine to warn passersby to be careful. Be sure that the machine, flags or lights do not obstruct traffic.
  Parking procedure → See "12.11 PARKING MACHINE".
- Before leaving the machine, lower the work equipment to the ground, move the SAFETY LEVER to LOCK position, stop the engine, and lock all the doors, windows, and covers and remove the key(s).
  Work equipment posture → See "12.11 PARKING MACHINE".
  Locks → See "12.15 LOCKING".

Locking



7.3 TRANSPORTATION

LOADING AND UNLOADING

- Loading and unloading the machine always involves potential hazards. EXTREME CAUTION SHOULD BE USED.
- Perform loading and unloading on firm, level ground only. Maintain a safe distance from the edge of a road.
- ALWAYS block the wheels of the hauling vehicle and place blocks under both ramps before loading and unloading.
- ALWAYS use ramps of adequate strength. Be sure the ramps are wide and long enough to provide a safe loading slope.
- Be sure that the ramps are securely positioned and fastened, and that the two sides are at the same level as one another.
- Be sure the ramp surface is clean and free of grease, oil, ice and loose materials. Remove dirt from the machine tracks.
- NEVER correct your steering on the ramps. If necessary, drive away from the ramps and climb again.
- After loading, block the machine tracks and secure the machine with tie-downs.

Loading and unloading → See "13. TANSPORTATION".
Tie-downs → See "13. TRANSPORTATION".

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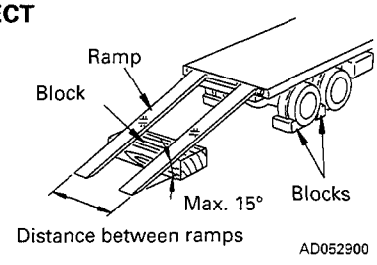


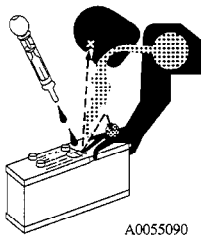
SHIPPING

- When shipping the machine on a hauling vehicle, obey all state and local laws governing the weight, width, and length of a load. Also obey all applicable traffic regulations.
- Determine the shipping route while taking into account the width, height and weight of the load.

7.4 BATTERY

BATTERY HAZARD PREVENTION

- Battery electrolyte contains sulfuric acid and can quickly burn the skin and eat holes in clothing. If you spill acid on yourself, immediately flush the area with water.
- Battery acid could cause blindness if splashed into the eyes. If acid gets into the eyes, flush them immediately with large quantities of water and see a doctor at once.
- If you accidentally drink acid, drink a large quantity of water or milk, beaten egg or vegetable oil. Call a doctor or poison prevention center immediately.
- When working with batteries. ALWAYS wear safety glasses or goggles.
- Batteries generate hydrogen gas. Hydrogen gas is very EXPLOSIVE, and is easily ignited with a small spark or flame.
- Before working with batteries, stop the engine and turn the starting switch to the OFF position.
- Avoid short-circuiting the battery terminals through accidental contact with metallic objects, such as tools, across the terminals.
- Tighten the battery terminals securely. Loosened terminals can generate sparks and lead to an explosion.
- When removing or installing, check which is the positive (+) terminal and negative (–) terminal.
- Tighten the battery cap.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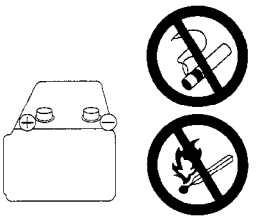
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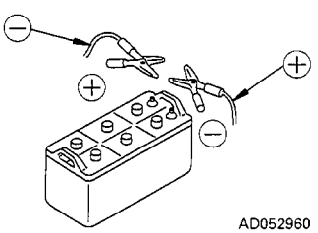
STARTING WITH BOOSTER CABLES

- ALWAYS wear safety glasses or goggles when starting the machine with booster cables.
- When starting from another machine, do not allow the two machines to touch.
- Be sure to connect the positive (+) cable first when installing the booster cables. Disconnect the ground or negative (–) cable first when removing them.
- Connect the batteries in parallel: positive to positive and negative to negative.
- When connecting the ground cable to the frame of the machine to be started, be sure to connect it as far as possible from the battery.

Starting with booster cables → See "16.2 IF BATTERY IS DISCHARGED".

INCORRECT

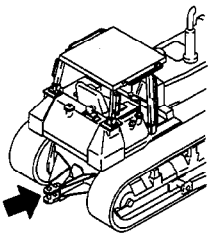

AD052960


A0055110

7.5 TOWING

FIT WIRE TO HOOK OR DRAWBAR PIN WHEN TOWING

- Injury or death could result if a disabled machine is towed incorrectly.
- If your machine is towed by another machine, ALWAYS use a wire rope with a sufficient towing capacity.
- If your machine is towed by another machine, stop the engine and release the brake. Please contact your Komatsu distributor to have the brake released.
- NEVER allow a disabled machine to be towed on a slope.
- Do not use a kinked or frayed wire rope.
- Do not straddle the towing cable or wire rope.
- When connecting up a towing machine, do not let anyone enter the area between the towing machine and the equipment being towed.
- Set the towing machine and the towing connection of the equipment being towed in a straight line when connecting it.
- Take up the slack in the wire rope and tow the machine.

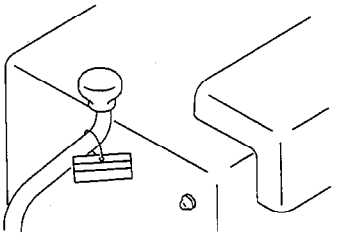


AE079860

8.1 BEFORE CARRYING OUT MAINTENANCE

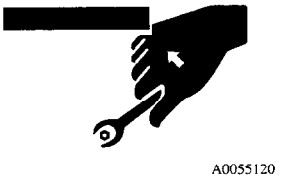
WARNING TAG

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



PROPER TOOLS

- Use only tools suited to the task. Using damaged, low quality, faulty, or makeshift tools could cause personal injury.
  Tools → See "21.1 INTRODUCTION OF NECESSARY TOOLS".



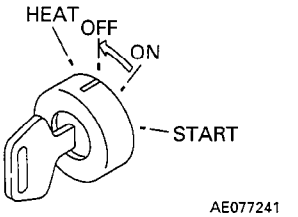
PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS

- Replace the following fire-related components periodically:
  Fuel system: Fuel hose, spilling hose, and fuel tube cap
  Hydraulic system: Pump outlet hoses
- Replace these components periodically with new ones, regardless of whether or not they appear to be defective. These components deteriorate over time.
- Replace or repair any such components if any defect is found, even though they have not reached the time specified.

Replacement of safety critical components → See "22. PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS".

STOP THE ENGINE BEFORE CARRYING OUT INSPECTION AND MAINTENANCE

- Always stop the machine on firm flat ground and stop the engine before carrying out inspection and maintenance.
- If it is necessary to run the engine when carrying out maintenance, such as when cleaning the inside of the radiator, place the safety lock lever at the LOCK position and carry out the operation with two workers.
- One worker should sit in the operator's seat so that he can stop the engine immediately if necessary. He should also be extremely careful not to touch any lever by mistake. Touch the levers only when they have to be operated.
- The worker carrying out the maintenance should be extremely careful not to touch or get caught in the moving parts.
- If maintenance is carried out with the work equipment raised, always support it securely with blocks.



8.2 DURING MAINTENANCE

PERSONNEL

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

ATTACHMENTS

- Place attachments that have been removed from the machine in a safe place so that they do not fall. If they fall on you or others, serious injury could result.


A0055130

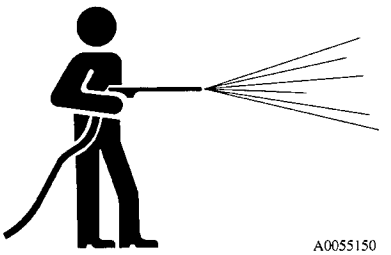
WORK UNDER THE MACHINE

- Always lower all movable work equipment to the ground or to their lowest position before performing service or repairs under the machine.
- Always block the tracks of the machine securely.
- Never work under the machine if the machine is poorly supported.


A0055140

KEEP THE MACHINE CLEAN

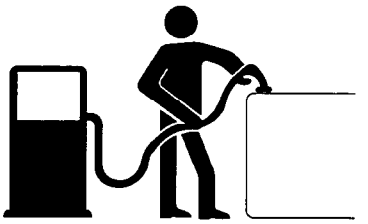
- Spilled oil or grease, or scattered tools or broken pieces are dangerous because they may cause you to slip or trip. Always keep your machine clean and tidy.
- If water gets into the electrical system, there is danger that the machine may not move or may move unexpectedly. Do not use water or steam to clean the sensors, monitors, controllers, connectors, or the inside of the operator's compartment.


A0055150

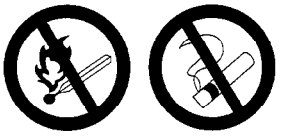
RULES TO FOLLOW WHEN ADDING FUEL OR OIL

- Spilled fuel and oil may cause you to slip, so always wipe it up immediately.
- Always tighten the cap of the fuel and oil fillers securely.
- Never use fuel for washing any parts.
- Always add fuel and oil in a well-ventilated place.

A0055020



A0055030



A0055040

RADIATOR WATER LEVEL

- When checking the water level, stop the engine and wait for the engine and radiator to cool down, then check the water level in the sub-tank. Normally, do not remove the radiator cap.
- If removing the radiator cap, turn it slowly to release the internal pressure.

AD051740

\USE OF LIGHTING

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

A0055160

PRECAUTIONS WITH BATTERY

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

A0055170

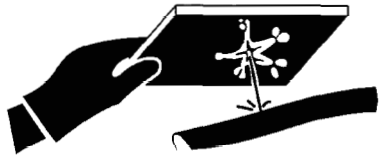
HANDLING HIGH-PRESSURE HOSES

- Do not bend high-pressure hoses or hit them with hard objects. Do not use any bent or cracked piping, tubes or hoses. They may burst during use.
- Always repair any loose or broken fuel hoses or oil hoses. If fuel or oil leaks, it may cause a fire.
- Avoid torching, soldering, or welding on pipes, tubes and equipment that contain fuel or oils. If heated, they can generate flammable fumes or mist and could cause a fire or explosion.

PRECAUTIONS WITH HIGH PRESSURE OIL

- Do not forget that the work equipment circuits are always under pressure.
- Do not add oil, drain oil, or carry out maintenance or inspection before completely releasing the internal pressure.
- If oil is leaking under high pressure from small holes, it is dangerous if the jet of high-pressure oil hits your skin or enters your eyes. Always wear safety glasses and thick gloves, and use a piece of cardboard or a sheet of wood to check for oil leakage.
- If you are hit by a jet of high-pressure oil, consult a doctor immediately for medical attention.

A0055180



A0055190

PRECAUTIONS WHEN CARRYING OUT MAINTENANCE AT HIGH TEMPERATURE OR HIGH PRESSURE

- Immediately after stopping operations, the engine cooling water and oil at all parts is at high temperature and under high pressure.
  In this condition, if the cap is removed, or the oil or water are drained, or the filters are replaced, this may result in burns or other injury. Wait for the temperature to go down, then carry out the inspection and maintenance in accordance with the procedures given in this manual.

Clean inside or cooling system → See "24.2 WHEN REQUIRED".

Check cooling water level, lubricating oil level, hydraulic oil level → See "24.3 CHECK BEFORE STARTING".

Checking final drive case → See "24.5 PERIODIC MAINTENANCE".

Changing oil, replacing filters → See "24.6 - 8 PERIODIC MAINTENANCE".

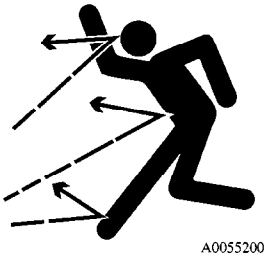
A0055050

PRECAUTIONS WHEN USING HIGH PRESSURE GREASE TO ADJUST TRACK TENSION

Grease is pumped into the track tension adjustment system under high pressure.
If the specified procedure for maintenance is not followed when making adjustments, the plug or grease fitting may fly out and cause damage or personal injury.

- When loosening the grease drain plug, never loosen it more than one turn.
- Never put your face, hands, feet, or any other part of your body directly in front of any grease drain plug or valve.

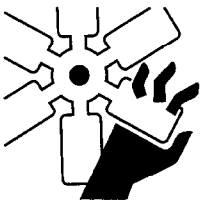
Adjusting track tension → See "24.2 WHEN REQUIRED".



A0055200

ROTATING FAN AND BELT

- Keep away from rotating parts and be careful not to let anything get caught in them.
- If your body or tools touch the fan blades or fan belt, they may be cut off or sent flying, so never touch any rotating parts.

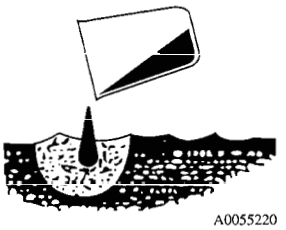


A0055210

WASTE MATERIALS

- Never dump waste oil in a sewer system, rivers, etc.
- Always put oil drained from your machine in containers. Never drain oil directly on the ground.
- Obey appropriate laws and regulations when disposing of harmful objects such as oil, fuel, coolant, solvent, filters, batteries, and others.

INCORRECT



A0055220

9. POSITION FOR ATTACHING SAFETY LABELS

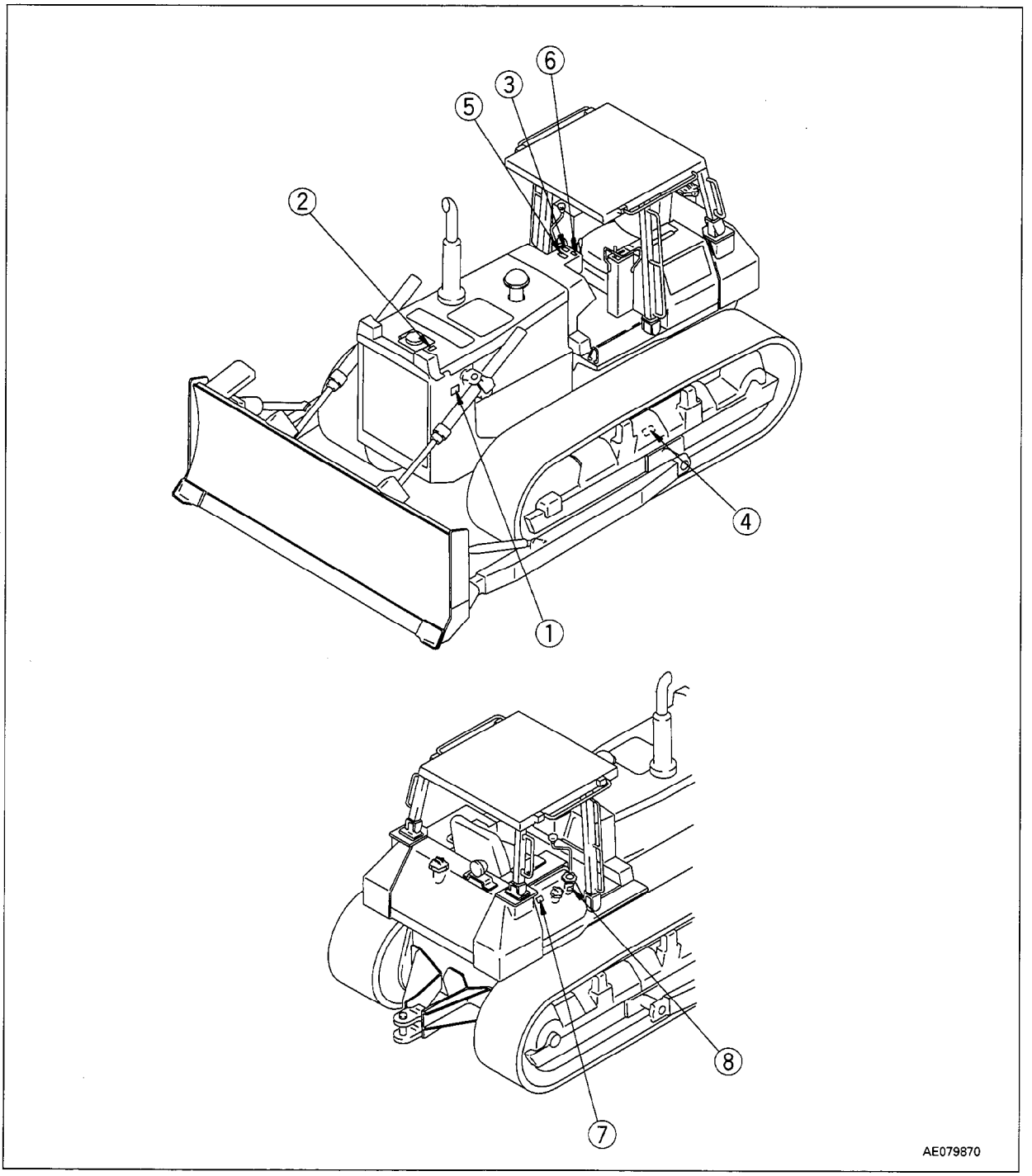
Always keep these labels clean. If they are lost or damage, attaching them again or replace them with a new label.

There are other labels in addition to the safety labels listed as follows, so handle them in the same way.

Safety labels may be available in languages other than English.

To find out what labels are available, contact your Komatsu distributor.

9.1 POSITION FOR ATTACHING SAFETY LABELS



1. Cautions for checking engine room (09667-03000)

⚠ CAUTION

WHILE ENGINE IS RUNNING:

1. DO NOT OPEN COVER.
2. KEEP AWAY FROM FAN AND FAN-BELT.

09667-03000

2. Warnings for opening radiator cap (09668-03000)

⚠ WARNING

DO NOT LOOSEN CAP WHEN WATER TEMPERATURE IS HIGH. IF LOOSENED, BOILING WATER MAY GUSH OUT BECAUSE OF HIGH INTERNAL PRESSURE.

09668-03000

3. Cautions for inspection and maintenance (09173-03000)

⚠ CAUTION

WHEN CARRYING OUT MAINTENANCE.
1. PARK THE MACHINE ON LEVEL GROUND.
2. LOWER WORK EQUIPMENT TO THE GROUND, AND LOCK THE LEVER.
3. DO NOT GO UNDER MACHINE WHEN IT IS RAISED BY THE WORK EQUIPMENT.

09173-03000

4. Warnings for adjusting track tension (09657-03010)

⚠ WARNING

1. TO INCREASE TRACK TENSION. PUMP IN GREASE THROUGH LUBRICATOR.
2. TO SLACKEN IT. RELEASE GREASE BY ROTATING LUBRICATION ONE TURN. (FOR TRACK ADJUSTMENT PROCEDURE, READ OPERATION AND MAINTENANCE MANUAL.)
3. DO NOT LOOSEN LUBRICATOR MORE THAN ONE FULL TURN, ALSO BE CAREFUL NOT TO LOOSEN ANY PARTS OTHER THAN LUBRICATOR. SINCE THE GREASE IS UNDER HIGH PRESSURE EXCESS LOOSENING IS HIGHLY DANGEROUS.
4. RETIGHTEN LUBRICATOR SECURELY AFTER ADJUSTMENT.

09657-03010

5. Warnings for leaving operator's seat (09654-03000)

⚠ WARNING

OBSERVE THE FOLLOWING CAUTIONS WHEN STARTING THE MACHINE OR WHEN YOU LEAVE OPERATOR'S SEAT AFTER PARKING THE MACHINE:
1. SET THE GEARSHIFT LEVER INTO NEUTRAL POSITION AND LOCK IT WITH THE SAFETY LEVER WHEN APPLICABLE.
2. LOCK THE BRAKES.
3. LOWER THE WORKING EQUIPMENT TO THE GROUND AND LOCK THE LEVER.

09654-03000

6. Cautions before operating machine (09651-03000)

⚠ CAUTION

BEFORE OPERATING MACHINE, READ OPERATION MMANUAL CAREFULLY.

09651-03000

7. Cuations for opening hydraulic tank cap (09653-03000)

⚠ CAUTION

1. ALWAYS STOP ENGINE WHEN REMOVING CAP.
2. DO NOT LOOSEN CAP WHEN OIL TEMPERATURE IS HIGH. IF LOOSENED, OIL MAY GUSH OUT.
3. SLOWLY OPEN HYDRULIC OIL TANK CAP AND RELEASE INTERNAL PRESSURE COMPLETELY.
4. DO NOT OPEN DRAIN PLUG WHEN OIL TEMPERATURE IS HIGH.

09653-03000

8. Caution for oil filter (09655-30120)

CAUTION

- AFTER THE FIRST 250 OPERATING HOURS, AND THEREAFTER EVERY 1000 OPERATING HOURS, RENEW THE OIL IN THE HYDRAULIC TANK AND THE ELEMENT IN THIS FILTER.
(SEE YOUR OPERATION AND MAINTENANCE MANUAL FOR DETAILS.)

WHEN RENEWING THE ELEMENT:
- REST THE WORK ATTACHMENT ON THE GROUND AND STOP THE ENGINE.

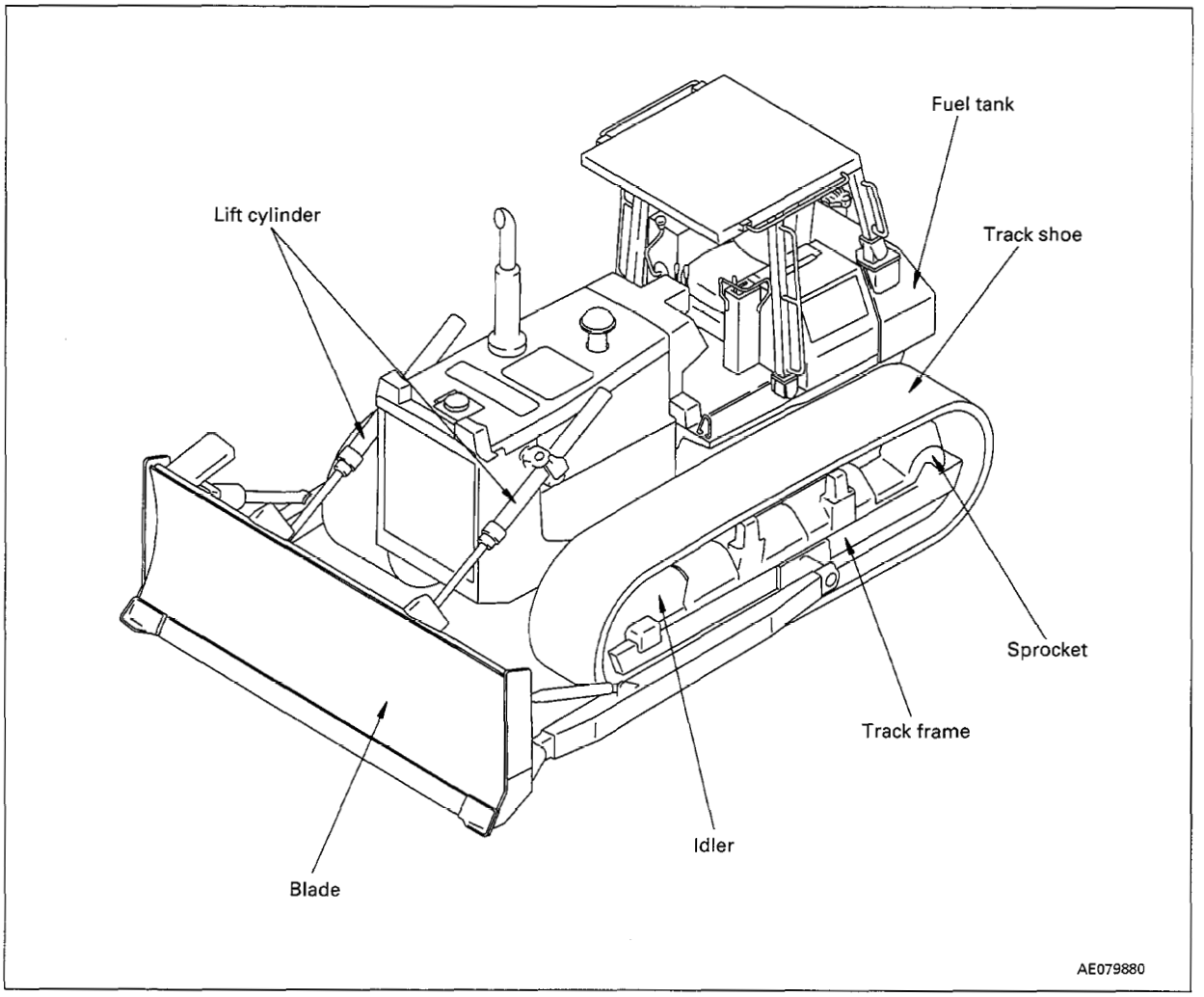
09655-30120

OPERATION

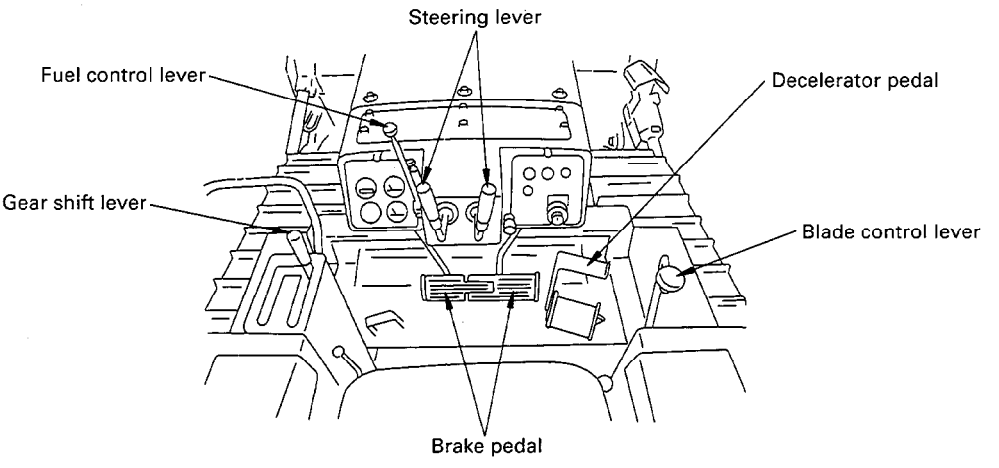
10. GENERAL VIEW

10.1 GENERAL VIEW OF MACHINE

If directions are indicated in this section, they refer to the directions shown by the arrows in the diagram below.



10.2 GENERAL VIEW OF CONTROLS AND GAUGES



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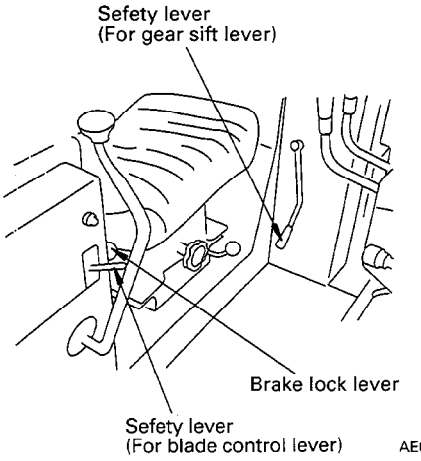
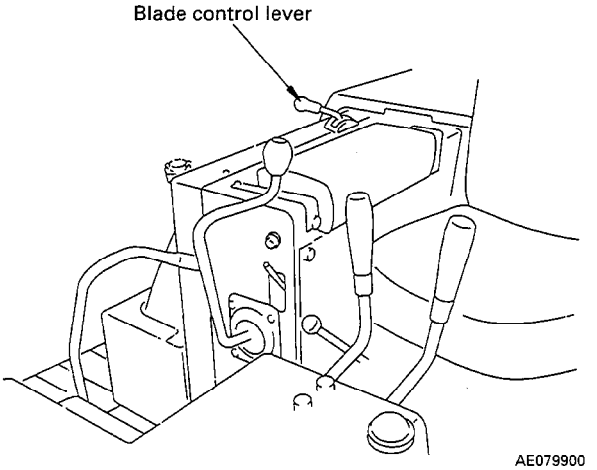
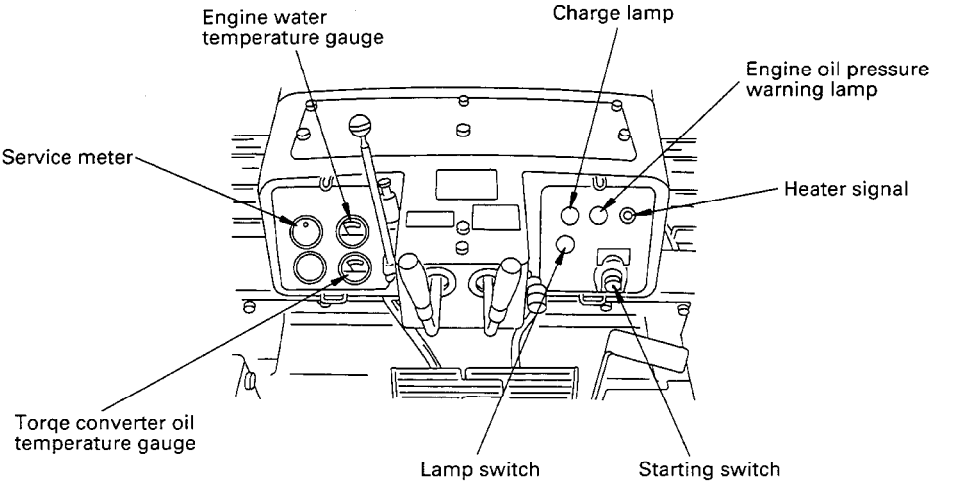


AE079910



AE079900



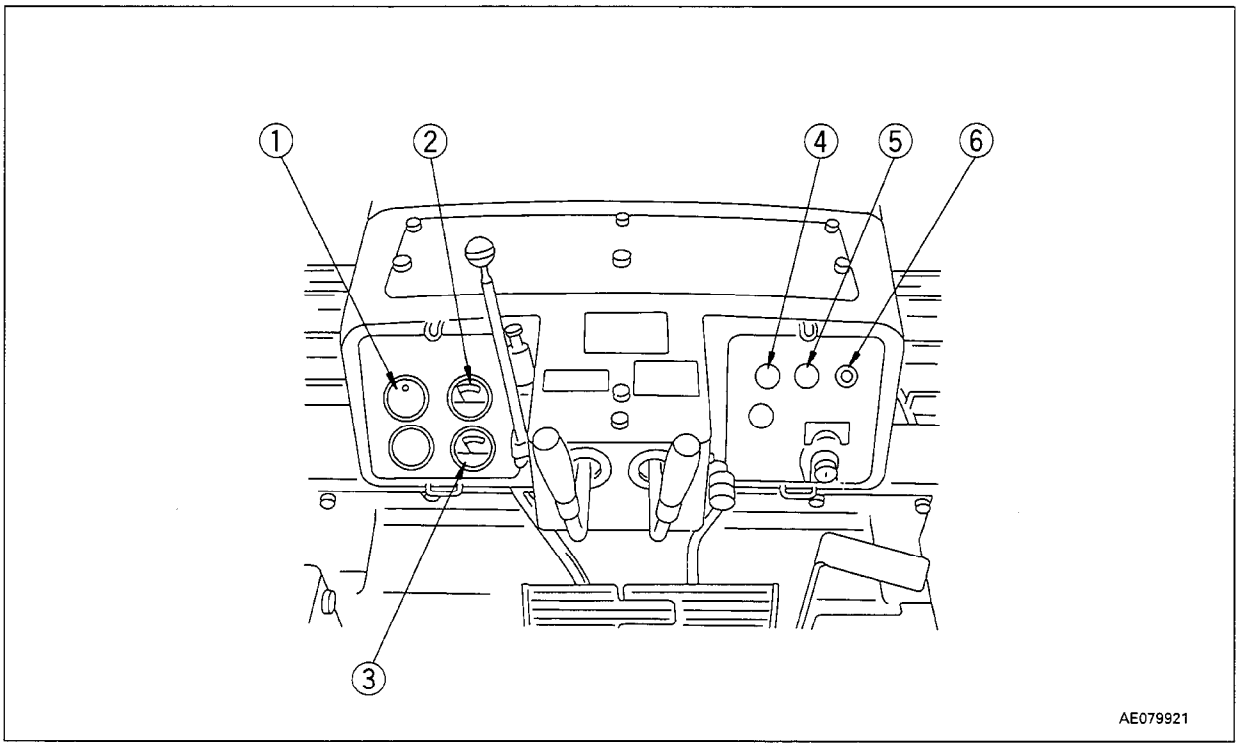
AE079920

11. EXPLANATION OF COMPONENTS

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

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

11.1 METERS AND LAMPS



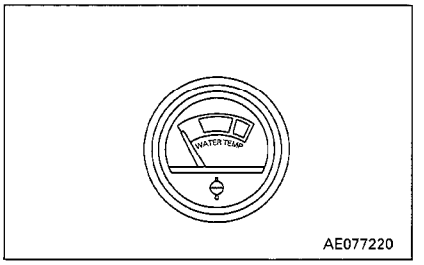
1. ENGINE WATER TEMPERATURE GAUGE

This gauge indicates the cooling water temperature.

When the indicator is in the green range during operation, the water temperature is normal.

If the indicator moves from the green range into the red range during operation, stop the machine and run the engine with no load at medium speed until the water temperature goes down.

After starting the engine, warm up it until the indicator moves into the green range.

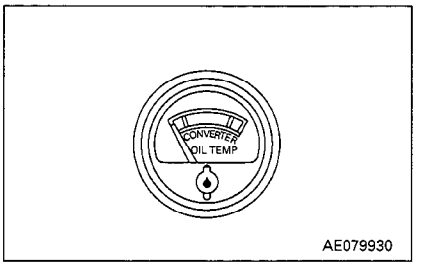


2. TORQUE CONVERTER OIL TEMPERATURE GAUGE

This gauge indicates the torque converter lubricating oil temperature.

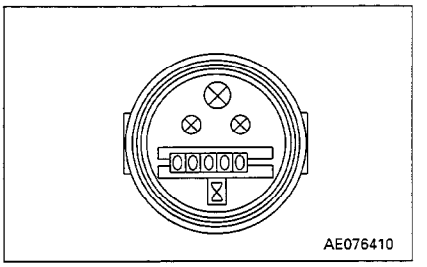
When the indicator is in the green range during operation, the torque converter oil temperature is normal.

If the indicator moves from the green range into the red range during operation, reduce the load and wait for the temperature to go down.



3. SERVICE METER

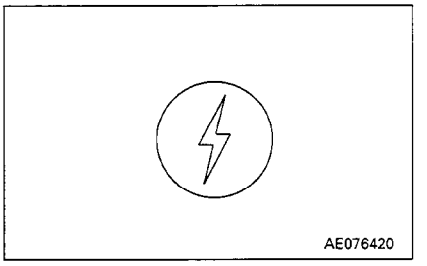
This meter shows the total hours of operation of the machine. The service meter advances while the engine is running. It advances 1 unit for each hour of operation, regardless of engine speed. Therefore, if the engine is running, the service meter will advance even if the machine is not moving.


AE076410

4. CHARGE LAMP

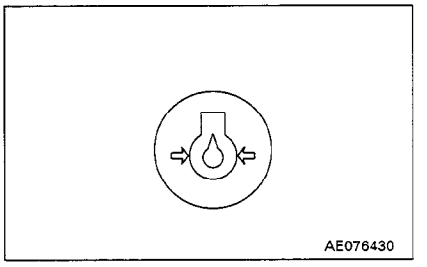
This lamp indicates malfunction of the alternator.
When the starting switch is turned ON, it will light up, but it should go out when the engine speed rises.

If the lamp lights up during operation, stop the engine and check the V-belt tension. If any abnormality is found, see "16. TROUBLE-SHOOTING."


AE076420

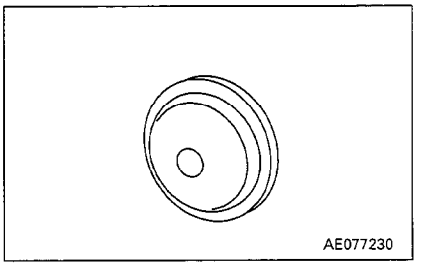
5. ENGINE OIL PRESSURE WARNING LAMP

This lamp warns that the engine lubricating oil pressure has dropped. When the starting switch is turned ON, it will light up.
When the lamp goes off after the engine is started, the oil pressure is normal.
When the lamp lights up during operation, the oil pressure is lower. Immediately stop the engine and look for the cause. For details, see "16. TROUBLESHOOTING".

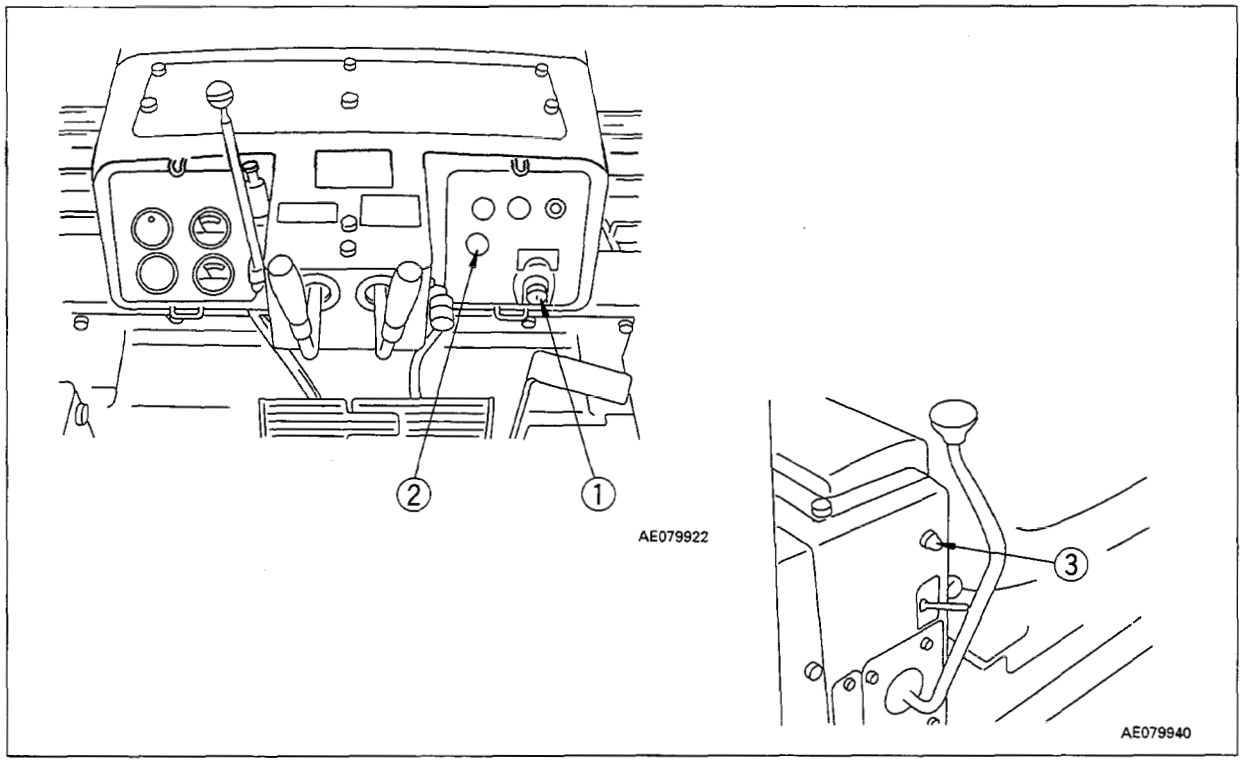

AE076430

6. HEATER SIGNAL

This indicates the electrical intake air heater is red-heated.
When holding the starting switch key at the HEAT position, this signal glows red after 20 – 30 seconds.
When releasing the key, the key will return to the OFF position and the signal will go off.


AE077230

11.2 SWITCHES



1. STARTING SWITCH

(For machines stopped by fuel control lever)

This switch is used to start the engine.

OFF position:

At this position, the starting switch key can be inserted or removed. When the switch is turned to this position, the electrical circuits are switched off.

ON position:

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

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

START position:

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

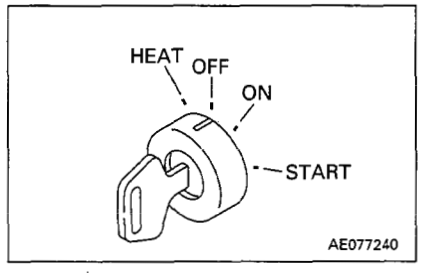
HEAT position:

Turn the starting switch key to the HEAT position when starting in cold weather.

The electrical intake air heater is operated while the key is held in the HEAT position.

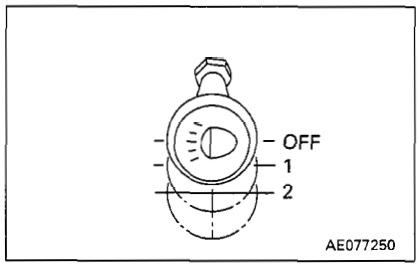
When the heater signal is red hot, release the key.

When the key is released, it will return to OFF, so turn it immediately to the START position to start the engine.



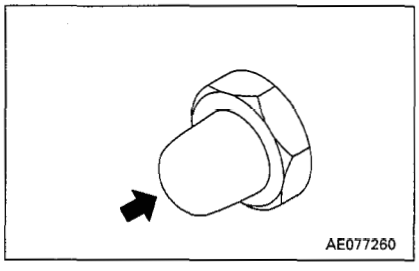
2. LAMP SWITCH

This lights up the head lamps, the rear working lamp and the panel lamp.
Position OFF: Lamps go off.
Position 1: Head lamps and panel lamp light up.
Position 2: Rear working lamp lights up in addition to the lamps in position 1.

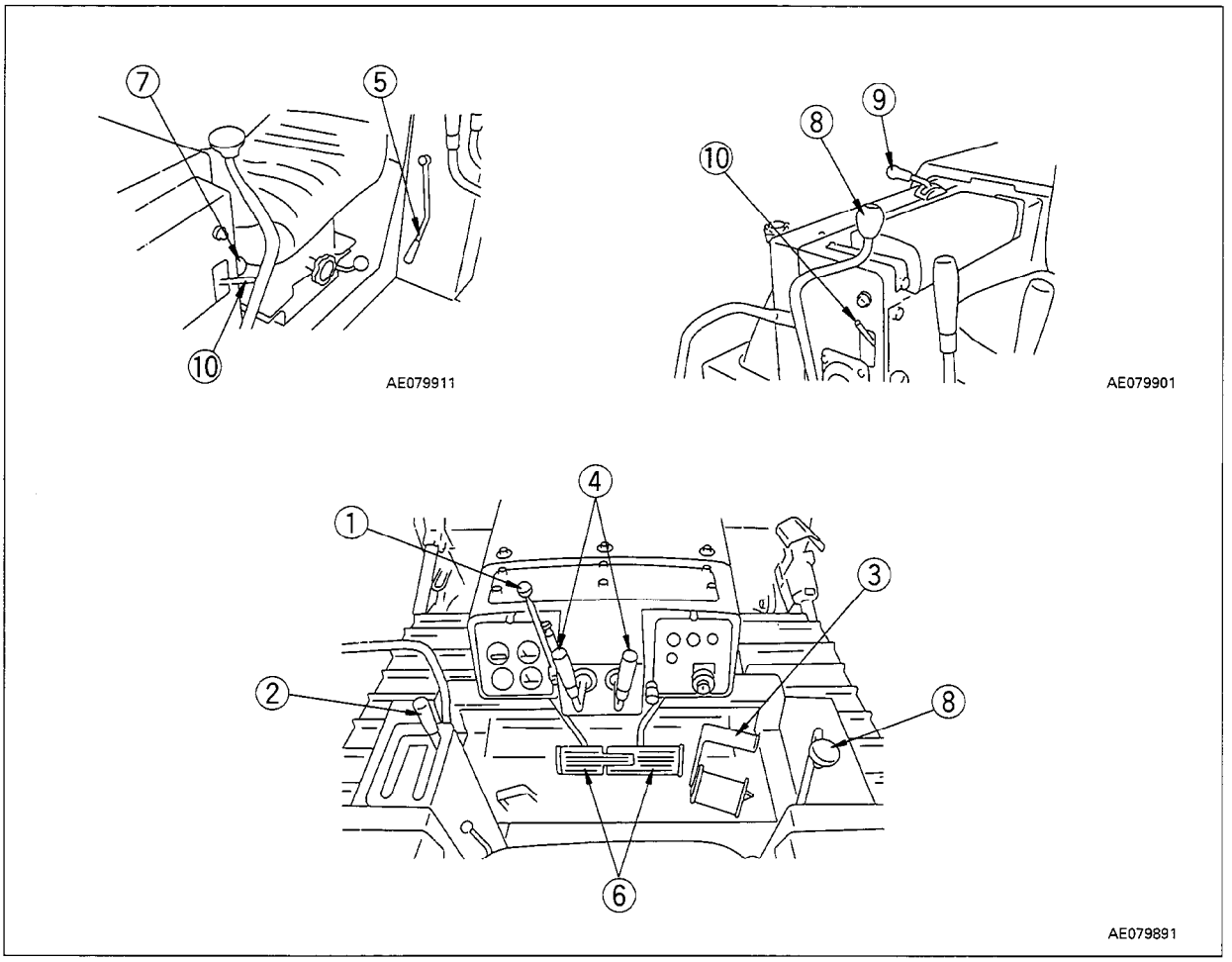


3. HORN SWITCH

To sound the horn, push the button located at the front of R.H. armrest.



11.3 CONTROL LEVERS AND PEDALS



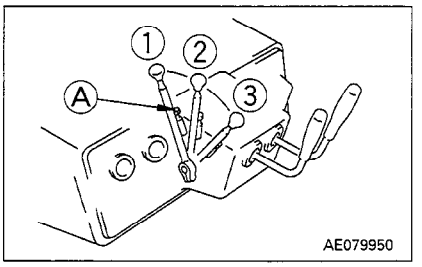
1. FUEL CONTROL LEVER

This lever is used to control the engine speed and output.

① Engine stop position: Lever pushed fully forward.
When stopping engine, place lever in engine stop position ① by pushing lever beyond the low idling position ② after pulling the knob Ⓐ.

② Low idling position: Lever pulled back from position ① to position where operating effort is less

③ High idling position: Lever pulled back fully from position ②

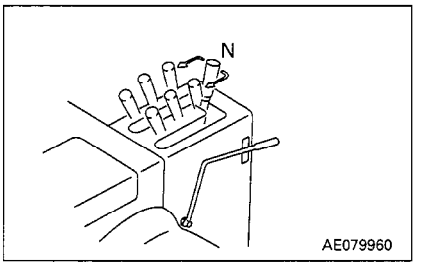


2. GEAR SHIFT LEVER

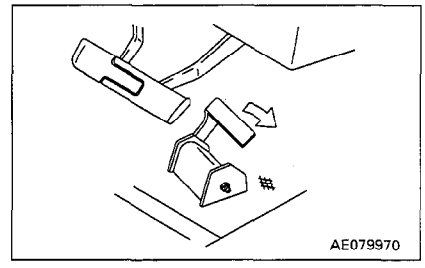
This lever changes the transmission gear range. There are three ranges in both forward and reverse, and the gears can be shifted simply by moving the gear shift lever to the desired position.

REMARK

If the gear shift lever is not at the neutral position, the engine cannot be started.



3. DECELERATOR PEDAL

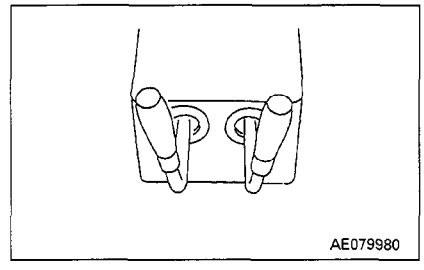


⚠ WARNING

- **Do not place your foot on this pedal unnecessarily.**
- **When arriving at the top of a slope, or when dumping earth from a cliff, the machine will increase its speed with the sudden loss of load. Slow the machine by depressing the decelerator pedal.**

This pedal is used to decelerate engine speed.

4. STEERING LEVER



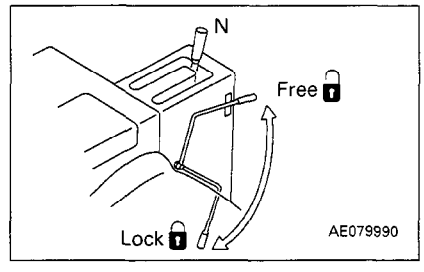
This lever is used to steer the machine.

If the lever is pulled halfway towards the side to which the machine will turn, the steering clutch is disengaged, and the machine will turn gradually. If the steering lever is pulled further, the steering brake is applied and the machine will carry out a pivot turn.

REMARK

When using the steering lever and brake pedal together, pull the steering lever until it enters the detent range (steering clutch disengaged), then depress the brake pedal.

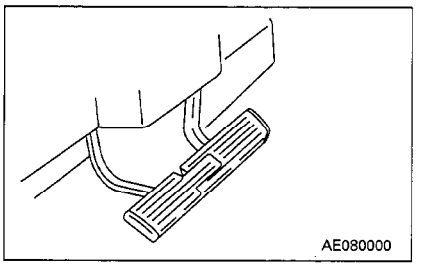
5. SAFETY LEVER (FOR GEAR SHIFT LEVER)



⚠ WARNING

- **When leaving the operator's seat, be sure to set the safety lever securely to the LOCK position.**
  If the lock is not applied and the gear shift lever is touched by accident, the machine may move and cause serious damage or injury.
- **If the safety lever is not placed securely at the LOCK position, the lock may not be applied.**
- **When parking the machine, always set the gear shift lever to the neutral position and apply the lock.**
  This lever is used to lock the gear shift lever.

6. BRAKE PEDAL



⚠ WARNING

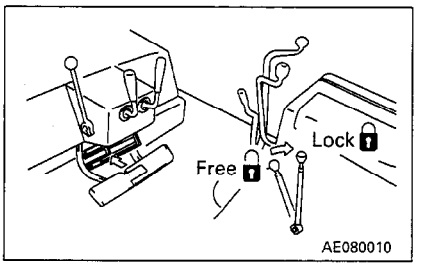
Do not place your foot on this pedal if you are not using it.

If the center of the left and right pedals is depressed, both the left and right brakes are applied. If the steering lever is pulled to the detent position, and the brake pedal on the same side is depressed, the machine will carry out a pivot turn.

REMARK

When carrying out a pivot turn on ground where there is high turning resistance, and the steering lever is heavy, depress the brake pedal on the same side as the direction of turning, and the lever operating effort will become lighter.

7. BRAKE LOCK LEVER



⚠ WARNING

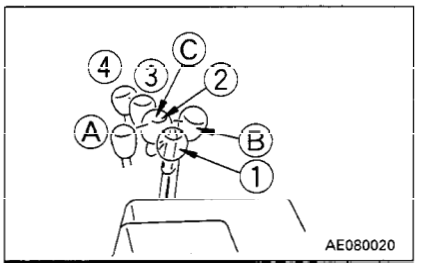
When parking the machine, always lock the brake pedal.

This lever is used to lock the brake pedal. Use it when parking the machine.

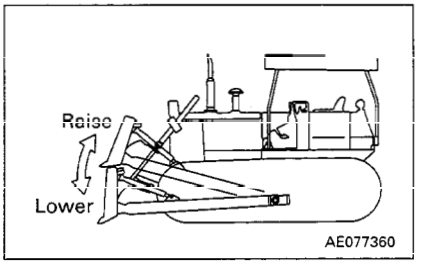
When locking the brake pedal, pull the lock lever, then depress the brake pedal strongly to apply the lock securely.

When releasing the brake, depress the brake pedal and press the knob at the tip of the lock lever.

8. BLADE CONTROL LEVER (LIFT, TILT, PITCH)
This lever is used to operate the blade lift, tilt, and pitch.

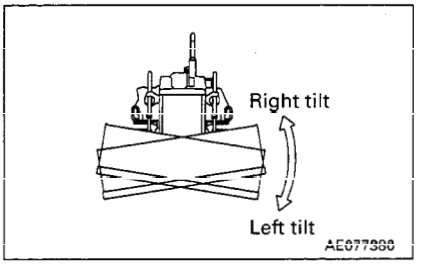


① RAISE
② HOLD: Blade is stopped and held in this position



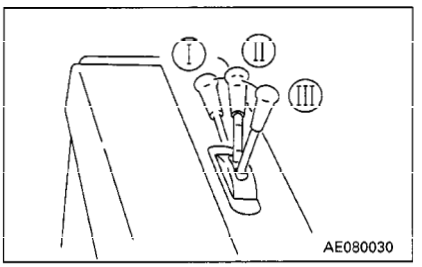
③ LOWER
④ FLOAT: Blade will move freely according to external force.

REMARK
When the lever is at the FLOAT position, it will not return to the HOLD position when it is released, so it must be moved back by hand.

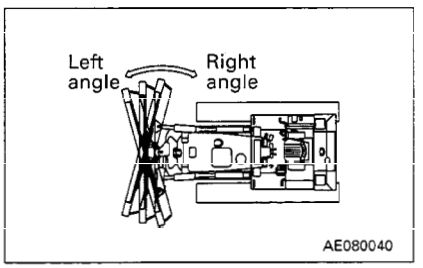


Ⓐ LEFT TILT
Ⓑ RIGHT TILT

9. BLADE CONTROL LEVER (ANGLE) PAT machines only
This lever is used to angle the blade.



Ⓘ LEFT ANGLE
Ⓘ HOLD: Blade is stopped and held in this position
Ⓘ RIGHT ANGLE



10. SAFETY LEVER (FOR BLADE CONTROL LEVER)

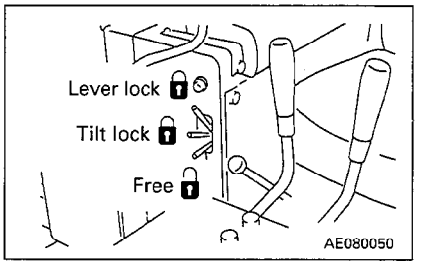
⚠ WARNING

- **When leaving the operator's seat, be sure to set the safety lever securely to the LOCK position.**
  If the lock is not applied and the blade control lever is touched by accident, the work equipment may move and cause serious damage or injury.
- **If the safety lever is not placed securely at the LOCK position, the lock may not be applied.**
- **When parking the machine or carrying out maintenance, always lower the blade to the ground and apply the lock.**

This lever is used to lock the blade control lever.

(Tiltdozer)

Lever LOCK position:	This locks the blade lift and tilt control.
Tilt LOCK position:	This locks only the tilt control; the blade can be raised or lowered.
FREE position:	The blade can be raised, lowered or tilted.



11.4 FUSE BOX

NOTICE

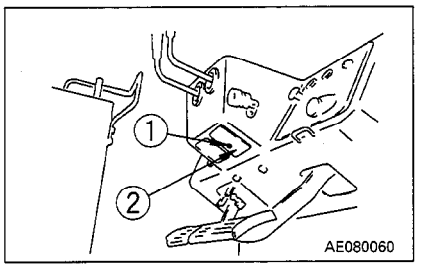
Before replacing a fuse, be sure to turn off the electric power (turn the starting switch to the OFF position).

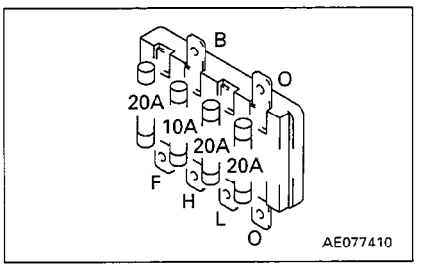
The fuses protect the electrical equipment and wiring from burning out.

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

Replace the fuse with one of the same capacity.

Loosen bolt ①, open cover ②, then replace the fuse.





Fuse capacity and circuit name

No.	Terminal mark	Fuse capacity	Circuit	Remarks
①	L	20A	Head lamp Rear lamp Illumination lamp for gauges	Torque converter oil temperature gauge Engine water temperature gauge
②	H	10A	Horn	–
③	F	10 A	Engine water temperature gauge Torque converter oil temperature gauge	–
④	O	20 A	–	Spare

12. OPERATION

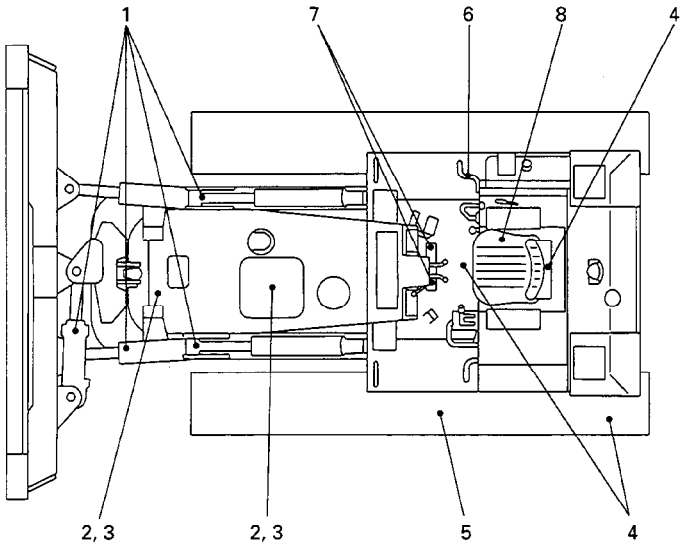
12.1 CHECK BEFORE STARTING ENGINE

12.1.1 WALK-AROUND CHECK

⚠ WARNING

- **Leakage of oil or fuel, or accumulation of flammable material around high temperature parts, such as the engine muffler or turbocharger, may cause fire.**
  Check carefully, and if any abnormality is found, repair it or contact your Komatsu distributor.

Before starting the engine, look around the machine and under the machine to check for loose nut or bolts, or leakage of oil, fuel, or coolant, and check the condition of the work equipment and hydraulic system. Check also for loose wiring, play, and collection of dust at places which reach high temperatures.



AE080070

1. **Check for damage, wear, play in work equipment, cylinders, linkage, 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 radiator**
   Check if there is any dirt or dust accumulated around the engine or radiator. Check also if there is any flammable material (dead leaves, twigs, grass, etc.) accumulated around the battery or high temperature engine parts, such as the engine muffler or turbocharger. Remove all such dirt or flammable material.

3. **Check for leakage of water or oil around engine**
   Check that there is no leakage of oil from the engine or leakage of water from the cooling system. If any abnormality is found, repair it.

4. **Check for oil leakage of oil from power train case, final drive case, hydraulic tank, hose, joints**
   Check that there is no oil leakage. If any abnormality is found, repair the place where the oil is leaking.
   Check for leakage of oil from the undercover. Check the ground for traces of oil leakage.

5. **Check the undercarriage (track, sprocket, idler, guard) for damage, wear, loose bolts, or leakage of oil from rollers**
   If any damage, wear, or oil leakage is found, repair the problem and tighten the bolts.

6. **Check for damage to handrail, loose bolts**
   Repair any damage and tighten any loose.

7. **Check for damage to gauges, lamps on instrument panel, loose bolts**
   Check that there is no damage to the panel, gauges and lamps. If any abnormality is found, replace the parts. Clean off any dirt on the surface.

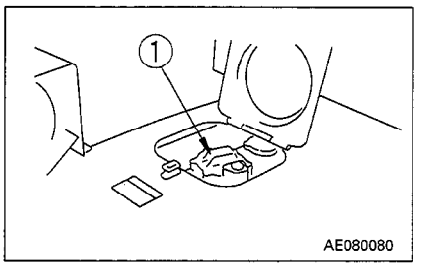
8. **Check for damage to seat belt and mounting clamps**
   Check that there is no abnormality in the seat belt or mounting clamps. If there is any damage, replace with new parts.

12.1.2 CHECKS BEFORE STARTING

CHECK COOLANT LEVEL, ADD WATER

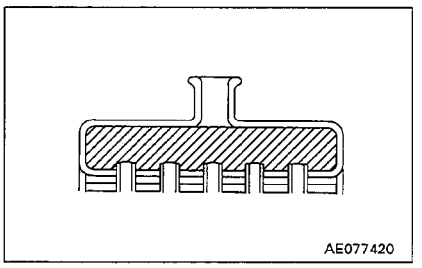
⚠ WARNING

Do not remove the radiator cap if the coolant is hot. Hot water may spurt out.
Wait for the water temperature to go down, turn the radiator cap slowly to release the pressure, then remove it.



AE080080

1. Open the top cover at the front of the machine.
2. Remove radiator cap ①, and check that the coolant is up to the shaded area. Add water if necessary.


AE077420

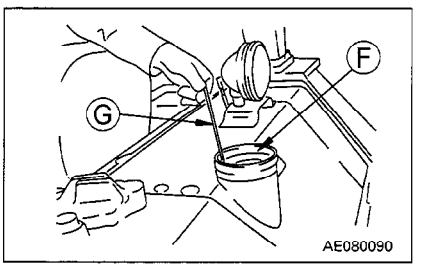
NOTICE

If more water than normal must be added, there is probably leakage, so check for the location of the leakage.

CHECK FUEL LEVEL

⚠ WARNING

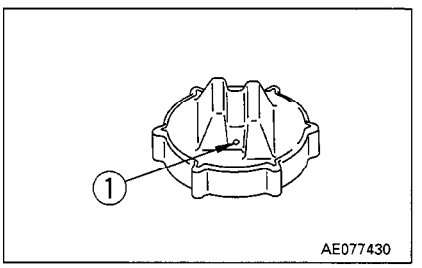
When adding fuel, never let the fuel overflow. This may cause a fire. Wipe up any fuel that is spilled.



AE080090

1. Remove the cap, then check the fuel level with oil level gauge Ⓖ.
2. After completing operations, add fuel through fuel filler Ⓕ to fill the tank.
3. After adding fuel, tighten the cap securely.

Fuel capacity: 250 ℓ (66 US gal, 55 UK gal)



AE077430

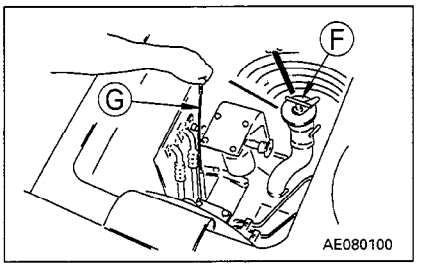
NOTICE

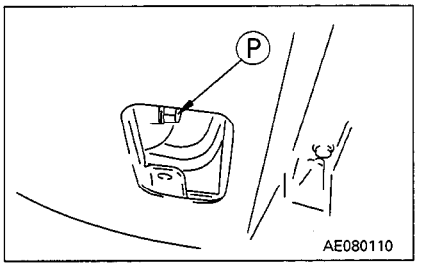
If breather hole ① in the cap is clogged, the pressure inside the tank will go down and the fuel may stop flowing, so clean the breather hole from time to time.

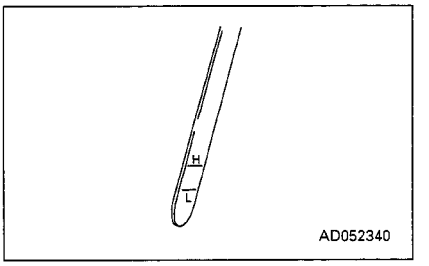
CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL

1. Open the upper cover at the front of the machine.
2. Remove dipstick Ⓖ, and wipe the oil off with a cloth.
3. Insert dipstick Ⓖ fully in the dipstick guide, then pull it out again.
4. The oil level should be between the H and L marks on dipstick Ⓖ.
   If the oil is below the L mark, add engine oil through oil filler Ⓕ.

   For details of the oil to use, see "20. USE OF FUEL, COOLANT, AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
5. If the oil is above the H mark, drain the excess oil from the drain plug Ⓟ, then check the oil level again.
6. If the oil level is correct, tighten the oil filler cap securely and close the upper cover.







REMARK

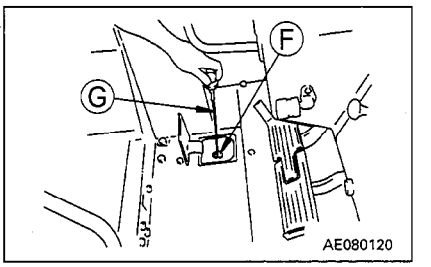
When checking the oil level after the engine has been operated, stop the engine and wait for at least 15 minutes before checking.

If the machine is at an angle, make it horizontal before checking.

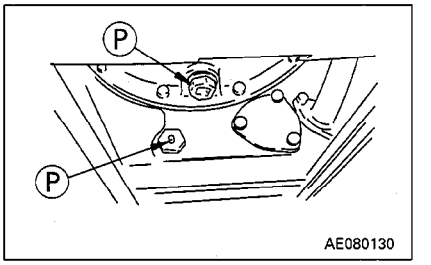
When adding oil, remove the dipstick from the dipstick guide, and release the air inside the crankcase.

CHECK OIL LEVEL IN TRANSMISSION CASE (INCL. TORQUE CONVERTER CASE), ADD OIL

1. Open the cover, remove dipstick Ⓖ, and wipe the oil off with a cloth.
2. Insert dipstick Ⓖ fully in the oil filler pipe, then take it out again.
3. The oil level should be between the H and L marks on dipstick Ⓖ.
   If the oil level is below the L mark, add engine oil through oil filler Ⓕ.
   For details of the oil to use, see "20. USE OF FUEL, COOLANT, AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
4. If the oil is above the H mark, drain the excess engine oil from drain plug Ⓟ, and check the oil level again.
5. If the oil level is correct, tighten the oil filler cap securely and close the cover.



AE080120



AE080130

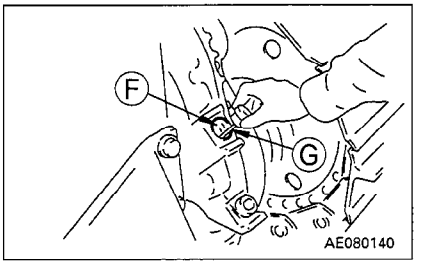
REMARK

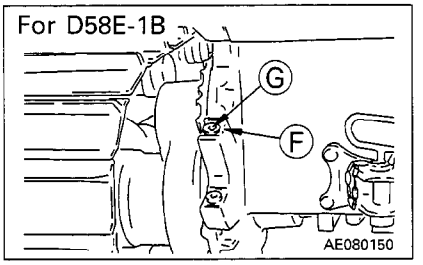
When checking the oil level after the engine has been operated, wait for at least 15 minutes after stopping the engine before checking.

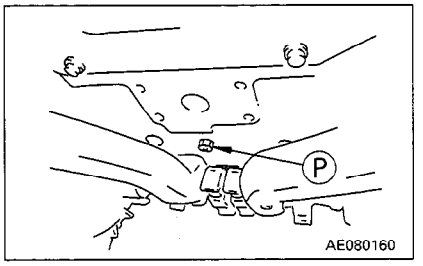
If the machine is at an angle, make it horizontal before checking.

CHECK OIL LEVEL IN STEERING CLUTCH CASE (INCL. BEVEL GEAR CASE), ADD OIL

1. Open the cover, remove dipstick Ⓖ, and wipe the oil off with a cloth.
2. Insert dipstick Ⓖ fully in the oil filler pipe, then take it out again.
3. The oil level should be between the H and L marks on dipstick Ⓖ.
   If the oil level is below the L mark, add engine oil through oil filler Ⓕ.
   For details of the oil to use, see "20. USE OF FUEL, COOLANT, AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
4. If the oil is above the H mark, drain the excess engine oil from drain plug Ⓟ, and check the oil level again.
5. If the oil level is correct, tighten the oil filler cap securely and close the cover.







REMARK

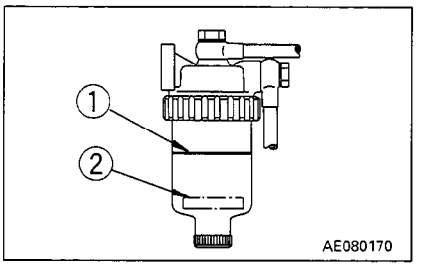
When checking the oil level after the engine has been operated, wait for at least 15 minutes after stopping the engine before checking.

If the machine is at an angle, make it horizontal before checking.

In case the work is carried out on sloped land of more than 25° declination, supply oil up to H level.

CHECK WATER SEPARATOR

The water separator separates water mixed in the fuel. If float ② is at or above red line ①, drain the water. For the draining procedure, see section "24.2 WHEN REQUIRED".

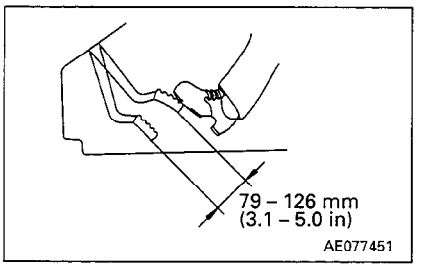


REMARK

Even if a water separator is installed, be sure to check the fuel tank to remove water and sediment in the fuel.

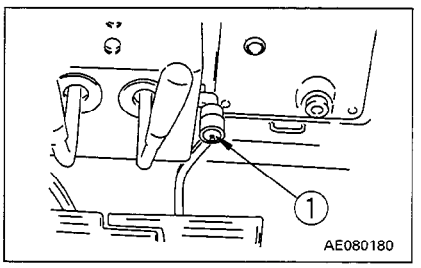
CHECK BRAKE PEDAL TRAVEL

1. Depress the brake pedal fully.
2. Check that the travel at the tip of the pedal is 79 – 126 mm (3.1 – 5.0 in).
3. If the travel is more than 126 mm (5.0 in), or the effect is poor, adjust the brake pedal. For details, see "24.2 WHEN REQUIRED".



CHECK DUST INDICATOR

1. Check that the red piston of dust indicator ① has not reached the service level.
2. If the red piston can be seen, clean or replace the element.
3. For details of element cleaning method, see "24.2.2 CHECK, CLEAN, REPLACE AIR CLEANER".
4. After cleaning the element, press button to return the red piston to its original position.



CHECK ELECTRIC WIRINGS

⚠ WARNING

If the fuse blows frequently, or there are traces of shortcircuiting in the electric wiring, always locate and repair the cause.

Check for damage of the fuse and any sign of disconnection or short circuit in the electric wiring. Check also for loose terminals and tighten any loose parts. Check the following points carefully.

- Battery
- Starting motor
- Alternator

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

⚠ WARNING

Accumulation of flammable material (dead leaves, twigs, grass, etc.) around the battery may cause fire, so always check and remove such material.

When carrying walk-around checks or checks before starting, always check if there is any accumulation of flammable material around the battery, and remove such flammable material.

12.1.3 ADJUST OPERATOR'S SEAT

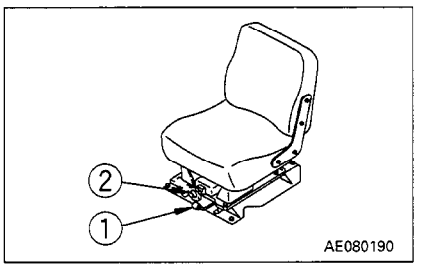
⚠ WARNING

Adjust the seat position before starting operations or after changing of operator.
Adjust the seat so that the brake pedal can be depressed fully with the operator's back against the backrest.

Fore-aft adjustment of seat

Move lever ① to the left (in the direction of the arrow), set the seat to the desired position, then release the lever.

Fore-aft adjustment: 160 mm (6.3 in) (9 stages)



Cushion adjustment

To improve the comfort, adjust the cushion setting to match the operator's weight

For operators below average weight, turn knob ② to the right; for operators above average weight, turn knob ② to the left.

12.1.4 OPERATIONS AND CHECK BEFORE STARTING ENGINE

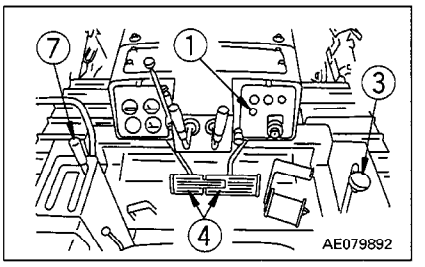
⚠ WARNING

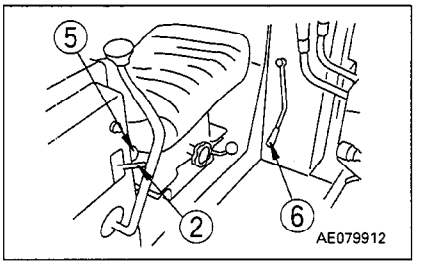
If the control levers are touched by accident, the machine may move suddenly.
When leaving the operator's compartment, always place the safety lever securely at the LOCK position.

Carry out the checks before starting. For details, see "12.1 CHECK BEFORE STARTING ENGINE".

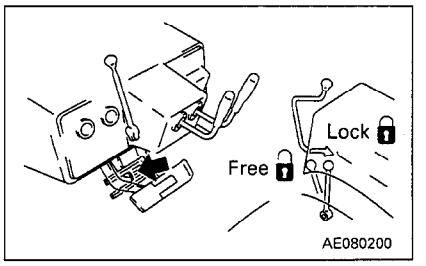
1. Adjust the seat so that brake pedal ④ can be depressed fully with the operator's back against the backrest.

2. Check the positions of the levers before starting the engine.

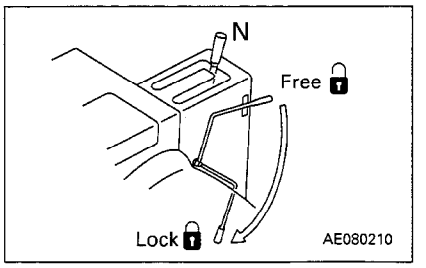




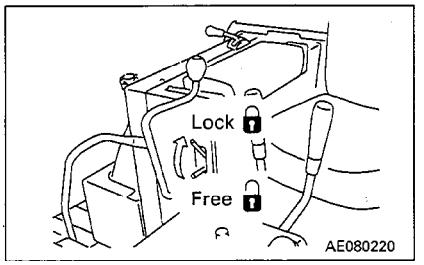
3. Check that the brake pedal ④ is locked with brake lock lever ⑤.



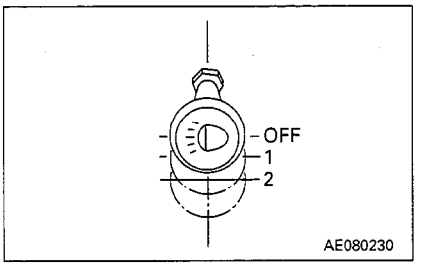
4. Check that the gear shift lever ⑦ is at the neutral position and that it is locked with safety lever ⑥.



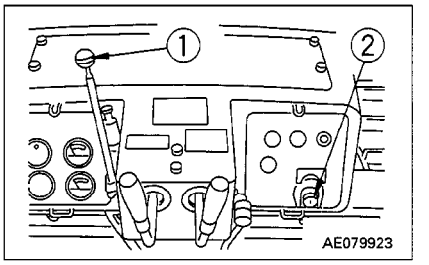
5. Check that the blade is lowered to the ground and that the blade control lever ③ is locked with safety lever ②.



6. Operate lamp switch ① and check that the front lamp lights up. If the lamp does not light up, the bulb is probably blown or there is a disconnection, please so contact your Komatsu distributor for repairs.



12.2 STARTING ENGINE



12.2.1 NORMAL STARTING

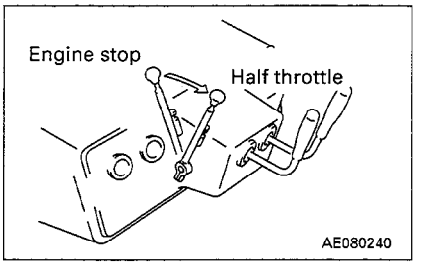
⚠ WARNING

Check that there are no persons or obstacles in the surrounding area, then sound the horn and start the engine.

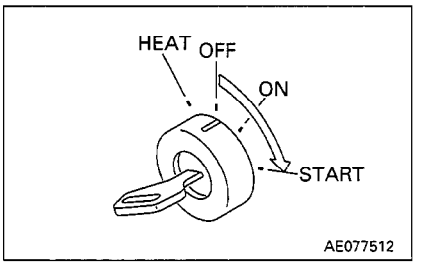
NOTICE

Do not keep the engine rotating for more than 20 seconds. If the engine does not start, wait for at least 2 minutes before trying to start the engine again.

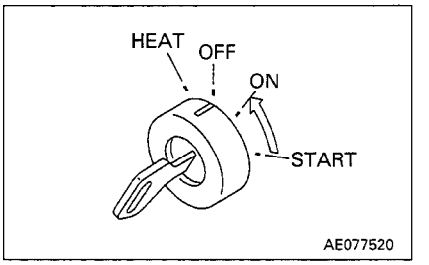
1. Move fuel control lever ① to a position midway between the engine stop position and the high idling position.



2. Turn the key in starting switch ② to the START position and start the engine.

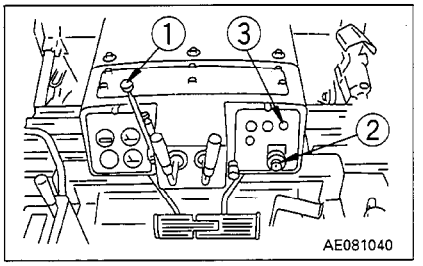


3. After the engine starts, release the key in starting switch ②. The key will automatically return to the ON position.



12.2.2 STARTING IN COLD WEATHER

When starting in low temperatures, do as follows.



⚠ WARNING

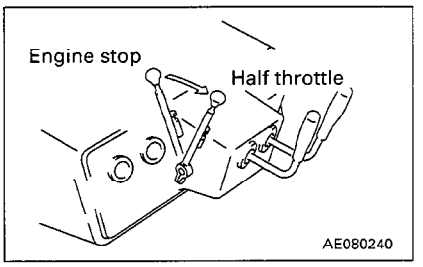
Never use starting aid fluids as they may cause explosions.

NOTICE

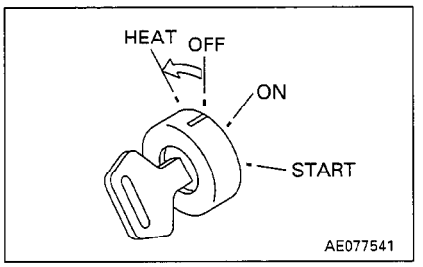
Do not keep the engine rotating for more than 20 seconds.

If the engine does not start, wait for at least 2 minutes, then repeat Steps 2 and 3.

1. Move fuel control lever ① to a position midway between the engine stop position and the high idling position.



2. Turn the key in the starting switch ② to the HEAT position and hold it until heater signal ③ glows red.

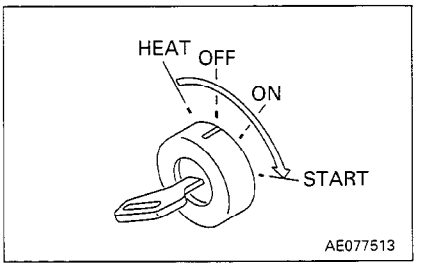


The preheating times are as shown below.

Ambient temperature	Preheating time
Above 0°C	–
0°C – –10°C	Approx. 20 seconds
–10°C – –20°C	Approx. 30 seconds

Always use the correct preheating time. If the preheating time is too long or too short, the engine will not start easily.

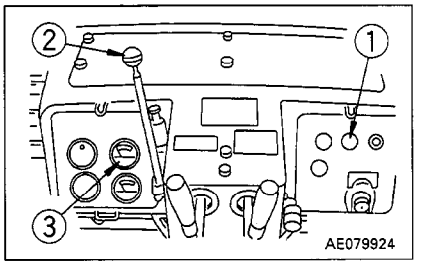
3. When heater signal ③ glows red, turn the key in the starting switch ② to the START position and start the engine.



REMARK

After carrying out warming-up operation, travel at low speed and gradually apply the load.

12.3 OPERATIONS AND CHECKS AFTER STARTING ENGINE



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

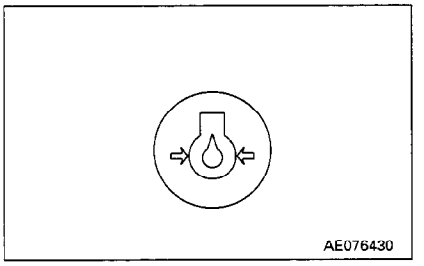
NOTICE

Avoid sudden acceleration until warming-up operation is completed.

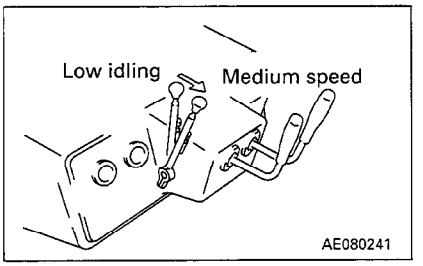
Do not run the engine at low idling or high idling for more than 20 minutes.

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

1. Run the engine at low idling and check that engine oil pressure caution lamp ① is off.



2. Pull fuel control lever ② and run the engine at a mid-range speed under no load for approx. 5 minutes.



3. After completing the warming-up operation, check that all the gauges and caution lamps are normal. If any abnormality is found, carry out service or repair.

   Run the engine under light load until engine water temperature gauge ③ is in the green range.

   Check that there is no abnormality in the exhaust gas color, sound, or vibration. If any abnormality is found, repair it.

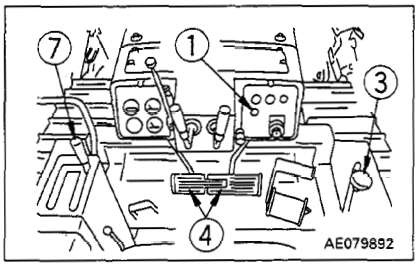
REMARK

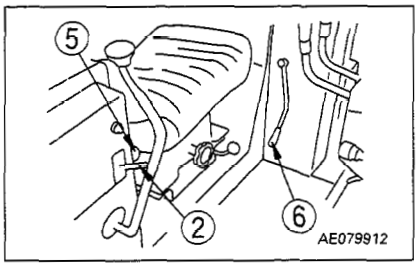
After completing the warming-up operation, if it is difficult to shift gears, continue the warming-up operation.

12.4 MOVING MACHINE

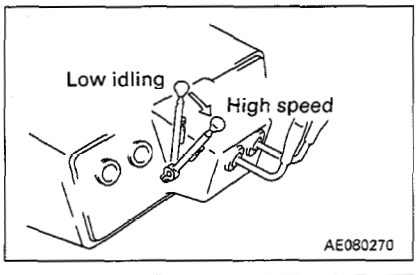
⚠ WARNING

- **When moving machine, check that the area around the machine is safe, and sound the horn before moving.**
  Do not allow any persons in the area around the machine.
  There is a blind spot behind the machine, so be particularly careful when reversing.
- **When starting on slopes, always keep brake pedal ④ depressed after setting parking brake lever ⑤ to the FREE position.**
- **When starting the machine on a steep uphill grade, keep brake pedal ④ depressed, run the engine at full throttle, then set gear shift lever ⑦ to the F1 or R1 position. When the machine starts to move slowly (or the shoes slip), release brake pedal ④ slowly and let the machine start moving.**

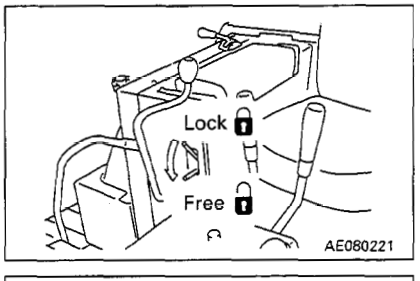




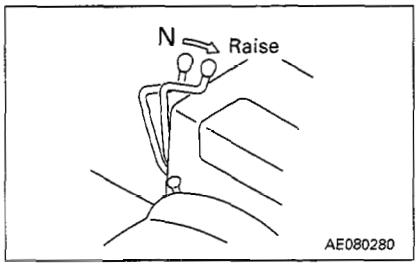
1. Pull fuel control lever ① to increase the engine speed.



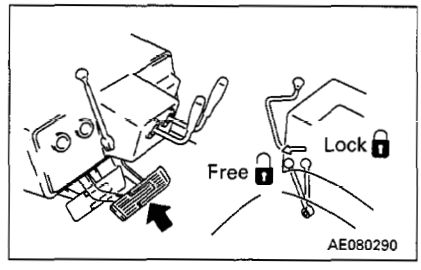
2. Set safety lever ② of blade control lever ③ to the FREE position.



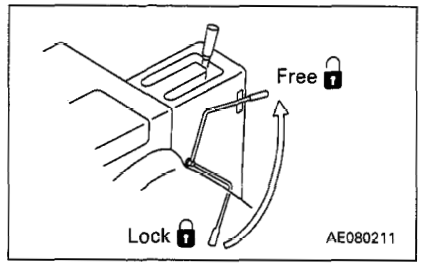
3. Move blade control lever ③ to the RAISE position and raise the blade 400 – 500 mm (1.6 – 2.0 in) off the ground.



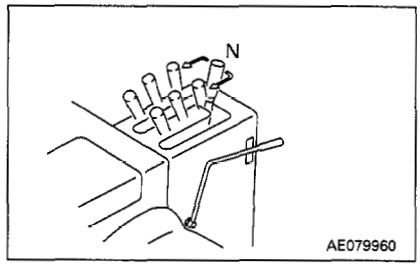
4. Depress the center of left and right brake pedals ④, set brake lock lever ⑤ to the FREE position.
   Keep brake pedal ④ depressed.



5. Set safety lever ⑥ of gear shift lever ⑦ to the FREE position.



6. Set gear shift lever ⑦ to the desired position.

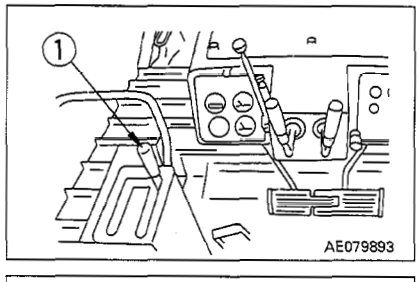


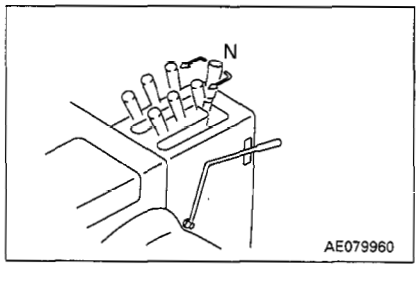
7. Release brake pedal ④ and let the machine move.

12.5 SHIFTING GEAR

The gears can be shifted while the machine is traveling, so there is no need to stop the machine to shift gears.

Set gear shift lever ① to the desired position to shift gears.

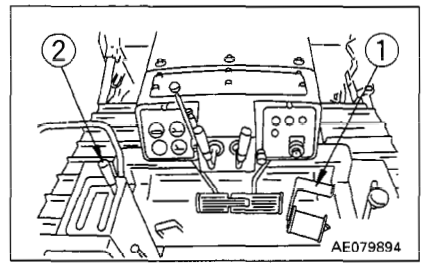




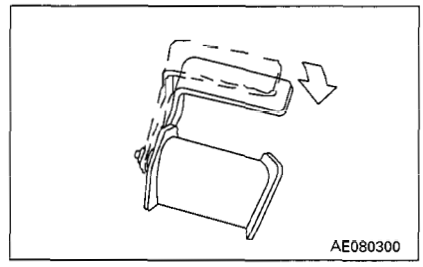
12.6 SHIFTING BETWEEN FORWARD AND REVERSE

⚠ CAUTION

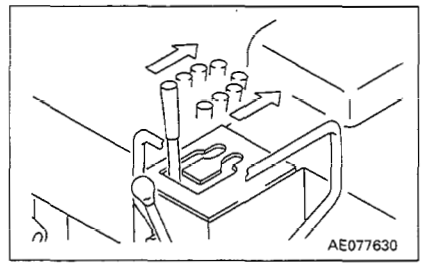
When shifting between forward and reverse, reduce the travel speed to ensure safety and to reduce shock.



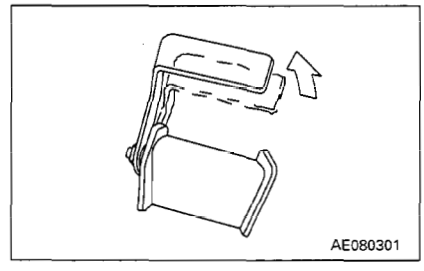
1. Depress decelerator pedal ① to reduce the engine speed.



2. Move gear shift lever ② to the desired position.



3. Release the decelerator pedal to raise the engine speed.



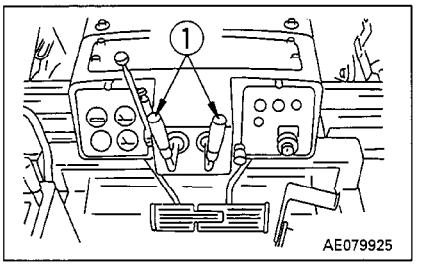
12.7 STEERING MACHINE

⚠ WARNING

- **Avoid turning the machine on slopes as far as possible. The machine will tend to slip to the side.**
  Be particularly careful when steering the machine on soft or clayey ground.
- **Never make a pivot turn at high speed.**

12.7.1 NORMAL TURNING

To turn the machine while traveling, pull steering lever ① on the side to turn.

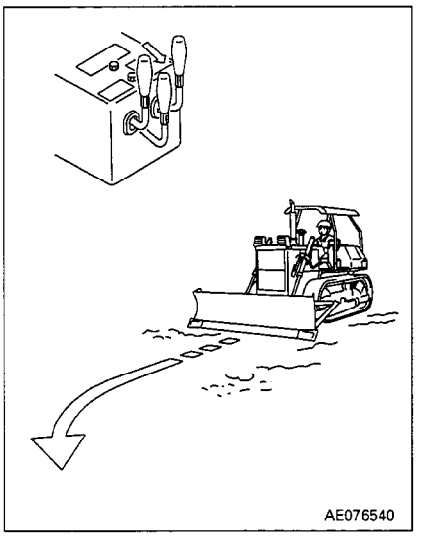


Making a gradual left turn

When the left steering lever is pulled partially (to a point where it enters the detent range), the steering clutch is disengaged and the machine turns gradually to the left.

REMARK

To make a gradual right turn, operate the right steering lever in the same way as explained above.



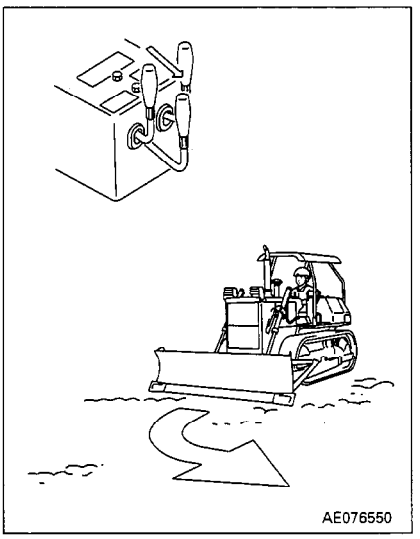
Making a pivot left turn

When the left steering lever is pulled fully, the steering clutch is disengaged and the steering brake is applied.

REMARK

To make a pivot right turn, operate the right steering lever in the same way as explained above.

When carrying out a pivot turn, if the turning resistance is high and the steering lever is heavy, depress the brake pedal on the same side as the direction of turning, and the operating force of the lever will become lighter.



12.7.2 TURNING WHILE DESCENDING A SLOPE

⚠ WARNING

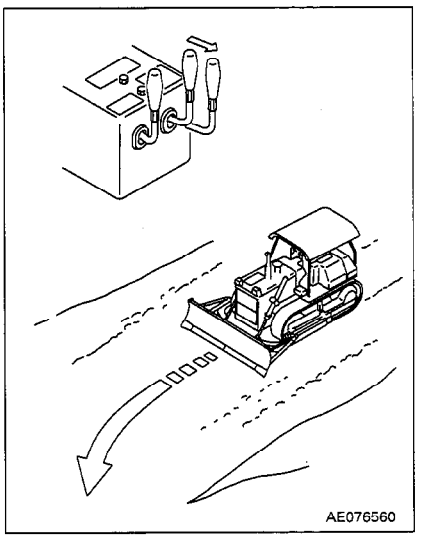
Be careful when traveling down a steep slope where the machine travels under its own weight or when it is being pushed downhill by a towed object. The machine may turn in the opposite direction.

When making a gradual left turn

If the right steering lever is pulled partially, the machine will turn slowly to the left. (It will steer in the opposite direction from the lever operation.)

REMARK

To make a gradual right turn, operate the left steering lever in the same way as explained above.

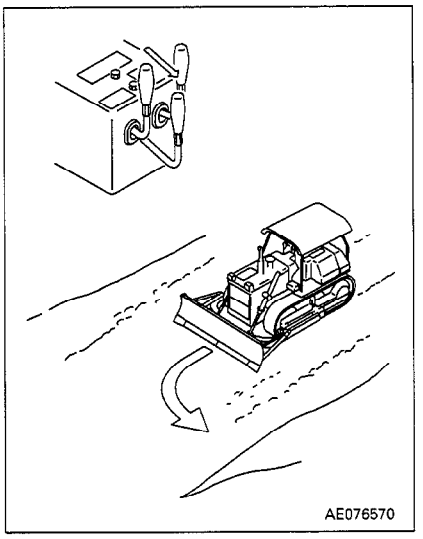


Making a left pivot turn

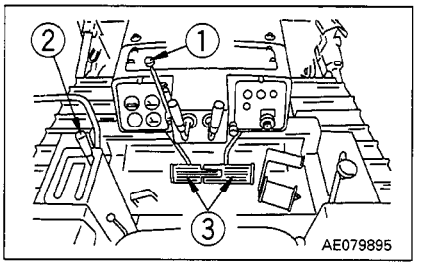
If the left steering lever is pulled fully, the machine will make a pivot turn to the left. (It will steer in the same direction as the lever operation.)

REMARK

To make a right pivot turn, operate the right steering lever in the same way as explained above.



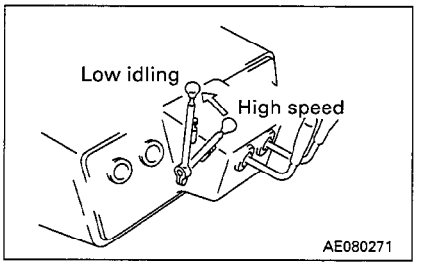
12.8 STOPPING MACHINE



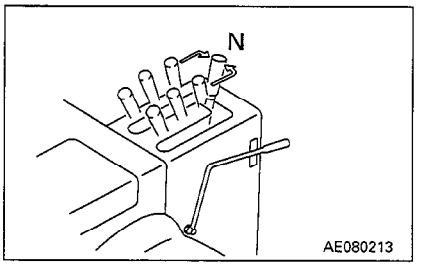
⚠ WARNING

- **Avoid stopping suddenly. Allow ample room when stopping.**
- **When stopping the machine, select flat hard ground and avoid dangerous places. If it is necessary to park the machine on a slope, put blocks under the tracks and dig the work equipment into the ground to prevent the machine from moving.**
- **If the control levers are touched by accident, the work equipment or machine may move suddenly and cause serious damage or injury. When leaving the operator's compartment, always place the safety lever securely at the LOCK position.**

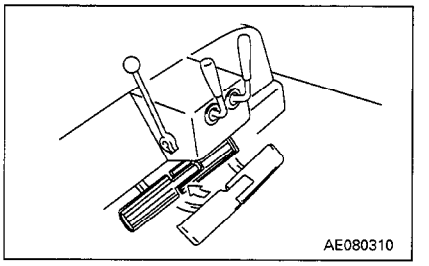
1. Lower the engine speed with fuel control lever ①.



2. Place gear shift lever ② at the neutral position.



3. Depress the center of left and right brake pedals ③ to apply the brake. The machine will stop.

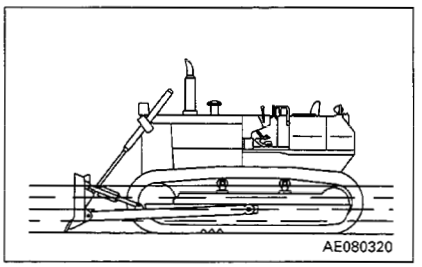


12.9 PRECAUTIONS FOR OPERATION

12.9.1 METHOD OF USING STEERING CLUTCH

If the steering clutch one side is used frequently or if many gradual turns are made with steering clutch half-engaged, the steering clutch will wear out in a short time. Design the travel road well and steer the machine properly.

12.9.2 PERMISSIBLE WATER DEPTH



When operating in water, always keep the bottom of the carrier roller above the surface of the water.

Also, be careful that the engine cooling fan will not come in contact with water. The fan can be damaged.

12.9.3 PRECAUTIONS WHEN TRAVELING UP OR DOWN HILLS

Use engine as a brake

When going downhill, shift gear shift lever into low speed to run engine at slow speed and travel down slope using the engine as a brake.

Never coast down slope with the steering and directional lever in the N (neutral) position or with the inching pedal depressed.

Braking when traveling downhill

While descending a slope using the engine as a brake, also apply the brakes.

Failure to brake may result in overrunning, causing engine trouble.

12.9.4 PRECAUTIONS ON SLOPES

Be careful of fuel level

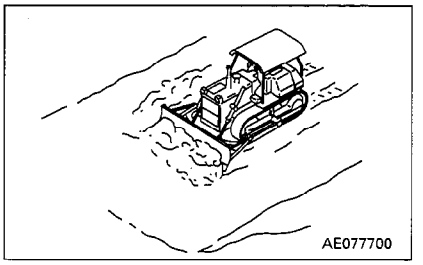
If the fuel level in the fuel tank becomes low when working on slopes, the engine may suck in air because of the angle of the machine or the swaying of the machine. If this makes the engine stop, so be careful not to let the fuel level in the fuel tank become too low.

Precautions when engine stops on slopes

If the engine stops while working or traveling on a hill, immediately depress the brake pedal, lower the blade to the ground to stop the machine, then lock the brake pedal with the brake lock lever.

Thereafter, move the gear shift lever to the N (neutral) position, lock the lever, then restart the engine.

12.10 WORK POSSIBLE USING BULLDOZER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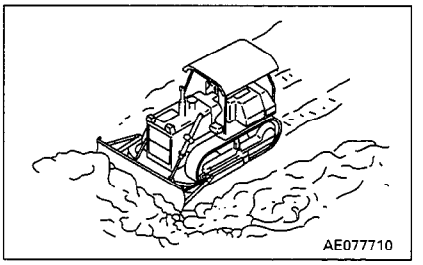
In addition to the following, it is possible to further increase the range of applications by using various attachments.

12.10.1 DOZING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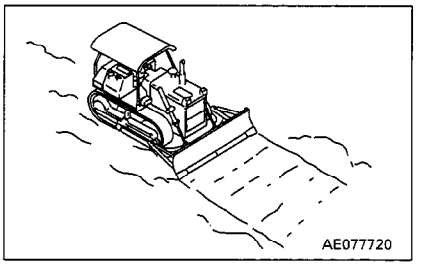
A bulldozer digs and transports dirt in a forward direction. Slope excavation can always be most effectively carried out by proceeding from the top downward.

When dozing toward one side only, operate with angled blade (angledozer only).

12.10.2 SMOOTHING

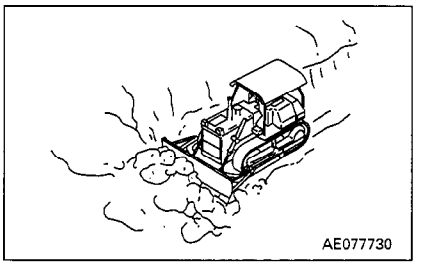

AE077720

NOTICE

Avoid smoothing on rocky or stony ground. It can damage the blade.

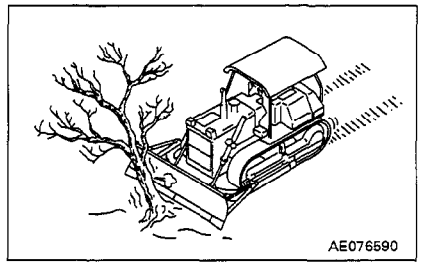
Uneven ground surfaces remaining after digging can be levelled off by fine operation of blade. The basic method is to operate the machine at low speeds with the blade fully loaded with soil and sand. A flat finished surface is also possible by slowly backing the machine with the blade "floating" so it is dragged across the surface. However, avoid this on rocky or stony ground, as it may damage the blade.

12.10.3 DITCHING OR EXCAVATING HARD OR FROZEN GROUND


AE077730

Tilt the blade when digging hard or frozen ground. Tilting the blade is effective for digging even on hard ground.
For even harder ground, using the ripper (optional) to break up the hard ground first makes it possible to carry out efficient blade operations.

12.10.4 FELLING TREES, STUMPING



NOTICE

Do not angle or tilt the blade to carry out heavy-duty operations such as stumping.

For trees of diameters up to 100 – 300 mm (4 – 12 in), it is possible to fell the tree by raising the blade high and pushing two or three times.

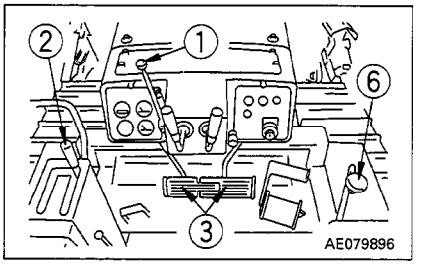
Following this, drive back, then push the tip of the blade into the ground to cut the roots and dig up while pushing.

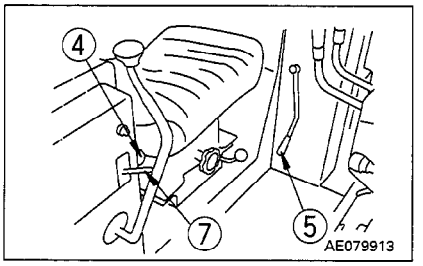
When carrying out this operation, do not hit the tree at high speed or use impact to fell the tree.

12.11 PARKING MACHINE

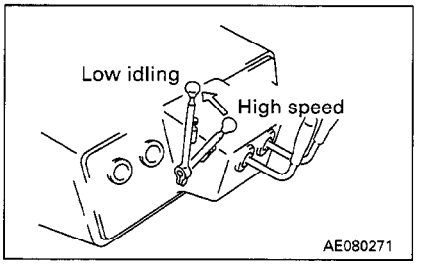
⚠ WARNING

- **Avoid stopping suddenly. Allow ample room when stopping.**
- **When stopping the machine, select flat hard ground and avoid dangerous places. If it is necessary to park the machine on a slope, put blocks under the tracks and dig the work equipment into the ground to prevent the machine from moving.**
- **If the control levers are touched by accident, the work equipment or machine may move suddenly and cause serious damage or injury. When leaving the operator's compartment, always place the safety lever securely at the LOCK position.**

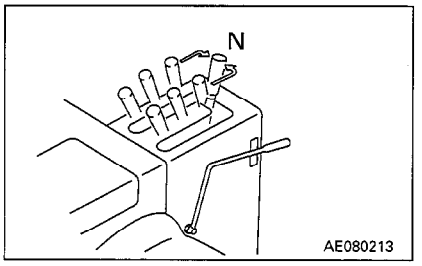




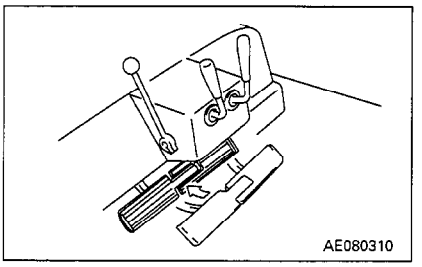
1. Lower the engine speed with fuel control lever ①.



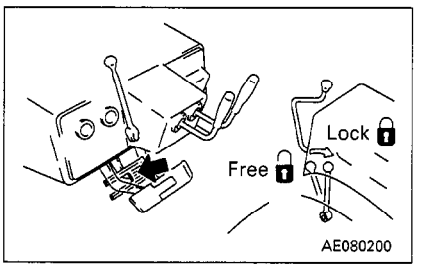
2. Place gear shift lever ② at the neutral position.



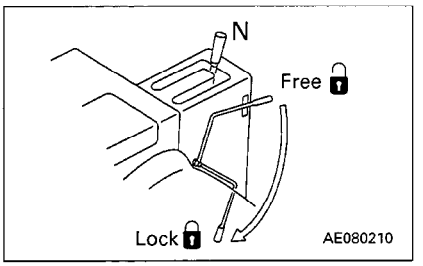
3. Depress the center of left and right brake pedals ③ to apply the brake.



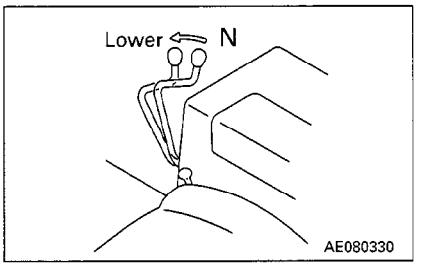
4. Pull brake lock lever ④ and lock brake pedal ③.



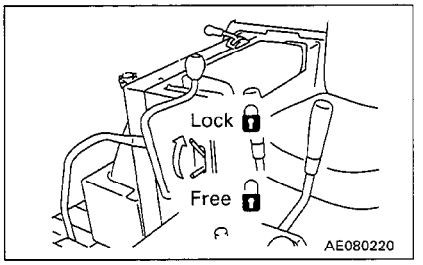
5. Lock gear shift lever ② with safety lever ⑤.



6. Lower the blade to the ground with blade control lever ⑥.



7. Lock blade control lever ⑥ with safety lever ⑦.

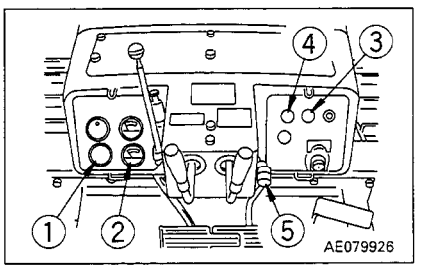


REMARK

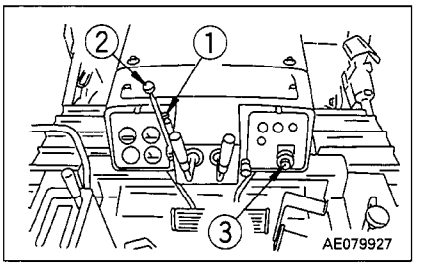
For details of the method of stopping the engine, see "12.13 STOPPING ENGINE".

12.12 CHECK AFTER FINISHING WORK

1. Use the meters and lamps to check the engine water temperature ①, torque converter oil temperature ②, engine oil pressure warning lamp ③, charge lamp ④, and dust indicator ⑤.



12.13 STOPPING ENGINE



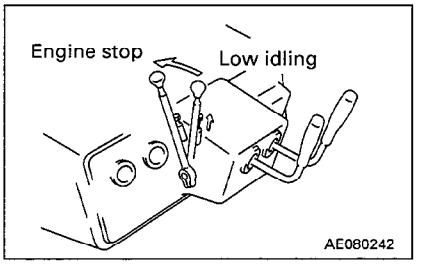
NOTICE

If the engine is stopped suddenly before it has cooled down, the engine life may be greatly shortened. Do not stop the engine suddenly except in case of emergency.

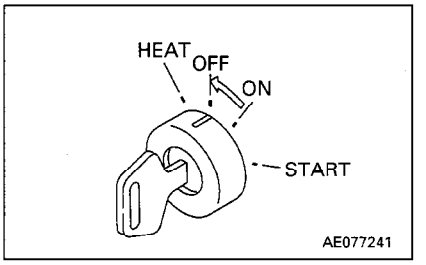
If the engine has been overheated, do not stop it suddenly, but run it at a mid-range speed to allow it to cool gradually, then stop it.

1. Run the engine at low idling speed for about 5 minutes to allow it to cool down gradually.

2. Pull up knob ①, push fuel control lever ② to the engine stop position and stop the engine.



3. Turn the key in starting switch ③ to the OFF position, then remove the key.



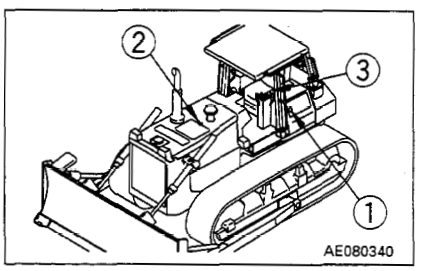
12.14 CHECK AFTER STOPPING ENGINE

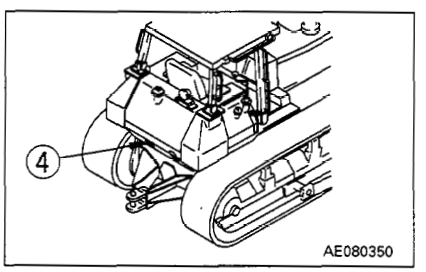
1. Walk around the machine and check the work equipment, paintwork, and undercarriage, and check also for leakage of oil or water. If any abnormalities are found, repair them.
2. Fill the fuel tank.
3. Check the engine compartment for paper and debris. Clean out any paper and debris to avoid a fire hazard.
4. Remove any mud stuck to the undercarriage.

12.15 LOCKING

Commercially available locks can be fitted to the following places.

1. Battery inspection cover
2. Engine hood upper cover
3. Armrest cover
4. Fuel drain valve cover





12.16 TIPS FOR LONGER UNDERCARRIAGE LIFE

Undercarriage life greatly varies depending on operation method, inspection and maintenance. For most efficient operation, keep the following point in mind.

12.16.1 OPERATION METHOD

- Select the track shoe that best suits the type of soil to be encountered in service.
  Please consult your Komatsu distributor when selecting track shoes.

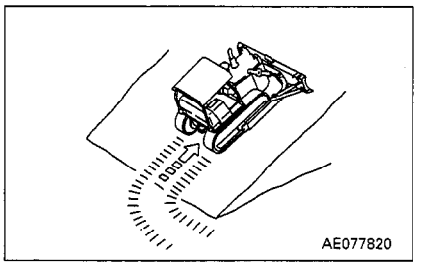
- Do not allow shoe slipping to occur during operation. If shoe slipping occurs, reduce load to the blade until slipping stops.

- Avoid sudden starts, acceleration or stops, unnecessarily high speed and sharp turns.

- Always operate machine in a straight line whenever possible. When making turns, be careful not to allow the machine to stay to one side, so operation in both turning directions can be done properly. Make turns with the largest possible radius.

- Prior to operation, clear boulders and obstacles to prevent machine from riding over them while operating.

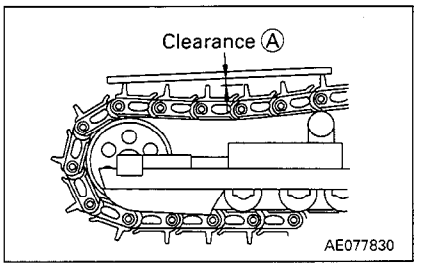
- On a slope, operate the machine parallel to the inclination of the slope. Do not operate across the slope. Also when stopping the machine on a slope, the machine should face toward the top of the slope.



- When ground inclines to left or right during digging operation, do not continue to dig with machine inclined. Move machine back to level ground and start to dig again.

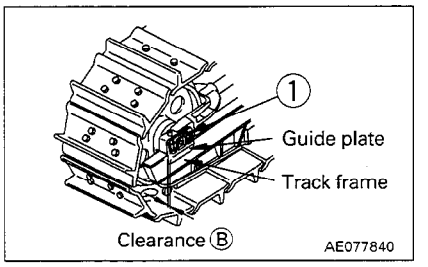
- When idlers or sprockets are lifted due to obstacles during dozing, do not attempt to force the machine to perform. Because work at this time exceeds machine working capability.

12.16.2 INSPECTION AND ADJUSTMENT



- Properly adjust track tension.
  Tension should be measured at clearance Ⓐ shown in the diagram – usually 20 to 30 mm (0.8 to 1.2 in) at this point. For rocky terrain, tighten tracks slightly. In clay or sandy areas, slightly loosen them. (For inspection and adjustment procedures, refer to "24.2 WHEN REQUIRED".)

- Check idler rollers for oil leakage as well as for loose bolts and nuts. If any trouble is detected, repair immediately.



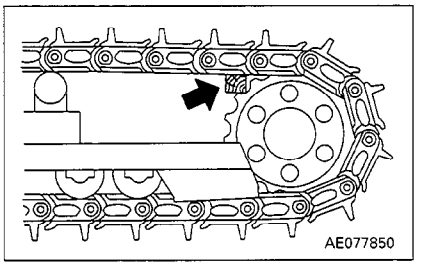
- Check the clearance between the idler guide plate and the track frame. If clearance Ⓑ increases, idler may develop side motion and tracks may come off. (For inspection and adjustment procedures, refer to "24.2 WHEN REQUIRED".)

12.16.3 INSPECTION AND REPAIR

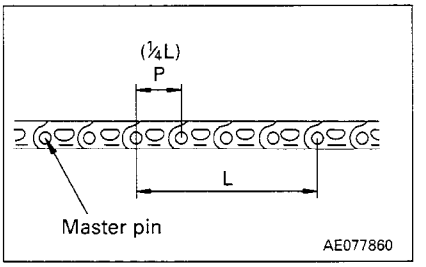
Frequent inspection and prompt repair will reduce repair costs. The following items for inspection will serve as a guide to maintenance service of each undercarriage part. Perform periodical inspection and contact the Komatsu distributor in your area when machine has approached repairable limits and reversing limits.

Measuring link pitch

1. Insert a wooden block between track shoe and sprocket to take up the slack in track shoes.



2. Measure pitch length of 4 links in stretched portion at more than 2 links away from master pin. Of length obtained, 1/4 is the link pitch.
   Standard link pitch: 175.25 mm (6.9 in)
   Reversing limit link pitch: 178.25 mm (7.0 in)
   A center hole is provided on both ends of master pin.

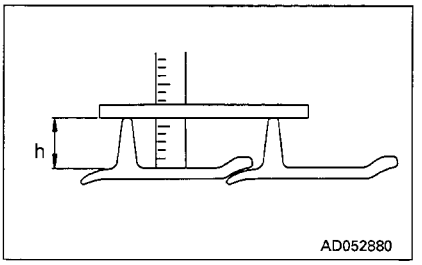


Measuring height of grouser (only D58E)

After taking up slack in track shoes, measure height at center of shoe as shown below.

Standard height (h): 50 mm (2 in)

Repair limits: 25 mm (1 in)



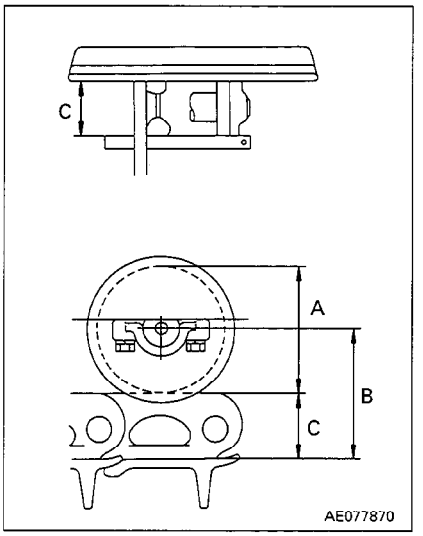
Measuring outside diameter of track roller

1. Measure height (size C) of link tread as shown.
2. Stop machine at position where link tread, whose size C has been measured completely, contacts roller tread. Then measure size B.
3. Calculate outside diameter of tread (size A):

   A = (B – C) x 2

   Standard size (A): 200 mm (7.8 in)

   Repair limits: 190 mm (7.5 in)



13. TRANSPORTATION

When transporting the machine, observe all related laws and regulations, and be careful to assure safety.

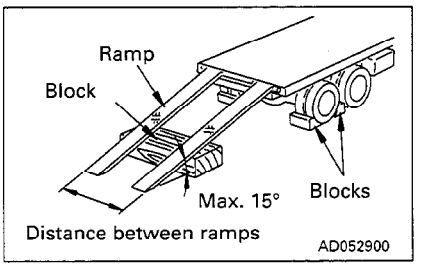
13.1 LOADING, UNLOADING WORK

⚠ WARNING

- **Make sure the ramp has sufficient width, length and thickness to enable the machine to be safely loaded and unloaded. If the ramp sags appreciably, reinforce it with blocks, etc.**
- **When loading and unloading the machine, park the trailer on a flat firm roadbed. Keep a fairly long distance between the road shoulder and the machine.**
- **Remove the mud from the undercarriage to prevent the machine from slipping to the side on slopes.**
  Be sure the ramp surface is clean and free of grease, oil, ice and loosen materials.
- **Never change the direction of travel when on the ramps. If it is necessary to change direction, drive off the ramps and correct the direction, then drive on to the ramps again.**

When loading or unloading, always use ramps or a platform and carry out the operations as follows.

1. Properly apply the brakes on the trailer and insert blocks beneath the tires to ensure that it does not move. Then fix the ramps in line with the centers of the trailer and the machine. Be sure that the two sides are at the same level as one another.
2. Determine the direction of the ramps, then slowly load or unload the machine.
3. Load the machine correctly in the specified position on the trailer.



13.2 PRECAUTIONS FOR LOADING

⚠ WARNING

When the edge of the blade protrudes beyond the trailer, angle the blade. (Angledozer)

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

1. Lower the blade slowly.
2. Lock all the control levers securely with the safety lever.
3. Depress the brake pedal, pull the brake lock lever, and lock the brake.
4. Push the fuel control lever to the engine stop position and stop the engine.
   Turn the key in starting switch to the OFF position, then remove the key.
5. When transporting the machine, place rectangular timber underneath the front and rear track shoes to prevent the machine from moving about. Also, hold it down with chains or rope. Be particularly careful to ensure that the machine does not slip sideways.

13.3 PRECAUTIONS FOR TRANSPORTATION

⚠ WARNING

Determine the route for transporting the machine by taking into account the width, height and weight of the machine.

Obey all state and local laws governing the weight, width and length of a load. Observe all regulations governing wide loads.

14. COLD WEATHER OPERATION

14.1 PRECAUTIONS FOR LOW TEMPERATURE

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

14.1.1 FUEL AND LUBRICANTS

Change to fuel and oil with low viscosity for all components.

For details of the specified viscosity, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".

14.1.2 COOLANT

⚠ WARNING

Antifreeze is flammable, so keep it away from flames. Never smoke when handling antifreeze.
Antifreeze is added to the coolant to prevent the water from freezing when the machine is not being used.

NOTICE

Never use methanol, ethanol, or propanol-based antifreeze.
For details of the timing for changing the coolant and the proportions for mixing antifreeze with the coolant, see "24.2 WHEN REQUIRED".

REMARK

Komatsu genuine Super Coolant (AF-ACL) is added to the cooling water. Adjust the density according to the ambient temperature at the place of operation. For details, see "24.2 WHEN REQUIRED".

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

Standard requirements for permanent antifreeze.

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

14.1.3 BATTERY

⚠ WARNING

- **To avoid gas explosions, 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 large amounts of water, and consult a doctor.**

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%, and insulate it against cold temperature so that the machine can be started easily the next morning.

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

Rate of charge \ Temp. of fluid	20°C	0°C	−10°C	−20°C
100%	1.28	1.29	1.30	1.31
90%	1.26	1.27	1.28	1.29
80%	1.24	1.25	1.26	1.27
75%	1.23	1.24	1.25	1.26

14.2 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, always observe the following precautions.

- Mud and water on the machine body should be completely removed. This is to prevent damage to the seal caused by mud or dirt getting inside the seal with frozen drops of water.
- Park the machine on concrete or hard ground. If this is impossible, park the machine on wooden boards.
- Open the drain valve and drain any water collected in the fuel system to prevent it from freezing.
- As the battery capacity drops markedly in low temperatures, cover the battery or remove it from the machine, keep it in a warm place, and install it again the next morning.
- If electrolyte level is found low, add distilled water in the morning before beginning work. Do not add the water after day's work so as to prevent fluid in the battery from freezing in the night.

14.3 AFTER COLD WEATHER

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

- Replace the fuel and oil for all parts with oil of the viscosity specified.
  For details, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
- If for any reason permanent antifreeze cannot be used, and an ethyl glycol base antifreeze (winter, one season type) is used instead, or if no antifreeze is used, drain the cooling system completely, then clean out the inside of the cooling system thoroughly, and fill with fresh water.

15. LONG-TERM STORAGE

15.1 BEFORE STORAGE

When putting the machine in storage for more than one month, do as follows.

- After every part is washed and dried, the machine shall be housed in a dry building. Never leave it outdoors.
  In case it is indispensable to leave it outdoors, park the machine on the flat ground and cover it with canvas etc.

- Completely fill the fuel tank, lubricate and change the oil before storage.

- Apply a thin coat of grease to metal surface of the hydraulic piston rods and the idler adjusting rods.

- Disconnect the negative terminals of the battery and cover it, or remove it from the machine and store it separately.

- If the ambient temperature is expected to drop below 0°C, always add antifreeze to the cooling water. Adjust the density according to the ambient temperature at the place of operation. For details, see "24.2 WHEN REQUIRED".

- Lock each control lever with the safety lock, and place the fuel control lever at the engine stop position.
  Do not lock the brake pedal; use blocks to stop the machine from moving.

15.2 DURING STORAGE

⚠ WARNING

If possible, prepare the machine for long-term storage outdoors. If this must be done indoors, open doors and windows for ventilation to prevent carbon monoxide poisoning.

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

- Before operating the work equipment, wipe off the grease on the hydraulic piston rod.

15.3 AFTER STORAGE

NOTICE

If the machine is stored without carrying out the monthly rust prevention operation, request your Komatsu distributor for service.

Carry out the following procedure when taking the machine out of long-term storage.

- Wipe off the grease from the hydraulic cylinder rods.
- Add oil and grease to all places.

16. TROUBLESHOOTING

16.1 AFTER RUNNING OUT OF FUEL

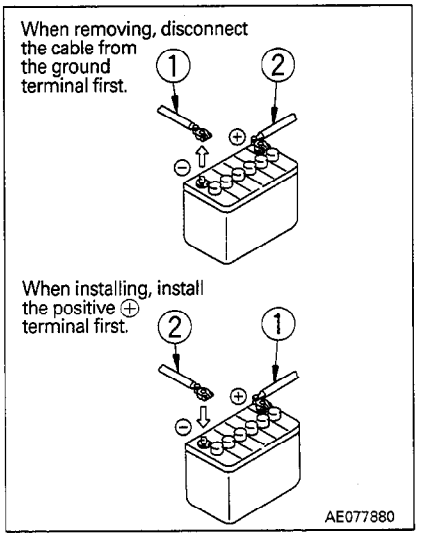
When starting the engine after running out of fuel, fill with fuel, then fill the fuel filter cartridge with clean fuel and bleed the air from the fuel system before starting.

For details of the method of bleeding the air, see "24.6 EVERY 500 HOURS SERVICE".

16.2 IF BATTERY IS DISCHARGED

⚠ WARNING

- **When checking or handling the battery, stop the engine and turn the starting key to the OFF position before starting.**
- **The battery generates hydrogen gas, so there is danger of explosion. Do not bring lighted cigarettes near the battery, or do anything that will cause sparks.**
- **Battery electrolyte is dilute sulphuric acid, and it will attack your clothes and skin. If it gets on your clothes or on your skin, wash it immediately off with large amounts of water. If it gets in your eyes, wash it out with fresh water, and consult a doctor.**
- **When handling battery, always wear protective goggles.**
- **When removing the battery, first disconnect the cable from the ground (normally, from the negative ⊖ terminal). When installing, install the positive ⊕ terminal first. If a tool touches the cable connecting the positive terminal and the chassis, there is danger that it will cause sparks.**
- **If the terminals are loose, there is danger that the defective contact may generate sparks that will cause an explosion. When installing the terminals, install them tightly.**



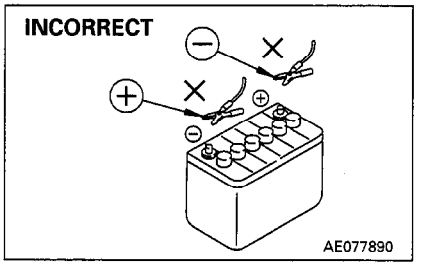
16.2.1 STARTING ENGINE WITH BOOSTER CABLE

When starting the engine with a booster cable, do as follows:

Precautions when connecting and disconnecting booster cable

⚠ WARNING

- **When starting the engine from another machine, connect the batteries in parallel.**
- **When connecting the cables, never contact the positive ⊕ and negative ⊖ terminals.**
- **When starting the engine with a booster cable, always wear safety glasses.**
- **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. If hydrogen gas explodes. It could cause serious injury.**
- **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.**
- **Use care when removing the cables from the machine that has been started. Do not allow the cable ends to contact each other or the machine, to avoid hydrogen explosion.**

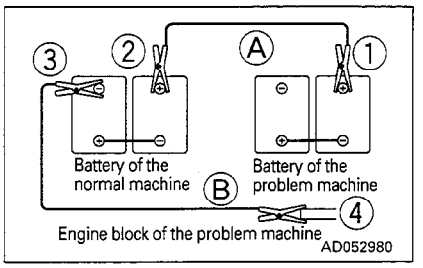


NOTICE

- **The size of the booster cable and clip should be suitable for the battery size.**
- **The battery of the normal machine must be the same capacity as that of the engine to be started.**
- **Check the cables and clips for damage or corrosion.**
- **Make sure that the cables and clips are firmly connected.**

Connecting the booster cables

Keep the starting switch at the OFF position.



Connect the booster cable as follows, in the order of the numbers marked in the diagram.

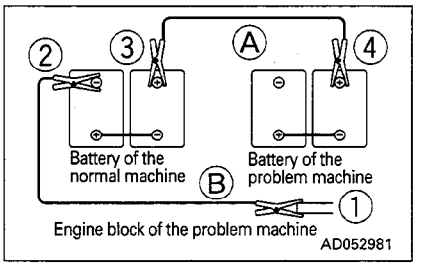
1. Make sure that the starting switches of the normal machine and problem machine are both at the OFF position.
2. Connect one clip of booster cable Ⓐ to the positive ⊕ terminal of the problem machine.
3. Connect the other clip of booster cable Ⓐ to the positive ⊕ terminal of the normal machine.
4. Connect one clip of booster cable Ⓑ to the negative ⊖ terminal of the normal machine.
5. Connect the other clip of booster cable Ⓑ to the negative block of the problem machine.

Starting the engine

1. Make sure the clips are firmly connected to the battery terminals.
2. Start the engine of the normal machine and keep it to run at high idling speed.
3. Turn the starting switch of the problem machine to the START position and start the engine. Refer to "12.2 STARTING ENGINE".

Disconnecting the booster cables

After the engine has started, disconnect the booster cables in the reverse of the order in which they were connected.



1. Remove one clip of booster cable Ⓑ from the engine block of the problem machine.
2. Remove the other clip of booster cable Ⓑ from the negative ⊖ terminal of the normal machine.
3. Remove one clip of booster cable Ⓐ from the positive ⊕ terminal of the normal machine.
4. Remove the other clip of booster cable Ⓐ from the positive ⊕ terminal of the problem machine.

16.3 OTHER TROUBLE

- ( ): Always contact your Komatsu distributor when dealing with these items.
- In cases of abnormalities or causes which are not listed below, please contact your Komatsu distributor for repairs.

16.3.1 ELECTRICAL SYSTEM

Problem	Main causes	Remedy
Lamp does not glow brightly even when the engine runs at high speed	• Defective wiring • Defective adjustment of fan belt tension	(• Check, repair loose terminals, disconnections) • Adjust fan belt tension For details, see EVERY 250 HOURS SERVICE
Lamp flickers while engine is running		
Charge lamp does not go out even when engine is running	• Defective alternator • Defective wiring	(• Replace) (• Check, repair)
Abnormal noise is generated from alternator	• Defective alternator	(• Replace)
Starting motor does not turn when starting switch is turned to ON	• Defective wiring • Insufficient battery charge	(• Check, repair) • Charge
Pinion of starting motor keeps going in and out	• Insufficient battery charge	• Charge
Starting motor turns engine sluggishly	• Insufficient battery charge • Defective starting motor	• Charge (• Replace)
Starting motor disengages before engine starts	• Defective wiring • Insufficient battery charge	• (Check, repair) • Charge
Heater signal does not glow red	• Defective wiring • Defective heater relay • Defective heater signal	(• Check, repair) (• Replace) (• Replace)
Oil pressure warning lamp does not light up when engine is stopped (starting switch at ON position)	• Defective warning lamp • Defective warning lamp switch	(• Replace) (• Replace)
Charge lamp does not light up when engine is stopped (starting switch at On position)	• Defective charge lamp • Defective wiring	(• Replace) (• Check, repair)
Outside of electrical intake air heater is not warm when touched by hand	• Defective wiring • Disconnection in electrical intake air heater • Defective operation of heater relay switch	(• Check, repair) (• Replace) (• Check, repair heater relay switch)

16.3.2 CHASSIS

Problem	Main causes	Remedy
Transmission oil pressure does not rise	• Entry of air or leakage of oil caused by damage or improper tightening of oil pipe, pipe joint • Wear, scuffing of gear pump • Lack of oil in transmission case • Clogged oil filter element strainer in transmission case	(• Check, repair) (• Check, replace) • Add oil to specified level. See CHECK BEFORE STARTING. • Clean
Lack of drawbar pull (travel speed does not rise)	• Lack of engine horsepower	• See section related to engine
Machine does not move off even when gear shift lever is placed in position	• Lack of oil in transmission case • Transmission oil pressure does not rise • Steering clutch is slipping ○ Wear, scuffing of gear pump	• Add oil to specified level. See CHECK BEFORE STARTING. • See "Transmission oil pressure does not rise" (○ Check, repair)
When steering lever on one side is pulled during operations, machine does not turn, but stops or engine speed changes	• Steering clutch on side which is pulled is not disengaged ○ Excessive clearance between adjustment bolt and bellcrank • Steering clutch slipping on opposite side ○ Improper adjustment	○ Adjust. For details, see WHEN REQUIRED ○ Adjust. For details see WHEN REQUIRED
When steering lever is pulled on one side, machine does not turn and travels straight	• Steering clutch on side which was pulled is not disengaged • Brake on side which was pulled does not work	• Adjust. For details see WHEN REQUIRED • Adjust. For details see WHEN REQUIRED
When brake pedal is depressed, machine does not stop	• Defective brakes	• Adjust. For details see WHEN REQUIRED
Track comes off	• Track too loose	• Adjust. For details see WHEN REQUIRED
Abnormal wear of sprocket	• Track too loose or too tight	
Blade rises slowly or does not rise at all	• Lack of hydraulic oil	• Add oil to specified level. See EVERY 250 HOURS SERVICE.

16.3.3 ENGINE

Problem	Main causes	Remedy
Engine oil pressure warning lamp remains alight when engine speed is raised after completion of warm-up	• Engine oil pan oil level is low (sucking in air) • Clogged oil filter cartridge • Defective tightening of oil pipe joint, oil leakage from damaged part • Defective warning lamp	• Add oil to specified level, see CHECK BEFORE STARTING • Replace cartridge, see EVERY 500 HOURS SERVICE (• Check, repair) (• Replace lamp)
Steam is emitted from top part of radiator (pressure valve)	• Cooling water level low, water leakage • Loose fan belt • Dirt or scale accumulated in cooling system • Clogged radiator fin or damaged fin • Defective thermostat	• Add cooling water, repair, see CHECK BEFORE STARTING • Adjust fan belt tension, see EVERY 250 HOURS SERVICE • Change cooling water, clean inside of cooling system, see WHEN REQUIRED • Clean or repair, see EVERY 500 HOURS SERVICE (• Replace thermostat)
Indicator of water temperature gauge is in red range on right side of gauge	• Loose radiator filler cap (high altitude operation) • Defective water temperature gauge	• Tighten cap or replace packing (• Replace water temperature gauge)
Indicator of water temperature gauge is in white range on left side of gauge	• Defective thermostat • Defective water temperature gauge	• Replace thermostat • Replace water temperature gauge
Engine does not start when starting motor is turned	• Lack of fuel • Air in fuel system • Defective fuel injection pump or nozzle • Starting motor cranks engine sluggishly • Heater signal does not glow red • Defective compression ○ Defective valve clearance	• Add fuel, see CHECK BEFORE STARTING • Repair place where air is sucked in (• Replace pump or nozzle) } See ELECTRICAL SYSTEM (○ Adjust valve clearance)
Exhaust gas is white or blue	• Too much oil in oil pan • Improper fuel	• Add oil to specified level, see CHECK BEFORE STARTING • Change to specified fuel
Exhaust gas occasionally turns black	• Clogged air cleaner element • Defective nozzle • Defective compression	• Clean or replace, see WHEN REQUIRED (• Replace nozzle) (• Adjust valve clearance)
Combustion noise occasionally makes breathing sound	• Defective nozzle	(• Replace nozzle)
Abnormal noise generated (combustion or mechanical)	• Low grade fuel being used • Overheating • Damage inside muffler • Excessive valve clearance	• Change to specified fuel • See item "Indicator of water temperature gauge is in red range on right side of gauge". (• Replace muffler) (• Adjust valve clearance)

MAINTENANCE

17. GUIDES TO MAINTENANCE

Do not carry out any inspection and maintenance operation that is not given in this manual.

Perform maintenance work on hard, flat ground.

Check service meter
Check the service meter reading every day to see if the time has come for any necessary maintenance to be carried out.

Komatsu genuine replacement parts:
Use Komatsu genuine parts specified in the parts list as replacement parts.

Komatsu genuine oils:
Use Komatsu genuine oils and grease. Choose oils and grease with proper viscosities specified for ambient temperature.

Always use clean washer fluid:
Use automobile window washer fluid and be careful not to let any dirt get into it.

Clean oil and grease:
Use clean oil and grease. Also, keep containers of the oil and grease clean. Keep foreign materials away from oil and grease.

Keeping the machine clean:
Always keep the machine clean. This makes is easier to find parts causing problems. Keep in particular grease fittings, breathers and oil level gauges clean and avoid foreign matters from getting in them.

Be careful of hot water and oil:
Draining hot oils and coolants and removing their filters immediately after the engine stops are hazardous. Allow the engine to cool.
If the oil has to be drained when it is cold, warm up the oil to a suitable temperature (approx. 20 – 40°C) before draining it.

Checking foreign materials in drained oil:
After oil is changed or filters are replaced, check the oil and filters for metallic particles and foreign materials. If large quantities of metallic particles or foreign materials are found, consult your Komatsu distributor.

Fuel strainer:
If your machine is equipped with a fuel strainer, do not remove it while fueling.

Oil change:
Check or change oils in the places where dust is scarce to keep foreign materials away from oils.

Warning tag:
Attach the warning tag to the starting switch or other appropriate control lever to avoid someone who is not aware of the circumstances from starting the engine.

Obey precautions:
During the operation, always obey the precautions on the safety label stuck to the machine.

Welding instructions:
- Turn off the engine starting switch.
- Do not apply more than 200 V continuously.
- Connect grounding the cable within 1 m from the area to be welded.
- Avoid seals or bearings from being between the area to be welded and the position of grounding point.

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

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

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

Checking undercarriage:
When working in rocky areas, check for damage to the undercarriage and for looseness, flaws, wear and damage in bolts and nuts. Loosen the track tension a little when working in such areas.

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

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

Dusty sites:
When working at the jobsites, do as follows:
- Use the dust indicator to check the air cleaner for clogging. Clean the air cleaner element at shorter intervals than specified.
- Clean the radiator core frequently to avoid clogging.
- Clean and replace the fuel filter frequently.
- Clean electrical components, especially the starting motor and alternator, to avoid accumulation of dust.

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

18. OUTLINES OF SERVICE

- Use Komatsu genuine parts for replacement.
- When changing or adding oil, do not use a different type of oil.
- Unless otherwise specified, the oil and coolant used at the time of shipment from the factory are as shown in the table below.

Item	Kind of fluid
Engine oil pan	SAE 15W-40 API classification CD
Transmission case (incl. torque converter case) Steering clutch case (incl. bevel gear case) Final drive case	SAE 30 API classification CD
Hydraulic tank	SAE 10W API classification CD
Fuel tank	ASTM D975 No. 2 (However, ASTM D975 No. 1 is used for the winter season (October to March))
Radiator	Komatsu Super Coolant (AF-ACL) 41% added to water

18.1 OUTLINE OF OIL, FUEL, COOLANT

18.1.1 OIL

- Oil is used in the engine and work equipment under extremely severe conditions (high temperature, high pressure), and it deteriorates with use.
  Always use oil that matches the grade and temperature for use given in the Operation and Maintenance Manual. Even if the oil is not dirty, always replace the oil after the specified interval.
- Oil corresponds to blood in the human body, so always be careful when handling it to prevent any impurities (water, metal particles, dirt, etc.) from getting in.
  The majority of problems with 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 to 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.

18.1.2 FUEL

- The fuel pump is a precision instrument, and if fuel containing water or dirt is used, it cannot work properly.
- Be extremely careful not to let impurities get in when storing or adding fuel.
- Always use the fuel specified in the Operation and Maintenance Manual.
  Fuel may congeal depending on the temperature when it is used (particularly in low temperature below –15°C), so it is necessary to change to a fuel that matches the temperature.
- 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.
- 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.

18.1.3 COOLANT

- River water contains large amounts of calcium and other impurities, so if it is used, scale will stick to the engine and radiator, and this will cause defective heat exchange and overheating.
  Do not use water that is not suitable for drinking.
- When using anti-freeze, always observe the precautions given in the Operation and Maintenance Manual.
- Komatsu machines are supplied with Komatsu original anti-freeze in the coolant when the machine is shipped.
  This anti-freeze is effective in preventing corrosion of the cooling system.
  The anti-freeze can be used continuously for two years or 4000 hours. Therefore, it can be used as it is even in hot areas.
- Anti-freeze is inflammable, so be extremely careful not to expose it to flame or fire.
- The proportion of anti-freeze to water differs according to the ambient temperature.
  For details of the mixing proportions, see "24.2.1 CLEAN INSIDE OF COOLING SYSTEM".
- 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 from the air in the coolant.

18.1.4 GREASE

- Grease is used to prevent twisting and noise at the joints.
- The nipples not included in the maintenance section are nipples for overhaul, so they do not need grease.
  If any part becomes stiff after being used for a long time, add grease.
- Always wipe off all of the old grease that is pushed out when greasing. Be particularly careful to wipe off the old grease in places where sand or dirt sticking in the grease would cause wear of the rotating parts.

18.1.5 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 drum can is at the side. (To prevent moisture from being sucked in)
  If drum cans 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).

18.1.6 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, it is necessary to consider replacing 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 stuck to the old filter. If any metal particles are found, please contact your Komatsu distributor.
- Do not open packs of spare filters until just before they are to be used.
- Always use Komatsu genuine filters.

18.2 RELATING TO ELECTRIC SYSTEM

- If the wiring gets wet or the insulation is damaged, the electric system leaks and this could result in hazardous malfunction of the machine.

- Services relating to the electric system are (1) check of fan belt tension, (2) check of damage or wear in the fan belt and (3) check of battery fluid level.

- Never remove or disassemble any electric components installed in the machine.

- Never install any electric components other than these specified by Komatsu.

- Be careful to keep the electric system free of water when washing the machine or when it rains.

- When working on the seashore, carefully clean the electric system to prevent corrosion.

- Never connect any optional power source to the fuse, starting switch, battery relay, etc.

19. WEAR PARTS LIST

Wear parts such as the filter element, cutting edge, 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.

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

Item	Part No.	Part Name	Q'ty	Replacement frequency
Power line oil filter	281-16-11290 (07000-03098)	Element (O-ring)	1 (1)	Every 500 hours service
Engine oil filter	6136-51-5120	Cartridge	1	Every 500 hours service
Fuel filter	600-311-8292	Cartridge	1	Every 500 hours service
Steering clutch case oil filter	101-60-15171 (07000-02075)	Element (O-ring)	1 (1)	Every 500 hours
Corrosion resistor	600-411-1150	Cartridge	1	Every 1000 hours service
Hydraulic oil filter	130-60-48210 (07000-02080)	Element (O ring)	1 (1)	Every 1000 hours service
Air cleaner	6114-80-7101	Element assembly	1	—
	600-181-2500	Outer element assembly	1	
Electrical intake air heater	6150-11-4820	Gasket	2	—
Blade [D58E-1, 1A Straight tiltdozer]	130-Z20-1510 144-70-11180 144-70-11190 (02091-11205) (02090-11270) (02290-11219)	Cutting edge End bit (Left) End bit (Right) (Bolt) (Bolt) (Nut)	2 1 1 (4) (22) (26)	—
Blade [D58P-1 Straight tiltdozer]	13F-Z27-1510 13F-Z27-1581 13F-Z27-1571 (02091-11205) (02090-11270) (02290-11219)	Cutting edge End bit (Left) End bit (Right) (Bolt) (Bolt) (Nut)	2 1 1 (4) (26) (30)	—
Blade [D58E-1B Angle tiltdozer]	130-70-41130 130-Z20-1510 144-70-11180 144-70-11190 (02091-11205) (02090-11270) (02290-11219)	Cutting edge Cutting edge End bit (Left) End bit (Right) (Bolt) (Bolt) (Nut)	1 1 1 1 (4) (23) (27)	—

Item	Part No.	Part Name	Q'ty	Replacement frequency
Blade [D58P-1 Angle tiltdozer]	130-Z20-1510 130-920-2180 13F-Z27-1570 13F-Z27-1580 (02091-11210) (02090-11270) (02290-11219)	Cutting edge Cutting edge End bit (Left) End bit (Right) (Bolt) (Bolt) (Nut)	1 1 1 1 (4) (30) (34)	—
Blade [D58E-1 Power tilt mechanical angle-dozer]	130-70-61170 144-70-11180 144-70-11190 (02091-11205) (02090-11270) (02290-11219)	Cutting edge End bit (Left) End bit (Right) (Bolt) (Bolt) (Nut)	2 1 1 (4) (26) (30)	—
Blade [D58P-1B Angle tiltdozer	13F-Z27-1510 130-Z20-1610 13F-Z27-1581 13F-Z27-1571 (02091-11205) (02090-11270) (02290-11219)	Cutting edge Cutting edge End bit (Left) End bit (Right) (Bolt) (Bolt) (Nut)	1 1 1 1 (4) (28) (32)	—

20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE

20.1 FUEL, OIL

Select the fuel and oil from the table below according to the ambient temperature.

The specified capacity is the total amount of oil, including the oil in the piping of the various components. The refill capacity is the amount of oil added when changing the oil during inspection and maintenance.

When starting the engine in an ambient temperature of lower than 0°C, always use SAE10W, SAE10W-30 or SAE15W-40, even if the temperature goes up to 10°C during the daytime.

20.2 COOLANT

Use tap water for the coolant. If the only available water is river water or well water, please contact your Komatsu distributor for advice.

When changing the coolant, adjust the density according to the ambient temperature at the place of operation. For details, see "24.2 WHEN REQUIRED".

PROPER SELECTION OF FUEL, COOLANT AND LUBRICANTS

RESERVOIR	KIND OF FLUID	AMBIENT TEMPERATURE -4 14 32 50 68 86°F -20 -10 0 10 20 30°C	CAPACITY	
			Specified	Refill
Engine oil pan	Engine oil	SAE 30 SAE 10W SAE 10W-30 SAE 15W-40	30 ℓ 7.93 US gal 6.60 UK gal	26 ℓ 6.87 US gal 5.72 UK gal
Steering clutch case (incl. bevel gear case)			63 ℓ 16.64 US gal 13.86 UK gal	58ℓ 15.32 US gal 12.76 UK gal
Final drive case (each)		SAE 30 SAE 10W	D58E-1, -1A: 13ℓ 3.43 US gal 2.86 UK gal D58E-1B: 14 ℓ 3.70 US gal 3.08 UK gal D58P-1: 14.5 ℓ 3.83 US gal 3.19 UK gal	13ℓ 3.43 US gal 2.86 UK gal 14 ℓ 3.70 US gal 3.08 UK gal 14.5 ℓ 3.83 US gal 3.19 UK gal
Transmission case (incl. torque converter case)			34 ℓ 8.98 US gal 7.48 UK gal	34 ℓ 8.98 US gal 7.48 UK gal
Damper case		SAE 30	1.3 ℓ 0.34 US gal 0.29 UK gal	1.3 ℓ 0.34 US gal 0.29 UK gal
Hydraulic system		SAE 10W SAE 10W-30 SAE 15W-40	92 ℓ 24.31 US gal 20.24 UK gal	65 ℓ 17.17 US gal 14.30 UK gal
Fuel tank	Diesel fuel	※ ASTM D975 No.2	250 ℓ 66 US gal 55 UK gal	–
Cooling system	Water	Add antifreeze	57 ℓ 15.06 US gal 12.54 UK gal	–

※ ASTM D975 No. 1

REMARK

- When fuel sulphur content is less than 0.5%, change oil in the oil pan every periodic maintenance hours described in this manual.
  Change oil according to the following table if fuel sulphur content is above 0.5%.

Fuel sulphur content	Change interval of oil in engine oil pan
0.5 to 1.0%	1/2 of regular interval
Above 1.0%	1/4 of regular interval

- When starting the engine in an atmospheric temperature of lower than 0°C, be sure to use engine oil of SAE10W, SAE10W-30 and SAE15W-40, even though an atmospheric temperature goes up to 10°C more or less in the day time.

- Use API classification CD as engine oil and if API classification CC, reduce the engine oil change interval to half.

- There is no problem if single grade oil is mixed with multigrade oil (SAE10W-30, 15W-40), but be sure to add single grade oil that matches the temperature in the table.

- We recommend Komatsu genuine oil which has been specifically formulated and approved for use in engine and hydraulic work equipment applications.

Specified capacity: Total amount of oil including oil for components and oil in piping.
Refill capacity: Amount of oil needed to refill system during normal inspection and maintenance.

ASTM: American Society of Testing and Material
SAE: Society of Automotive Engineers
API: American Petroleum Institute

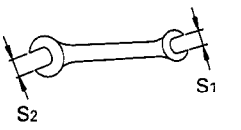
No.	Supplier	**Engine Oil [CD or CE]** SAE10W, 30, 40 10W30, 15W40 (The 15W40 oil marked * is CE.)	**Gear Oil [GL-4 or GL-5]** SAE80, 90, 140	**Grease [Lithium-Base]** NLGI No. 2	**Anti-freeze Coolant [Ethylene Glycol Base] Permanent Type**
1	KOMATSU	EO10-CD EO30-CD EO10-30CD EO15-40CD	GO90 GO140	G2-LI G2-LI-S	AF-ACL AF-PTL AF-PT (Winter, one season type)
2	AGIP	Diesel sigma S Super dieselmulti-grade *Sigma turbo	Rotra MP	GR MU/EP	–
3	AMOCO	*Amoco 300	Multi-purpose gear oil	RYKON prenium grease	–
4	ARCO	*Arcofleet S3 plus	Arco HD gear oil	Litholine HEP 2 Arco EP moly D	–
5	BP	Vanellus C3	Gear oil EP Hypogear EP	Energrease LS-EP2	Antifreeze
6	CALTEX	*RPM delo 400 RPM delo 450	Universal thuban Universal thuban EP	Marfak all purpose 2 Ultra-duty grease 2	AF engine coolant
7	CASTROL	*Turbomax *RX super CRD	EP EPX Hypoy Hypoy B Hypoy C	MS3 Spheerol EPL2	Anti-freeze
8	CHEVRON	*Delo 400	Universal gear	Ultra-duty grease 2	–
9	CONOCO	*Fleet motor oil	Universal gear lubricant	Super-sta grease	–
10	ELF	Multiperformance 3C Performance 3C	–	Tranself EP Tranself EP type 2	Glacelf
11	EXXON (ESSO)	Essolube D3 *Essolube XD-3 *Essolube XD-3 Extra *Esso heavy duty Exxon heavy duty	Gear oil GP Gear oil GX	Beacon EP2	All season coolant
12	GULF	Super duty motor oil *Super duty plus	Multi-purpose gear lubricant	Gulfcrown EP2 Gulfcrown EP special	Antifreeze and coolant
13	MOBIL	Delvac 1300 *Delvac super 10W-30, 15W-40	Mobilube GX Mobilube HD	Mobilux EP2 Mobilgrease 77 Mobilgrease special	–

No.	Supplier	**Engine Oil [CD or CE]** SAE10W, 30, 40 10W30, 15W40 (The 15W40 oil marked * is CE.)	**Gear Oil [GL-4 or GL-5]** SAE80, 90, 140	**Grease [Lithium-Base]** NLGI No. 2	**Anti-freeze Coolant [Ethylene Glycol Base] Permanent Type**
14	PENNZOIL	*Supreme duty fleet motor oil	Multi-purpose 4092 Multi-purpose 4140	Multi-purpose white grease 705 707L White – bearing grease	Anti-freeze and summer coolant
15	PETROFINA	FINA kappa TD	FINA potonic N FINA potonic NE	FINA marson EPL2	FINA tamidor
16	SHELL	Rimula X	Spirax EP Spirax heavy duty	Alvania EP grease	–
17	SUN	–	Sunoco GL5 gear oil	Sunoco ultra prestige 2EP Sun prestige 742	Sunoco antifreeze and summer coolant
18	TEXACO	*Ursa super plus Ursa premium	Multigear	Multifak EP2 Starplex 2	Code 2055 startex antifreeze coolant
19	TOTAL	Rubia S *Rubia X	Total EP Total transmission TM	Multis EP2	Antigel/antifreeze
20	UNION	*Guardol	MP gear lube LS	Unoba EP	–
21	VEEDOL	*Turbostar *Diesel star MDC	Multigear Multigear B Multigear C	–	Antifreeze

21. STANDARD TIGHTENING TORQUES FOR BOLTS AND NUTS

21.1 INTRODUCTION OF NECESSARY TOOLS

The following tools are needed when carrying out maintenance.

No.	Name of tool	Part No.	Remarks
1	Wrench set	09000-30006	Applicable width across flats (S_1 – S_2) 8 mm – 10 mm, 12 mm – 14 mm 13 mm – 17 mm, 19 mm – 22 mm 24 mm – 27 mm, 30 mm – 32 mm  AD053370
2	Socket	09021-01016	Applicable width across flats 10 mm
3	Socket	09021-01319	Applicable width across flats 13 mm
4	Socket	09021-01422	Applicable width across flats 14 mm
5	Socket	09021-01725	Applicable width across flats 17 mm
6	Socket	09021-01928	Applicable width across flats 19 mm
7	Socket	09021-02233	Applicable width across flats 22 mm
8	Socket	09021-02436	Applicable width across flats 24 mm
9	Socket	09021-03653	Applicable width across flats 36 mm
10	Extension	09022-00150	
11	Handle	09023-00300	
12	Joint	09025-00075	
13	Handle	09026-00250	
14	Bar	09027-00300	
15	Socket	09084-01422	
16	Handle	09026-00250	
17	Screwdriver	09033-00190	Interchangeable flat-head and cross-head type
18	Filter wrench	09019-08035	For filter cartridge
19	Grease pump	07952-80002	For greasing work
20	Grease cartridge	07950-90403	(Lithium base grease, 400 g)
21	Body sheet	130-84-71570	

If any of the above tools are broken, please order them from your Komatsu distributor.

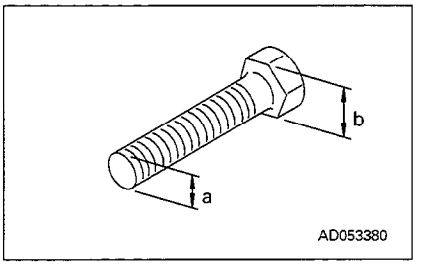
21.2 TORQUE LIST

Unless otherwise specified, tighten the metric bolts and nuts to the torque shown in the table.

The tightening torque is determined by the width across the flats ⓑ of the nut and bolt.

If it is necessary to replace any nut or bolt, always use a Komatsu genuine part of the same size as the part that was replaced.

Nm (newton meter): 1Nm ≒ 0.1 kgm
≒ 0.74 lbft



Thread diameter of bolt (mm) (a)	Width across flat (mm) (b)	Ⓣ Ⓗ AD054300		
		Nm	kgm	lbft
6	10	13.2 ± 1.4	1.35 ± 0.15	9.73 ± 1.03
8	13	31.4 ± 2.9	3.2 ± 0.3	23.2 ± 2.1
10	17	65.7 ± 6.8	6.7 ± 0.7	48.5 ± 5.0
12	19	112 ± 9.8	11.5 ± 1.0	82.6 ± 7.2
14	22	177 ± 19	18.0 ± 2.0	131 ± 14
16	24	279 ± 29	28.5 ± 3	206 ± 21
18	27	383 ± 39	39 ± 3	282 ± 29
20	30	549 ± 58	56 ± 6	405 ± 43
22	32	745 ± 78	76 ± 8	549 ± 58
24	36	927 ± 98	94.5 ± 10	684 ± 72
27	41	1320 ± 140	135 ± 15	973 ± 100
30	46	1720 ± 190	175 ± 20	1270 ± 140
33	50	2210 ± 240	225 ± 25	1630 ± 180
36	55	2750 ± 290	280 ± 30	2030 ± 210
39	60	3280 ± 340	335 ± 35	2420 ± 250

NOTICE

When tightening panels or other parts having tightening fixtures made of plastic, be careful not to use excessive tightening torque: doing so will damage the plastic parts.

22. 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 user should also carry out periodic replacement of the parts given in the table. These parts are particularly closely connected to safety and fire prevention.

With these parts, the material changes as time passed, or they easily wear or deteriorate. However, it is difficult to judge the condition of the parts simply by periodic maintenance, so they should always be replaced after a fixed time has passed, regardless of their condition. This is necessary to ensure that they always maintain their function completely.

However, if these parts show any abnormality before the replacement interval has passed, they should be repaired or replaced immediately.

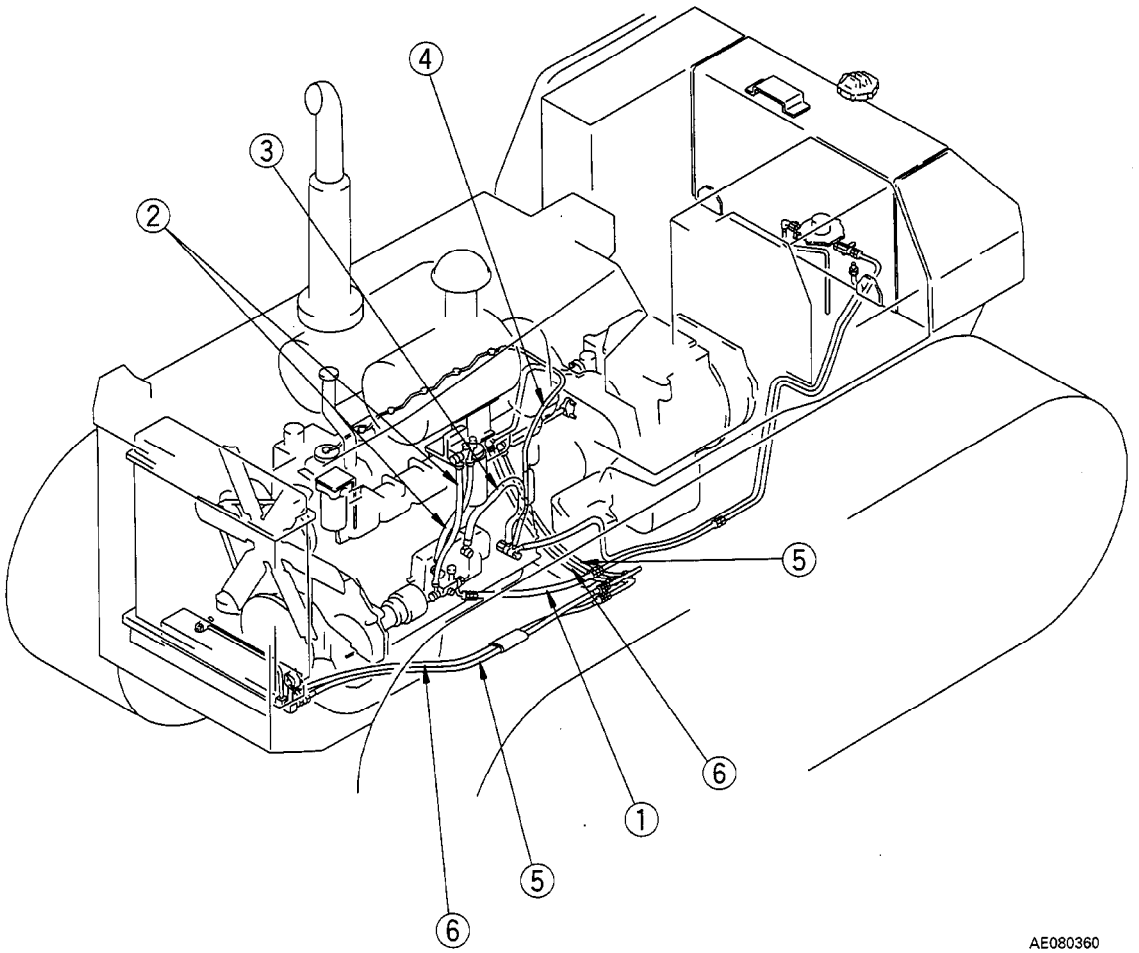
If the hose clamps show any deterioration, such as deformation or cracking, replace the clamps at the same as the hoses.

When replacing the hoses, always replace the O-rings, gaskets, and other such parts at the same time.

Ask your Komatsu distributor to replace the critical parts.

SAFETY CRITICAL PARTS

No.	Safety critical parts for periodic replacement	Q'ty	Replacement interval
1	Fuel hose (fuel tank – injection pump)	1	Every 2 years or 4000 hours, whichever comes sooner
2	Fuel hose (injection pump – fuel filter)	2	
3	Fuel return hose (injection pump – adapter)	1	
4	Fuel return hose (injection nozzle – adapter)	1	
5	Hose (torque converter case – transmission oil cooler)	2	
6	Hose (transmission oil cooler – transmission case)	2	
7	Seat belt (option)	1	Every 3 years



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23. MAINTENANCE SCHEDULE CHART

23.1 MAINTENANCE SCHEDULE CHART

SERVICE ITEM	PAGE
INITIAL 250 HOURS SERVICE (only after the first 250 hours)	
Replace fuel filter cartridge	3-50
Change oil in engine oil pan, replace engine oil filter cartridge	3-51
Change oil in steering clutch case (incl. bevel gear case), replace oil filter element	3-52,61
Change oil in transmission case (incl. torque converter case), replace oil filter element	3-53,55
Change oil in hydraulic tank, replace hydraulic oil filter element	3-56,60
Change oil in final drive case	3-59
Check, adjust engine valve clearance	3-62
WHEN REQUIRED	
Clean inside of cooling system	3-22
Check, clean and replace air cleaner	3-26
Check, adjust track tension	3-28
Grease control lever, pedal shaft	3-30
• Blade control lever shaft (2 points)	3-30
• Steering clutch brake pedal shaft (4 points)	3-30
• Brake lock lever shaft (1 point)	3-30
• Gear shift lever shaft (1 point)	3-30
• Decelerator pedal shaft (4 points)	3-31
• Fuel control lever shaft (1 point)	3-31
Check electrical intake air heater	3-32
Reverse, replace the cutting edges and end bits	3-32
Check for loose track shoe bolts, tighten	3-33
Drain water from water separator	3-33
Adjust brake pedal	3-34
Adjust idler clearance	3-35
Adjust angle of blade edge	3-35
Adjust amount of blade tilt	3-36

SERVICE ITEM	PAGE
EVERY 500 HOURS SERVICE	
Replace fuel filter cartridge	3-50
Change oil in engine oil pan, replace engine oil filter cartridge	3-51
Replace steering clutch case oil filter element	3-52
Replace transmission case oil filter element	3-53
Clean breather	3-53
Clean, check radiator fins	3-54
EVERY 1000 HOURS SERVICE	
Lubricating	3-55
• Universal joint (2 points)	3-55
• Diagonal brace (2 points)	3-55
Change oil in transmission case (incl. torque converter case), clean strainer	3-55
Replace hydraulic oil filter element	3-56
Check oil in undercarriage components	3-57
Replace corrosion resistor cartridge	3-57
EVERY 2000 HOURS SERVICE	
Check oil level in damper case, add oil	3-58
Change oil in final drive case	3-59
Change oil in hydraulic tank	3-60
Change oil in steering clutch case (incl. bevel gear case)	3-61
Clean engine breather element	3-62
Check alternator, starting motor	3-62
Check vibration damper (rubber)	3-62
Check, adjust engine valve clearance	3-62
EVERY 4000 HOURS SERVICE	
Check water pump	3-63

24. SERVICE PROCEDURE

24.1 INITIAL 250 HOURS SERVICE

Carry out the following maintenance only after the first 250 hours.

- **REPLACE FUEL FILTER CARTRIDGE**
- **CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE**
- **CHANGE OIL IN STEERING CLUTCH CASE (INCL. BEVEL GEAR CASE), REPLACE OIL FILTER ELEMENT**
- **CHANGE OIL IN TRANSMISSION CASE (INCL. TORQUE CONVERTER CASE), REPLACE OIL FILTER ELEMENT**
- **CHANGE OIL IN HYDRAULIC TANK, REPLACE HYDRAULIC OIL FILTER ELEMENT**
- **CHANGE OIL IN FINAL DRIVE CASE**
- **CHECK, ADJUST ENGINE VALVE CLEARANCE**

For details of the method of replacing or maintaining, see the section on EVERY 500 HOURS, 1000 HOURS AND 2000 HOURS SERVICE.

24.2 WHEN REQUIRED

24.2.1 CLEAN INSIDE OF COOLING SYSTEM

⚠ WARNING

- **Soon after the engine has been stopped, the coolant is hot and can cause personal injury. Allow the engine to cool before draining water.**
- **Never remove the radiator cap when the engine is at operating temperature. At operating temperature, the coolant is under pressure. Steam blowing up from the radiator could cause personal injury. Allow the engine to cool until the radiator filler cap is cool enough to touch with your hand. Remove the filler cap slowly to relieve pressure.**
- **Never be under the machine with the engine running. To avoid serious injury, always stop the engine before being under the machine to open the drain valve.**
- **When removing drain plug, avoid pouring coolant on yourself.**
- **Antifreeze is flammable, so keep it away from any flame.**
- **Flushing agents, neutralizing agents, and anti-corrosive agents are strong acids or alkalize, so be careful not to get them on your skin. If you should get any of these on your skin, wash off immediately with ample water.**
- **After using the agent, do not use the empty packet for keeping food, etc.**

Stop the machine on level ground when cleaning or changing the coolant.

Clean the inside of the cooling system, change the antifreeze, and replace the corrosion resistor according to the table below.

REMARK

When using a corrosion resistor cartridge element marked REPLACE EVERY 500 HOURS, see the table on the next page.

Kind of coolant	Cleaning inside of cooling system and changing coolant	Adding corrosion resistant KI (in hard water areas)
Permanent type antifreeze (All season type)	Every year (autumn) or every 2000 hours whichever comes first	Every 1000 hours and when cleaning the inside of the cooling system and when changing coolant
Non permanent type antifreeze containing ethylene glycol (Winter, one season type)	Every 6 months (spring, autumn) (Drain antifreeze in spring, add antifreeze in autumn)	
When not using antifreeze	Every 6 months or every 1000 hours whichever comes first	

Super Coolant (AF-ACL) has an anti-corrosion effect as well as an antifreeze effect.

The ratio of antifreeze to water depends on the ambient temperature, but to obtain the corrosion resistance effect, a minimum ratio of 30% by volume is necessary.

To determine the proportion for mixing coolant with water, check the lowest temperature in the past and decide the proportion of the mix from the table below.
Set to a temperature 10°C (50°F) lower than the minimum temperature.

Table of ratios of water and anti-freeze.

Min. temperature (°C) / Proportion of mix (ℓ)	°C	−5	−10	−15	−20	−25
	°F	23	14	5	−4	−13
Antifreeze (ℓ)	ℓ	8	10.5	12.5	14.5	16.5
	US gal	2.11	2.77	3.30	3.83	4.36
	UK gal	1.76	2.31	2.75	3.19	3.63
Water (ℓ)	ℓ	27	24.5	22.5	20.5	18.5
	US gal	7.13	6.47	5.94	5.42	4.89
	UK gal	5.94	5.39	4.95	4.51	4.07

⚠ WARNING

Antifreeze is flammable, so keep it away from flames. Never smoke when handling antifreeze.

Use tap water as the coolant. If the only available water is river water or well water, please contact your Komatsu distributor for advice.

We recommend using an antifreeze density gauge to control the proportion of the mix.

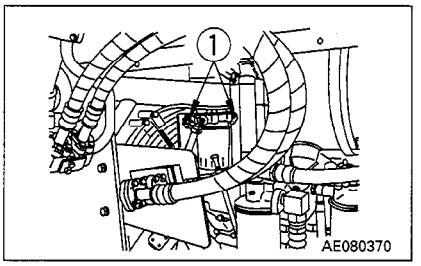
Table

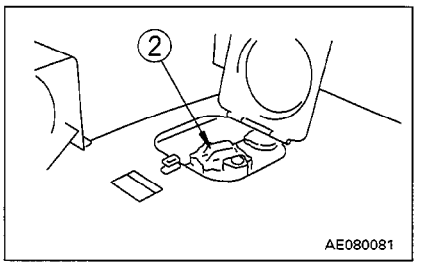
Type of antifreeze	Cleaning inside of cooling system and changing antifreeze	Replacing corrosion resistor
AF-ACL antifreeze (corrosion resistant, all-season type)	2 years (every other year: autumn)	Keep corrosion resistor valve closed
AF-PTL antifreeze (all-season type)	Every year (autumn) or every 1000 hours, whichever comes first	During EVERY 500 HOURS SERVICE and when cleaning inside of cooling system and changing antifreeze
AF-PT antifreeze (winter one-season type)	Every 6 months (spring, autumn), but add antifreeze only in autumn	Dring EVERY 500 HOURS SERVICE and when cleaning inside of cooling system and changing antifreeze
When not using antifreeze	Every 6 months or every 1000 hours, whichever comes first	During EVERY 500 HOURS SERVICE and when cleaning inside of cooling system

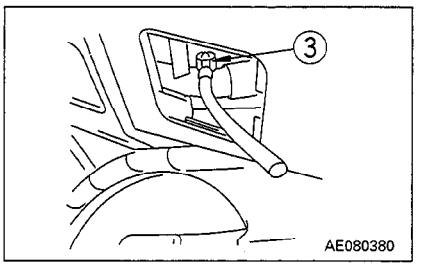
⚠ WARNING

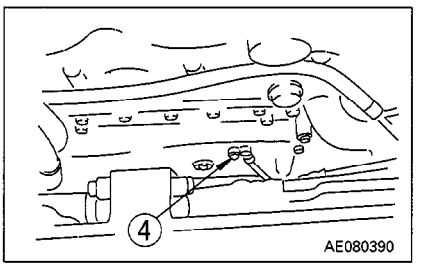
When removing the drain plug, be careful not to get any water containing antifreeze on yourself.

1. Stop the engine and tighten corrosion resistor valve ①.
2. Turn radiator cap ② slowly to remove it.
3. Place a container to catch the coolant, then open drain valve ③ at the bottom of the radiator and drain plug ④ on the side face of the oil cooler.
4. After draining the coolant, close drain valve ③ and drain plug (4), and fill with tap water.
5. When the radiator is full, open drain valve ③ and drain plug ④, run the engine at low idling, and flush water through the system for 10 minutes.
   Adjust the flow of the water flowing in and draining out to ensure that the radiator is always full during the flushing operation. While flushing water through the system, watch carefully that the water inlet hose does not come out of the radiator filler port.
6. After flushing, stop the engine, open drain valve ③ and drain plug ④, drain out all the water, then close the valve and plug again.
6. After flushing, stop the engine, open drain valve ③ and drain plug ④, drain out all the water, then close the valve and plug again.
7. After draining the water, use a cleaning agent to carry out cleaning.
   Use a genuine Komatsu product for the cleaning agent. Follow the instructions on the cleaning agent container when carrying out the cleaning operation.
8. After cleaning, open drain valve ③ and drain plug ④, drain out all the water, then close drain valve ③ and drain plug ④, and fill with tap water to near the water filler port.









9. When the water comes to near the water filler port, open drain plug ③ and drain plug ④, run the engine at low idling, and continue to run water through the system until clean water comes out.

Adjust the flow of the water flowing in and draining out to ensure that the radiator is always full during the flushing operation.

10. When the water is completely clean, stop the engine, then close drain valve ③ and drain plug ④.

11. Replace the corrosion resistor.

For details of the procedure for replacing the corrosion resistor, see "24.7 EVERY 1000 HOURS SERVICE".

12. Add tap water until the water flows out from the water filler port.

13. To remove the air in the coolant, run the engine for 5 minutes at low idling, then run for a further 5 minutes at high idling. (When doing this, leave the water filler cap off.)

14. Stop the engine, wait for 3 minutes, add tap water until the water level reaches near the water filler port, then tighten the cap.

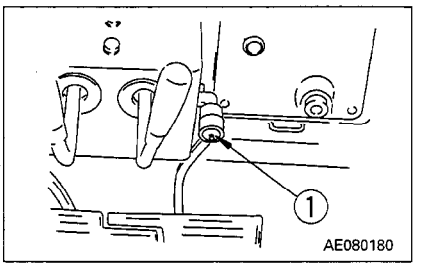
24.2.2 CHECK, CLEAN AND REPLACE AIR CLEANER

⚠ WARNING

- **Never clean or replace the air cleaner while the engine is running.**
- **When using compressed air to clean the element, there is danger that dust will fly and get into your eyes, so always wear protective glasses.**

NOTICE

When installing both the inner element and outer element, move the element lightly so that the seal rubber at the tip of the element is in tight contact with the inside of the body, then tighten the nut.



CHECK

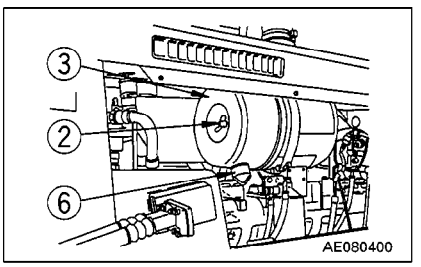
If dust indicator ① shows red, clean the air cleaner element.

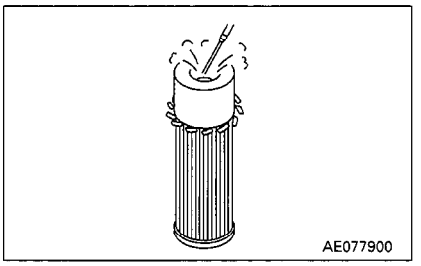
CLEAN OUTER ELEMENT, REPLACE

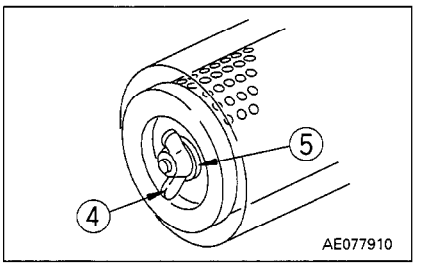
1. Remove wing bolt ②, then remove cover ③, and take out the outer element.

2. Clean the inside of the body and the dust cap.

3. Direct dry compressed air (Max. 700 kPa (7 kg/cm², 100 psi)) from inside of the element along its folds. Then blow with air along the folds from the outside, and finally blow again from the inside.
   (1) Remove one seal from the element each time it is cleaned.
   (2) Replace any outer element which has been cleaned 6 times or used for one year. Replace the inner element at the same time.
   (3) Replace both the inner and outer elements if the air cleaner clogging caution lamp lights up immediately after the element is cleaned, even if the element has not been cleaned 6 times.
   (4) Check for looseness of the inner element tightening nuts, and tighten if necessary.
   (5) If seal washer ⑤ is damaged or the thread of wing nut ④ is damaged, replace with new parts.
   (6) Remove vacuator valve ⑥, and blow with compressed air to clean.
   After cleaning, install the vacuator valve.





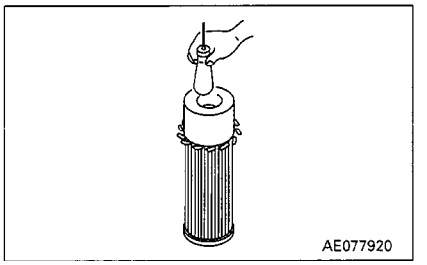


NOTICE

After cleaning the element, shine a light from the inside and check if any small holes or thin parts are found on the element. If such parts are found, replace the element.

When cleaning the element, do not hit it against anything.

Do not use any element if its folds, gasket or seal are damaged.



4. Install the cleaned element, then install cover ③.

REPLACE INNER ELEMENT

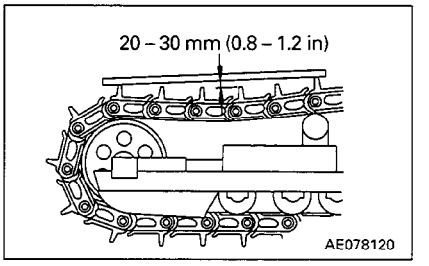
1. After removing the cover and outer element, remove the inner element.
2. Cover the air connector (outlet port) with a clean cloth or cloth tape to prevent dirt from getting in.
3. Clean the inside of the body, then remove the cover installed in Step 2.
4. Install a new inner element to the connector, then tighten the nuts.
   Do not clean the inner element and use it again.
5. Install the outer element and cover.
6. After replacing the element, return the red piston in the dust indicator to its original position.

24.2.3 CHECK, ADJUST TRACK TENSION

The wear of the undercarriage pins and bushings differs according to the working conditions and soil quality, so check the track tension from time to time to maintain the standard tension.
Carry out the check and adjustment under the same conditions as when operating (on jobsites where the track becomes clogged with mud, measure with the track clogged with mud).

CHECK

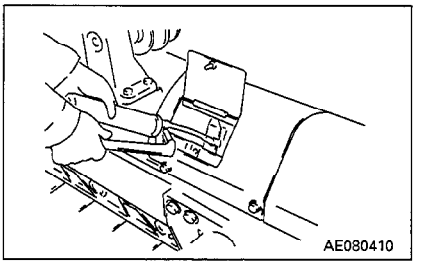
Stop the machine on flat ground (drive forward and stop the machine without using the brakes). Place a straight rod across the top of the carrier roller and idler as shown in the diagram, then measure the distance between the rod and the grouser at the center. The standard distance for the track tension is 20 – 30 mm (0.8 – 1.2 in).
If the tension is not the standard, adjust as follows.



ADJUSTMENT

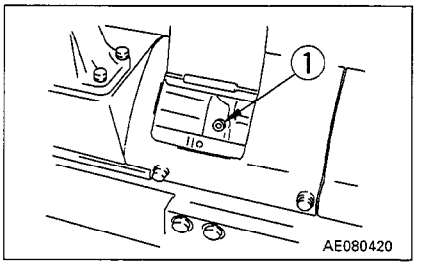
⚠ WARNING

The grease is under high pressure, so there is danger that it will spurt out. For this reason, do not loosen lubricator ① more than one turn.
Do not loosen any part other than lubricator ①. Furthermore, do not bring your face in front of lubricator ①.
If the track tension is not relieved by this procedure, please contact your Komatsu distributor.

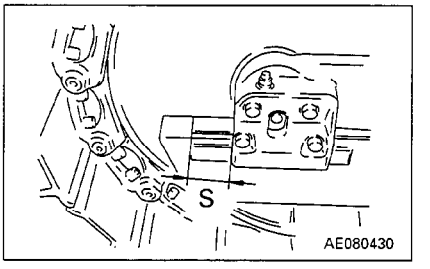


When increasing tension

1. Pump in grease through lubricator ① with a grease pump.
2. To check that the correct tension has been achieved, move the machine backwards and forwards.
3. Check the track tension again, and if the tension is not correct, adjust it again.



4. Continue to pump in grease until S becomes 0 mm. If the tension is still loose, the pin and bushing are excessively worn, so they must be either turned or replaced. Please contact your Komatsu distributor.

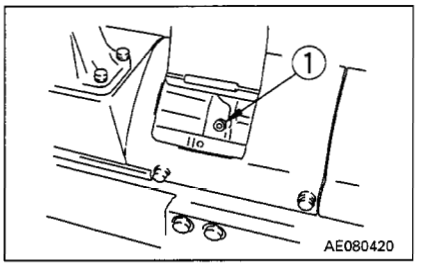


When loosening tension

⚠ WARNING

It is extremely dangerous to release the grease by any method except the procedure given below. If the track tension is not relieved by this procedure, please contact your Komatsu distributor.

1. Loosen lubricator ① gradually to release the grease.
2. Turn lubricator ① a maximum of one turn.
3. If the grease does not come out smoothly, move the machine backwards and forwards a short distance.
4. Tighten lubricator ①.
5. To check that the correct tension has been achieved, move the machine backwards and forwards.
6. Check the track tension again, and if the tension is not correct, adjust it again.

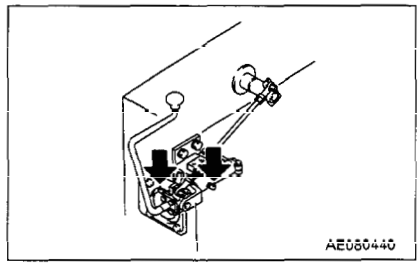


24.2.4 GREASE CONTROL LEVER, PEDAL SHAFT

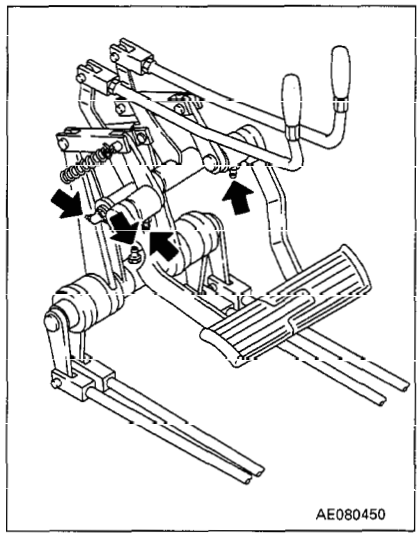
Carry out greasing only when necessary after at least 2000 hours have passed.

Add grease to the grease fittings marked by arrows.

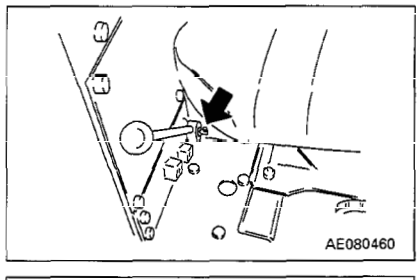
1. Blade control lever shaft (2 points)



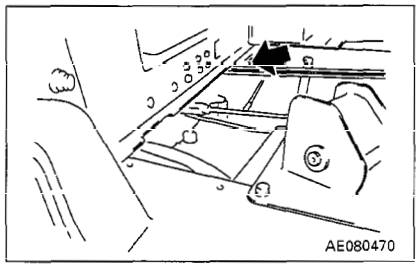
2. Steering clutch brake pedal shaft (4 points)



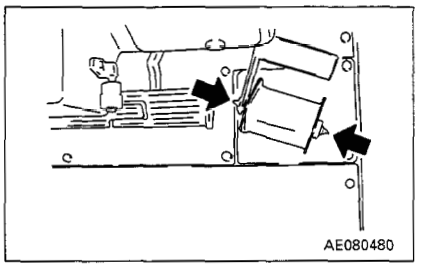
3. Brake lock lever shaft (1 point)

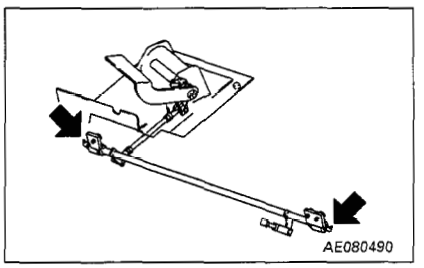


4. Gear shift lever shaft (1 point)

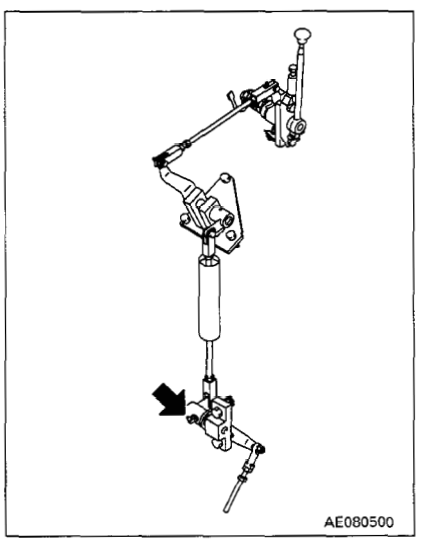


5. Decelerator pedal shaft (4 points)

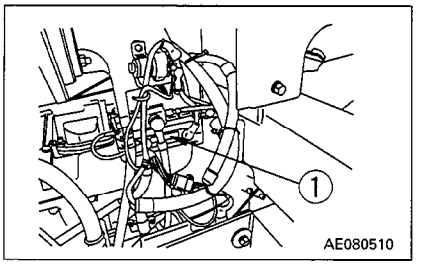




6. Fuel control lever shaft (1 point)



24.2.5 CHECK ELECTRICAL INTAKE AIR HEATER



Ask your Komatsu distributor to check electrical intake air heater ① once a year before commencing work in the cold season.

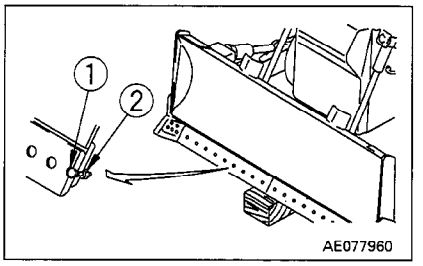
Remove electrical intake air heater ① from the engine intake connection, and check it for possible open-circuits and dirt.

When inspecting and replacing electrical intake air heater ① replace the gasket with new one.

24.2.6 REVERSE, REPLACE THE CUTTING EDGES AND END BITS

⚠ WARNING

It is dangerous if the work equipment moves by mistake when the cutting edges and end bits are being reversed or replaced. Set the work equipment in a stable condition, then stop the engine and apply the locks securely to the levers.



Reverse or replace the end bits and cutting edges before it is worn out to the blade end.

1. Raise the blade to a proper height and apply a block to the frame so as to prevent fall of the blade.
2. Remove the cutting edge and the end bit and clean the mounting surface.

   If the cutting edge and the end bit on both sides are worn out, replace with new one.

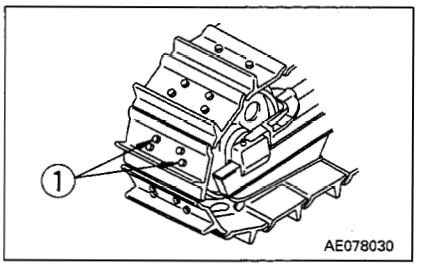
   If it has been worn out up to the fitting surface, repair the fitting surface and then reverse or replace.
3. Reverse or replace the cutting edge and the end bit when worn out.

   Nut tightening torque: 460 ± 69 Nm (47 ± 7 kgm, 340 ± 51 lbft)

   If bolt ① and nut ② are damaged, replace them with new ones at the same time.
4. After several hours of running, retighten the nuts.

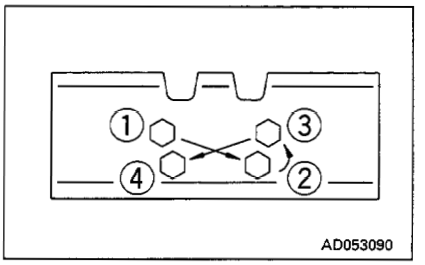
24.2.7 CHECK FOR LOOSE TRACK SHOE BOLTS, TIGHTEN

If the track is used when track shoe bolts ① are loose, they will be damaged. If any loose bolts are found, tighten them immediately.



Method for tightening (shoe bolt)

1. First tighten to a tightening torque of 196 ± 20 Nm (20 ± 2 kgm, 145 ± 14 lbft), then check that the nut and shoe are in close contact with the link contact surface.
2. After checking, tighten a further 120° ± 10°.

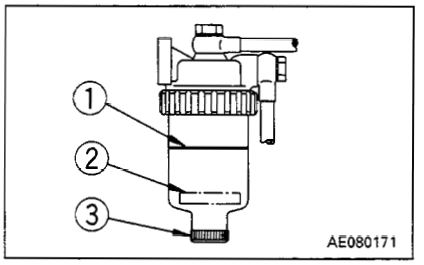


Method for tightening (master link connecting bolt)

1. First tighten to a tightening torque of 196 ± 20 Nm (20 ± 2 kgm, 145 ± 14 lbft), then check that the link contact surfaces are in close contact.
2. After checking, tighten a further 180° ± 10°.

24.2.8 DRAIN WATER FROM WATER SEPARATOR

When float ② is at or above red line ①, drain the water according to the following procedure:



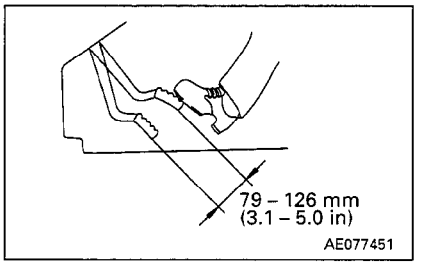
1. Loosen drain plug ③ and drain the accumulated water until the float reaches the bottom.
2. Tighten drain plug ③.
3. If the air is sucked into fuel line when drain the water, be sure to bleed air in the same manner as for the fuel filter.
   (See Fuel Filter Cartridge in "24.6 EVERY 500 HOURS SERVICE" section.)

24.2.9 ADJUST BRAKE PEDAL

If the brake lining worn, the brake pedal travel will increase, so adjust the clearance between the brake band and the brake drum.

CHECK

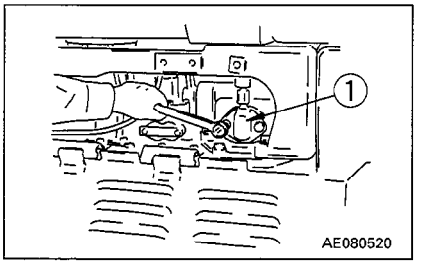
Check that the brake pedal travel is within a range of 79 - 126 mm (3.1 – 5.0 in).

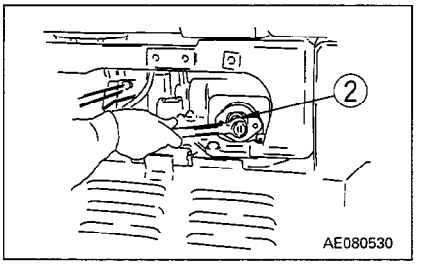


METHOD OF ADJUSTMENT

Adjust the brakes on both the left and right sides.

1. Remove the rear cover, then remove inspection cover ①.
2. Tighten adjustment nut ② (tightening torque: 88 Nm (9 kgm, 65 lbft) to bring the lining into tight contact with the drum, then turn adjustment nut ② back 1.5 turns.
3. Check the brake pedal travel. For details, see "24.3 CHECK BEFORE STARTING".





Adjust so that the travel of both brake pedals is the same.
If there is a difference, the brakes will pull to one side.
If the braking effect is still poor even after adjustment, please contact your Komatsu distributor for repairs.

24.2.10 ADJUST IDLER CLEARANCE

Since the idlers are forced to move forward and backward by an external force the guide plates will be worn out.

Wear of these plates will cause the vibration of idlers from side to side or inclination of the idlers, and running off of track links from the idlers or unevenly worn idler and links may result.

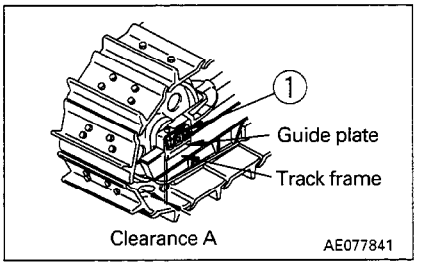
Therefore, adjust the idlers according to the following procedure.

ADJUSTMENT

1. Move machine about 1 or 2 meters (3.3 – 6.6 ft) on a flat ground and measure the clearance **A** (4 locations: left, right, inside and outside) between the track frame and the guide plate.

2. If the clearance **A** exceeds 3.0 mm (0.12 in), loosen bolt ①, and pull out the shim to adjust the clearance at one end to 1.0 mm (0.04 in).

   Thickness of one shim is 1.0 mm (0.04 in)



24.2.11 ADJUST ANGLE OF BLADE EDGE

⚠ WARNING

It is dangerous if the work equipment moves by mistake when adjusting angle of the blade edge. Set the work equipment in a stable condition, then stop the engine and apply the locks securely to the levers.

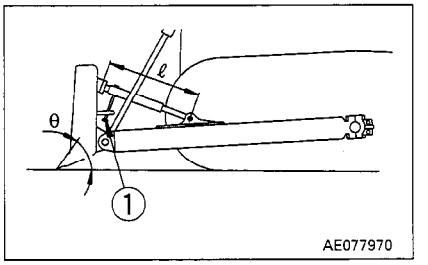
- Hydraulic tiltdozer
  Adjust the angle of the blade edge to match the type of soil.

METHOD OF ADJUSTMENT

Turn the brace with bar handle ① and adjust the length (ℓ) between the joints to change the angle (θ) of the edge of the blade as follows.

INCREASE length to INCREASE angle.
DECREASE length to DECREASE angle.

Standard blade angle: 55°



24.2.12 ADJUST AMOUNT OF BLADE TILT

⚠ WARNING

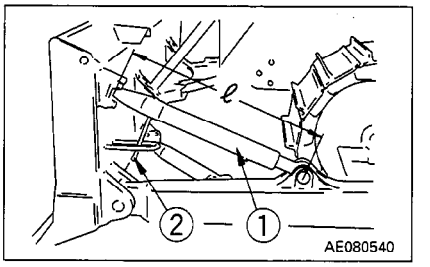
It is dangerous if the work equipment is moved by mistake when adjusting the tilt. Set the work equipment in a stable position, stop the engine, and lock the lever securely.

ADJUSTMENT

1. Raise the blade approx. 400 to 500 mm (16 – 20 in) off the ground and apply block to the frame.

2. By shifting the blade control lever to R.H. or L.H., tilting 444 (442) mm [17.48 (17.40) in] at right side or 427 (418) mm [16.81 (16.46) in] at left side of blade is possible.

3. Lengthen (ℓ) of brace ① by turning bar ② at one side of the blade until 680 (600) mm [26.77 (23.62) in] of maximum tilting can be obtained.
   ★ Tilt the blade up within a range of 680 (600) mm. [26.77 (23.62) in]
   ( ): D58P-1

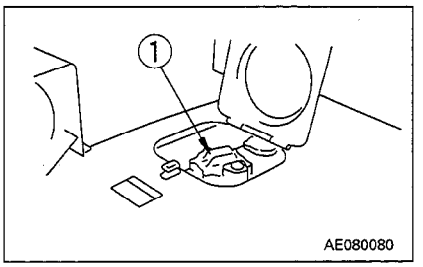


24.3 CHECK BEFORE STARTING

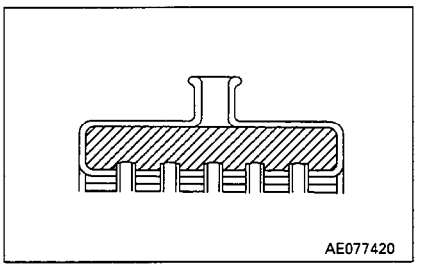
24.3.1 CHECK COOLANT LEVEL, ADD WATER

⚠ WARNING

Do not remove the radiator cap if the coolant is hot. Hot water may spurt out.
Wait for the water temperature to go down, turn the radiator cap slowly to release the pressure, then remove it.



1. Open the top cover at the front of the machine.
2. Remove radiator cap ①, and check that the coolant is up to the shaded area. Add water if necessary.



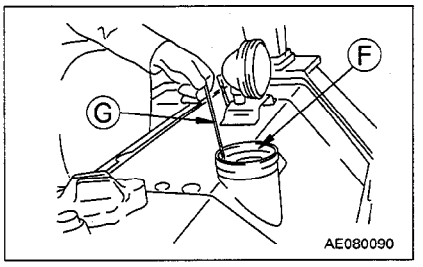
NOTICE

If more water than normal must be added, there is probably leakage, so check for the location of the leakage.

24.3.2 CHECK FUEL LEVEL

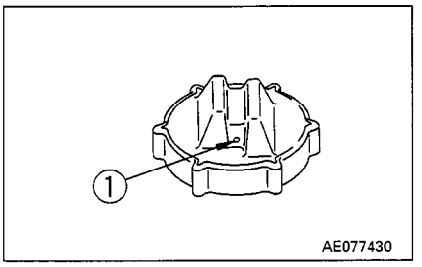
⚠ WARNING

When adding fuel, never let the fuel overflow. This may cause a fire. Wipe up any fuel that is spilled.



1. Remove the cap, then check the fuel level with oil level gauge Ⓖ.
2. After completing operations, add fuel through fuel filler Ⓕ to fill the tank.
3. After adding fuel, tighten the cap securely.

Fuel capacity: 250 ℓ (66 US gal, 55 UK gal)



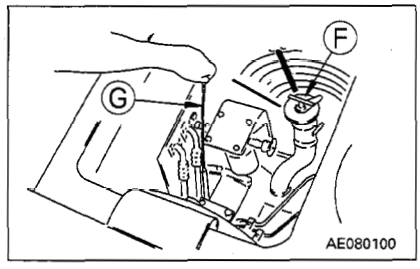
NOTICE

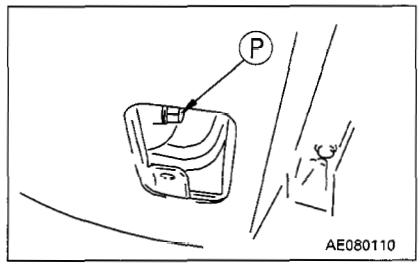
If breather hole ① in the cap is clogged, the pressure inside the tank will go down and the fuel may stop flowing, so clean the breather hole from time to time.

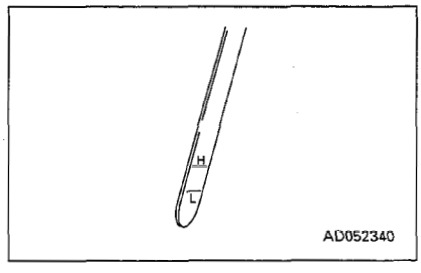
24.3.3 CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL

1. Open the upper cover at the front of the machine.
2. Remove dipstick Ⓖ, and wipe the oil off with a cloth.
3. Insert dipstick Ⓖ fully in the dipstick guide, then pull it out again.
4. The oil level should be between the H and L marks on dipstick Ⓖ.
   If the oil is below the L mark, add engine oil through oil filler Ⓕ.

   For details of the oil to use, see "20. USE OF FUEL, COOLANT, AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
5. If the oil is above the H mark, drain the excess oil from the drain plug Ⓟ, then check the oil level again.
6. If the oil level is correct, tighten the oil filler cap securely and close the upper cover.







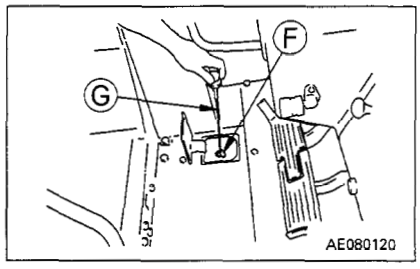
REMARK

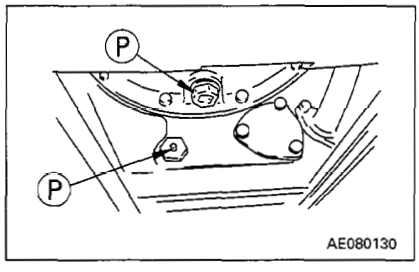
When checking the oil level after the engine has been operated, stop the engine and wait for at least 15 minutes before checking.

If the machine is at an angle, make it horizontal before checking.

When adding oil, remove the dipstick from the dipstick guide, and release the air inside the crankcase.

24.3.4 CHECK OIL LEVEL IN TRANSMISSION CASE (INCL. TORQUE CONVERTER CASE), ADD OIL



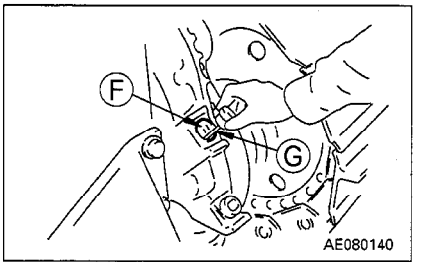


1. Open the cover, remove dipstick Ⓖ, and wipe the oil off with a cloth.
2. Insert dipstick Ⓖ fully in the oil filler pipe, then take it out again.
3. The oil level should be between the H and L marks on dipstick Ⓖ.
   If the oil level is below the L mark, add engine oil through oil filler Ⓕ.
   For details of the oil to use, see "20. USE OF FUEL, COOLANT, AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
4. If the oil is above the H mark, drain the excess engine oil from drain plug Ⓟ, and check the oil level again.
5. If the oil level is correct, tighten the oil filler cap securely and close the cover.

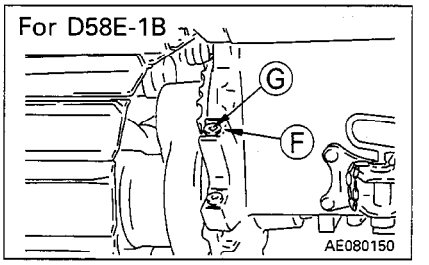
REMARK

When checking the oil level after the engine has been operated, wait for at least 15 minutes after stopping the engine before checking.
If the machine is at an angle, make it horizontal before checking.

24.3.5 CHECK OIL LEVEL IN STEERING CLUTCH CASE (INCL. BEVEL GEAR CASE), ADD OIL

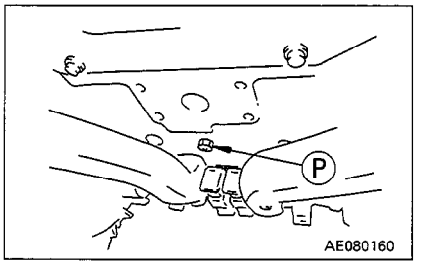


1. Open the cover, remove dipstick Ⓖ, and wipe the oil off with a cloth.
2. Insert dipstick Ⓖ fully in the oil filler pipe, then take it out again.
3. The oil level should be between the H and L marks on dipstick Ⓖ.
   If the oil level is below the L mark, add engine oil through oil filler Ⓕ.
   For details of the oil to use, see "20. USE OF FUEL, COOLANT, AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
4. If the oil is above the H mark, drain the excess engine oil from drain plug Ⓟ, and check the oil level again.
5. If the oil level is correct, tighten the oil filler cap securely and close the cover.



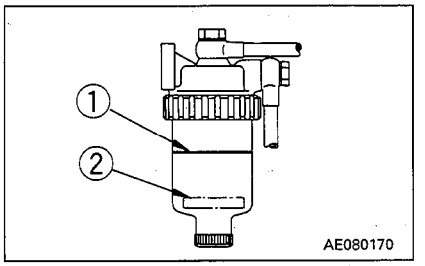
REMARK

When checking the oil level after the engine has been operated, wait for at least 15 minutes after stopping the engine before checking.
If the machine is at an angle, make it horizontal before checking.
In case the work is carried out on sloped land of more than 25° declination, supply oil up to H level.



24.3.6 CHECK WATER SEPARATOR

The water separator separates water mixed in the fuel. If float ② is at or above red line ①, drain the water. For the draining procedure, see section "24.2 WHEN REQUIRED".

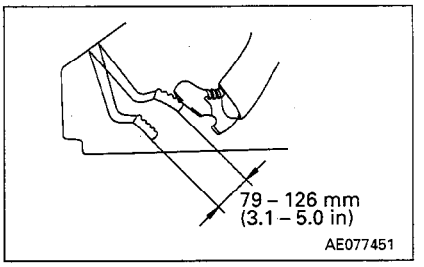


REMARK

Even if a water separator is installed, be sure to check the fuel tank to remove water and sediment in the fuel.

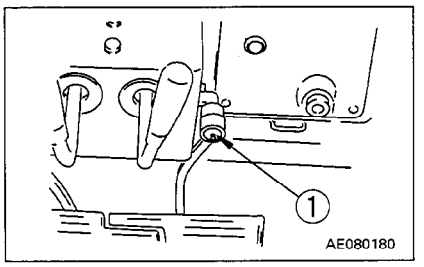
24.3.7 CHECK BRAKE PEDAL TRAVEL

1. Depress the brake pedal fully.
2. Check that the travel at the tip of the pedal is 79 – 126 mm (3.1 – 5.0 in).
3. If the travel is more than 126 mm (5.0 in), or the effect is poor, adjust the brake pedal. For details, see "24.2 WHEN REQUIRED".



24.3.8 CHECK DUST INDICATOR

1. Check that the red piston of dust indicator ① has not reached the service level.
2. If the red piston can be seen, clean or replace the element.
3. For details of element cleaning method, see "24.2.2 CHECK, CLEAN, REPLACE AIR CLEANER".
4. After cleaning the element, press button to return the red piston to its original position.



24.3.9 CHECK ELECTRIC WIRINGS

⚠ WARNING

If the fuse blows frequently, or there are traces of shortcircuiting in the electric wiring, always locate and repair the cause.

Check for damage of the fuse and any sign of disconnection or short circuit in the electric wiring. Check also for loose terminals and tighten any loose parts. Check the following points carefully.

- Battery
- Starting motor
- Alternator

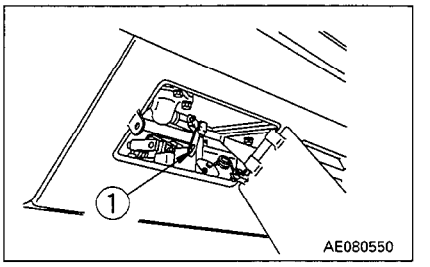
Please contact your Komatsu distributor for investigation and correction of the cause.

⚠ WARNING

Accumulation of flammable material (dead leaves, twigs, grass, etc.) around the battery may cause fire, so always check and remove such material.

When carrying walk-around checks or checks before starting, always check if there is any accumulation of flammable material around the battery, and remove such flammable material.

24.4 EVERY 50 HOURS SERVICE



24.4.1 DRAIN WATER, SEDIMENT FROM FUEL TANK

1. Carry out this procedure before operating the machine.
2. Prepare a container to catch the fuel that is drained.
3. Open drain valve ① at the bottom of the tank and drain the sediment and water that has accumulated at the bottom together with fuel. When doing this, be careful not to get fuel on yourself.
4. When only clean fuel comes out, close drain valve ①.

REMARK

Even if a water separator is installed, be sure to check the fuel tank to remove water and sediment in the fuel.

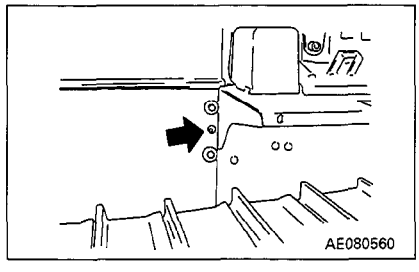
24.5 EVERY 250 HOURS SERVICE

Maintenance for the 50 hours service should be carried out at the same time.

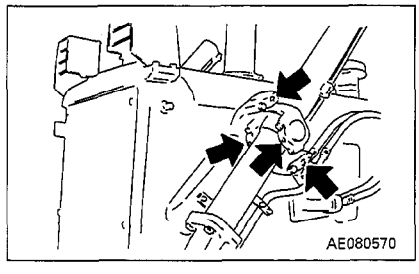
24.5.1 LUBRICATING

1. Lower the blade to the ground, then stop the engine.
2. Using a grease pump, pump in grease through the grease fittings shown by arrows.
3. After greasing, wipe off any old grease that was pushed out.

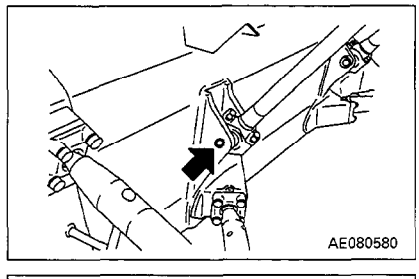
1. Equalizer bar pin (1 point)



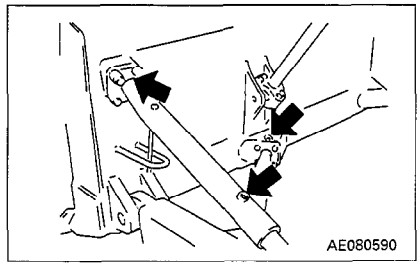
(TILTDOZER)
2. Blade lift cylinder support yoke (8 points)



3. Piston rod bearing (2 points)

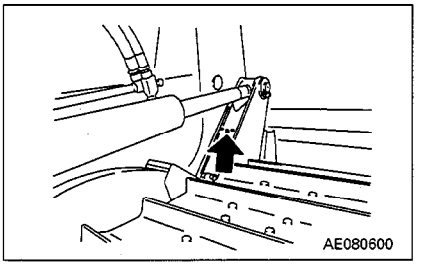


4. Brace (5 points)

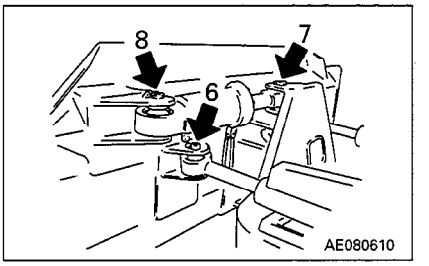


(ANGLE-TILTDOZER)

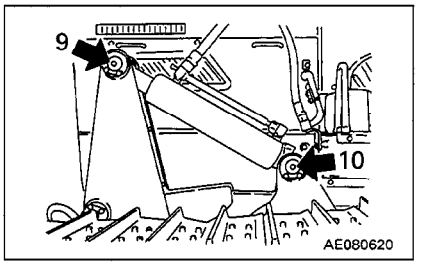
5. Angle cylinder bottom shaft (2 points)



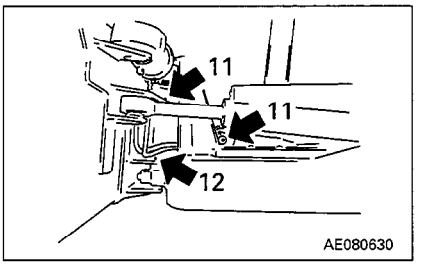
6. Angle cylinder head shaft (2 points)
7. Tilt cylinder head shaft (1 point)
8. Tilt cylinder bottom shaft (1 point)



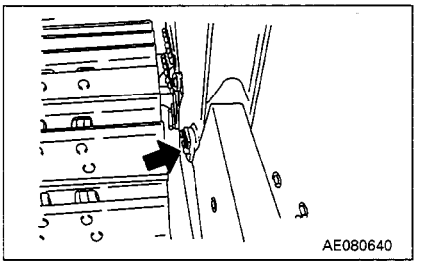
9. Lift cylinder head shaft (2 points)
10. Lift cylinder bottom shaft (2 points)



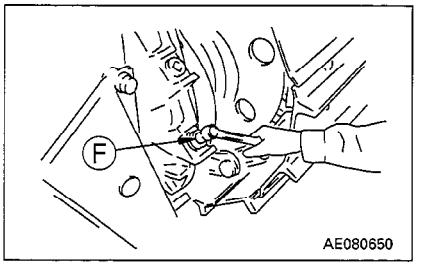
11. Brace rod shaft (2 points)
12. Angle-tilt frame center shaft (1 point)



13. Angle-tilt frame support shaft (2 points)



24.5.2 CHECK OIL LEVEL IN FINAL DRIVE CASE, ADD OIL



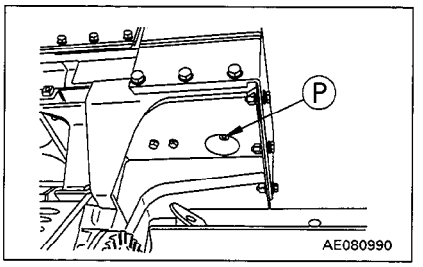
⚠ WARNING

The oil is at high temperature immediately after the machine has been operated. Wait for the oil to cool down before starting the operation.

1. Remove plugs Ⓕ on both sides and check whether the final drive case is filled with oil to lower edge of the plug hole.

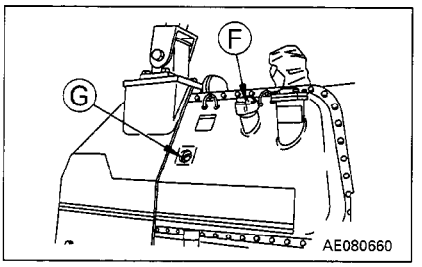
2. If the oil level is still too low, add engine oil through the plug hole until the oil overflows.
   For details of the oil to use, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".

24.5.3 CHECK OIL LEVEL IN HYDRAULIC TANK, ADD OIL



⚠ WARNING

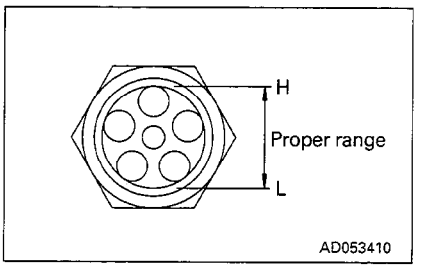
- **When removing the oil filler cap, oil may spurt out, so turn the cap slowly to release the internal pressure before removing the cap.**
- **If oil has been added to above the H mark, stop the engine and wait for the hydraulic oil to cool down, then drain the excess oil from drain plug Ⓟ.**



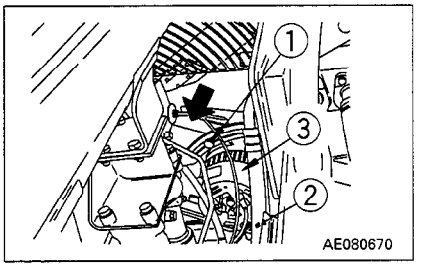
NOTICE

Do not add oil if the level is above the H line. This will damage the hydraulic equipment and cause the oil to spurt out.

1. Lower the blade to the ground, stop the engine and wait for about 5 minutes before checking oil level. If oil level is between H and L in sight gauge Ⓖ.
2. If the level is below the L mark, add engine oil through oil filler Ⓕ. For details of the oil to use, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".



24.5.4 CHECK FAN BELT TENSION, ADJUST



CHECK

The belt should normally deflect by about 10 mm (0.39 in) when pressed with the finger (with a force of approx. 6 kg (13 lb)) at a point midway between the alternator pulley and crankshaft pulley.

ADJUSTMENT

1. Loosen bolts and nuts ① and ②.
2. Move alternator ③ with a bar so that the deflection of the belt is about 10 mm (0.39 in) (approx. 6 kg (13 lb)).
3. Tighten bolts and nuts ① and ② to fix alternator ③ in position.
4. Check each pulley for damage, wear of the V-groove, and wear of the V-belt. In particular, be sure to check that the V-belt is not touching the bottom of the V-groove.
5. If the belt is stretched, leaving no allowance for adjustment, or if it is cut or cracked, replace the belt.
6. If the belt has been replaced, operate for one hour, then adjust again.

NOTICE

Do not push the alternator directly with a bar. Put a wooden block between the bar and the alternator.

24.5.5 CHECK LEVEL OF BATTERY ELECTROLYTE

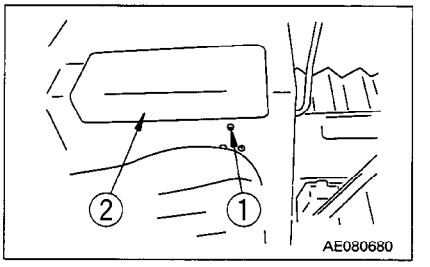
Carry out this check before operating the machine.

The battery can be checked from the operator's seat and from the outside of the machine.

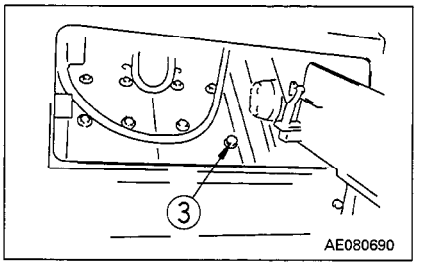
⚠ WARNING

- **The battery generates flammable gas, so keep away from flames.**
- **Battery electrolyte is dangerous. If it gets in your eyes or on your skin, wash it off with large amounts of water, and consult a doctor.**

1. To check from the operator's seat, press button ① and open arm rest ②.



2. To check from outside the machine, open the cover.



CHECK

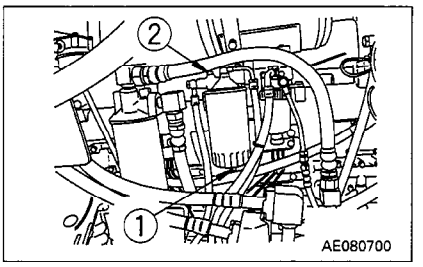
1. Remove cap ③, and check that the electrolyte is at the specified level (10 to 12 mm (0.39 – 0.47 in) above the plate). If the electrolyte level is low, add distilled water to the specified level. If the battery electrolyte is spilled, have dilute sulphuric acid added.

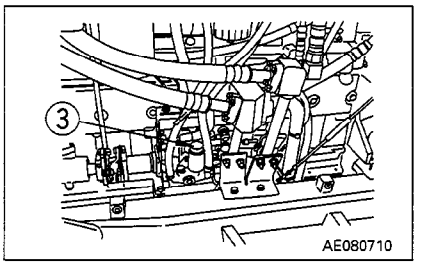
2. Clean the air hole in the battery cap, then tighten the cap securely.

REMARK

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

24.5.6 DRAIN WATER AND SEDIMENT FROM FUEL FILTER





1. Remove drain plug ① on the bottom of the filter to drain water and sediment accumulated on the bottom. After draining, tighten plug ①.
2. Loosen air vent plug ②.
3. Loosen feed pump knob ③ and move the pump up and down to draw off fuel until air ceases to come out of plug ②.
4. Tighten air vent plug ②, push feed pump knob ③ into place, and tighten it.

24.6 EVERY 500 HOURS SERVICE

Maintenance for every 50 hours and 250 hours should be carried out at the same time.

24.6.1 REPLACE FUEL FILTER CARTRIDGE

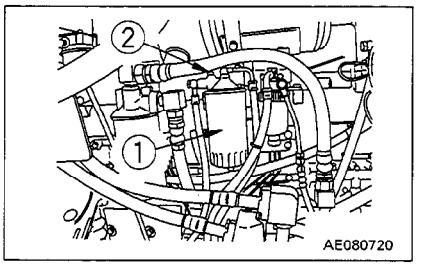
⚠ WARNING

- **The machine is at high temperature after the engine has been operated, so never replace the filter immediately after finishing operations. Wait for the machine to cool down before replacing the fuel filter cartridge.**
- **Never bring flames near the fuel filter cartridge.**

Prepare a filter wrench and oil container.

1. Set the fuel container under the filter cartridge.

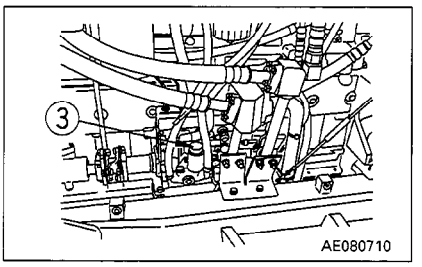
2. Using the filter wrench, turn filter cartridge ① counterclockwise to remove.



3. Clean the filter holder, fill the new filter cartridge with clean fuel, then coat the packing surface with engine oil and install it to the filter holder.

4. When installing, tighten until the packing surface contacts the seal surface of the filter holder, then tighten approx. a further 1/2 – 3/4 turns.

If the filter cartridge is tightened too far, the packing will be damaged and cause leakage of fuel. If it is not tightened enough, there will be a gap at the packing, and this will also cause fuel leakage, so be sure to tighten exactly to the specified tightening angle.



5. After replacing filter cartridge ①, loosen air bleed plug ②.

6. Loosen the knob of feed pump ③, pump it up and down, and continue until no more bubbles come out in the fuel flowing out from air bleed plug ②.

7. Tighten air bleed plug ②, push in the knob of feed pump ③, and tighten it.

8. After replacing the filter cartridge, run the engine and check for any leakage from the filter seal surface. If any leakage is found, check the tightening of the filter cartridge. If there is still fuel leakage, repeat Steps 1 and 2 to remove the filter cartridge, then check the packing surface for damage or foreign material caught in the surface.
   If any damage or foreign material is found in the packing, replace the filter cartridge with a new one, then repeat Steps 3 to 8 to install the new filter cartridge.

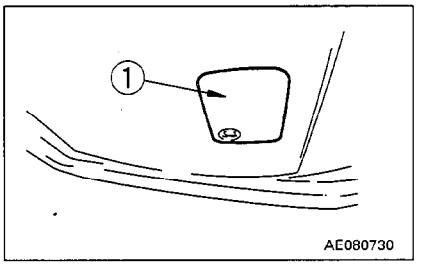
24.6.2 CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE

⚠ WARNING

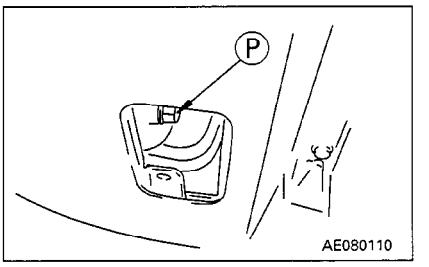
The oil is at high temperature after the engine has been operated, so never change the oil immediately after finishing operations. Wait for the oil to cool down before changing it.

- Oil container: Min. 26 ℓ (6.87 US gal, 5.72 UK gal)
- Refill capacity: 26 ℓ (6.87 US gal, 5.72 UK gal)
- Prepare a socket wrench and filter wrench.

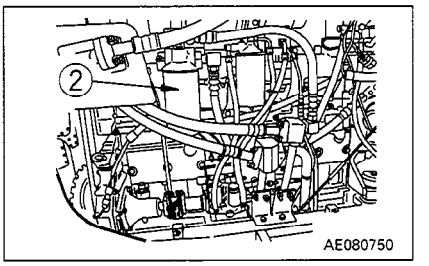
1. Remove cover ① under the chassis, then set a container to catch the oil immediately under drain plug Ⓟ.



2. Remove drain plug Ⓟ slowly to avoid getting oil on yourself, and drain the oil.
3. Check the drained oil, and if there are excessive metal particles or foreign material, please contact your Komatsu distributor.
4. Install drain plug Ⓟ.

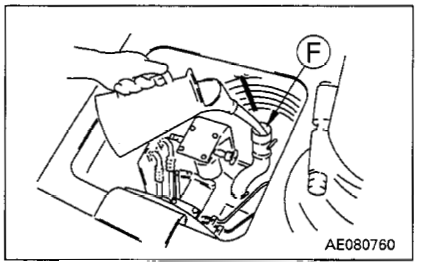


5. Using a filter wrench, turn filter cartridge ② counterclockwise to remove it.
   When doing this, to prevent getting oil on yourself, do not carry out this operation from immediately under the cartridge.
   In particular, if this operation is carried out immediately after stopping the engine, a large amount of hot oil will come out, so wait for 10 minutes before starting the operation.
6. Clean the filter holder, fill the new filter cartridge with clean engine oil, then coat the packing surface with engine oil (or coat thinly with grease), and install it to the filter holder.
7. When installing, tighten until the packing surface contacts the seal surface of the filter holder, then tighten approx. a further 1/2 – 3/4 turn.



8. After replacing the filter cartridge, add engine oil through oil filler Ⓕ until the oil level is between the H and L marks on the dipstick.
   For details of the oil to use, see "20. USE OF FUEL, COOLANT, AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
   When adding oil, be careful not to get oil on the alternator.

9. Idle-run the engine for a short time, then stop the engine, and check that the oil level is between the H and L marks on the dipstick. For details, see "24.3 CHECKS BEFORE STARTING".



NOTICE

Change the engine oil and replace the filter once every 6 months regardless of the amount of time the machine has been operated.

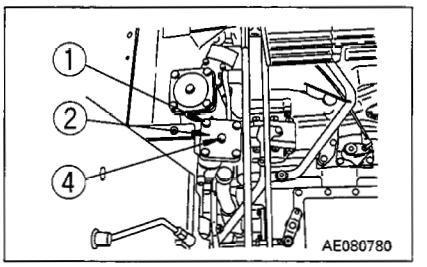
24.6.3 REPLACE STEERING CLUTCH CASE OIL FILTER ELEMENT

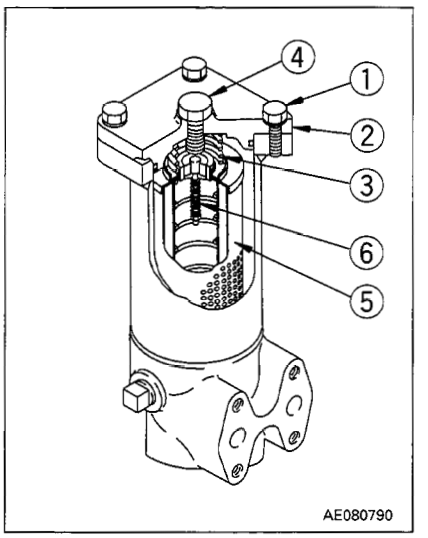
1. Remove the floor plate.

2. Remove bolt ① and remove cover ② to take out spring ③, valve ⑥ and element ⑤.

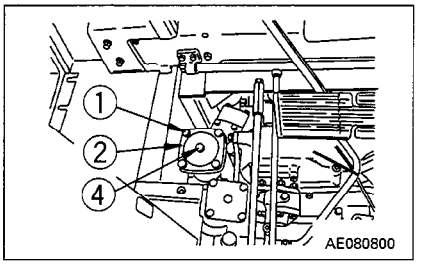
3. Clean inside of case and removed parts, and install a new element. Fill case with oil and fix cover ② with bolts ①.

4. After replacement of element, loosen air vent plug ④ and start engine. Overflow oil until no air bubble comes out from plug ④ and tighten plug ④.
   Always use a genuine Komatsu element.

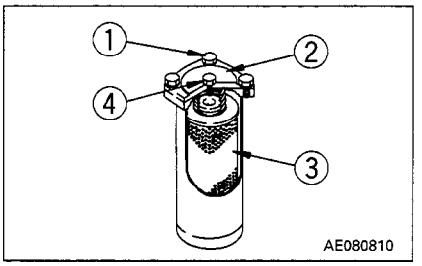




24.6.4 REPLACE TRANSMISSION CASE OIL FILTER ELEMENT

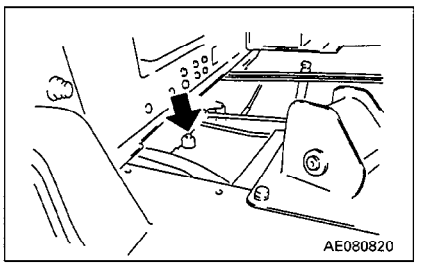


1. Remove the floor plate.
2. Remove bolts ①, and cover ②, and take element ③ out from case.
3. Clean inside of case and removed parts, and install a new element. Fill case with oil and fix cover ② with bolts ①.
4. After replacement of element, loosen air vent plug ④ and start engine. Overflow oil until no air bubble comes out from plug ④ and tighten plug ④.
   Always use a genuine Komatsu element.

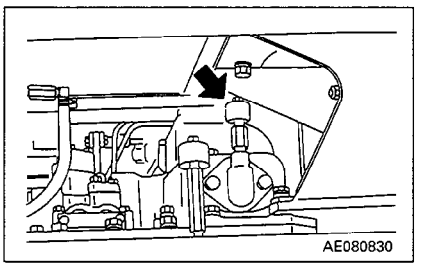


24.6.5 CLEAN BREATHER

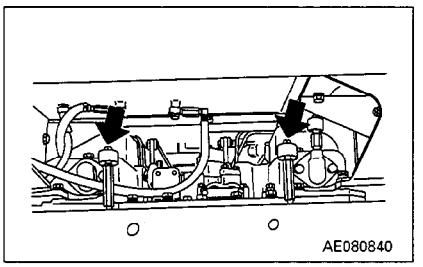
Remove the breather, and rinse with clean diesel oil or flushing oil to remove the dirt from the inside.



1. Transmission case breather

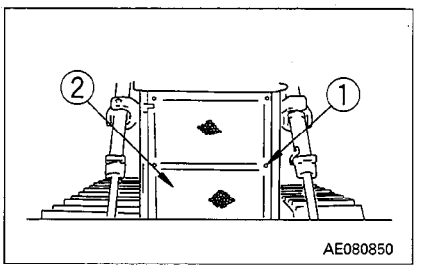


2. Steering clutch case breather



3. Final drive case breather (For D58E-1B only)

24.6.6 CLEAN, CHECK RADIATOR FINS



⚠ WARNING

If compressed air, steam, or water hit your body directly, there is danger of injury. Always wear protective glasses, mask, and safety boots.

1. Remove the bolts ① and open the radiator grill ②.
2. Blow with compressed air to remove any dirt or leaves that are clogging the radiator fins. Steam can be used instead of compressed air.
3. Check the rubber hoses, and if any cracks or deterioration are found, replace the hose. Check also for loose hose clamps.

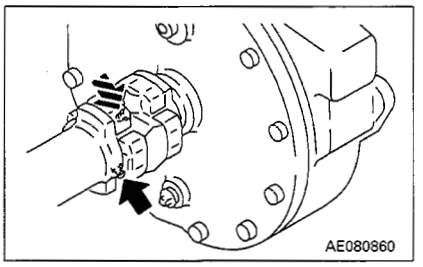
24.7 EVERY 1000 HOURS SERVICE

Maintenance for every 50, 250, and 500 hours should be carried out at the same time.

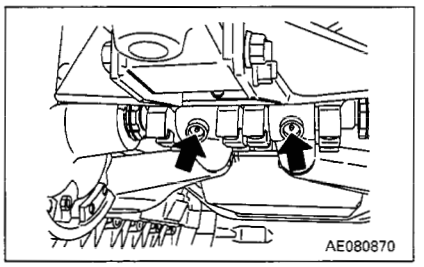
24.7.1 LUBRICATING

Add grease to the grease fittings marked by arrows.

1. Universal joint (2 points)



2. Diagonal brace (2 points)



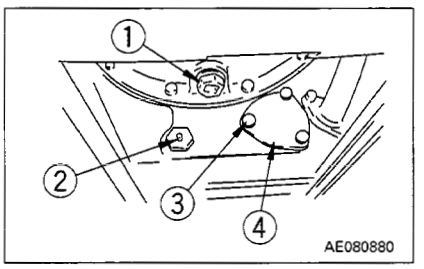
24.7.2 CHANGE OIL IN TRANSMISSION CASE (INCL. TORQUE CONVERTER CASE), CLEAN STRAINER

⚠ WARNING

The oil is at high temperature immediately after the machine has operated. Wait for the oil to cool down before starting the operation.

Prepare the following.

- Container to catch drained oil: Min. 34 ℓ (8.98 US gal, 7.48 UK gal) capacity
- Refill capacity: 34 ℓ (8.98 US gal, 7.48 UK gal)
- Socket wrench



1. Remove the cover at the bottom of the machine, and set the container to catch the oil under drain plugs ① and ②.

2. Remove drain plugs ① and ② slowly to avoid getting oil on yourself, and drain the oil. After draining the oil, tighten the drain plugs.

3. Remove bolt ③, then remove cover ④ and take out the strainer.

4. If the strainer is damaged, replace it with a new one.

5. Remove all dirt from the strainer, then wash in clean diesel oil or flushing oil. Clean the inside of the case and the plugs at the same time.

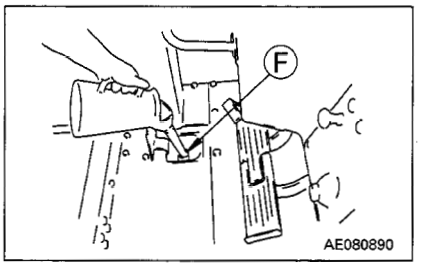
6. Install the strainer to its original position.

7. Replace the transmission oil filter. For details, see "24.6 EVERY 500 HOURS SERVICE".

8. Add engine oil through oil filler port Ⓕ to the specified level.

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

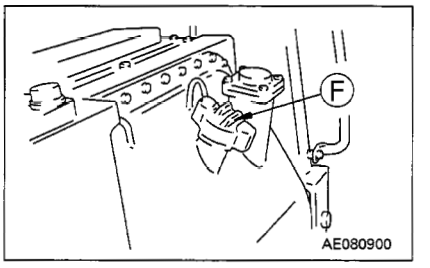
9. After adding the oil, check the oil level. For details, see "24.3 CHECK BEFORE STARTING".



24.7.3 REPLACE HYDRAULIC OIL FILTER ELEMENT

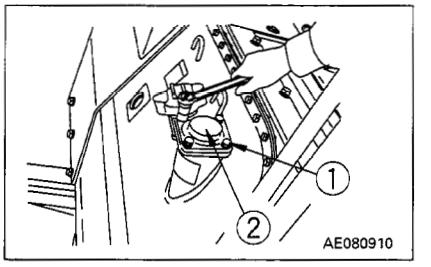
⚠ WARNING

The oil is at high temperature immediately after the machine has operated. Wait for the oil to cool down before changing the oil.
When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it carefully.

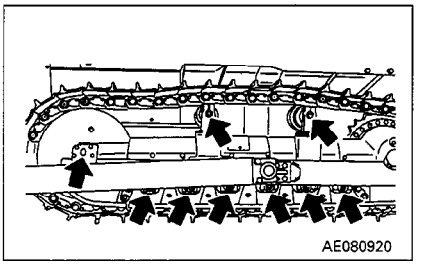


1. Lower the blade to the ground and stop the engine. Move the blade control lever to the front and rear (left and right), then turn the cap of oil filler port Ⓕ slowly to release the pressure before removing the cap.

2. Loosen bolt ①, remove cover ②, then take out the element. Clean the inside of the case and the removed parts, then install a new element.
   Always use a Komatsu genuine element.



24.7.4 CHECK OIL IN UNDERCARRIAGE COMPONENTS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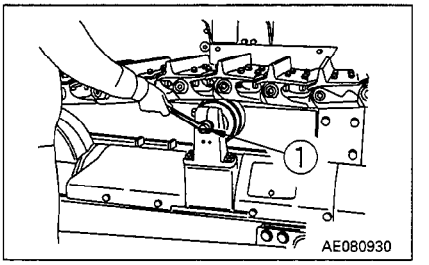
Do as follows to check if the oil level in the track rollers, carrier rollers, and idler has gone down.

1. Stop the machine on flat ground.
2. Loosen the seal bolt ① slowly and check if oil oozes out from the thread. If oil comes out, the oil level has not come down, so tighten the bolt immediately.
3. If no oil comes out even when the seal bolt ① is removed, the oil level is low, so please contact your Komatsu distributor for repair.

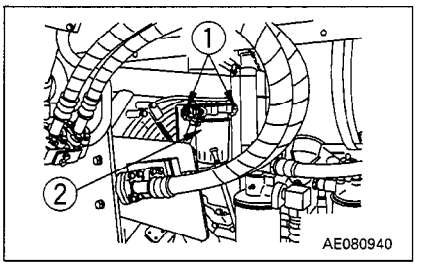


AE080930

24.7.5 REPLACE CORROSION RESISTOR CARTRIDGE

The replacement interval for the cartridge element is printed on the cartridge, so replace the cartridge at the specified interval.

1. Screw in valves ① (2 places) at the top of the corrosion resistor.
2. Using a filter wrench, turn cartridge ② counterclockwise to remove it.
3. Coat the seal surface of the new cartridge with oil, then install it to the filter holder.
4. When installing, bring the packing surface into contact with the seal surface of the filter holder, then tighten a further 2/3 turn.
5. Open valves ①.



AE080940

Always use a genuine Komatsu cartridge.

REMARK

After replacing the element, run the engine and check that there is no leakage of water from the filter seal surface.

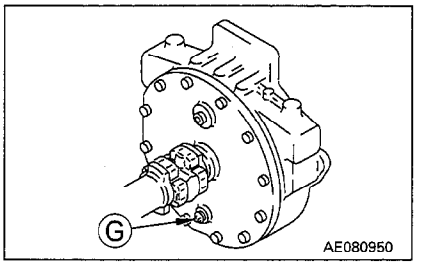
24.8 EVERY 2000 HOURS SERVICE

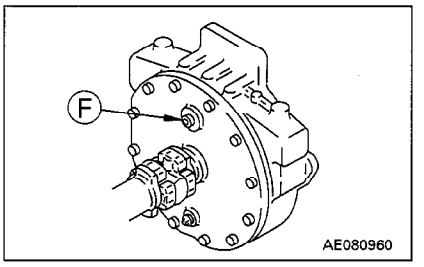
Maintenance for every 50, 250, 500, and 1000 hours should be carried out at the same time.

24.8.1 CHECK OIL LEVEL IN DAMPER CASE, ADD OIL

Remove plug Ⓖ, and check that the oil is near the bottom of the plug hole. If the oil level is low, add engine oil through oil filler port Ⓕ.

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





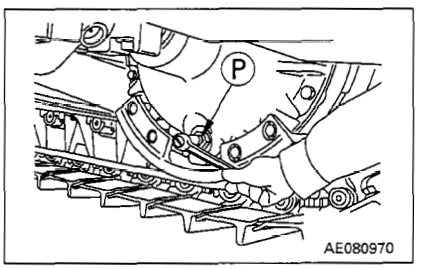
24.8.2 CHANGE OIL IN FINAL DRIVE CASE

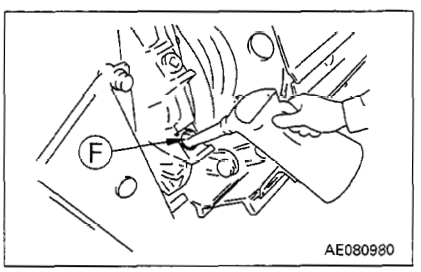
⚠ WARNING

The oil is at high temperature immediately after the machine has been operated. Wait for the oil to cool down before starting the operation.

Prepare the followings.
- Container to catch drained oil: Min 15 ℓ (3.96 US gal, 3.30 UK gal)
- Refill capacity:
  D58E-1, 1A 13 ℓ (3.43 US gal, 2.86 UK gal)
  D58E-1B 14 ℓ (3.70 US gal, 3.08 UK gal)
  D58P-1 14.5 ℓ (3.83 US gal, 3.19 UK gal)
- Socket wrench

1. Set a container to catch the oil under drain plug Ⓟ.
2. Remove drain plug Ⓟ and drain the oil.
   After draining the oil, tighten drain plug Ⓟ.
3. Refill the specified quantity of engine oil through oil filler Ⓕ.
   For details of the oil to use, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".
4. Check that the oil is at the specified level.
   For details, see "24.5 EVERY 250 HOURS SERVICE".





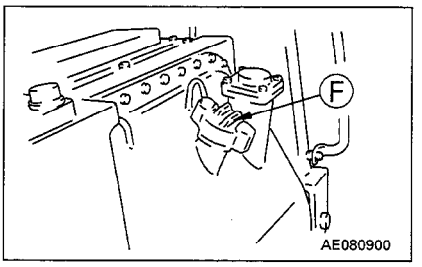
24.8.3 CHANGE OIL IN HYDRAULIC TANK

⚠ WARNING

The oil is at high temperature immediately after the machine has been operated. Wait for the oil to cool down before changing it.
When removing the oil filler cap, turn it slowly to release the internal pressure, then remove the cap carefully.

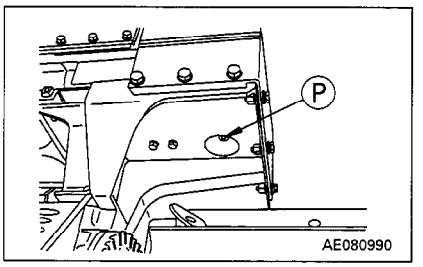
- Oil container: Min. 65 ℓ (17.17 US gal, 14.30 UK gal)
- Refill capacity: 65 ℓ (17.17 US gal, 14.30 UK gal)
- Prepare a socket wrench and filter wrench.

1. Lower the blade to the ground and stop the engine. Move the blade control lever to the front and rear (left and right), then turn the cap of oil filler port Ⓕ slowly to release the internal pressure, and remove the cap.



2. Place a container to catch the oil under drain plug Ⓟ at the bottom of the tank.

3. Remove drain plug Ⓟ and drain the oil. After draining the oil, tighten drain plug Ⓟ.



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

4. Add engine oil through oil filler Ⓕ to the specified level.
For details of the oil to use, see "20. USE OF FUEL, COOLANT, AND LUBRICANT ACCORDING TO AMBIENT TEMPERATURE".

5. After adding oil, check that the oil is at the specified level.
For details, see "24.5 EVERY 250 HOURS SERVICE".

24.8.4 CHANGE OIL IN STEERING CLUTCH CASE (INCL. BEVEL GEAR CASE)

⚠ WARNING

The oil is at high temperature immediately after the machine has been operated. Wait for the oil to cool down before starting the operation.

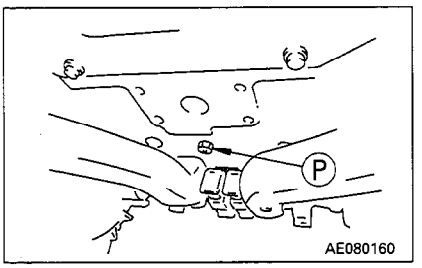
Prepare the followings.
- Container to catch drained oil: Min 58 ℓ (15.32 US gal, 12.76 UK gal)
- Refill capacity: 58 ℓ (15.32 US gal, 12.76 UK gal)
- Socket wrench

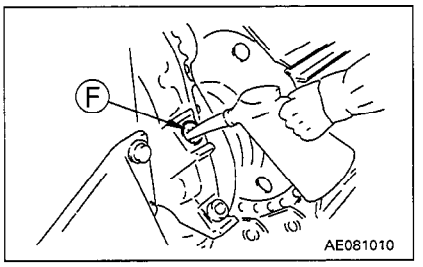
1. Set a container to catch the oil under drain plug Ⓟ at the bottom of the machine.

2. Remove drain plug Ⓟ slowly to avoid getting oil on yourself, and drain the oil.
   After draining the oil, tighten drain plug Ⓟ.

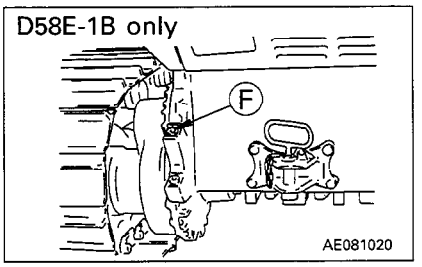
3. Refill the specified quantity of engine oil through oil filler Ⓕ.
   For details of the oil to use, see "20. USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE".

4. Check that the oil is at the specified level.
   For details, see "24.3 CHECK BEFORE STARTING".

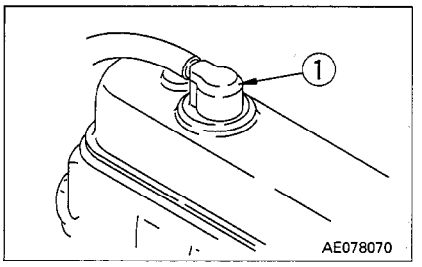




D58E-1B only



24.8.5 CLEAN ENGINE BREATHER ELEMENT



1. Loosen the clamp and remove the hose, then remove breather ① from the cylinder head cover.

2. Rinse whole breather ① in diesel oil or flushing oil, then blow with compressed air to dry, and install again.

3. Check the breather hose, and if there is any deteriorated oil (sludge) stuck to the inside, replace with a new hose.

Wipe off all dirt from the surrounding area before removing the breather.

Check the O-ring and replace with a new one if necessary.

24.8.6 CHECK ALTERNATOR, STARTING MOTOR

The brushes may be worn or the bearings may have run out of grease, so please contact your Komatsu distributor for inspection and repair.

If the engine is started frequently, ask your Komatsu distributor to carry out this check every 1000 hours.

24.8.7 CHECK VIBRATION DAMPER (RUBBER)

Check the outside surface of the rubber for cracks or peeling. If any cracks or peeling are found, please contact your Komatsu distributor for replacement of the rubber.

24.8.8 CHECK, ADJUST ENGINE VALVE CLEARANCE

Please contact your Komatsu distributor.

24.9 EVERY 4000 HOURS SERVICE

Maintenance for every 50, 250, 500, 1000 and 2000 hours should be carried out at the same time.

24.9.1 CHECK WATER PUMP

Check that there is no play in the pulley, water leakage, or clogging of the drain hole. If any abnormality is found, contact your Komatsu distributor for disassembly and repair or replacement.

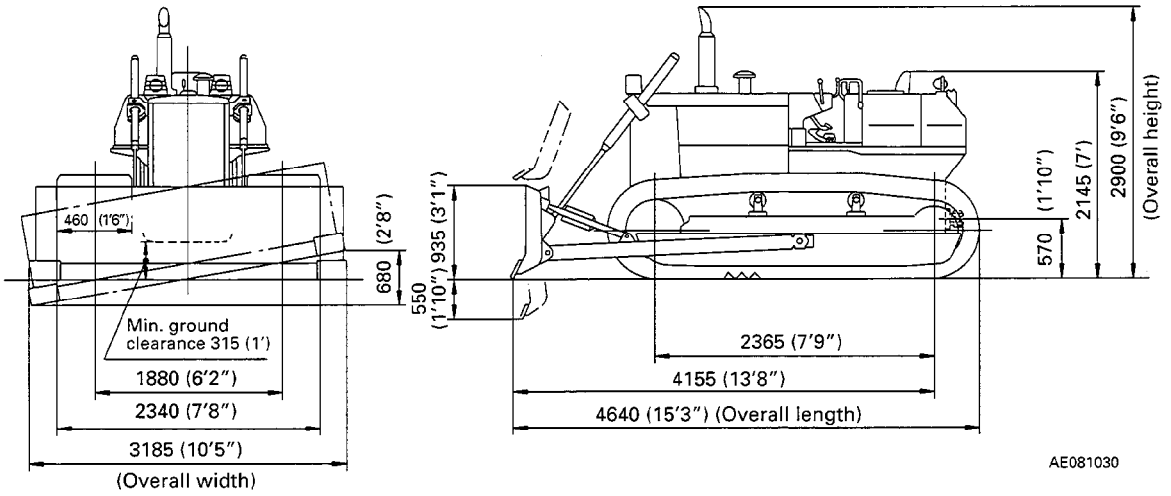
SPECIFICATIONS

25. SPECIFICATIONS

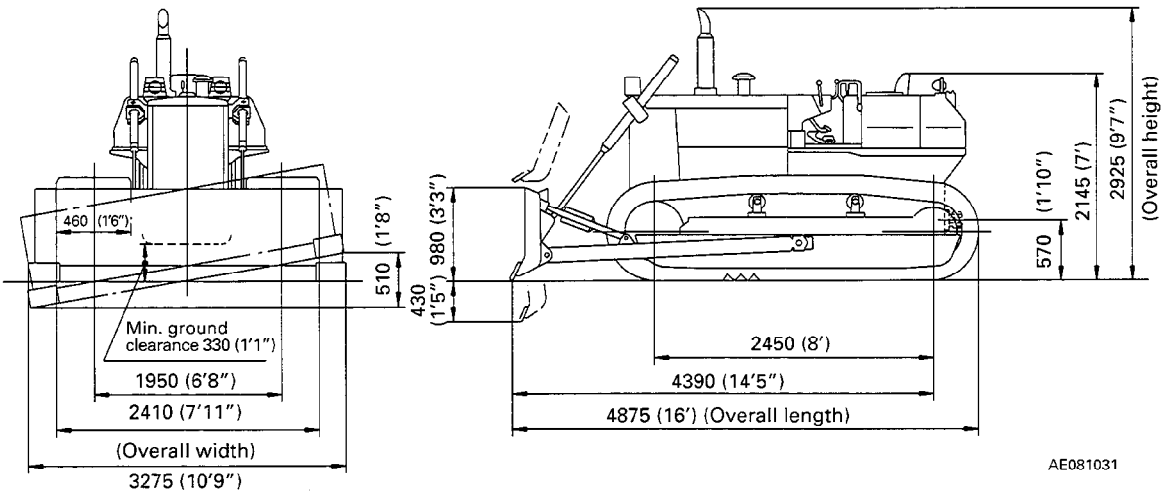
D58E-1, 1A, 1B
D58P-1, 1B

			D58E-1, 1A	D58E-1B	D58P-1	D58P-1B
WEIGHT						
• Operating weight (without operator)			12800 kg (28220 lb)	14200 kg (31310 lb)	14630 kg (32260 lb)	15990 kg (35260 lb)
BLADE						
• Equipment weight (incl. cylinder)			1620 kg (3570 lb)	2360 kg (5200 lb)	1660 kg (3660 lb)	2600 kg (5730 lb)
PERFORMANCE						
• Travel speed	Forward	1st	3.2 km/h (2.0 MPH)		2.9 km/h (1.8 MPH)	
		2nd	5.9 km/h (3.7 MPH)		5.3 km/h (3.3 MPH)	
		3rd	9.8 km/h (6.1 MPH)		8.6 km/h (5.3 MPH)	
	Reverse	1st	3.9 km/h (2.4 MPH)		3.5 km/h (2.2 MPH)	
		2nd	7.1 km/h (4.4 MPH)		6.4 km/h (4.0 MPH)	
		3rd	11.9 km/h (7.4 MPH)		10.2 km/h (6.3 MPH)	
• Maximum drawbar pull						
• Ground pressure			0.59 kg/cm² (8.39 lb/in²)	0.63 kg/cm² (8.96 lb/in²)	0.28 kg/cm² (3.98 lb/in²)	0.30 kg/cm² (4.27 lb/in²)
ENGINE						
• Model			Komatsu 6D125-1 diesel engine			
• Flywheel horsepower			129 HP (132 PS)/1900 rpm			
• Max. torque			628 Nm (64 kgm)/1300 rpm			
• Starting motor			24 V 7.5 kW			
• Alternator			24 V 13 A			
• Battery			12 V 150 Ah x 2 pieces			

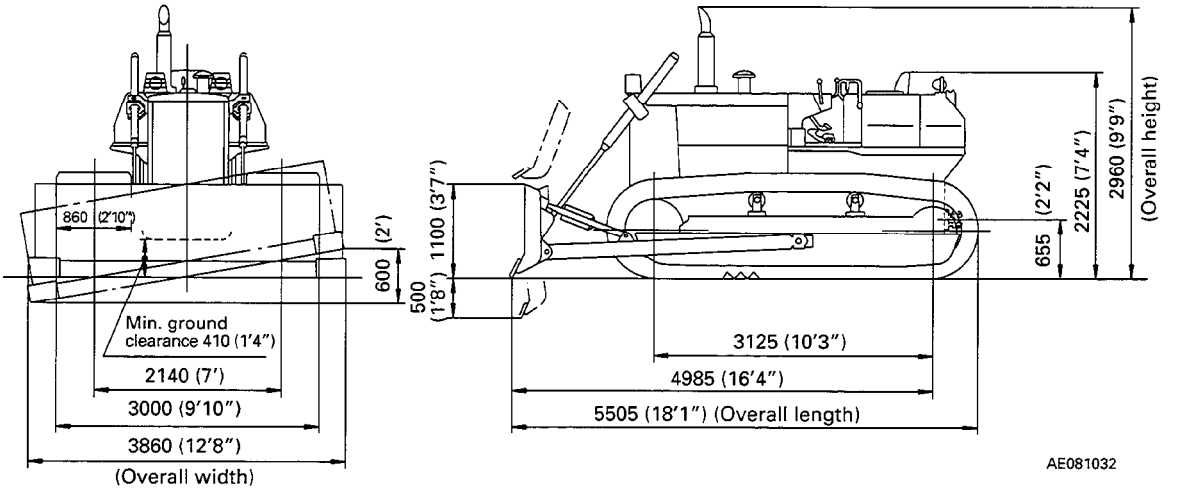
D58E-1, 1A



D58E-1B



D58P-1



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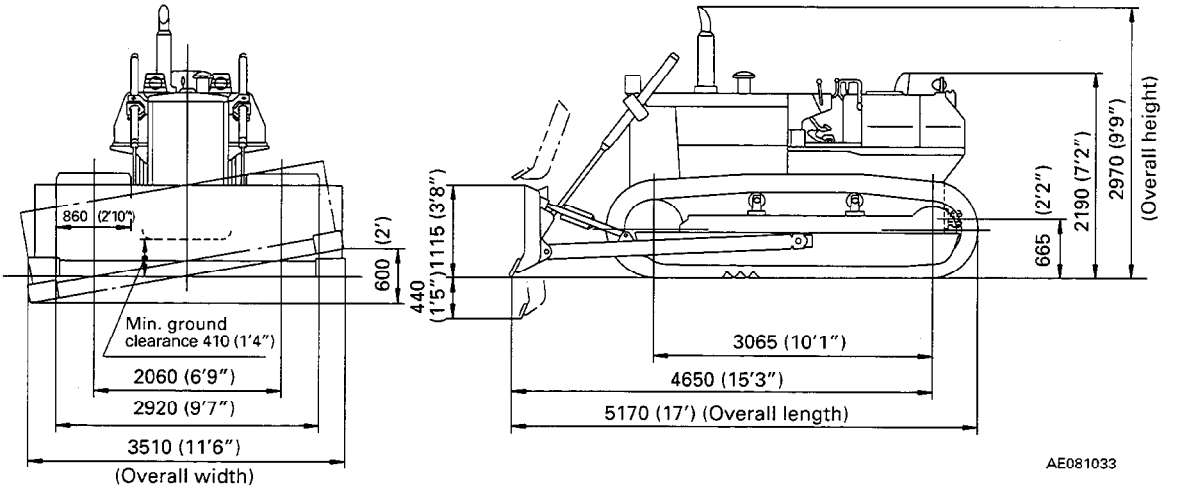


OPTIONS, ATTACHMENTS

26. GENERAL PRECAUTIONS

26.1 PRECAUTIONS RELATED TO SAFETY

If attachments or options other than those authorized by Komatsu are installed, this will not only affect the life of the machine, but will also cause problems with safety.
When installing attachments not listed in this Operation and Maintenance Manual, please contact your Komatsu distributor first.

If you do not contact Komatsu, we cannot accept any responsibility for any accident or failure.

⚠ WARNING

Precautions for removal and installation operations

- **When removing or installing attachments, obey the following precautions and take care to ensure safety during the operation.**
- **Carry out the removal and installation operations on a flat, firm ground surface.**
- **When the operation is carried out by two or more workers, determine signals and follow these during the operation.**
- **When carrying heavy objects (more than 25 kg (55.1 lb)), use a crane.**
- **When removing heavy parts, always support the part before removing it.**
  When lifting such heavy parts with a crane, always pay careful attention to the position of the center of gravity.
- **It is dangerous to carry out operations with the load kept suspended. Always set the load on a stand, and check that it is safe.**
- **When removing or installing attachments, make sure that they are in a stable condition and will not fall over.**
- **Never go under a load suspended from a crane.**
  Always stand in a position that is safe even if the load should fall.

NOTICE

Qualifications are required to operate a crane. Never allow the crane to be operated by an unqualified person.

For details of the removal and installation operations, please contact your Komatsu distributor.

27. USING SEAT BELT

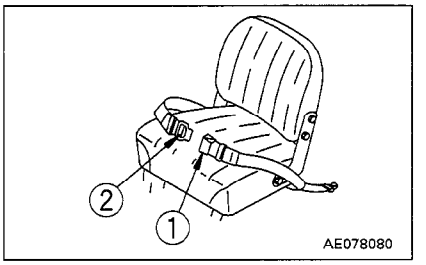
27.1 SEAT BELT (For fixed type)

When operating a machine equipped with ROPS, be sure to use the seat belt.

⚠ WARNING

- **Before fastening the seat belt, inspect the securing brackets and belt for abnormal conditions.**
  Replace any worn or damaged seat belt or the securing brackets.
- **Adjust and fasten the seat belt before operating the machine.**
- **Always use seat belt when operating the machine.**
- **Do not use seat belt with either half of the belt kinked.**

27.1.1 FASTEN THE BELT AND REMOVE IT IN THE FOLLOWING MANNER

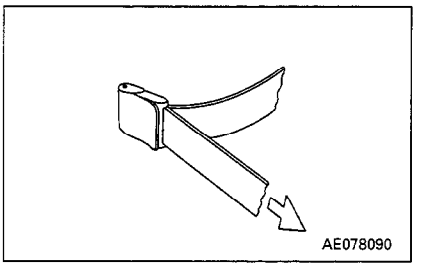


1. Adjust the seat so that the brake pedal can be depressed all the way with the operator's back against the backrest.

2. After positioning the seat, sit in the seat. Hold buckle ① with your left hand and tongue ② with our right hand, put the tongue into buckle ①. Check that the belt has locked by pulling it.

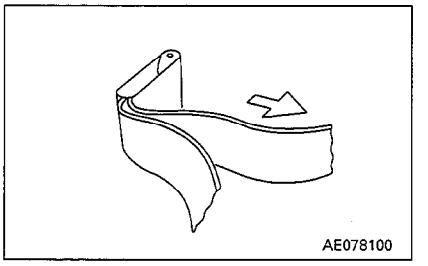
3. When removing the belt, raise the tip of the buckle lever to release it.
   Fasten belt along your body without kinking it. Adjust the lengths of the belt on both the buckle and the tongue sides so that the buckle is located at the mid-point of your body front.

27.1.2 ADJUST THE BELT LENGTH IN THE FOLLOWING MANNER


AE078090

To shorten the belt

Pull the free end of the belt on either the buckle body or tongue side.


AE078100

To lengthen the belt

Pull the belt while holding it at a right angle to buckle or tongue.

Inspect bolts and fittings on the chassis for tightness. Retighten any loose bolts to 19.6 to 29.4 Nm (2 to 3 kgm, 14.5 to 21.7 lbft) torque.

If the seat is scratched or frayed or if any of the fittings are broken or deformed from long service, replace the seat belt immediately.

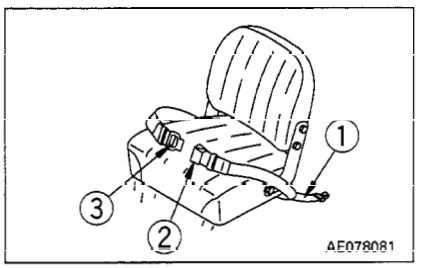
27.2 SEAT BELT (For suspension type)

When operating a machine equipped with ROPS, be sure to use the seat belt.

⚠ WARNING

- **Before fastening the seat belt, inspect the securing brackets and belt for abnormal conditions.**
  Replace any worn or damaged seat belt or the securing brackets.
- **Adjust and fasten the seat belt before operating the machine.**
- **Always use seat belt when operating the machine.**
- **Do not use seat belt with either half of the belt kinked.**
- **Check that there are not kinks in the tether belt.**

27.2.1 FASTEN THE BELT AND REMOVE IT IN THE FOLLOWING MANNER



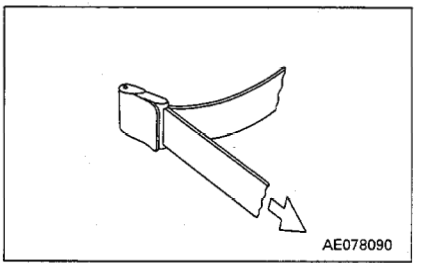
1. Adjust the seat so that the brake pedal can be depressed all the way with the operator's back against the backrest.

2. After positioning the seat, adjust the tether belt ①. With the seat unoccupied, tense the belt slightly across the seat and install.

3. Sit in the seat. Hold buckle ② with your left hand and tongue ③ with your right hand, put the tongue into the buckle. Check that the belt has locked by pulling it.

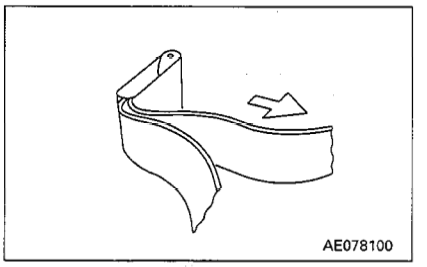
4. When removing the belt, raise the tip of the buckle lever to release it.
   Fasten belt along your body without kinking it. Adjust the lengths of the belt on both the buckle and the tongue sides so that the buckle is located at the mid-point of your body front.

27.2.2 ADJUST THE BELT LENGTH IN THE FOLLOWING MANNER


AE078090

To shorten the belt

Pull the free end of the belt on either the buckle body or tongue side.


AE078100

To lengthen the belt

Pull the belt while holding it at a right angle to buckle or tongue.

Inspect bolts and fittings on the chassis for tightness. Retighten any loose bolts to 19.6 to 29.4 Nm (2 to 3 kgm, 14.5 to 21.7 lbft) torque.

If the seat is scratched or frayed or if any of the fittings are broken or deformed from long service, replace the seat belt immediately.

28. HANDLING SUSPENSION SEAT

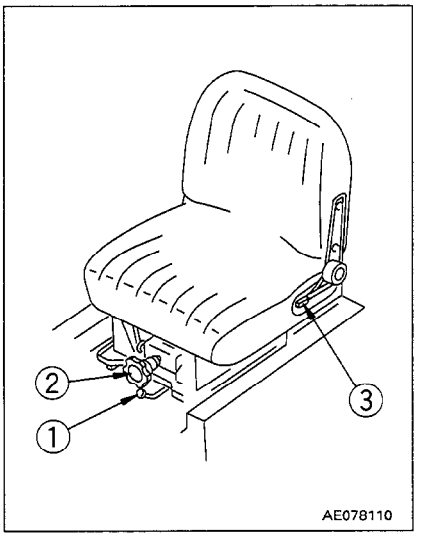
⚠ WARNING

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

- Fore-aft adjustment of seat
  Move lever ① to the left set the seat to position where it is easy to operate, then release the lever.
  Fore-aft adjustment: 160 mm (6.30 in) (9 stages)

- Adjusting seat cushion
  Turn knob ② to the desired direction to adjust the riding condition.

- Adjusting reclining angle
  Pull lever ③, set the seatback to a position where it is easy to operate, then release the lever.



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PROPOSAL FOR MANUAL REVISION

FOR INTERNAL USE ONLY -- No. PMR

PROPOSER		
	NAME OF COMPANY:	LOCATION: PHONE NO:
	DEPARTMENT:	DATE:
	NAME:	

MANUAL NAME:

MANUAL NO:

MACHINE MODEL:
S/N IF APPLICABLE:

PAGE NO:

PROBLEM:

Attach photo or sketch.
If more space is needed, use another sheet.

FOR INTERNAL USE ONLY

CORRECTIVE ACTION: