TEN00132-05

Operation & Maintenance Manual

BULLDOZER

D475A-5E0

SERIAL NUMBERS 30001 and up

⚠ WARNING

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

NOTICE

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

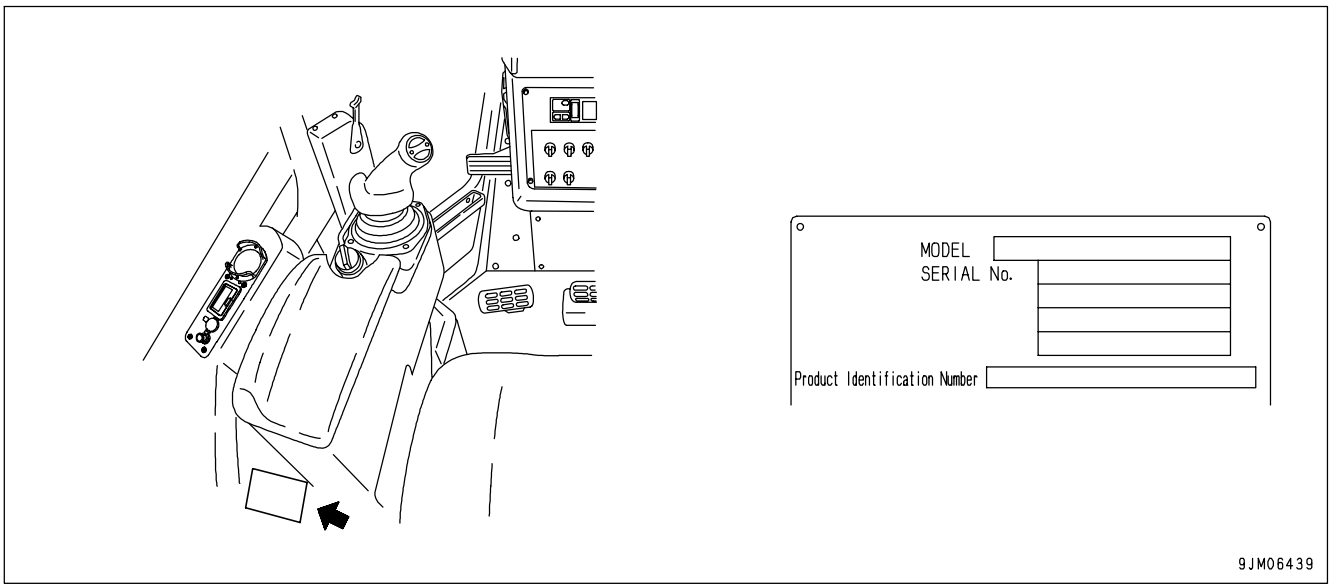
KOMATSU

NECESSARY INFORMATION

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

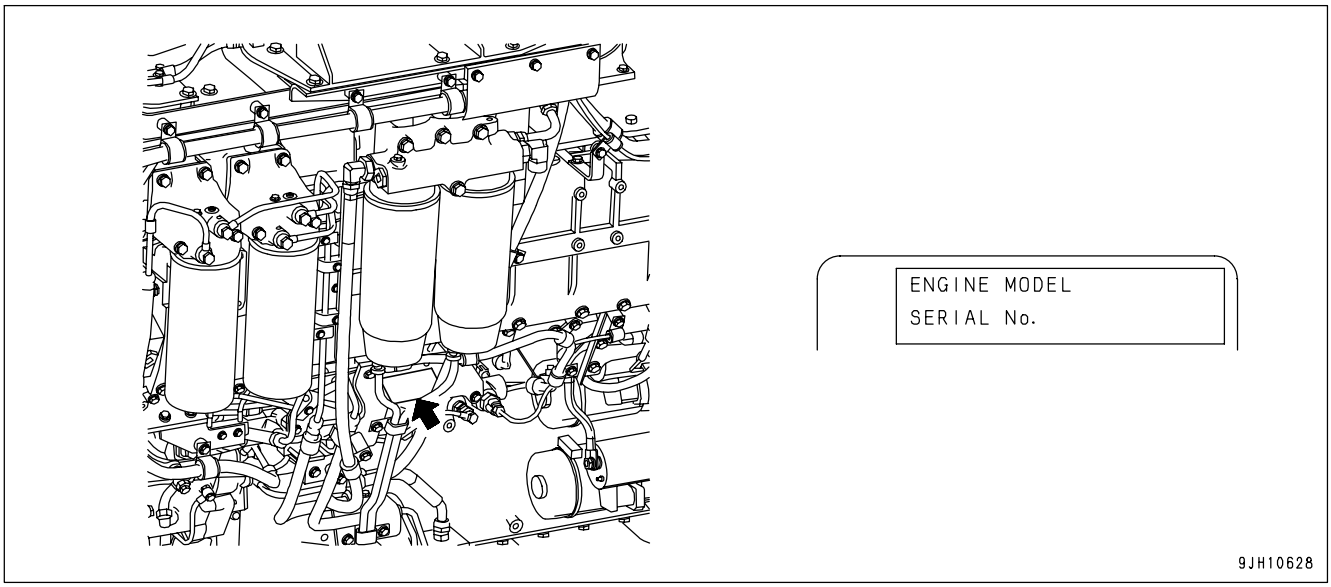
PRODUCT IDENTIFICATION NUMBER (PIN), MACHINE SERIAL NO. PLATE

This is inside the console box on the left side of the operator's seat.
The design of the nameplate differs according to the territory.



EPA REGULATIONS, ENGINE NUMBER PLATE

The normal nameplate and the EPA nameplate are on the common rail cover at the bottom of the fuel pre-filter on the left side of the engine.



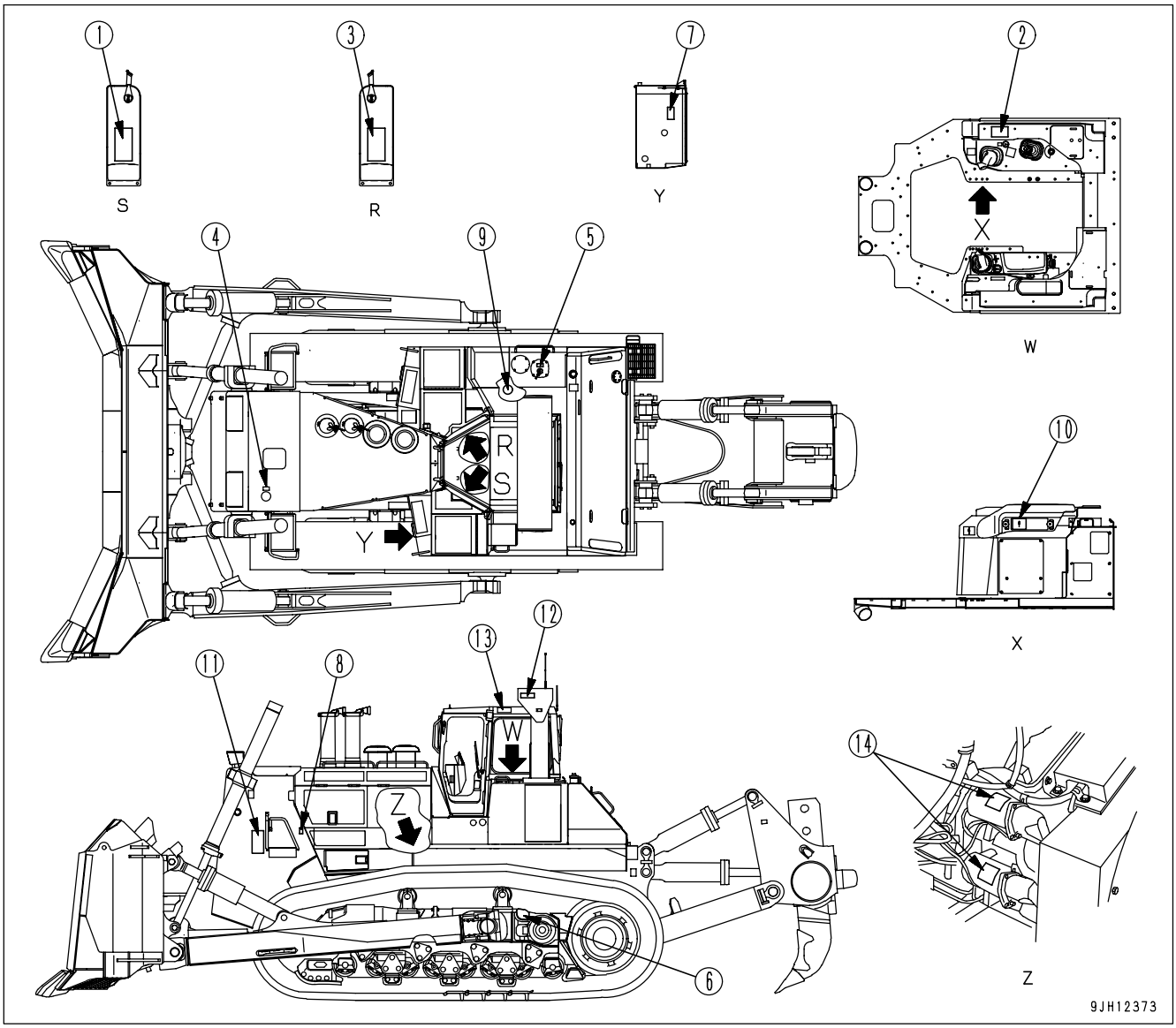
EPA: Environmental Protection Agency, U.S.A.

SAFETY LABELS

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

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

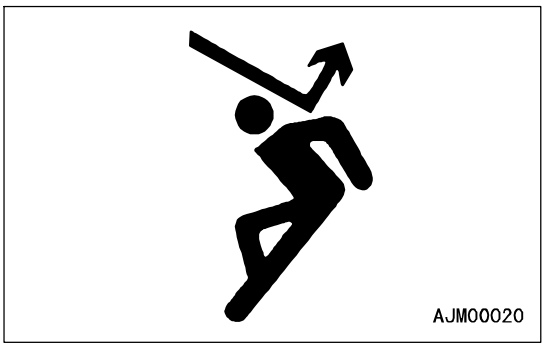
POSITIONS OF SAFETY PICTOGRAMS



ACTION IF FIRE OCCURS
If a fire occurs, escape from the machine as follows.
- Turn the start switch OFF to stop the engine.
- Use the handrails and steps to get off the machine.

WINDOW WASHER LIQUID
Use an ethyl alcohol base washer liquid.
Methyl alcohol base washer liquid may irritate your eyes, so do not use it.

PRECAUTIONS WHEN USING ROPS (Roll Over Protective Structure)
Install ROPS when working in places where there is danger of falling rocks, such as in mines and quarries, or in places where there is danger of rolling over.
- If ROPS is installed, do not remove it when operating the machine.
- ROPS is installed to protect the operator when machine rolls over. When machine rolls over, ROPS supports its weight and absorbs its impact energy.



- If ROPS is modified, its strength may lower. When modifying it, consult your Komatsu distributor.
- If ROPS is deformed by falling objects or by rolling over, its strength lowers and its design functions cannot be maintained. In this case, be sure to ask your Komatsu distributor about repair method.

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

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

CAB WINDOW GLASSES
If the cab glass on the work equipment side is broken, there is a hazard that the work equipment may contact the operator's body directly. Stop operation immediately and replace the glass.

UNAUTHORIZED MODIFICATION
If this machine is modified without permission from Komatsu, there is danger that problems may occur with safety and that this may lead to serious personal injury. Modifications may have an adverse effect on items such as machine strength and visibility. Before making any modifications, please consult your Komatsu distributor. Komatsu cannot take any responsibility for accidents, failures, or damage caused by modifications not authorized by Komatsu.

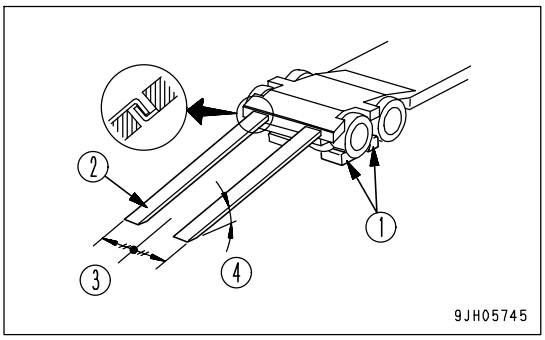
TRANSPORTATION

The machine can be divided into parts for transportation, so when transportating the machine, please contact your Komatsu distributor to have the work carried out.

LOADING AND UNLOADING

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

- Perform loading and unloading on firm, level ground only. Maintain a safe distance from the edge of the road or cliff.
- Never use the work equipment to load or unload the machine. There is danger that the machine may fall or tip over.
- Always use ramps of adequate strength. Be sure that the ramps are wide, long, and thick enough to provide a safe loading slope. Take suitable steps to prevent the ramps from moving out of position or coming off.



(1)Blocks
(2)Ramp
(3)Centerline of trailer
(4)Angle of ramps: Max. 15°

- Be sure the ramp surface is clean and free of grease, oil, ice and loose materials. Remove dirt from machine-tracks. On a rainy day, in particular, be extremely careful since the ramp surface is slippery.
- Run the engine at low speed and travel slowly.
- When on the ramps, do not operate any lever except for the travel lever.
- Never correct your steering on the ramps. If necessary, drive off the ramps, correct the direction, then enter the ramps again.
- The center of gravity of the machine will change suddenly at the joint between the ramps and the track or trailer, and there is danger of the machine losing its balance. Travel slowly over this point.
- When loading or unloading to an embankment or platform, make sure that it has suitable width, strength, and grade.
- For machines equipped with a cab, always lock the door after boarding the machine. If this is not done, the door may suddenly open during transportation.
  Refer to "TRANSPORTATION (PAGE 3-156)".

SHIPPING

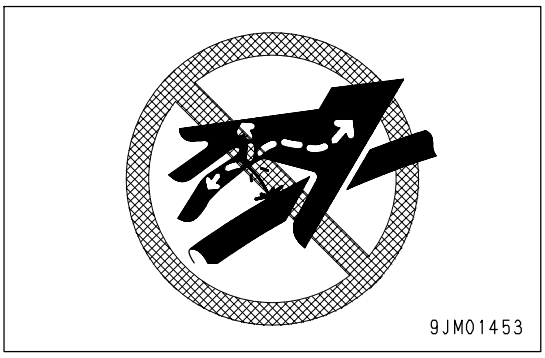
When shipping the machine on a trailer, do as follows.

- The weight, transportation height, and overall length of the machine differ according to the work equipment, so be sure to confirm the dimensions.
- When passing over bridges or structures on private land, check first that the structure is strong enough to support the weight of the machine. When traveling on public roads, check first with the relevant authorities and follow their instructions.
- For details of the shipping procedure, see "TRANSPORTATION (PAGE 3-156)" in the OPERATION section.

PRECAUTION WITH HIGH-PRESSURE OIL

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

- Release the pressure in the hydraulic circuit. For details, see "METHOD OF RELEASING PRESSURE IN HYDRAULIC CIRCUIT (PAGE 4-85)". Do not carry out any inspection or replacement work when the hydraulic system is under pressure.
- If there is any leakage from the piping or hoses, the surrounding area will be wet, so check for cracks in the piping and hoses and for swelling in the hoses.
  When carry out inspection, wear safety glasses and leather gloves.
- There is a hazard that high-pressure oil leaking from small holes may penetrate your skin or cause blindness if it contacts your eyes directly. If you are hit by a jet of high-pressure oil and suffer injury to your skin or eyes, wash the place with clean water, and consult a doctor immediately for medical attention.



PRECAUTION FOR HIGH FUEL PRESSURE

High pressure is generated inside the fuel piping while the engine is running. Therefore, when carrying out an inspection and maintenance of the fuel piping and other engine-related parts, wait for more than 30 seconds after the engine stops and before proceeding to the inspection and maintenance work in order to allow the engine internal pressure to go down.

HANDLING HIGH-PRESSURE HOSES

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

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

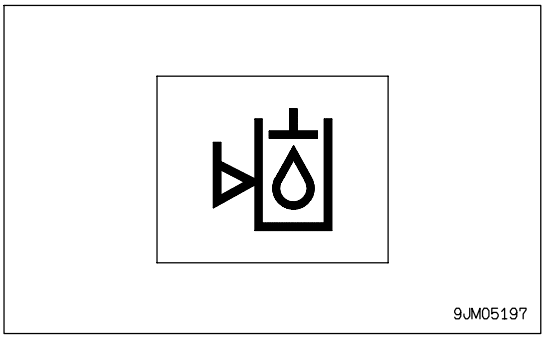
- Damaged or leaking hydraulic fitting.
- Frayed or cut covering or exposed reinforcement wire layer.
- Covering swollen in places.
- Twisted or crushed movable portion.
- Foreign material embedded in covering.

HYDRAULIC OIL LEVEL CAUTION LAMP

(if equipped)

This lamp (5) warns the operator that the level of the hydraulic oil in the hydraulic tank has gone down.

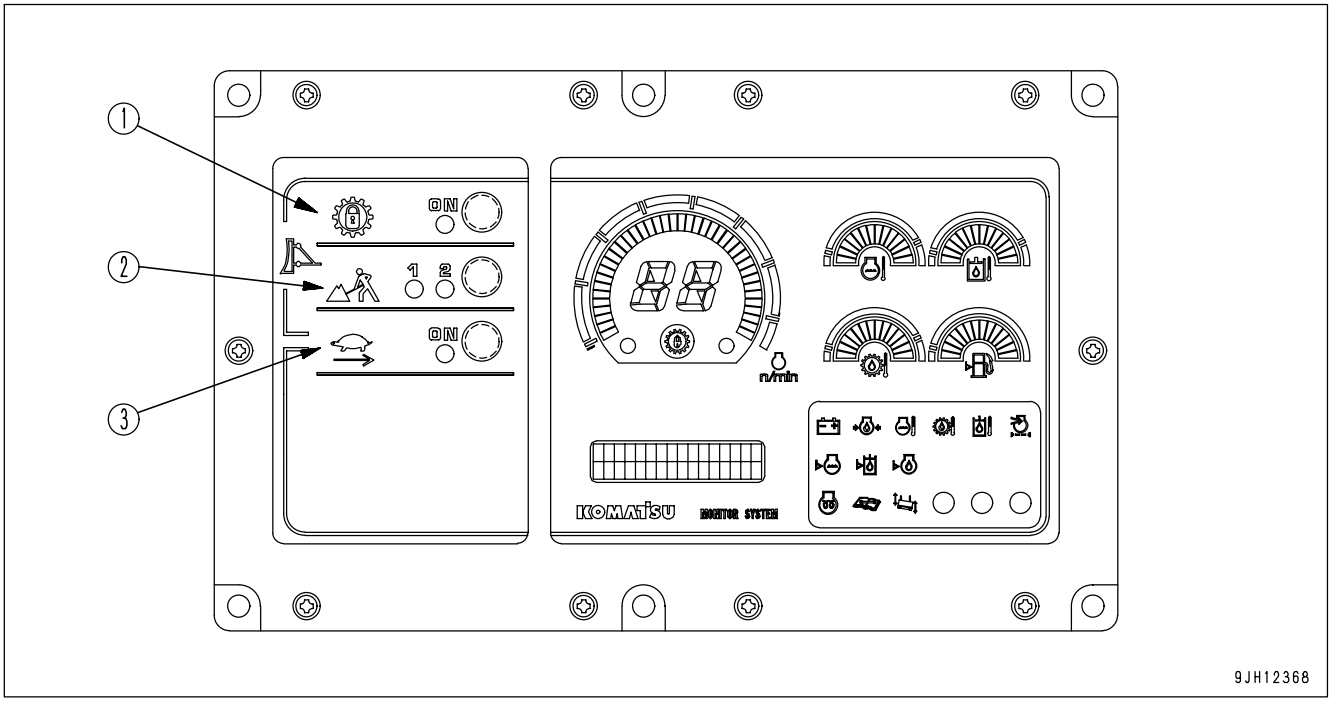
If the lamp flashes, check the level of the hydraulic oil in the hydraulic tank, and add oil.



MODE SELECTION SWITCH GROUP

- Press each mode switch to turn it ON or OFF and to select the mode.
- For details of setting the mode to use, see "EFFECTIVE USE OF MODE SELECTION SYSTEM (PAGE 3-138)".

- Only the reverse slow mode can be selected in combination with the lock-up mode.
- The economy mode, and reverse slow mode can be used independently or in combination.



(1) Lock up mode switch
(2) Economy mode switch
(3) Reverse slow mode selector switch

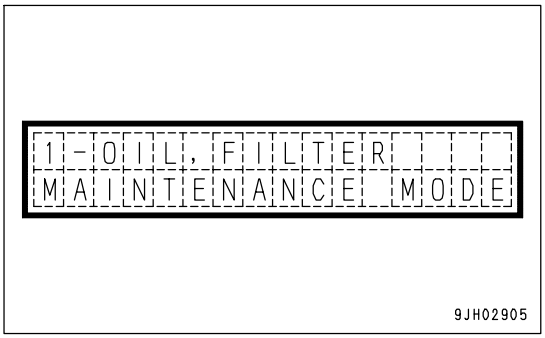
Selecting mode to match the type of work and quality of rock and soil makes to perform operations effectively.

Dozing		Reverse slow mode
Lock up mode	Economy mode	
○	×	○
×	○	○

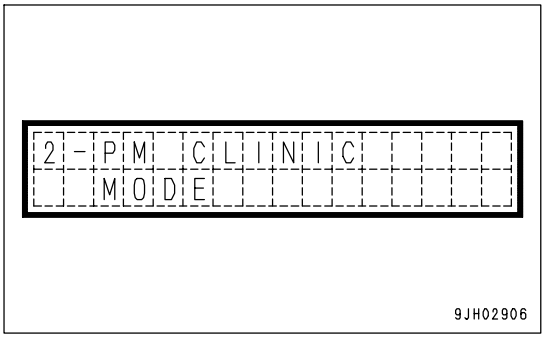
○: Possible to use ×: Compound use not possible

METHOD OF SELECTING MODES

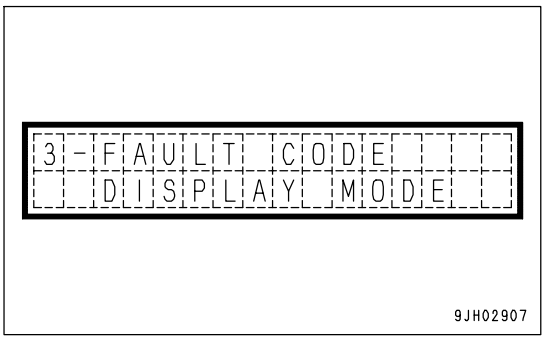
1. When moving from the normal operation display to a user mode, the maintenance mode is displayed. Use the controls to change the mode as follows.
   > position: Go to PM clinic auxiliary mode
   < position: Go to user adjust mode
   ☐ position: Go to normal operation screen
   ◇ position: Go to maintenance mode selection screen.



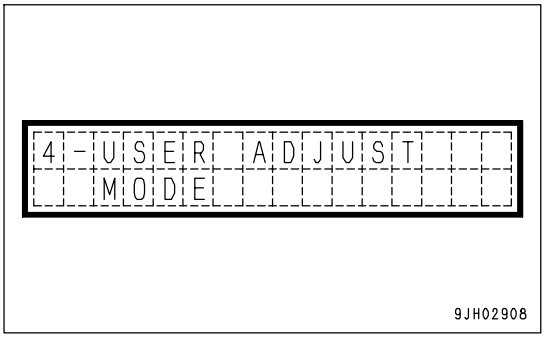
2. The diagram on the right shows the screen display for the PM clinic auxiliary mode. Use the controls to change the mode as follows.
   > position: Go to fault code display mode
   < position: Go to maintenance mode
   ☐ position: Go to normal operation screen
   ◇ position: Go to PM clinic auxiliary mode selection item screen



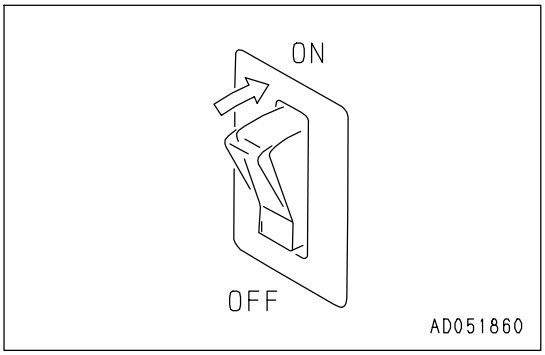
3. The diagram on the right shows the screen display for the fault code display mode. Use the controls to change the mode as follows.
   > position: Go to adjustment mode
   < position: Go to PM clinic auxiliary mode
   ☐ position: Go to normal operation screen
   ◇ position: Go to fault code selection item screen



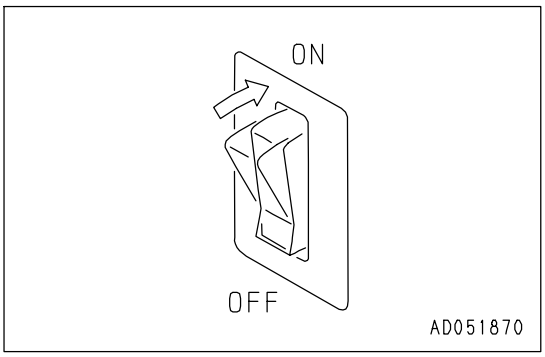
4. The diagram on the right shows the screen display for the user adjust mode. Use the controls to change the mode as follows.
   > position: Go to maintenance mode
   < position: Go to fault code display mode
   ☐ position: Go to normal operation screen
   ◇ position: Go to user adjust mode selection item screen



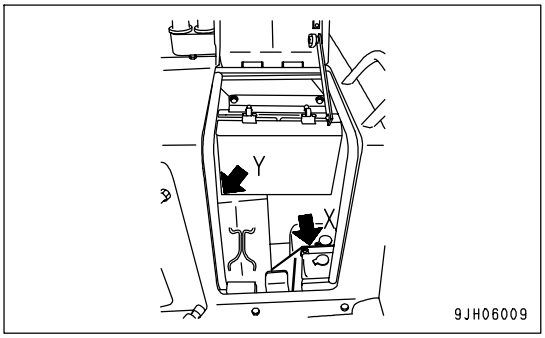
- Wiper only
  If this is switched on, the wiper will start.



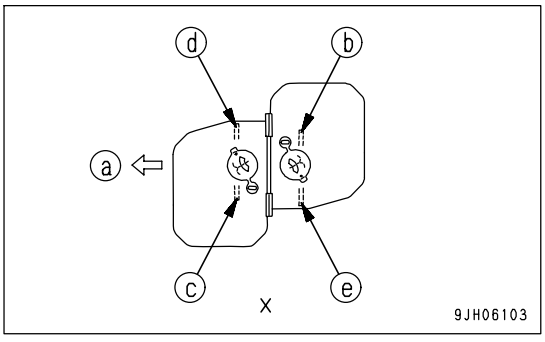
- Wiper and window washer
  If this is kept pressed to the ON position while the wiper is working, water will be sprayed out.



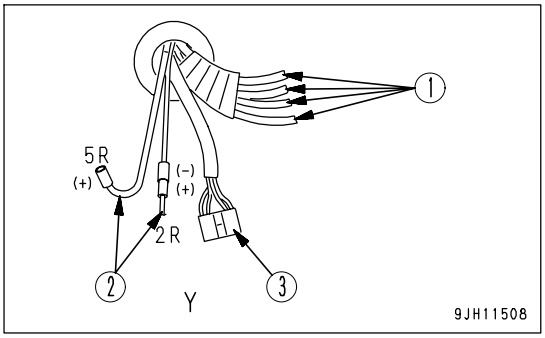
REMARK
When installing the cab, check the colors of the washer tank and window washer hoses, and be sure to connect correctly.



(a) Front of machine
(b) Front (no color)
(c) Rear (black)
(d) Left side (blue)
(e) Right side (red)



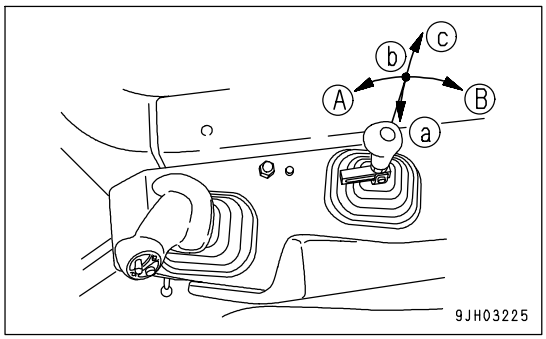
(1)	Washer tube	Red-Right door Blue-Left door Black-Rear window Colorless-Front window
(2)	Power source of cab	5R-ACC power source of cab 2R-Back up power source
(3)	4-pin socket	For washer motor



RIPPER CONTROL LEVER

(For variable ripper)

Lever (8) is used to operate the ripper.

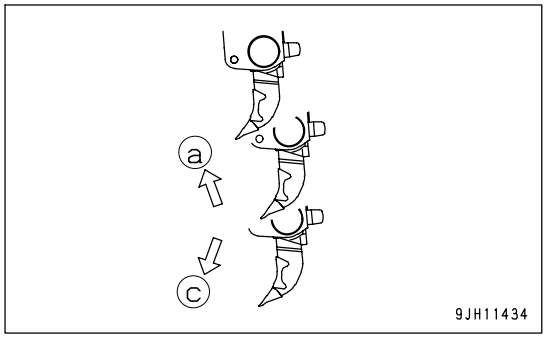


• Lifting control

(a) RAISE

(b) HOLD: Ripper is stopped and held in the same position.

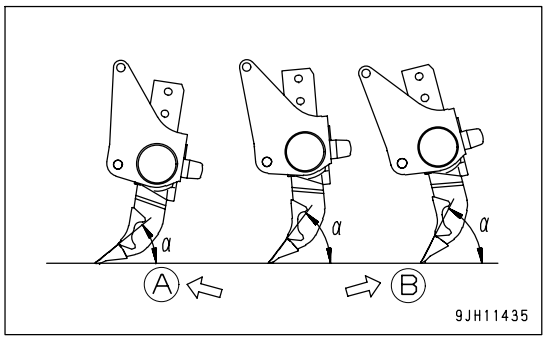
(c) LOWER



• Tilting control

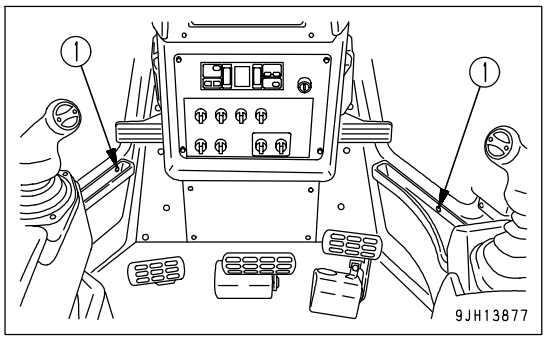
(A) Digging angle reduced: Cutting angle (α) becomes smaller.

(B) Digging angle increased: Cutting angle (α) becomes larger.



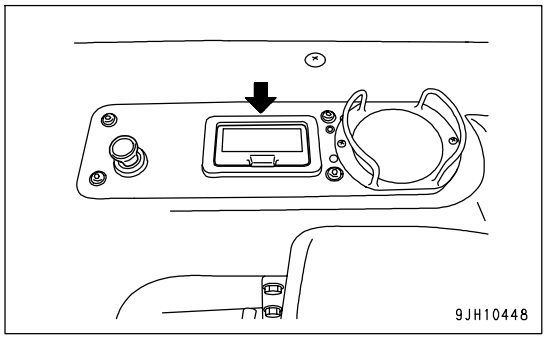
DOOR POCKET

This is inside the left and right doors. Use it for keeping things.
Do not put the heavy tools or other heavy objects in it.
If the pocket is dirty, loosen three bolts (1), then remove the pocket and rinse it.



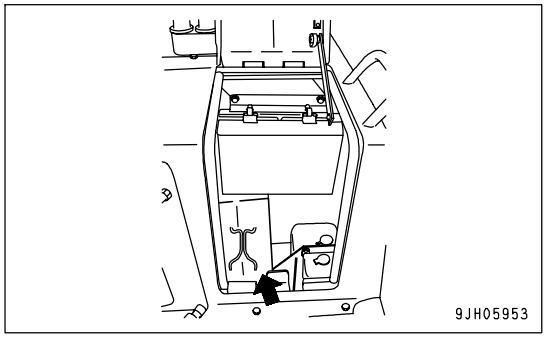
ASHTRAY

This is on the left side of the operator's seat.
Always make sure that you extinguish the cigarette before closing the lid.



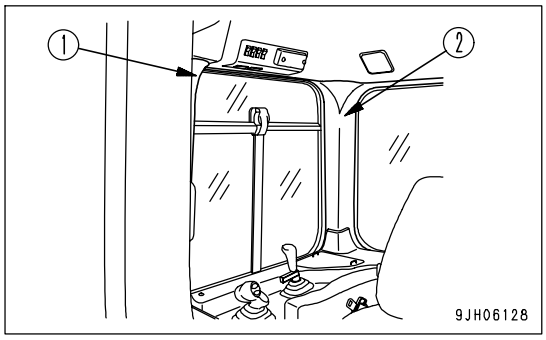
TOOL BOX

This is inside the front of the right fender.
It is used for storing tools.

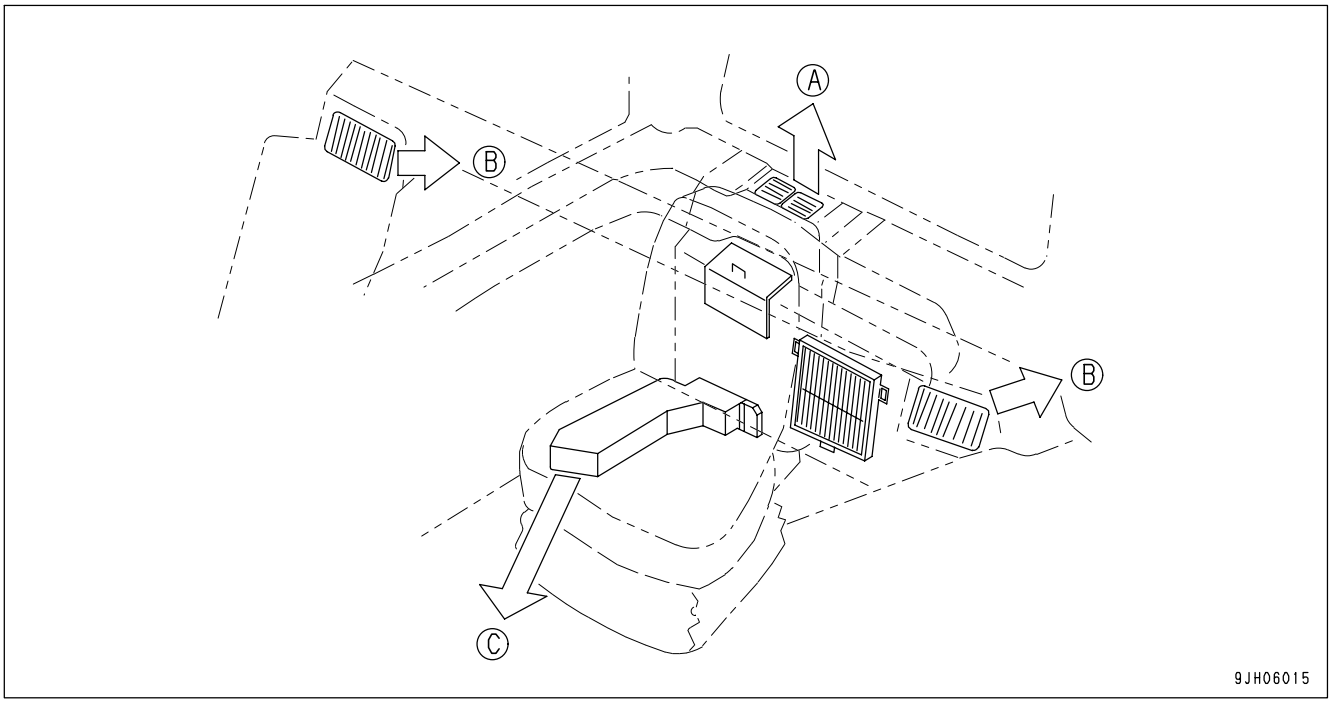


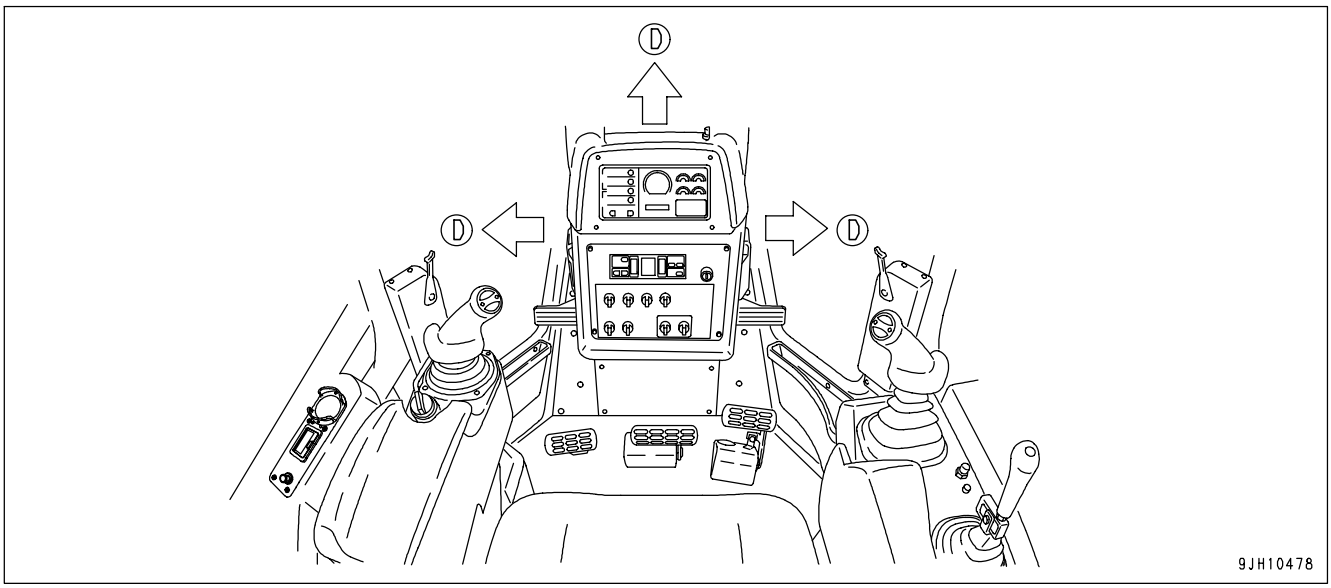
CLEAN INTERIOR OF CAB

If there is any oil or dirt stuck to cab interior (1) and (2), apply a neutral detergent to a cloth and dab to remove the dirt, then wash with water.
After washing with water, dry completely and assemble.



AIR CONDITIONER, HANDLING





The air conditioner is installed behind the operator's seat. The vents blow out cool air or hot air to cool or heat the cab.

Location of vents

(A) Rear vent

(B) Front vent (ceiling)

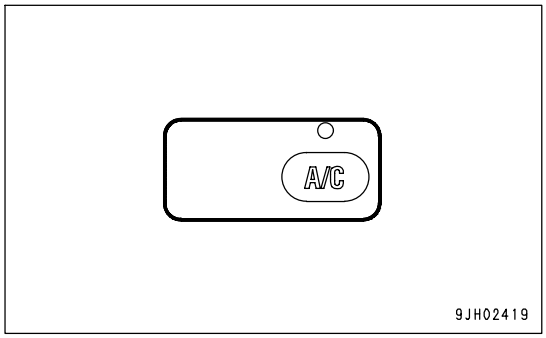
(C) Foot vent

(D) Defroster vent

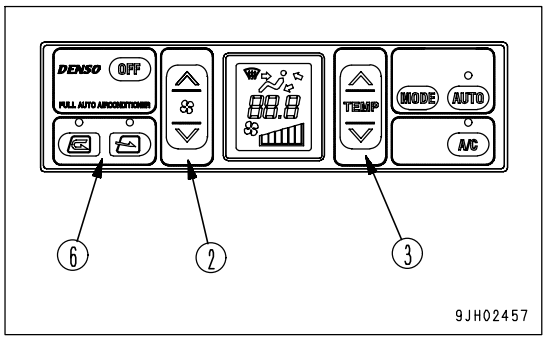
REMARK

- Vents (A) and (B) have louvers to make it possible to change the direction of the airflow as desired.
- Vent (D) can be opened and closed manually.

3. Turn air conditioner switch (8) ON. Check that the lamp above air conditioner switch lights up.



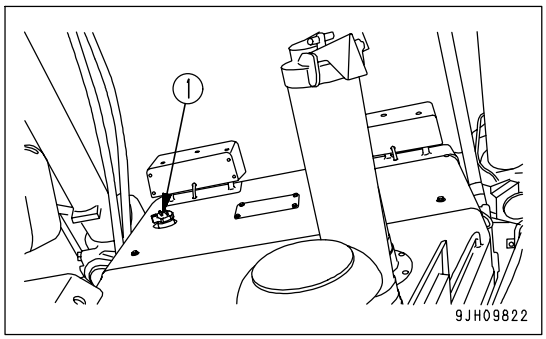
4. Adjust fan switch (2), temperature setting switch (3) and RECIRC/FRESH selector switch (6) to the desired positions.



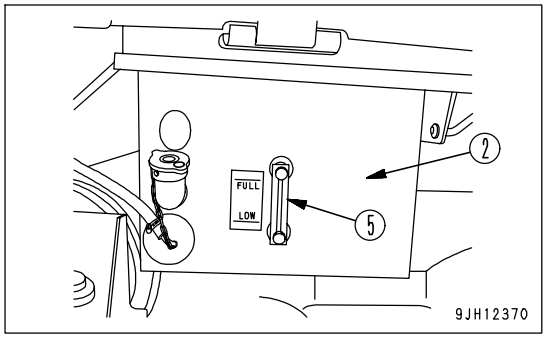
CHECK COOLANT LEVEL, ADD COOLANT

WARNING

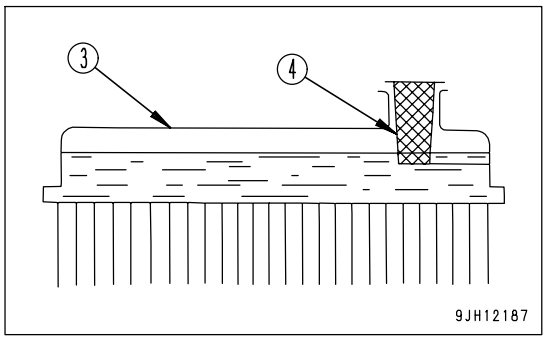
- **Normally, do not open the radiator cap (1). When checking the coolant level, check the reserve tank (2) when the engine is cold.**
- **Do not remove the cap (1) when the radiator (3) coolant is hot. Boiling coolant may spurt out. After the coolant temperature goes down, turn the cap (1) slowly to release the pressure, then remove it.**



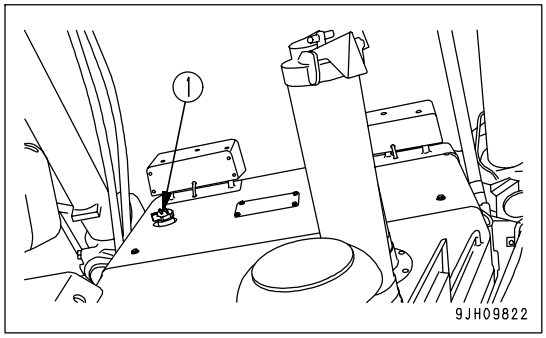
1. Open the side cover on the left side of the machine, then check that the water level (5) in the reserve tank (2) is between the FULL and LOW marks. If the water level (5) is low, add coolant as follows.



2. In refilling, fill with water through cap (1). Check that the coolant level is higher than the strainer (4) bottom as illustrated at right. At the same time, fill reserve tank (2) with coolant to the full.



3. To refill the radiator, first stop the engine and pour coolant until it reaches the top of the filler opening. Then start the engine, after idling for 5 minutes recheck the coolant level, add coolant if necessary.
4. After adding water, tighten caps (1) and (6) securely.



ADJUSTMENT

ADJUSTING OPERATOR'S SEAT

⚠ WARNING

- **Park the machine in a safe place and stop the engine when carrying out adjustment of the operator's seat.**
- **Adjust the seat position at the beginning of each shift or when operators change.**
- **Adjust the seat so that the brake pedal can be depressed all the way down with the operator's back against the backrest.**

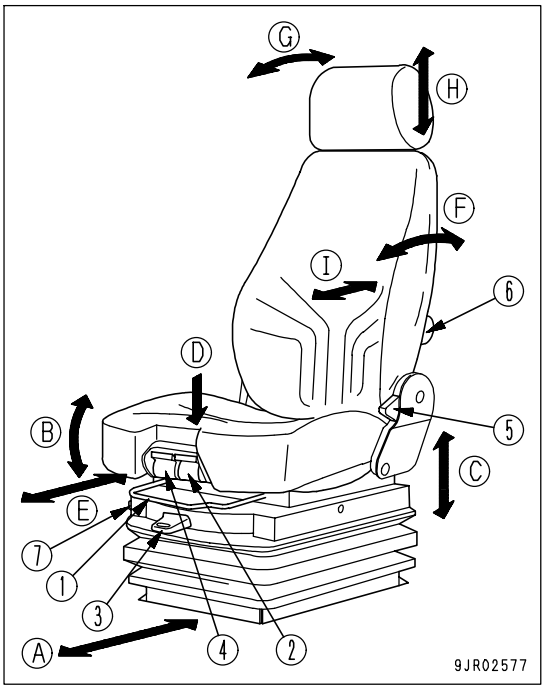
Adjustments (C), (D), and (K) use the air compressor built into the seat, so turn the engine starting switch to the ON position.

NOTICE

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

(A) Fore-and-aft adjustment
Pull lever (1) up, set the seat to the desired position, then release the lever.
Fore-and-aft adjustment: 190 mm (10 mm x 19 stages)

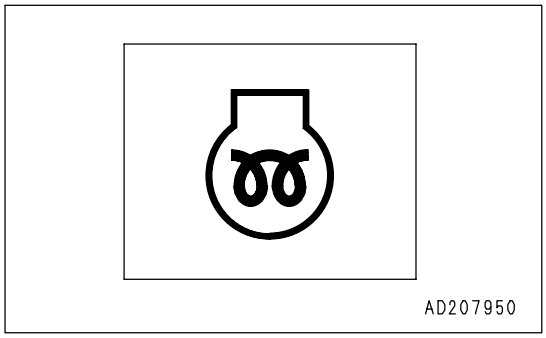
(B) Adjusting seat angle
Move lever (2) up, move the seat cushion at the front up or down to set to the desired position, then release the lever.
Amount of adjustment
Forward tilt: 3 degrees
Rear tilt: 11 degrees



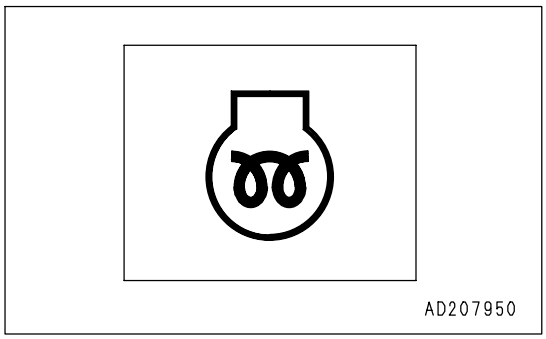
(C) Adjusting seat height
The seat height adjustment uses an air system, and it can be adjusted steplessly.
When adjusting the height, pull lever (3) up fully or push it down fully (when pulling it up, pull it until a click is felt). When the seat is set at the desired height, release the lever. If the lever is kept pulled up, the position where the seat does not rise any further is the maximum height. When the seat reaches the maximum height, the suspension automatically goes down slightly to secure the amount of movement of the lever.
If the operator raises his body from the seat or changes the amount of weight applied to the seat during adjustment, the air in the suspension may be discharged.
Amount of adjustment: 80 mm (3.2 in)

(D) Setting seat for weight
To protect the operator, it is necessary to adjust the suspension to match the operator's weight. When carrying out this adjustment, stop the machine, set the seat to the correct posture, then operate the lever.
Pull up lever (3) lightly a short distance. The weight setting is adjusted automatically. (The air pressure inside the suspension is increased or decreased to match the operator's weight.)

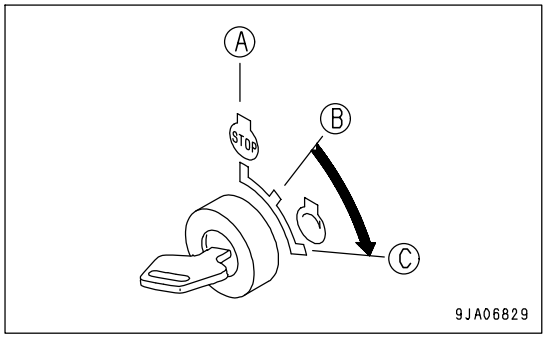
3. Check that engine pre-heating pilot lamp (3) on the monitor panel lights up.
   If the engine pre-heating pilot lamp does not light, go to step 5.



4. Keep in this condition until engine pre-heating pilot lamp (3) goes out.
   (Pre-heating is completed after approx. 12 seconds, and the lamp goes out.)

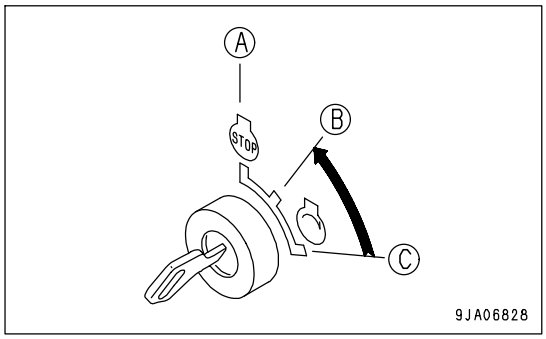


5. When preheating pilot lamp (3) goes off, turn the key of ignition switch (2) to the START position (C) to crank the engine.
   The time that preheating pilot lamp (3) stays on changes according to the ambient temperature as shown in the table below.



Ambient temperature	Pre-heat time
0 ˚C to -20 ˚C	20 to 40 seconds
-20 ˚C or less	40 seconds

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



REMARK

Immediately after starting the engine, run at idle. While running the engine, release the decelerator pedal and do not operate the work equipment.

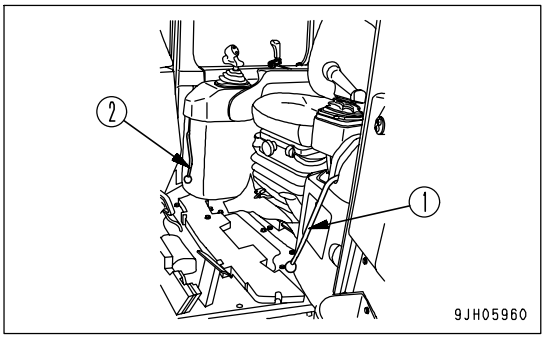
Guideline for idle time

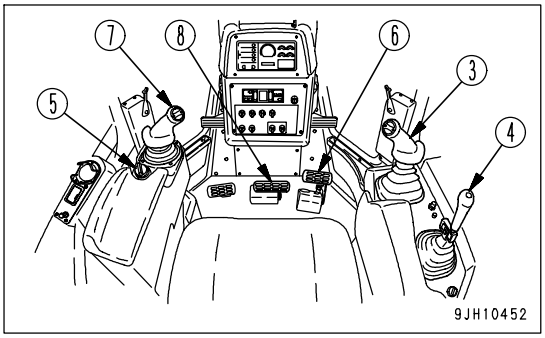
- Cold weather: At least 15 seconds
- 1st start after changing engine oil or engine oil filter: 20 seconds

MOVING MACHINE

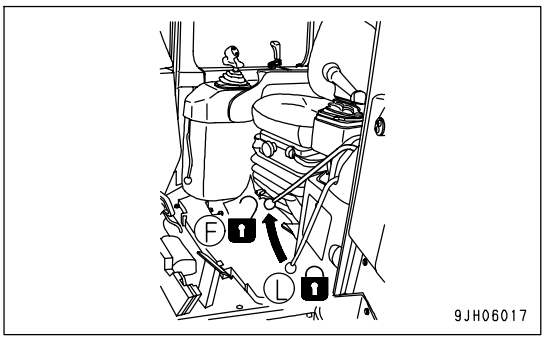
WARNING

- **Before moving the machine, check that the area around the machine is safe, and always sound the horn before moving.**
  Do not allow anyone to enter the area around the machine.
  The rear of the machine is a blind spot, so be extremely careful when traveling in reverse.
- **When moving the machine down a slope, always keep brake pedal (8) depressed, even after releasing parking brake lever (1).**
- **When moving the machine up a steep slope, turn fuel control dial (5) to high idling (MAX) position and run the engine at full speed, and keep brake pedal (8) and decelerator pedal (6) depressed. Then operate steering, directional, and gearshift lever (4) from the N (neutral) position to the direction of travel and slowly release brake pedal (8). When the travel speed rises, slowly release decelerator pedal (6).**

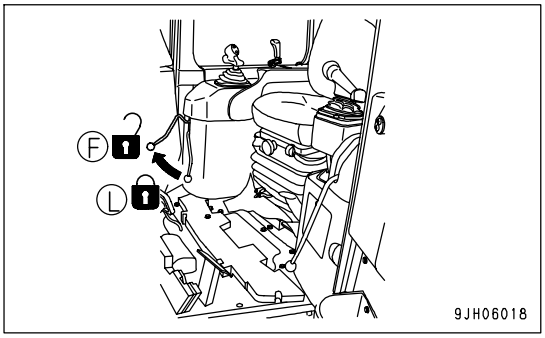




1. Operate parking brake lever (1) to the FREE (F) position.



2. Operate work equipment lock lever (2) to the FREE (F) position.



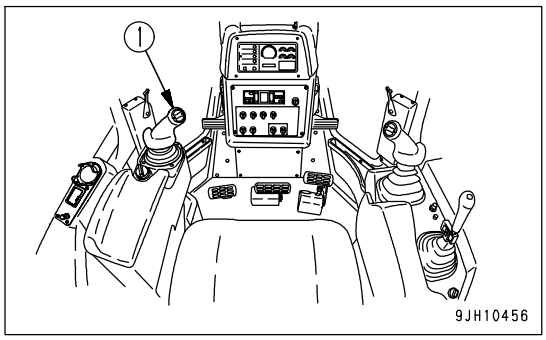
STEERING MACHINE

⚠ WARNING

- **Avoid as much as possible turning the machine on a slope.**
  The machine will tend to slip sideways. Particular care should be taken on soft or clay soil.
- **Never make a pivot turn at high speed.**

NORMAL TURNING

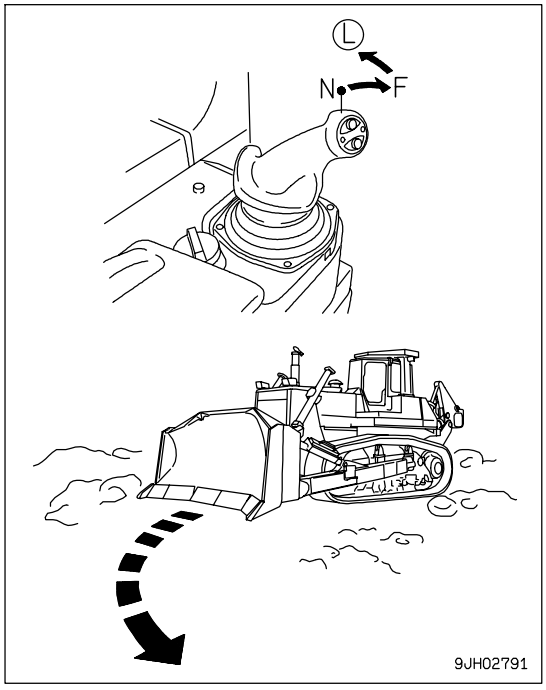
To turn the machine while traveling, incline steering, forward-reverse, gear shift lever (1) in the direction of the turn.



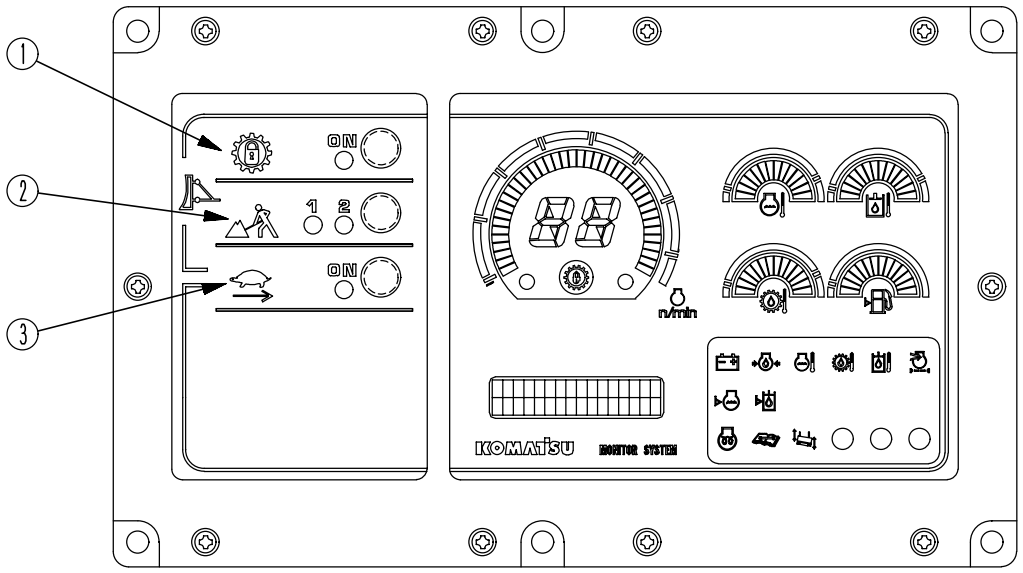
TURNING GRADUALLY TO LEFT WHILE TRAVELING FORWARD

If the joystick is pushed forward and moved partially to the left (L), the steering clutch is disengaged and the machine turns gradually to the left.

When turning gradually to the right, push the joystick forward, and move it partially to the right.
Do the same when traveling in reverse.



EFFECTIVE USE OF MODE SELECTION SYSTEM



(1) Lock up mode switch
(2) Economy mode selector switch
(3) Reverse slow mode selector switch

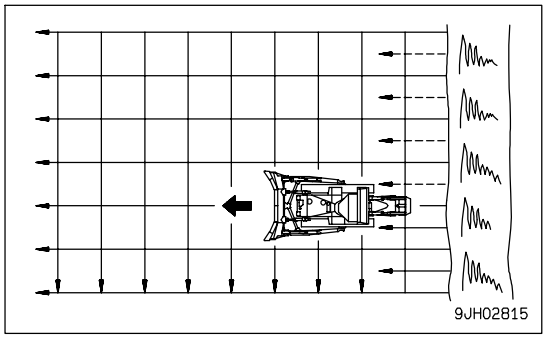
Selecting mode to match the type of work and quality of rock and soil makes to perform operations effectively.
For the machine that is solely used for crushed rocks, it can be done that when the ignition switch is turned ON, all mode switches are turned ON. Contact your Komatsu distributor for such modification of the switches.
When all the mode selection switches are off, the selection is suitable for conventional digging and dozing of bedrock.
The condition when all the mode selection switches are off is called the standard mode.
Only the reverse slow mode can be selected in combination with the lock-up mode.
The economy mode, and reverse slow mode can be used independently or in combination.

Dozing		Reverse slow mode
Lock up mode	Economy mode	
○	×	○
×	○	○

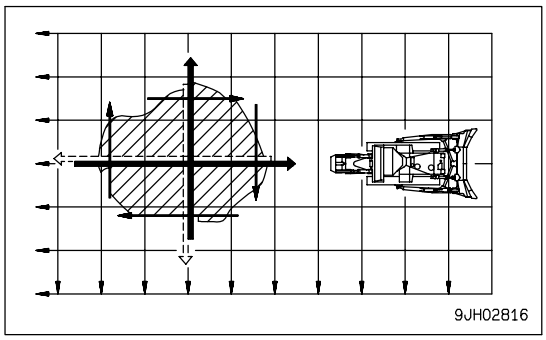
○: Possible to use ×: Compound use not possible

Cross ripping

- On jobsites with hard bedrock, for rocks and boulders which are impossible to break or dig up with one ripping pass, carry out the second ripping pass at right angles to the first ripping direction.
- At the edge of cliffs, where it is impossible to apply the ripper in a cross direction, make the space between the shanks smaller and carry out ripping.

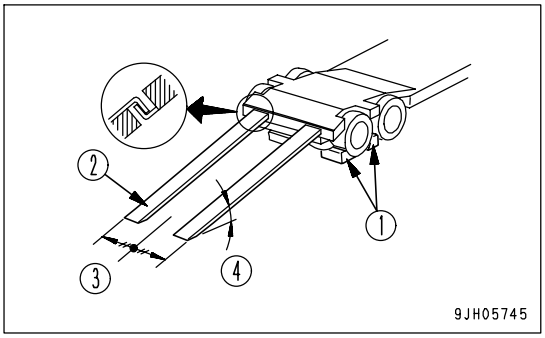


- During the ripping operation, if there is any hard bedrock, carry out ripping in the opposite direction to the direction where the ripper was applied. If it is still impossible to break up the rock, break up the area around the bedrock a little at the time.
- When carrying out concentrated ripping of hard bedrock, the work efficiency is high if the ripper is applied to the whole of the digging face.

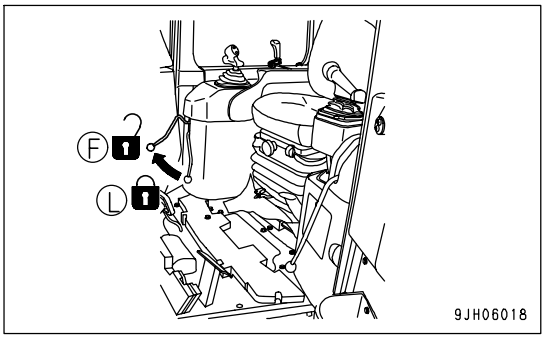


UNLOADING

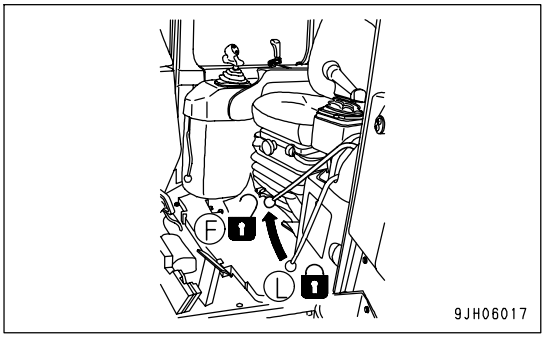
1. Load and unload on firm level ground only. Maintain a safe distance from the edge of a road.
2. Apply the trailer brakes securely, then put blocks (1) under the tires to prevent the trailer from moving.
   - Set left and right ramps (2) parallel to each other and equally spaced to the left and right of center (3) of the trailer. Make angle of installation (4) a maximum of 15°. If the ramps bend a large amount under the weight of the machine, put blocks under the ramps to prevent them from bending.



3. Remove the chains and wire ropes fastening the machine.
4. Start the engine.
   Warm the engine up fully.
5. Set main work equipment lock lever to FREE position (F), and raise the work equipment.
   (When transporting with work equipment installed)



6. Set parking brake lever to the FREE position (F).
7. Set the transmission in the 1st gear and run the engine at low idle.
8. Set the travel direction toward the ramps and drive slowly.



9. The center of gravity of the machine shifts suddenly at the border between the ramps and trailer, and the machine is unbalanced and becomes dangerous. Accordingly, pass the border slowly.
10. Drive down the ramps slowly and carefully until the machine leaves the ramps perfectly.

AFTER COMPLETION OF WORK

WARNING

Performing idle-running of the tracks is dangerous, stay well away from the tracks.

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

- Remove all the mud and water from the machine body. In particular, wipe the hydraulic cylinder rods clean to prevent damage to the seal caused by mud, dirt, or drops of water on the rod from getting inside the seal.
- Park the machine on hard, dry ground.
  If this is impossible, park the machine on boards.
  The boards prevent the tracks from freezing to the ground, and allow the machine to be moved the next morning.
- Open the drain valve and drain any water collected in the fuel system to prevent it from freezing.
- Fill the fuel tank to capacity. This minimizes moisture condensation in the tank when the temperature drops.
- After operation in water or mud, remove water from undercarriage as described below to extend undercarriage service life.

AFTER COLD WEATHER

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

- Replace the fuel and oil for all parts with oil of the viscosity specified.
  For details, see "RECOMMENDED FUEL, COOLANT, AND LUBRICANT (PAGE 4-12)".

CHASSIS

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

Problem	Main causes	Remedy
Torque converter oil pressure does not rise	• Improper tightening of oil pipe or pipe joint, air leaking in because of damage, oil leakage	• Inspect, repair
	• Wear, gouging of gear pump	(• Check, replace)
	• Lack of oil in transmission case	• Add oil to specified level. See Checks before starting
	• Clogged oil filter element strainer in transmission case	• Clean. See EVERY 500 HOURS SERVICE
Torque converter overheats	• Clogged radiator	• Clean, wash radiator core
	• Fan rotation speed is slow	(• Check and repair hydraulic circuit of fan motor)
	• Engine coolant temperature too high	• See Engine Related
	• Clogged oil cooler	(• Clean or replace)
	• Oil pressure too low	• See Torque converter oil pressure does not rise
	• Low circulation of oil due to worn gear pump	(• Replace gear pump)
Torque converter oil temperature gauge does not work	• Defective oil temperature gauge	(• Replace oil temperature gauge)
	• Defective connection of wiring	(• Check, repair)
Lacks drawbar pull	• Lack of engine horsepower	• See Engine Related
	• Torque converter oil pressure too low	• See Torque converter oil pressure does not rise
	• Steering clutch slipping	(• Inspect, repair)
Machine does not move when steering, directional, speed lever is placed in FORWARD	• Lack of oil in the steering clutch case	• Add oil to specified level. See Checks before starting
	• Oil pressure in transmission does not rise	• See Torque converter oil pressure does not rise
	• Steering clutch slipping	
	• Wear, gouging of gear pump	(• Check, repair)
	• Clogged oil strainer element in steering clutch case	• Clean. See EVERY 1000 HOURS SERVICE
	• Defective wiring of steering, directional, speed lever	• Check wiring
	• Parking brake is at LOCK	• Set parking brake to FREE position
Machine does not turn when steering is operated	• Brake is not applied on side which is pulled	(• Adjust linkage, Check brake pressure)
	• Defective wiring of steering, directional, speed lever	(• Check wiring)
Machine does not stop when brake pedal is depressed	• Defective brake adjustment	(• Adjust linkage, adjust brake pressure)
	• Defective brake pedal wiring	(• Check wiring)
Track comes off	• Track shoe assembly too loose	• Adjust track tension. See WHEN REQUIRED
Abnormal wear of sprocket	• Track shoe assembly too loose or too tight	• Adjust track tension. See WHEN REQUIRED

FUEL

- To prevent the moisture in the air from condensing and forming water inside the fuel tank, always fill the fuel tank after completing the day's work.
- The fuel pump is a precision instrument, and if fuel containing water or dirt is used, it cannot work properly.
- Be extremely careful not to let impurities get in when storing or adding fuel.
- Always use the fuel specified for the temperature in the Operation and Maintenance Manual.
  - If the fuel is used at temperatures lower than the specified temperature (particularly at temperatures below -15 °C (5°F), the fuel will solidify.
  - If the fuel is used at temperatures higher than the specified temperature, the viscosity will drop, and this may result in problems such as a drop in output.
- Before starting the engine, or when 10 minutes have passed after adding fuel, drain the sediment and water from the fuel tank.
- If the engine runs out of fuel, or if the filters have been replaced, it is necessary to bleed the air from the circuit.
- If there is any foreign material in the fuel tank, wash the tank and fuel system.

NOTICE

Always use diesel oil for the fuel.

To ensure good fuel consumption characteristics and exhaust gas characteristics, the engine mounted on this machine uses an electronically controlled high-pressure fuel injection device. This device requires high precision parts and lubrication, so if low viscosity fuel with low lubricating ability is used, the durability may drop markedly.

COOLANT AND WATER FOR DILUTION

- The coolant has the important function of preventing corrosion as well as preventing freezing.
  Even in the areas where freezing is not an issue, the use of antifreeze coolant is essential.
  Komatsu machines are supplied with Komatsu Supercoolant (AF-NAC). Komatsu Supercoolant (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for 2 years or 4000 hours. Komatsu Supercoolant (AF-NAC) is strongly recommended wherever available.
- When using Komatsu super coolant (AF-NAC), there is no need to use a corrosion resistor. For details, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-22)".
- When diluting the antifreeze coolant, use distilled water or tap water (soft water).
  Natural water, such as a river water or well water (hard water), contains large amounts of minerals (calcium, magnesium, etc.), and this makes it easier for scale to form inside the engine or radiator. Once scale is deposited inside the engine or radiator, it is extremely difficult to remove. It also causes overheating due to poor heat exchange, so when you dilute the coolant, we recommend that you use water with an overall hardness of less than 100 PPM.
- When using antifreeze, always observe the precautions given in the Operation and Maintenance Manual.
- Antifreeze coolant is flammable, so be sure to keep it away from flame.
- The ratio of Supercoolant (AF-NAC) to water differs according to the ambient temperature.
  For details of the ratio when mixing, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-22)".
  Supercoolant (AF-NAC) may be supplied already mixed. In such cases, never dilute with water.
- If the engine overheats, wait for the engine to cool before adding coolant.
- If the coolant level is low, it will cause overheating, and will also cause problems with corrosion due to air entering the coolant.

PERIODIC REPLACEMENT OF SAFETY CRITICAL PARTS

For using the machine safely for an extended period of time, you are required to periodically replace the safety (critical and fire prevention) related parts listed in the table of important parts on the following page.

Material quality of these parts can change as time passes and they are likely to wear out or deteriorate. However, it is difficult to determine the extent of wear or deterioration at the time of periodic maintenance. Hence, it is required to replace them with new ones regardless of their condition after a certain period of usage. This is important to ensure that these parts maintain their full performance at all times.

Furthermore, should anything abnormal be found on any of these parts, replace it with a new one even if the periodic replacement time for the part has not yet arrived.

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

Also perform the following checks with hydraulic hoses which need to be replaced periodically. Tighten all loose clamps and replace defective hoses, as required.

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

Have your Komatsu distributor replace the critical parts.

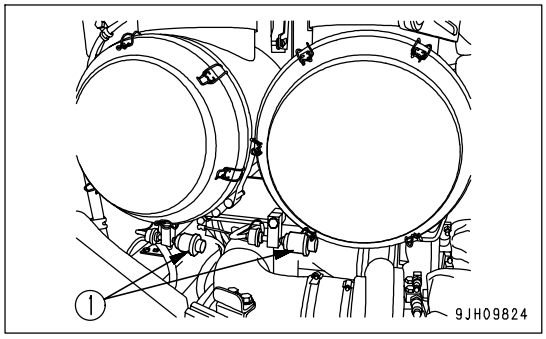
CHECK, CLEAN AND REPLACE AIR CLEANER ELEMENT

⚠ WARNING

- **Always wear protective glasses, dust mask, or other protective equipment.**
- **When removing the air cleaner element from the air cleaner body, it is dangerous to pull it out by force.**
  When working at high places or where the foothold is poor, be careful not to fall because of the reaction when pulling out the outer element.

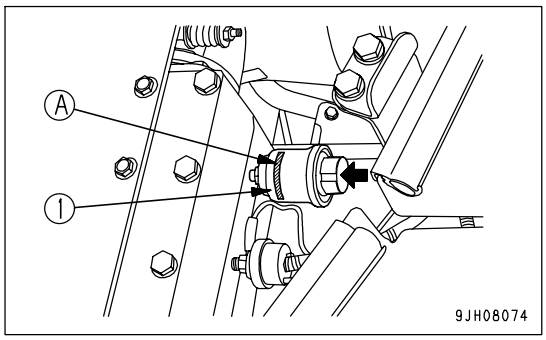
CHECKING

If the internal yellow piston overlaps the red zone (A) on the outside diameter of dust indicator (1), clean the air cleaner element.
After cleaning, press the reset button to reset the piston.



NOTICE

Do not clean the element until the yellow piston in dust indicator (1) overlaps the red zone (A) on the outer diameter.
If the element is cleaned frequently before the yellow piston in dust indicator (1) overlaps the red zone (A) on the outer diameter, the air cleaner will not be able to provide its expected performance and the cleaning efficiency will become poor.
In addition, dirt stuck to the element will drop inside the inner element more frequently during the cleaning operation.

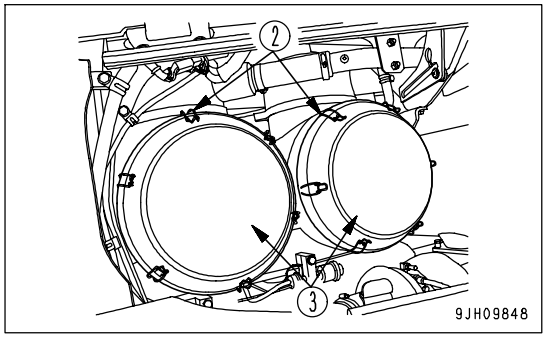


CLEANING OUTER ELEMENT

NOTICE

Before and after cleaning the element, do not leave or keep it in direct sunlight.

1. Remove 6 holders (2), then remove cover (3) and take out outer element (4).



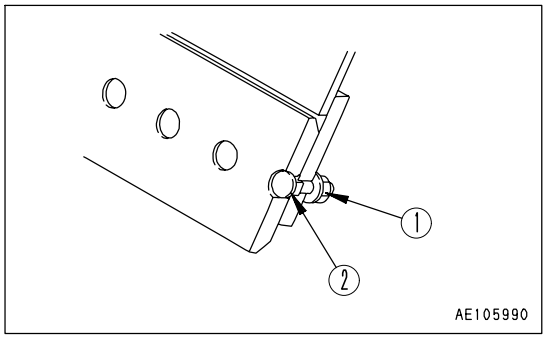
REVERSE AND REPLACE THE END BITS AND CUTTING EDGES

WARNING

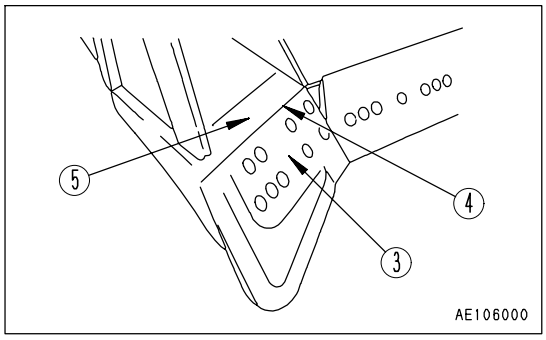
It is dangerous if the work equipment moves by mistake when the cutting edges and end bits are being reversed or replaced. Set the work equipment in a stable condition, then stop the engine and lock the blade control lever securely with the work equipment lock lever.

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, position a block under the frame to prevent the blade from falling.
2. Operate the work equipment lock lever to the LOCK position.
   If the cutting edge and the end bit on both sides are worn out, replace with new one.
   If the mounting surface is worn, correct it before turning or replacing the end bits.



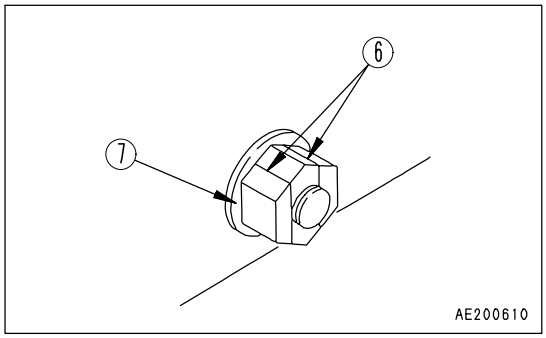
3. Loosen nut (1) and remove bolt (2). Then remove the cutting edge and the end bit and clean the mounting surface.
4. Reverse or replace the cutting edge and the end bit when worn out.
   If bolt (1) and nut (2) are damaged, replace them with new ones at the same time.



5. Install the edge to the blade, then tighten partially. Drop the blade three to five times on to the ground or rock to remove any play in bolt (2), then tighten it to the correct tightening torque. When installing end bit (3), put top surface (4) of the end bit in close contact with stopper (5), then tighten with the bolts.
   - Tightening torque: 3340 ± 373 Nm (341 ± 38 kgm, 2466.3 ± 274.8 lbft)
6. After several hours of running, retourque the nuts.

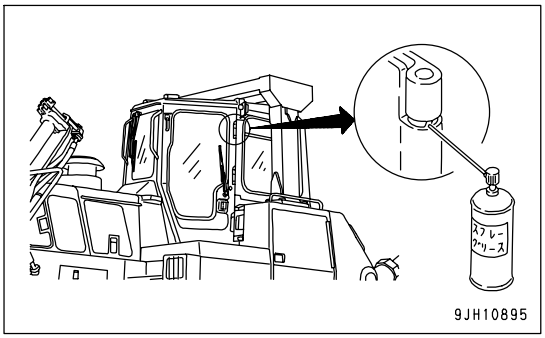
REMARK
The tightening operation is easier if the power wrench that has been supplied is used.

When the nut is rusted and is removed by gas cutting, cut on both side (6) of the nut as shown in the diagram.
Be careful not to damage seat surface (7).
If it is damaged, repair it. Be careful not to get spatter on the mounting surface.



LUBRICATE DOOR HINGE

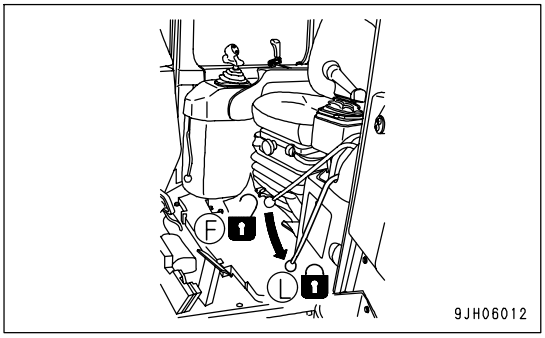
If the door makes a squeaking noise when it is opened or closed, spray lubricant in through the split in the hinge bushing.
If the bushing is worn, replace the hinge.



CHECK DOOR LATCH

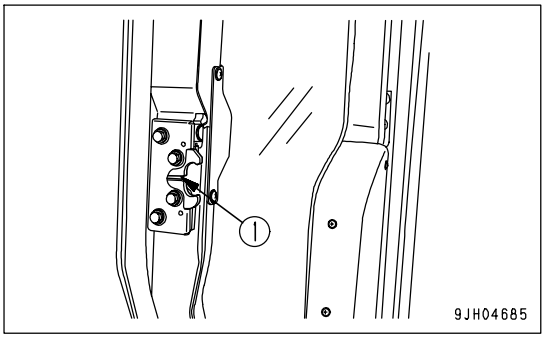
WARNING

If the control lever is touched by accident during checking, the machine moves off suddenly, and this may lead to serious injury or death.
Before checking door latch, stop the engine and set the parking brake lever securely to the LOCK position.



Check
Hold the door open-locked, and check that there is still grease inside the latch. If the amount of grease is low or there is no more grease, coat the inside of the latch with grease from portion (1).

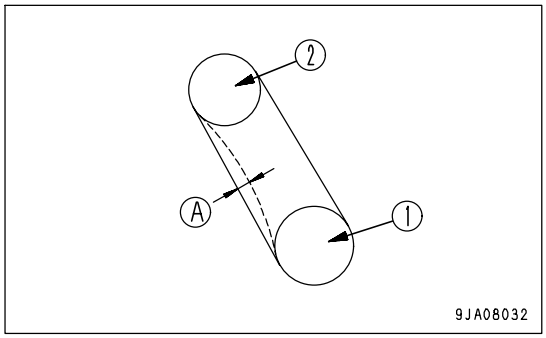
REMARK
If there is no more grease inside the latch, the movement will become poor because of dust inside the latch, and the handle may be stiff when opening the door.



CHECK ALTERNATOR DRIVE BELT TENSION, ADJUST

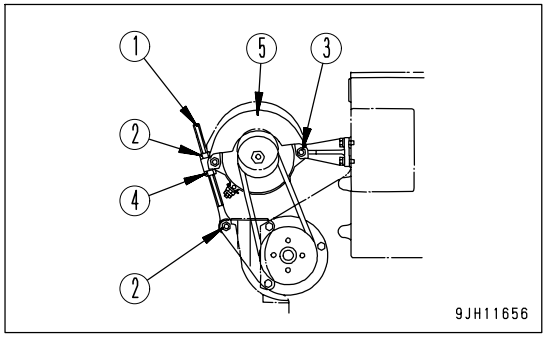
CHECKING

Push a point midway between drive pulley (1) and alternator pulley (2) with a finger to check the tension. Deflection (A) when 1 belt is pressed with a finger force of approx. 6 kg should be approx. 15 mm.



ADJUSTING

1. Loosen nuts (2) of adjust bolt (1) and mounting nut (3) (at 3 spots).
2. Turn nut (4) clockwise, then move alternator (5) to adjust the belt tension so that the deflection is approx. 15 mm (0.59 in) when pushed with a force of 6 kg.

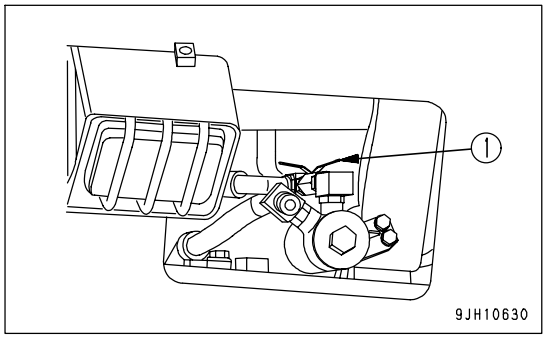


REMARK

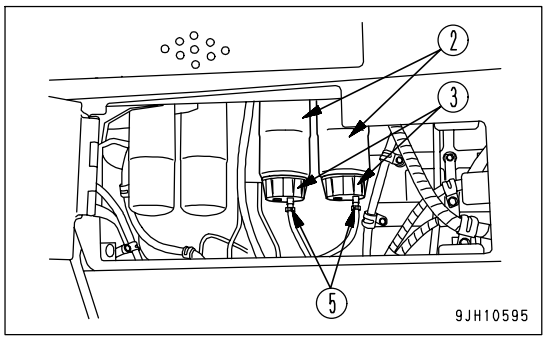
When adjusting the belt tension, never push the alternator directly with a bar. If it is necessary to push the alternator, insert a piece of wood in-between and push it with a bar.

3. Tighten loosened nuts (2) and (3) to secure alternator (5) (at 3 spots).
4. Check for damage to the pulleys, and wear of the V-groove and V-belt. Be particularly careful to check that the V-belt is not in contact with the bottom of the V-groove.
5. If any belt has stretched and there is no allowance for adjustment, or if there are cuts or cracks on any belt, replace the belt.
6. After replacing the belt, operate for one hour, then adjust again.

1. Close the fuel valve (1).
2. Set a container under the fuel pre-filter cartridge to catch the oil.
3. Remove transparent cup (3) from the filter (2) and inspect it. If it is broken or damaged, replace it with a new part.



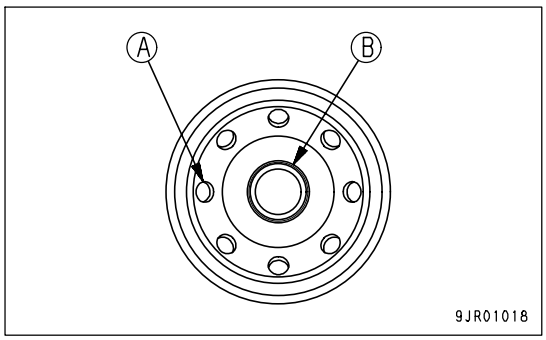
4. Clean transparent cup (3) and remove seal (4). Coat the new seal with clean fuel or oil.
5. Install transparent cup (3) to the new filter cartridge.
   Tightening torque for cup: 10 Nm {1.0 kgm, 7.2 lbft}



6. Check that cap (B) is installed to the new filter cartridge, then fill with clean fuel.

NOTICE

When filling with fuel, always use fresh fuel and be careful not to let any dirt or dust get in. Fill with fuel through 8 small holes (A) (dirty side). Cap (B) is to prevent oil containing dirt from getting into the clean side. Always add the oil with cap (B) installed.



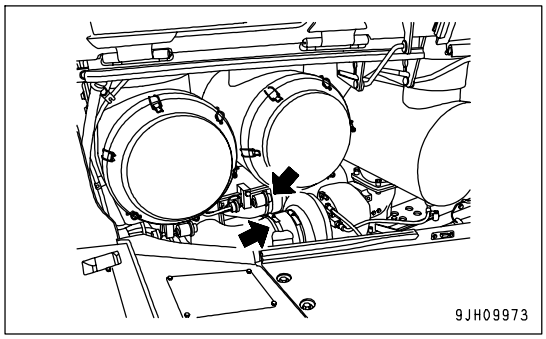
7. Remove cap (B) after topping off the filter cartridge with fuel.
8. Clean the filter holder, coat the seal surface of the new cartridge thinly with oil, then install the cartridge.
9. When installing, tighten until the packing surface contacts the seal surface of the filter holder, then tighten it 3/4 of a turn.
   If the filter cartridge is tightened too far, the packing will be damaged and this will lead to leakage of fuel. If the filter cartridge is too loose, fuel will also leak from the packing, so always tighten the correct amount.
10. Open the fuel valve, start the engine, and run the engine for approx. 10 minutes at low idling until the engine speed stabilizes. Check for any leakage of oil from the filter cartridge seal surface or transparent cup, and check for any sucking in of air.

NOTICE

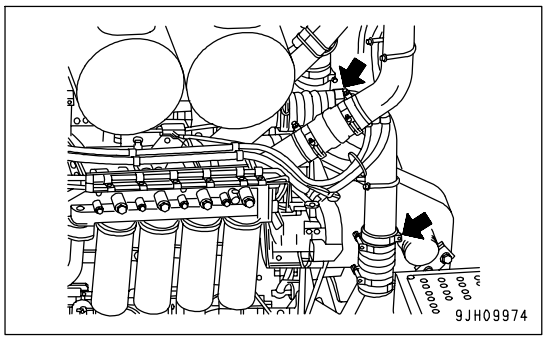
When replacing the fuel main filter cartridge, replace the filter cartridge, then bleed the air. For details, see "REPLACE FUEL MAIN FILTER CARTRIDGE (PAGE 4-70)" in the Operation and Maintenance Manual.
Do not fill the fuel main filter cartridge with fuel.

CHECK HOSE CLAMPS BETWEEN AIR CLEANER AND TURBOCHARGER, TURBOCHARGER AND AFTERCOOLER, AFTERCOOLER AND ENGINE

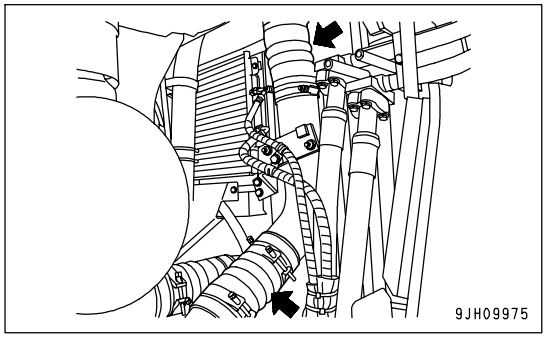
1. Check hose clamps between air cleaner and turbocharger
   Check that the hose is inserted is at least 40mm. Check that the clamps are tightened.
   Tightening torque: 8.83 ± 0.5Nm
   (0.9 ± 0.05kgm, 6.5 ± 0.4lbft)



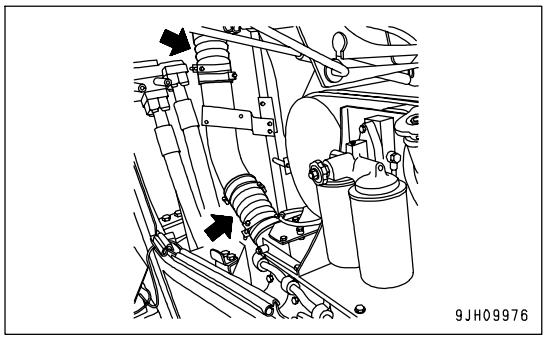
2. Check hose clamps between turbocharger and aftercooler
   Check that the hose is inserted is at least 80 mm. Check that the clamps are tightened.
   Tightening torque: 24.0 ± 1.0 Nm
   (2.45 ± 0.1kgm, 17.7 ± 0.7lbft)



3. Check hose clamps between aftercooler and engine
   Check that the hose is inserted is at least 80 mm. Check that the clamps are tightened.
   Tightening torque: 24.0 ± 1.0 Nm
   (2.45 ± 0.1kgm, 17.7 ± 0.7lbft)



Check those on the other side, too.



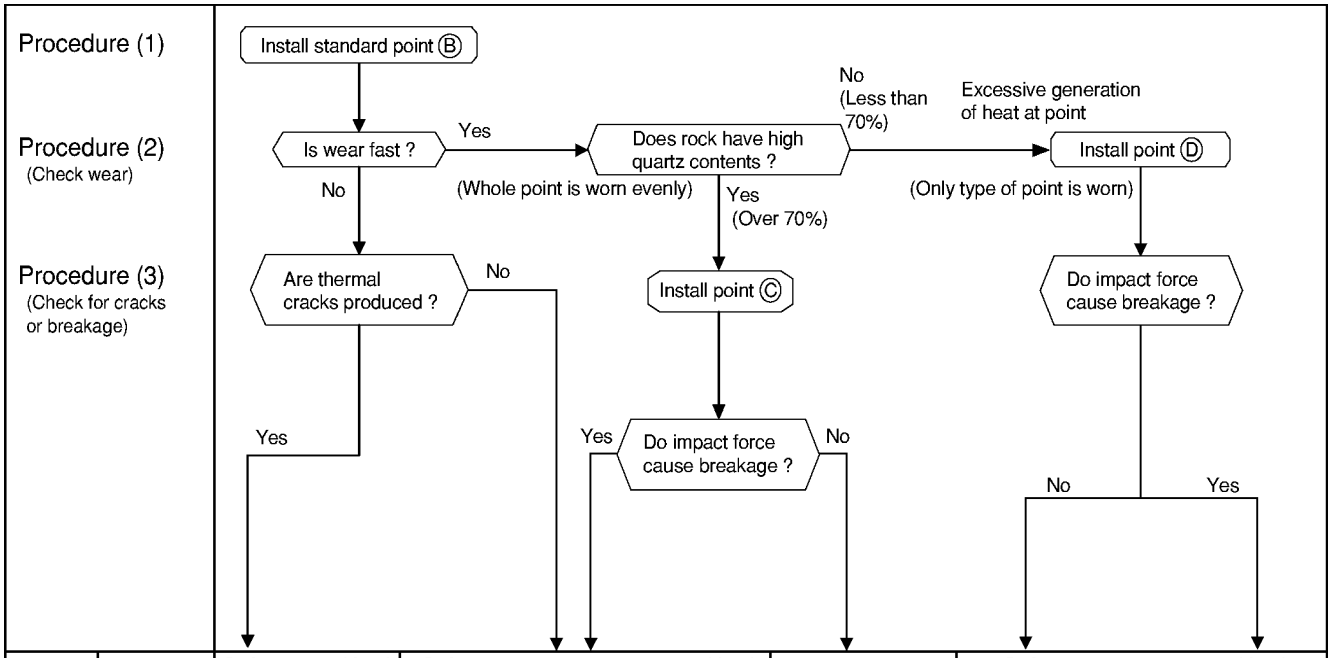
EVERY 4000 HOURS SERVICE

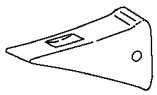
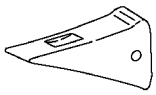
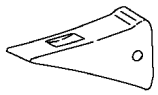
Maintenance for every 250, 500, 1000 and 2000 hours service should be carried out at the same time.

CHECK WATER PUMP

Check for oil and coolant leakage, or clogging of the drain hole. If any abnormality is found, contact your Komatsu distributor for disassembly, repair, or replacement.

PROCEDURE FOR SELECTING RIPPER POINT



Typical rock	Hardness	Soft ⟷ Hard	Soft ⟷ Hard	Soft ⟷ Medium	Soft ⟷ Hard	
	Type of rock	Shale, limestone	All type of general rock	Sandstone	Basalt, andesite, granite, chest	
	Features	·Little quartz, little wear ·Deposited in layers, so ripping is easy	—	·Proportion of quartz is high (70% - 90%), point wears rapidly	·Proportion of quartz is not so high (40% - 70%) ·Rock is not in layers or seams, so heat is generated at point, point wear rapidly, ripping is difficult	
Suitable	Features	Ⓐ Point for lime stone ·Symmetrical shape ·Yellow ·Short	Ⓑ Standard Point ·Symmetrical shape ·Yellow ·Short (Turn and use again)	Ⓒ Point ·Non-symmetrical shape ·Yellow ·Long	Ⓓ Point ·Non-symmetrical shape ·Red ·Long	Ⓔ Point ·Symmetrical shape ·Red ·Short
	Shape					
	Part No.	198-78-21420	·198-78-21340 ·198-78-21510 (Made by Hensley)	198-78-21370	198-78-21350	198-78-21380

REMARK

- A symmetrical ripper point is suited to a terrain of hard rocks because it recovers penetrability by turning the point after the penetrability drops due to its worn tip.
- Ripper points usually lose their hardness when they undergo intense heat generated by a contact with rocks during the use. In this respect, red ripper points are suited to a terrain of hard rocks where those others are likely to slip during the use, because red ones are made of materials whose hardness less lowers under intense heat, compared with yellow ripper points.
- Where an amount of wear on a ripper point is limited, a heat- originated (thermal) crack on the point surface is not readily removed, and the point itself can break with the crack as a starting point. For this reason, ripper points for limestone are suited to a jobsite where they are comparatively free of wear.

ECONOMY MODE

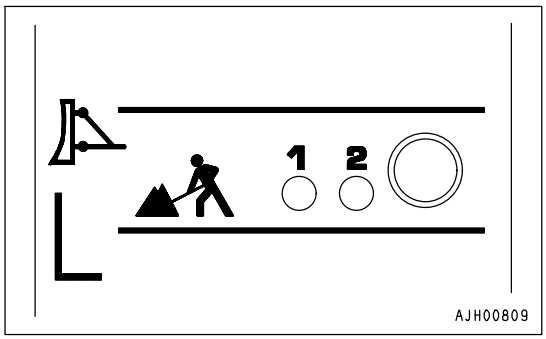
Using the economy mode makes it possible to reduce wasteful shoe slippage and to reduce the fuel consumption.

- Speed ranges that can be used: F1
- Applicable operations: Hauling after ripping, dozing blasted rock, smoothing.

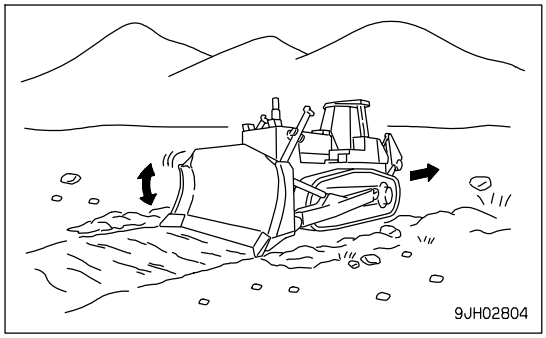
When the economy mode is turned ON, it is automatically set to [1]. Carry out dozing operations in this condition, then set to [2] and carry out operations. From this test, select the matching that gives power and low shoe slip ratio (frequency of deceleration operation).

Mode [1] is set to approx. 90% of full power and mode [2] is set to approx 70%.

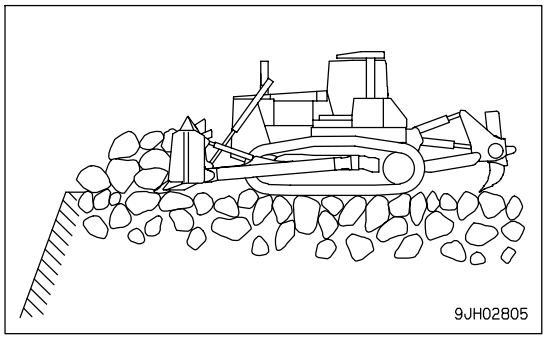
(Example)



- Fine leveling operations



- Ripping and dozing operations



REMARK

- If the shoe slip control switch is turned ON and the ripper is lowered during dozing operations in the standard mode, the system will enter the shoe slip control mode. If this happens, return to the N position, set the speed range to F1, and this will return to the standard mode.
- If the economy mode and shoe slip control switches are turned ON and the ripper is lowered during dozing operations in the economy mode, the system will enter the shoe slip control mode. If this happens, return to the N position, set the speed range to F1, and this will return to the standard mode.