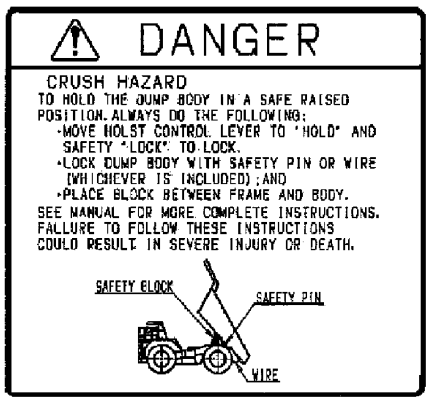
- **Safety labels**

Safety labels are affixed to the machine to inform the operator or maintenance worker on the spot when carrying out operation or maintenance of the machine that may involve hazard.
This machine uses "Safety labels using words" and "Safety labels using pictograms" to indicate safety procedures.

Example of safety label using words



Safety labels using pictogram

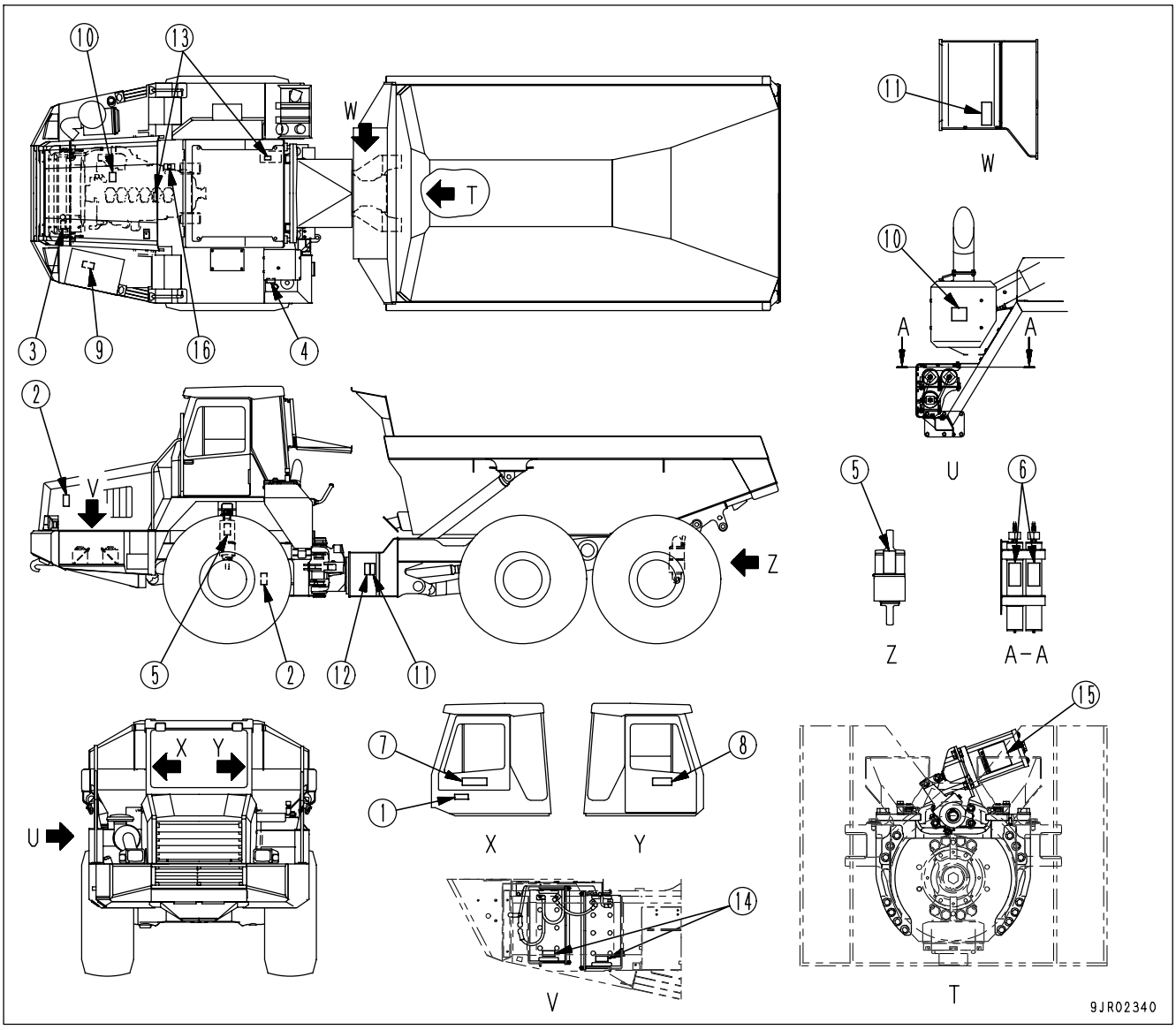
Safety pictograms use a picture to express a level of hazardous condition equivalent to the signal word. These safety pictograms use pictures in order to let the operator or maintenance worker understand the level and type of hazardous condition at all times. Safety pictograms show the type of hazardous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

Komatsu cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore, the safety messages in this manual and on the machine may not include all possible safety precautions. If any procedures or actions not specifically recommended or allowed in this manual are used, it is your responsibility to take the necessary steps to ensure safety.
In no event should you engage in prohibited uses or actions described in this manual.

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

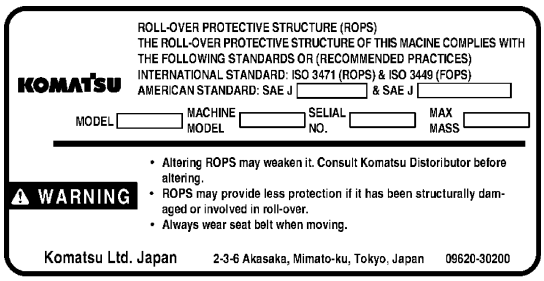
The numbers in circles in the illustrations correspond to the numbers in ( ) in the text. (For example: ① -> (1))

POSITION FOR ATTACHING SAFETY LABELS

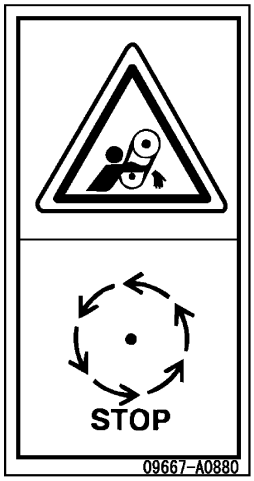


SAFETY LABELS

(1) Caution about modifying ROPS (09620-30200)



(2) Caution for checking engine room (09667-A0880)



Sign indicates a hazard of rotating parts, such as belt.

Turn off before inspection and maintenance.

(3) Caution when releasing radiator cap (09653-A0641)

Sign indicates a burn hazard from spurting hot water or oil if radiator or hydraulic tank is uncapped while hot.

Allow radiator or hydraulic tank to cool before removing cap.

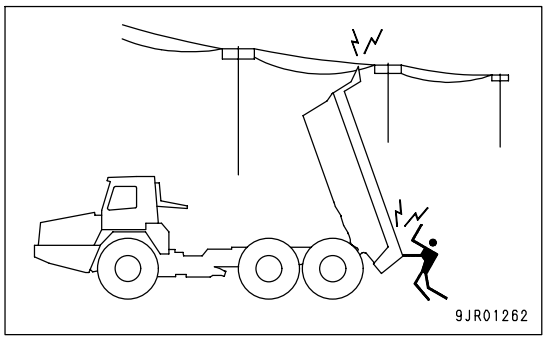
WORKING ON LOOSE GROUND

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

DO NOT GO CLOSE TO HIGH-VOLTAGE CABLES

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

- Before starting work near electric cables, inform the local power company of the work to be performed, and ask them to take the necessary action.



- Even going close to high-voltage cables can cause electric shock, which may cause serious burns or even death. Always maintain a safe distance (see the table on the right) between the machine and the electric cable. Check with the local power company about safe operating procedure before starting operations.
- To prepare for any possible emergencies, wear rubber shoes and gloves. Lay a rubber sheet on top of the seat, and be careful not to touch the chassis with any exposed part of your body.
- Use a signalman to give warning if the machine approaches too close to the electric cables.
- When carrying out operations near high voltage cables, do not let anyone come close to the machine.

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

- If the machine should come too close or touch the electric cable, to prevent electric shock, the operator should not leave the operator's compartment until it has been confirmed that the electricity has been shut off. Also, do not let anyone come close to the machine.

ENSURE GOOD VISIBILITY

- Check for any persons or obstacles in the area around the machine and check the conditions of the jobsite to ensure that operations and travel can be carried out safely. Always do as follows.
  - Position a signalman if there are areas at the rear of the machine where the visibility is not good.
  - When working in dark places, turn on the working lamp and front lamps installed to the machine, and set up additional lighting in the work area if necessary.
  - Stop operations if the visibility is poor, such as in mist, snow, rain, or dust.

HANDLING HIGH-PRESSURE HOSES, PIPING

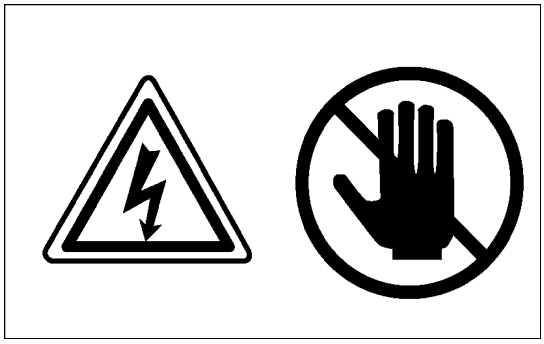
- If oil or fuel leaks from high-pressure hoses, it may cause fire or defective operation, which may lead to serious injury. If any loose bolts are found, stop work and tighten to the specified torque. If any damaged hoses are found, stop operations immediately and contact your Komatsu distributor.

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

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

PRECAUTIONS FOR HIGH VOLTAGE

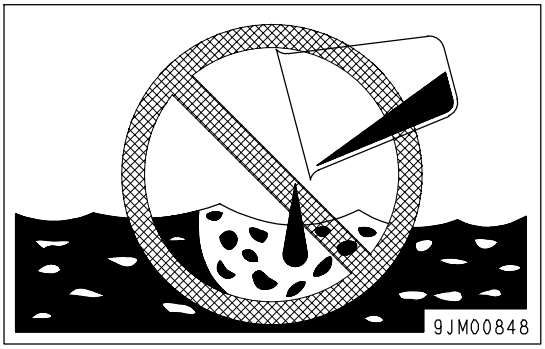
When the engine is running or immediately after it has stopped, high voltage is generated at the injector terminal and inside the engine controller, so there is danger of electrocution. Never touch the injector terminal or the inside of the engine controller.
If it is necessary to touch the injector terminal or the inside of the engine controller, please contact your Komatsu distributor.



WASTE MATERIALS

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

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



MAINTENANCE OF AIR CONDITIONER

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

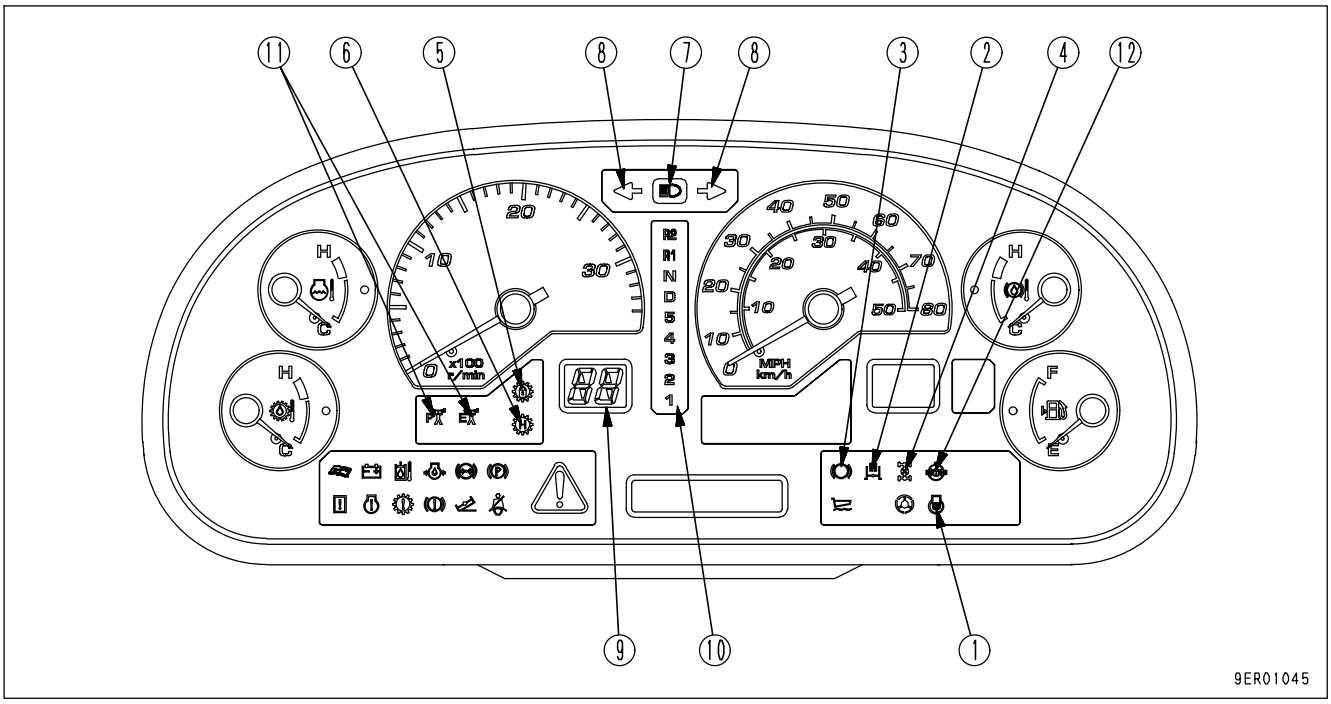
COMPRESSED AIR

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

METER DISPLAY PORTION

PILOT DISPLAY PORTION

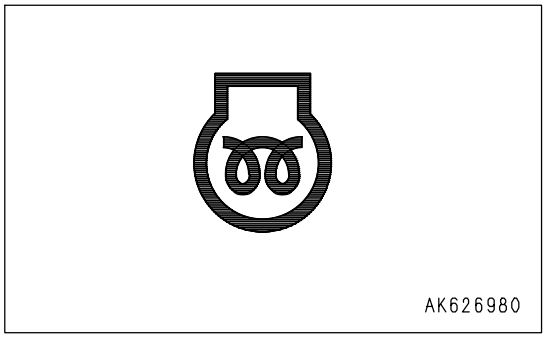
When starting switch is ON, the pilot display lights up when display items are functioning.



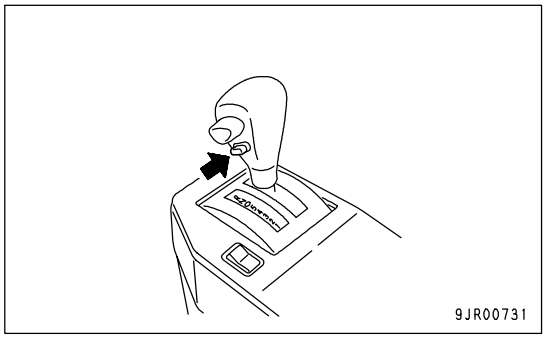
(1) Engine pre-heating pilot lamp
(2) Exhaust brake pilot lamp (if equipped)
(3) Retarder pilot lamp
(4) Inter-axle differential lock pilot lamp
(5) Lockup pilot lamp
(6) Shift hold pilot lamp
(7) Head lamp high beam pilot lamp
(8) Turn signal pilot lamp
(9) Shift indicator
(10) Shift lever position pilot lamp
(11) Power mode pilot lamp
(12) Left and right differential lock pilot lamp

ENGINE PRE-HEATING PILOT LAMP

This monitor (1) lights up when the electrical heater for pre-heating the engine is being actuated. When the starting switch is turned to the ON position in cold weather, the monitor lights up. It goes out after 20 to 30 seconds to indicate that the pre-heating has been completed.



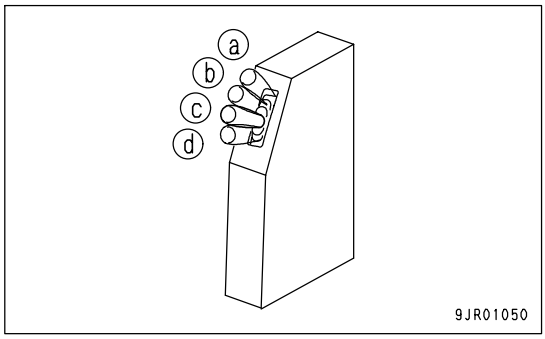
Activating the shift hold function will restrict the automatic shifting of the transmission to gear speeds below the gearshift lever gear shifting.
The shift hold function can be canceled by [1] moving the gearshift lever or [2] activating the shift hold switch located on the gearshift lever.
The shift hold pilot lamp located on the machine instrument panel will indicated the status of the shift hold function.
Before starting either up or down a range, pre-select the transmission gear and maintain a machine travel speed which will give you full control under all the anticipated conditions.



DUMP LEVER

CAUTION

To prevent damage to the dump body through vibration from the road surface, always lower the dump body before traveling.



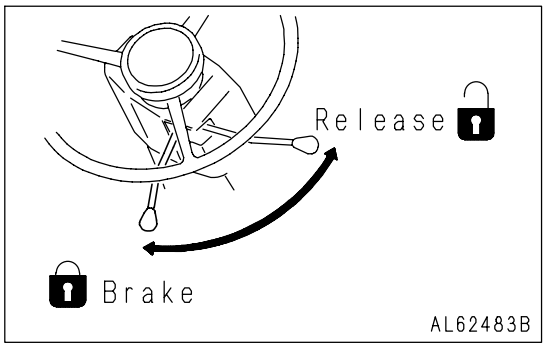
This lever (4) is used to operate the dump body.
(a) RAISE
(b) HOLD: The dump body stops and is held in position.
(c) FLOAT: The dump body moves freely under external force.
(d) LOWER
Always set to the FLOAT position when traveling.

It is impossible to travel in reverse if the dump body is raised.
If the engine stops during the dump operation, the dump body is held in position, regardless of the position of the dump lever. Even when the engine starts again, the dump body is held in position. For details of the method of canceling the hold function, see "CANCELING DUMP BODY HOLD CONDITION (PAGE 3-84)".

RETARDER CONTROL LEVER

WARNING

The retarder must not be used as a parking brake.

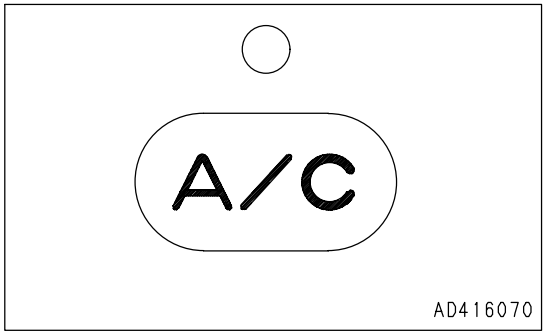


Use this lever (5) to operate the retarder when traveling downhill. The more the lever is pulled, the greater the braking force becomes.
When the retarder is operated, the retarder operation lamp lights up.

When leaving the operator's seat, always apply the parking brake.

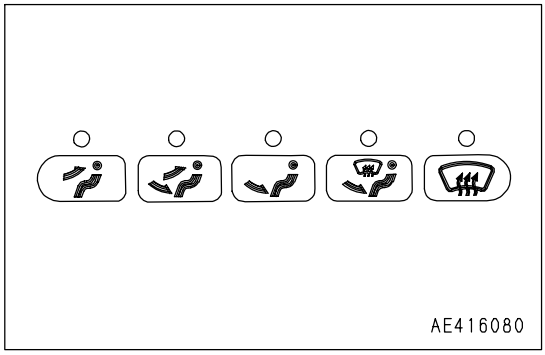
AIR CONDITIONER SWITCH

This switch (2) is used to start or stop the cooling or dehumidifying function.
When the fan switch is turned ON and the air conditioner switch is pressed, the indicator lamp above the switch lights up.
When the switch is pressed again, the switch is turned OFF and the indicator lamp goes out.



MODE SELECTOR SWITCH

This switch (3) is used to select the vents.
The following five vent modes are available: FACE, FACE/FOOT, FOOT, FOOT/DEF, DEF.
When the switch is pressed, the indicator lamp above the switch lights up to display the vent mode.

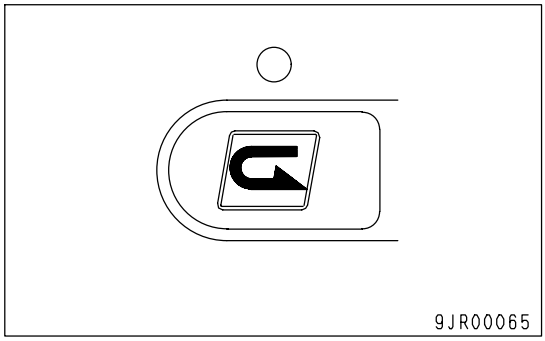


RECIRC/FRESH SELECTOR SWITCH

This switch (4) changes between recirculation of the internal air (RECIRC) or intake of external air (FRESH).
When pressing the switch, the indicator lamp on the top of switch lights up.

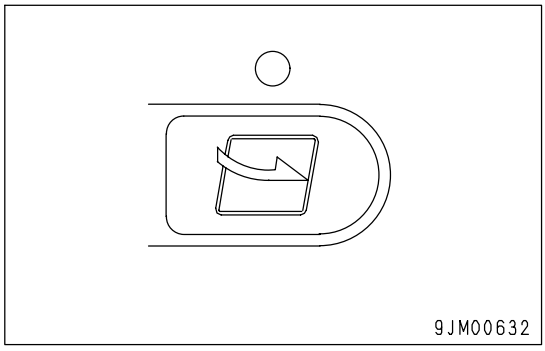
RECIRC

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



FRESH

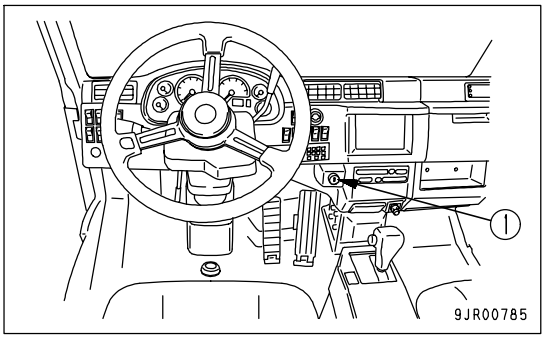
This switch (4) is used to cool or warm the cab with the fresh. Also, it is used for fresh air intake or to remove condensation on windows.



STARTING IN COLD WEATHER

⚠ WARNING

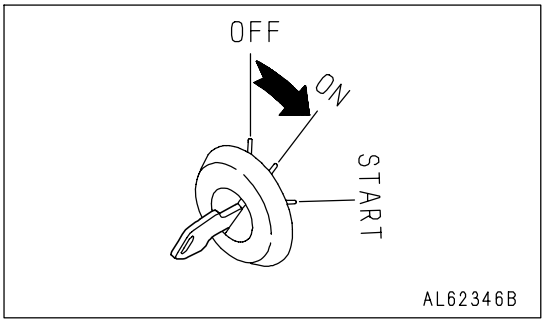
- **Start the engine only after sitting down in the operator's seat.**
- **Do not attempt to start the engine by short-circuiting the engine starting circuit. Such an act may cause a serious bodily injury or fire.**
- **Check that there are no persons or obstacles in the surrounding area, then sound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



NOTICE

- **Do not accelerate the engine suddenly before completing the warming-up operation.**
- **Do not keep the starting motor rotating continuously for more than 20 seconds.**
- **If the engine does not start, wait for at least 2 minutes before trying to start the engine again.**
- **If the accelerator pedal is kept depressed after starting the engine, the engine speed will suddenly rise after the turbo protect time, this may damage the turbocharger.**

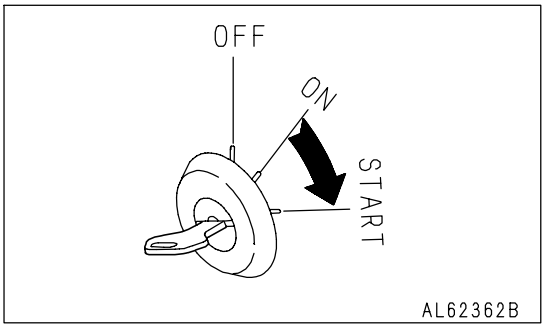
1. Turn the key of starting switch (1) to the ON position.
2. The pre-heating will start automatically according to the engine water temperature and the pre-heating pilot lamp will light up.



The pre-heating times are as shown below.

Engine water temperature	Pre-heating time
above - 5˚C (23˚F)	–
- 5˚C to - 20˚C (23˚F to - 4˚F)	20 to 40 sec
below - 20˚C (- 4˚F)	40 sec

3. When the pre-heating is completed, the pre-heating pilot lamp will go out.
4. When the engine starts, release the key in starting switch (1). The key will return automatically to the ON position.



REMARK

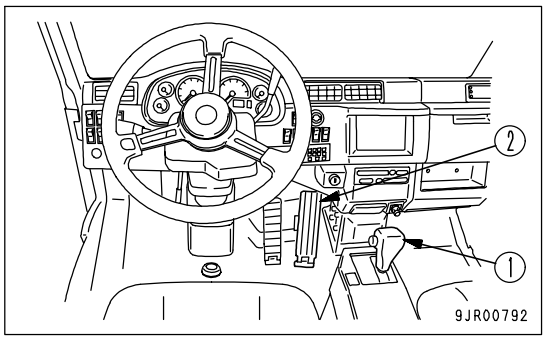
When starting the engine, the monitor may flash while the starting motor is turning, but if the monitor lamp goes out after the engine is started, there is no abnormality.

SHIFTING GEAR

When shifting gear, do as follows.

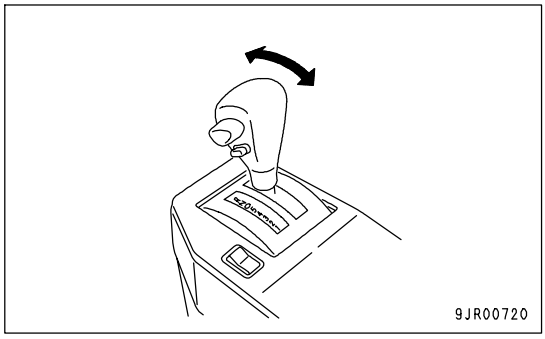
This machine has an automatic transmission, so set gear shift lever (1) to the desired position, and the transmission will automatically shift to a position to match the travel speed.

When the dump body is raised, if the shift lever is at the D position, the transmission is fixed in 2nd, and if it is at positions 1 - 5, the transmission is fixed in 1st. Keep the dump body lowered when traveling.



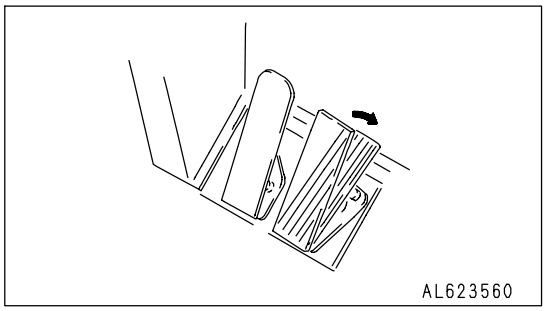
NOTICE

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



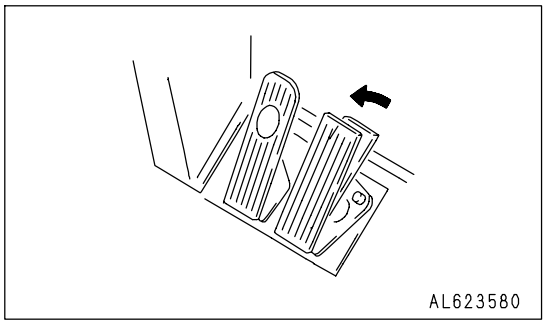
SHIFTING UP

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



SHIFTING DOWN

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



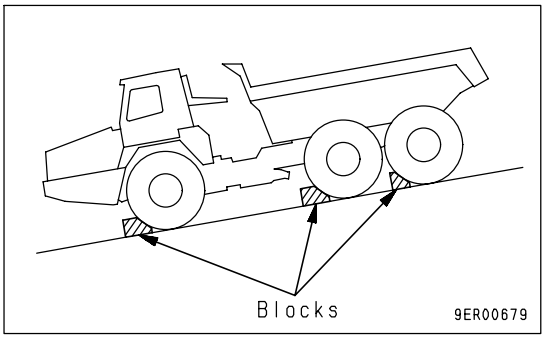
DOWN SHIFT INHIBIT

If the shift lever is operated when the machine is traveling, and the travel speed is faster than the maximum speed for each gear position, the transmission is not shifted immediately but is shifted down when the travel speed drops. This prevents overrunning of the engine.

PARKING MACHINE

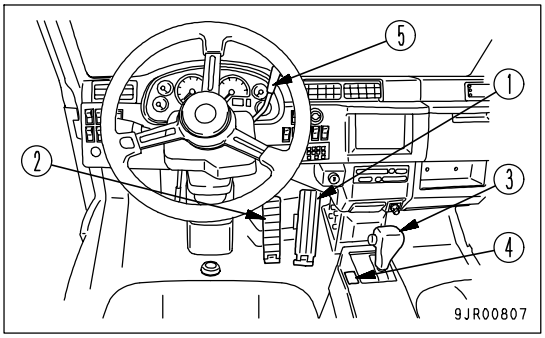
WARNING

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

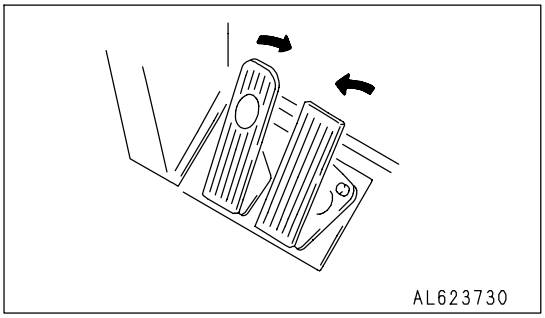


CAUTION

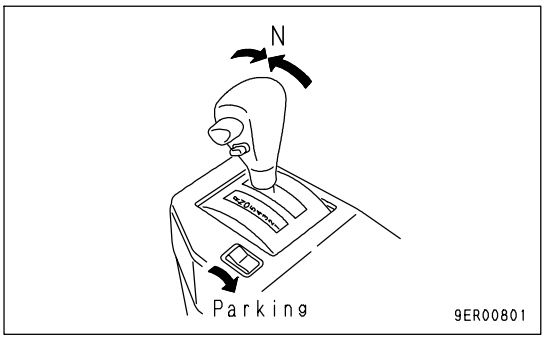
To prevent damage to the parking brake, apply the parking brake only when parking the machine.



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



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



LONG-TERM STORAGE

BEFORE STORAGE

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

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

DURING STORAGE

⚠ WARNING

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

Operate the engine and move the machine for a short distance once a month so that a new film of oil will be coated over movable parts and component surfaces. At the same time, also charge the battery.
Before operating the work equipment, wipe off all the grease from hydraulic piston rods.

AFTER STORAGE

NOTICE

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

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

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

PRECAUTIONS BEFORE TRAVELING AFTER LONG-TERM STORAGE

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

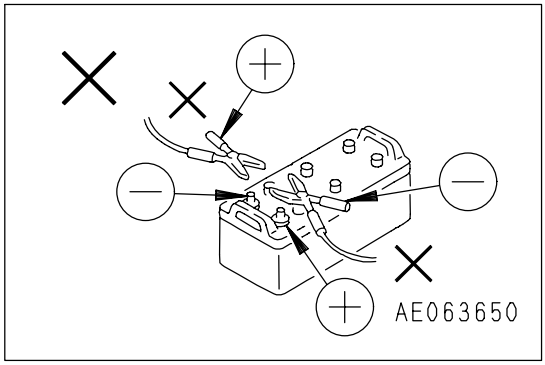
STARTING ENGINE WITH BOOSTER CABLE

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

PRECAUTIONS WHEN CONNECTING AND DISCONNECTING BOOSTER CABLE

⚠ WARNING

- **When connecting the cables, never contact the positive (+) and negative (-) terminals.**
- **When starting the engine with a booster cable, wear safety glasses and rubber gloves.**
- **Be careful not to let the normal machine and problem machine contact each other. This prevents sparks from generating near the battery which could ignite the hydrogen gas given off by the battery.**
- **Make sure that there is no mistake in the booster cable connections. The final connection is to the engine block of the problem machine, but sparks will be generated when this is done, so connect to a place as far as possible from the battery.**
- **When disconnecting the booster cable, take care not to bring the clips in contact with each other or with the machine body.**



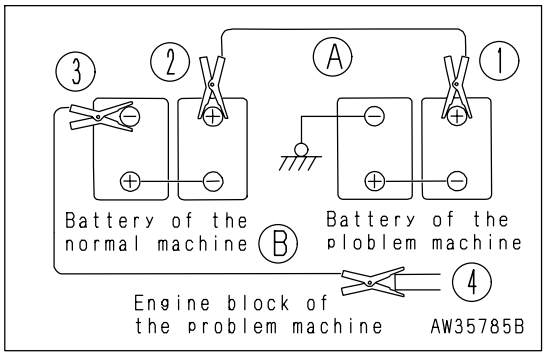
NOTICE

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

CONNECTING THE BOOSTER CABLES

Keep the starting switch of the normal machine and problem machine in the OFF position.
Connect the booster cable as follows, in the order of the numbers marked in the diagram.

1. Connect one clip of booster cable (A) to the positive (+) terminal of the problem machine.
2. Connect the other clip of booster cable (A) to the positive (+) terminal of the normal machine.
3. Connect one clip of booster cable (B) to the negative (-) terminal of the normal machine.
4. Connect the other clip of booster cable (B) to the engine block of the problem machine.



WHEN REQUIRED

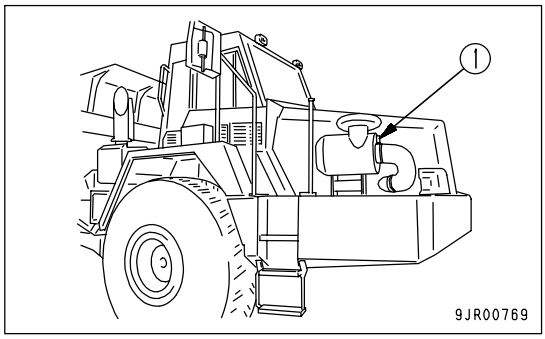
CHECK, CLEAN OR REPLACE AIR CLEANER

⚠ WARNING

- **If inspection, cleaning, or maintenance is carried out with the engine running, dirt will get into the engine and damage it. Always stop the engine before carrying out these operations.**
- **When using compressed air, there is danger that dirt may be blown around and cause serious injury. Always use protective glasses, dust mask, and other protective equipment.**

CHECKING

1. Check that the red line in the transparent portion of dust indicator (1) does not indicate 0.0075 MPa (30 INCHES H_2O) (0.076 kgf/cm^2, 1.1 PSI).
2. If the red line indicates 0.0075 MPa (30 INCHES H_2O) (0.076 kgf/cm^2, 1.1 PSI), clean or replace the air cleaner element immediately.
3. After checking, cleaning, or replacing, press the top of dust indicator (1) to return the red line to its original position.



NOTICE

- **Do not clean the element until the dust indicator shows 0.0075 MPa (30 INCHES H_2O) (0.076 kgf/cm^2, 1.1 PSI).**
- **If the element is cleaned frequently before the dust indicator shows 0.0075 MPa (30 INCHES H_2O) (0.076 kgf/cm^2, 1.1 PSI), the air cleaner will not be able to display its basic performance fully, and the cleaning efficiency will also go down. In addition, during the cleaning operation, more dirt stuck to the element will fall inside the inner element.**
- **If the pressure rises to 0.005 MPa (20 INCHES H_2O) (0.051 kgf/cm^2, 0.7 PSI) immediately after it is cleaned, replace the air cleaner elements (outer element and inner element). Even if the rise in pressure is slow, replace the air cleaner element once a year.**

EVERY 500 HOURS SERVICE

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

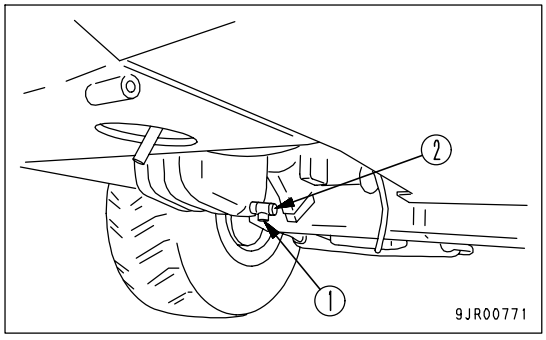
CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE

⚠ WARNING

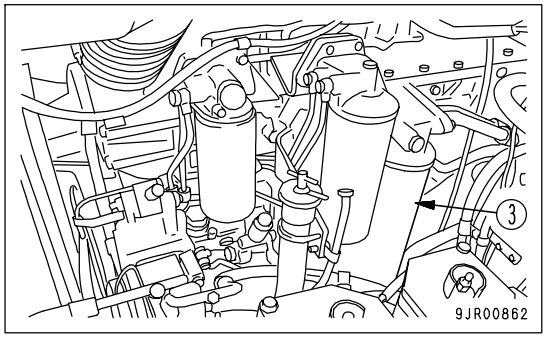
The parts and oil is at high temperature after the engine has been operated, and it can result in a burn. Wait for the oil to cool down before changing it.

- Refill capacity: 52 liters (13.74 US gal)
- Filter wrench

1. Set a container to catch the oil immediately under the drain valve under the chassis.
2. Remove drain plug (1), then loosen drain valve (2) slowly to avoid getting oil on yourself, and drain the oil. Be careful not to loosen the drain valve too far and deform the stopper pin inside the valve.



3. Check the drained oil, and if there are excessive metal particles or foreign material, please contact your Komatsu distributor.
4. Tighten drain valve (2) and drain plug (1).
   Tightening torque
   Drain plug (1), drain plug (2): 68.6 ± 9.8 N·m
   (7 ± 1 kgf·m, 50.6 ± 7.2 lbft)
5. Using the filter wrench, turn filter cartridge (3) to the left 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 oil will come out, so wait for 10 minutes before starting the operation.



6. Clean the filter holder, fill the new filter cartridge with oil, coat the packing face and thread with oil (or coat thinly with grease), then install the filter cartridge.
7. Install the filter cartridge. When doing this, be careful not to damage the outside cylinder of the cartridge.
   When installing the filter cartridge, tighten until the packing face is in contact with the filter holder, then tighten a further 3/4 to 1 turn.
8. Pour in the specified amount of engine oil from oil filler (F).
9. Run the engine for a short time at idling, then check the oil if it is filled up to a specified level. For details, see "CHECK OIL LEVEL IN ENGINE OIL PAN, ADD OIL (PAGE 3-72)".