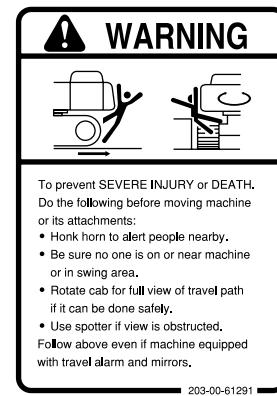


● Safety labels

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



Part No.

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.



Part No.

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.

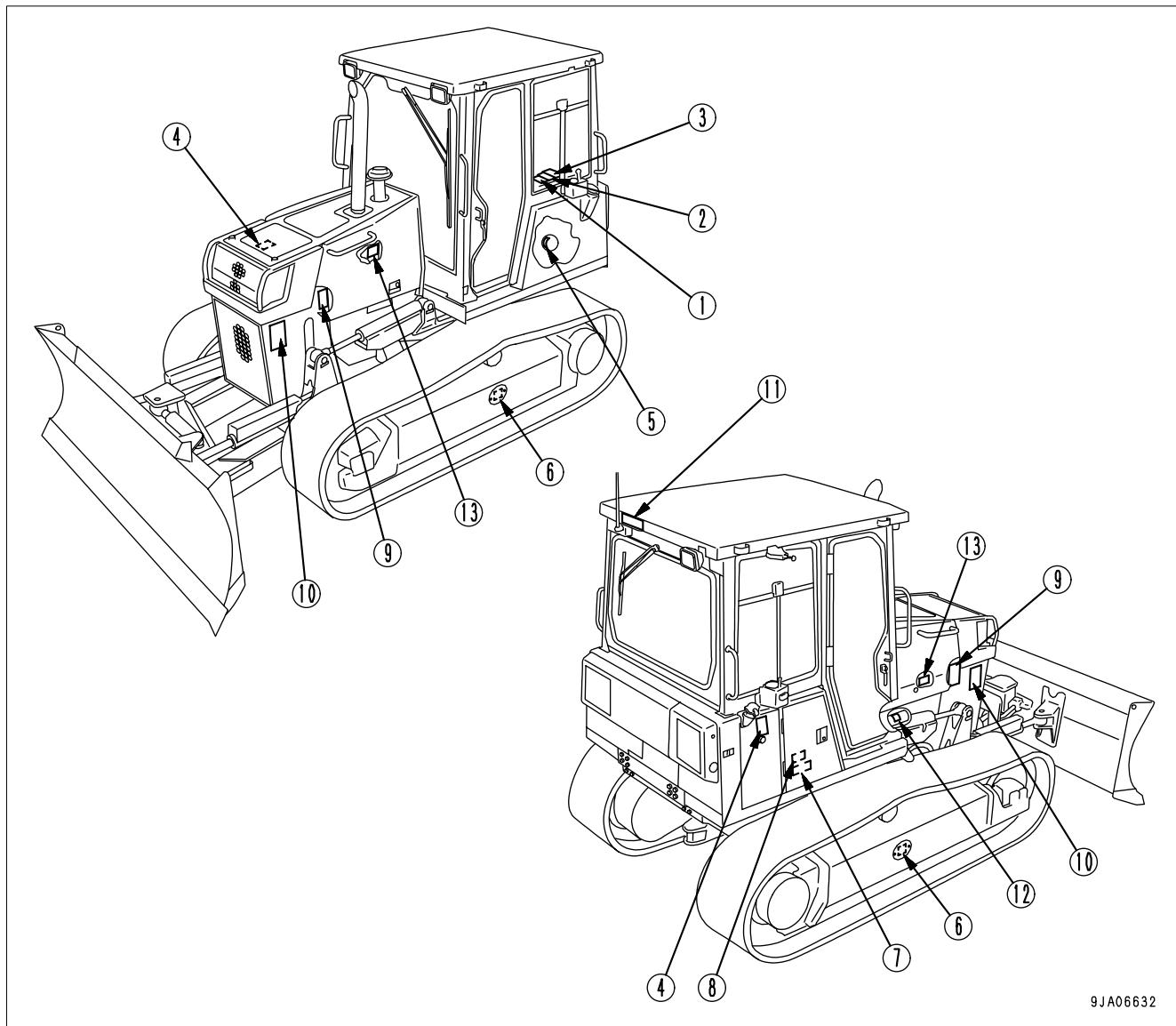
The numbers in circles in the illustrations correspond to the numbers in () in the text. (For example: ① -> (1))

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



GENERAL PRECAUTIONS

SAFETY RULES

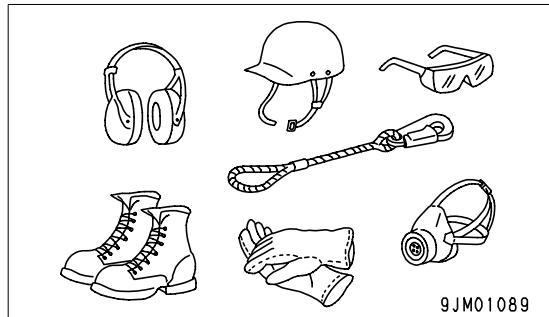
- Only trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
- If you are under the influence of alcohol or medication, your ability to safely operate or repair your machine may be severely impaired putting yourself and everyone else on your jobsite in danger.
- When working with another operator or with a person on worksite traffic duty, be sure that all personnel understand all hand signals that are to be used.

IF ABNORMALITIES ARE FOUND

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

CLOTHING AND PERSONAL PROTECTIVE ITEMS

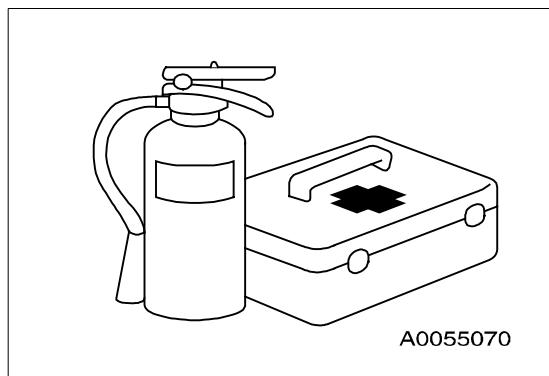
- Do not wear loose clothing and accessories. There is a hazard that they may catch on control levers or other protruding parts.
- If you have long hair and it hangs out from your hard hat, there is a hazard that it may get caught up in the machine, so tie your hair up and be careful not to let it get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



FIRE EXTINGUISHER AND FIRST AID KIT

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

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

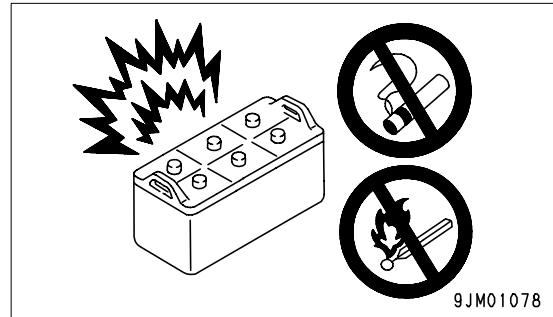


BATTERY

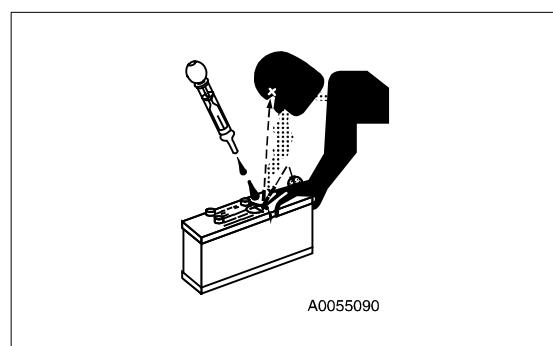
BATTERY HAZARD PREVENTION

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

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



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

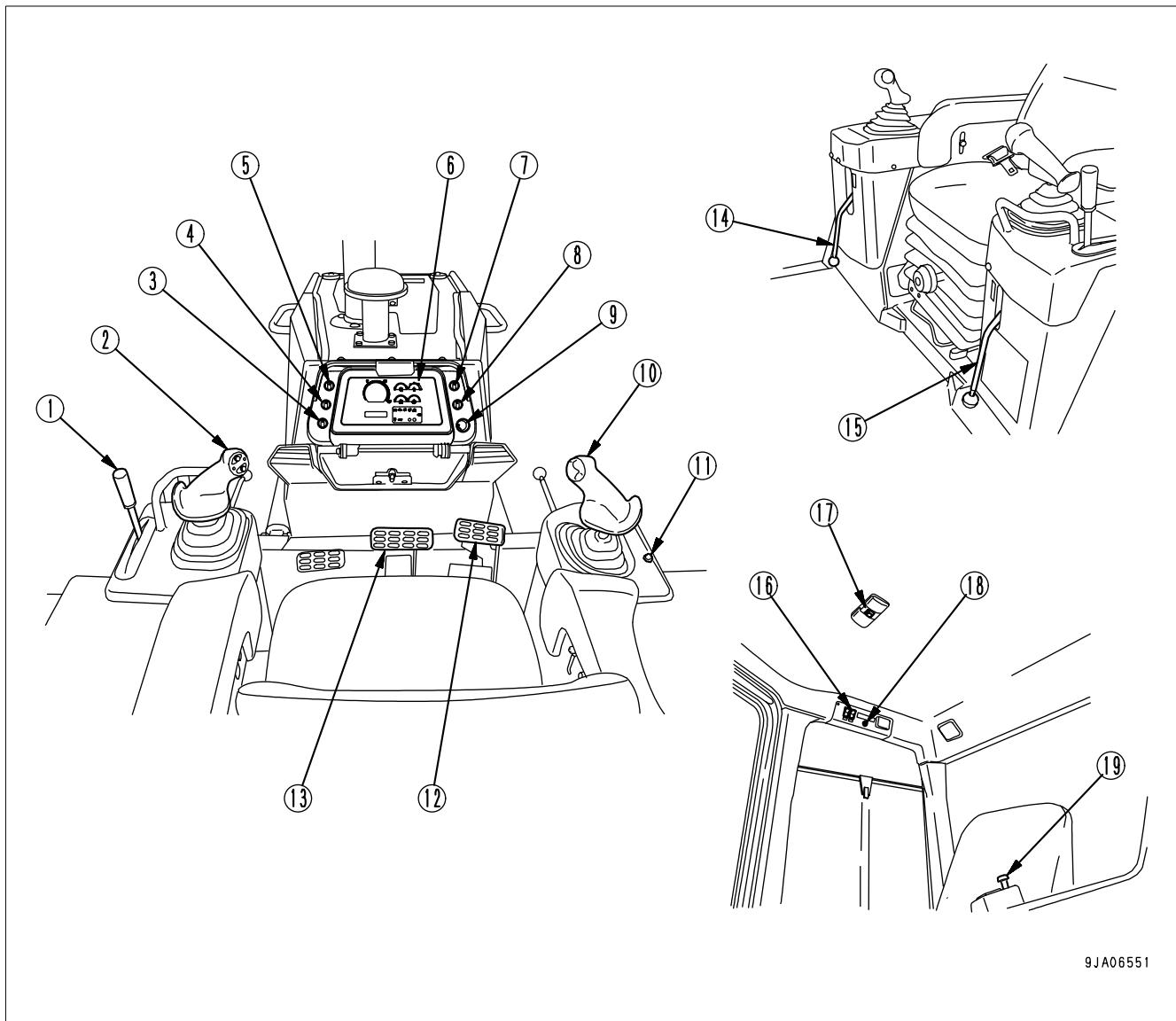


- Before working with batteries, turn the starting switch to the OFF position.

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

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

GENERAL VIEW OF CONTROLS AND GAUGES



9JA06551

(1) Fuel control lever	(11) Horn switch
(2) Joystick (Steering, directional and gear shift lever)	(12) Decelerator pedal
(3) Information switch	(13) Brake pedal
(4) Buzzer cancel switch	(14) Safety lock lever
(5) Lamp switch	(15) Parking lever
(6) Monitor panel	(16) Wiper switch (machine equipped with cab)
(7) Reverse travel speed setting switch	(17) Room lamp switch (machine equipped with cab)
(8) Shift mode switch	(18) Wiper motor breaker reset button (machine equipment with cab)
(9) Starting switch	
(10) Blade control lever	(19) Cigarette lighter (machine equipped with cab)

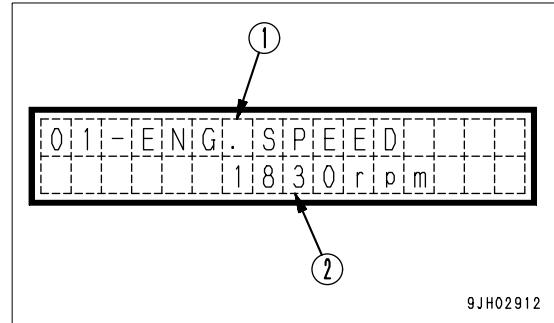
METHOD OF USING PM CLINIC AUXILIARY MODE

CAUTION

When moving the work equipment or setting the transmission to the travel position for carrying out measurements, check carefully that the situation is safe.

The PM clinic auxiliary mode displays the engine speed or hydraulic pressure on display panel B (multi-information).

Display panel B (Multi-information) displays the item on the top line (1) and the measured value on the bottom line (2).



The display items consist of the four items in the table below.

The items can be selected by operating the information switch (<, >).

Display	Item	Measured value
01-ENG.SPEED	Engine speed	rpm
02-BATTERY VOLT	Battery voltage	mV
03-HST TEMP	HST oil temperature	°C
04-VEHICLE SPEED	Vehice speed	km/h

REMARK

Items such as the engine speed fluctuate and are difficult to see during the measurement. In such cases, operate the buzzer cancel switch to \diamond . This makes it possible to hold the display of the value.

To cancel this mode, operate the buzzer cancel switch again to \diamond .

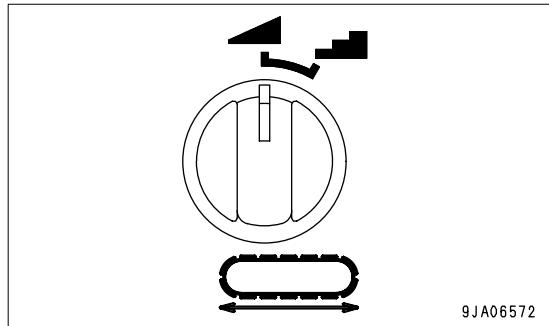
To return to the maintenance mode, operate the buzzer cancel switch to ■.

When switching the display item of the PM clinic auxiliary mode, set the safety lock lever to the LOCK position. If the safety lock lever is not at the LOCK position, the display item will not change when the information switch is operated.

SHIFT MODE SWITCH

Use this switch (5) to switch the shift mode.

For details, see "DISPLAY PANEL A (SPEED RANGE, SET TRAVEL SPEED, SHIFT MODE INDICATOR) (3-15)".



STARTING SWITCH

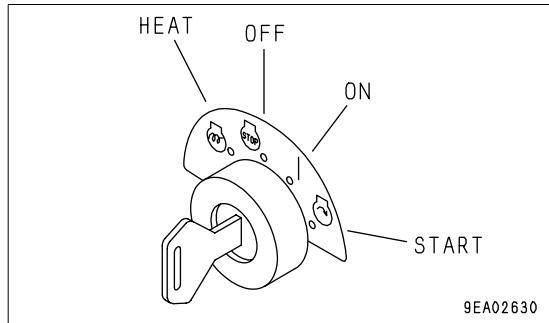
The switch (6) is used to start and stop the engine.

OFF position:

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

ON position:

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



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

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:

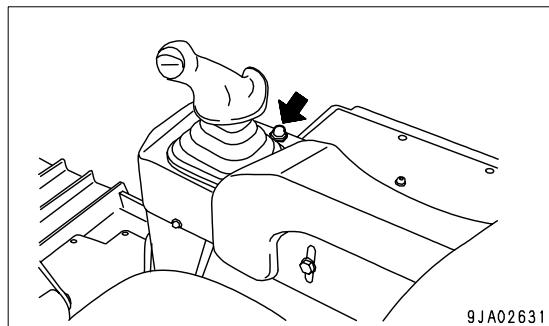
When starting the engine in cold weather, set the switch to this position. If the key is kept at the HEAT position, the engine preheating pilot lamp will light up.

Keep it at the HEAT position for the specified preheating time.

For details, see "STARTING IN COLD WEATHER (3-79)" in OPERATION portion.

HORN SWITCH

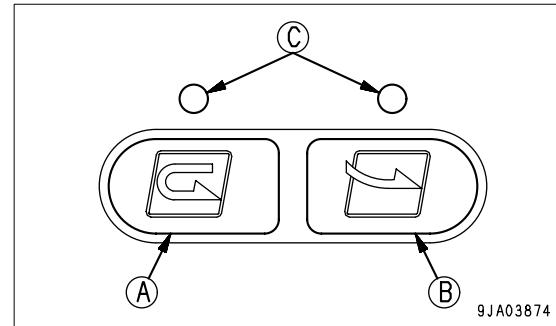
The horn sounds when the button (7) at the rear of the blade control lever at the right side of the operator's seat is pressed.



FRESH/RECIRC SELECTOR SWITCH

This switch (3) serves to change the air intake port when cooling or warming up the cab interior.

- Inside air: When switch (A) is depressed, the air conditioner takes in air inside the cab. Set the switch to this position, when strong cooling or warming is desired. There is no air ventilation or pressurizing function with this mode.
- Outside air: When switch (B) is depressed, the air conditioner takes in air outside the cab. Set the switch to this position, when normal cooling or warming is desired. With this mode, the inside air is ventilated and pressurized, preventing dust from entering the cab.

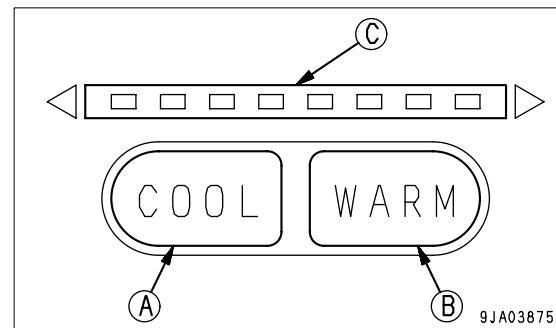


When pressing this switch, indicator (C) above lights up.

TEMPERATURE CONTROL SWITCH

This switch (4) serves to set the temperature in the cab when cooling or warming up the cab interior.

- If this switch (A) is kept depressed, the temperature of breeze continues to go down.
- If this switch (B) is kept depressed, the temperature of breeze continues to go up.



As the number of red lights in indicator lamp (C) increases, the room temperature becomes higher. Conversely, as the number of blue lights increases, the room temperature becomes lower.

AIR FLOW SELECTOR SWITCH

This switch (5) serves to adjust wind power from the air conditioner in three stages.

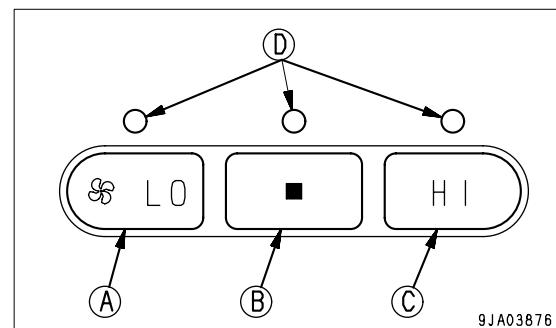
Switch (A): Low

Switch (B): Medium

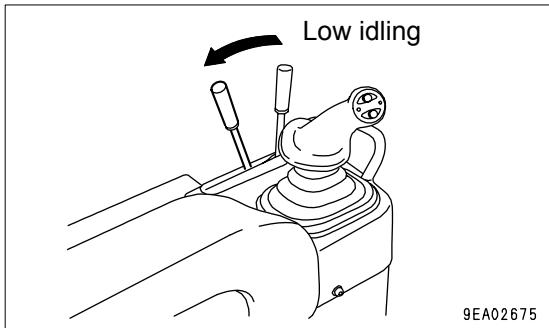
Switch (C): High

When pressing this switch, indicator (D) above lights up.

When stopping breeze, press OFF switch (1).



- Pull fuel control lever (1) to the center position between LOW IDLING and HIGH IDLING and run the engine at medium speed for about 5 minutes with no load.



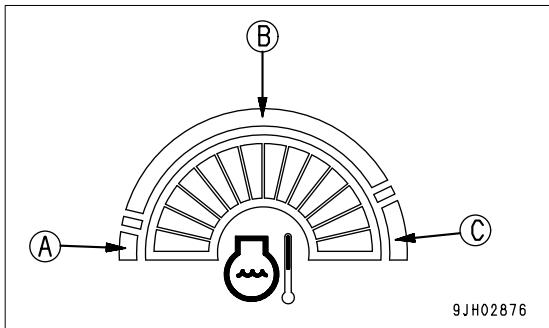
- After warm-up run is completed, check gauges and caution lamps for proper operation. If any abnormality is found, repair it.

Continue to run the engine under a light load until engine coolant temperature gauge indicator (2) is within the green range (B).

(A): White range

(B): Green range

(C): Red range



- Check that there is no abnormal exhaust gas color, noise or vibration. If any abnormality is found, contact your Komatsu distributor.

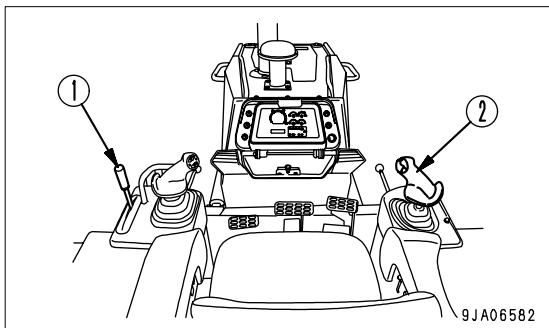
STARTING IN COLD WEATHER

(Ambient temperature below 10°C)

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

! CAUTION

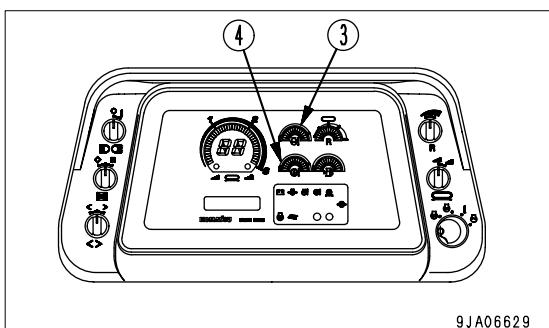
If the warming-up operation is not carried out thoroughly, the movement of the HST and work equipment will be slow, and there may be damage to the gauges and instruments.



NOTICE

Avoid abrupt acceleration until warm-up run is completed. Do not run the engine at low idle or high idle for more than 20 minutes.

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

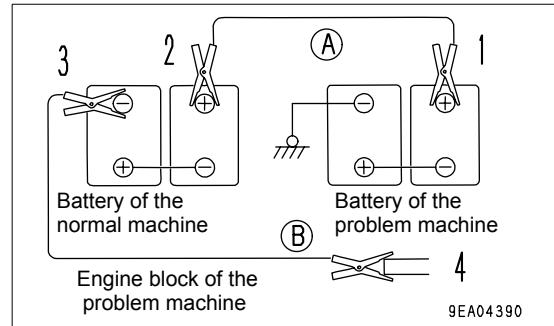


CONNECTING THE BOOSTER CABLE

Keep the starting switch of the normal machine and problem machine in the OFF position.

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

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



STARTING ENGINE

WARNING

Always check that the safety lock lever is set to the LOCK position, regardless of whether the machine is working normally or has failed. Check also that all the control levers are in the HOLD or neutral position.

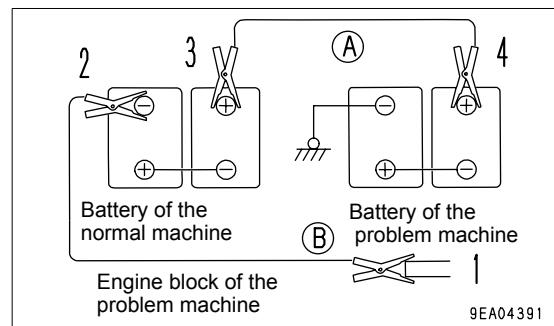
1. Make sure the clips are firmly connected to the battery terminals.
2. Start the engine of the normal machine and keep it running at high idle.
3. Turn the starting switch of the problem machine to the START position and start the engine.

If the engine doesn't start at first, try again after 2 minutes or so.

DISCONNECTING THE BOOSTER CABLE

After the engine has started, disconnect the booster cables in reverse order of connection.

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



WEAR PARTS LIST

Replace wear parts such as the filter element or air cleaner element at the time of periodic maintenance or before they reach the wear limit. The wear parts should be replaced correctly in order to ensure more economic use of the machine. When replacing parts, always use Komatsu genuine parts.

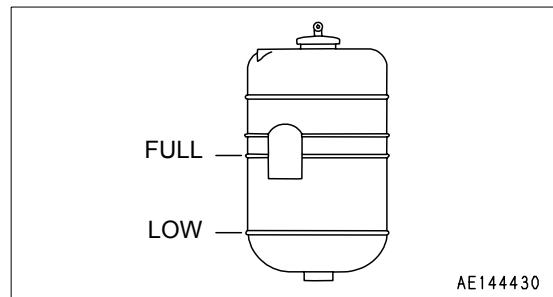
As a result of our continuous efforts to improve product quality, the part number may change, so inform your Komatsu distributor of the machine serial number and check for the latest part number when ordering parts.

WEAR PARTS LIST

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

Item	Part NO.	Part Name	Weight kg	Q'ty	Replacement frequency
Fuel filter	6732-71-6111	Cartridge	-	1	Every 500 hours service
Engine oil filter	6733-51-5141	Cartridge	-	1	
Corrosion resistor (if equipped)	600-411-1151	Cartridge	-	1	
Hydraulic oil filter	113-60-43321	Cartridge	-	1	Every 2000 hours service
HST charge filter	714-07-28712	Cartridge	-	1	
Air cleaner	600-185-2500	Element assembly (inner and outer)	-	1	-
Air condi- tioner	Fresh filter	14X-911-7750	Filter	-	-
	Recirc filter	14X-911-7741	Filter	-	

7. After draining the water, clean the cooling system with cleaning agent.
For the cleaning method, see the instructions for the cleaning agent.
8. Close drain valve (2). Wind seal tapes onto drain plug (3), then tighten it.
9. Add coolant until it overflows from the water filler.
Decide the proportions of antifreeze and water according to the table for the mixing rate of water and anti-freeze.
10. To remove the air in the coolant, run the engine for 5 minutes at low idling, then for another 5 minutes at high idling. (While doing this, leave the radiator cap removed)
11. Drain the cooling water inside sub-tank (4), clean the inside of the sub-tank, then fill again with cooling water to a point midway between the FULL and LOW marks.
12. Stop the engine and tighten the cap. Check the coolant level, and add water if the level is low.



CHECK TRACK SHOE TENSION, ADJUST

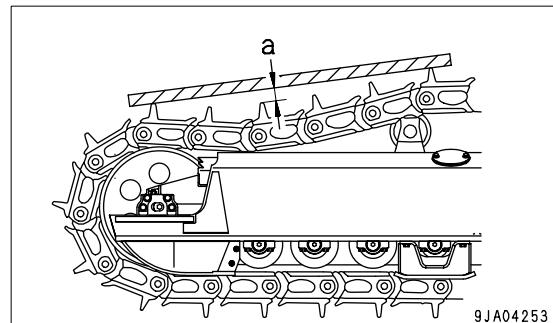
The wear of pins and bushings on the undercarriage will vary with the working conditions and types of soil. It is thus necessary to continually inspect the track tension so as to maintain the standard tension.

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).

INSPECTION

Stop the machine on level ground (stop with the transmission in FORWARD without applying the brake). Then place a straight bar on the track shoes between the carrier roller and the idler as shown in the figure, and measure the clearance between the bar and the grouser at the midpoint. If the clearance (a) is 20 to 30 mm, the tension is standard.

If the track tension is not at the standard value, adjust it in the following manner.



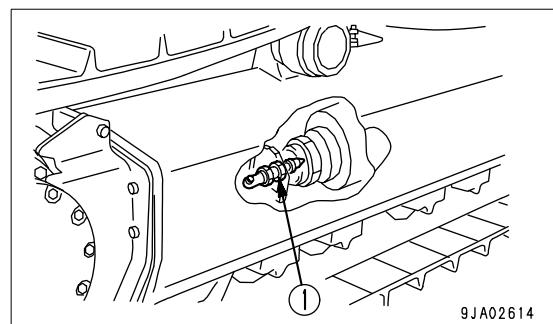
ADJUSTMENT

WARNING

There is danger of plug (1) flying out under the high internal pressure of the grease. Never loosen plug (1) more than 1 turn.

Never loosen any part other than plug (1). Never put your face in the mounting direction of plug (1).

If the track tension cannot be loosened with the procedure given here, please contact your Komatsu distributor.

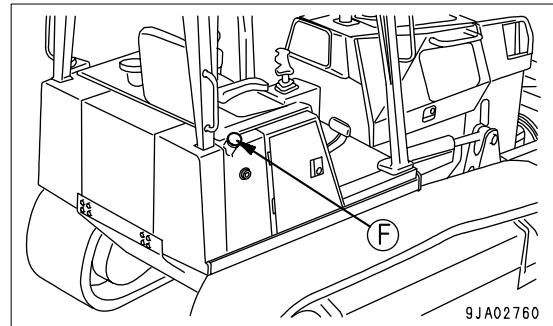


PROCEDURE FOR RELEASING INTERNAL PRESSURE OF HYDRAULIC SYSTEM

⚠ WARNING

- The hydraulic system is always under internal pressure, so when inspecting or replacing the piping or hoses, always release the pressure in the circuit before starting. If the pressure is not released, high pressure oil may spurt out and cause serious personal injury.
- The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.
- When the oil filler cap is removed, oil may spurt out, so turn the cap slowly to release the pressure before removing the cap.

1. Stop the machine on firm level ground.
2. Lower the blade to the ground, then stop the engine.
3. To release the internal pressure, operate the blade control lever in each direction to the end of its stroke within 15 seconds after stopping the engine.
4. Loosen oil filler cap (F) at the top of the hydraulic tank slowly to release the internal pressure.



SPECIFICATIONS

With power angle power tiltdozer and ROPS cab

	Item	Unit	D31EX-21	D31PX-21
	Machine weight	kg	7,130	7,650
	Name of engine	-	Komatsu SAA4D102E-2 diesel engine	
	Engine horsepower	kW (HP)/rpm	56 (75)/2,000	
A	Overall length	mm	4,015	3,995
B	Overall height (Not including antenna) (To tip of exhaust pipe)	mm	2,700 2,645	2,700 2,645
C	Overall width	mm	2,435	3,200 *2,875
	Travel speed (Quick shift mode)	Forward 1st/2nd/3rd	km/h	3.4/5.6/8.5
		Bckward 1st/2nd/3rd	km/h	4.1/6.5/8.5
	Travel speed (Variable shift mode)	Forward	km/h	0.8 - 8.5
		Backward	km/h	0.8 - 8.5

* Machines equipped with narrow blade

With power angle power tiltdozer and ROPS cab

	Item	Unit	D37EX-21	D37PX-21
	Machine weight	kg	7,410	7,770
	Name of engine	-	Komatsu SAA4D102E-2 diesel engine	
	Engine horsepower	kW (HP)/rpm	63 (85)/2,000	
A	Overall length	mm	4,015	3,995
B	Overall height (Not including antenna) (To tip of exhaust pipe)	mm	2,700 2,645	2,700 2,645
C	Overall width	mm	2,720	3,250 *2,875
	Travel speed (Quick shift mode)	Forward 1st/2nd/3rd	km/h	3.4/5.6/8.5
		Bckward 1st/2nd/3rd	km/h	4.1/6.5/8.5
	Travel speed (Variable shift mode)	Forward	km/h	0.8-8.5
		Backward	km/h	0.8-8.5

* Machines equipped with narrow blade

EQUIPPING FIRE EXTINGUISHER AND FIRST-AID KIT

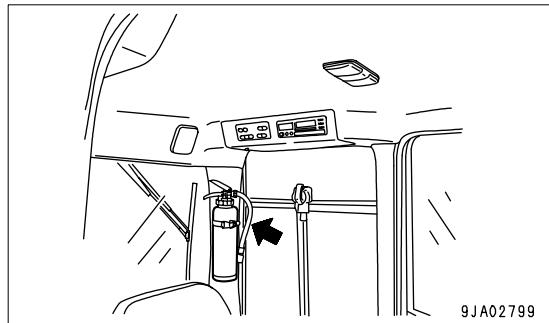
Equipping the fire extinguisher and the first-aid kit at the illustrated position needs brackets (if equipped).

The fire extinguisher and the first-aid kit can be installed to the positions shown in the following illustration.

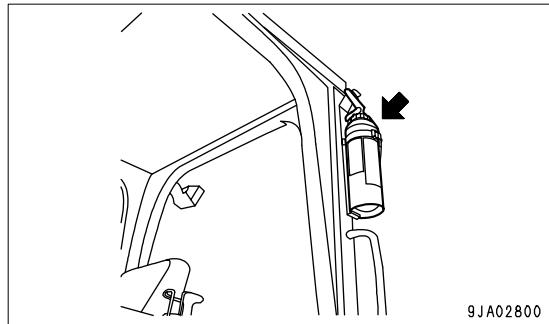
Equipping the fire extinguisher and the first-aid kit at the illustrated position needs brackets (option). For the brackets, please contact your Komatsu distributor.

When installing a fire extinguisher, install it in the position shown in the diagram.

- Machine equipped with cab



- Machine equipped with canopy



When installing a first aid box, install it in the position shown in the diagram.

