TEN00365-01

Operation & Maintenance Manual

HYDRAULIC
EXCAVATOR

PC2000-8

SERIAL NUMBERS 20186 and up

⚠ WARNING

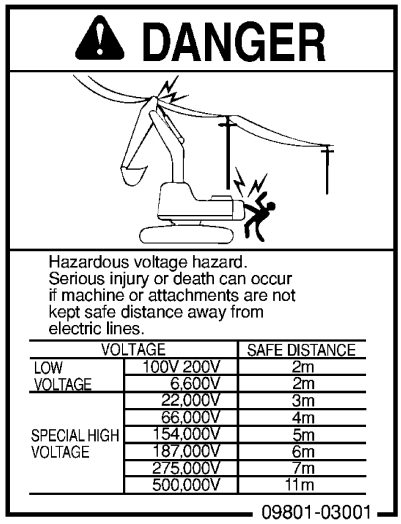
Unsafe use of this machine may cause serious injury or death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept near the machine for reference and periodically reviewed by all personnel who will come into contact with it.

NOTICE

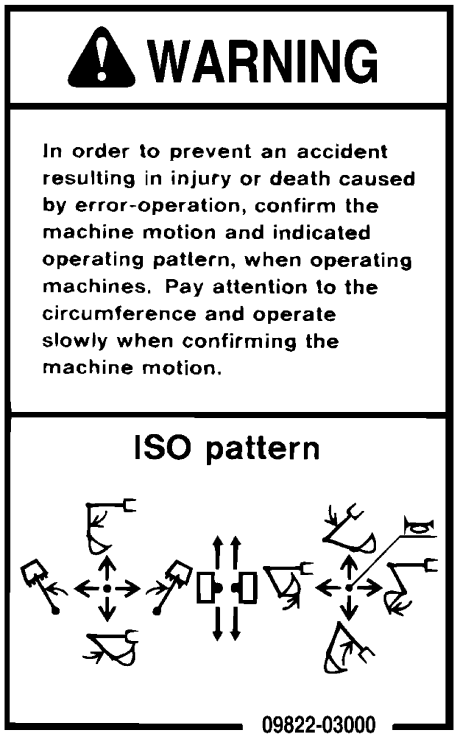
Komatsu has Operation & Maintenance Manuals written in some other languages. If a foreign language manual is necessary, contact your local distributor for availability.

KOMATSU

(4) Caution for going close to electric cables (09801-03001)



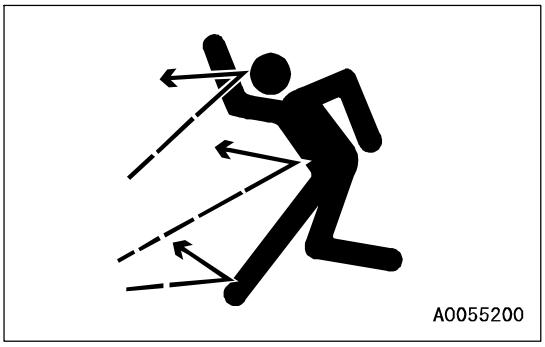
(5) Caution for operating pattern (09822-03000)



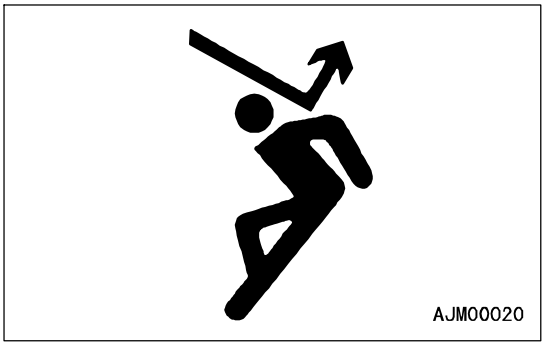
(6) Caution for adjusting track tension (09657-03003)

PROTECTION AGAINST FALLING, FLYING, INTRUDING OBJECTS

On jobsites where there is a hazard that falling objects, flying objects, or intruding objects may hit or enter the operator's cab, consider the operating conditions and install the necessary guards to protect the operator.



- When operating on jobsites, such as mines or quarries, where there is a hazard of falling rocks, install FOPS and a front guard, and always keep all the windows and doors closed when operating. In addition, always check that there is no one except the operator in the surrounding area. They may be hit by falling objects or flying objects.



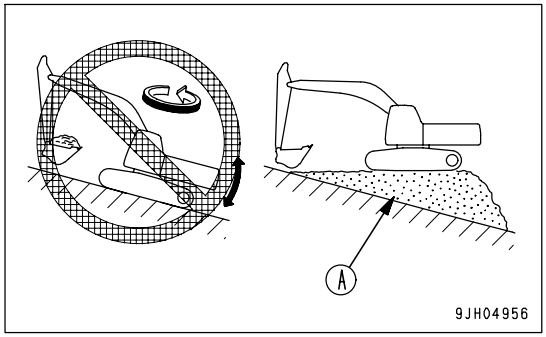
- When carrying out demolition or breaker operations, install a front guard and always keep all the windows closed when operating. In addition, always check that there is no one except the operator in the surrounding area. They may be hit by falling objects or flying objects.
- If, furthermore, the machine is used for standard operations, it is also necessary to install additional guards, depending on the prevailing conditions at the jobsite.
  In such a case, do not operate the machine without an additional guard. Be sure to consult with your Komatsu distributor about necessary guards.

UNAUTHORIZED MODIFICATION

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

OPERATING ON SLOPES

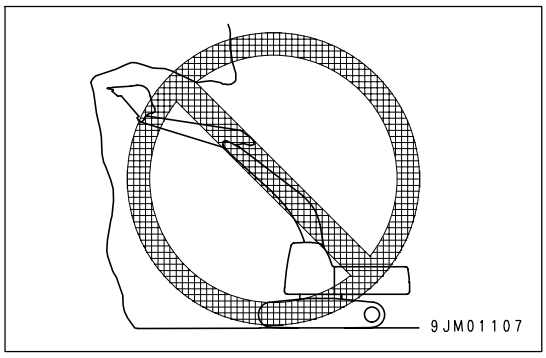
- When working on slopes, there is a hazard that the machine may lose its balance and turn over when the swing or work equipment are operated. This may lead to serious injury or property damage, so always provide a stable place when carrying out these operations, and operate carefully.
- Do not swing the work equipment from the uphill side to the downhill side when the bucket is loaded. This operation is dangerous, and may cause the machine to tip over.
- If the machine has to be used on a slope, pile the soil to make a platform (A) that will keep the machine as horizontal as possible.
- Do not work on a slope covered with the steel plates. Even with slight slopes there is a hazard that the machine may slip.



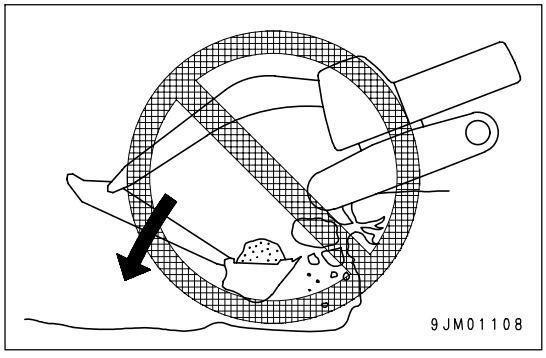
PROHIBITED OPERATIONS

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

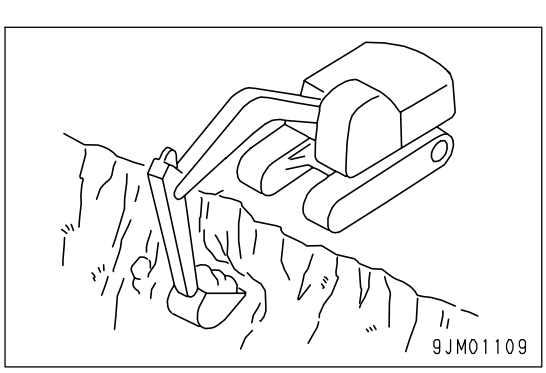
- Never dig the work face under an overhang. There is a hazard that rocks may fall or that the overhang may collapse and fall on top of the machine.



- Do not excavate too deeply under the front of the machine. The ground under the machine may collapse and cause the machine to fall.



- To make it easier to escape if there is any problem, set the tracks at right angles to the road shoulder or cliff with the sprocket at the rear when carrying out operations.

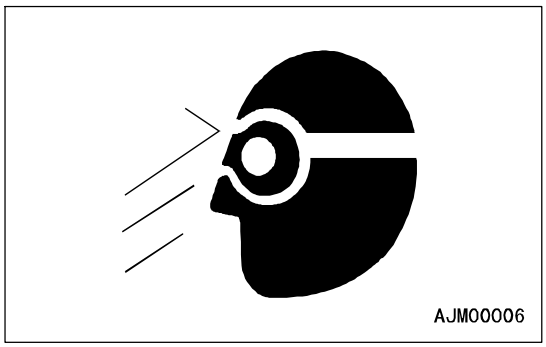


- **Danger of sparks**
  There is hazard that sparks will be generated, so always observe the following.
  - Do not let tools or other metal objects make any contact between the battery cables. Do not leave tools lying around near the battery.
  - When removing the battery cables, remove the ground cable (negative (-) cable) first. When installing, connect the positive (+) cable first, then connect the ground.
    Tighten the battery cable terminals securely.
  - Secure the battery firmly in the specified position.

PRECAUTIONS WHEN USING HAMMER

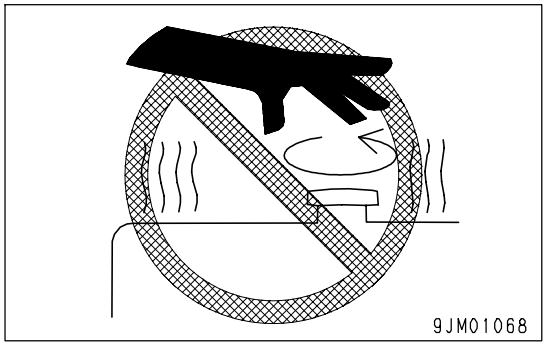
When using a hammer, pins may fly out or metal particles may be scattered. This may lead to serious personal injury or death. Always do as follows.

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



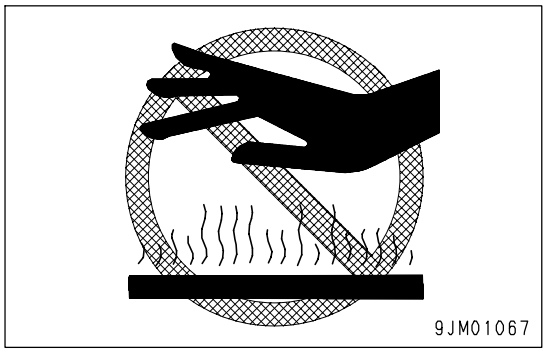
PRECAUTIONS WITH HIGH-TEMPERATURE COOLANT

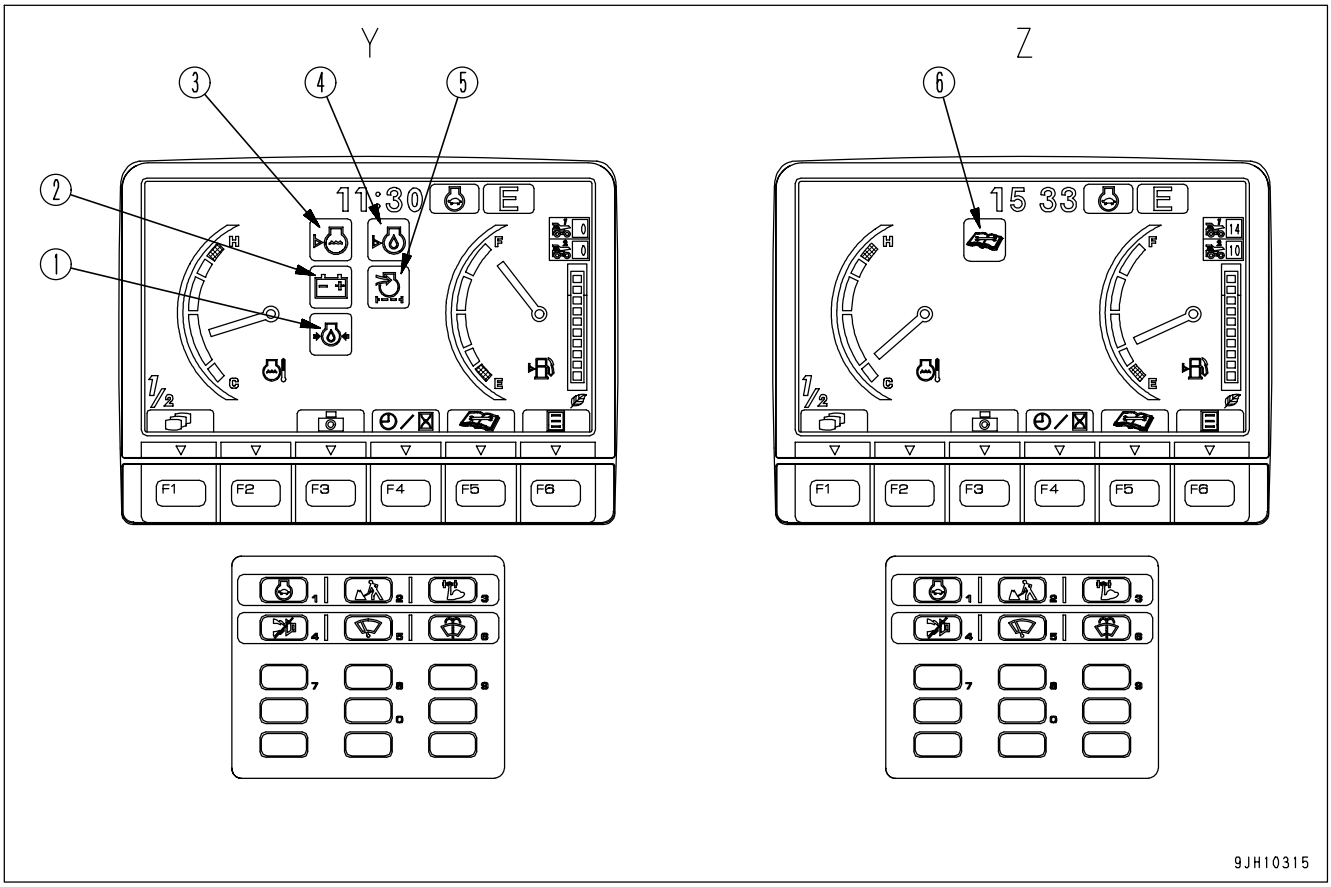
To prevent burns from boiling water or steam spurting out when checking or draining the coolant, wait for the coolant to cool down to a temperature where the radiator cap can be touched by hand. Then loosen the cap slowly to release the pressure inside the radiator, and remove the cap.



PRECAUTIONS WITH HIGH-TEMPERATURE OIL

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



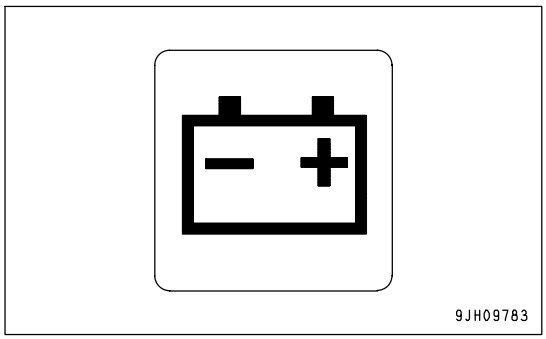


Y: Check before starting screen Z: Maintenance interval monitor screen

(1) Engine oil pressure monitor
(2) Charge level monitor
(3) Radiator coolant level monitor
(4) Engine oil temperature monitor
(5) Air cleaner clogging monitor
(6) Maintenance interval monitor

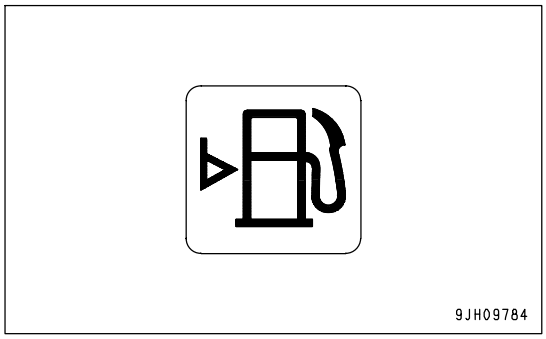
Charge Level Monitor

Monitor (1) warns the operator of an abnormality in the charging system while the engine is running.
If the battery is not being charged properly while the engine is running, monitor lights up red.
If monitor lights up red, check the V-belt for looseness. If any abnormality is found, perform the necessary actions. For details, see "OTHER TROUBLE (PAGE 3-268)".



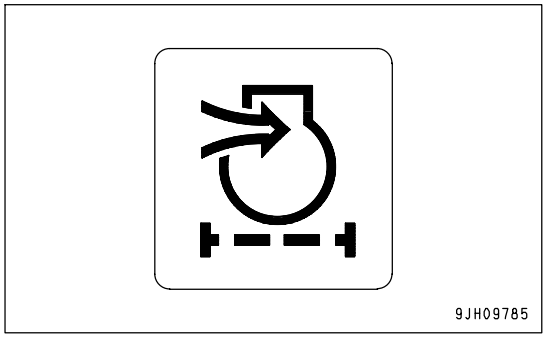
Fuel Level Monitor

Monitor (2) lights up to warn the operator the fuel level in the tank is low.
When the remaining amount of fuel in the tank goes down to approx. 200 liter (52.84 US gal), the monitor portion lights up red, so add fuel quickly.



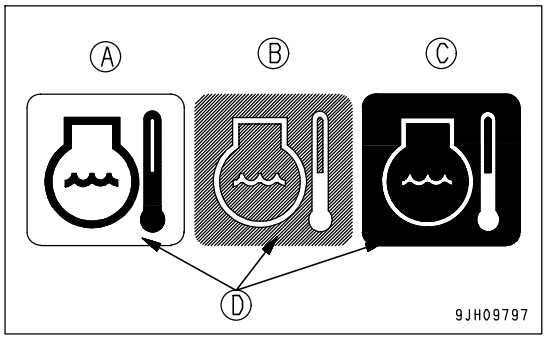
Air Cleaner Clogging Monitor

Monitor (3) warns the operator of a clogged air cleaner.
If the monitor lights up red, stop the engine, inspect and clean the air cleaner.



Engine Coolant Temperature Monitor

If this monitor (4) shows low-temperature display (A), carry out the warming-up operation. For details, see "Engine Warm Up (PAGE 3-211)".
Monitor (4) will show normal display (B), so carry out the warming-up operation for the engine.
Display (A) at low temperatures: Monitor background (D) is white
Display (B) at correct temperatures: Monitor background (D) is blue
Display (C) when condition is abnormal: Monitor background (D) is red

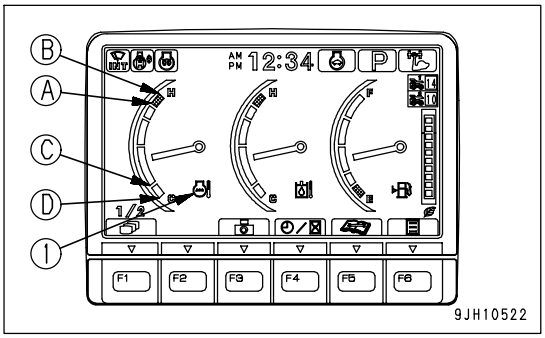


Gauges and Meter

Engine Coolant Temperature Gauge

This meter (6) shows the engine coolant temperature.

The indicator should be in the green range during operations. If the indicator enters the red range during operations, the overheat prevention system is actuated.



- (A) - (B): Red range
- (A) - (C): Green range
- (C) - (D): White range

The overheat prevention system is actuated as follows.

Red range (A) position: Engine coolant temperature monitor (1) shows abnormality display

Red range (B) position: Engine speed changes to low idling, engine coolant temperature monitor (1) shows abnormality display, alarm buzzer sounds at same time

The overheat prevention system continues to work until the indicator enters the green range.

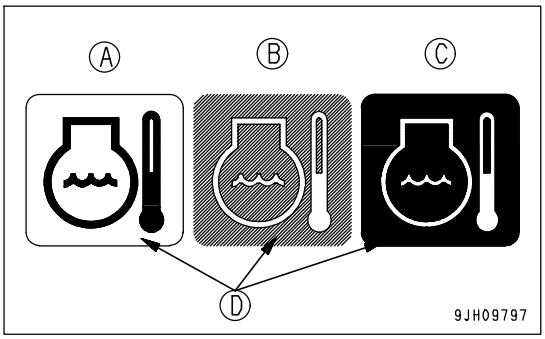
When the engine is started, if the indicator is in the (C) - (D) range, engine coolant temperature monitor (1) shows the low-temperature display.

If this happens, carry out the warming-up operation. For details, see "AFTER STARTING ENGINE (PAGE 3-210)".

Display (A) at low temperatures: Monitor background (D) is white

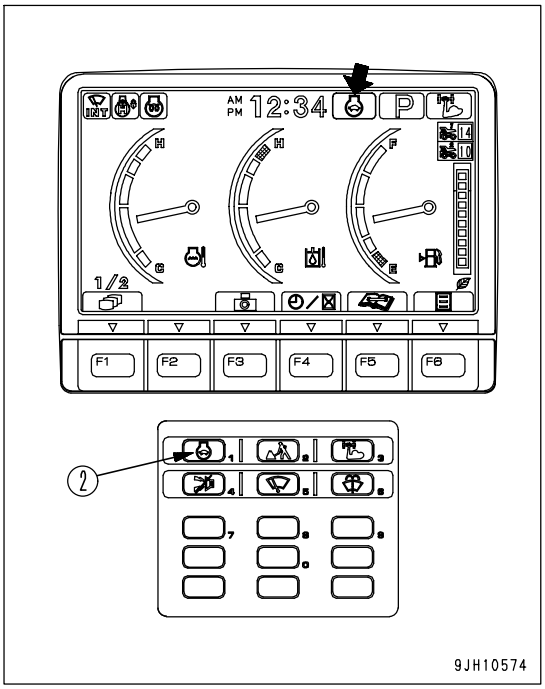
Display (B) at correct temperatures: Monitor background (D) is blue

Display (C) when condition is abnormal: Monitor background (D) is red



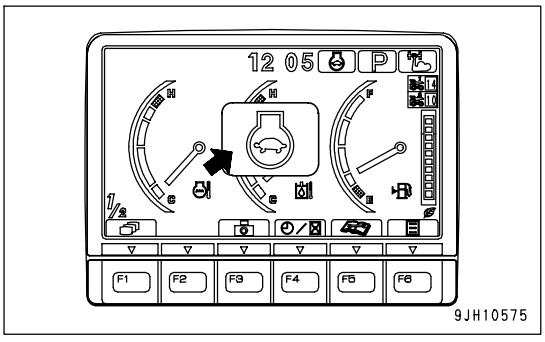
Auto-deceleration Switch

If the control levers are at neutral, this switch (2) automatically lowers the engine speed and turns on the function to reduce fuel consumption.
Auto-deceleration monitor ON: Auto-deceleration ON
Auto-deceleration monitor OFF: Auto-deceleration OFF
Each time the switch is pressed, the auto-deceleration is switched between ON and OFF.

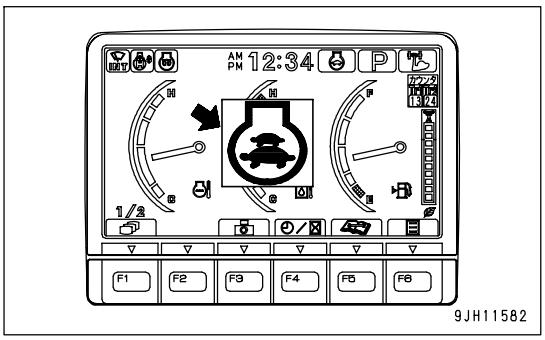


- Auto-deceleration function
  When the auto-deceleration function is ON, if the work equipment and travel levers are returned to the N position, the engine speed will drop after 4 seconds from the operating speed to idling speed.
  This makes it possible to reduce fuel consumption.
  If any lever is operated when the machine is in this condition, engine speed will return to the previous operating speed to make it possible to perform operations.

1. When auto-deceleration switch (2) is pressed and the auto-deceleration function is turned ON, the mode is displayed in the center of the monitor display, and after two seconds, the screen returns to the standard screen.

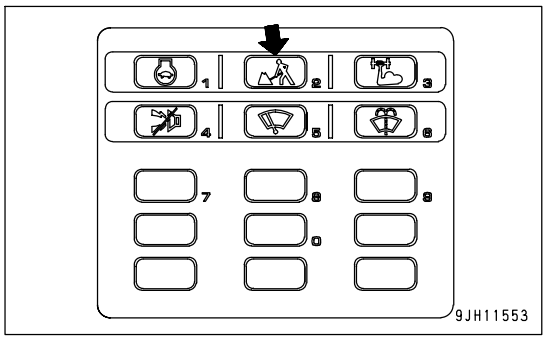


- When auto low idle function is ON

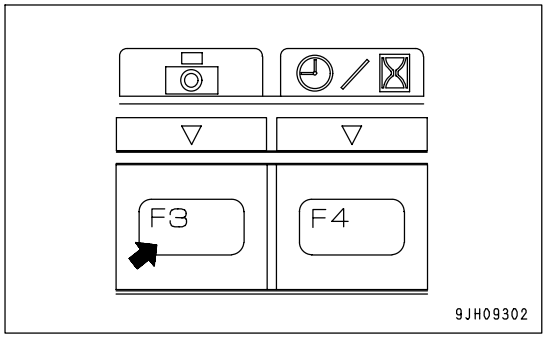


Other Mode Operations When Displaying Camera Image

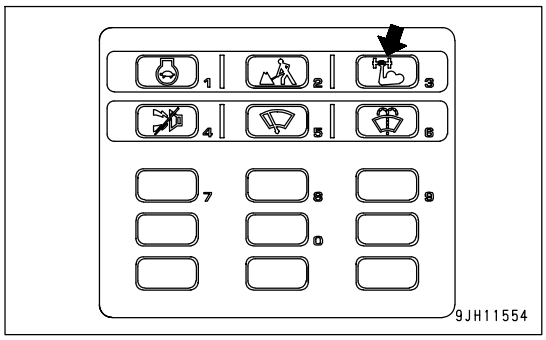
- It is possible to change the working mode by pressing the working mode selector switch.
  For details of the working mode selector switch, see "Working Mode Selector Switch (PAGE 3-33)".



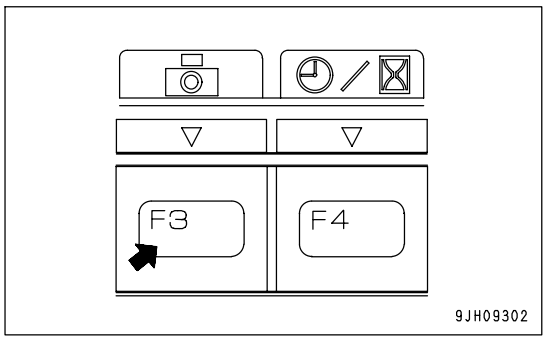
If the working mode is changed, the screen returns to the standard screen.
Press switch F3 again to return to the camera image display.



- When the heavy lift switch is pressed, the boom lifting power is increased when the boom RAISE is being operated independently.
  For details of the heavy lift switch, see "Heavy Lift Switch (PAGE 3-38)".

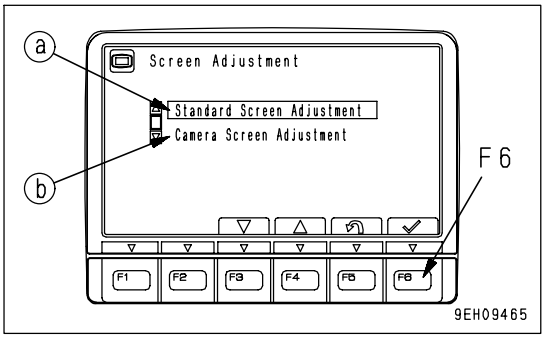


When the heavy lift switch is pressed, the screen returns to the standard screen. To display the camera screen, press function switch F3 again.



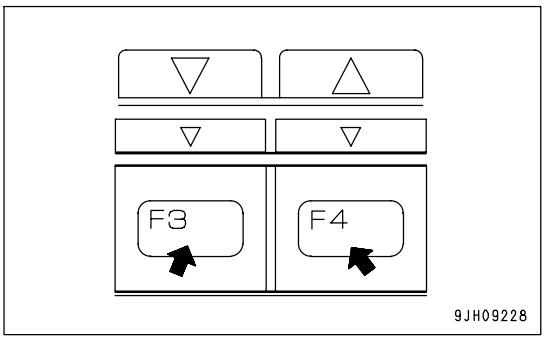
3. Select item to be adjusted (a) or (b) from the selection menu screen for screen adjustment, then press switch F6. The screen switches to the setting screen for the selected item.

   (a): Standard screen adjustment
   (b): Camera screen adjustment (only machines equipped with camera)

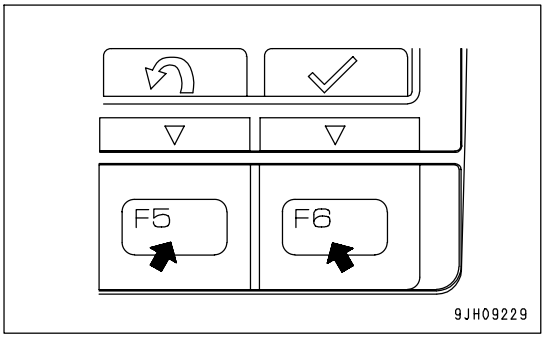


   • On the mode selection screen shown on the right, it is possible to carry out the following operations with switches F3 to F6.

   F3: Moves to next item (1 line down).
   F4: Moves to previous item (1 line up).
   F5: Returns to user menu screen.
   F6: Switches to setting screen for selected item.

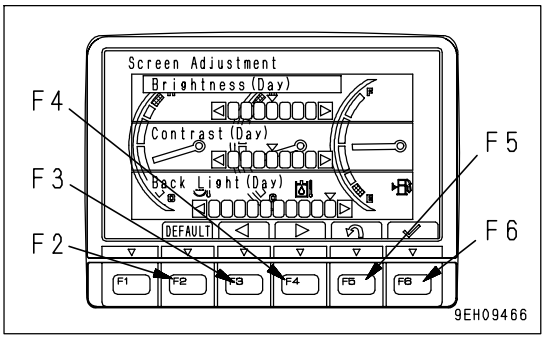


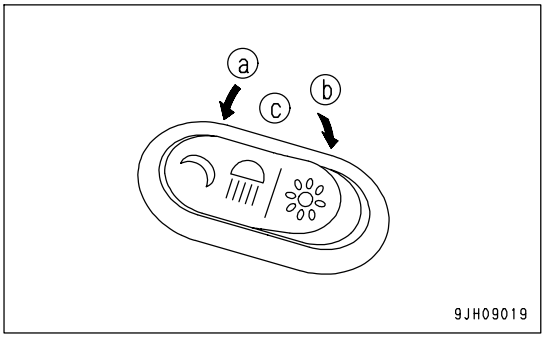
REMARK
If the machine is not equipped with a camera, the selection menu for screen adjustment is not displayed.
If screen adjustment is selected from the user menu, the adjustment screen in Step 4 is displayed.



4. Use switches F2 to F6 to adjust the brightness, contrast, and back light of the selected screen.

   1) Adjusting the standard screen
      • When the working lamp switch is in night position (a), if the standard screen is adjusted, it is possible to adjust the brightness of the monitor screen (night mode).
      • When the working lamp switch is in day position (b) or OFF position (c), if the standard screen is adjusted, it is possible to adjust the brightness of the monitor screen (day mode).

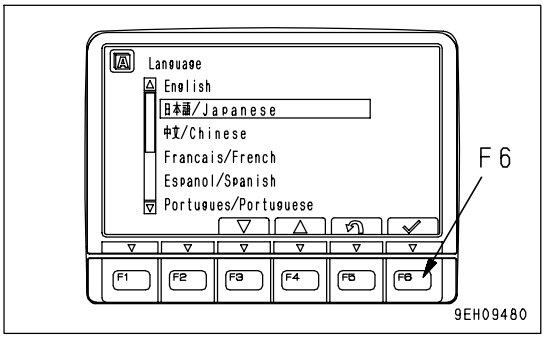


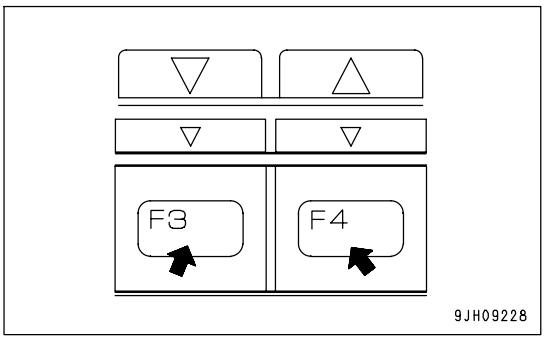


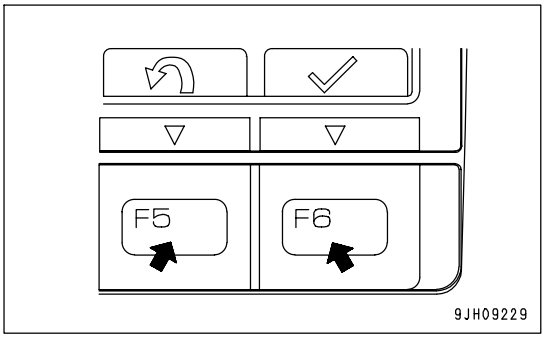
3. Select the language to use for the display, then press switch F6. The screen display changes to the selected language.

   • On the language selection screen, it is possible to carry out the following operations with switches F3 to F6.

   F3: Moves to item below.
   F4: Moves to item above.
   F5: Cancels change and returns to user menu screen.
   F6: Accepts change and returns to user menu screen.



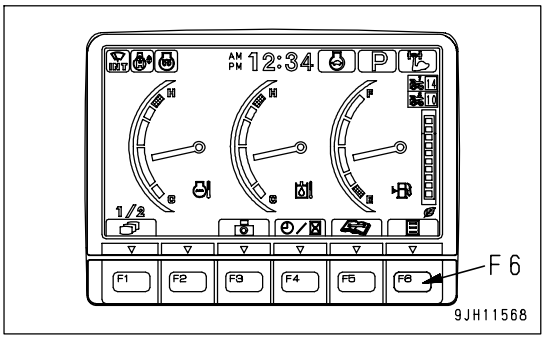




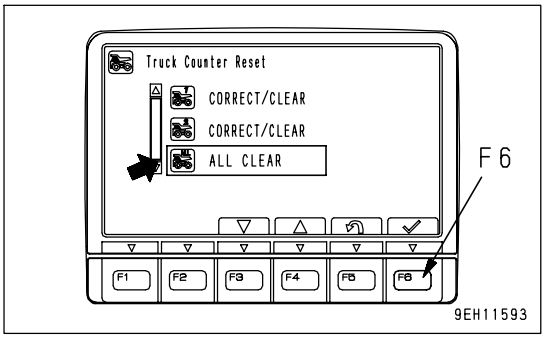
Adjusting Economy Mode

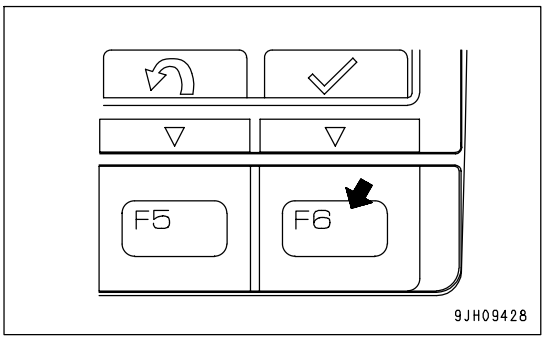
With this economy mode, the engine output can be adjusted to improve the fuel consumption in E mode.

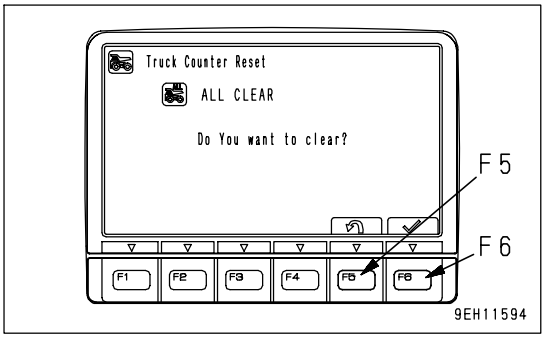
1. On the standard screen, press switch F6.

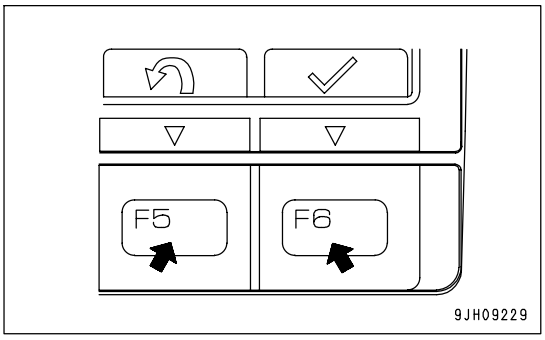


3) When resetting all the truck counters, select ALL CLEAR, then press function switch F6. The screen will switch to the ALL CLEAR screen.
When the ALL CLEAR screen is displayed, press function switch F6 to confirm.
   - After confirming, press function switch F5 to return to the previous screen.
   - If no switch is operated after confirming, the screen will return to the previous screen after 30 seconds.







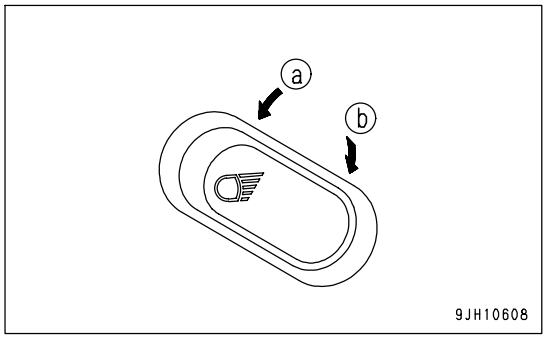


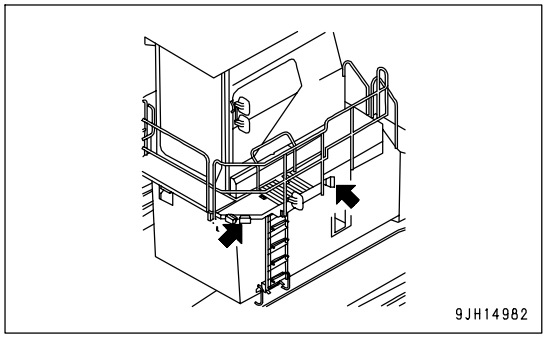
Additional Lamp Switch

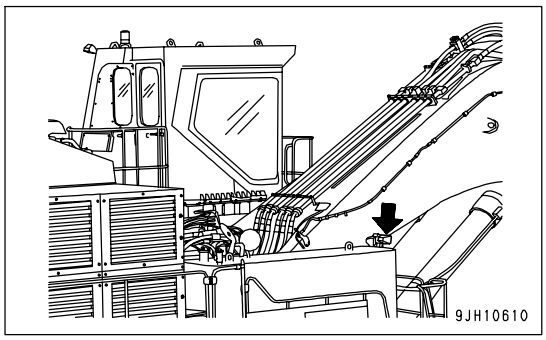
Use this switch (6) to light up the additional lamps on the left and right of the machine.

(a) ON position: Lights up

(b) OFF position: Goes out

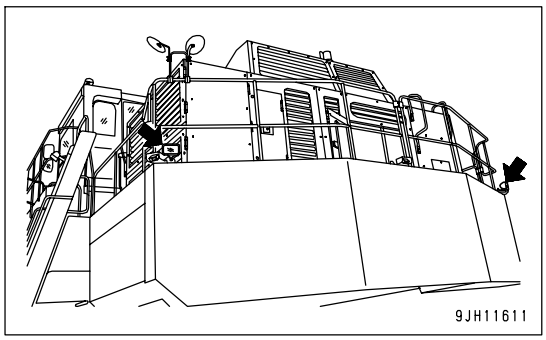






REMARK

- The rear lamp (if equipped) also lights up with the additional lamp switch.
- If a camera (if equipped) is installed to the rear counterweight, use the rear lamp (if equipped) fortnight lighting.



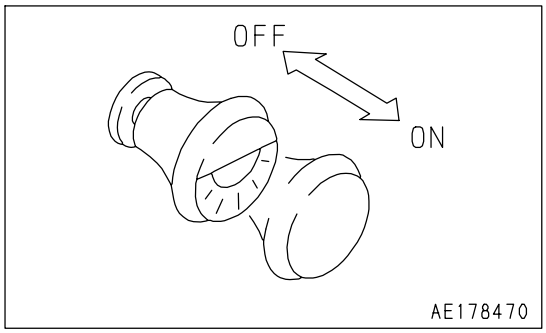
Room Lamp Switch (front of engine room)

NOTICE

It is possible to turn on the interior cab room lamp even when starting switch is in the OFF position, do not forget to turn it off.

Use this switch (23) to light up the room lamp inside the engine room.

ON position: Lights up
OFF position: Goes out



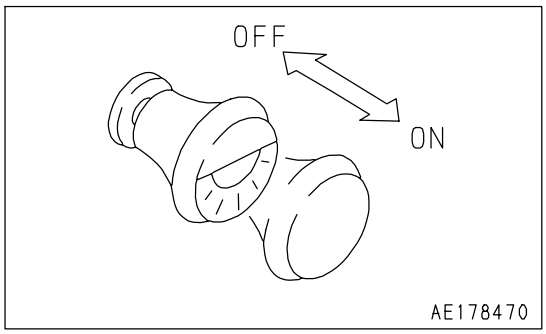
Room Lamp Switch (rear of engine room)

NOTICE

It is possible to turn on the interior cab room lamp even when starting switch is in the OFF position, do not forget to turn it off.

Use this switch (24) to light up the room lamp inside the engine room.

ON position: Lights up
OFF position: Goes out



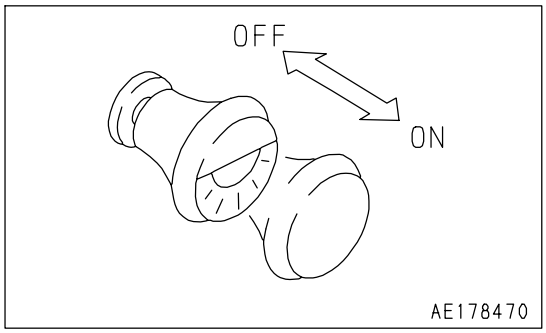
Room Lamp Switch (pump room)

NOTICE

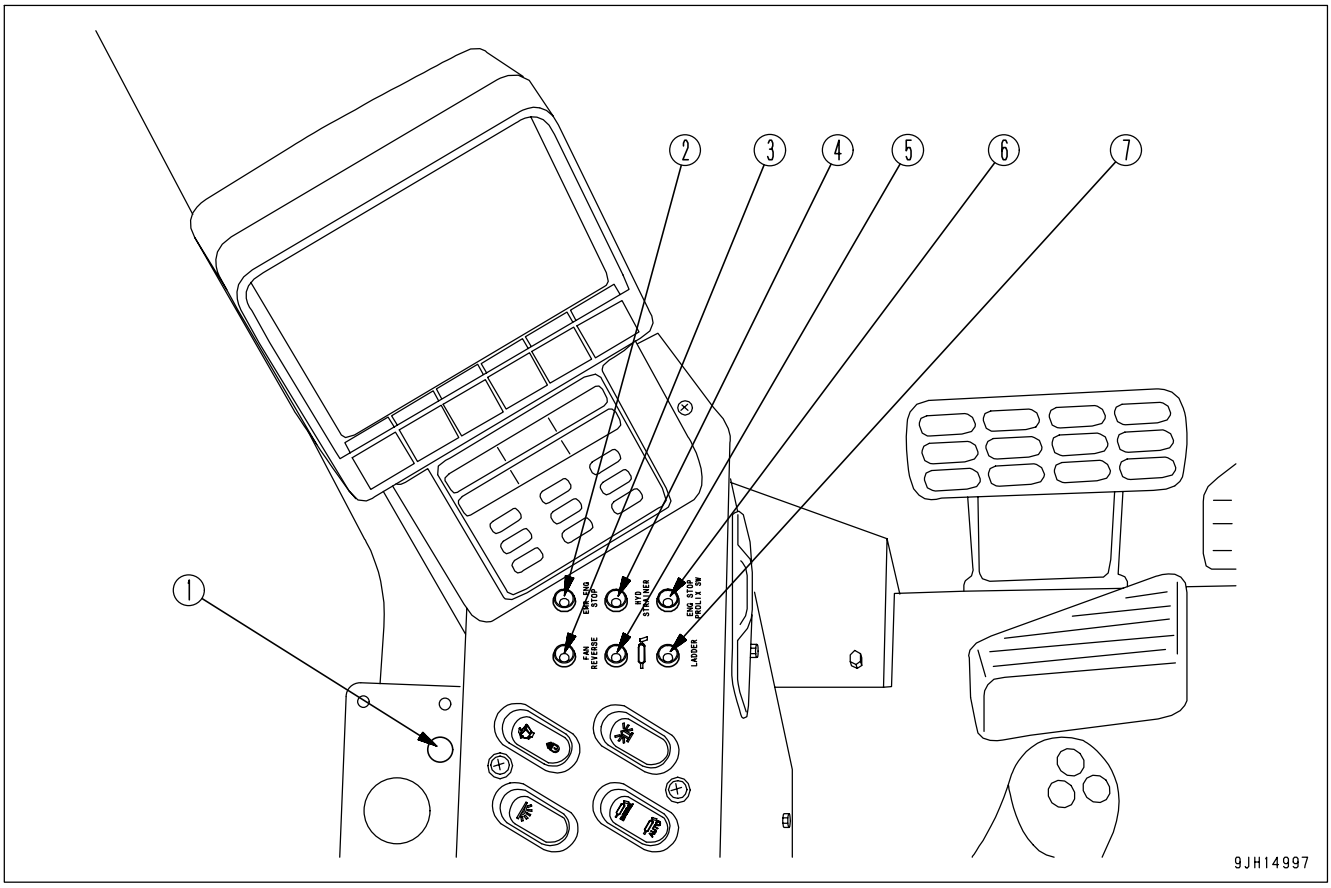
It is possible to turn on the interior cab room lamp even when starting switch is in the OFF position, do not forget to turn it off.

Use this switch (25) to light up the room lamp inside the pump room.

ON position: Lights up
OFF position: Goes out



LAMP (INSIDE OPERATOR'S CAB)

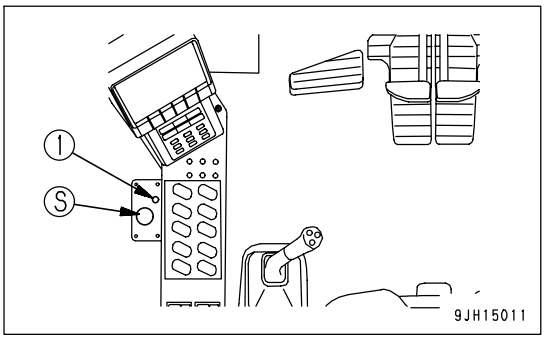


(1) Engine emergency stop Indicator lamp
(2) Engine emergency stop warning lamp
(3) Hydraulic oil strainer warning lamp
(4) Engine emergency stop cancel warning lamp
(5) Fan reverse rotation display lamp
(6) Automatic greasing warning lamp
(7) Ladder warning lamp

Engine Emergency Stop Indicator Lamp

This lamp (1) displays the status (ON/OFF) of engine emergency stop switch (S) to the left under the lamp.

Lighted up (Green): Engine emergency stop switch is at ON (emergency stop) position
Light off: Engine emergency stop switch (S) is at OFF (normal operation) position



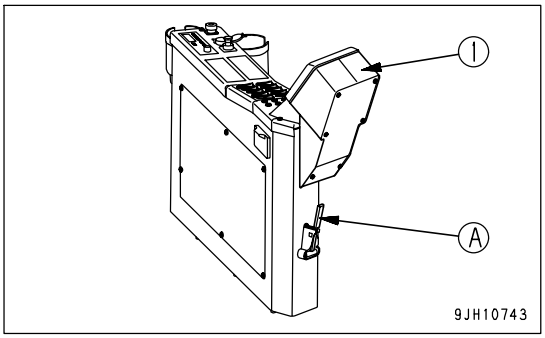
EMERGENCY ESCAPE HAMMER

NOTICE

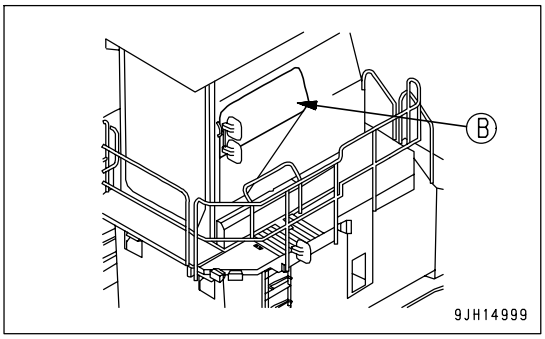
When escaping, remove the broken pieces of the glass from the sash so that you will not cut yourself with them. Take care not to slip on the broken and scattered pieces.

Hammer (A) is provided to help the operator get out of the cab in emergency, when the cab door or window will not open.

- Hammer (A) is installed at the front at the rear of the front left multi-monitor (1) inside the operator's compartment.

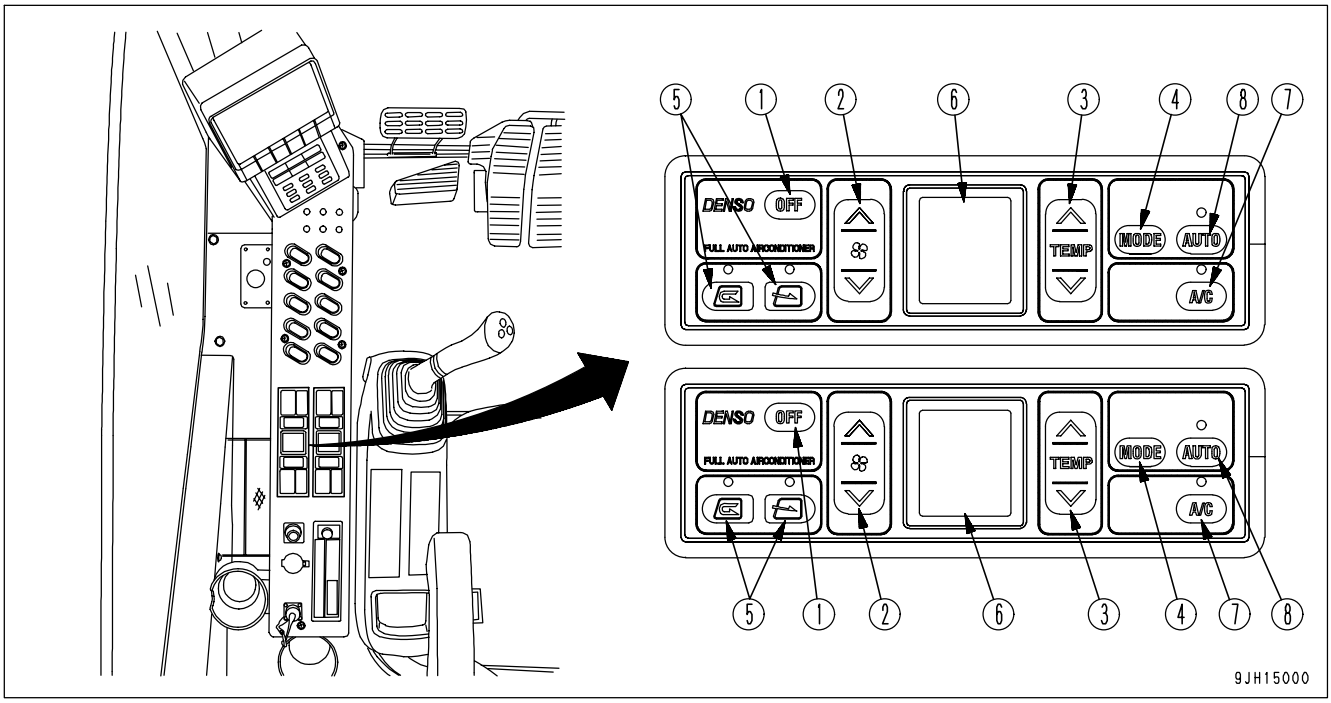


To escape, hit window glass (B) with hammer (A) to break it, then escape through the window.



AIR CONDITIONER CONTROLS

Air Conditioner Control Panel



(1) OFF switch
(2) Fan switch
(3) Temperature control switch
(4) Vent selector switch
(5) FRESH/RECIRC selector switch
(6) Display monitor
(7) Air conditioner switch
(8) Auto switch

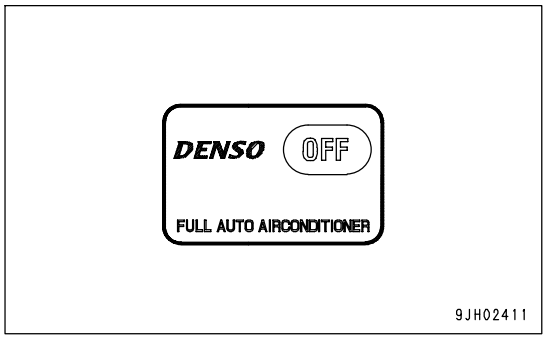
OFF Switch

Switch (1) is used to stop the fan and air conditioner.

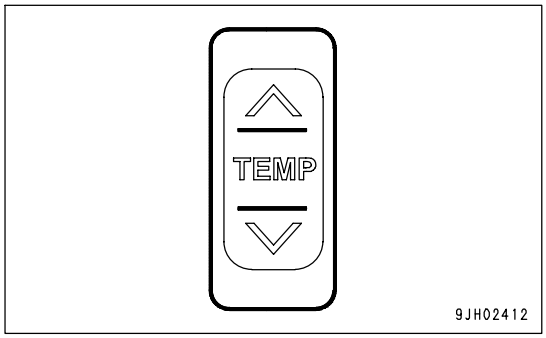
- When OFF switch (1) is pressed, the top portion of each of set temperature and air flow displays on display monitor (6) and air conditioner switch (7) go out, and operation stops.

REMARK

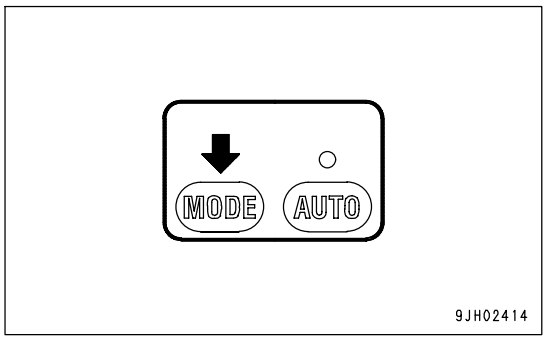
Even if switch (1) is turned OFF, the lamp at the top of FRESH/RECIRC selector switch (5) does not go out, but this does not indicate any abnormality.

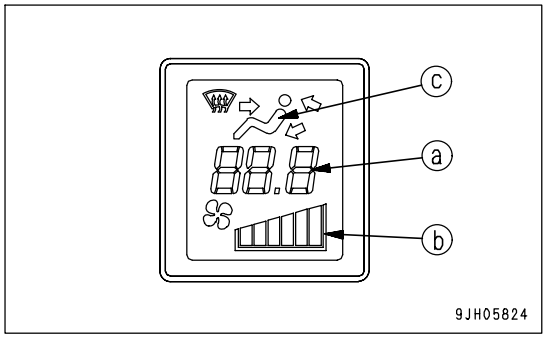


3. Press temperature setting switch (3) and adjust temperature inside the cab.

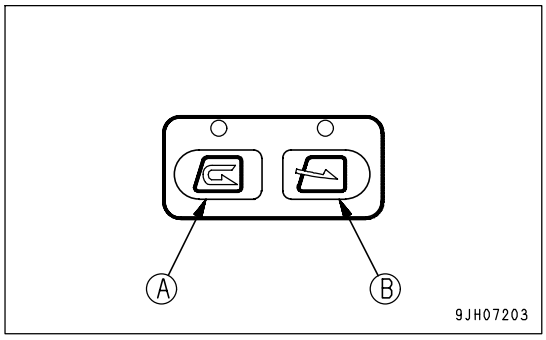


4. Press vent selector switch (4) and select the desired vents. When this is done, the display for vent (c) of the display monitor changes according to the selection.



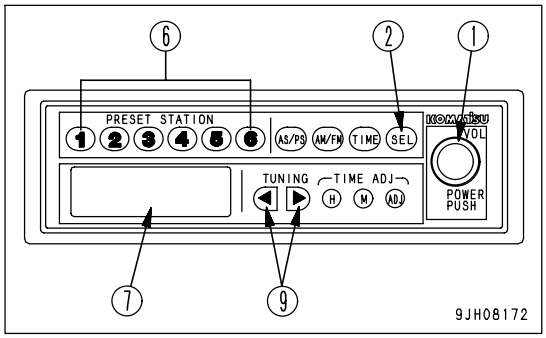


5. Press RECIRCL (A) or FRESH (B) on air source selector switch (5).



Controls of Radio

Method of Setting with Preset Button



1. Press power switch (1) and display the frequency on display (7).
2. Use tuning button (9) to set to the desired frequency. There are two methods for tuning: auto tuning and manual tuning.
3. With the display (7) showing the desired frequency, keep the desired Preset button No pressed for at least 1.5 seconds. The reception sound will disappear, but when the presetting operation (saving to memory) is completed, the sound will appear again and the Preset No and frequency will be shown on the display to show that the presetting operation has been completed.
   After completing the presetting, press Preset button (6) and release it within approx. 1.5 seconds. This will make it possible to receive the channel preset to that button. One channel each for AM and FM can be preset to each Preset button.

REMARK
It is also possible to save to the Preset button by using the auto store button.

Method of Tuning

1. Press power switch (1) and display the frequency on display (7).
2. Use tuning button (9) to set to the desired frequency. There are two methods for tuning: auto tuning and manual tuning.

• Manual tuning

Press tuning button (9) until the frequency is displayed on display (7).
< button: Frequency moves down
> button: Frequency moves up
When the frequency reaches the top or bottom frequency, it automatically continues as follows: Top → Bottom, or Bottom → Top.

• Auto tuning

Press tuning button (9) for at least 3 seconds. When a station is picked up, the tuning automatically stops. To search for the next station, press the tuning button again for at least 3 seconds.
< button: Frequency moves down
> button: Frequency moves up
If this button is pressed during auto tuning, the auto tuning will be cancelled and the setting will return to the frequency in use before the button was pressed.

CONTROLLER

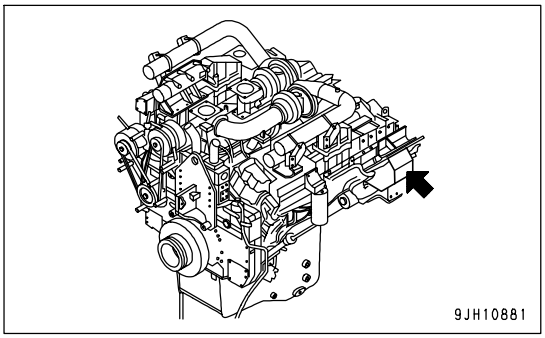
NOTICE

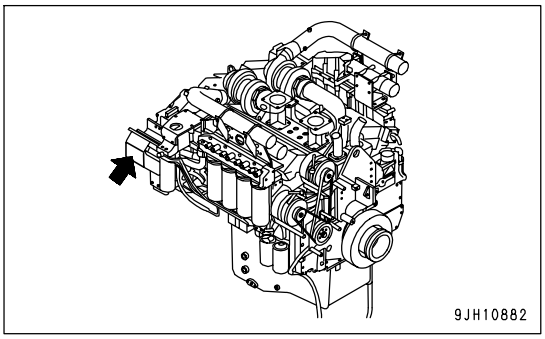
- **Do not let water, mud, or juice spill on the controller. This will cause failures.**
- **If any problem occurs in the controller, do not repair it by yourself. Please contact your Komatsu distributor for repairs.**

(1): Engine controller

There are two engine controllers: one each on the left and right sides of the engine body.

- When removing the engine controller, use the following procedure.
  1. Turn the starting switch OFF, wait for 3 minutes, then remove the negative (-) terminal of the battery.
     (For machines equipped with the optional battery isolator switch, turn the starting switch OFF, then wait for at least 3 minutes before turning the battery isolator switch OFF.)
  2. Remove the positive (+) terminal of the battery.

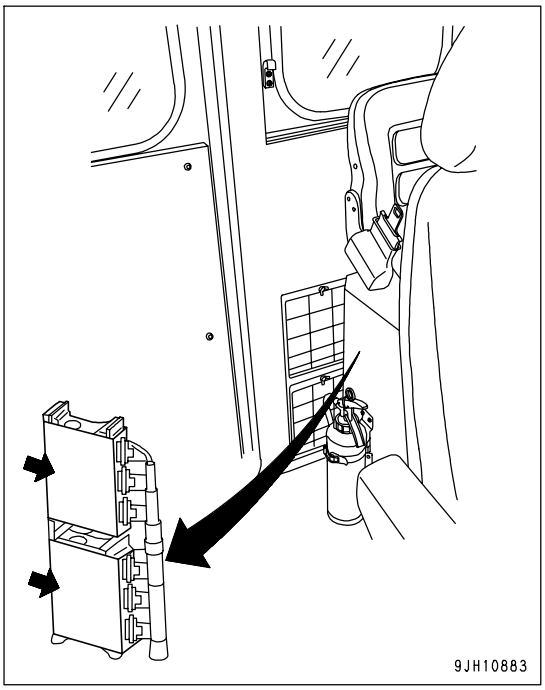




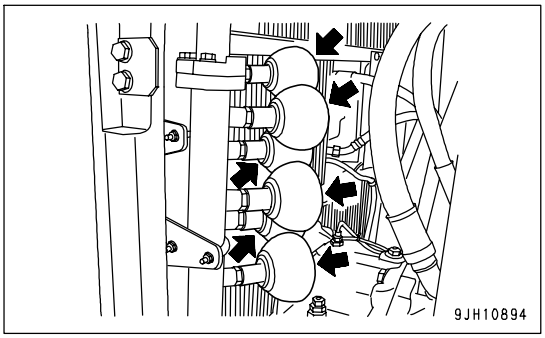
(2): Pump controller

There are two pump controllers under the assistant's seat.

- When removing the pump controller, remove as follows.
  1. Turn the starting switch OFF, wait for 3 minutes, then remove the negative (-) terminal of the battery.
     (For machines equipped with the battery isolator switch (option), turn the starting switch OFF, then wait for at least 3 minutes before turning the battery isolator switch OFF.)
  2. Remove the positive (+) terminal of the battery.



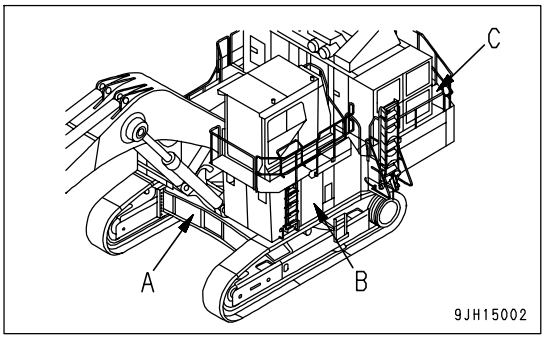
- Accumulator for oil cooler circuit
  There are six at the oil cooler end inside the power container at the rear left of the machine.



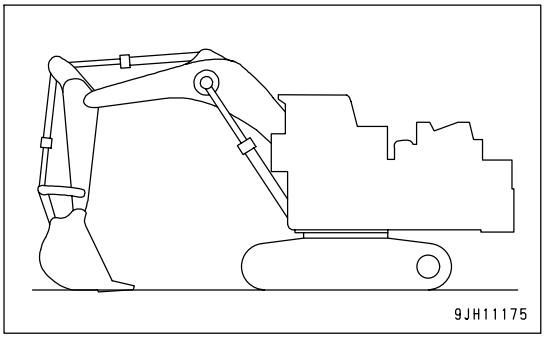
REMARK
These accumulators are installed to protect the oil cooler from abnormal pressure in the hydraulic circuit, and to improve the reliability of the hydraulic equipment.

METHOD OF RELEASING PRESSURE IN ACCUMULATOR FOR HYDRAULIC CONTROL CIRCUIT

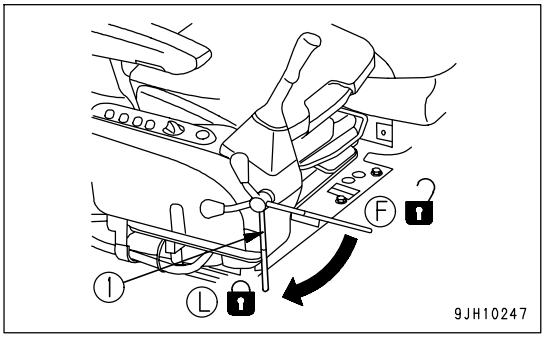
A: Accumulator for cushioning the front idler
B: Accumulator for hydraulic control circuit
C: Accumulator for oil cooler circuit



1. Lower the work equipment to the ground.
2. Stop the engine.
3. Turn the engine starting switch to the ON position.



4. Move the lock lever (1) to the free position (F), and operate the work equipment control lever and the attachment operation pedal (optional) back and forth and to the left and right up to the stroke end in order to release pressure from the respective control circuits.
5. Start up the engine and stop it in a few seconds. And then carry out the work 3 and 4 above.
6. Continue the operation in Step 4 until the hissing noise of pressure oil can no longer be heard. (Approx. 2 - 3 times)
7. Push down lock lever (1) to locking position (L) to lock the control lever and attachment operation pedal. However, pressure cannot be released completely, so when removing the accumulator for the control circuit, loosen the screw slowly and do not stand in the direction of hydraulic oil spurting out.



MACHINE OPERATIONS AND CONTROLS

BEFORE STARTING ENGINE

Walk-around Checks

Before starting the engine, walk around the machine and look at the underside of chassis for anything unusual like loose bolts and nuts, leakage of fuel, oil and coolant. Also check the condition of the work equipment and the hydraulic system.
Also check for loose wiring, play, and collection of dust at places that reach high temperature.

⚠ WARNING

Remove any flammable materials from around the battery, engine, muffler, turbocharger, or other high temperature engine parts. Leakage of fuel or oil will cause the machine to catch fire. Check carefully, be sure to repair any problem, or contact your Komatsu distributor.

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

1. Check for damage, wear, play in work equipment, cylinders, linkage, hoses
   Check for cracks, excessive wear, play in wotk equipment, cylinders, linkage, and hoses. If any problem is found, repair it.

2. Remove dirt and debris from around the engine, battery, and radiator.
   Check for dirt accumulated around the engine and radiator. Also check for flammable material (dry leaves, twigs, etc.) around the battery, engine muffler, turbocharger, or other high temperature engine parts. If any dirt or flammable materials are found, remove them.
   For the method of removing dirt from the radiator, see "CLEAN AND INSPECT RADIATOR FINS, OIL COOLER FINS, FUEL COOLER AND AFTER COOLER FINS (PAGE 4-74)".

3. Check for coolant and oil leakage around the engine
   Check for oil leakage from the engine and coolant leaks from the cooling system. If any problem is found, repair it.

4. Check for leakage from fuel line.
   Check that there is no leakage of fuel or damage to the hoses and tubes. If any problem is found, carry out repairs.

5. Inspection of PTO lubrication tube, hose and strainer for oil leaks
   Check these parts for oil leaks. If any leak is found, repair that leaking spot.

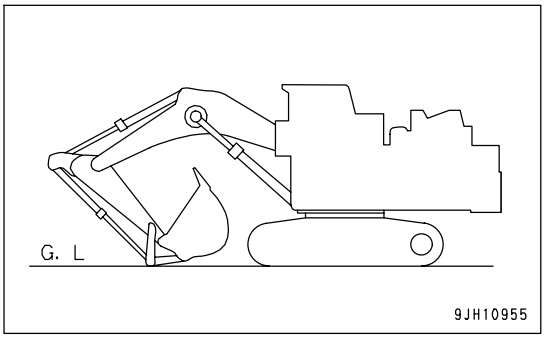
6. Check for oil leakage from hydraulic equipment, hydraulic tank, hoses, and joints
   Check for oil leakage. If any problem is found, repair the area where oil is leaking.

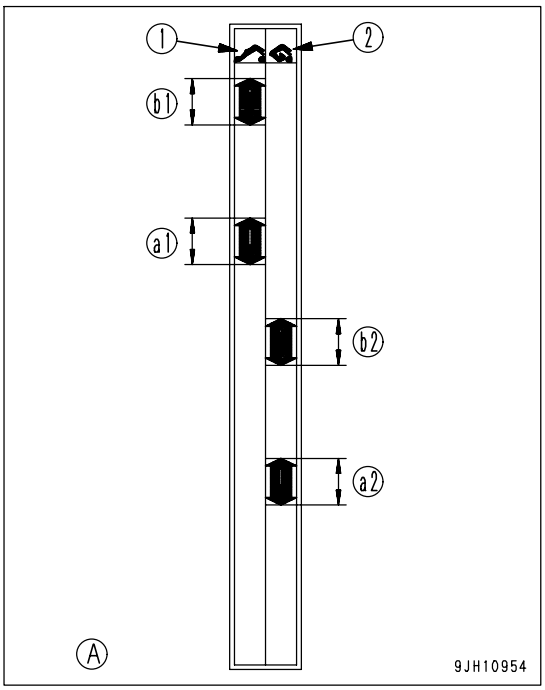
7. Check the undercarriage (track, sprocket, idler, guard) for damage, wear, loose bolts, or leakage of oil from rollers.
   If any problem is found, repair it.

8. Check for problems in handrails, steps, loose bolts.
   If any problem is found, repair it. Tighten any loose bolts.

REMARK

When the working posture is (2) in the diagram on the right, the correct oil level on the gauge label is range (a2) at normal temperature and (b2) at high temperature.

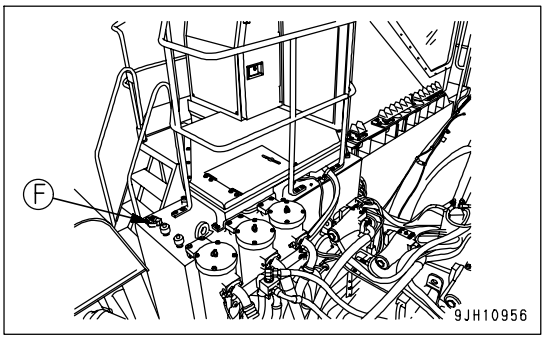




5. If the level is below the correct line, add oil through filler port (F) at the top of the hydraulic tank.

NOTICE

Do not add oil above the correct level. This may damage the hydraulic circuit and cause the oil to spurt out.



6. If the oil level is above the correct level, do as follows to drain the oil.

Adjustment

Seat Adjustment

WARNING

When adjusting the position of the operator's seat, always set the lock lever to the LOCK position to prevent any accidental contact with the control levers.

- Always adjust the operator's seat before starting each operation or when the operators change shift.
- Push your back against the backrest of the operator's seat and adjust so that you can depress the brake pedal fully. In addition, adjust the seat so that you can operate the control levers and switches freely.
- An air compressor built into the seat is used for adjustments (C), (D), and (I), so turn the engine starting switch to the ON position before adjusting.

NOTICE

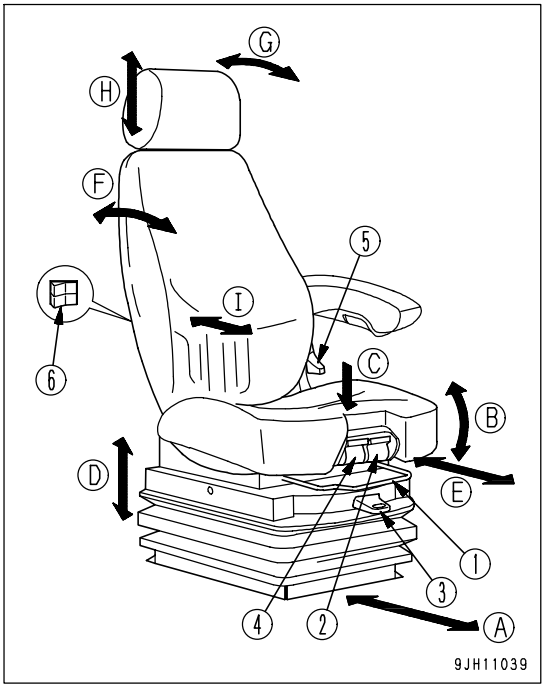
There is danger of damage to the air compressor, so do not keep lever (3) operated continuously for more than 1 minute.

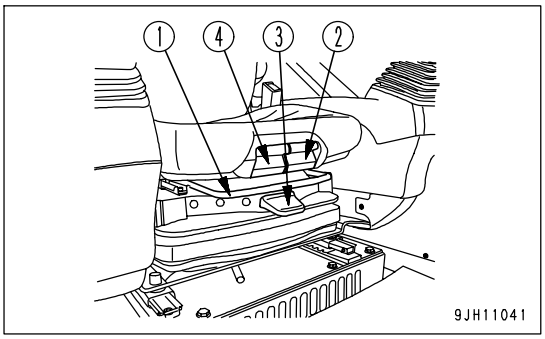
(A) Fore-and-aft adjustment
Pull lever (1) up, set the seat to the desired position, then release the lever.
Fore-and-aft adjustment: 170 mm (6.7 in) [10 mm (0.394 in) x 17 stages]

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

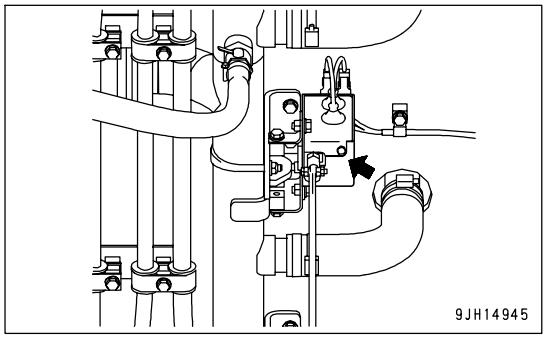
(C) Setting seat for operator's weight
Sit in the seat in the normal operating posture, pull lever (3) up lightly until a click is felt, then release lever (3). Of the range that can be adjusted, the lowest position is automatically adjusted.

- If the operator raises his body from the seat or changes the amount of weight applied to the seat during adjustment, the air in the suspension may be discharged.
- When operators change shifts, the new operator should push lever (3) down to release all the air in the suspension. Then the new operator should carry out the weight adjustment again.





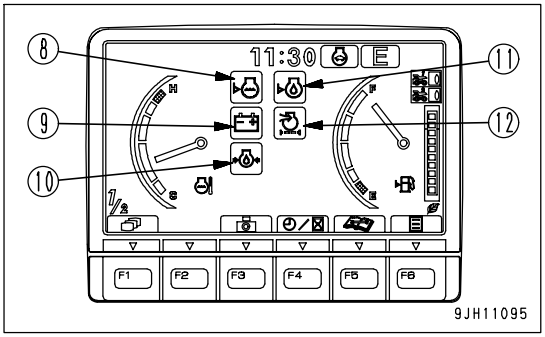
Engine emergency stop switch (right side of the machine) (if equipped)

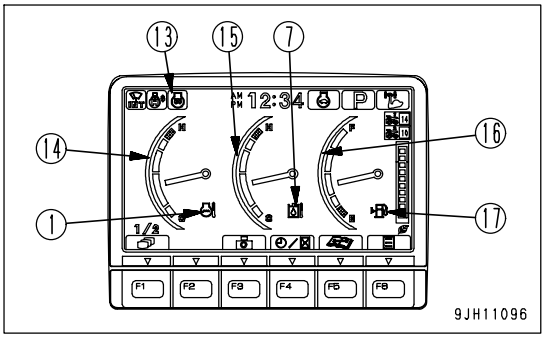


For details of the operation of the engine emergency stop switch, see "Stopping in Emergencies (PAGE 3-223)".

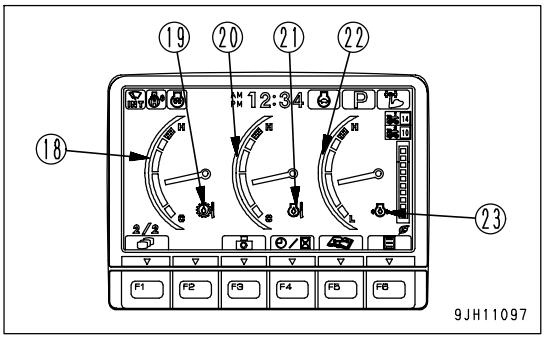
13. Check that the hydraulic oil temperature monitor and engine coolant temperature monitor are displaying the correct temperature, then check that all the gauges and caution monitors on the machine monitor are in the following status.

1/2 monitor screen
- Radiator coolant level monitor (8): OFF
- Charge level monitor (9): OFF
- Engine oil pressure monitor (10): ON
- Engine oil level monitor (11): OFF
- Air cleaner clogging monitor (12): OFF
- Engine preheating lamp (13): OFF
- Engine water temperature gauge (14): Displays green range
- Engine coolant temperature monitor (1): Displays correct temperature
- Hydraulic oil temperature gauge (15): Displays green range
- Hydraulic oil temperature monitor (7): Displays correct temperature
- Fuel gauge (16): Displays green range
- Fuel level monitor (17): Display is correct level

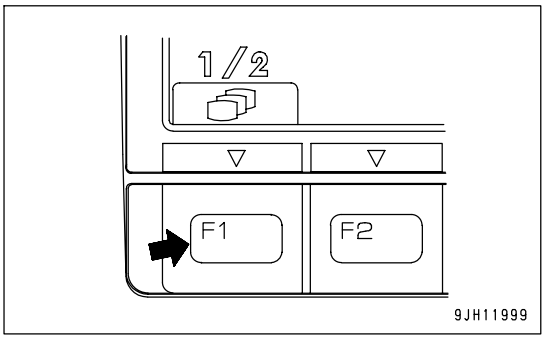




2/2 monitor screen
- PTO temperature gauge (18): Displays green range
- PTO oil temperature monitor (19): Displays correct temperature
- Engine oil temperature gauge (20): Displays green range
- Engine oil temperature monitor (21): Displays correct temperature
- Engine oil pressure gauge (22): Displays green range
- Engine oil pressure monitor (23): Displays correct pressure

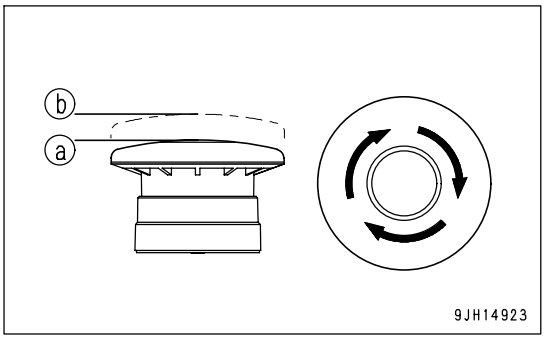


1/2 and 2/2 monitor screens can be switched by pressing function switch F1.

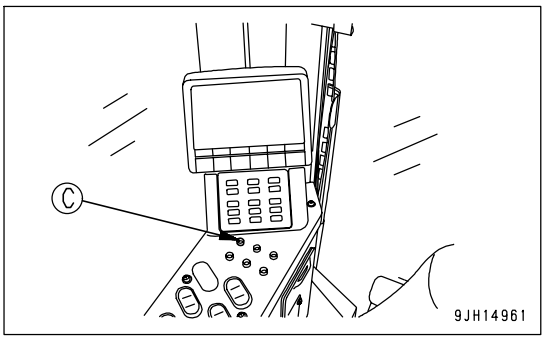


When starting the engine again after stopping it, do as follows.

1. Turn the head of engine emergency stop switch (S) to the right. The switch will spring out slightly and will be reset to OFF (normal operation) position (b). When doing this, check set indicator lamp (L) is off.



2. Turn the starting switch key to the ON position.
3. Check that engine emergency stop warning lamp (C) on the console panel to the left of the operator's seat inside the cab is off.
4. Start the engine. For details, see "STARTING ENGINE (PAGE 3-207)".



REMARK
When the engine is stopped with the emergency stop switch, there is no need to bleed air from the fuel circuit.

Steering when Traveling

When turning to the left:

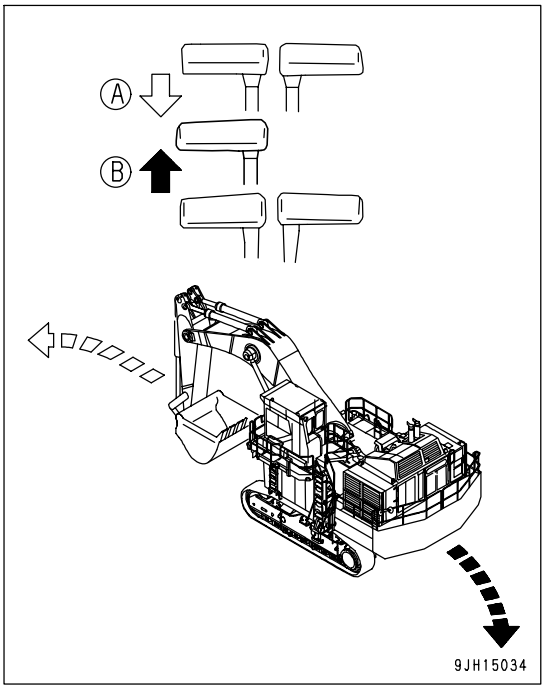
If the left travel lever is returned to the neutral position, the machine will turn to the left.

(A): Forward left turn

(B): Reverse left turn

REMARK

When turning to the right, operate the right travel lever in the same way.

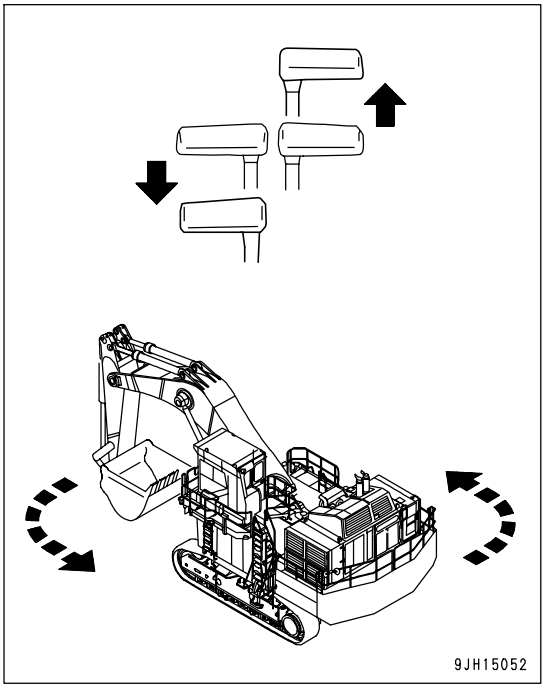


Counter-rotation Turn (Spin Turn)

When using counter-rotation (spin turn) to turn left, pull the left travel lever back and push the right travel lever forward.

REMARK

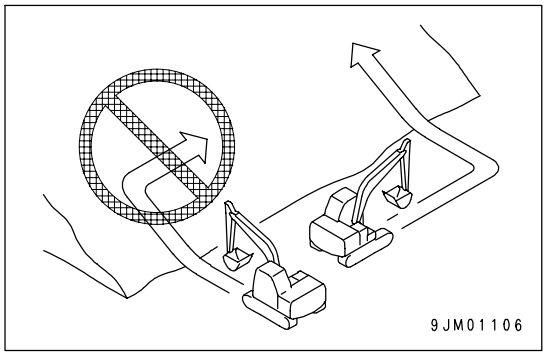
When using counter-rotation to turn right, pull the right travel lever back and push the left travel lever forward.

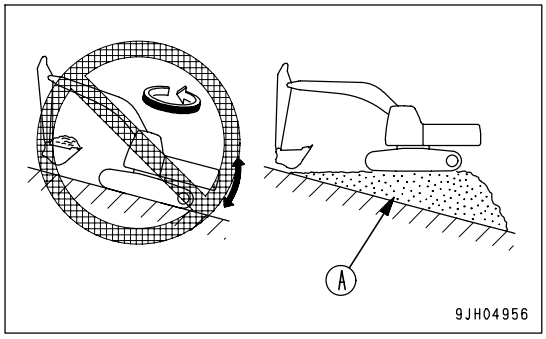


TRAVELING ON SLOPES

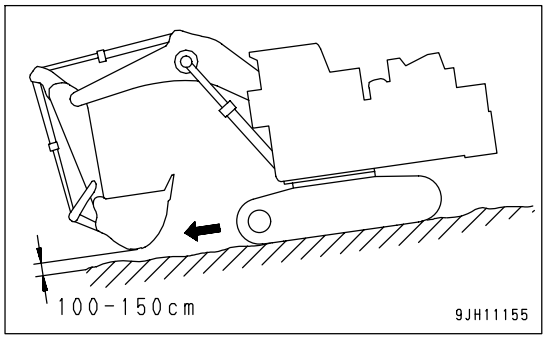
WARNING

- **Turning or operating the work equipment when working on slopes may cause the machine to lose it balance and turn over, so avoid such operations.**
  It is particularly dangerous to swing downhill when the bucket is loaded. If such operations have to be performed, pile soil to make a platform (A) on the slope so the machine is kept horizontal during operation.
- **Do not work on a slope covered with the steel plates. Even with slight slopes there is a hazard that the machine may slip.**
- **Do not travel up or down steep slopes. There is a danger that the machine may turn over.**
- **When traveling, raise the bucket approx. 100 to 150 cm (3 to 11 in) from the ground.**
  Do not travel downhill in reverse.
- **Never turn on slopes or travel across slopes.**
  Always go down to a flat place to perform these operations. It may be longer, but it will ensure safety.
- **Always operate or travel in such a way that it is possible to stop safely at any time if the machine slips or becomes unstable.**
- **When traveling uphill, if the shoes slip or it is impossible to travel uphill using only the force of the tracks, do not use the pulling force of the arm to help the machine travel uphill. There is danger that the machine may turn over.**

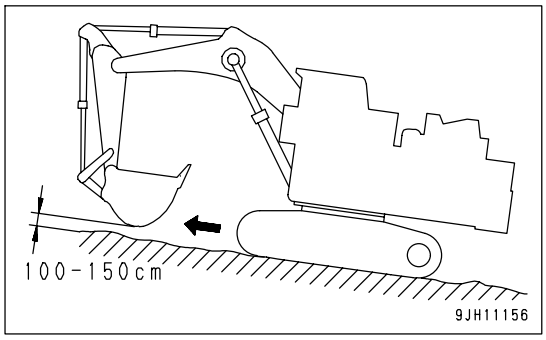




1. When traveling down steep hills, use the fuel control lever and travel lever to keep the travel speed low.
   When traveling down a slope with a grade of more than 15°, set the machine to the posture shown in the diagram on the right and reduce the engine speed when traveling.



2. When traveling up a steep hill of more than 15°, set the work equipment to the posture shown in the diagram on the right.



COLD WEATHER OPERATION

COLD WEATHER OPERATION INFORMATION

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

Fuel and Lubricants

Change to fuel and oil with low viscosity for all components. For details of the specified visicosity, see "RECOMMENDED FUEL, COOLANT, AND LUBRICANT (PAGE 4-10)".

Cooling System Coolant

WARNING

- **Antifreeze is toxic. Be careful not to get it into your eyes or on your skin. If it should get into your eyes or on your skin, wash it off with large amounts of fresh water and see a doctor at once.**
- **When changing the coolant or when handling coolant containing antifreeze that has been drained when repairing the radiator, please contact your Komatsu distributor or request a specialist company to carry out the operation. Antifreeze is toxic. Do not let it flow into drainage ditches or spray it onto the ground surface.**

NOTICE

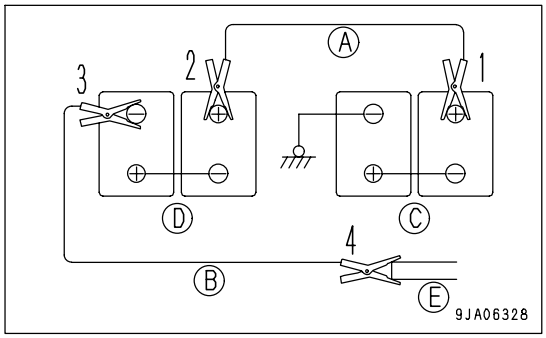
Please use Komatsu genuine supercoolant (AF-NAC) for the coolant. As a basic rule, we do not recommend the use of any coolant other than Komatsu genuine supercoolant.

The Supercoolant is already diluted with distilled water, so it is not flammable.
For details of the density of the Supercoolant and the interval for changing the coolant, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-26)".

Booster Cable Connection

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.

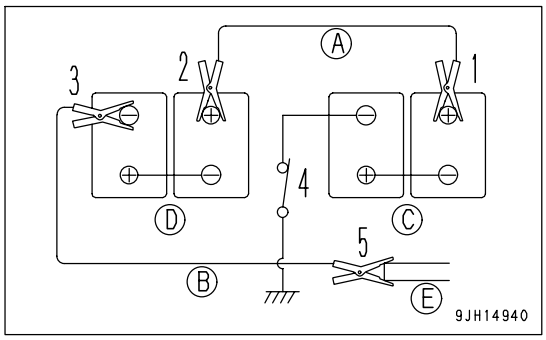
1. Connect the clip of booster cable (A) to the positive (+) terminal of battery (C) on the problem machine.
2. Connect the clip at the other end of booster cable (A) to the positive (+) terminal of battery (D) on the normal machine.
3. Connect the clip of booster cable (B) to the negative (-) terminal of battery (D) on the normal machine.
4. Connect the other clip of booster cable (B) to the revolving frame (E) of the problem machine.



Booster Cable Connection for Battery Isolator Installation Machine

If the problem machine is equipped with the battery isolator switch (option), turn the starting switch OFF on both the problem machine and the normal machine, then turn the battery isolator switch of the problem machine OFF. After that, connect the booster cable as follows in the order shown by the numbers in the diagram.

1. Connect the clip of booster cable (A) to the positive (+) terminal of battery (C) on the problem machine.
2. Connect the clip at the other end of booster cable (A) to the positive (+) terminal of battery (D) on the normal machine.
3. Connect the clip of booster cable (B) to the negative (-) terminal of battery (D) on the normal machine.
4. Turn the battery isolator switch on the problem machine to the ON position.
5. Connect the other clip of booster cable (B) to the revolving frame (E) of the problem machine.



MAINTENANCE INFORMATION

Do not perform any inspection and maintenance operation that is not found in this manual.

Service Meter Reading

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

Komatsu Genuine Replacement Parts

Use Komatsu genuine parts specified in the Parts Book as replacement parts.

Komatsu Genuine Lubricants

For lubrication of the machine, use the Komatsu genuine lubricants. Moreover use oil of the specified viscosity according to the ambient temperature.

Windshield Washer Fluid

Use automobile window washer fluid, and be careful not to let any dirt get into it.

Fresh and Clean Lubricants

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

Check Drained Oil and Used Filter

After oil is changed or filters are replaced, check the old oil and filters for metal particles and foreign materials. If large quantity of metal particles or foreign materials are found, always report to the person in charge, and carry out suitable action.

Fuel Strainer

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

Welding Instructions

- Cut off power. Wait for approx. one minute after turning off the engine starting switch key, and then disconnect the negative (-) terminal of the battery.
- Do not apply more than 200 V continuously.
- Connect grounding cable within 1 m (3.3 ft) of the area to be welded. If grounding cable is connected near instruments, connectors, etc., the instruments may malfunction.
- If a seal or bearing happens to come between the part being welded and grounding point, change the grounding point to avoid such parts.
- Do not use the area around the work equipment pins or the hydraulic cylinders as the grounding point.

Do not Drop Things Inside Machine

- When opening inspection windows or the oil filler port of the tank to carry out inspection, be careful not to drop nuts, bolts, or tools inside the machine.
  If such things are dropped inside the machine, it may cause damage and/or malfunction of the machine, and will lead to failure. If you drop anything inside the machine, always remove it immediately.
- Do not put unnecessary things in your pockets. Carry only things which are necessary for inspection.

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.

Note 1: HTHS (High-Temperature High-Shear Viscosity 150°C), specified by ASTM D4741 must be equal to or higher than 3.5 mPa-S. Komatsu EOS0W30 and EOS5W40 are the most suitable oils.

Note 2: Powertrain oil has different properties from engine oil. Be sure to use the recommended oils.

Note 3: If the machine is equipped with an auto-greasing system, see "HANDLING GREASE PUMP AND GREASE GUN (PAGE 3-157)".

Note 4: Hyper grease (G2-T, G2-TE) has a high performance.
When it is necessary to improve the lubricating ability of the grease in order to prevent squeaking of pins and bushings, the use of G2-T or G2-TE is recommended.

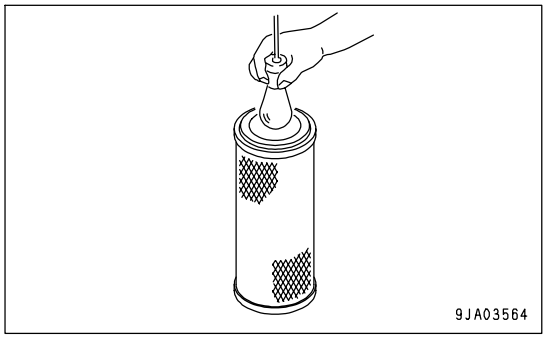
Note. 5: Supercoolant (AF-NAC)

1) Coolant has the important function of anticorrosion as well as antifreeze.
   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.
2) For details of the ratio when diluting super coolant with water, see "CLEAN INSIDE OF COOLING SYSTEM (PAGE 4-26)".
   Supercoolant AF-NAC may be supplied in premix . In this case, always top off with premix solution. (never dilute with water)
3) To maintain the anticorrosion properties of Supercoolant AF-NAC, always keep the density of Supercoolant between 30% and 68%.

RECOMMENDED BRANDS, RECOMMENDED QUALITY FOR PRODUCTS OTHER THAN KOMATSU GENUINE OIL

When using commercially available oils other than Komatsu genuine oil, consult your Komatsu distributor.

7. If small holes or thinner parts are found on the element when it is checked by shining a light through it after cleaning, replace the element.



8. Remove the cloth or tape covering inner element (6).

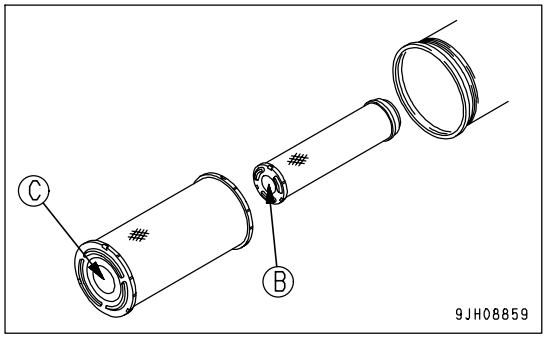
NOTICE

- **Do not use an element whose folds or gasket or seal are damaged.**
- **If the element or O-ring are cleaned and used again after they have been used for more than one year, it will cause problems. Do not use them again.**

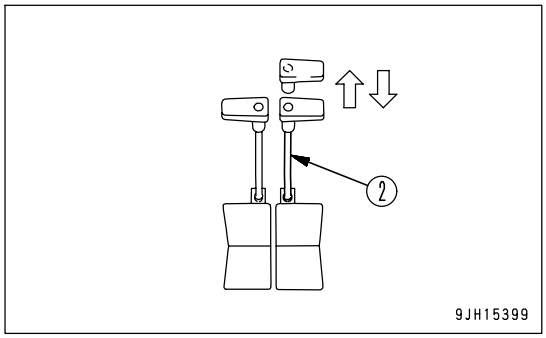
9. Check that there is no dirt or oil stuck to the seal portion of the new element or cleaned element. Wipe off any dirt or oil.
10. Push the outer element in straight with your hand when installing it to the air cleaner body.
    If the outer element is held and rocked lightly up and down and to the left and right while pushing it in, the outer element can be inserted easily.

NOTICE

Be sure to install the air cleaner element facing in the correct direction. Install so that the bottom of the air cleaner element cylinder (face where no hole is drilled) (B), (C) is at cover (3) end. If the direction of installation is mistaken, there is danger that it will cause breakage of the air cleaner element or serious damage to the engine.



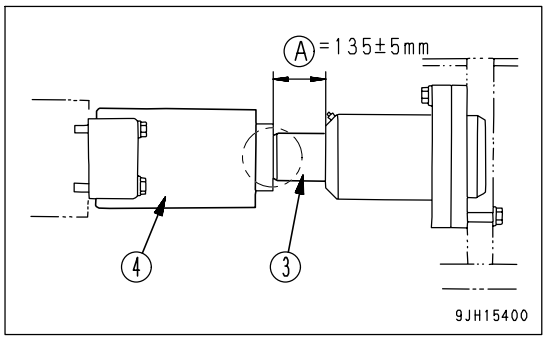
3. Thrust bucket teeth into the ground to prevent the machine to travel, then relief hydraulic valve (4 to 5 seconds) with forward / reverse operation of right travel lever (2). Repeat this operation 5 to 6 times.



NOTICE

- **Do not carry out this forward / reverse operation on a slippery surface (such as steel plates).**
- **Even if protrusion (A) of the hydraulic cushion cylinder plunger (3) is within the specified value, HIC circuit charge pressure may be low, so carry out Step 3 correctly.**

4. Check that protrusion (A) of hydraulic cushion cylinder plunger (3) is within the specified value on both the left and right.
5. If protrusion (A) is not within the specified value, carry out Step 3 again to obtain the correct value for dimension (A). If protrusion cannot be within the specified value, there is possibly too much grease in grease cylinder (4). In this case, release some of the grease. For details of the procedure, see "Adjust Grease Cylinder (PAGE 4-33)".



   - Specified value : 135 ± 5 mm (5.3 ± 0.2 in)

REMARK

If the end of hydraulic cushion cylinder plunger (3) is located around center of inspection hole of crawler frame, the protrusion is almost within the specified value.

6. Check that drain valve (1) is fully closed.

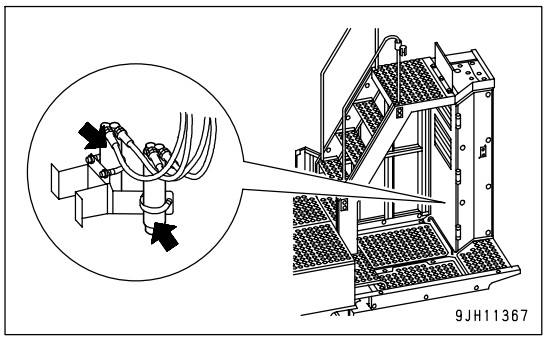
CHECK AND MAINTENANCE AIR CONDITIONER

Check Level of Refrigerant (gas)

WARNING

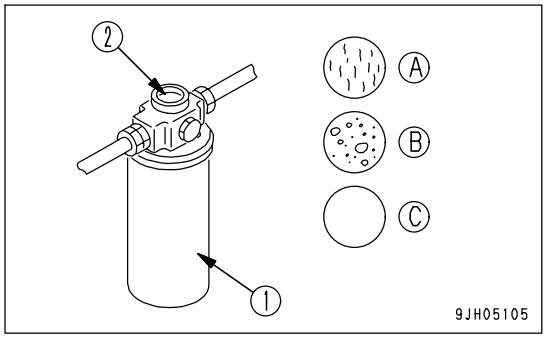
If the refrigerant used in the air conditioner gets into your eyes or on your hands, it may cause loss of sight or frostbite. Do not touch the refrigerant. Never loosen any part of the refrigerant circuit.
Do not bring any flame close to any point where the refrigerant gas is leaking.

If there is a lack of refrigerant (gas), the cooling performance will be poor. When operating the air conditioner at high speed with the engine at full throttle, use the receiver sight glass (inspection window) to check the condition of the refrigerant gas (R134a) flowing in the refrigerant circuit.
(A) No bubbles in refrigerant flow: Suitable
(B) Some bubbles in flow (bubbles pass continuously):
Lack of refrigerant
(C) Colorless, transparent: No refrigerant



REMARK

- When bubbles appear, there is lack of refrigerant gas, so have your service shop add refrigerant immediately. If the air conditioner is run when there is lack of refrigerant gas, it will cause damage to the compressor.
- Total volume of refrigerant: 0.95 kg (2.095 lb)/each unit [total for 2 units: 1.9 kg (4.19 lb)]



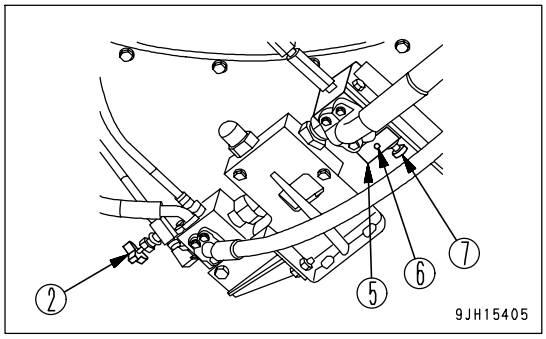
Inspection During Off Season

During the off-season, run the air conditioner once a month for 3-5 minutes at low idling to maintain the oil film at all parts of the compressor.

Inspection and Maintenance Items

Check, maintenance items	Content of check, maintenance	Guideline for maintenance interval
Refrigerant (gas)	Charge amount	Twice a year (spring, autumn)
Air conditioner condenser	Clogged fins	Every 500 hours
Compressor	Operating condition	Every 4000 hours
V-belt	Damage, tension	Every 250 hours
Blower motor, fan	Operating condition (does it make abnormal noise?)	When required
Control mechanism	Operating condition (does it function normally?)	When required
Piping mounts	Mounting condition, looseness at tightening or connecting portions, leakage of gas, damage	When required

4. Remove plug (6) on the bottom of the check valve block (5) and loosen air bleeding plug (7) on the side approximately by 1 turn.
5. Start the engine and run it at low idling for 2-3 minutes.



6. Screw in drain valve (2) completely as soon as oil free of white contamination begins to flow out of air bleeding plug (3) and out of the plug (6) hole.
7. Tighten air bleeding plugs (7) and (3). (Left and right, 2 places)
8. Install plug (6).
9. Finally tighten grease cylinder plug (1). (Left and right, 2 places)

Tightening torque
Air bleeding plug (3),(7),(1): 58.8 to 88.3 Nm (6 to 9 kgm , 43.4 to 65.1 lbft)
Plug (6): 3.9 to 6.9 Nm (0.4 to 0.7 kgm , 2.9 to 5.1 lbft)

REMARK
- Always tighten plug (1) last.
- Close all the drain valve and air bleed valves completely.
- After bleeding the air, check and adjust the track tension. For details, see "CHECK AND ADJUST TRACK TENSION (PAGE 4-30)".

EVERY 250 HOURS MAINTENANCE

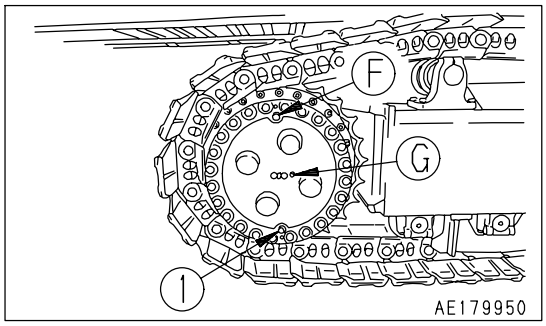
CHECK OIL LEVEL IN FINAL DRIVE CASE, ADD OIL

⚠ WARNING

- **The parts and oil are at high temperature immediately after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.**
- **If there is still pressure remaining inside the case, the oil or plug may fly out. Loosen the plug slowly to release the pressure.**

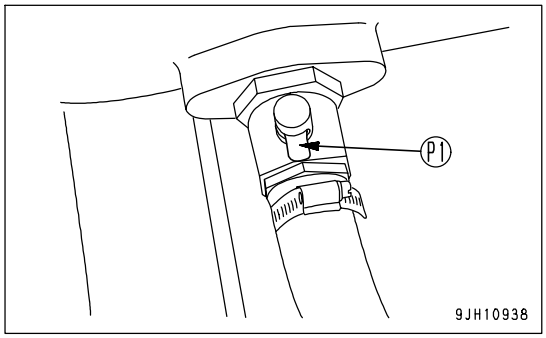
- Prepare a handle.

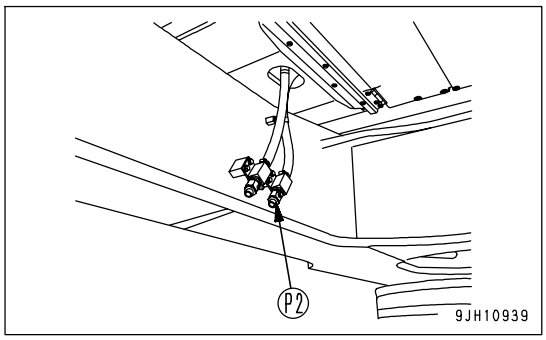
1. Set so that plug (1) on the outside of the machine is at the bottom position.
2. Using a handle, remove plug (G) and check the oil level. The oil level should be within a range from the bottom edge of the plug hole to 10 mm down from the hole.
3. If the oil level is low, install plug (G) again, then operate the travel levers to rotate the sprocket one turn in the forward or reverse direction. Repeat the procedure in Step 2 to check the oil level again.
4. If the oil level is low, add engine oil through the hole for plug (F).
5. After checking, install plug (F).



2. Loosen drain valve (P1) in the oil pan. The oil will go down to drain valve (P2).

   P1: Oil pan drain valve
   P2: External takeoff drain valve

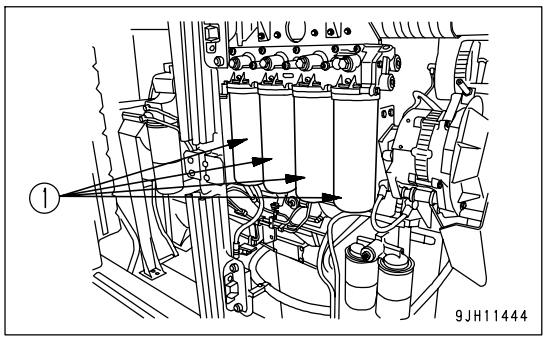




3. Open drain valve (P2) slowly through the drain control hole in the engine under cover and drain the oil. When doing this, be careful not to get oil over yourself.

   - When draining the oil, use the drain hose in the toolbox, install it to oil drain valve (2), and be careful not to let the drained oil spray out when draining it.
     (Drain hose part number: 07287-02618)
     After draining the oil, close drain valves (P1) and (P2).
   - Press drain valves (P1) and (P2), then turn them to open or close them, and carry out the drain operation.

4. If the filter cartridge is removed immediately after the engine is stopped, oil will spill out. Wait for at least 10 minutes after stopping the engine before starting the replacement operation.
5. Using a filter wrench, turn filter cartridge (1) counterclockwise to remove it.



6. Clean the filter holder, fill the new filter cartridge with clean oil, coat the thread and packing surface of the new filter cartridge with clean oil (or coat it thinly with grease), then install it to the filter holder.

REMARK
Check that there is no old packing stuck to the filter holder. If there is any old packing stuck to the filter, it will cause leakage of oil.

7. When installing, bring the packing surface into contact with the seal surface of the filter holder, then tighten a further 3/4 - 1 turn.

REPLACE FUEL PRE-FILTER CARTRIDGE

WARNING

- **After the engine has been operated, all parts are at high temperature, so do not replace the filter immediately. Wait for all parts to cool down before starting the operation.**
- **High pressure is generated inside the engine fuel piping system when the engine is running.**
  When replacing the filter, wait for at least 30 seconds after stopping the engine to let the internal pressure go down before replacing the filter.
- **Do not bring any fire or flame close.**
- **Be careful when opening the air bleed plug in the fuel filter head. It is still under pressure, so fuel may spurt out.**

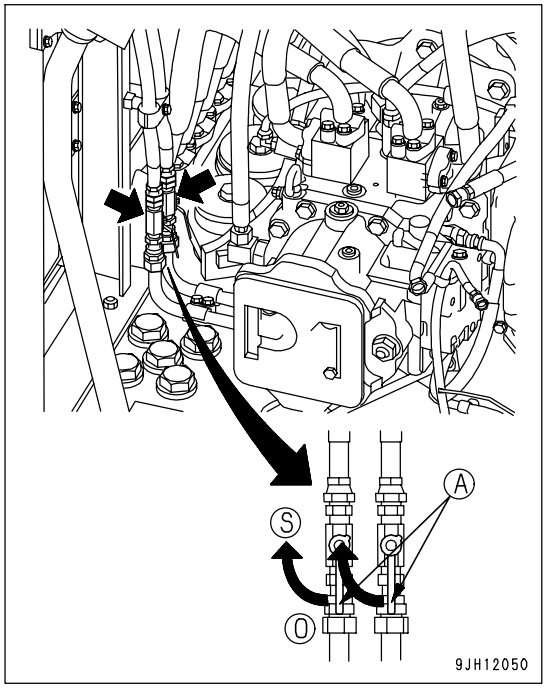
NOTICE

- **Genuine Komatsu fuel filter cartridges use a special filter that has highly efficient filtering ability. When replacing the filter cartridge, always use a genuine Komatsu part.**
- **The common rail fuel injection system used on this machine consists of more precise parts than the conventional injection pump and nozzle.**
  If any part other than a genuine Komatsu filter cartridge is used, dust or dirt may get in and cause problems with the injection system. Always avoid using substitute parts.
- **When carrying out inspection or maintenance of the fuel system, pay more attention than normal to the entry of dirt. If dirt is stuck to any part, use fuel to wash it off completely.**

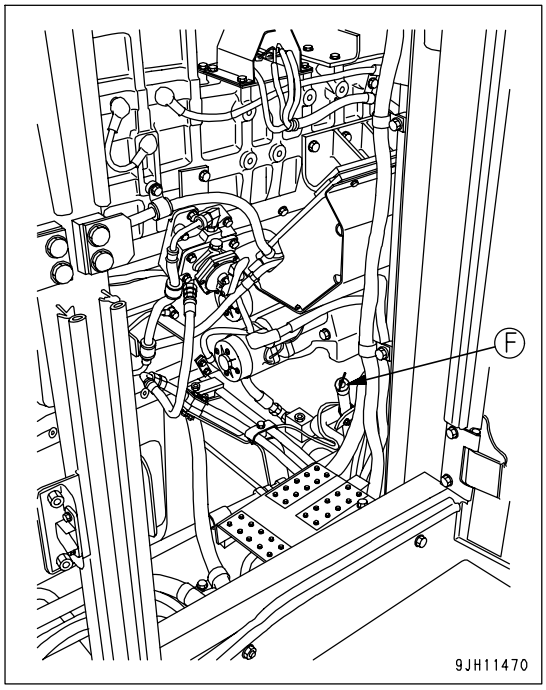
- Container to catch the oil
- Prepare a filter wrench

1. Pull fuel shut-off lever (A) installed to the front of the main pump inside the pump room, and close the fuel supply circuit from the fuel tank.

   (S): Shut off
   (O): Open

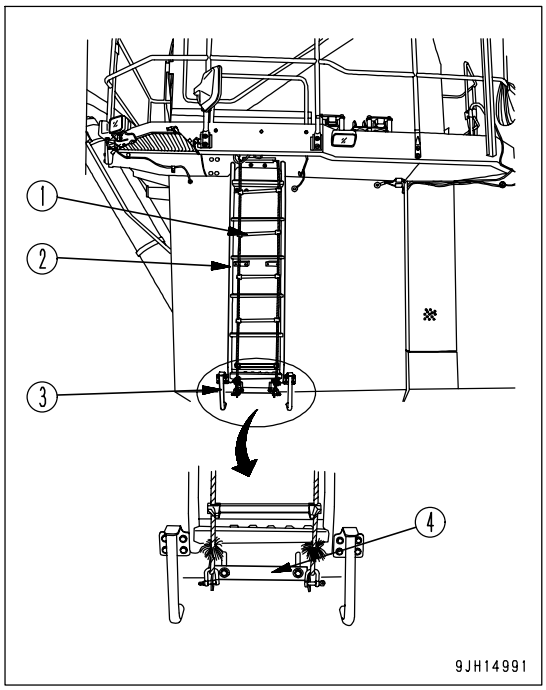


2. Add a specified amount of power train oil from oil filler port (F).



CHECK EMERGENCY LADDER

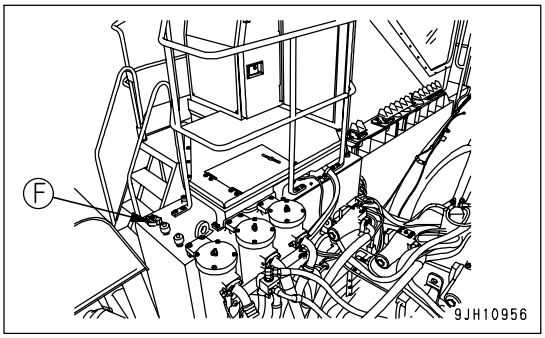
Check rope ladder (1), fixed ladder (2), handrail (3), and mounting bracket (4). Check that there is no wear, damage, or other abnormality. If any problem is found, replace with genuine parts.



NOTICE

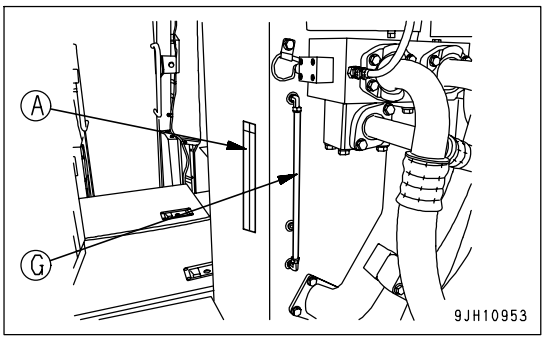
With a rope ladder (1), even if there is no visual wear or damage, the rope will deteriorate with time, so there is danger of a drop in the strength of the rope. For this reason, always replace the rope every two years.

9. Add the specified amount of hydraulic oil through oil filler port (F). When adding the oil, watch sight gauge (G), and check that the oil is at the correct level.



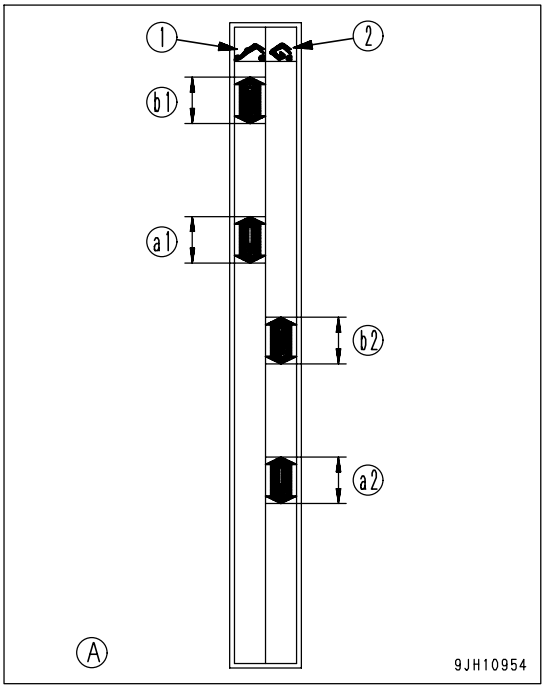
NOTICE

Do not add oil above the correct level. This may damage the hydraulic circuit and cause the oil to spurt out.



Check that the hydraulic oil is at the correct level as follows.

- When the hydraulic oil is at normal temperature [15 - 30 °C (59 - 86 °F)], the correct oil level is in blue range (a1) or (a2) on the gauge label shown in the diagram on the right.
- When the hydraulic oil is at high temperature [50 - 80 °C (122 - 176 °F)], the correct oil level is in red range (b1) or (b2) on the gauge label shown in the diagram on the right.

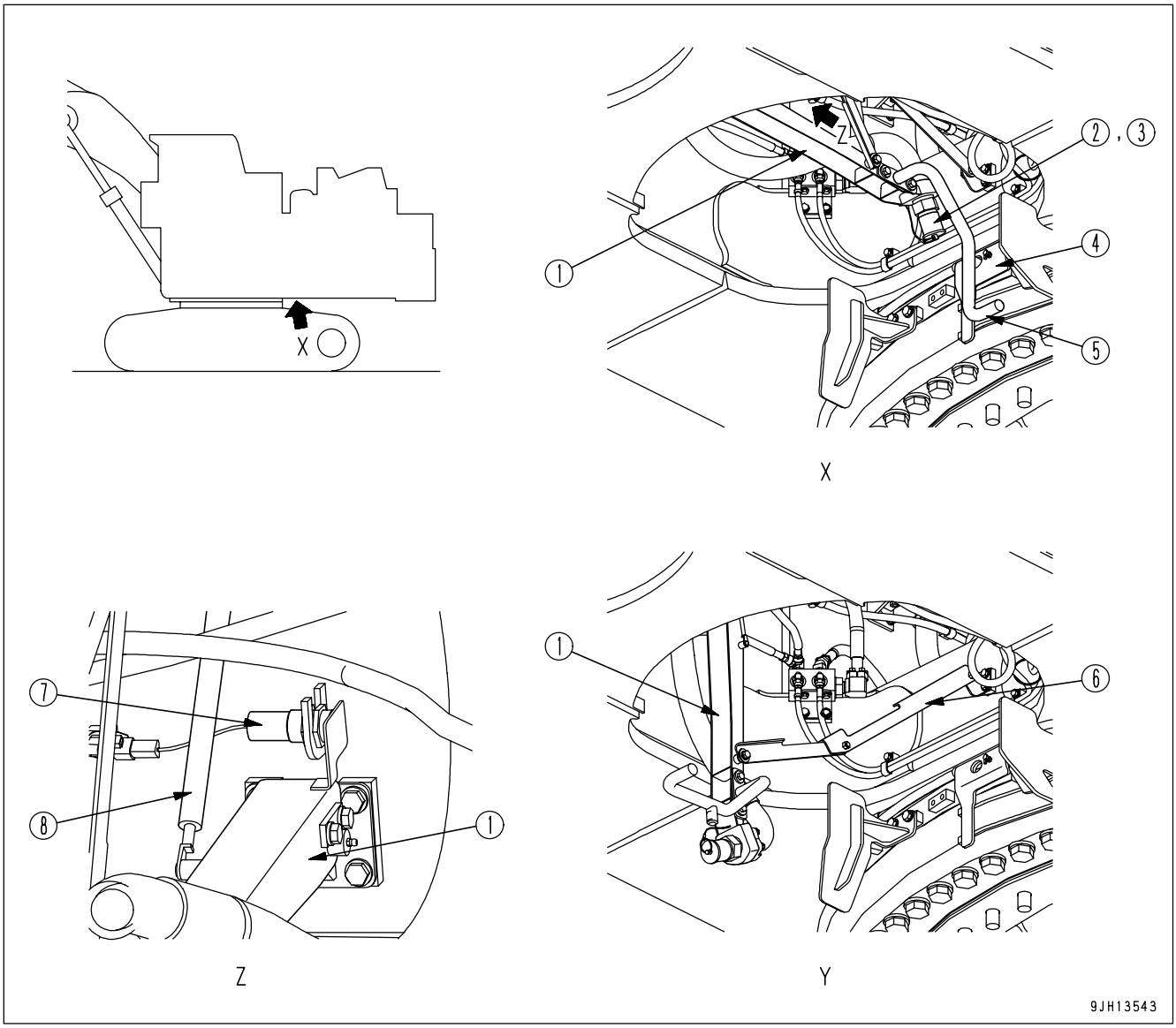


Correct level check chart

Working posture [see scale plate (A)]	Applicable scale	
	Normal temperature	High temperature
(1)	(a1)	(b1)
(2)	(a2)	(b2)

HANDLING FUEL QUICK CHARGE

GENERAL LOCATIONS

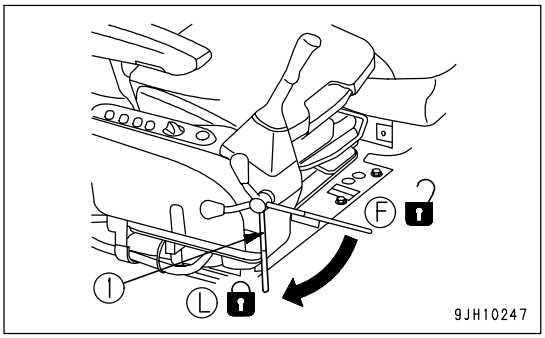


X Position for stowing fuel quick charge lever
Y Position for adding fuel to fuel quick charge lever
(1) Fuel quick charge lever
(2) Fuel filler port (Wiggins ZN2B) *1
(3) Fuel filler cap
(4) Lock plate
(5) Lever operating handle
(6) Stopper
(7) Proximity switch
(8) Shock absorber

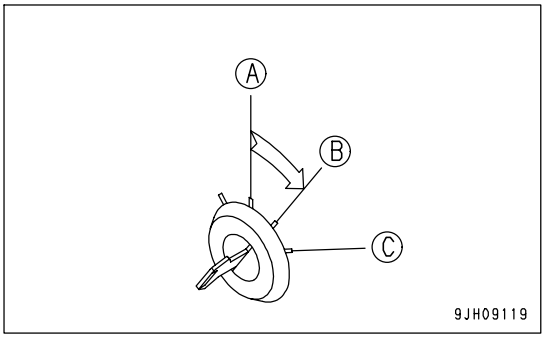
*1: When adding oil through this oil filler port, an oil filler pump unit and nozzle (Wiggins- made ZZ9A1 or an equivalent) are required.

When Lowering Service Arm (Setting to Position for Use)

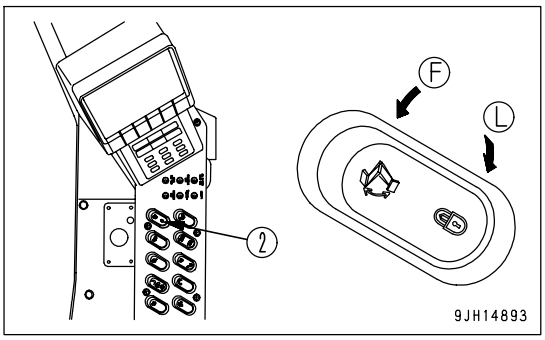
1. Check the lock lever (1) is at the LOCK position (L). When lock lever (1) is in FREE position (F), the service arm cannot be operated.



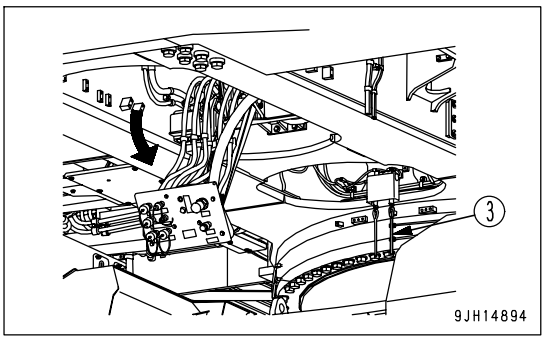
2. Turn the starting switch key to the ON (B) position.



3. Set service center switch (2) to the FREE position (F).



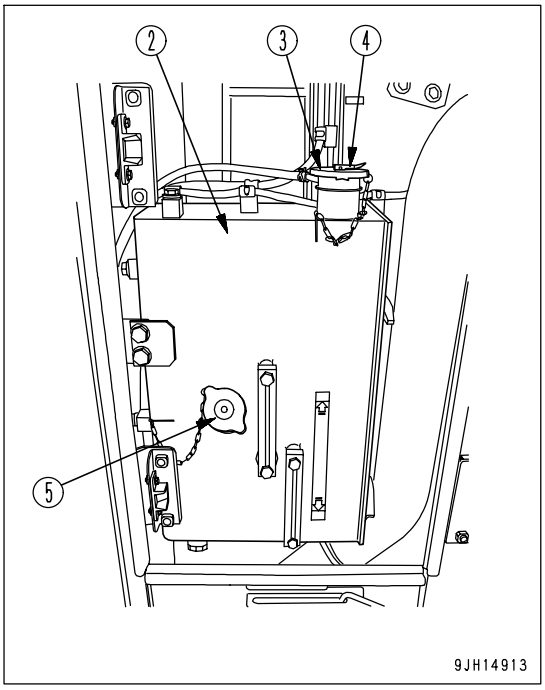
4. Keep pulling service arm LOWER switch (3)(Yellow) at the rear of the swing circle until the service arm automatically stops.



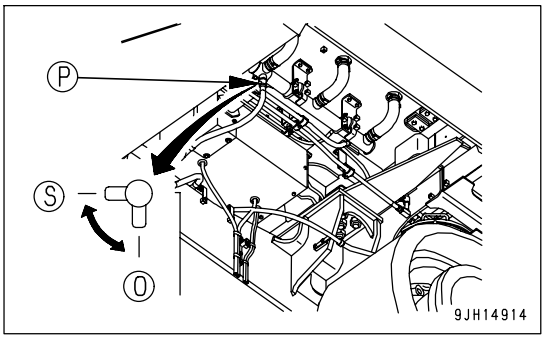
REMARK

- When the lock lever is in the FREE position, the service arm cannot be operated.
- It is possible to lower the service arm even when the engine is running. In this case, the movement of the service arm will be faster than when the engine is stopped.
- When the service arm is lowered with the engine running, the service arm will automatically be reset to the stowing position if the service arm is not lowered to the range where the automatic stowing mechanism is actuated (when the height of the tip of the service arm from the ground is less than 2.0 m (6 ft 7 in)).

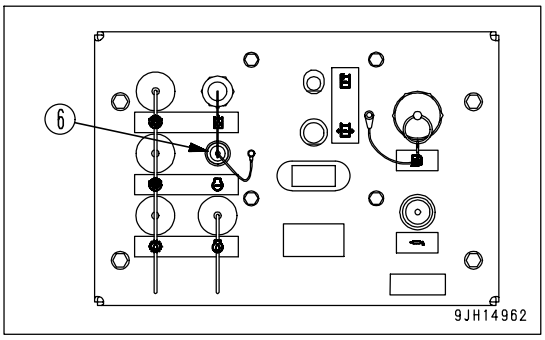
3. Check that the surface temperature of the cap of reservoir tank (2) is cool enough to be touched by hand, then raise cap lever (4) of cap (3) at the top of the reservoir tank, and release the pressure inside the reservoir tank.
4. Remove water filler cap (5).



5. Set drain valve (P) under the machine to open position (O).



6. Remove the cap of coolant coupler (6) and connect the force-feed pump coupler securely.
7. Start to drain coolant.
8. Start to add coolant.
9. After completing the draining and adding of coolant, remove the force-feed pump coupler.
10. Install the cap to the coupler.



11. Set drain valve (P) under the machine to shut position (S).
12. Push down cap lever (4) of cap (3) at the top of the sub tank, then install water filler cap (5).
13. Check that the coolant in the reserve tank is in the range between the FULL and LOW marks. For details, see "Check Coolant Level, Add Coolant (PAGE 3-178)".

ORBCOM CONTROLLER (COMMUNICATIONS TERMINAL)

(if equipped)

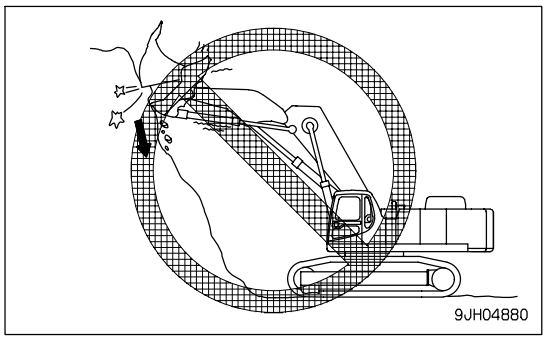
It is possible to send machine data without stopping the machine by using the satellite communications functions of ORBCOMM communications company.

Please ask your Komatsu distributor to make the initial setting when opening the communications system.

For further details, see "VHMS AND COMMUNICATIONS TERMINAL INSTALLED (PAGE 3-175)"

Scraping-down Operations are Prohibited.

Never use the front bucket of a bottom-dump bucket to scrap down rocks or soil.



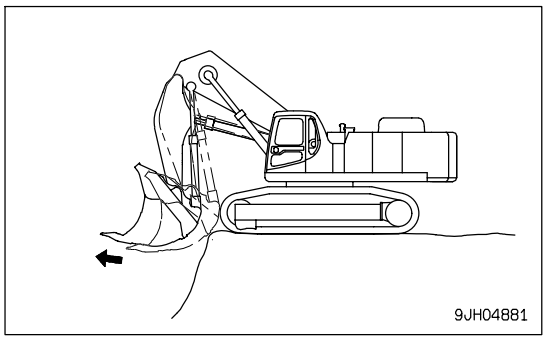
Digging Rocky Ground

Do not attempt to directly excavate hard rocky ground with the work equipment. It is better to excavate it after breaking up by some other means. This will not only save the machine from damage but will make for better economy.

Phenomena that do not Indicate Failure

Note that the following phenomena are not failures:

- When starting or stopping the swing, noise will be emitted from the brake valve.
- When going down a steep slope at low speed, a noise will be emitted from the travel motor.
- The arm may sometimes stop when the bucket teeth become more or less horizontal.



- The bottom dump of the bucket may sometimes stop at the bottom horizontal position when the bottom dump control lever changes from open to close.