Operation & Maintenance Manual

UEAM007200

PC450-8
PC450LC-8

HYDRAULIC EXCAVATOR

SERIAL NUMBER

PC450-8	**- K50001 and up**
PC450LC-8	**- K50001 and up**
PC450LCD-8	**- K50001 and up**
PC450LCHD-8	**- K50001 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 inside the cab for reference and periodically reviewed by all personel who will come into contact with the machine.

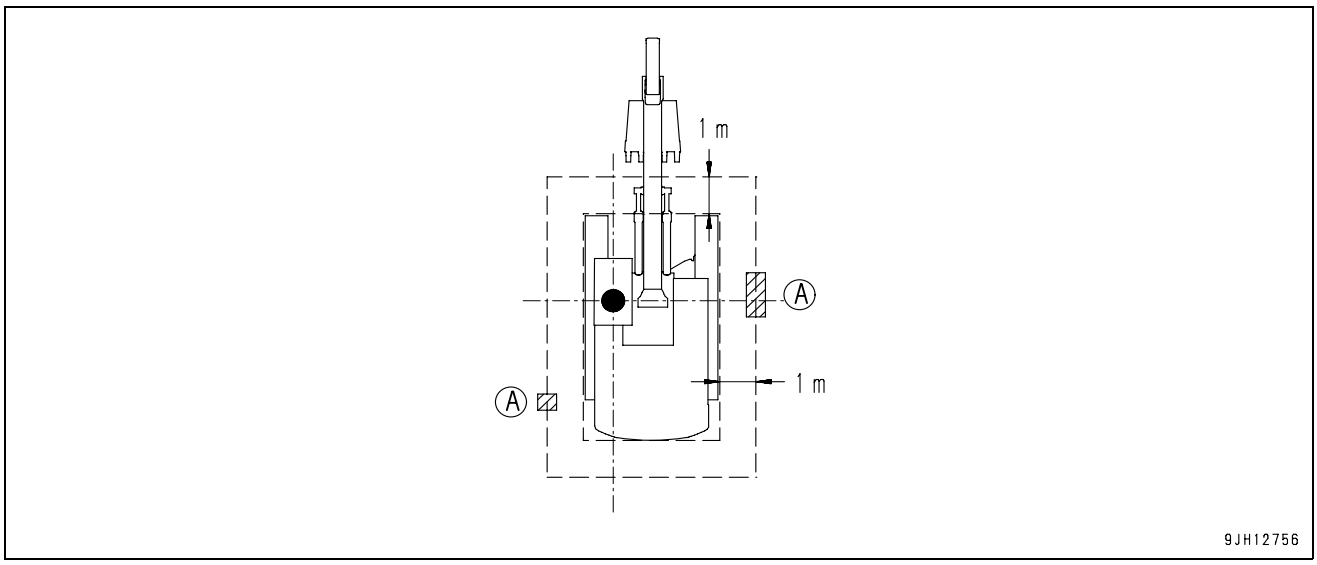
KOMATSU

VISIBILITY FROM OPERATOR'S SEAT

The visibility standards (ISO 5006) for this machine require a view shown in the diagram below.

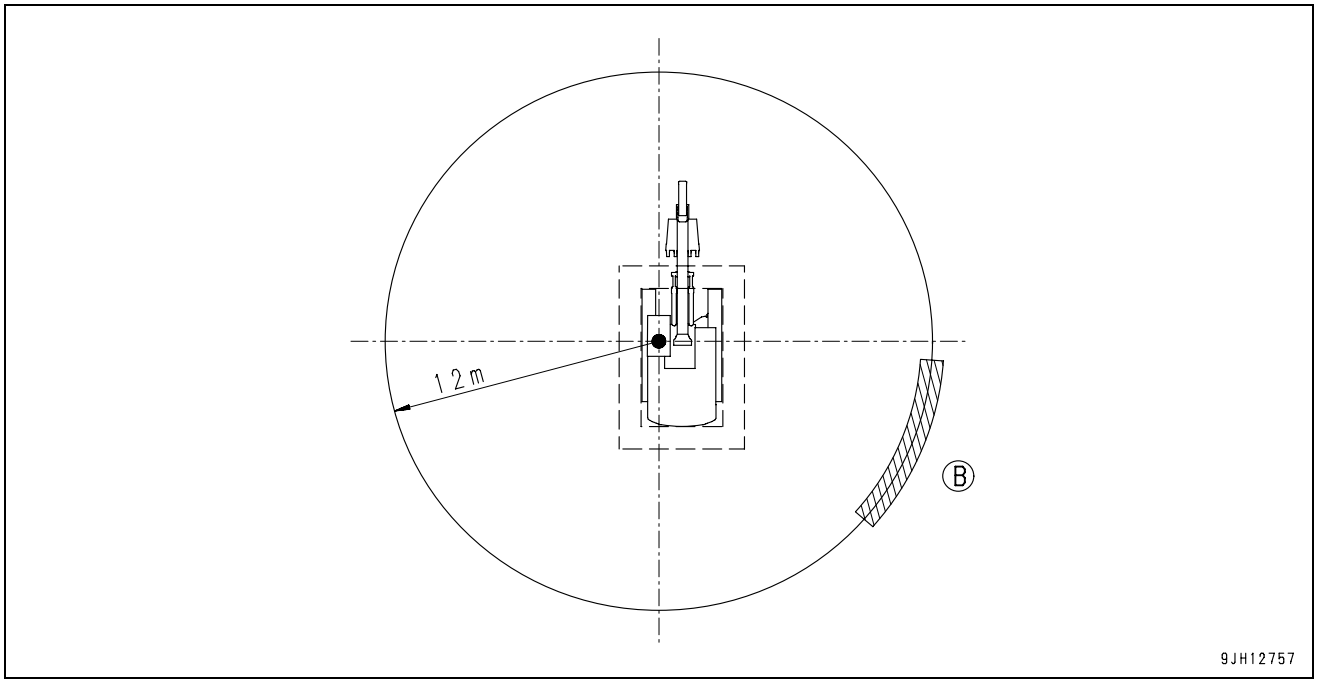
PROXIMITY VISIBILITY

The visibility of this machine in the area 1 m from the outside surface of the machine at a height of 1.5 m is shown in the diagram below. The hatched area (A) shows the area where the view is blocked by part of the machine when mirrors or other aids to visibility are installed as standard. Please be fully aware that there are places that cannot be seen when operating the machine.



12M CIRCUMFERENCE VISIBILITY

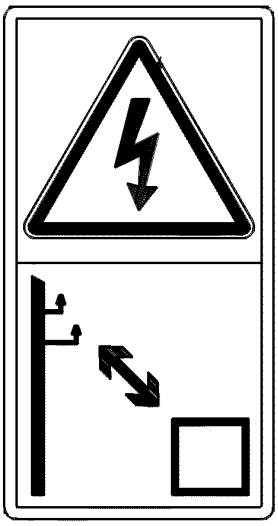
The visibility at a radius of 12 m from the machine is as shown in the diagram below. The hatched areas (B) show the areas where the view is blocked when mirrors or other aids to visibility are installed as standard. Please be fully aware that there are places that cannot be seen when operating the machine.



SPECIFICATIONS

ATTACHMENTS ANDD OPTIONS

- e. Caution for going close to electric cables.
- An electrocution hazard if the machine is brought too near to electric power lines

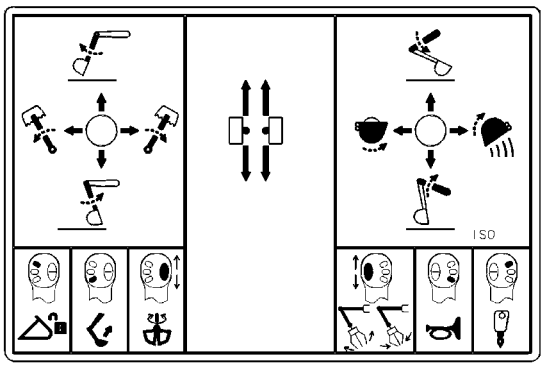


- Keep a safe distance from electric power lines.

- f. Control levers operational function diagram.

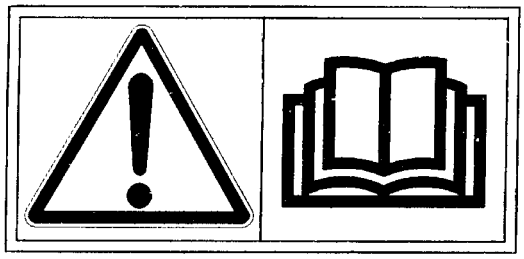
⚠ WARNING

In order to prevent an accident resulting in injury or death caused by error-operation, confirm the machine motion and indicated operating pattern, when operating machines. Pay attention to the circumference and operate slowly when confirming the machine motion.



(2) Caution for operation, inspection and maintenance (20E-00-K1120.)

- Read the manual before operation, maintenance, disassembly, assembly and transportation.



- **Fire caused by accumulation of flammable material.**

  Remove any dry leaves, chips, pieces of paper, dust, or any other flammable materials accumulated or affixed around the engine, exhaust manifold, muffler, or battery, or inside the undercovers.

- **Fire coming from electric wiring**

  Short circuits in the electrical system can cause fire.

  - Always keep electric wiring connections clean and securely tightened.
  - Check the wiring every day for looseness or damage. Tighten any loose connectors or wiring clamps. Repair or replace any damaged wiring.

- **Fire coming from hydraulic line**

  Check that all the hose and tube clamps, guards, and cushions are securely fixed in position.

  If they are loose, they may vibrate during operation and rub against other parts. This may lead to damage to the hoses, and cause high-pressure oil to spurt out, leading to fire damage or serious injury.

- **Explosion caused by lighting equipment**

  When checking fuel, oil, battery electrolyte, window washer fluid, or coolant, always use lighting with anti explosion specifications. If such lighting equipment is not used, there is danger of explosion that may cause serious injury.

  When taking the electrical power for the lighting from the machine itself, follow the instructions in of “AUXILIARY ELECTRIC POWER (3-105)“.

ACTION IF FIRE OCCURS

If a fire occurs, escape from the machine as follows.

- Turn the start switch OFF to stop the engine.
- Use the handrails and steps to get off the machine.

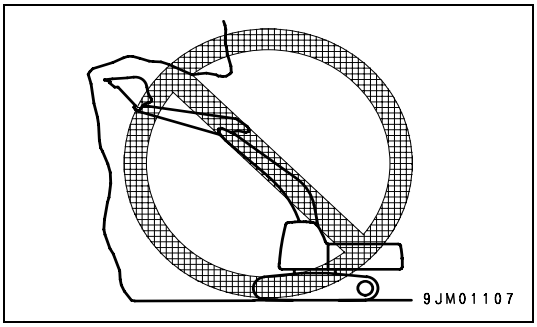
WINDSHIELD WASHER FLUID

Use an ethyl alcohol base washer liquid.

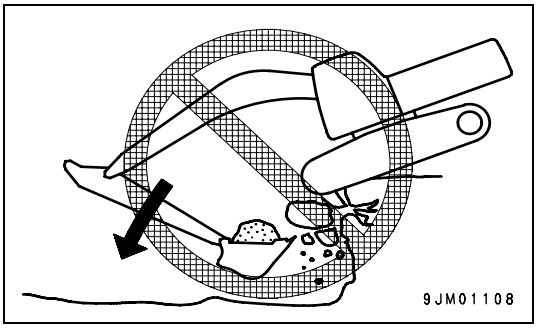
Methyl alcohol base washer liquid may irritate your eyes, so do not use it.

PROHIBITED OPERATIONS

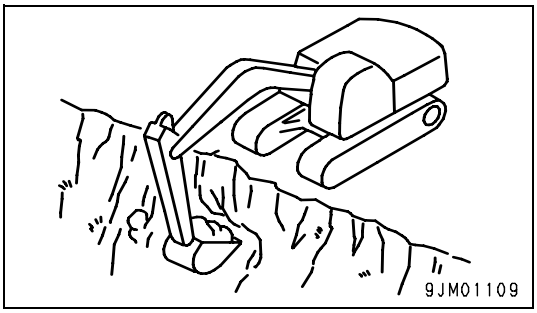
- Never dig the work face under an overhang. There is a hazard that rocks may fall or that the overhang may collapse and fall on top of the machine.



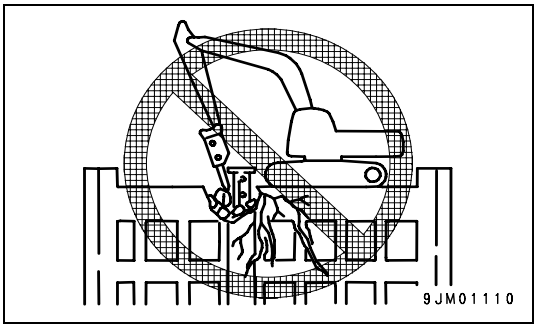
- Do not excavate too deeply under the front of the machine. The ground under the machine may collapse and cause the machine to fall.



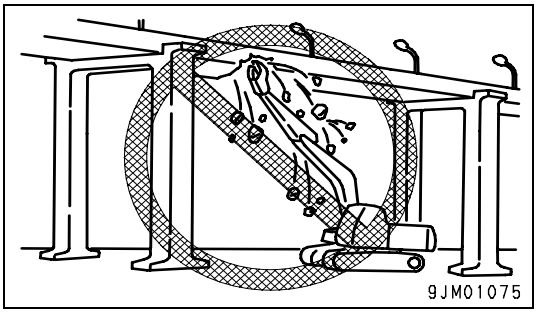
- To make it easier to escape if there is any problem, set the tracks at right angles to the road shoulder or cliff with the sprocket at the rear when carrying out operations.



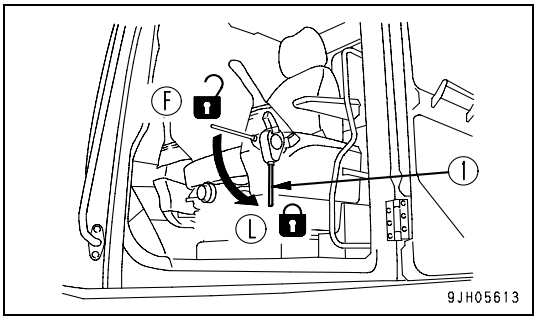
- Do not carry out demolition work under the machine. There is a hazard that the machine may become unstable and tip over.
- When working on or from the top of buildings or other structures, check the strength and the structure before starting operations. There is a hazard of the building collapsing and causing serious injury or damage.



- When carrying out demolition work, do not carry out demolition above your head. There is a hazard of broken parts falling or of the building collapsing and causing serious injury or property damage.

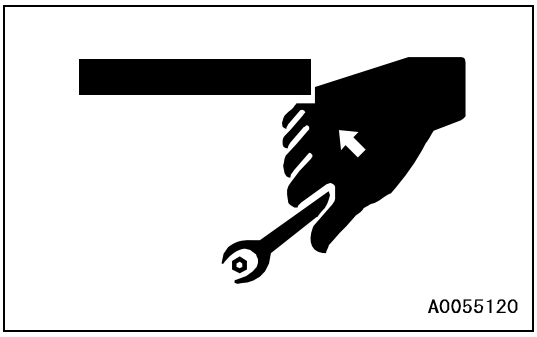


- Set lock lever (1) to the LOCK position (L) to prevent the work equipment from moving.
- Do not touch any control levers or control pedals. If any control levers or control pedals must be operated, always give a signal to the other workers to warn them to move to a safe place.



PROPER TOOLS

Use only tools suited to the task and be sure to use the tools correctly. Using damaged, low quality, faulty, makeshift tools or improper use of the tools could cause serious personal injury.



ACCUMULATOR, GAS SPRING

The accumulator and gas springs is charged with high-pressure nitrogen gas. When handling the accumulator, careless procedure may cause an explosion which could lead to serious injury or property damage. For this reason, always observe the following precautions.

- Do not disassemble the accumulator.
- Do not bring it near flame or dispose of it in fire.
- Do not make holes in it, weld it, or use a cutting torch.
- Do not hit or roll the accumulator, or subject it to any impact.
- When disposing of the accumulator, the gas must be released. Please contact your Komatsu distributor to have this work performed.

PERSONNEL

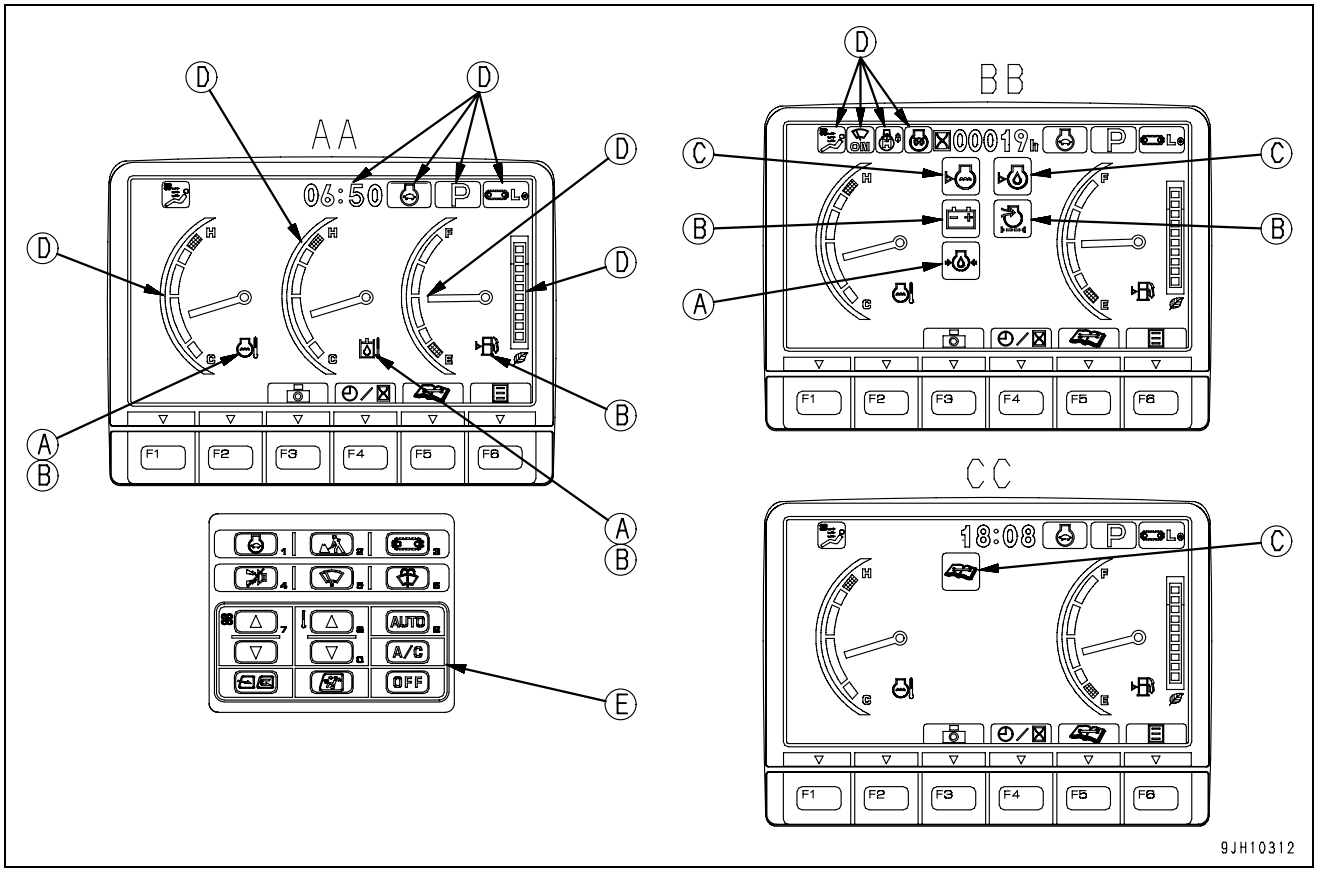
Only authorized personnel can service and repair the machine. Do not allow unauthorized personnel into the area. If necessary, employ an observer.

DETAILED CONTROLS AND GAUGES

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

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

MONITORING SYSTEM



AA: Screen for standard

BB: Screen with all lamps lighted up

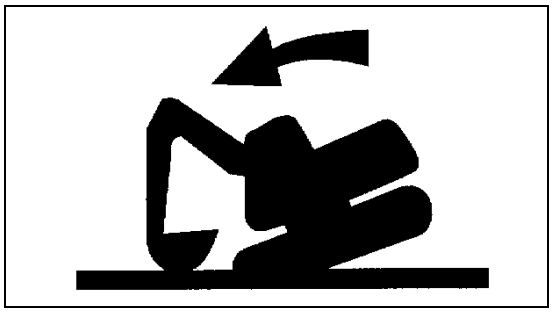
CC: Maintenance time warning screen

(A) Emergency monitors
(B) Caution monitors
(C) Basic check monitors
(D) Meter display portion, pilot display
(E) Monitor switches portion

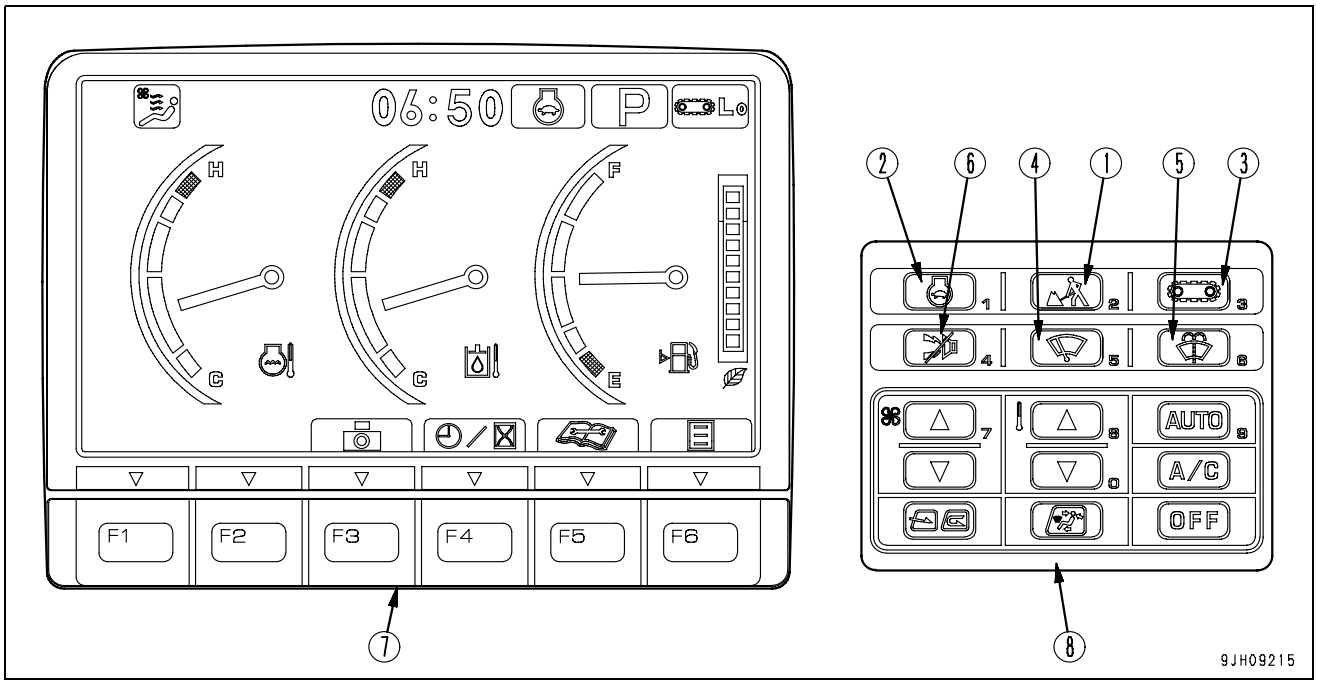
REMARK
One of the features of liquid crystal display panels is that there may be black spots (spots that do not light up) or white spots (spots that stay lighted up) on the screen. If there are fewer than 10 black or white spots, this is not a failure or a defect.

OVERLOAD CAUTION (When lifting)

This monitor (7) warns that the machine is close to tipping due to the load (an audible warning is also given), if the warning is given, lower the load. Refer the lifting capacity chart for safe load.



Monitor Switches Portion



(1) Working mode selector switch
(2) Auto-deceleration switch
(3) Travel speed selector switch
(4) Wiper switch
(5) Window washer switch
(6) Buzzer cancel switch
(7) Function switches
(8) Air conditioner switch

Working Mode Selector Switch

Use this switch (1) to set the movement or power of the work equipment.

The operation becomes easier if the mode is selected to match the content of the operation.

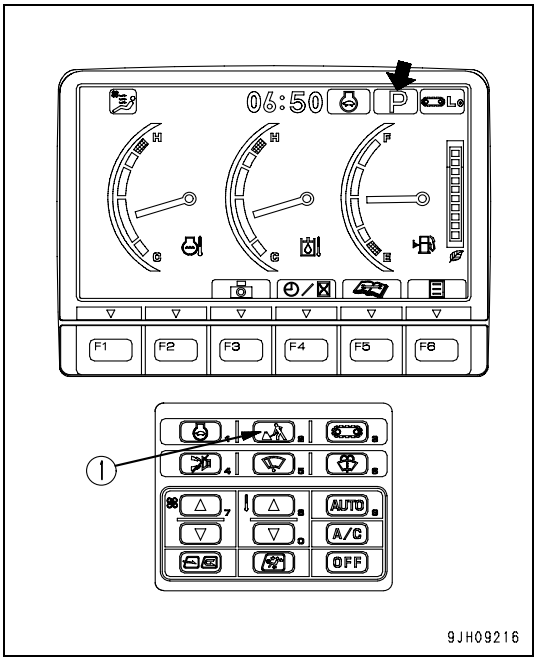
P mode: For heavy-load operations

E mode: For operation with emphasis on fuel consumption

L mode: For fine control operations

B mode: For breaker operations

ATT mode: For double-acting circuit attachment, such as crusher (attachment-ready machines)



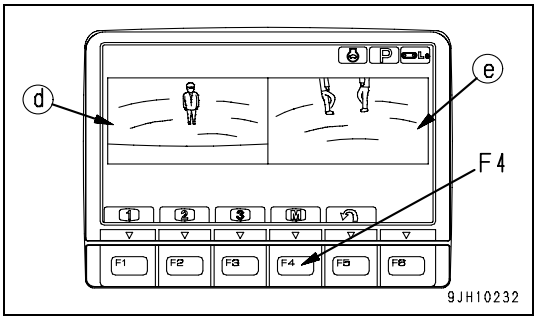
- When the monitor first appears, it is automatically set to the mode in use when it was started the previous time.
- Press switch (1) to display the working mode selection screen. For each set mode, the pilot monitor at the top right of the monitor display shows P, E, L, B, ATT.
- For machines ready for attachment, the attachment mode is added to the display.

  For details of the method for handling machines ready for attachment, see the ATTACHMENTS AND OPTIONS Section.

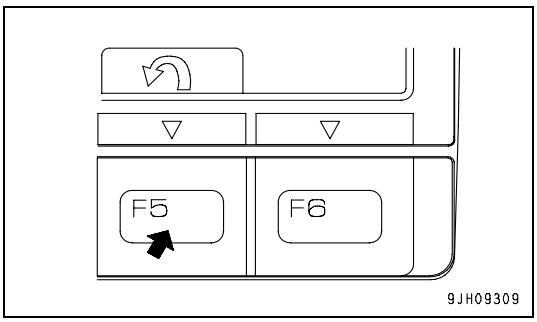
Operation of Image Display Screen When Two Camera Screens are Shown Simultaneously.

The following explanation describes the method of operation when it is desired to display two camera screens at the same time on the monitor.

- On the No. 1 camera image display screen, if switch F4 is pressed, No. 1 camera image (d) and No. 2 camera image (e) are displayed.
- Even if three cameras are installed, only the images from the No. 1 camera and No. 2 camera can be displayed at the same time.
- When two screens are displayed at the same time, the display changes more slowly than when only one screen is displayed.



- Press switch F5 to return to the standard screen.

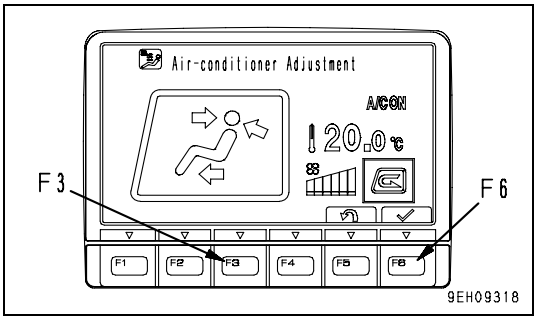


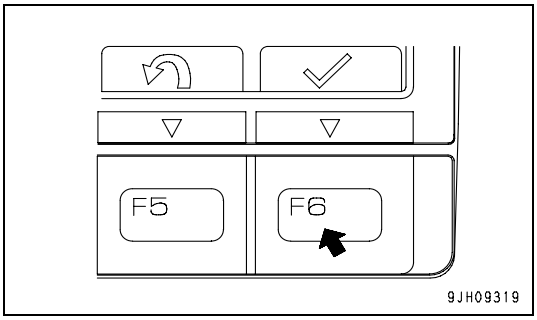
Other Mode Operations When Displaying Camera Image

- Even during the camera display, it is possible to operate other modes.
- The air conditioner can be operated.

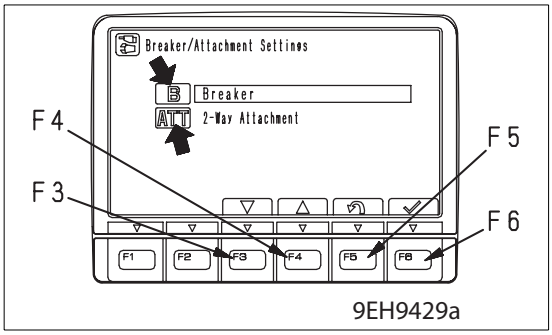
  If the air conditioner switch is operated, the screen switches to the air conditioner control screen. If the screen switches to the air conditioner control screen, press switch F6 to return to the camera image screen. In addition, if no operation is carried out for 5 seconds after the screen switches to the air conditioner control screen, the screen automatically returns to the camera image screen.

  For details of the operation of the air conditioner, see “AIR CONDITIONER CONTROLS (3-88)“.





3. On the working mode selection screen shown on the right, select B Breaker and press switch F6.



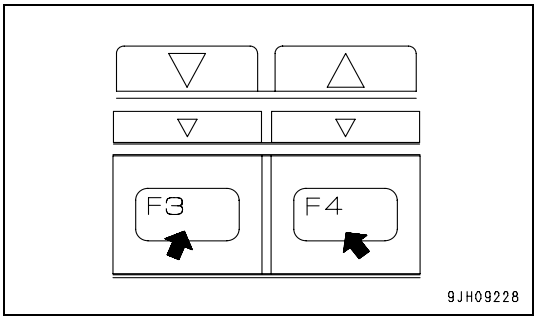
- On the working mode selection screen shown on the right, it is possible to carry out the following operations with switches F3 to F6.

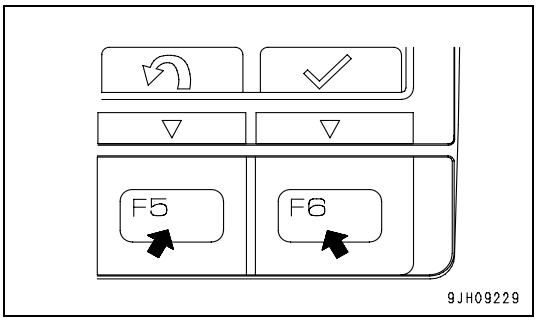
F3: Moves to next item (1 line down).

F4: Moves to previous item (1 line up).

F5: Returns to user menu screen.

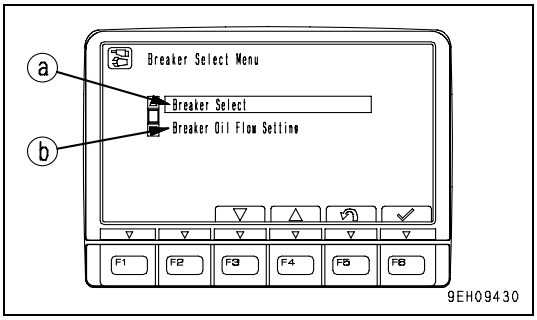
F6: Switches to setting screen for selected item.





4. The screen switches to the Breaker Select Menu.

- Breaker setting selection menu
  In breaker Select (a), the oil flow to be set in B mode can be set to one of two set values.
- Breaker flow setting menu
  In the breaker flow setting (b), the oil flow to be set in B mode can be changed.



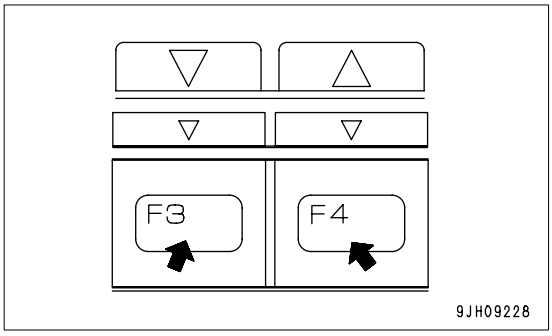
On the 2-Way Attachment Select Menu screen, it is possible to carry out the following operations with switches F3 - F6.

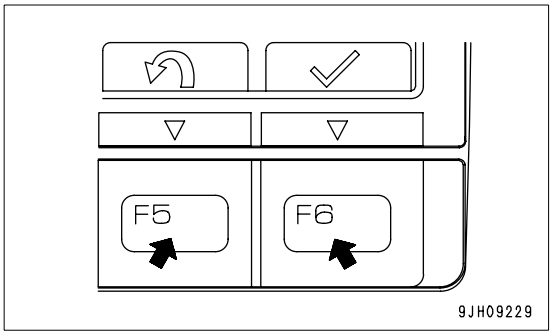
F3: Moves to next item (1 line down).

F4: Moves to previous item (1 line up).

F5: Returns to user menu screen.

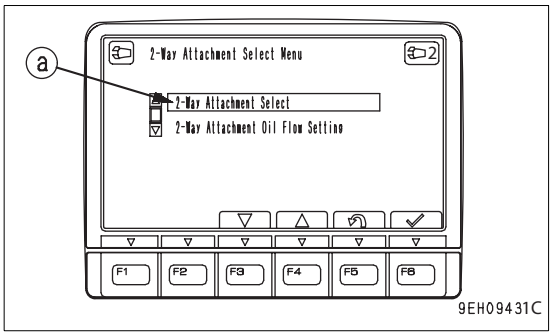
F6: Switches to setting screen for selected item.

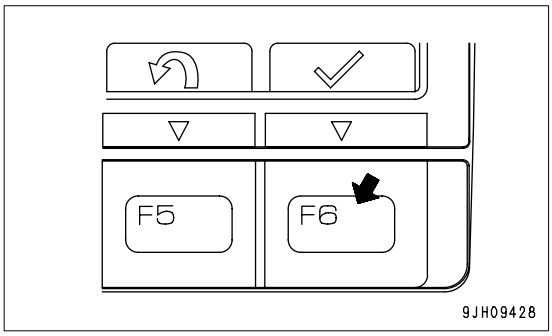




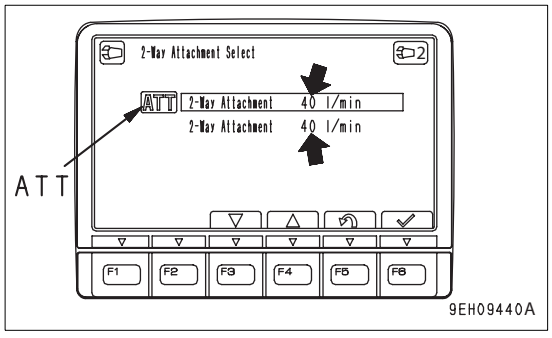
Changing attachment setting 2 selection

1. Select attachment setting selection (a) on the attachment setting menu screen, then press switch F6.



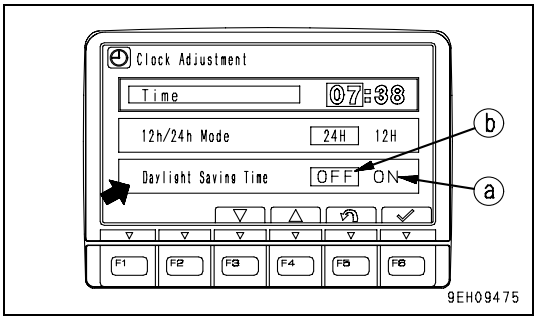


2. On the 2-Way Attachment Select Menu, select one of the two set values for the oil flow, then press switch F6.
   - ○ The default values for the oil flow setting are both set to 40 l/min, as shown in the illustration on the right. To change the oil flow setting, follow the procedure given in “See “Changing attachment 2 flow setting” on page 56.“
   - ○ The present oil flow set for ATT mode is marked with ATT in front of the item name as shown in the illustration on the right.



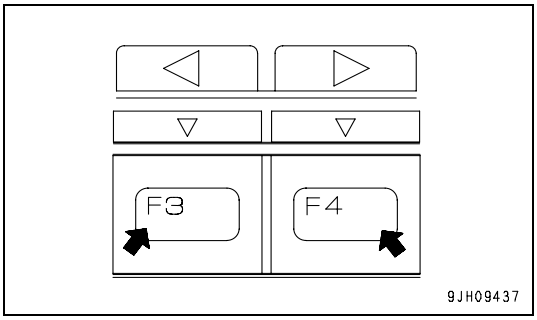
● Daylight Saving Time (Summer time)

1) If daylight saving time is turned ON (a), the clock display becomes 1 hour earlier. If daylight saving time is turned OFF (b), the clock display returns to the set time.



The selected display mode is highlighted in green.

2) Change the daylight saving time with the switches as follows.

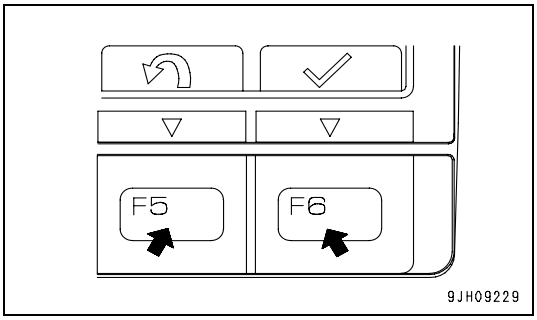


F3: Moves 1 item to left.

F4: Moves 1 item to right.

F5: Cancels change and returns to user menu.

F6: Accepts change and goes to setting for “Time“.



If the setting has been changed, always press switch F6.

REMARK
Daylight saving time or summer time means moving the clock forward 1 hour to take advantage of the fact that the sun rises early in summer. This system is used in many countries during the summer.

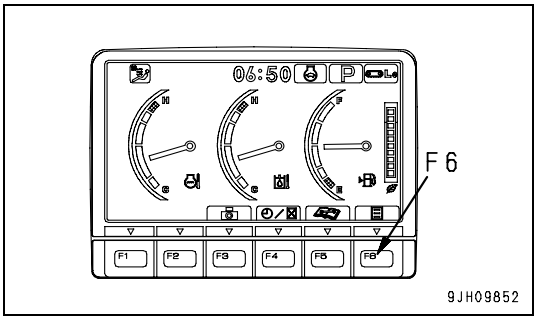
Language Selection

On this language selection menu, it is possible to select the language used on the monitor display.

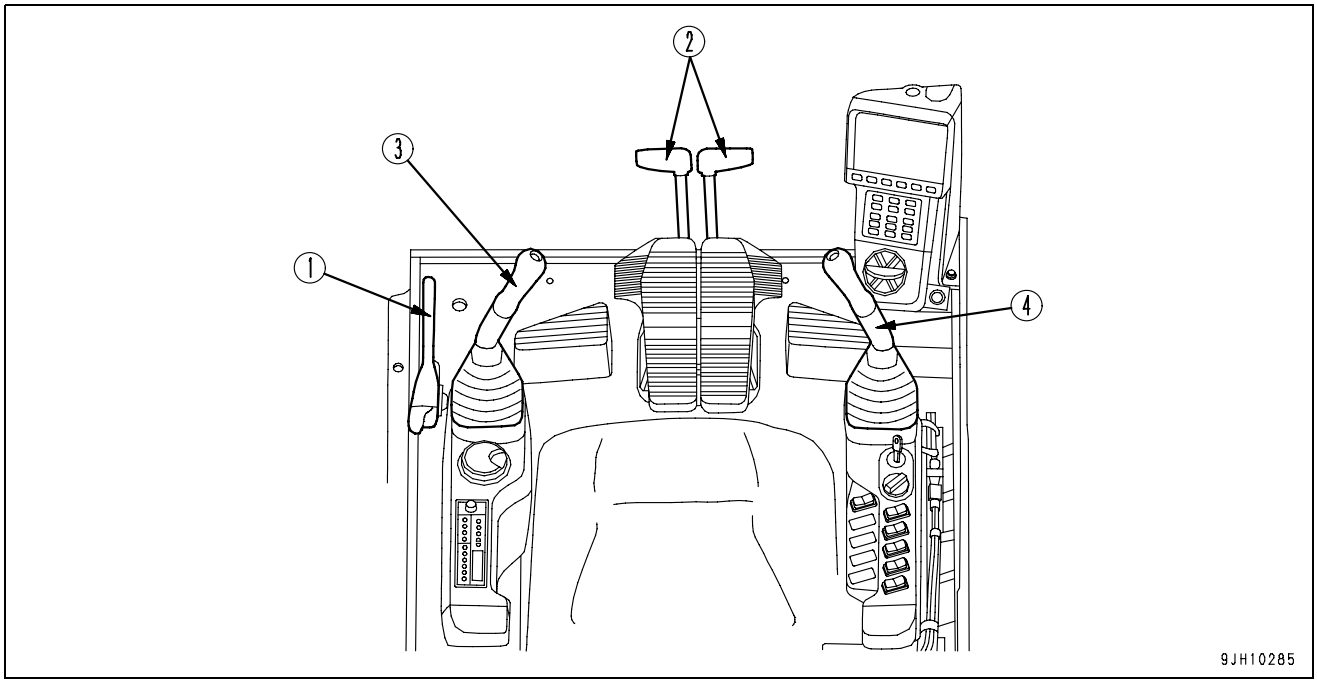
● The languages that can be selected are as follows.

Japanese, English, Chinese, French, Spanish, Portuguese, Italian, German, Russian, Turkish, Indonesian, Thai

1. On the standard screen, press switch F6.



CONTROL LEVERS AND PEDALS



(1) Lock lever
(2) Travel levers
(with pedal and auto-deceleration system)
(3) Left work equipment control lever
(with auto-deceleration system)
(4) Right work equipment control lever
(with auto-deceleration system)

Lock Lever

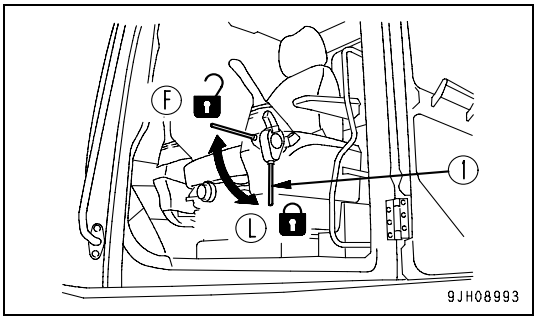
⚠ WARNING

- **When leaving the operator's compartment, set the lock lever securely to the LOCK position. If the lock lever is not at the LOCK position and the control levers or control pedals are touched by mistake, it may lead to serious personal injury.**
- **Check that the condition of the lever is as shown in the diagram.**
- **When pulling the lock lever up, be careful not to touch the work equipment control lever. When pushing the lock lever down, be careful not to touch the work equipment control lever.**

This lever (1) is a device to lock the work equipment, swing, travel, and attachment (if equipped) control levers.

(L) LOCK position: Even when levers or attachment control pedal (if equipped) are operated, machine does not move

(F) FREE position: Machine moves according to operation of levers or attachment control panel (if equipped)



REMARK
This lock lever is of hydraulic lock type. Accordingly, when it is in the lock position (L), the control levers or control pedals move but the machine does not move.

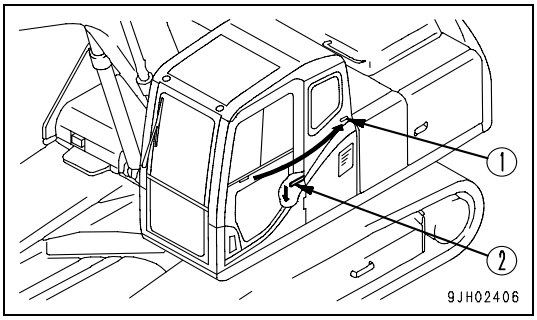
DOOR LOCK

⚠ WARNING

- **Before the releasing the door lock, always stop the machine on flat ground.**
- **Never release the door lock on a slope. The door may suddenly close and cause injury.**
- **When releasing the door lock, do not extend your body or hands outside the machine and do not put your hands on the door frame. The door may suddenly close and cause injury.**

Use the door lock to fix the door in position after opening it.

1. Push the door against catch (1) to lock it in position.
2. When closing the door, push down the lever (2) on the left of the operator's seat to release the catch.
3. When attaching the door in position, lock it firmly to the catch.

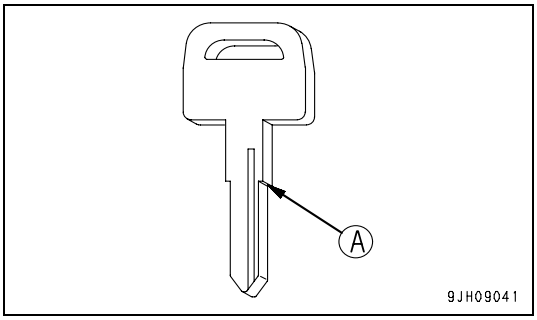


CAP WITH LOCK

Use the starting switch key to open and close the locks on the caps and covers.

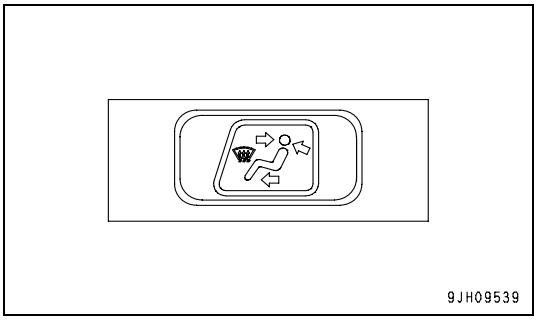
For details of the locations of the caps and covers with locks, see “LOCKING (3-168)“.

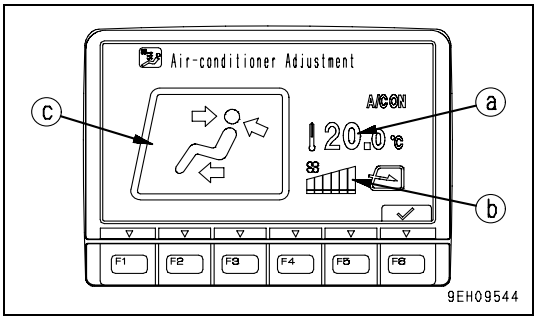
Insert the key as far as it will go to the shoulder (A). If the key is turned before it is inserted all the way, it may break.



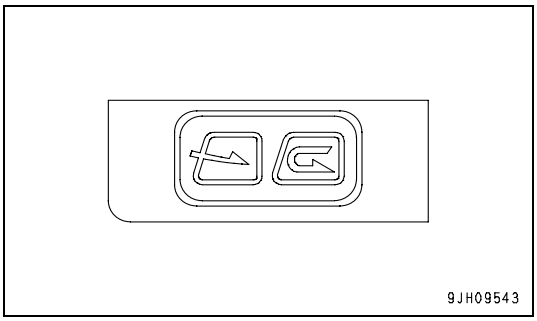
4. Press vent selector switch (4) and select the desired vents.

   When this is done, the display for vent (c) of the display monitor changes according to the selection.



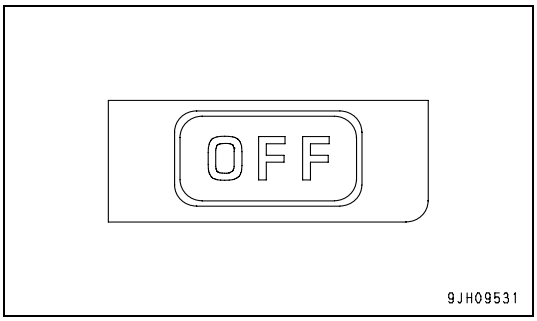


5. Press RECIRC/FRESH selector switch (6) and select recirculation of the air inside the cab (RECIRC) or intake of fresh air from outside (FRESH).



Stopping Manual Operation

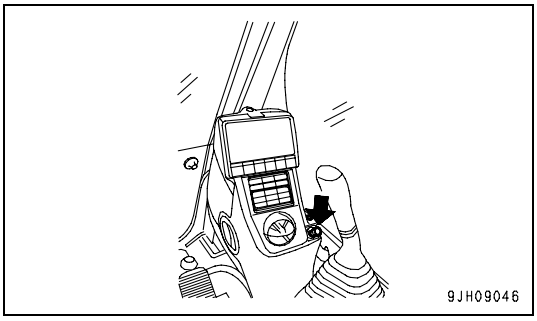
Press OFF switch (1). Operation stops.



AUXILIARY ELECTRIC POWER

24V Power Source

NOTICE
Do not use this as the power supply for 12V equipment.
It will cause failure of the equipment.



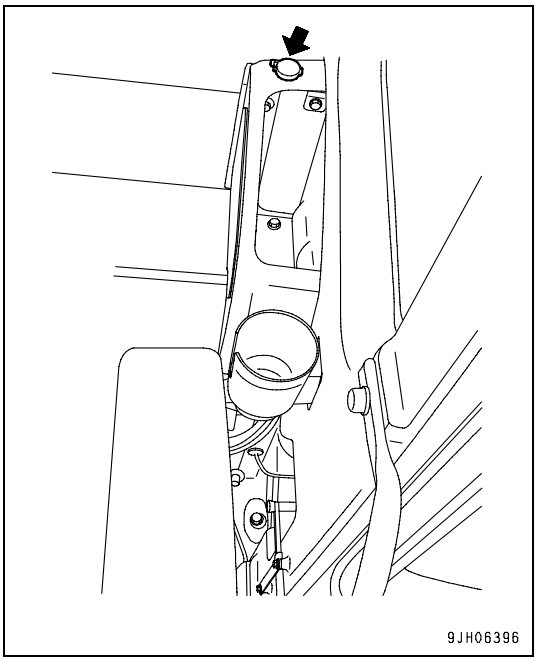
Pull out the connector plug for taking out electric power from the rear side of the panel.

Maximum usable electric power is 85 W (24 V x 3.5 A).

12V Power Source

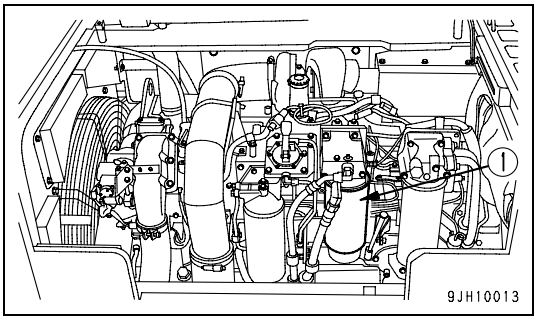
(If equipped)

This power source can be used up to a capacity of 60W (12V x 5A).



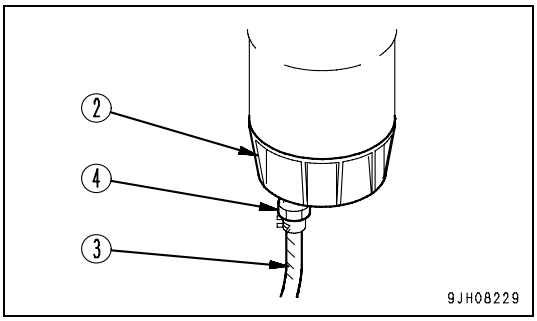
Check for Water and Sediment in Water Separator, Drain Water

1. Open the front engine hood.
2. The water separator forms one unit with fuel pre-filter (1).



3. It is possible to judge the water level and amount of sediment by looking through transparent cap (2). If there is any water or sediment collected at the bottom, set a container to catch the drain water under drain hose (3).
4. Loosen drain valve (4) and drain the water.
5. When fuel starts to drain from drain hose (3), tighten drain valve (4) immediately.

   Tightening torque: 0.2 to 0.45 Nm (0.02 to 0.046 kgm)



Seat Belt

⚠ WARNING

- **Before fitting the seat belt, check that there is no problem in the belt mount bracket or mounting belt. If it is worn or damaged, replace the seat belt.**
- **Even if no problem can be seen in the belt, replace the seat belt every 3 years. The date of manufacture of the belt is shown on the back of the belt.**
- **Always wear the seat belt during operations.**
- **Fit the seat belt so that it is not twisted.**

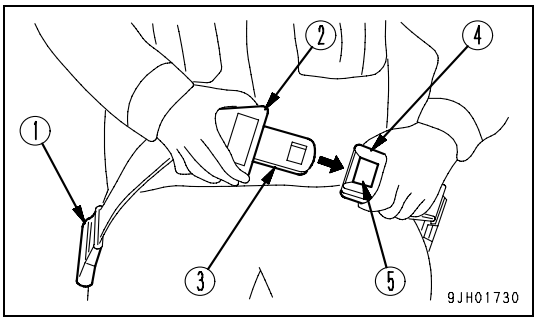
Fastening and Removing

This seat belt has a wind-in device, so it is not necessary to adjust the length.

Fastening Seat Belt

Hold grip (2) and pull the belt out from wind-in device (1), check that the belt is not twisted, then insert tongue (3) into buckle (4) securely.

When doing this, pull the belt lightly to check that it is properly locked.

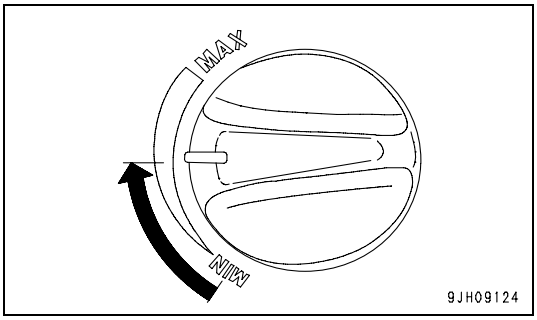


Removing Belt

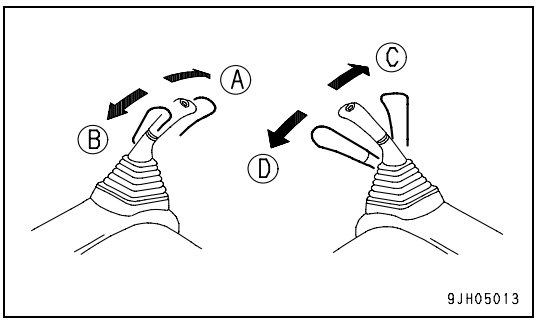
Press button (5) in buckle (4), and remove tongue (3) from buckle (4).

The belt is automatically wound in, hold grip (2) and return the belt slowly to wind-in device (1).

5. Turn fuel control dial (4) to a point midway between low idling (MIN) and full speed (MAX).

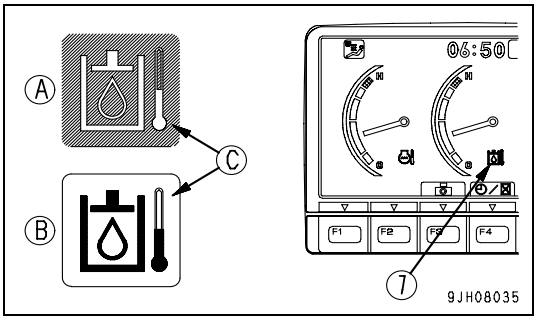


NOTICE
When the work equipment is retracted, take care that it does not interfere with the machine body or ground.



6. Move right work equipment control lever (5) slowly in the direction to pull in the bucket (D). Operate the lever to the end of its travel and hold it in position for 30 seconds.
7. Move right work equipment control lever (5) slowly in the direction to push out the bucket (C). Operate the lever to the end of its travel and hold it in position for 30 seconds.
8. Next, move left work equipment control lever (6) slowly in the direction to pull in the arm (B). Operate the lever to the end of its travel and hold it in position for 30 seconds.
9. Move left work equipment control lever (6) slowly in the direction to push out the arm (A). Operate the lever to the end of its travel and hold it in position for 30 seconds.
10. Repeat the operation in Steps 6 to 9 for 5 minutes.
11. Check that hydraulic oil temperature monitor (7) is displaying the correct temperature.

    If the hydraulic oil temperature monitor is not displaying the correct temperature (it is displaying low temperature), repeat Steps 6 to 10 until the display is the correct temperature.



    (A) Display when temperature is correct: Monitor background (C) is blue

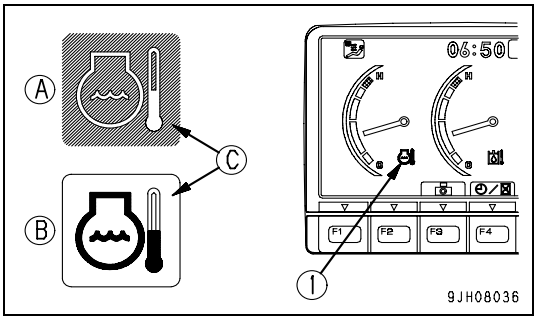
    (B) Display when temperature is low: Monitor background (C) is white

12. Check that engine coolant temperature monitor (1) displays the correct temperature.

    (A) Display when temperature is correct: Monitor background (C) is blue

    (B) Display when temperature is low: Monitor background (C) is white

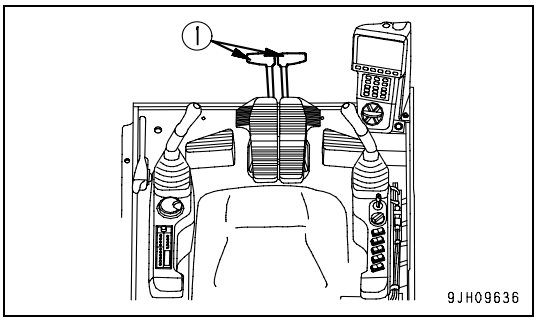
    If it displays low temperature, carry out additional warm up of the engine until engine coolant temperature monitor (1) displays the correct temperature.

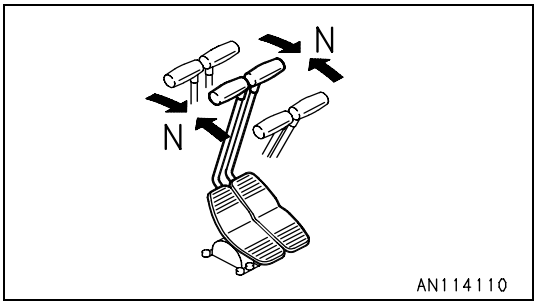


Stopping Machine

Avoid stopping suddenly. Give yourself ample room when stopping.

1. Put the left and right travel levers (1) in the neutral position, then stop the machine.

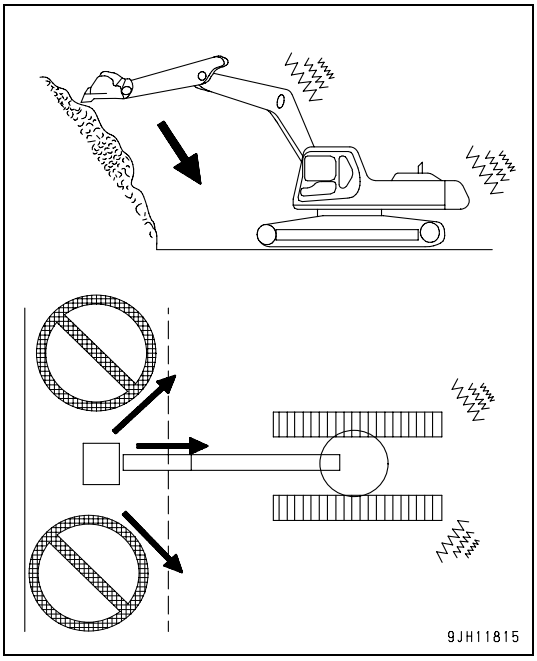




Operations Digging at an Angle without Engaging Teeth

Do not swing the upper structure when digging hard rock at a position higher than the machine if the bucket teeth will not penetrate the rock. The teeth will slip on the rock surface and generate excessive vibration of the machine, and this will lead to cracking of the work equipment or frame.

In addition, if the bucket teeth slip and hit the rock, there will be excessive impact load on the work equipment and frame, and this will reduce the service life of the machine.

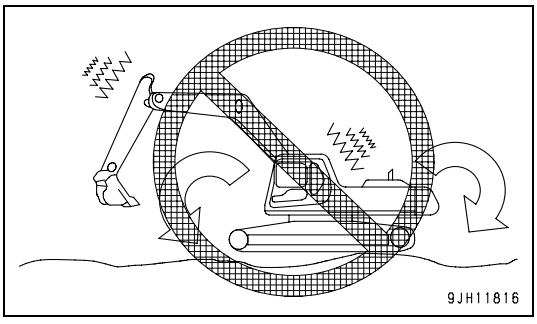


Digging Hard Rocky Ground

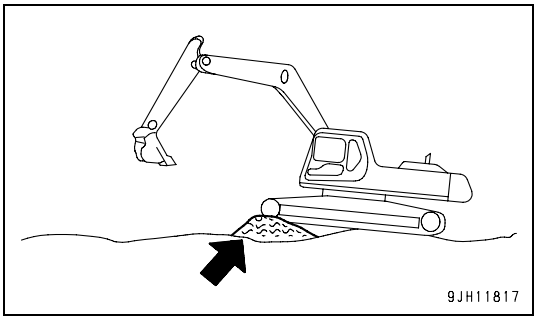
Do not attempt to directly excavate hard rocky ground with the work equipment. It is better to excavate it after breaking up by some other means. This will not only save the machine from damage but will make for better economy.

Operations When Machine is Not Stable

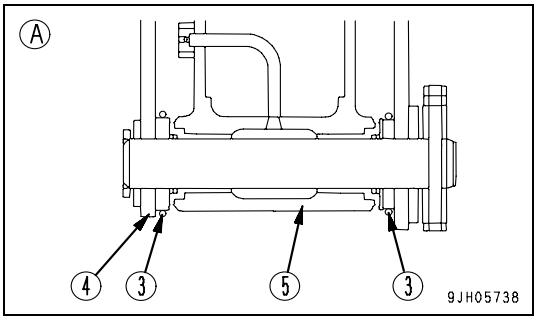
Do not carry out operations when the machine is not in a stable position. This will generate a twisting load on the frame and other parts and will reduce the service life of the machine.



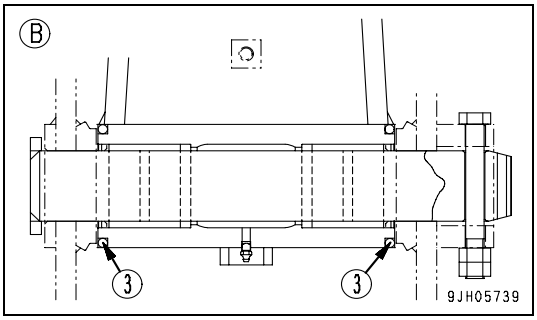
When carrying out operations in such a place, pile soil under the front of the track or take other measures to stabilize the machine before starting the operation.



REMARK
When installing the bucket, for arm pin portion (A), fit O-ring (3) to bucket (4) in the position shown in the diagram on the right. After inserting the pin, fit it in the standard groove.
For link pin portion (B), install the bucket with O-ring (3) fitted in the standard groove.



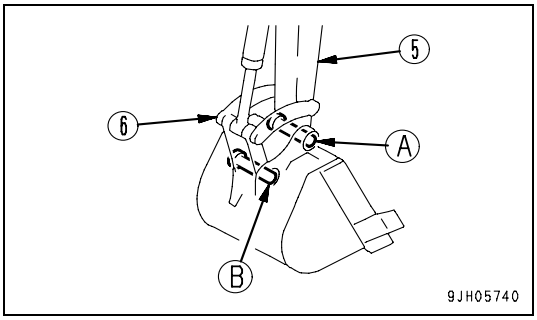
4. Install the stopper bolts and nuts for each pin, then grease the pin.



REMARK
Lubricate with grease thoroughly until the grease comes out from the end face.
When replacing the bucket, replace the dust seal if it has been damaged. If a damaged seal is used without being replaced, sand and dirt may enter the pin portion and cause abnormal wear of the pin.

Inversion

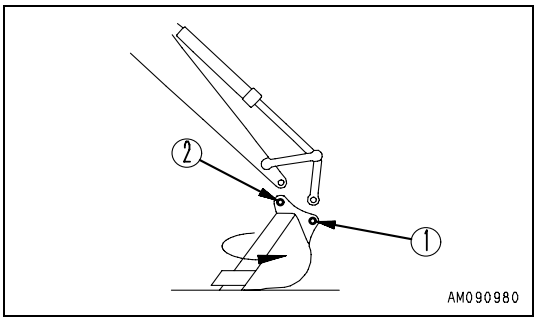
NOTICE
The rock bucket (PC 400: if equipped, PC 450: standard) interferes with the arm, so it cannot be reversed to carry out excavation to the front.



1. Place the bucket in contact with a flat surface.

REMARK
When removing the pins, place the bucket so that it is in light contact with the ground.
If the bucket is lowered strongly to the ground, the resistance will be increased and it will be difficult to remove the pins.

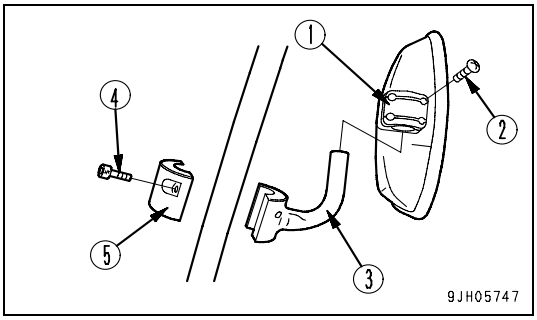
NOTICE
After removing the pins, make sure that mud or sand does not get on them. Dust seals are fitted at both ends of the bushings, be careful not to damage them.



2. Remove the double nut on the stopper bolt for arm pin (A) and link pin (B), remove the bolt, pull out arm pin (A) and link pin (B), and then remove the bucket.

Mirror (B)

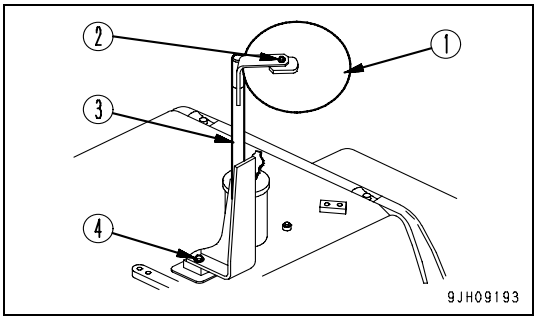
3. Loosen mounting bolt (2), then remove mirror (1) from support (3).
4. Loosen bolt (4) and remove support (3) and clamp (5) from the handrail.



Mirrors (C), (D)

(If equipped)

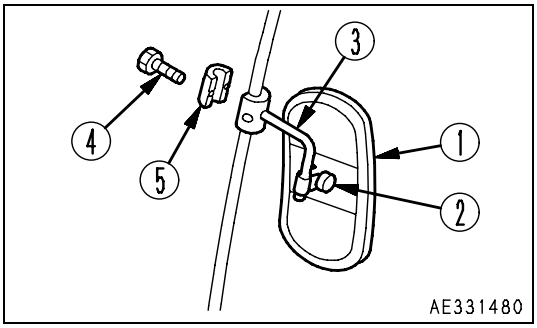
5. Loosen locknut (2), then remove mirror (1) from bracket (3).
6. Remove bolt (4), then remove bracket (3) from the machine.



Installation

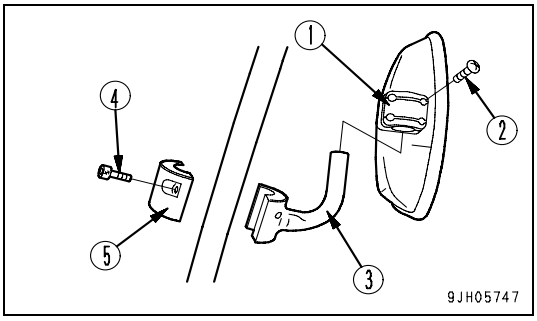
Mirror (A)

1. Install support (3) and clamp (5) to the handrail, then tighten with bolt (4).
2. Install mirror (1) to bracket (3),then tighten locknut (2).



Mirror (B)

3. Install support (3) and clamp (5) to the handrail, then tighten with bolt (4).
4. Install mirror (1) to support (3),then tighten lock bolt (2).



Battery

⚠ WARNING

- **The battery generates flammable gas. Do not bring fire or sparks near the battery.**
- **Battery electrolyte is dangerous. If it gets in your eyes or on your skin, wash it off with a large amount of water and consult a doctor.**
- **Battery electrolyte dissolves paint. If it gets on the bodywork, wash it off immediately with water.**
- **If the battery electrolyte is frozen, do not charge the battery or start the engine with a different power source. There is danger that the battery may explode.**
- **Battery electrolyte is toxic. Do not let it flow into drainage ditches or spray it on to the ground surface.**

When the ambient temperature drops, the capacity of the battery will also drop. If the battery charge ratio is low, the battery electrolyte may freeze. Maintain the battery charge as close as possible to 100%. Insulate it against cold temperature to ensure the machine can be started easily the next morning.

REMARK
Measure the specific gravity and calculate the charging rate from the following conversion table.

Charging Rate (%)	Electrolyte Temperature (°C)			
	20	0	-10	-20
100	1.28	1.29	1.30	1.31
90	1.26	1.27	1.28	1.29
80	1.24	1.25	1.26	1.27
75	1.23	1.24	1.25	1.26

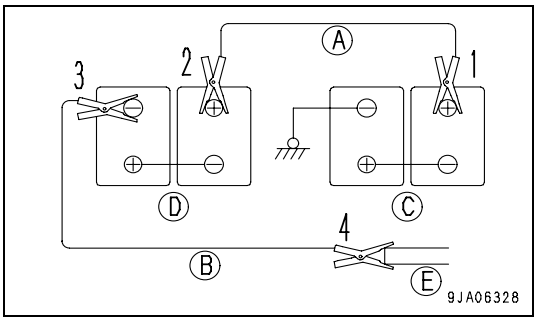
- As the battery capacity drastically drops in low temperatures, cover or remove the battery from the machine, store the battery in a warm place, and install it again the next morning.
- If the electrolyte level is low, add distilled water in the morning before beginning work. Do not add water after the day's work to prevent diluted electrolyte in the battery from freezing during the night.

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.



Starting the Engine

WARNING

Always check that the 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 neutral position.

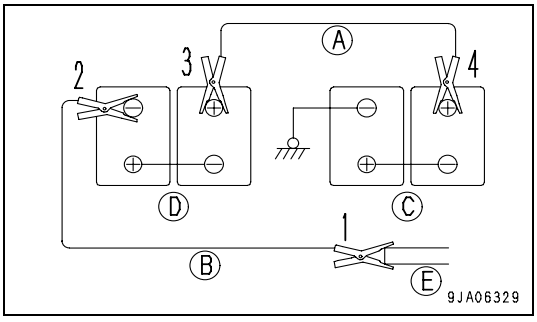
1. Make sure the clips are firmly connected to the battery terminals.
2. Start engine of the normal machine and run it at high idle speed.
3. Turn the starting switch of the problem machine to the START position and start the engine.

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

Booster Cable Disconnection

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

1. Remove one clip of booster cable (B) from the revolving frame (E) of the problem machine.
2. Remove the clip of booster cable (B) from the negative (-) terminal of battery (D) on the normal machine.
3. Remove the clip of booster cable (A) from the positive (+) terminal of battery (D) on the normal machine.
4. Remove the clip of booster cable (A) from the positive (+) terminal of battery (C) on the problem machine.



FUEL

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

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

COOLANT AND WATER FOR DILUTION

- The coolant has the important function of preventing corrosion as well as preventing freezing.

  Even in the areas where freezing is not an issue, the use of antifreeze coolant is essential.

  Komatsu machines are supplied with Komatsu Supercoolant (AF-NAC). Komatsu Supercoolant (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for 2 years or 4000 hours.

  Komatsu Supercoolant (AF-NAC) is strongly recommended wherever available.
- When using Komatsu Supercoolant (AF-NAC), there is no need to use a corrosion resistor. For details, see “CLEAN INSIDE OF COOLING SYSTEM (4-27)“.
- When diluting the antifreeze coolant, use distilled water or tap water (soft water).

  Natural water, such as a river water or well water (hard water), contains large amounts of minerals (calcium, magnesium, etc.), and this makes it easier for scale to form inside the engine or radiator. Once scale is deposited inside the engine or radiator, it is extremely difficult to remove. It also causes overheating due to poor heat exchange, so when you dilute the coolant, we recommend that you use water with an overall hardness of less than 100 PPM.
- When using antifreeze, always observe the precautions given in the Operation and Maintenance Manual.
- Antifreeze coolant is flammable, so be sure to keep it away from flame.
- The ratio of Supercoolant (AF-NAC) to water differs according to the ambient temperature.

  For details of the ratio when mixing, see “CLEAN INSIDE OF COOLING SYSTEM (4-27)“.

  Supercoolant (AF-NAC) may be supplied in premix. In this case, never add diluting water.
- If the engine overheats, wait for the engine to cool before adding coolant.
- If the coolant level is low, it will cause overheating, and will also cause problems with corrosion due to air entering the coolant.

TIGHTENING TORQUE SPECIFICATIONS

TIGHTENING TORQUE LIST

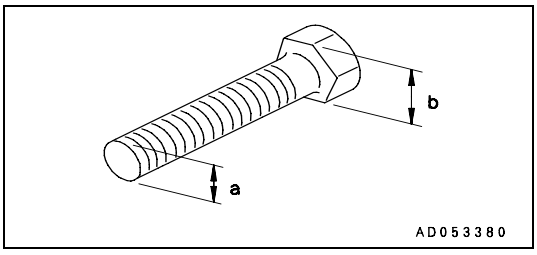
⚠ CAUTION

If nuts, bolts, or other parts are not tightened to the specified torque, it will cause looseness or damage to the tightened parts, and this will cause failure of the machine or problems with operation.
Always pay careful attention when tightening parts.

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

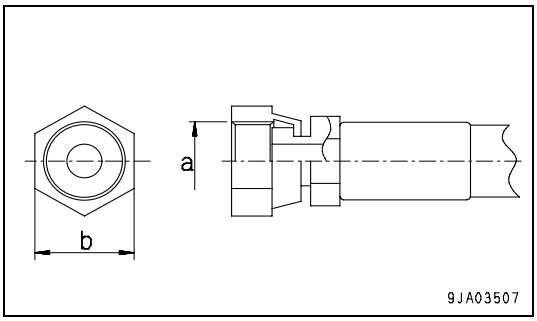
If it is necessary to replace any nut or bolt, always use a Komatsu genuine part of the same size as the part that was replaced.

Thread diameter of bolt (a)(mm)	Width across flats (b)(mm)	Tightening torque			
		Target value		Service limit	
		Nm	kgm	Nm	kgm
6	10	13.2	1.35	11.8-14.7	1.2-1.5
8	13	31	3.2	27-34	2.8-3.5
10	17	66	6.7	59-74	6.0-7.5
12	19	113	11.5	98-123	10.0-12.5
14	22	172	17.5	153-190	15.5-19.5
16	24	260	26.5	235-285	23.5-29.5
18	27	360	37	320-400	33.0-41.0
20	30	510	52.3	455-565	46.5-58.0
22	32	688	70.3	610-765	62.5-78.0
24	36	883	90	785-980	80.0-100.0
27	41	1295	132.5	1150-1440	118.0-147.0
30	46	1720	175.0	1520-1910	155.0-195.0
33	50	2210	225.0	1960-2450	200.0-250.0
36	55	2750	280.0	2450-3040	250.0-310.0
39	60	3280	335.0	2890-3630	295.0-370.0



Apply the following table for Hydraulic Hose.

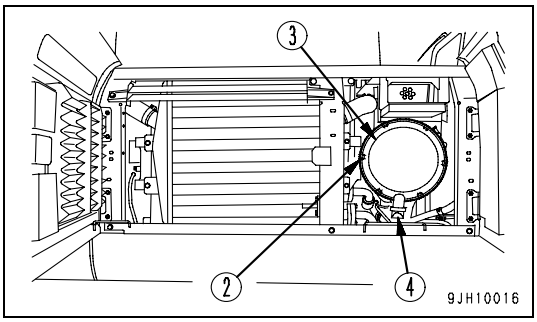
Thread diameter a (mm)	Width across flat b(mm)	Tightening torque [Nm (kgm)]	
		Target value	Permissible range
9/16 -18UNF	19	44 (4.5)	35 - 54 (3.5 - 5.5)
11/16 -16UN	22	74 (7.5)	54 - 93 (5.5 - 9.5)
13/16 -16UN	27	103 (10.5)	84 - 132 (8.5 - 13.5)
1 -14UNS	32	157 (16.0)	128 - 186 (13.0 - 19.0)
1·3/16 -12UN	36	216 (22.0)	177 - 245 (18.0 - 25.0)
*1-7/16-12UN -2B	41	215 (22)	176 - 234 (18 - 24)



- The torques marked * indicate the tightening torques for the hoses at the top of the swivel joint.

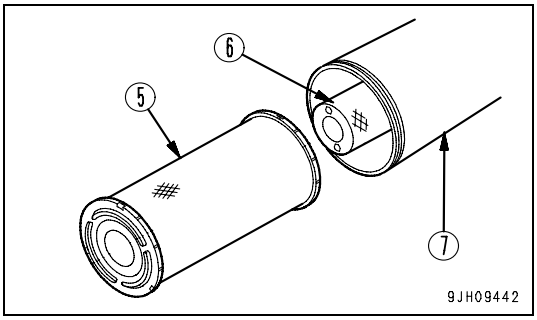
Replacing Element

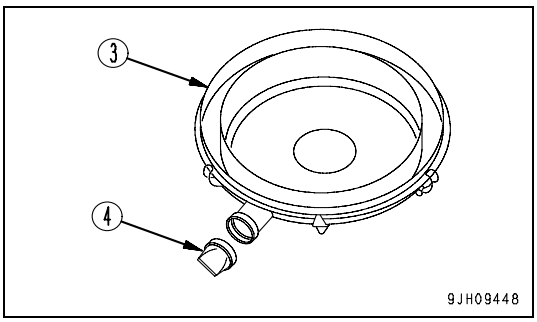
1. Open the right door of the machine, remove 6 hooks (2), then remove cover (3).



2. Hold the outer element (5), rock it lightly up and down and to the left and right, and rotate the element to the left and right to pull it out.

   Do not remove inner element (6) when doing this.
3. When the outer element (5) has been removed, check that the inner element has not come out of position and is not at an angle. If it is at an angle, insert your hand and push it in straight.
4. Wipe off or brush off the dirt stuck to cover (3) and the inside of the air cleaner body (7).
5. Remove any dirt or dust that is accumulated to evacuator valve (4) installed to cover (3).





NOTICE

- **The inner element must not be cleaned and used again. When replacing the outer element, replace the inner element at the same time.**
- **If the inner element is not installed properly and the outer element and cover are installed, there is danger that the outer element will be damaged.**
- **The seal portion on imitation parts lacks precision, and allows the entry of dust, which leads to damage of the engine. Do not use such imitation parts.**

6. Remove inner element (6), then quickly install the new inner element.

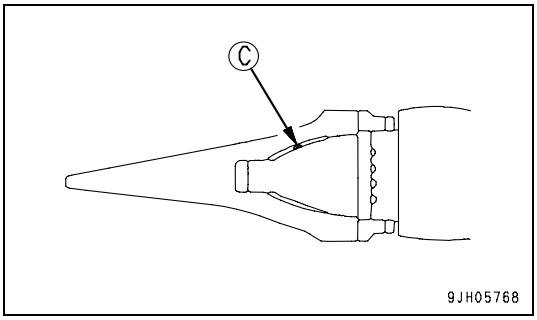
   Insert the inner element securely so that it does not move.
7. Push the new outer element (5) in straight with your hand when installing it to the air cleaner body.

   If the element is held and rocked lightly up and down and to the left and right while pushing it in, the element can be inserted easily.

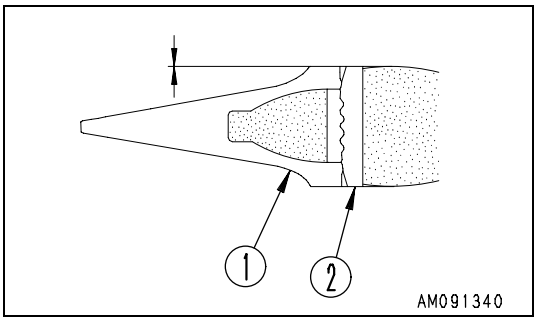
8. Fit tooth (1) to adapter (4), and confirm that when the pointer is pressed strongly, the rear face of the hole for the pin of the teeth (1) is at the same level as the rear face of the hole for the pin of the adapter (4).

   If the rear face of the pin hole of tooth (1) protrudes in front of the rear face of the pin hole of adapter (4), do not knock the pin in.

   If this happens, there is something (C) preventing the tooth (1) from fitting completely in adapter (4), locate the problem and remove the obstruction. When tooth (1) fits completely in adapter (4), knock in lock pin (2).



9. Insert lock pin (2) in the pin hole in the tooth (1), and knock it in so that the top surface of lock pin (2) is the same height as the surface of tooth (1).

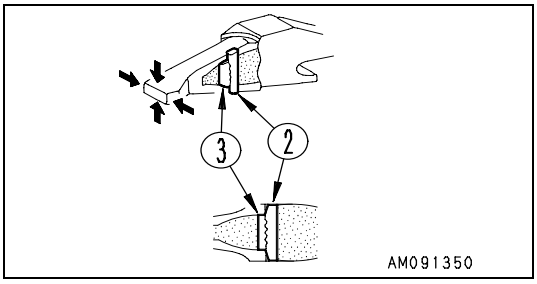


10. After replacing a bucket tooth, always check the following.

   1) After the lock pin (2) has been knocked in completely, check that it is secured by the teeth (1) and surface.

   2) Lightly hit lock pin (2) in the reverse direction from which it was hit in.

   3) Lightly hit the tip of the teeth (1) from above and below, and hit its sides from right and left.



   4) Confirm that rubber pin lock (3) and lock pin (2) are set as sho

REMARK

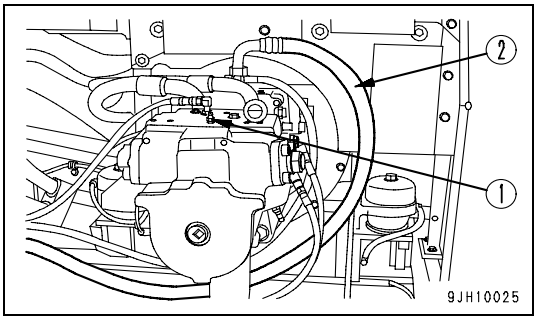
If the tooth is turned, the wear will become uniform. This will extend the service life of the tooth and reduce the frequency of replacement.

When replacing the tooth, replace the rubber pin lock and lock pin with new parts at the same time. This will prevent the tooth from falling out.

BLEEDING AIR FROM HYDRAULIC SYSTEM

For details, see “STARTING ENGINE (3-128)“. If it is necessary to refer to the items for starting the engine, moving the machine off, steering, or stopping, see the OPERATION section.

1. Bleeding air from pump



1) Loosen air bleeder (1) and check that oil oozes out from the air bleeder.

2) If the oil does not ooze out, remove the drain hose from the hydraulic pump case and fill the pump case completely with hydraulic oil through drain port (2).
Hold the removed hose firmly, keeping the mouthpiece higher than the oil level in the hydraulic tank so that oil will not spill out of the hose.

3) After completing the air bleed operation, tighten air bleeder (1) and install the drain hose.

NOTICE
If the drain hose is installed first, oil will spurt out from bleeder hole (1).
If the pump is operated without filling the pump case with hydraulic oil, abnormal heat will be generated and this may cause an unexpected damage to the pump.

2. Starting engine

Start the engine, referring to “STARTING ENGINE (3-128)“.

Run the engine at low idle for 10 minutes after starting, then start operations.

3. Bleeding air from cylinders

1) Run the engine at low idle, and extend and retract each cylinder 4 to 5 times, taking care that a cylinder is not moved to the end of its stroke. (Stop the cylinder approx. 100 mm short of its stroke end)

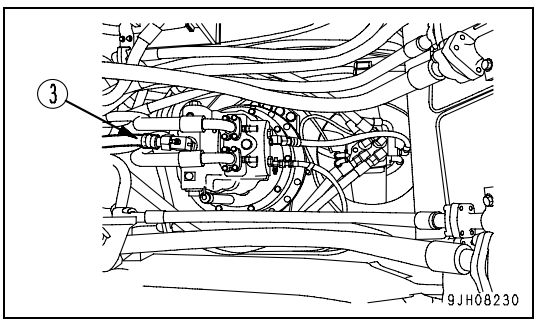
2) Next, operate each cylinder 3 to 4 times to the end of its stroke.

3) Finally, operate each cylinder 4 to 5 times to the end of its stroke to completely remove the air.

NOTICE
If the engine is run at high speed immediately after startup or a cylinder is pushed up to its stroke end, air taken inside the cylinder may cause damage to the piston packing.

4. Bleeding air from swing motor

1) Run the engine at low idling, loosen hose (3) at port S, and check that oil oozes out from port S hose (3).



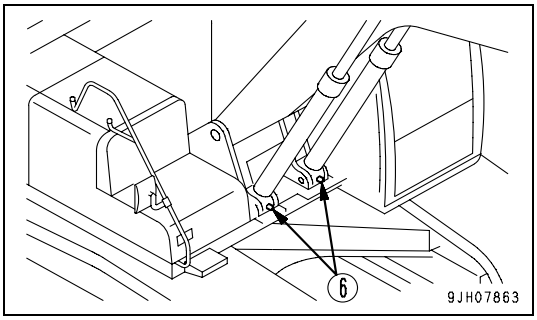
NOTICE
Do not operate the swing under any circumstances.

2) If oil does not ooze out, stop the engine, remove port S hose (3), and fill the inside of the motor case with hydraulic oil.

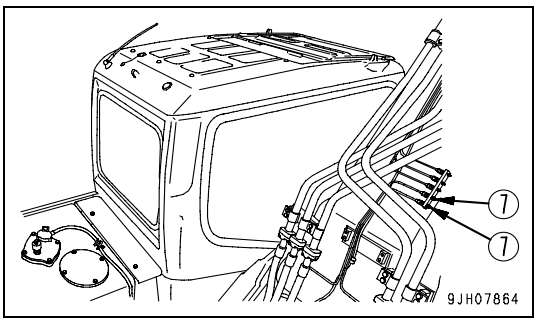
3) After completely bleeding the air from the swing motor, tighten port S hose (3).

4) Run the engine at low idle and slowly swing at least two times uniformly to the left and right. This will automatically bleed the air from the swing circuit.

(6) Boom cylinder foot pin (2 places)



(7) Boom foot pin (2 places)



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.**

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.**

- Prepare a container to catch drain fuel.
- Prepare a filter wrench

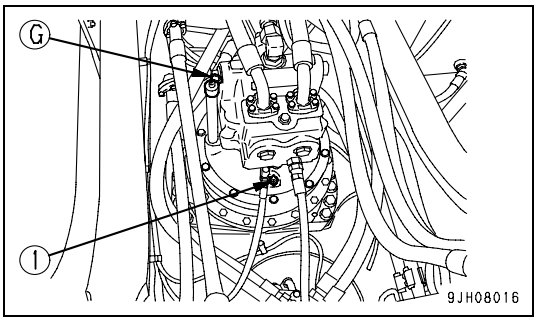
CHECK OIL LEVEL IN SWING MACHINERY CASE, ADD OIL

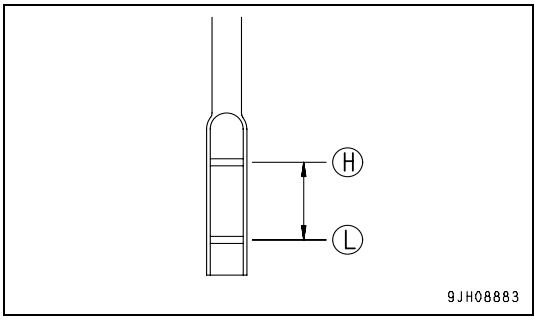
⚠ WARNING

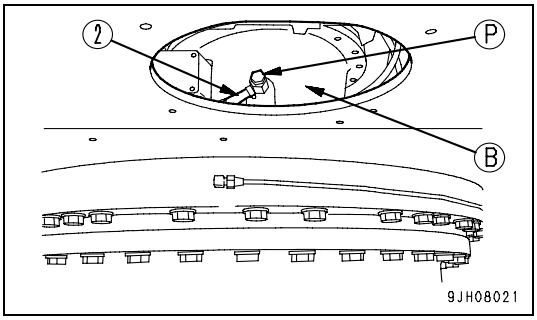
Parts and oil are at high temperature immediately after the engine is stopped and may cause serious burns. Wait for the oil temperature to go down before performing this operation.

1. Remove dipstick (G) and wipe the oil from the dipstick with a cloth.
2. Fully insert dipstick (G) into the filler pipe.
3. Pull out dipstick (G) and check that the oil level is between the (H) and (L) marks on the dipstick.
4. If the oil does not reach the L mark on dipstick (G), add engine oil through dipstick insertion hole.

   When refilling, remove bleeding plug (1).
5. If the oil level is above the (H) mark on dipstick (G), loosen drain valve (P) and drain the excess oil.
   - When draining the oil, first pull hose (2) out from inspection hole (B), then turn the drain valve to the OPEN position.
6. After checking oil level or adding oil, insert the dipstick into the hole and install air bleeding plug (1).







EVERY 2000 HOURS MAINTENANCE

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

CHANGE OIL IN FINAL DRIVE CASE

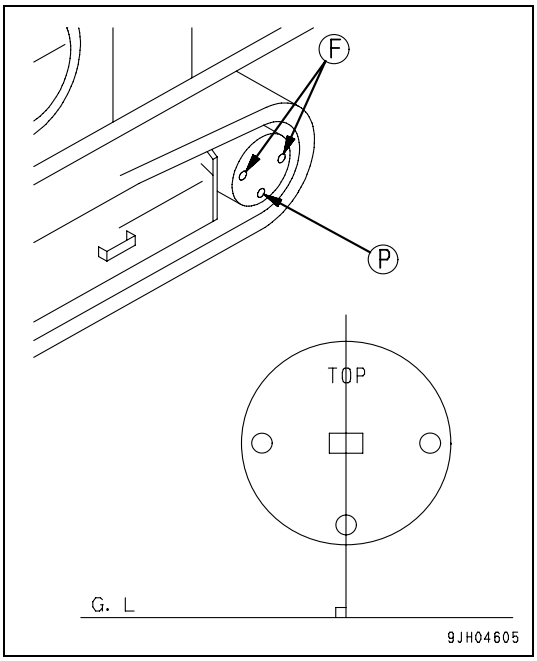
⚠ WARNING

- **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.**

- Refill capacity: each 10.5 liters
- Prepare a handle.

1. Set the TOP mark at the top, with the TOP mark and plug (P) perpendicular to the ground surface.
2. Set a container under plug (P) to catch the oil.
3. Remove plugs (P) and (F) with the handle and drain the oil.

REMARK
Check the O-rings in the plugs for damage. If necessary, replace with new ones.



4. Tighten plug (P).
5. Add oil through the hole of plug (F).
6. When oil begins to overflow from the plug (F) hole, install plug (F).
   Tightening torque of plugs (P) and (F):
   68.6 ± 9.8 Nm (7 ± 1 kgm)

REMARK
There are two plugs (F). Add oil through the one easier to fill oil and through which no internal gears are to be seen.

SPECIFICATIONS

ATTACHMENTS ANDD OPTIONS

⚠ WARNING

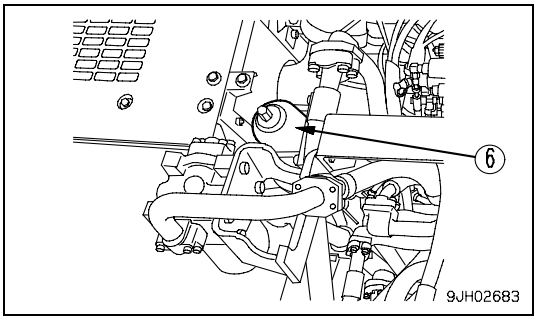
Please read and make sure that you understand the SAFETY section before reading this section.

Accumulator

⚠ WARNING

The accumulator is charged with high-pressure nitrogen gas, so mistaken operation may cause an explosion, which will lead to serious injury or damage. When handling the accumulator, always do as follows.
The pressure in the hydraulic circuit cannot be completely removed. When removing the hydraulic equipment, do not stand in the direction that the oil spurts out when carrying out the operation. In addition, loosen the bolts slowly when carrying out the operation.
Do not disassemble the accumulator.
Do not bring it near flame or dispose of it in fire.
Do not make holes in it or weld it.
Do not hit it, roll it, or subject it to any impact.
When disposing of the accumulator, the gas must be released. Please contact your Komatsu distributor to have this work carried out.

This accumulator (6) is installed to reduce the peak pressure in the hydraulic circuit when a breaker is used. Normally, do not touch it.



NOTICE
On machines equipped with a breaker, it is necessary to install an accumulator to the breaker piping to match the model number of the breaker manufacturer. If no accumulator is installed and the breaker is operated, the service life of the machine will be reduced. For questions about the breaker, please contact your Komatsu distributor.
For details, see "CHECK NITROGEN GAS CHARGE PRESSURE IN ACCUMULATOR (for breaker) (4-73)" or "CHECKING CHARGE PRESSURE OF NITROGEN GAS IN ACCUMULATOR (FOR CONTROL CIRCUIT) (4-76)".

ATTACHMENT OPERATIONS

⚠ WARNING

- **If the pedal is operated when the auto-deceleration is being actuated and the engine speed has dropped, the engine speed will suddenly rise, so be careful when operating.**
- **If you leave your foot resting on the pedal and depress the pedal by mistake, there is danger that the attachment may suddenly move and cause serious personal injury. If you do not need to operate the pedal, do not rest your foot on the pedal.**
- **When the attachment is not being used, set the lock pin of the pedal to the LOCK position to prevent the pedal from being operated.**

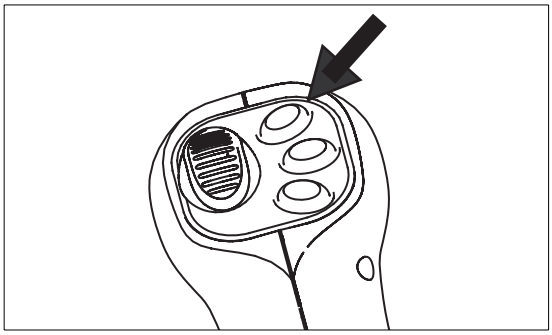
The method of operating the attachment is as follows.

Operation When Using Breaker

NOTICE
When carrying out breaker operations, use the breaker mode. If the breaker mode is not used, the breaker may be damaged.

Breaker can be operated using either the breaker switch or attachment control pedal.

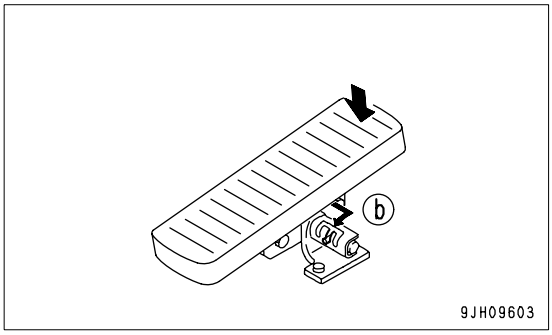
1. Breaker Switch - With the working mode set to B mode, press switch to operate breaker and release to stop.



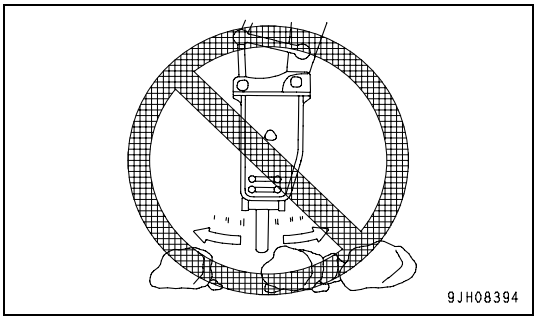
⚠ WARNING

When operating breaker using breaker switch, lock the pedal with the lock pin to avoid accidental operation.

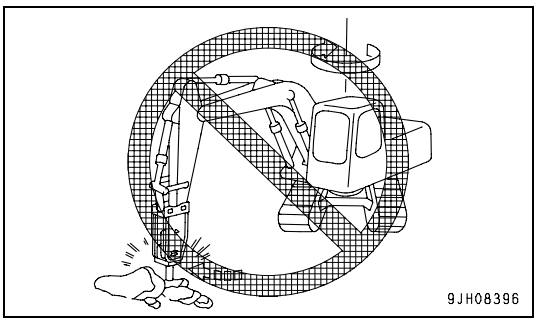
2. Attachment Control Pedal - With the working mode set to B mode, insert the lock pin in front-only FREE position (b). Press the front of the pedal to operate the breaker.



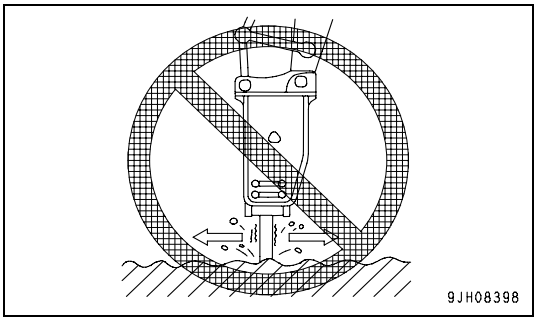
Using the mount together in pieces of rock



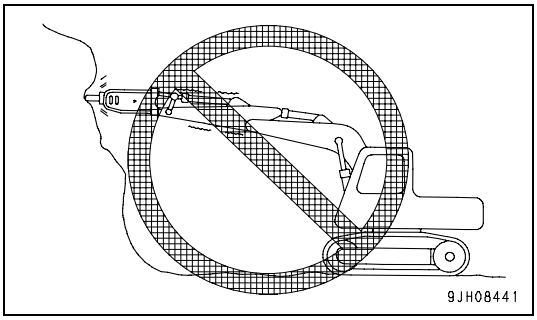
Operations using the swing force



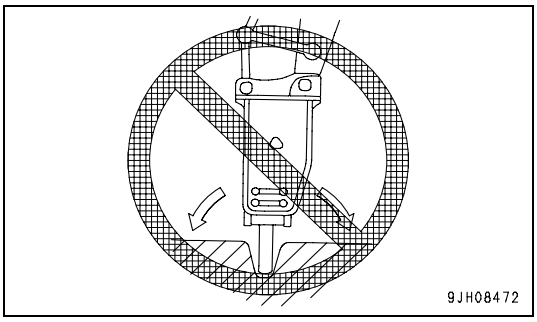
Moving the chisel while carrying out impacting operations



Holding the chisel horizontal or pointed up when carrying out impacting operations



Twisting the chisel when it has penetrated the rock

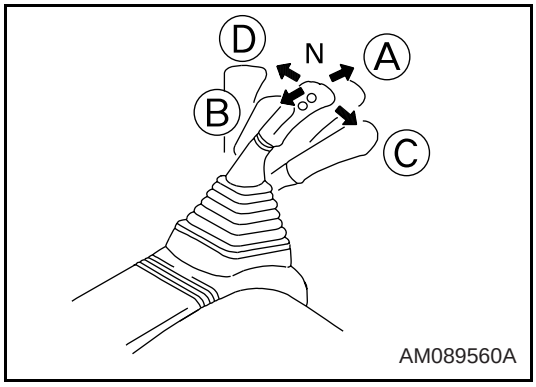


LEFT WORK EQUIPMENT CONTROL LEVER (3)

(with auto-deceleration device)

⚠ WARNING

If any lever is operated when in the deceleration range, the engine speed will suddenly increase, so be careful when operating the levers.



This lever is used to operate the arm and upper structure.

Arm operation	Swing operation
(A) Arm OUT	(C) Swing to right
(B) Arm IN	(D) Swing to left
N (Neutral)	

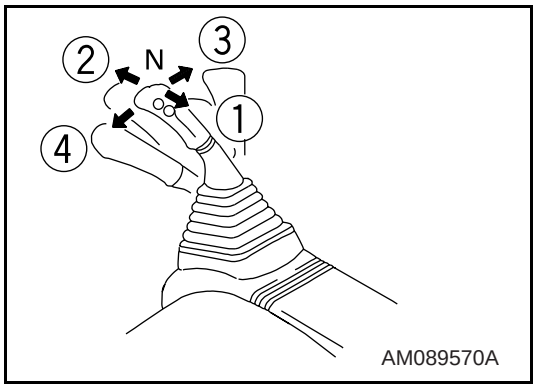
When the lever in Neutral (N) position, the upper structure and the arm will be retained in the position in which they stop.

RIGHT WORK EQUIPMENT CONTROL LEVER (4)

(with auto-deceleration device)

⚠ WARNING

If any lever is operated when in the deceleration range, the engine speed will suddenly increase, so be careful when operating the levers.



This lever is used to operate the boom and bucket.

Boom operation	Bucket operation
(1) RAISE	(3) DUMP
(2) LOWER	(4) CURL
N (Neutral)	

When the lever in Neutral (N) position, the boom and the bucket will be retained in the position in which they stop.

NOTICE

- **For levers (2), (3) and (4), the engine speed changes as follows because of the auto-deceleration mechanism.**
- **When the travel lever and work equipment control levers are at neutral, even if the fuel control dial is above the mid-range position, the engine speed will drop to a mid-range speed. If any of the levers are operated, the engine speed will rise to the speed set by the fuel control dial.**
- **If all control levers are set to neutral, the engine speed will drop by approx. 100 rpm, and after approx. 4 seconds, the engine speed will drop to the deceleration speed (approx. 1400 rpm).**

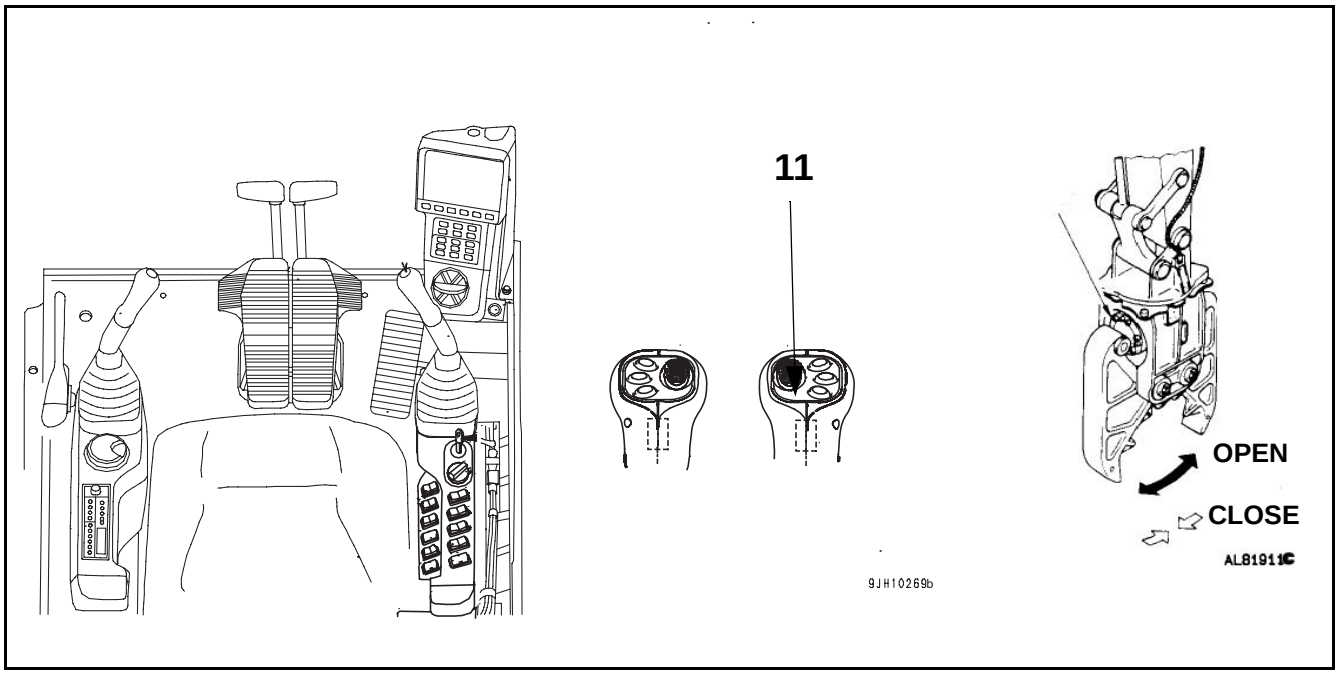
HIGH REACH DEMOLITION EQUIPMENT 27M

⚠ WARNING

Please read and make sure that you understand the safety volume of the standard machine operation and maintenance manual before reading this section.

This chapter describes only the High Reach Demolition machine. Therefore please refer to operation and maintenance section of the standard machine.

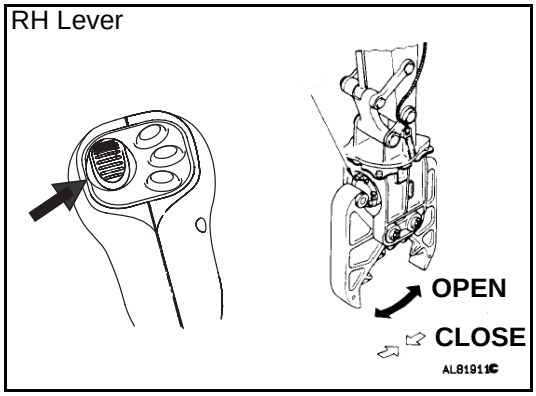
CRUSHER CONTROL FOR OPENING AND CLOSING



⚠ WARNING

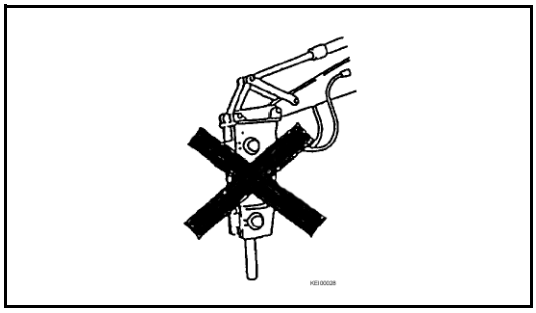
If any lever is operated when in the deceleration range, the engine speed will suddenly increase, so be careful when operating the levers.

- When the proportional control switch (11) is operated forward, the attachment is actuated in forward direction. When the rear of the switch is operated, the attachment is actuated in reverse direction.



PROHIBITION OF WORK WITH HYDRAULIC BREAKER

The machine is not suitable for breaker use in any configuration. Do not install a hydraulic breaker for breaking work. If you do, the work equipment will be damaged.

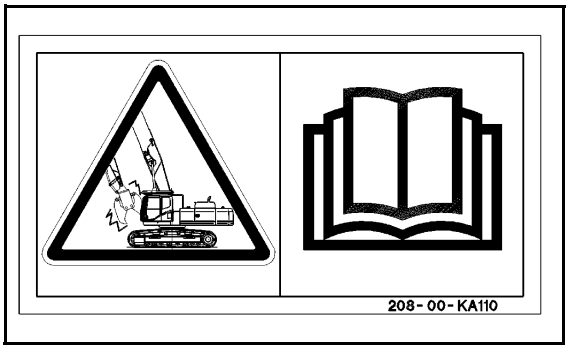


WHEN WORKING IN MEDIUM REACH CONFIGURATION

When in medium reach configuration (boom 2 removed).

⚠ WARNING

- **When the second boom is removed the attachment can hit the operator cab or chassis.**
- **Operate work equipment slowly and carefully to avoid any injury and damage.**



DEMOLITION DIGGING BOOM INSTALLATION AND REMOVAL

The Komatsu High Reach Demolition work equipment can be replaced by purpose built Komatsu Demolition Digging Equipment. The Demolition Digging Equipment allows easy removal and separation of demolished material.

⚠ WARNING

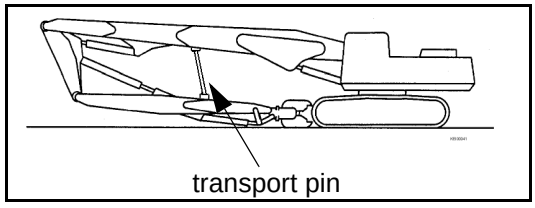
- **Make sure that all work equipment is safely supported or held and will not fall. Attach a lifting device or support of correct rating, to allow extraction of disconnected piece when ready.**
- **Make sure that the supports used will support the work equipment even if accidentally pushed by the machine.**
- **Follow these instructions step by step, in sequence. Do not omit any of the actions. Do not perform the actions in a different order.**

REMARK
A Komatsu demolition work equipment support system is available through your dealer. This system should be used to hold the demolition work equipment when it is removed.

PROCEDURE FOR INSTALLATION AND REMOVAL OF DEMOLITION DIGGING EQUIPMENT

REMOVAL OF HIGH REACH WORK EQUIPMENT

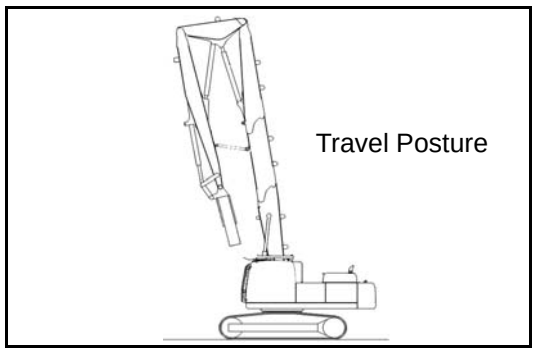
1. There must be plenty of room available to manoeuvre the machine for removal of work equipment. Make sure the operations are carried out in a flat, level, spacious area.
2. Fit the transport pin, holding the demolition equipment arm to the demolition boom.


transport pin

⚠ CAUTION

With the transport pin in position, do not operate the arm or mid link. Significant damage to the machine will result.

3. With the high reach work equipment in the normal travel position (see diagram), move the machine into a position where there is plenty of room to access the work equipment, even in the lowered position.
4. Carefully lower the demolition work equipment.


Travel Posture

PURGING AIR PROCEDURES

PURGING PROCEDURE TO REMOVE AIR FROM HYDRAULIC CYLINDER LINES.

NOTICE
Follow this procedure whenever hydraulic circuits have been disconnected and reconnected.

1. Run the engine at low idle speed to extend and retract the cylinder 4 to 5 times. For both extension and retraction, stop the cylinder approximately 100mm before the end of the stroke.
2. In addition extend and retract the cylinder to the stroke ends 3 to 4 times.
3. Again extend and retract the cylinder 4 to 5 times to the stroke ends to completely purge air from the hydraulic circuit.
4. On completing these operations, run the engine at normal speed.

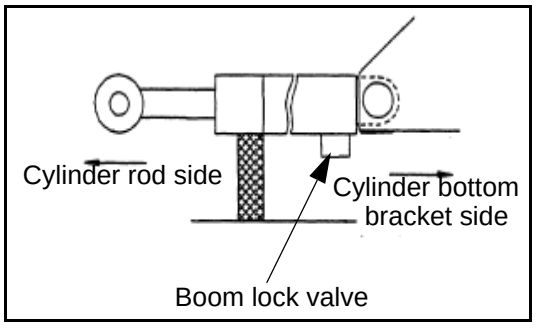
PROCEDURE FOR PURGING AIR FROM BOOM LOCK VALVE PPC CIRCUIT

⚠ WARNING

While monitoring oil temperature, loosen the cap of the hydraulic oil tank to release residual pressure (purge air) in the tank.

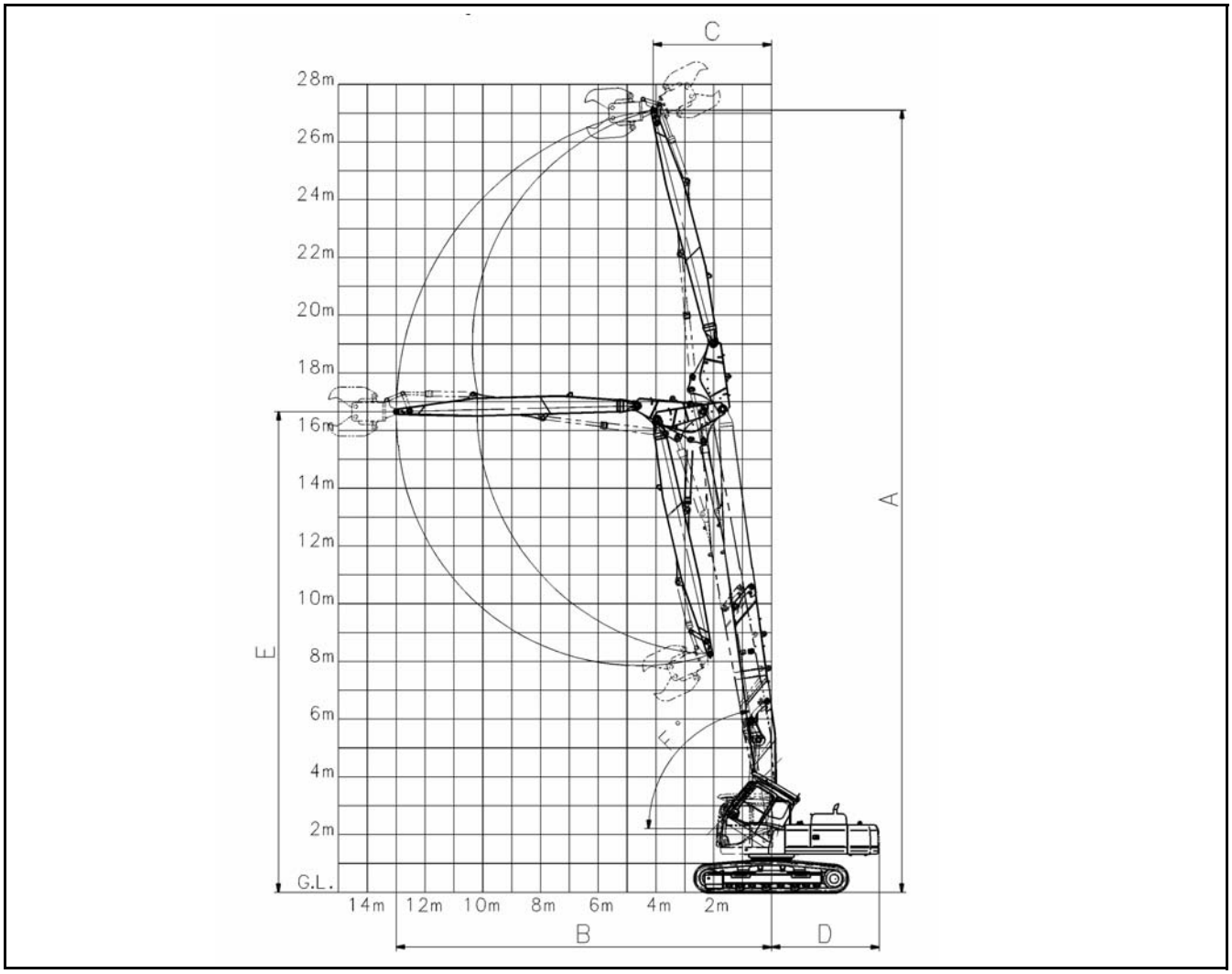
1. PRECAUTIONS FOR PURGING AIR FROM BOOM LOCK VALVE PPC CIRCUIT.

1. To mount the demolition high reach boom and arm, purge air from the boom lock valve PPC circuit before operating the cylinder.
2. To assemble the demolition high reach work equipment, purge air from the boom lock valve PPC circuit before the cylinder rod side work equipment is mounted.
3. To remove the PPC circuit hoses, stop the engine and operate the control levers and pedals to release residual pressure in the circuit.
4. For safety, during air purging, close the stop valve in the work equipment piping.



SPECIFICATIONS

WORKING RANGE (PC450LCD HIGH REACH)



	Working ranges	Unit	HIGH REACH
A	Maximum working height (to pin at arm end)	mm	27100
B	Maximum forward reach	mm	13000
C	Minimum swing radius of arm end pin (max height)	mm	4100
D	Tail Swing radius	mm	3740
E	Height at Max. Reach	mm	16650
F	Minimum boom angle from ground	degrees	81
	Operating weight, 600mm shoes*	kg	57585
	Operating weight, 700mm shoes*	kg	57035

*Includes 2500kg demolition attachment