UEAM004912

Operation & Maintenance Manual

PC210-8, PC210LC-8
PC210NLC-8
PC230NHD-8
PC240LC-8
PC240NLC-8

HYDRAULIC EXCAVATOR

SERIAL NUMBER

PC210, PC210LC-8	- K51095 and up
PC210NLC-8	- K51095 and up
PC230NHD-8	- K50114 and up
PC240LC-8	- K50304 and up
PC240NLC-8	- K50304 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 personnel who will come into contact with the machine.

ORIGINAL INSTRUCTIONS

KOMATSU

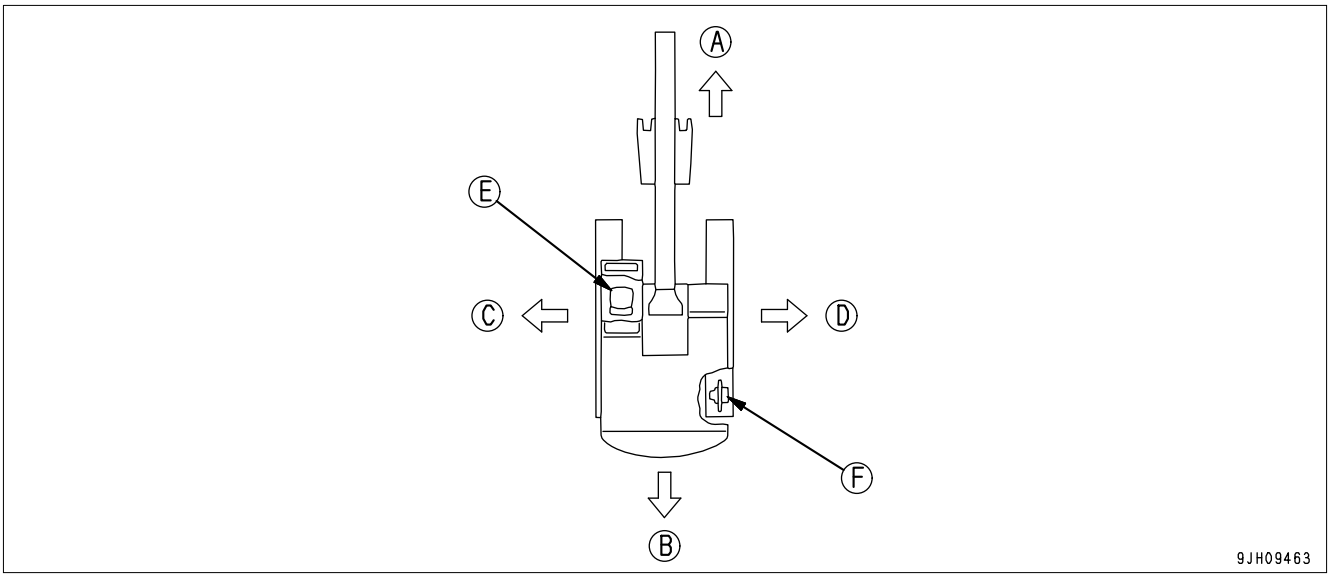
INTRODUCTION

This Komatsu machine is designed to be used mainly for the following work:

- Digging work
- Levelling work
- Ditching work
- Loading work
- Demolition work

See the section “RECOMMENDED APPLICATIONS (3-172)“ for further details.

DIRECTIONS OF MACHINE



(A) Front
(B) Rear
(C) Left
(D) Right
(E) Operator's seat
(F) Sprocket

In this manual, the terms front, rear, left, and right refer to the travel direction as seen from the operator's seat when the operator's seat is facing the front and the sprocket is at the rear of the machine.

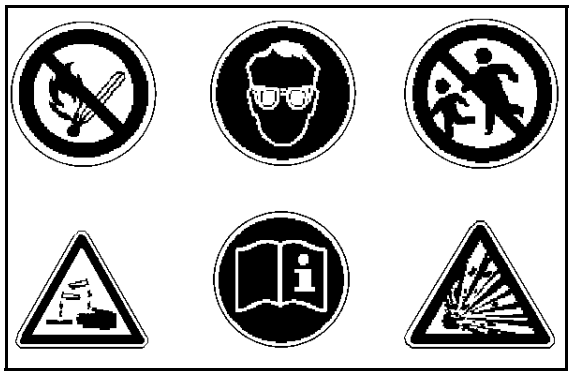
OPERATOR PROTECTIVE STRUCTURE

This machine is ROPS compliant to ISO12117-2:2008 when a ROPS plate is installed - see "LOCATION OF SAFETY LABELS (2-4)" for location of ROPS plate.

VISIBILITY FOR OPERATOR

This machine complies with the visibility standard (ISO 5006).
This machine maintains a close visibility of a height of 1.5 m at a point 1 m away from the outside surface of the machine and a visibility for a radius of 12 m.

16. Caution when handling batteries.



(a) Never smoke or use any naked flame near the batteries, no sparks.

(b) Always wear safety glasses when working with batteries.

(c) Keep children away from batteries.

(d) Caution - battery acid.

(e) Read the operator's manual before working with batteries.

ACTIONS IN THE EVENT OF DAMAGE TO SAFETY STRUCTURES

The following components comprise the machine safety structure that can prevent injury to the operator from falling objects, flying objects and intruding objects as detailed in the previous section

- Operator cabin
- FOPS (falling object protective structure)
- Front window guard

In the event any of the above parts become broken or damaged such that their function would be impaired they must be replaced with genuine Komatsu replacement parts.

No attempt should be made to repair these parts as this may have an adverse effect on component strength or durability.

If such a repair is undertaken without authorisation from Komatsu there is a danger that a problem might occur that will lead to serious personal injury.

If in doubt please contact your Komatsu distributor.

Komatsu can not take any responsibility for accidents, failures or damage caused by unauthorised repair to the above mentioned components.

ATTACHMENT INSTALLATION

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

ATTACHMENT COMBINATIONS

Depending on the type or combination of work equipment, there is a hazard that the work equipment may hit the cab or other parts of the machine. Before using unfamiliar work equipment, check if there is any hazard of interference, and operate with caution.

CAB WINDOW GLASSES

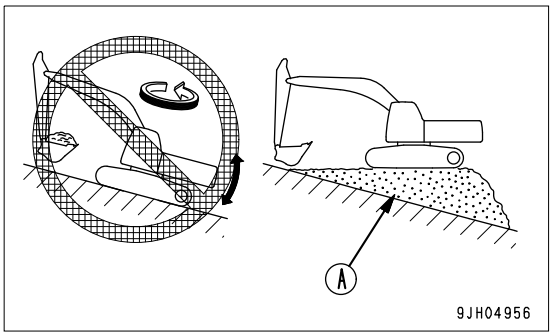
- If the cab glass on the work equipment side is broken, there is a hazard that the work equipment may contact the operator's body directly. Stop operation immediately and replace the glass.
- The ceiling window is made of organic glass (polycarbonate), and as such it is apt to break easily when receiving damage on the surface, thereby deteriorating its protective characteristic. If there is a crack or damage caused by a fallen rock, or when any sign of them is noticed, replace it with a new window.

UNAUTHORIZED MODIFICATIONS

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

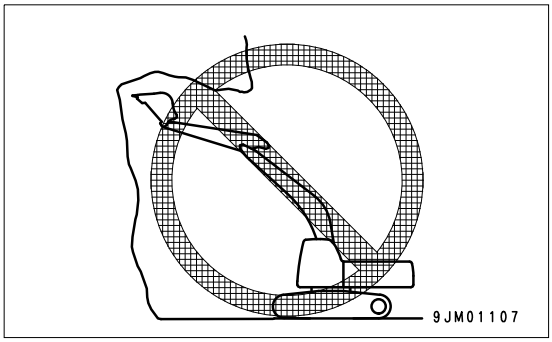
OPERATIONS ON SLOPES

- 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.

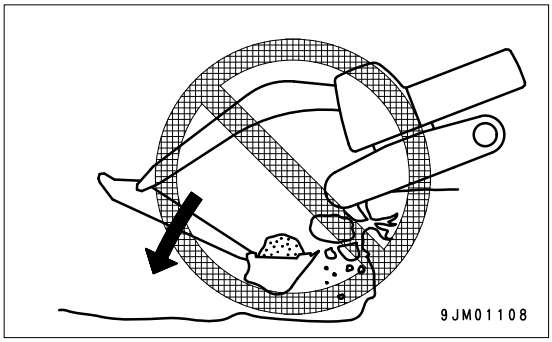


PROHIBITED OPERATIONS

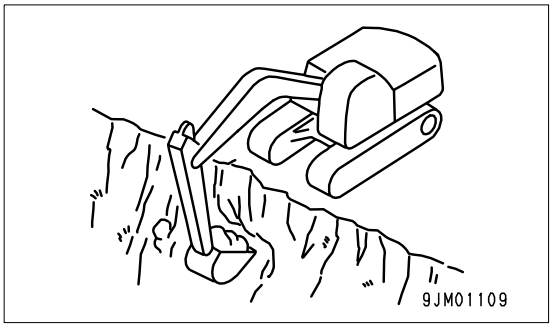
- Never dig the work face under an overhang. There is a hazard that rocks may fall or that the overhang may collapse and fall on top of the machine.



- 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.



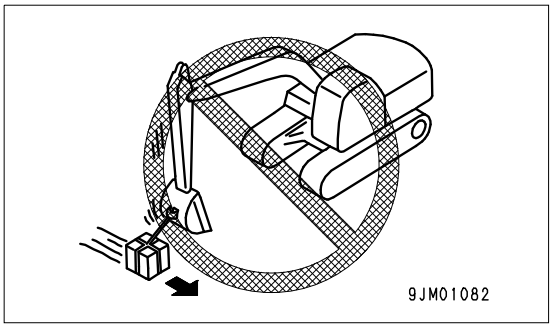
LIFTING OBJECTS WITH BUCKET

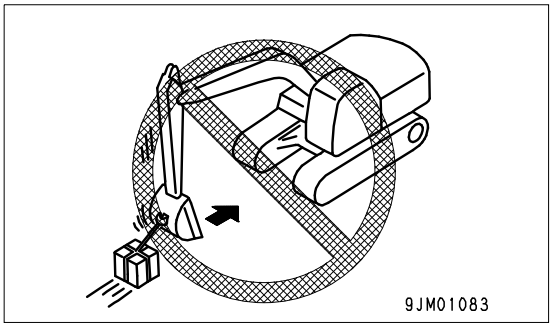
SAFETY RULES FOR LIFTING OBJECTS

- Determine the signals to be used and place a signalman in position.
- To prevent the machine from tipping over or falling, carry out the operation on flat ground.
- To prevent the danger of contact with a raised load or the danger from a falling load, do not allow any worker inside the area.
- Do not exceed the specified lifting load.
  For details of the maximum lifting load permitted for the machine see the decal and bucket manufacturers RLL (Rated Lifting Load).

NOTE: RLL (Rated Lifting Load) for the bucket may not be the same as the lifting capacity of the machine. Always be sure to lift within the relevant lifting limits.

- All components in the load line (eg.chains, shackles etc.) must be rated correctly for the load to be lifted.
- It is dangerous if the raised load hits any person or structure. When swinging or operating the work equipment, check carefully that the surrounding area is safe.
- Do not swing or operate the work equipment suddenly. There is danger that this may cause the load to sway and the machine to tip over.
- Do not leave the operator's seat when there is a raised load.
- Do not use the work equipment or swing to pull the load in any direction. There is danger that the hook may break and the load come off, causing the work equipment to move suddenly and cause personal injury.
- When swinging or operating the work equipment, check carefully that the surrounding area is clear from objects, structures or any persons working around the machine.
- During the lifting operation, reduce the engine speed and carry out the operation in L mode.
- Never travel the machine while lifting the load.
- If the load approaches the lifting limit of the machine, a warning is shown on the monitor panel and an audible alarm sounds. In this case, lower the load to the ground.





OPERATION

⚠ WARNING

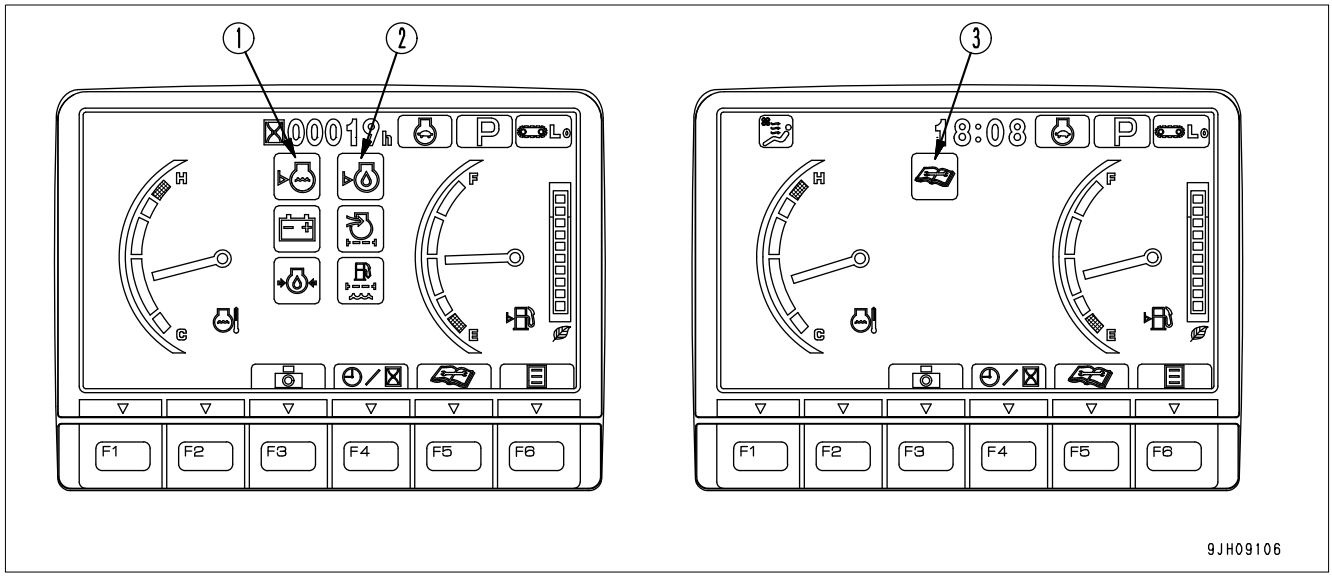
Please read and make sure that you understand the safety volume before reading this section.

Basic Check Monitors

⚠ CAUTION

These monitors DO NOT ensure that the machine is in good condition. When performing checks before starting (daily checks), do not simply rely on the monitors. Always dismount the machine and check each item directly.

Displays basic items among the check before starting items that must be checked before starting the engine. If there is any abnormality, monitor for the location of abnormality will light up.

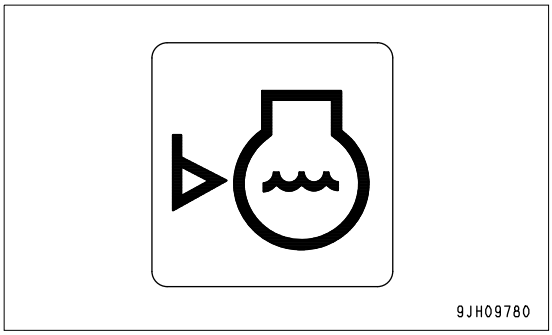


A (1) Radiator coolant level monitor
A (2) Engine oil level monitor
A (3) Maintenance interval monitor

Radiator Coolant Level Monitor

Monitor (1) warns the operator that there has been a drop in the radiator coolant level.

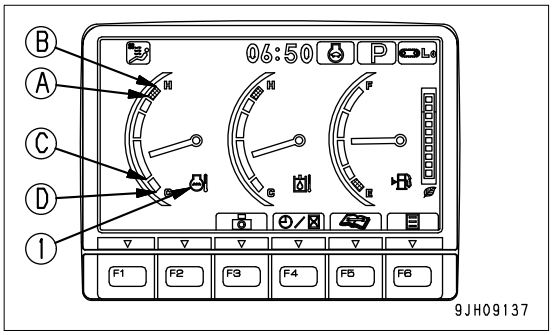
If the radiator coolant is low, the lamp lights up red, so check coolant level in the radiator and subtank and add Supercoolant.



Gauges and Meter

Engine Coolant Temperature Gauge

This meter (8) shows the engine coolant temperature.
During normal operations, the indicator should be in the green range. 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.

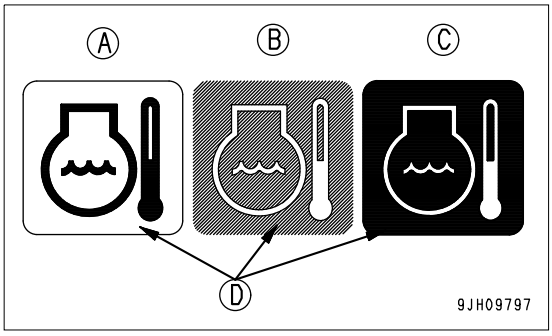
When the engine is started, if the indicator is in the (C) - (D) range, engine coolant temperature monitor (1) shows the low-temperature display.

If this happens, carry out the warming-up operation. For details, see “AFTER STARTING ENGINE (3-142)“.

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

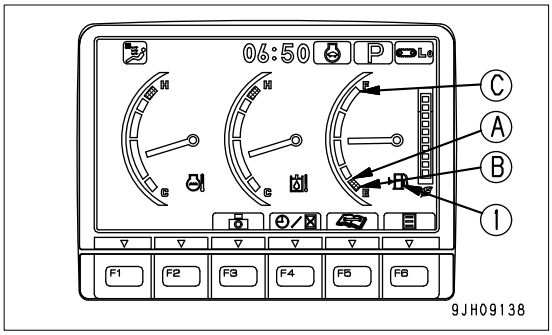
Display (B) at normal temperatures: Monitor background (D) is blue

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



Fuel Gauge

This meter (9) shows the amount of fuel remaining in the fuel tank.
During normal operations, the indicator should be in the green range.
If the indicator starts to enter red range (A) during operation, there is less than 60 litres of fuel remaining, so carry out inspection and add fuel.



- (A) - (B): Indicates red range
- (A) - (C): Indicates green range

REMARK
When the indicator reaches red range (B), there is less than 30 litres of fuel remaining.
When the indicator is in red range (A) - (B), fuel level monitor (1) lights up red.

The correct fuel level may not be displayed for a short time when the starting switch is turned ON, but this is not an abnormality.

Wiper Switch

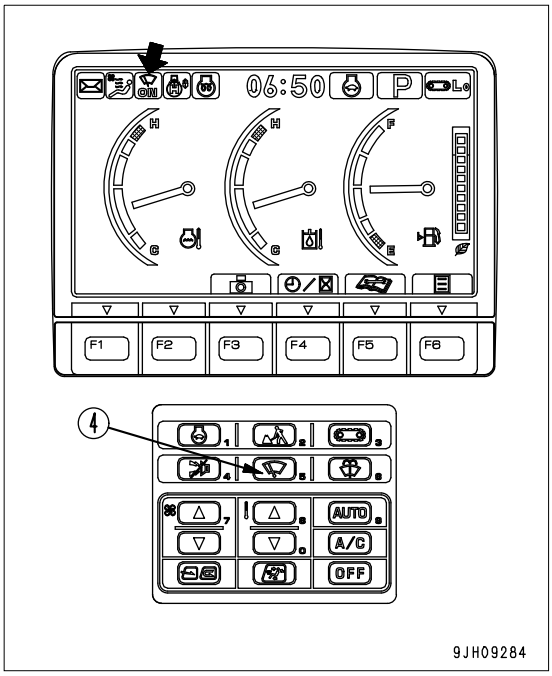
Switch (4) operates the wiper for the front glass.

Each time the switch is pressed, it changes ON → INT → stop (OFF).

Monitor display pilot monitor INT lighted up: Wiper operates intermittently

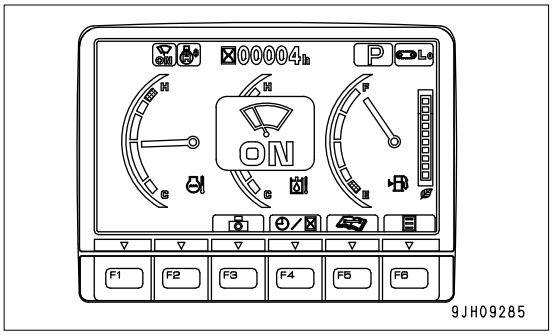
Monitor display pilot monitor ON lighted up: Wiper operates continuously

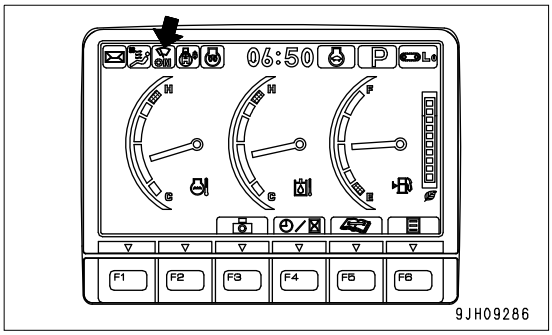
Monitor display pilot monitor OFF: Wiper stops



REMARK

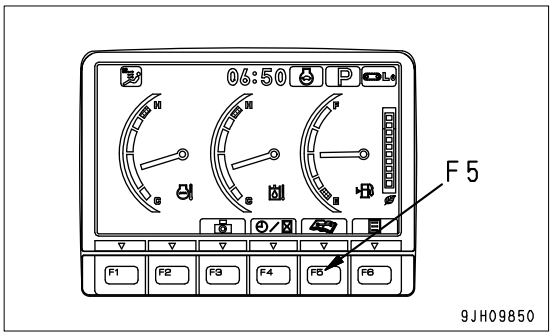
Each time wiper switch (4) is pressed, the mode is displayed in the centre of the monitor display, and after two seconds, the screen returns to the normal operation screen.

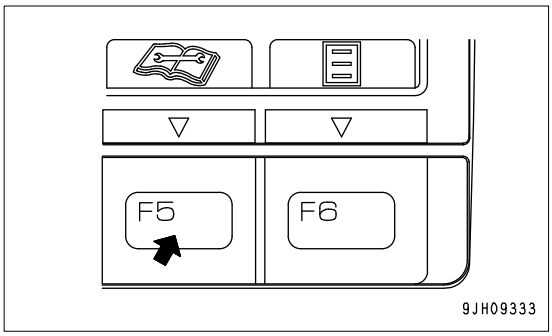




Maintenance Selector Switch

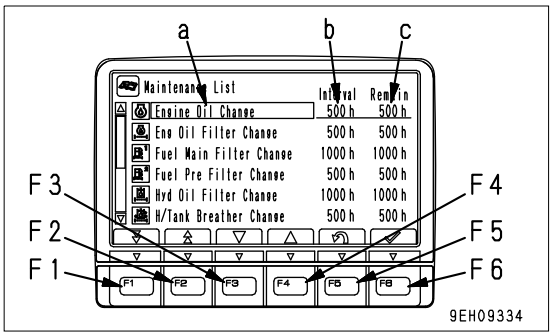
When switch F5 is pressed on the standard screen, the monitor display screen switches to the maintenance mode screen.





The items on the maintenance display are as follows.

a	b	c
Engine oil change	500	500
Engine oil filter change	500	500
Fuel main filter change	1000	1000
Fuel pre-filter change	500	500
Hydraulic oil filter change	1000	1000
Hydraulic tank breather change	500	500
Damper case service	1000	1000
Final drive oil change	2000	2000
Swing machinery oil change	1000	1000
Hydraulic oil change	5000	5000



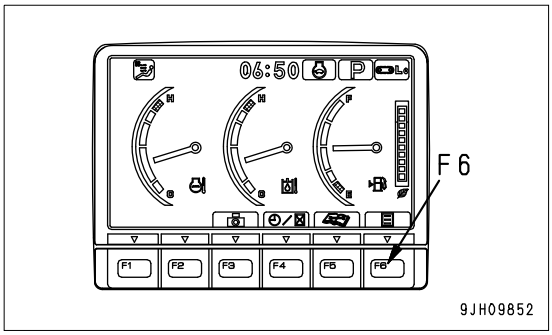
a: Maintenance items

b: Default maintenance interval settings (h)

c: Time remaining until maintenance (h)

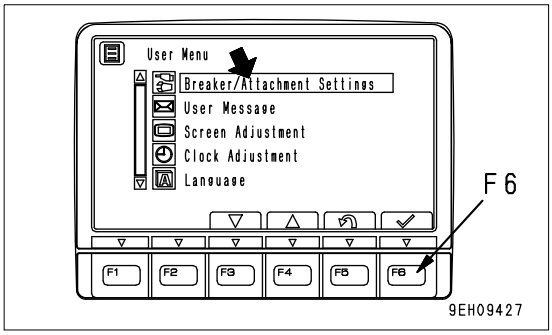
Changing Attachment Mode Setting

1. On the standard screen, press switch F6.

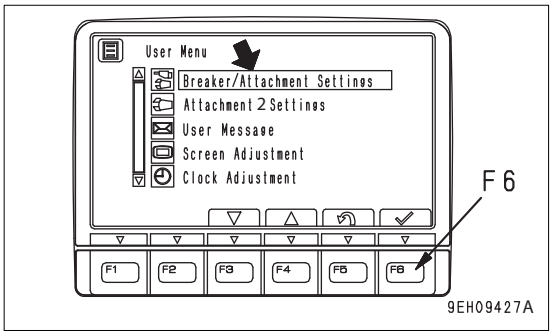


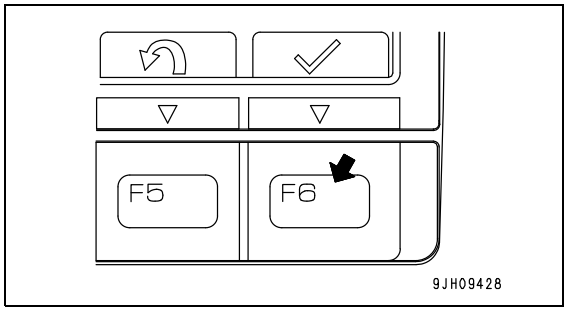
2. Select Breaker/Attachment Settings on the user menu, then press switch F6.

   Screen for machine with 1 Attachment Line



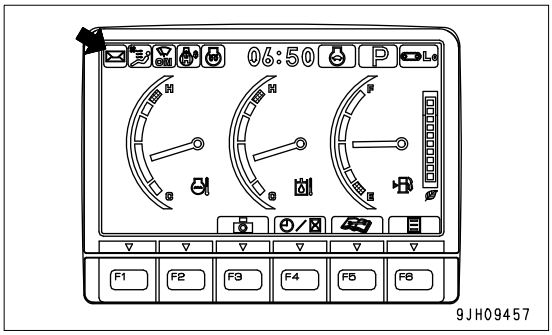
   Screen for machine with 2 Attachment Lines



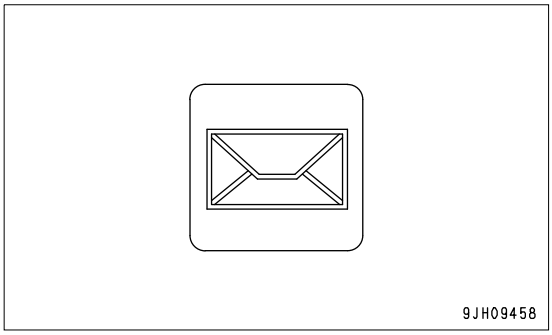


Message Display

On machines equipped with KOMTRAX, it is possible to see the messages from your Komatsu distributor on this message display menu. When there are any messages, the pilot monitor at the top left of the monitor standard screen lights up.



- It is possible to judge the following from the lighting up condition of the message display pilot monitor.



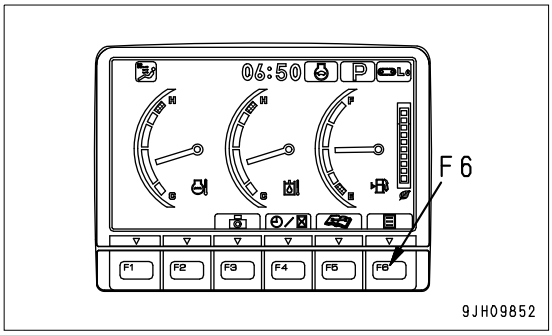
Lighted up green: There is unread message

Lighted up blue: There is no unread message

OFF: There are no messages

REMARK
When the pilot monitor is lighted up blue, open the message. The display shows that the reply to the message has not been sent to your Komatsu distributor.

1. On the standard screen, press switch F6.



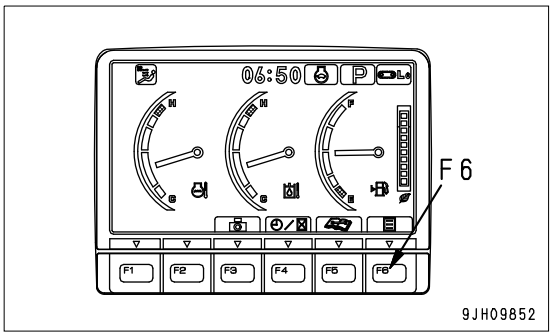
Language Selection

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.

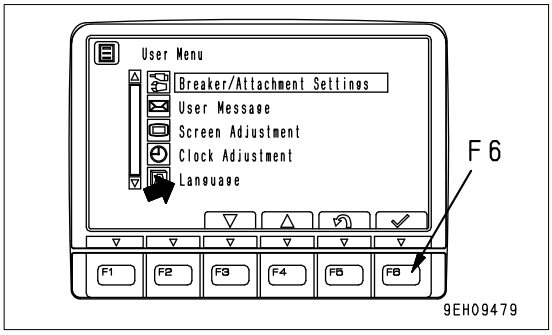
  Japanese, English, Chinese, French, Spanish, Portuguese, Italian, German, Russian, Turkish

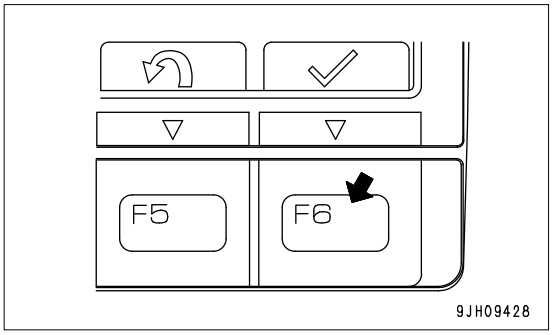
1. On the standard screen, press switch F6.



2. Select “Language“ on the user menu, then press switch F6.

   The screen switches to the language selection menu screen.





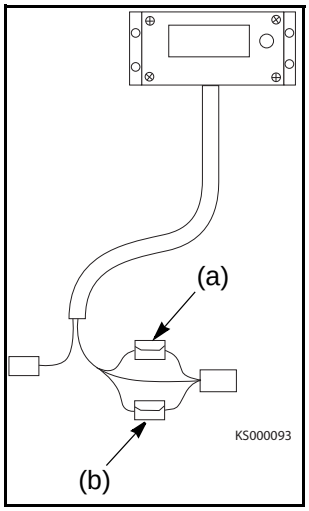
Temperature / sensor fault

When the DPF Monitor gives the following message, please check the sensor and cabling.

Temperature / sensor fault

NOTE: Please ensure that the power is disconnected before the temperature sensor is re-connected to the monitor. Reset the message once the problem has been rectified.

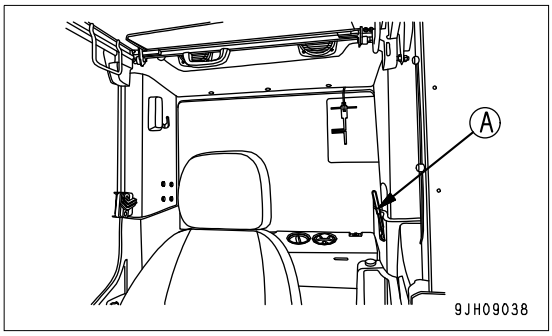
NOTE: The DPF Monitor is protected by two in-line blade fuses (a) 1A Monitor and (b) 1A Monitor backup.



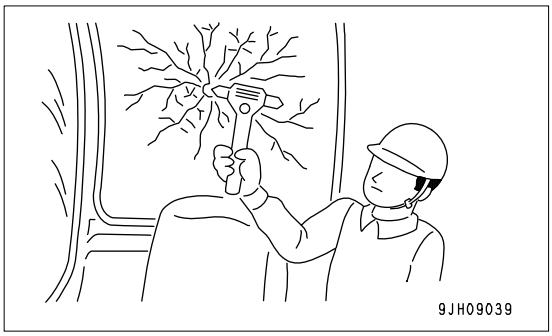
EMERGENCY ESCAPE HAMMER

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.

- An escape hammer (A) is provided to enable the operator to escape from the operator's cab in emergencies if the cab door does not open.



- When escaping, break the window glass with hammer (A) and escape through the window.



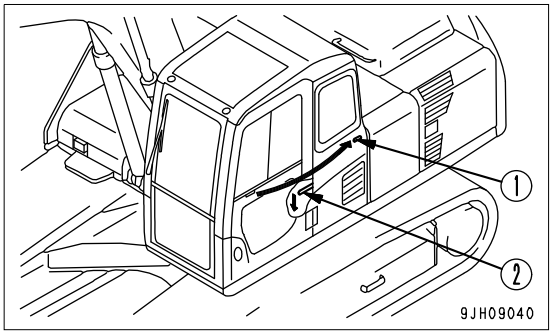
DOOR LOCK

⚠ 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.**

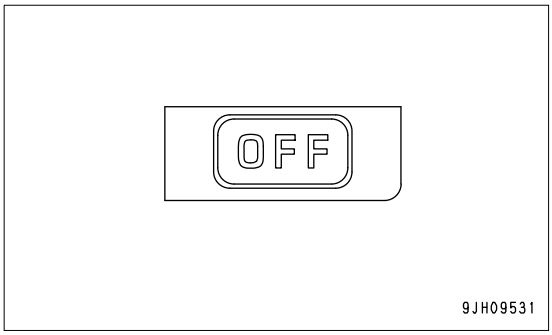
Use the door lock to fix the door in position after opening it.

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.



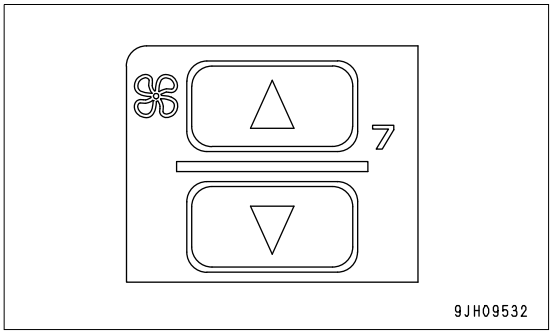
Stopping Automatic Operation

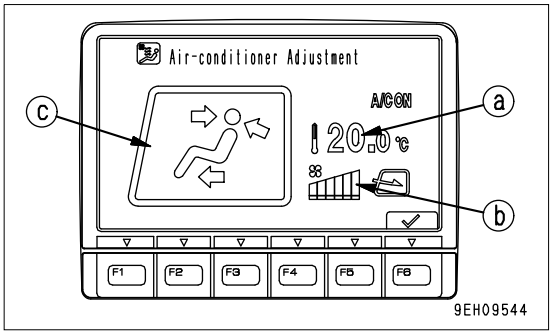
Press OFF switch (1). Operation stops.



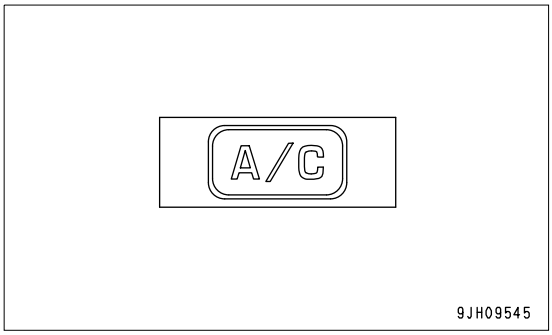
Manual Operation

1. Press fan switch (2) and adjust the air flow. When doing this, check that temperature setting (a) and air flow (b) are displayed on monitor (7).





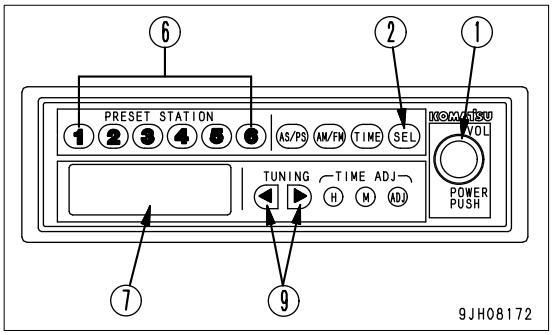
2. Turn air conditioner switch (8) ON.



Controls of Radio

Preset Station Buttons

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.7

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

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.

- 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

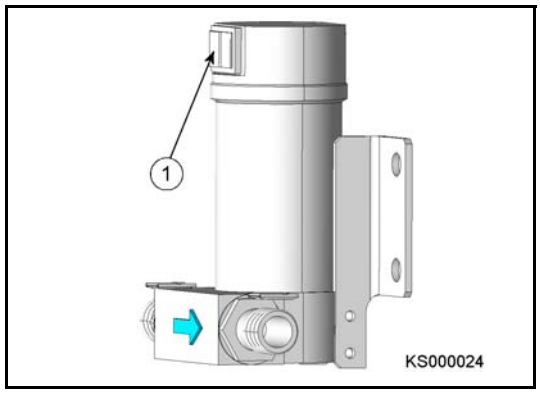
Press tuning button (9) for at least 3 seconds. When a station is picked up, the tuning automatically stops. To search for the next station, press the tuning button again for at least 3 seconds.

< button: Frequency moves down

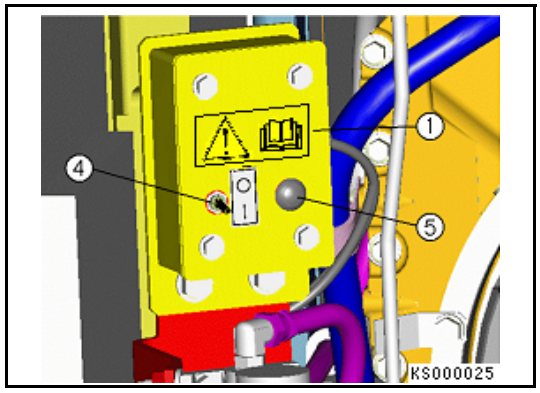
> button: Frequency moves up

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.

3. **a) Refuel Pump without Auto Shut-off Refuel System.**
Switch ON the refuel pump using switch (1) on the pump assembly to begin refuelling. Once desired level of fuel is achieved, turn OFF refuel pump using switch (1).
A float gauge (G) will rise out of the filler neck of the tank when it is nearing full capacity. Position of tip (a) of float gauge when the tank is full : 50mm.

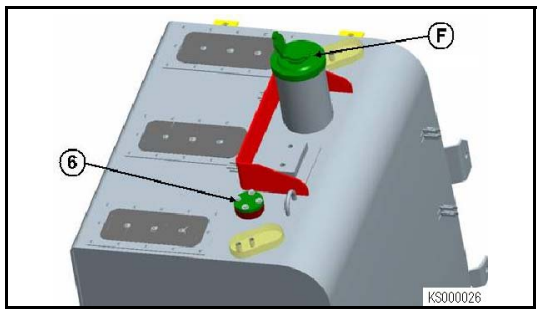


3. **b) Refuel Pump with Auto Shut-off Refuel System.**
Refuel Switch Box (1) is located on the right hand side pump compartment. Switch ON the master switch of the refuel system (4) on the refuel switch box. To start refuelling press switch (5) once. Refuelling will continue automatically until the tank has reached capacity (float switch (6) will reach its limit and the pump will stop). It is important to ensure the machine is parked on level ground and monitor refuelling to avoid fuel overfill or spillage.



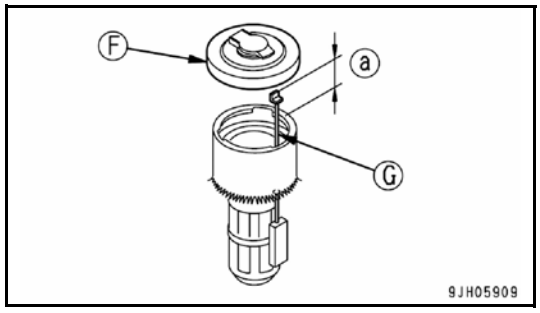
Refuelling can be stopped at any time by turning off the master switch (4).

If more fuel is needed in the fuel tank after the float switch has stopped the pump, press and hold switch (5). When switch (5) is pressed and held, the refuel pump will fill tank. Releasing switch (5) will stop the refuel pump in this override condition. When using this override, the level of the tank must be monitored to prevent overfilling and fuel spillage. If fuel is allowed to overflow stop refuelling immediately by turning off the master switch



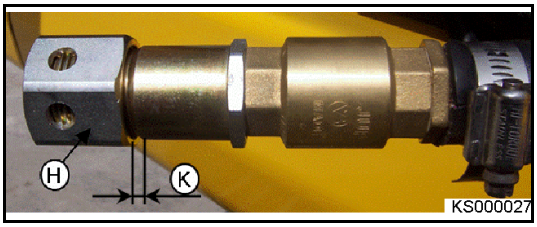
After finishing refuelling make sure the master switch (4) is returned to the OFF position.

4. After refuelling is complete:
(a) Push float gauge (G) straight down with fuel filler cap (F), be careful not to get the float gauge (G) caught in the tab of the fuel filler cap (F) and tighten fuel filler cap (F) securely.



(b) Tighten strainer valve cap (H) to the closed position (K) to prevent leakage of fuel left in the hose.

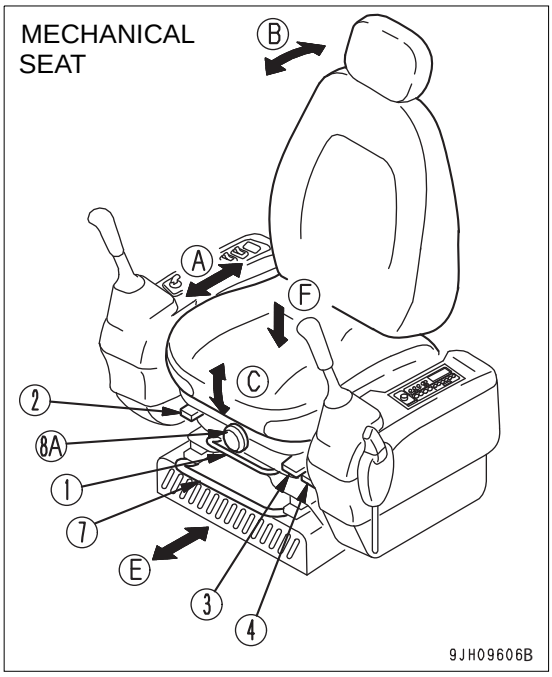
(c) Replace the fuel hose into storage tray (3).



(G) Adjusting suspension - mechanical seat (if equipped)

Turn knob (8A) to the right to make the suspension harder, or to the left to make the suspension softer. Adjust the reading of the dial to match the operator's weight and select the optimum suspension.

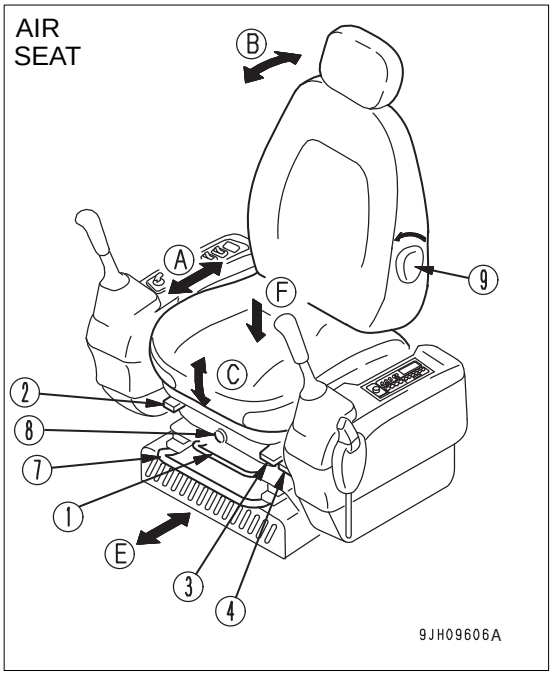
REMARK
To obtain the optimum adjustment, turn the knob (8A) so that the indicator of the weight display (kg) in the transparent portion of knob (8A) is the same as the operator's weight.



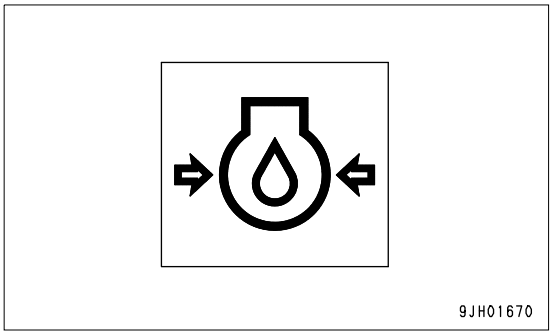
(H) Lumbar Adjustment
Rotate knob (9) in direction shown to adjust curve of backrest cushion (5 positions).

(H) Lumbar Adjustment

Rotate knob (9) in direction shown to increase the amount of lumbar support (five positions). Further rotation in the same direction causes the lumbar support to return to the original position.

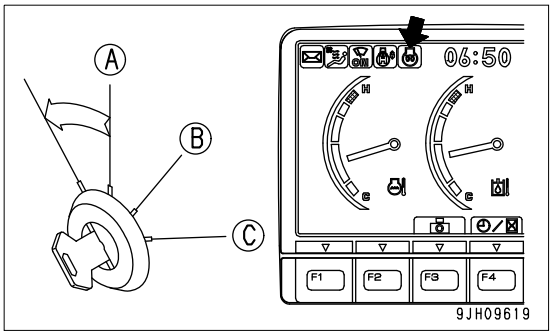


6. Even if the engine starts, wait for the engine oil pressure monitor to go out. Do not touch the control levers or control pedal while the engine oil pressure monitor is lighted up.

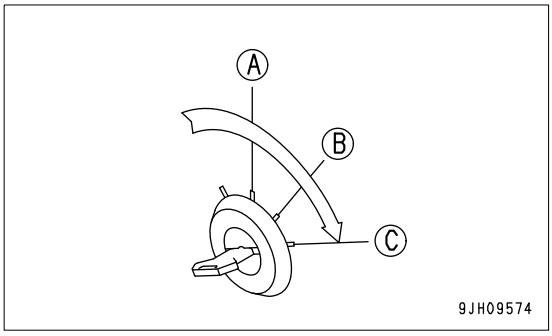


NOTICE
If the engine oil pressure monitor does not go out even after 4 to 5 seconds have passed, stop the engine immediately. Check the oil level, check for leakage of oil, and take the necessary action.

REMARK
Regardless of the ambient temperature, it is possible to start the engine preheating manually.
1. Turn the key in starting switch (3) to the left from OFF position (A). The preheating monitor lights up and engine preheating starts.
(Preheating continues while the key in starting switch (3) is held at the left position.)
During the preheating operation, the preheating monitor lights up to show that preheating is taking place.
2. After approx. 30 seconds, the preheating monitor will go out to inform that the preheating has been completed.
3. Turn the key in starting switch (3) to the START position. The engine will start.



If the engine cannot be started with the above procedure, wait for at least two minutes, then start again from Step 1.



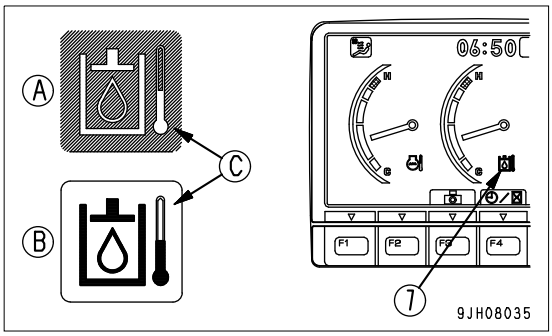
AMBIENT TEMPERATURE RANGE FOR OPERATION AND STORAGE

- The recommended ambient temperature range for operation and storage is -20°C to +45°C.

When operating in ambients below 0°C, refer to "COLD WEATHER OPERATION (3-195)" for detail of precautions.

Operation After Completion Of Warming-Up Operation

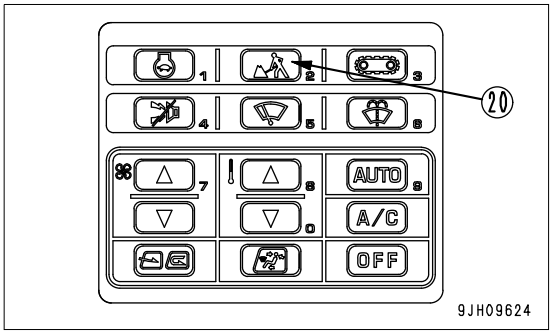
1. Check that hydraulic oil temperature monitor (7) displays the correct temperature.



   - ○ (A) Display when temperature is correct: Monitor background (C) is blue
   - ○ (B) Display when temperature is low: Monitor background (C) is white

2. Push working mode selector switch (20) of the machine monitor to select the working mode to be used.

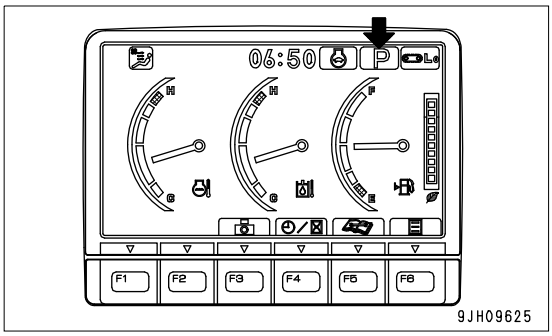
   For details of the procedure for selecting the working mode, see “Working Mode Selector Switch (3-25)“.



- Working mode monitor display

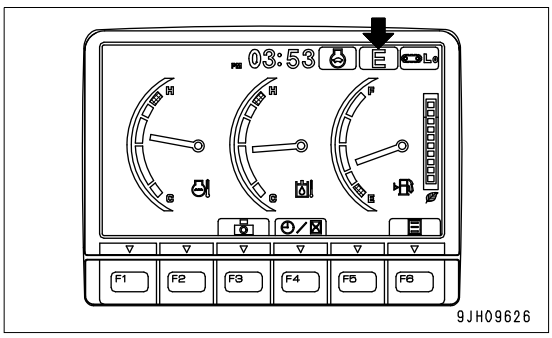
   1) P mode

   For heavy-duty operations



   2) E mode

   For operations with emphasis on fuel economy



WORK EQUIPMENT CONTROLS AND OPERATIONS

⚠ WARNING

If the lever is operated when the engine speed has been lowered by the auto-deceleration function, the engine speed will suddenly rise, operate the levers carefully.

Use the control levers to operate the work equipment.

Note that when the levers are released, they return to the HOLD position and the work equipment is held in that position.

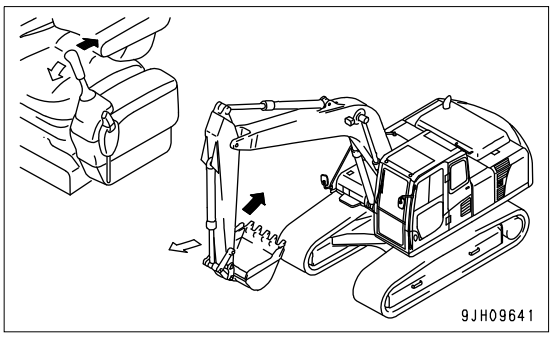
The work equipment is operated by the left and right work equipment control levers. The left work equipment control lever operates the arm and swing, and the right work equipment control lever operates the boom and bucket.

The movements of the lever and work equipment are as shown in the diagrams on the right. When the levers are released, they automatically return to the neutral position and the work equipment is held in place.

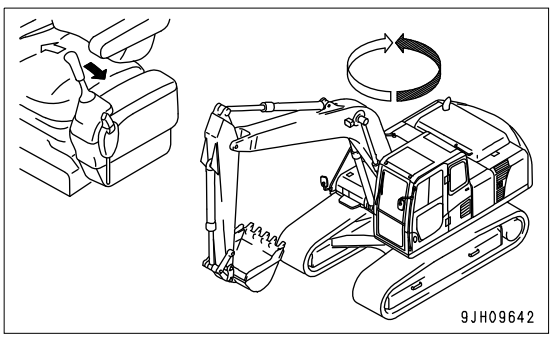
- If the work equipment control levers are returned to the neutral position when the machine is stopped, even if the fuel control dial is set to FULL, the auto-deceleration mechanism will act to reduce the engine speed to a mid-range speed.

REMARK
With this machine, an accumulator is installed in the operating circuit, if less than 15 seconds has passed since the engine was stopped, when the starting switch is turned to the ON position even with the engine stopped, it is possible to operate the levers to lower work equipment to the ground.
In addition, this operation can also be used to release the remaining pressure in the hydraulic cylinder circuit or to lower the boom after the machine has been loaded onto a trailer.

Arm operation



Swing operation

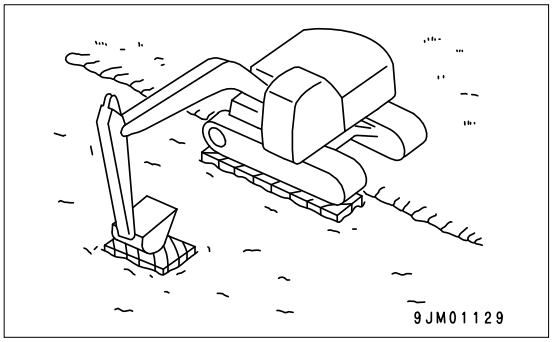


ESCAPE FROM MUD

Always operate carefully to avoid getting stuck in mud. If the machine does get stuck in mud, do as follows to get the machine out.

Track on One Side Stuck

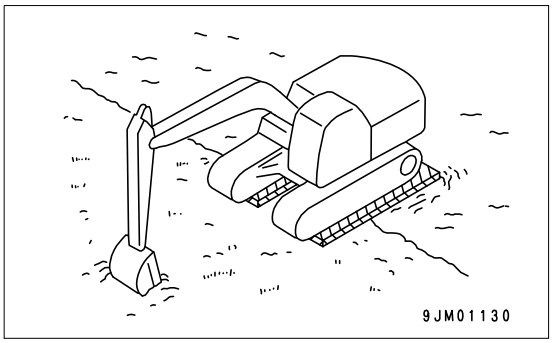
NOTICE
When using the boom or arm to raise the machine, always have the bottom of the bucket in contact with the ground. The angle between the boom and arm should be 90° to 110°.
The same applies when using the bucket installed in the reverse direction.



When only one side is stuck in mud, use the bucket to raise the track, then lay boards or logs and drive the machine out.

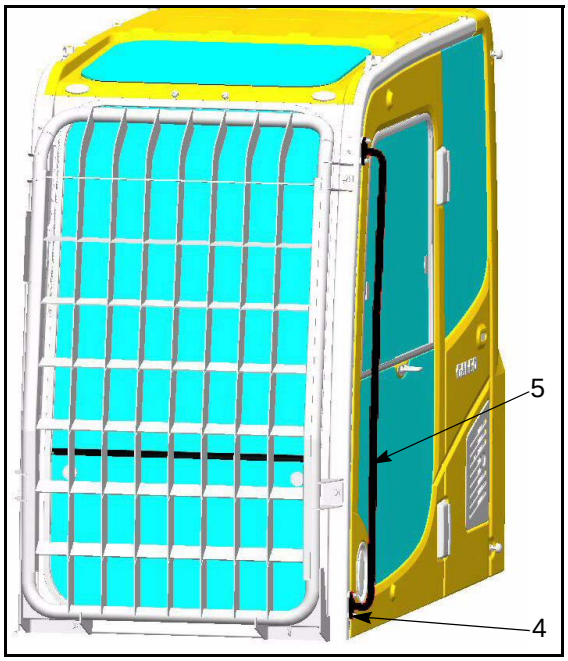
Tracks on Both Sides Stuck

When the tracks on both sides are stuck in mud and they slip, making it impossible for the machine to move, lay boards or logs as explained above, and dig the bucket into the ground in front. Then pull in the arm as in normal digging operations and put the travel levers in the FORWARD position to pull the machine out.



4. Removal of wide handrail if OPG front guard is fitted.

- Remove 4 bolts (4)
- Store handrail (5) and bolts (4) safely
- Replace handrail after transportation
  Tightening torque for bolts (4) : 27 ~ 34Nm (2.8 ~ 3.5Kgm)



⚠ WARNING

Before starting work on the new jobsite ensure that the mirrors are installed again in the correct place, and are correctly adjusted.

NOTICE

- **For adjusting, see the section Rear view Mirrors (3-133)**
- **For installing, see the section Rearview Mirrors (3-188)**

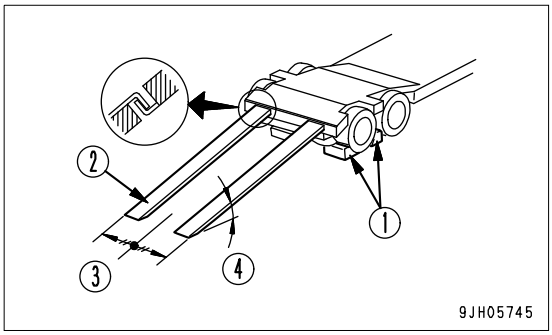
⚠ WARNING

Failure to comply with this warning will result in a risk of serious injury or death to exposed persons.

5. The trailer on which the machine is transported is suitable for road transportation, and is itself within 2.55m width.

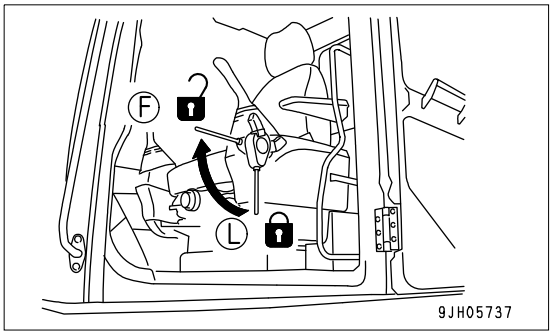
Unloading

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

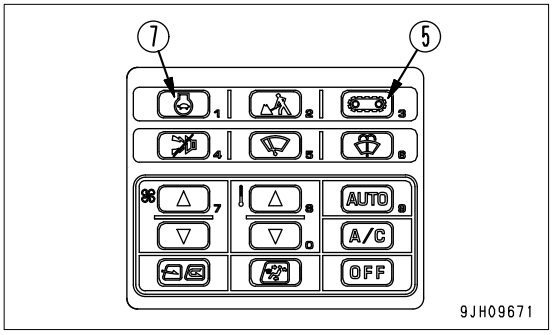


3. Remove the chains and wire ropes fastening the machine.
4. Start the engine.

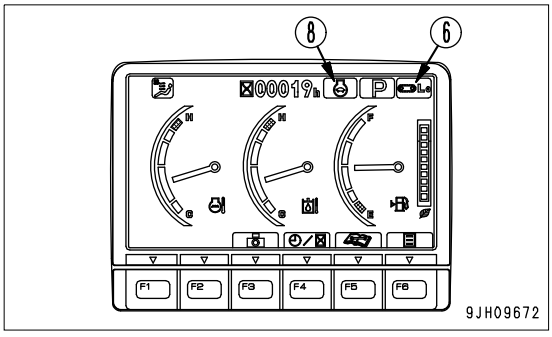
   Warm the engine up fully.
5. Set the lock lever to FREE position (F).



6. Turn the travel speed selector switch to low speed travel (Lo lamp lights up).
   - ○ Press travel speed selector switch (5) to switch the travel speed. The travel speed (Lo, Mi, Hi) is displayed on pilot monitor display portion (6).



7. Turn auto-deceleration switch (7) OFF and operate the fuel control dial to set the engine speed to low idling.
   - ○ Each time auto-deceleration switch (7) is pressed, it switches OFF → ON → OFF in turn.
   - ○ When auto-deceleration switch (7) is turned OFF, pilot monitor display (8) goes out.



TROUBLES AND ACTIONS

RUNNING OUT OF FUEL

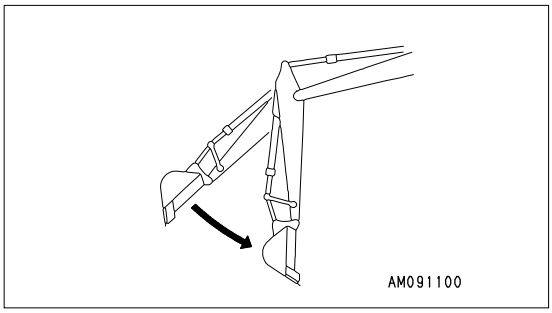
When starting after running out of fuel, fill with fuel (if a diesel particulate filter is fitted then the maximum sulphur content of diesel fuel must be less than 0.005%) and bleed the air from the fuel system before starting.

For details on bleeding the air, see “REPLACE FUEL PRE-FILTER CARTRIDGE (4-57)“, “REPLACE FUEL MAIN FILTER CARTRIDGE (4-73)“.

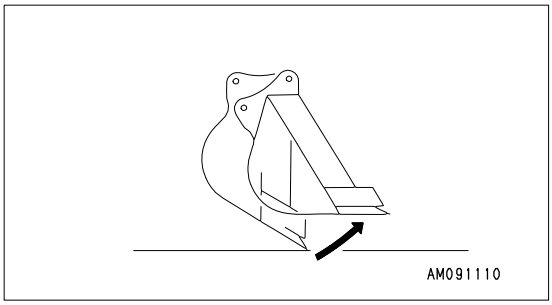
PHENOMENA THAT ARE NOT FAILURES

Note that the following phenomena are not failures:

- When the arm control lever is operated to the IN position and the work equipment is lowered under no load from a high position, the arm speed will drop momentarily when the arm is more or less at the vertical position.



- When the bucket is empty and digging operations are carried out from above, the movement will momentarily become slow when the bucket teeth are almost perpendicular.
- The bucket or arm will fluctuate by itself during heavy-duty digging operations.
- 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 brake valve.



Engine

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

Problem	Main causes	Remedy
Engine oil pressure monitor lights up	•Engine oil pan oil level is low (sucking in air) •Clogged oil filter cartridge •Defective tightening of oil pipe, pipe joint, oil leakage from damaged point •Defective engine oil pressure sensor •Defective monitor	•Add oil to specified level, see CHECK BEFORE STARTING •Replace cartridge, see EVERY 500 HOURS SERVICE (•Check, repair) (•Replace sensor) (•Replace monitor)
Steam spurts out from top of radiator (pressure valve) Radiator coolant level monitor lights up	•Coolant level low, leakage of water •Loose fan belt •Dirt or scale accumulated in cooling system •Clogged radiator fins or damaged fins •Defective thermostat •Loose radiator filler cap (high-altitude operations) •Defective coolant level sensor •Defective monitor	•Check, add Supercoolant, repair, see CHECK BEFORE STARTING (•Check fan belt tension, replace) •Change coolant, flush inside of cooling system, see WHEN REQUIRED •Clean or repair, see EVERY 500 HOURS SERVICE (•Replace thermostat) •Tighten cap or replace packing (•Replace sensor) (•Replace monitor)
Engine does not start when starting motor is turned	•Lack of fuel •Air in fuel system •Defective fuel injection pump or defective nozzle •Starting motor cranks engine sluggishly •Engine pre-heating monitor does not light up •Defective compression ° (Defective valve clearance)	•Add fuel, see CHECK BEFORE STARTING •Repair place where air is sucked in, see EVERY 500 HOURS SERVICE (•Replace pump or nozzle) •See ELECTRICAL SYSTEM •See ELECTRICAL SYSTEM (•Adjust valve clearance)
Exhaust gas is white or blue with muffler fitted, if DPF fitted cause and remedy do not apply	•Too much oil in oil pan •Improper fuel	•Set oil to specified level, see CHECK BEFORE STARTING •Change to specified fuel
Exhaust gas occasionally turns black with muffler fitted, if DPF fitted cause and remedy do not apply	•Clogged air cleaner element •Defective nozzle •Defective compression •Defective turbocharger	•Clean or replace, see WHEN REQUIRED (•Replace nozzle) (•See defective compression above) •Clean or replace turbocharger
Combustion noise occasionally make breathing sound	•Defective nozzle	(•Replace nozzle)

GREASE

- Grease is used to prevent seizure and noises at the joints.
- This construction equipment is used under heavy-duty conditions. Always use the recommended grease and follow the change intervals and recommended ambient temperatures given in this Operation and Maintenance Manual. This comment applies to both manual and Automatic Grease Systems.
- The nipples not included in the maintenance section are nipples for overhaul, so they do not need grease.

  If any part becomes stiff after being used for long time, add grease.
- Always wipe off all of the old grease that is pushed out when greasing.

  Be particularly careful to wipe off the old grease in places where sand or dirt sticking in the grease would cause wear of the rotating parts.

TIGHTENING TORQUE SPECIFICATIONS

TIGHTENING TORQUE LIST

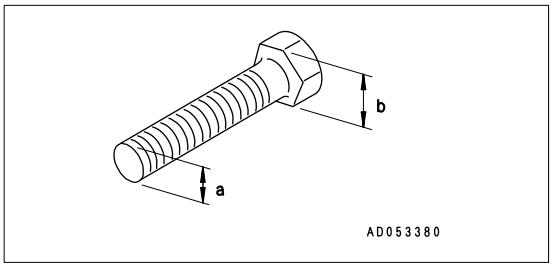
⚠ CAUTION

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.

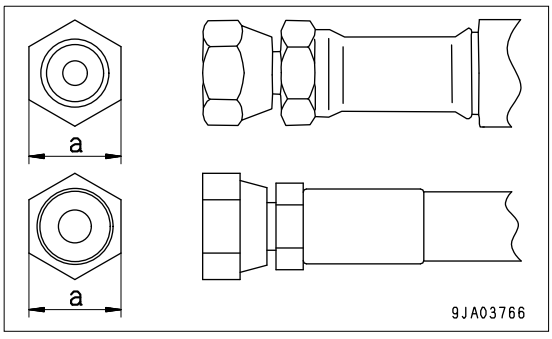
If it is necessary to replace any nut or bolt, always use a Komatsu genuine part of the same size as the part that was replaced.

Thread diameter of bolt (a)(mm)	Width across flats (b)(mm)	Tightening torque			
		Target value		Service limit	
		N·m	kgf·m	N·m	kgf·m
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



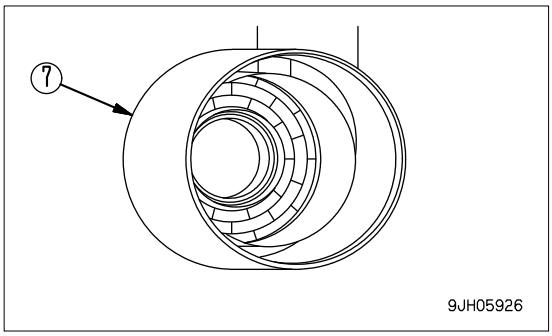
- Apply the following table for Hydraulic Hose.

Hose nominal number	Width across flat a (mm)	Tightening torque			
		Target valve		Service limit	
		N·m	kgf·m	N·m	kgf·m
02	19	44	4.5	35-54	3.5-5.5
03	22	74	7.5	54-93	5.5-9.5
	24	78	8.0	59-98	6.0-10.0
04	27	103	10.5	84-132	8.5-13.5
05	32	157	16.0	128-186	13.0-19.0
06	36	216	22.0	177-245	18.0-25.0

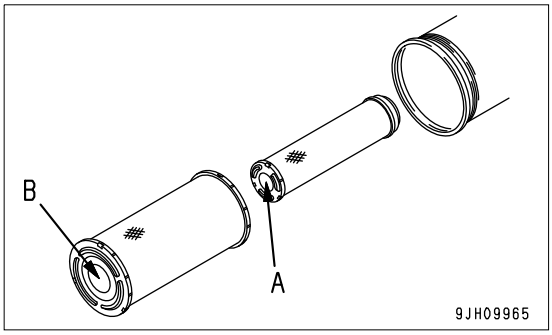


Replacing Inner Element

1. First remove the outer element, and then remove the inner element.
2. Fit a clean cloth or tape to cover the exit at the end inside air cleaner body (7).
3. Clean the air cleaner body interior, then remove the cover from the air intake port in Step 2.
4. Install the new inner element to the connector, then install the outer element.

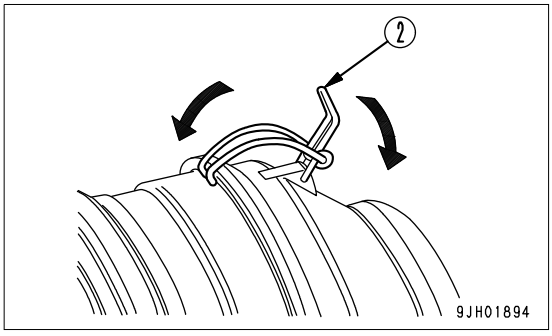


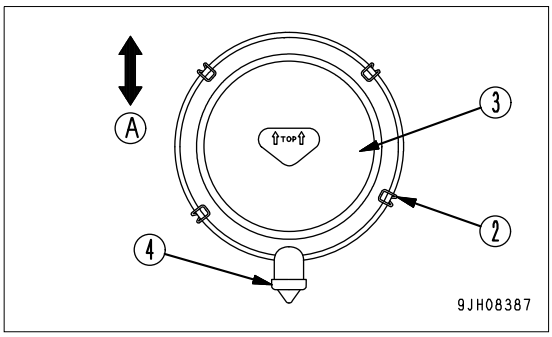
NOTICE
Be sure to install the air cleaner element facing in the correct direction.
Install so that the bottom of the air cleaner element cylinder (face where no hole is drilled) A, B is at air cleaner cover (3) end. If the direction of installation is mistaken, there is danger that it will cause breakage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



NOTICE
The inner element must not be used again even after cleaning. When replacing the outer element, replace the inner element at the same time.

5. Set the outer element in position, then lock cover (3) with hooks (2).



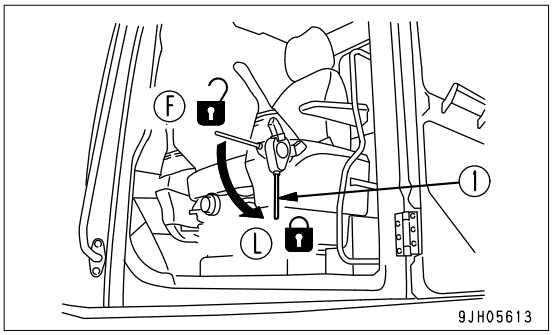


REPLACE BUCKET TEETH (HORIZONTAL PIN TYPE)

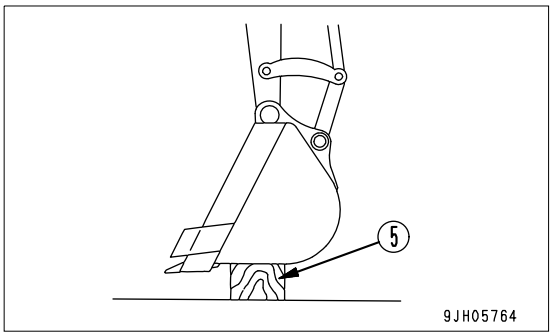
Replace the teeth before the wear reaches the adapter.

⚠ WARNING

- **It is dangerous if the work equipment is mistakenly moved when replacing the teeth.**
  Set the work equipment in a stable condition, stop the engine, then set lock lever (1) securely to the LOCK position (L).
- **As the locking pin is knocked out with force, there is danger that the pin may fly out. Check that there is no one near the machine.**
- **Broken pieces may fly during the replacement operation, so always wear safety glasses, gloves, or other protective equipment.**

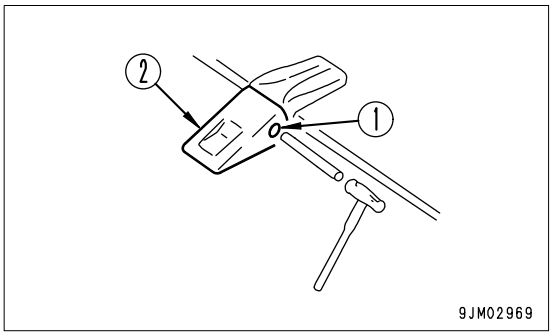


1. To make it possible to knock out pin (1) of tooth (2), put block (5) under the bottom of the bucket, and set so that the bottom surface of the bucket is horizontal.

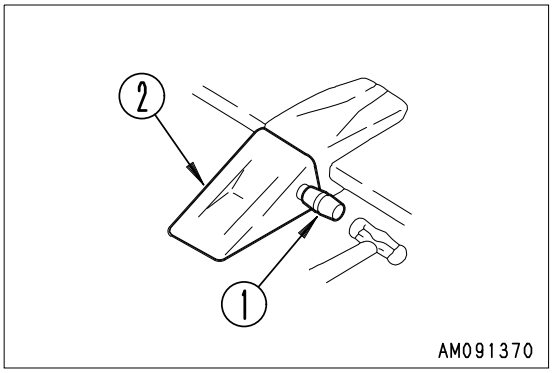


2. Place a bar on the head of pin (1), hit the bar with a hammer to knock out the pin, then remove tooth (2).

REMARK
If the bucket teeth cannot be safely removed by this method, have your Komatsu distributor replace the bucket teeth.



3. Clean the mounting face. Fit a new tooth (2) in the adapter, push in pin (1) partially by hand, then lock it with a hammer to install the tooth to the bucket.



CHECK BEFORE STARTING

For details of the following items, see “Checks Before Starting (3-122)“ in the OPERATION section.

- Check coolant level, add Supercoolant
- Check oil level in engine oil pan, add oil
- Check fuel level, add fuel
- Drain water and sediment from fuel tank
- Check for water and sediment in water separator, drain water
- Check oil level in hydraulic tank, add oil
- Check working lamp switch
- Check electric wiring
- Check function of horn
- If a diesel particulate filter is fitted check for high back pressure warning on the monitor, clean filter.

REPLACE FUEL PRE-FILTER CARTRIDGE

⚠ WARNING

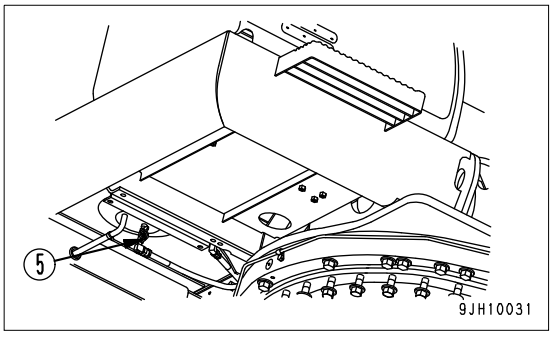
- **After the engine has been operated, all parts are at high temperature, so do not replace the filter immediately. Wait for all parts to cool down before starting the operation.**
- **High pressure is generated inside the engine fuel piping system when the engine is running. When replacing the filter, 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

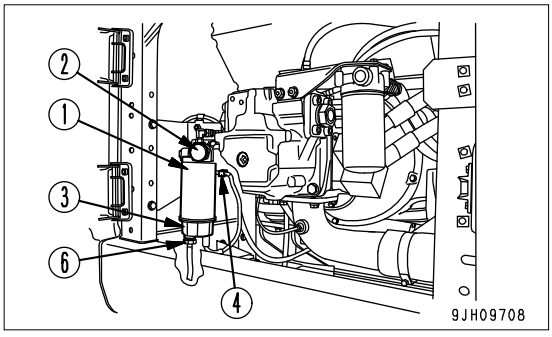
- **Genuine Komatsu fuel filter cartridges use a special filter that has highly efficient filtering ability. When replacing the filter cartridge, always use a genuine Komatsu part.**
- **The common rail fuel injection system used on this machine consists of more precise parts than the conventional injection 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 filter wrench and a container to catch the fuel.

1. Close valve (5) at the bottom of the fuel tank.
2. Set the container to catch the fuel under the filter cartridge.
3. Loosen drain valve (6), then drain all the water and sediment in the water separator and also the fuel accumulated in filter cartridge (1).



4. Remove connector (4). To prevent water from getting on the connector, wrap it in a vinyl bag to avoid contamination and keep it in a safe place until it is installed again. If the connector is dirty the sensor may not operate normally and engine may fail.
5. Using a filter wrench, turn water separator (3) counterclockwise to remove it.
6. Using a filter wrench, turn filter cartridge (1) counterclockwise on remove it.



7. Install new filter cartridge (1) to water separator (3).

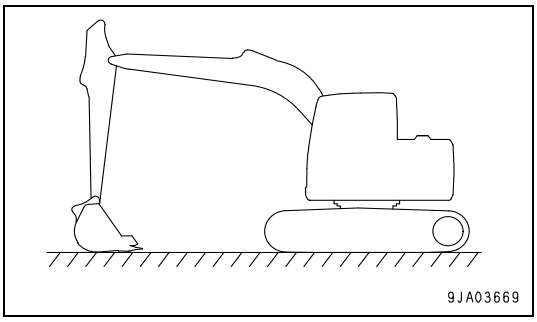
REPLACE PILOT FILTER ELEMENT

⚠ WARNING

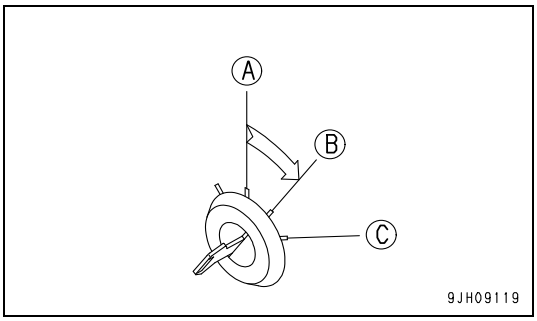
- **The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before cleaning the engine breather.**
- **When using compressed air, there is a hazard that dirt may be blown up and cause serious injury. Always use safety glasses, dust mask, or other protective equipment.**

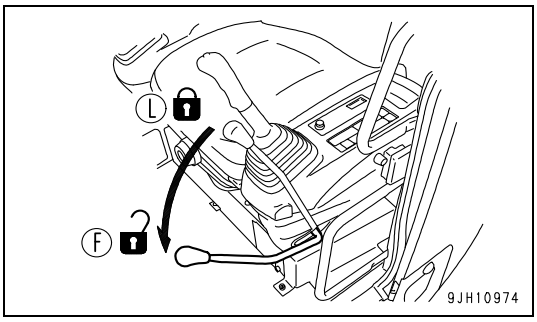
- Prepare a container to catch the oil.

1. Lower the work equipment to the ground and stop the engine.

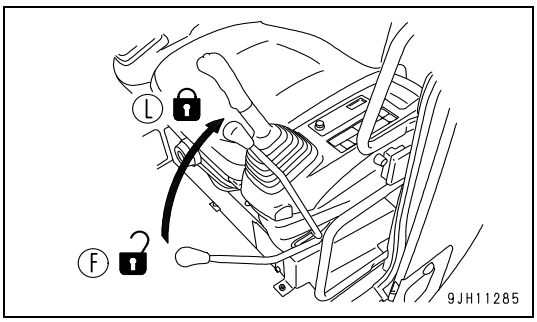


2. Turn the starting switch to the ON position (B), then set the lock lever to the FREE position (F).
3. After carrying out Step 2, operate each work equipment control lever and attachment control pedal fully to the front, rear, left, and right 2 or 3 times within 15 seconds to release the internal pressure in the hydraulic circuit.





4. Set the lock lever to LOCK position (L).



5.4. Remove the filter bag and close with any commercially available tie.

Used filter bags must be disposed of in the same way as spent oil filters. Disposal must comply with any relevant waste regulations.

The filter bag is made from polypropylene filter material which can trap dust particles of 1 micron.

6. Tighten all bolts and clamps, see section "CHECK AND TIGHTEN DIESEL PARTICULATE FILTER CLAMPS"

7. Reconnect the battery.

CHECK OPERATING CONDITION OF COMPRESSOR

Check the following two items.

1. When the air conditioner switch is turned ON-OFF, do the compressor and magnet clutch also turn ON-OFF?
2. Is any abnormal noise generated by the clutch or compressor body?

If any problem is found, contact your Komatsu distributor to have the parts disassembled, repaired, or replaced.

SPECIFICATIONS

PC210NLC-8

	L	A / B	kg											
			MAX		7.5m		6.0m		4.5m		3.0m		1.5m	
PC210NLC	2.9m	7.5m	* 2800	* 2800			* 4150	* 4150						
		6.0m	* 2650	2550	* 3450	2750	* 4250	* 4250						
		4.5m	* 2650	2150	* 4550	2700	* 4850	4100	* 5400	* 5400				
		3.0m	* 2750	1900	4950	2600	* 5800	3800	* 7350	6050	*11450	*11450		
		1.5m	* 3000	1800	4800	2450	* 6750	3550	* 9250	5350	* 6350	* 6350		
		0.0m	* 3400	1850	4650	2350	6650	3300	*10450	5100	* 7200	* 7200		
		-1.5m	4100	2000	4600	2300	6500	3150	10600	4800	*10450	8800	* 6300	* 6300
		-3.0m	4850	2400			6550	3200	*10450	4950	*15250	9600	*10050	*10050
		-4.5m	* 6300	3400					* 9000	5150	*12950	10000		
	2.4m	7.5m	* 4150	4150										
		6.0m	* 3950	2950			* 4750	4150						
		4.5m	* 3950	2450	* 4950	2650	* 5350	4000	* 6200	* 6200				
		3.0m	* 4200	2150	4900	2550	* 6200	3750	* 8050	5850				
		1.5m	4100	2050	4750	2400	6850	3500	* 9800	5200				
		0.0m	4200	2100	4650	2350	6650	3300	10700	5050	* 6750	* 6750		
		-1.5m	4650	2300	4650	2300	6550	3200	10600	4800	*11600	8900	* 7300	* 7300
		-3.0m	5700	2850			6600	3300	*10150	5050	*14500	9750	*12150	*12150
		-4.5m	* 6800	4350					* 8100	5300	*11500	10250		
	1.8m	7.5m	* 4950	* 4950										
		6.0m	* 4550	3400			* 5450	4050	* 5750	* 5750				
		4.5m	* 4550	2750			* 5900	3950	* 7100	6300	*10050	*10050		
		3.0m	4650	2400	4850	2550	* 6700	3700	* 8900	5700				
		1.5m	4500	2300	4750	2450	6800	3450	*10400	5100				
		0.0m	4700	2350	4700	2400	6600	3300	10650	5000				
		-1.5m	5250	2650			6600	3250	10650	4850	*12100	9050		
		-3.0m	6750	3400			6800	3450	* 9600	5200	*13150	10000		
		-4.5m												

EXPLANATION OF LIFTING CAPACITY CHART (PC240LC,NLC-8 2 PIECE BOOM)

LEGEND
A : Reach from swing centre
B : Bucket hook height

OF : Lifting capacity (rating overfront)
OS : Lifting capacity (rating overside)

LEGEND

(1) Position of lifting point
(2) Arm length:
(3) Boom length
(4) Hydraulic pressure: 37.2 MPa

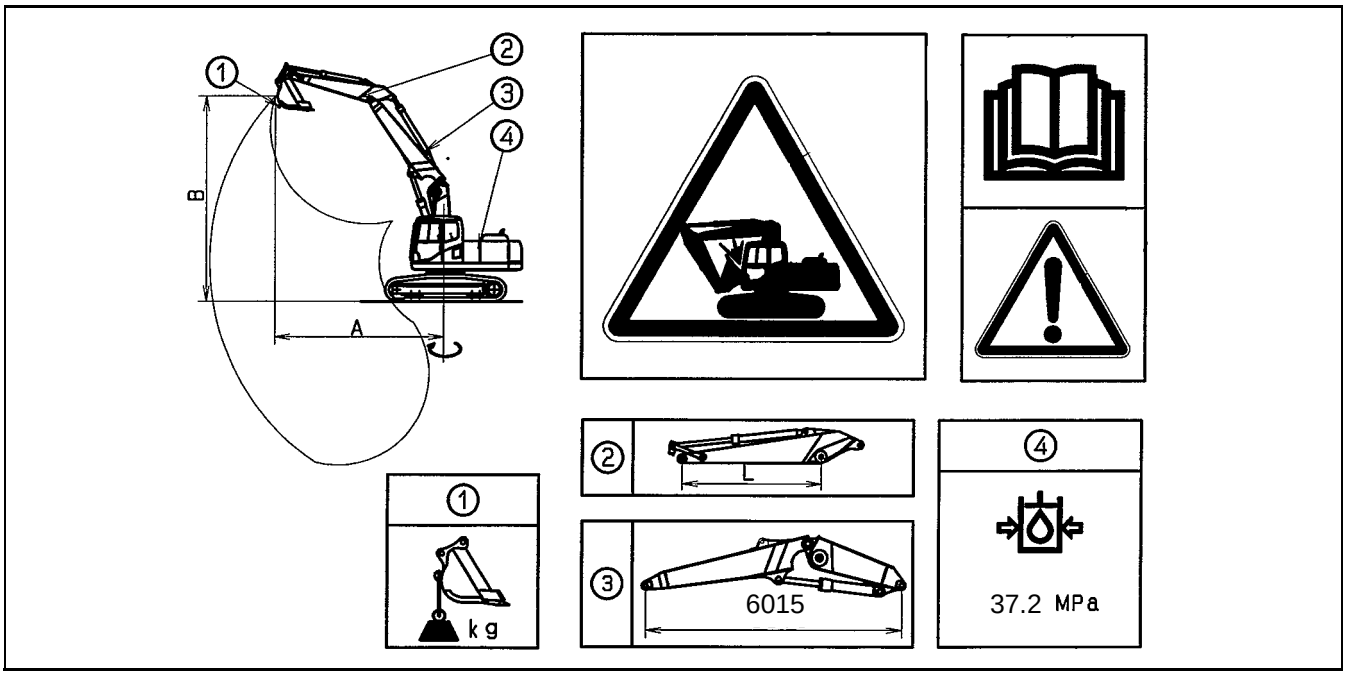
WORKING CONDITIONS:

- WITH BUCKET (0.96m^3 ISO).(731kg)
- IF OBJECT HANDLING IS PERFORMED WITH OTHER TOOL INSTALLED, THE WEIGHT DIFFERENCE OF THE TOOL SHALL BE DEDUCTED FROM THE VALUES OF THIS TABLE.
- WITH FULLY EXTENDED BUCKET CYLINDER.
- ON A COMPACT HORIZONTAL LEVEL GROUND.

PC240LC-8 with 700mm width shoe

PC240NLC-8 with 600mm width shoe

Loads do not exceed 87% of hydraulic capacity or 75% of tipping capacity (* load limited by hydraulic capacity rather than tipping)



⚠ WARNING

European safety standards require that it is possible to check the locked position of the quick coupler from the operator's position. Failure to check could cause the death of exposed persons. Check carefully that the locking of the quick coupler is complete and secure. Follow the manufacturer's instructions carefully, including the installation of any safety device, if required.

7. If the bucket or attachment needs a connection to the hydraulic system of the machine follow all instructions in ATTACHMENT REMOVAL AND INSTALLATION (6-18)

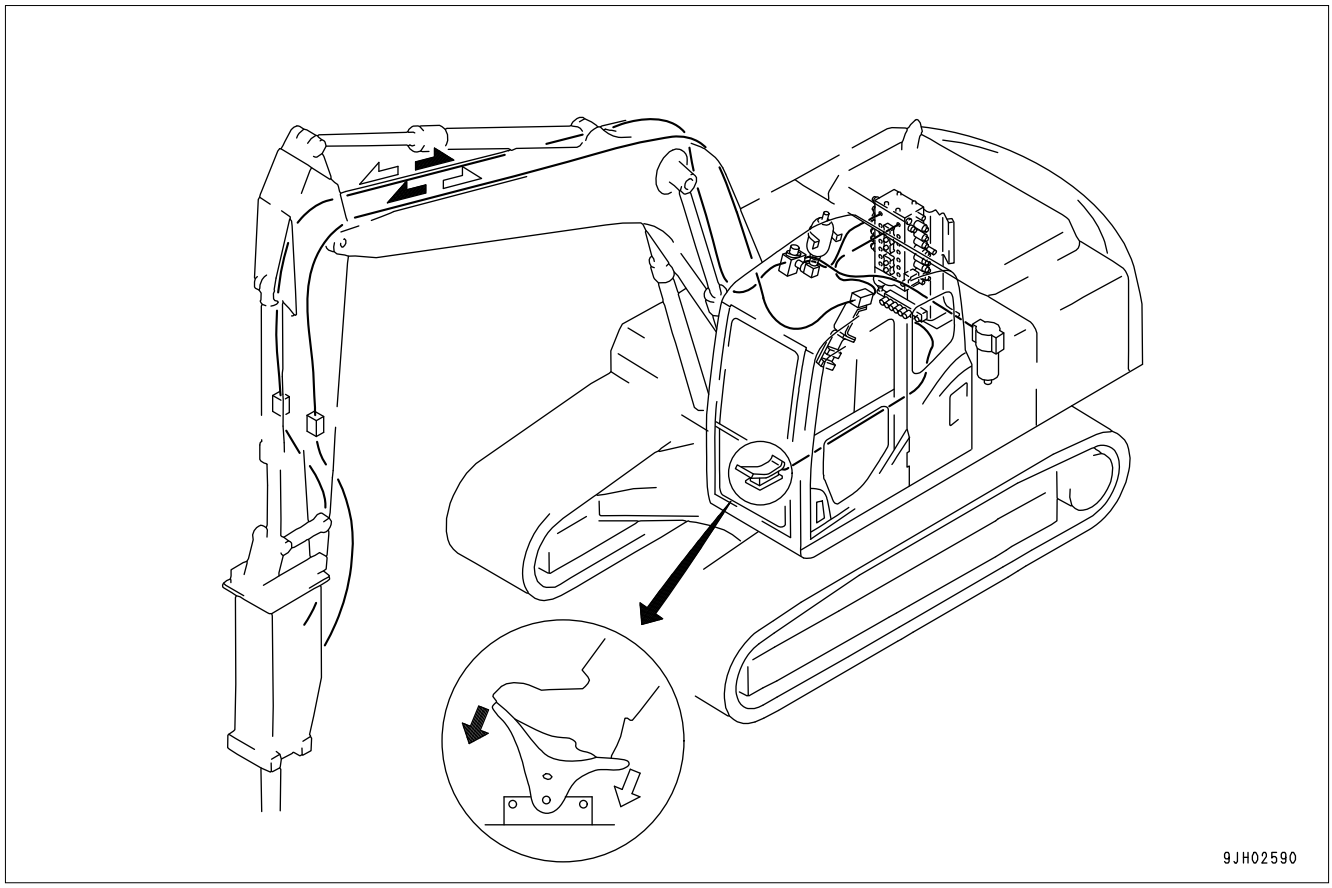
⚠ WARNING

Check daily that the hoses and fittings in the quick coupler piping system are in good condition. Pay particular attention to the hoses and fittings at the arm end as these can be damaged easily. In case of damage or leakage of oil stop work. Loss of oil could lead to the bucket or attachment falling and killing an exposed person. The damage or leakage must be repaired before continuing work.

This machine has a system installed to give a warning if there is a failure to maintain pressure in the quick coupler system. If the buzzer sounds in the cab make sure that the cause is clarified before continuing work. In particular check for leaks in the system. If in doubt call your Komatsu dealer.

Oil Flow Path

The direction of operation of the pedal and the path of the oil flow is as shown in the diagram below.

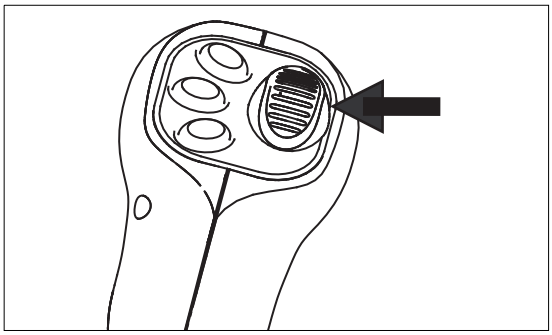


When the front of the pedal is depressed, oil flows to the piping on the left side of the work equipment; when the rear of the pedal is depressed, oil flows to the piping on the right side of the work equipment. (When a breaker is installed, only the front of the pedal can be used.)

Operation When Using Attachment 2 (e.g clamshell rotation, crusher rotation)

Note - If installing 2nd attachment line as a field kit, ask distributor to change monitor setting to allow 2 attachments.

The switch on left lever is a roller proportional control switch. Rolling the switch up produces rotation in one direction, rolling down produces rotation in the opposite direction. Slight movement of the roller will give slight movement of the attachment; full movement of the roller will give faster movement of the attachment.



If the working mode pilot monitor does not display ATT for the attachment mode, follow the instructions, see Working mode selection (6-26)

LONG TERM STORAGE

If the equipment is not to be used for a long time, do as follows.

- Set the stop valve in the LOCK condition.
- Install the plug and O-rings to the valves.
- Set the lock pin at the LOCK position.

If there is no breaker or general attachment installed, operating the pedal may cause overheating and other problems.

HANDLING CLAMSHELL BUCKET

Use a clamshell bucket for digging or loading soil for side ditching and in limited areas.

Digging Method

Digging is carried out with the clamshell pushed by the boom, but when operating the bucket, raise the boom slightly and carry out digging.

When the clamshell bucket rotates, relieve the hydraulic pressure in the bucket cylinder, then return the lever to the HOLD position. The rotation is locked for a short time.

Precautions During Operation

- It is dangerous to carry out sudden steering, sudden swings, or sudden stops when using the clamshell bucket. Avoid such operations.
- When pushing with the boom, keep the clamshell straight.
- Do not swing the bucket to the side to break up or cut rocks or soil.
- Do not use the bucket for driving piles or removing piles.
- When the machine is not being used, open the bucket and lower it to the ground to set the bucket in a stable position.

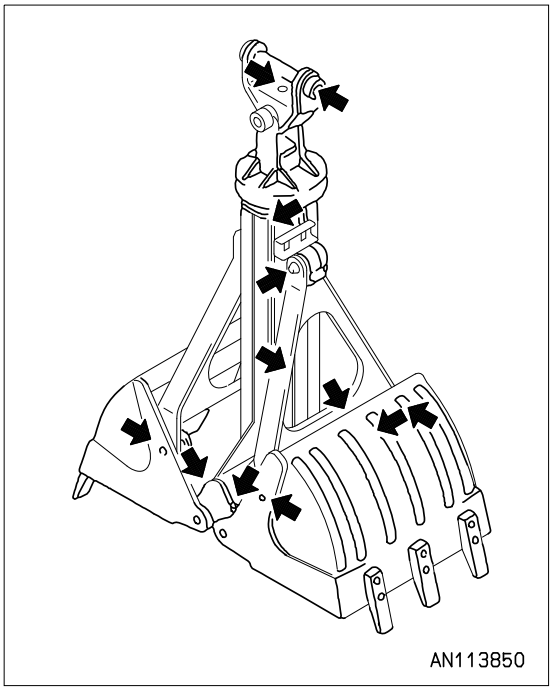
REMARK
Remove the clamshell bucket from the arm before transporting the machine.

Lubrication

- Prepare a grease gun

1. Lower the work equipment to the ground and set it in a stable condition before stopping the engine.
2. Using a grease gun, apply grease to the grease fittings marked by arrows (12 places).
3. After greasing, wipe off any old grease that was pushed out.

NOTICE
Clamshell bucket is NOT part of Automatic Grease System. Above procedure should be followed.



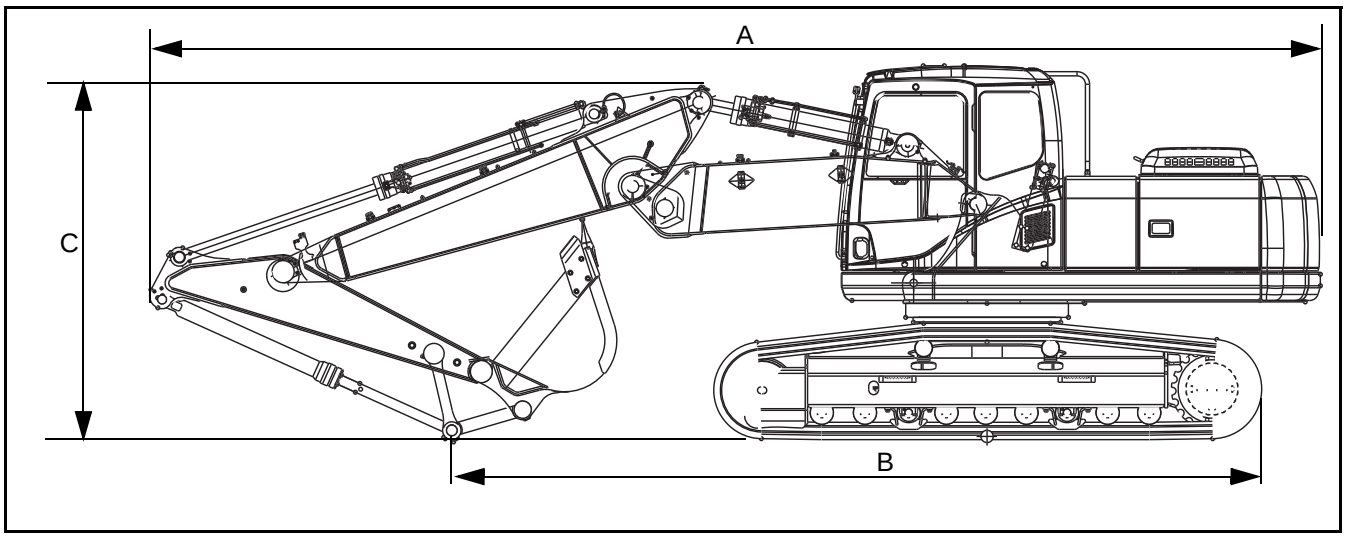
TRANSPORTATION

PROCEDURE FOR LOADING ON TO TRAILER

- Loading and unloading procedure.

Refer to TRANSPORTATION (3-180) for correct procedure for loading and unloading of machine.

(2-piece boom machine is same as mono-boom machine)



For transportation dimensions, refer to the below mentioned table.

	Arm	1800 mm	2400 mm	2930 mm
PC210-8	A	9515	9420	9395
	B	6390	5970	5185
	C	2865	3090	3030
PC210LC-8	A	9515	9420	9395
	B	6580	6160	5375
	C	2865	3090	3030

	Arm	1800 mm	2400 mm	2930 mm
PC230NHD-8	A	9515	9420	9395
	B	6485	6065	5280
	C	2875	3100	3040

HANDLING MACHINES EQUIPPED WITH KOMTRAX

- KOMTRAX is a machine management system that uses wireless communications.
- A contract with your Komatsu distributor is necessary before the KOMTRAX system can be used. Any customers desiring to use the KOMTRAX system should consult their Komatsu distributor.
- The KOMTRAX equipment is a wireless device using radio waves, so it is necessary to obtain authorization and conform to the laws of the country or territory where the machine equipped with KOMTRAX is being used. Always contact your Komatsu distributor before selling or exporting any machine equipped with KOMTRAX.
- When selling or exporting the machine or at other times when your Komatsu distributor decides it is required, it may be necessary for your Komatsu distributor to remove the KOMTRAX equipment or to carry out action to stop communications.
- If you do not obey the above precautions, neither Komatsu nor your Komatsu distributor can take any responsibility for any problem that is caused or for any loss that results.

BASIC PRECAUTIONS

⚠ WARNING

This machine is equipped with a Komtrax or VHMS (if equipped with optional modem) two-way radio communication device. Keep away from any blast zones. If the machine must work within 12m (40ft) of a blast zone or an active blasting machine, then the wiring harness must be disconnected from the Komtrax/ VHMS module. Failure to do so could result in serious injury or death.
This warning does not supersede the requirements or regulations of the area or country where this machine is in operation. The following specifications are provided to ensure compliance with all the applicable requirements or regulations.
Transmit power rating for the Komtrax/VHMS transmitter is 5 watts to 10 watts.
Operating frequency range for the Komtrax/VHMS module is 148MHz to 150MHz.

⚠ WARNING

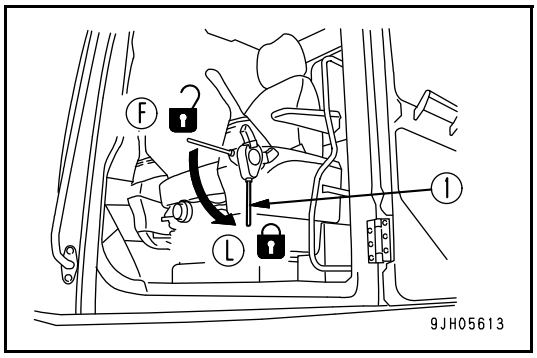
- **Never disassemble, repair, modify, or move the communications terminal, antenna, or cables. This may cause failure or fire on the KOMTRAX equipment or the machine itself. (Your Komatsu distributor will carry out removal and installation of KOMTRAX.)**
- **Do not allow cables or cords to become caught; do not damage or pull cables or cords by force. Short circuits or disconnected wires may cause failure or fire on the KOMTRAX equipment or the machine itself.**
- **For anyone wearing a pacemaker, make sure that the communications antenna is at least 22 cm from the pacemaker. The radio waves may have an adverse effect on the operation of the pacemaker.**

NOTICE

- **Even when the key in the starting switch of the KOMTRAX system is at the OFF position, a small amount of electric power is consumed. When putting the machine into long-term storage, take the action given in "LONG TERM STORAGE (3-198)". When storing the machine for a long time, first turn the starting switch to the OFF position, wait over one minute, then switch off the battery disconnect switch, and take out the battery disconnect switch key. By switching off the battery disconnect switch, battery drain can be reduced. Note however that it stops KOMTRAX functioning at the same time.**

This lever locks (1) the work equipment, swing and attachment controls.

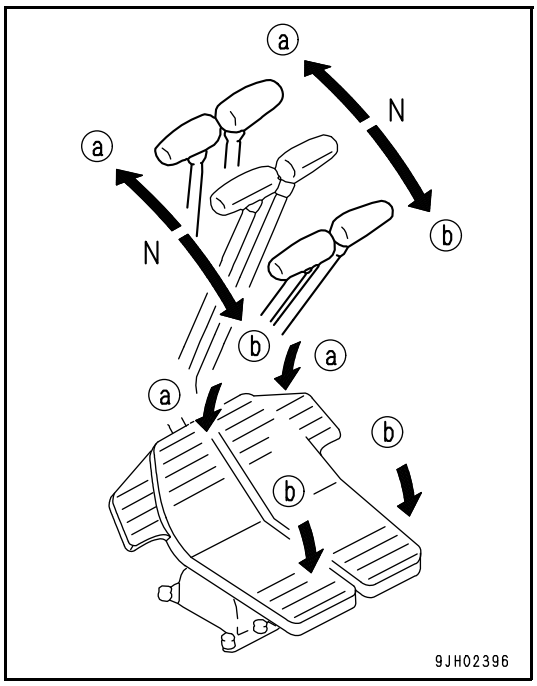
This lock lever (1) is a hydraulic lock, so even if it is in the LOCK position (L), the work equipment control lever will move, but the work equipment and swing motor will not work.



TRAVEL LEVERS (WITH PEDAL, AUTO-DECELERATION MECHANISM)

⚠ WARNING

- **Do not put your foot on the pedal unless the machine is travelling. If you leave your foot on the pedal and press it by mistake, the machine will move suddenly, and this may lead to a serious accident.**
- **With the track frame facing to the rear, the machine will move in the reverse direction by forward travelling and in the forward direction by reverse travelling.**
- **When the travel lever is used, check to see if the track frame is facing forward or backward. (If the sprocket is located to the rear, the track frame is facing forward.)**



This lever (2) is used to switch the direction of travel of the machine. ( ) shows the operation of the pedal.

(a) FORWARD:

The lever is pushed forward
(The pedal is angled forward)

(b) REVERSE:

The lever is pulled back
(The pedal is angled back)

N (Neutral): The machine stops

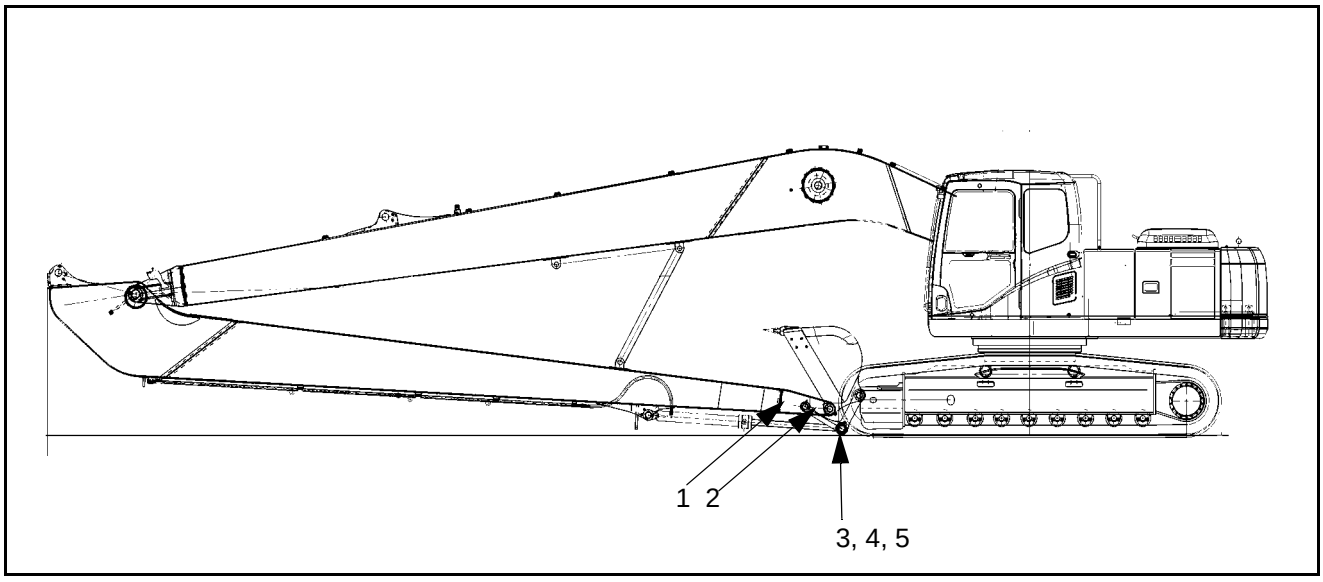
REMARK
Machines equipped with travel alarm (if equipped)
If the lever is shifted to the FORWARD or REVERSE position from the Neutral position, the alarm sounds to warn that the machine is starting to move.

EVERY 50 HOURS SERVICE

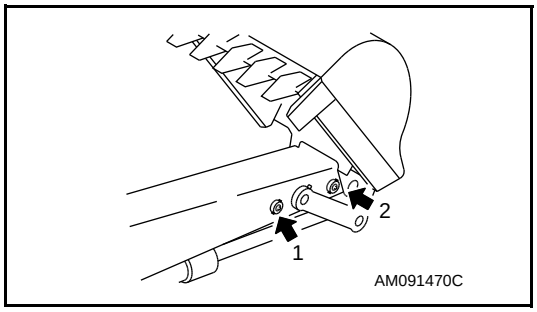
LUBRICATING (MANUAL GREASE SYSTEM)

NOTICE
For the first 100 hours on new machines where the parts are setting in, carry out greasing every 10 hours.

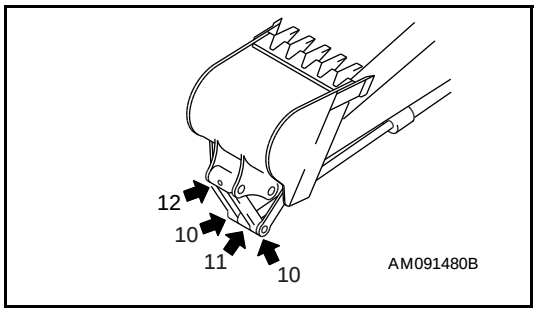
1. Set the work equipment in the greasing posture on next page, then lower the work equipment to the ground and stop the engine.
2. Using a grease pump, pump in grease through the grease fittings shown by arrows.
3. After greasing, wipe off any old grease that was pushed out.



1. Arm -Link coupling pin (1 point)
2. Arm-Bucket coupling pin (1 point)



3. Link coupling pin (2 points)
4. Bucket cylinder rod end (1 point)
5. Bucket-Link coupling pin (1 point)



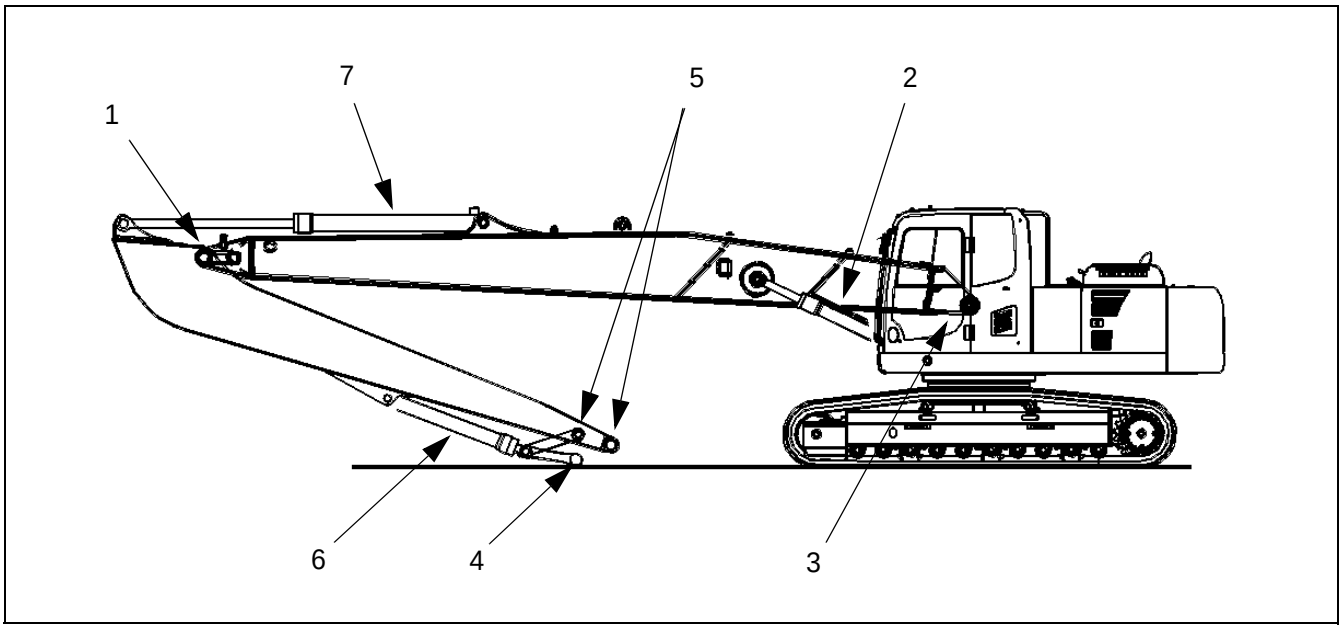
MACHINE OPERATIONS AND CONTROLS

BEFORE STARTING ENGINE

Always carry out the following inspection and maintenance before starting work each day.

- Greasing

Supply grease to the greasing points shown in the diagram.



1. Boom top pin (1 place)
2. Boom cylinder (4 places)
3. Boom foot (2 places)
4. Link (3 places)
5. Arm (2 places)
6. Attachment cylinder (2 places)
7. Arm cylinder (2 places)

- Check for cracks, furrows in the base metal.
- Check for wear and damage to the base metal.
- Perform all checks required by the basic machine manual.