TEN00003-01

Operation & Maintenance Manual

GALEO

PC138US-2

PC138USLC-2E0

HYDRAULIC EXCAVATOR

SERIAL NUMBERS

PC138US-2	**4501 and up**
PC138USLC-2E0	**1501 and up**

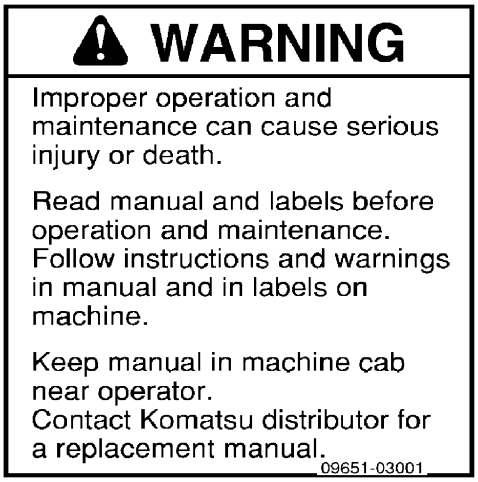
February 2005

YOUR MACHINE SERIAL NUMBERS AND DISTRIBUTOR

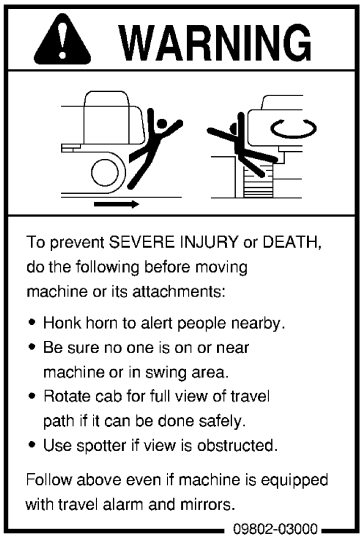
Machine serial No.	
Engine serial No.	
Product identification number (PIN)	
Distributor name Address Service Personnel Phone/Fax	

SAFETY LABELS

(1) Caution before operating or maintaining machine (09651-03001)



(2) Caution before operating (09802-03000)



(3) Warning for leaving operator's seat (09654-03001)

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 a pane of the cab window on the work equipment side is broken, the work equipment may directly hit the operator. In that case, stop the machine immediately and replace the broken pane with new one.
- 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

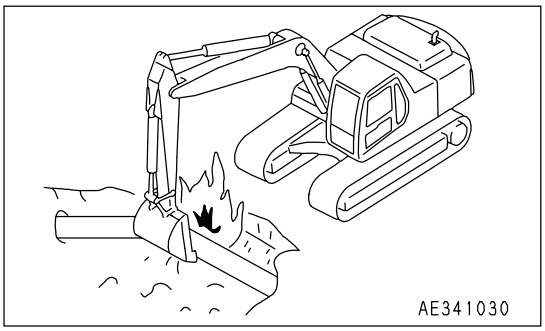
Any modification made without authorization from Komatsu can create hazards. Before making a modification, consult your Komatsu distributor.

- Komatsu will not be responsible for any injuries, accidents, product failures or other property damages resulting from modifications made without authorization from Komatsu.

SAFETY AT JOBSITE

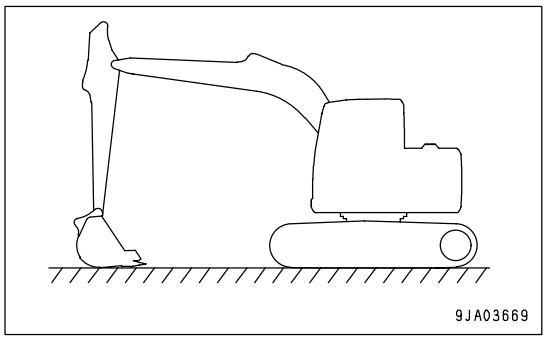
Before starting operations, thoroughly check the area for any unusual conditions that could be dangerous.

- When carrying out operations near combustible materials such as thatched roofs, dry leaves or dry grass, there is a hazard of fire, so be careful when operating.
- Check the terrain and condition of the ground at the worksite, and determine the safest method of operation. Do not carry out operations at places where there is a hazard of landslides or falling rocks.
- If water lines, gas lines, or high-voltage electrical lines may be buried under the worksite, contact each utility and identify their locations. Be careful not to sever or damage any of these lines.
- Take action to prevent unauthorized people from approaching the jobsite.
  When working on public roads, position flagmen and erect barriers to ensure the safety of passing traffic and pedestrians.
- When traveling or operating in shallow water or on soft ground, check the shape and condition of the bedrock, and the depth and speed of flow of the water before starting operations.

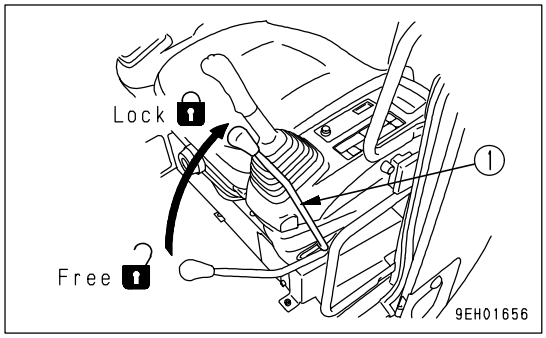


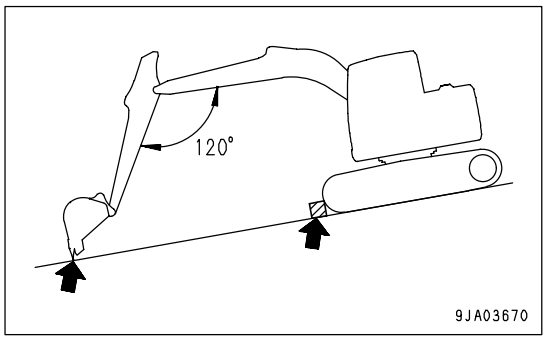
PARKING MACHINE

- Park the machine on firm, level ground.
- Select a place where there is no hazard of falling rocks or landslides, or of flooding if the land is low.
- Lower the work equipment completely to the ground.



- When leaving the machine, set lock lever (1) to the LOCK position, then stop the engine.
- Always close the operator's cab door, and use the key to lock all the equipment in order to prevent any unauthorized person from moving the machine. Always remove the key, take it with you, and leave it in the specified place.
- If it is necessary to park the machine on a slope, always do as follows.
  - Set the bucket on the downhill side, then dig it into the ground.
  - Put blocks under the tracks to prevent the machine from moving.





WELDING WORKS

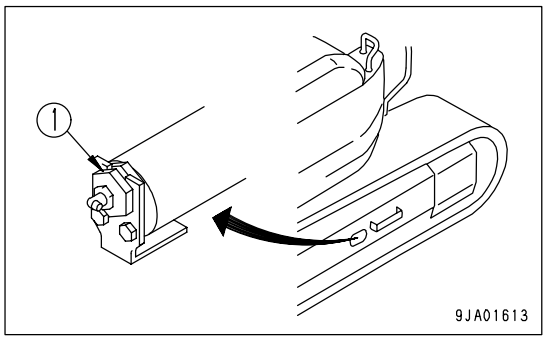
Welding operations must always be carried out by a qualified welder and in a place equipped with proper equipment. There is a hazard of gas, fire, or electrocution when carrying out welding, so never allow any unqualified personnel to carry out welding.

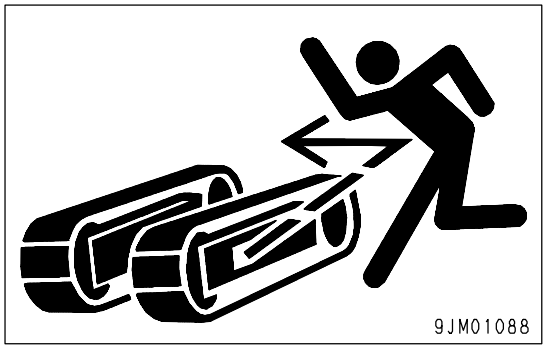
REMOVING BATTERY TERMINALS

When repairing the electrical system or when carrying out electrical welding, remove the negative (-) terminal of the battery to prevent the flow of current.

SAFETY FIRST WHEN USING HIGH-PRESSURE GREASE TO ADJUST TRACK TENSION

- Grease is pumped into the track tension adjustment system under high pressure.
  If the specified procedure for maintenance is not followed when making adjustment, grease drain plug (1) may fly out and cause serious injury or property damage.
- When loosening grease drain plug (1) to loosen the track tension, never loosen it more than one turn. Loosen the grease drain plug slowly.
- Never put your face, hands, feet, or any other part of your body close to grease drain plug (1).





DO NOT DISASSEMBLE RECOIL SPRINGS

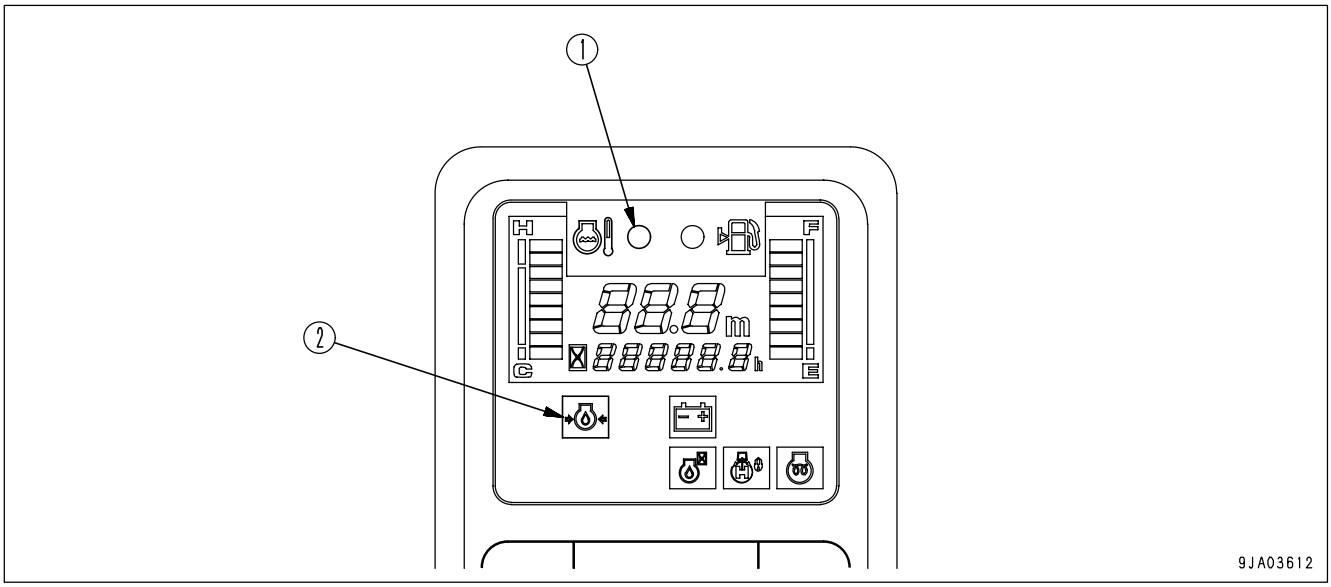
Never attempt to disassemble the recoils spring assembly. It contains a spring under high pressure which serves as a shock absorber for the idler. If it is disassembled by mistake, the spring will fly out and cause serious injury. When it becomes necessary to disassemble it, ask your Komatsu distributor to do the work.

Emergency Monitors

CAUTION

If the monitor flashes, stop the engine immediately or run at low idle, then inspect the problem point immediately and repair the problem.

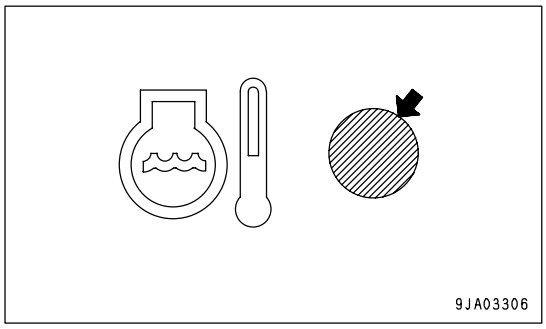
These are items which need to be observed when the engine is running. If there is any problem, the abnormal location on the monitor will lights up and the buzzer will second. Carry out the necessary repairs immediately.



(1) Engine coolant temperature monitor (2) Engine oil pressure monitor

Engine Coolant Temperature Monitor

This monitor (1) serves to warn against abnormal rise of the engine coolant temperature.
If the temperature of the engine coolant becomes abnormally high, the monitor lamp flashes, and the overheat prevention system is automatically actuated to reduce the engine speed.
Stop operations and run the engine at low idle until the engine coolant temperature gauge enters the green range.

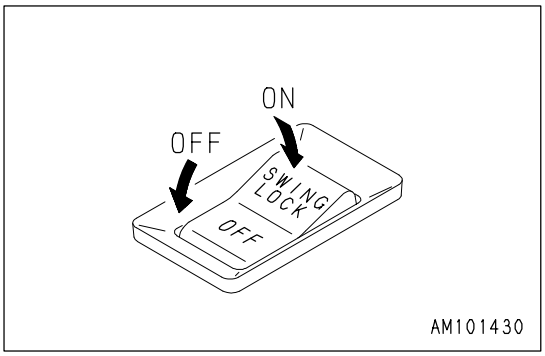


Swing Lock Switch

WARNING

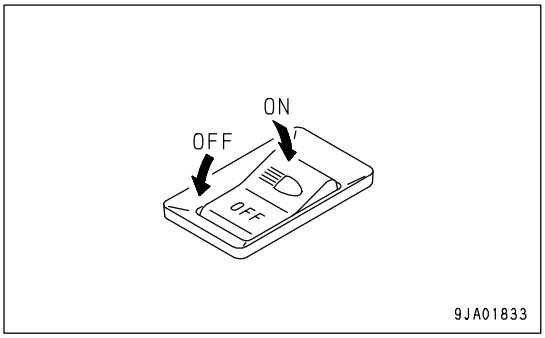
- **When not using the swing operation, e.g. in traveling, put the swing lock switch to the OFF position.**
- **On slopes, even when the swing lock switch is at the ON position, the weight of the work equipment may cause the upper structure to swing if the swing control lever is operated in the downhill direction.**

This switch (4) is used to lock the upper structure so that it cannot swing.
ON position (actuated):
The swing lock is always applied, and the upper structure will not swing even if the swing is operated. In this condition, the swing lock lamp lights up.
OFF position (canceled):
The swing lock is released, when operating the swing control lever, allowing the upper structure to swing.



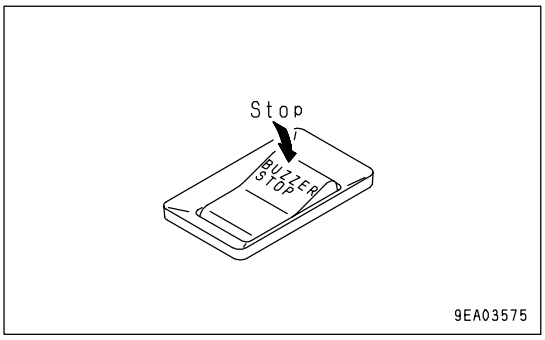
Lamp Switch

This lights (5) up the working lamp and the panel lamp.
Position ON: Working lamp and panel lamp light up.
Position OFF: Lamps go off.

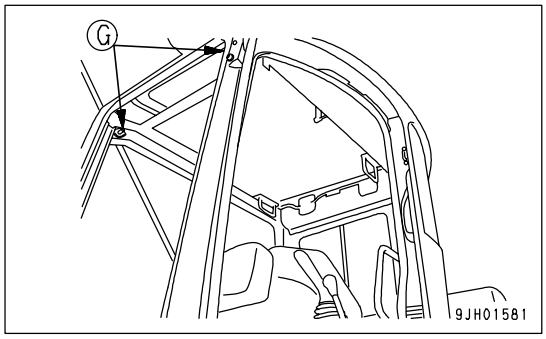


Alarm Buzzer Stop Switch

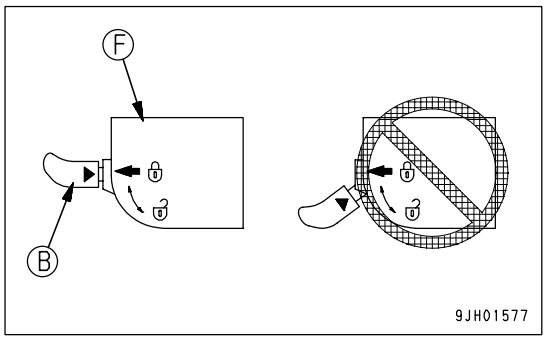
This switch (6) is used (when the engine is running) to stop the alarm buzzer when it has sounded to warn of a problem in a warning item.



5. When the bottom of the window reaches the top of the bottom window, push the top of the window to the front to push it against left and right lock catches (G) and engage the lock.

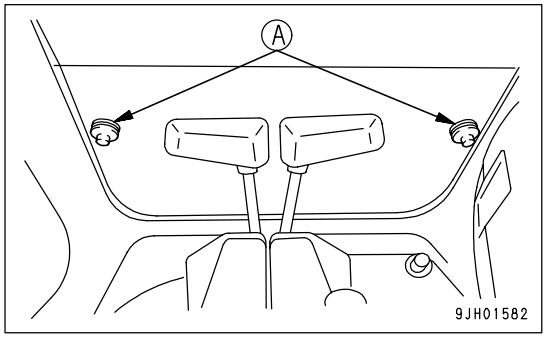


6. Check that lock lever (B) is securely at the LOCK position.
   - The lock is engaged if the arrow on lock case (F) matches the position of the arrow on lock lever (B). Check visually.
   - If the arrow on lock case (F) does not match the position of the arrow on lock lever (B), the lock is not engaged. Repeat the operation in Step 5 to engage the lock.

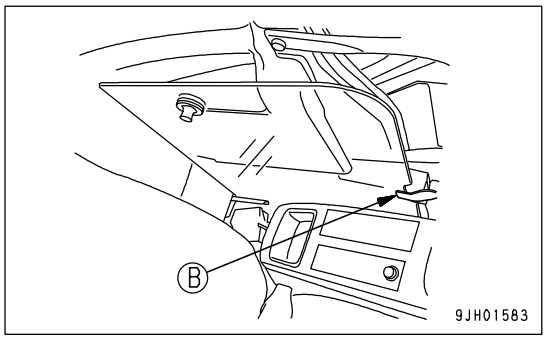


Removing Lower Windshield

1. Open the front window, then hold grip (A), pull up, and remove the bottom window.

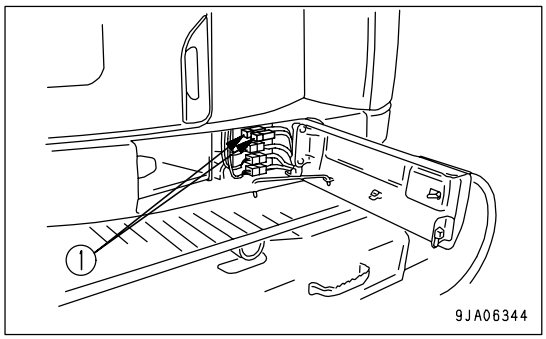


2. After removing the bottom window, stow it on the inside left of the operator's cab, then lock securely in position with lock lever (B). The procedure for stowing is as follows.



FUSIBLE LINK

If the starting motor does not move even when the starting switch is turned to the ON position, there is probably a break in the wire-shaped fusible link (1), so open the engine hood and check or replace.



REMARK

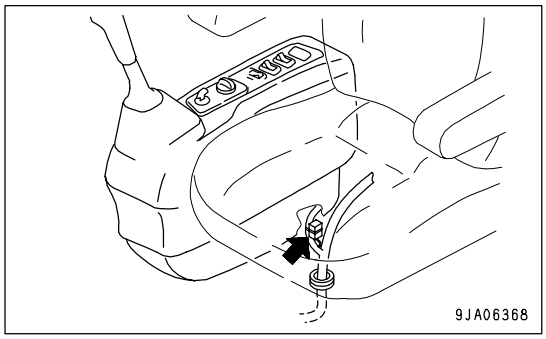
A fusible link refers to the large-sized fuse wiring installed in the high current flow portion of the circuit to protect electrical components and wiring from burning, in the same way as an ordinary fuse.

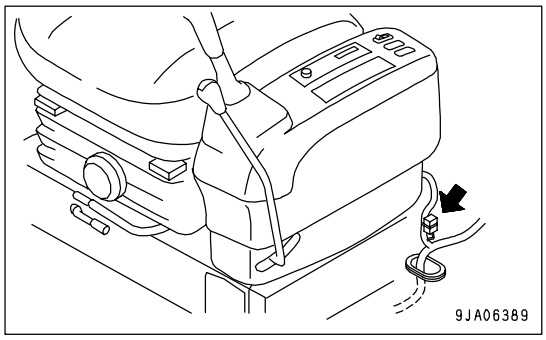
AUXILIARY ELECTRIC POWER

NOTICE

When installing electrical equipment not supplied by Komatsu, make sure that the equipment is 24 V specification with a maximum of 240 W (10 A or equivalent). When installing electrical equipment with a larger capacity, please consult your Komatsu distributor.

On both the left and right sides under the floor console, there are power takeoff connectors for optional equipment fixed to the wiring and held in position by tape. Remove the tape when using them. Use these connectors for taking off the power supply for components not supplied by Komatsu.
Left connector No: M30
Right connector No: M31





See the table below for the connection type of each connector. (Both left and right)

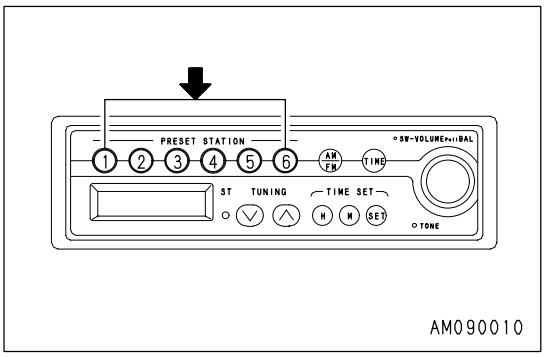
	M type housing (2-terminal)		Terminal		
	Body	Rear holder	AVS 0.5	AVS 0.85 - 2	AVS 3
Komatsu part No.	08056-00211	08056-00230	08056-00050	08056-00051	08056-00052

REMARK

Power may be sourced from the cigarette lighter, too. For the details, see the section of "Cigarette Lighter (PAGE 3-20)" in this manual.

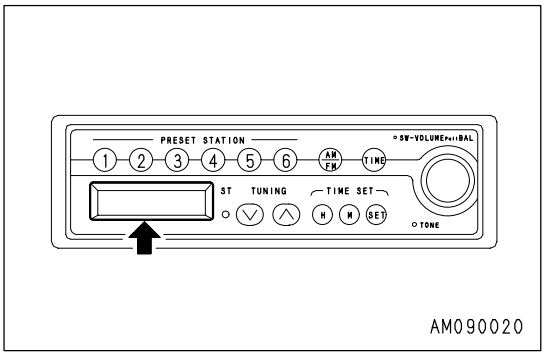
Preset Station Buttons (1, 2, 3, 4, 5, 6)

If these buttons (6) are set to the frequency of the desired broadcasting station, the station can be selected at a touch.
For details of the method of presetting, see "Preset Station Buttons (PAGE 3-49)".



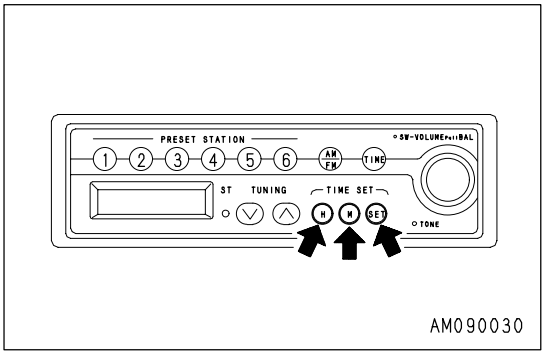
Display

In this display (7), receiving band, frequency, preset No. and time are shown.



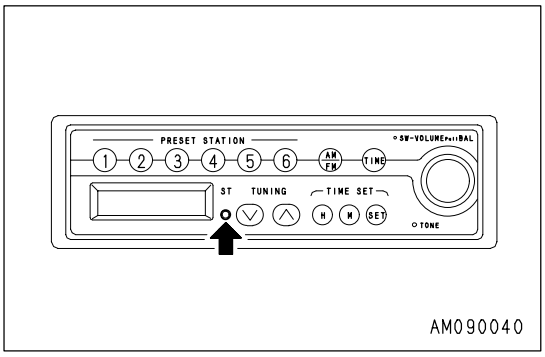
Time Reset Button

Button (8) is used to set the correct time.
H: Hour
M: Minute
SET: Sets to start of hour (00 minutes)



Stereo Indicator (ST)

This lamp (9) lights up when a stereo broadcast is picked up when receiving an FM broadcasting station.

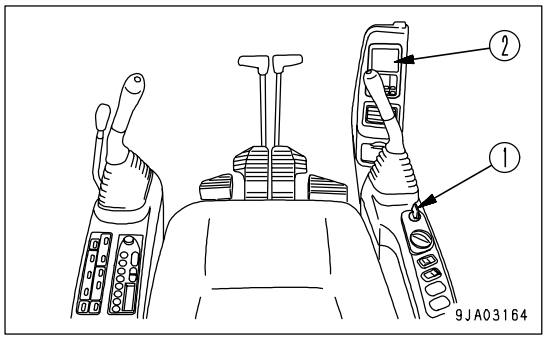


Check Fuel Level, Add Fuel

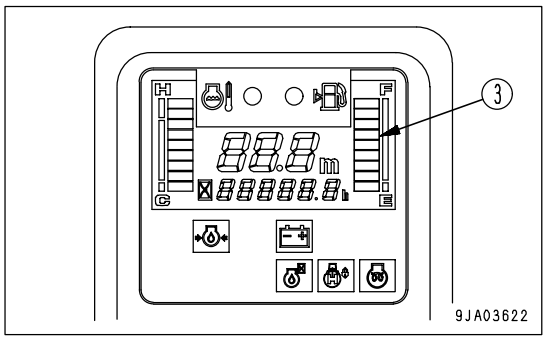
WARNING

When adding fuel, never spill the fuel or let it overflow. It will cause fire.
If any fuel has spilled, wipe it up completely. If fuel has spilled over soil or sand, remove that soil or sand.
Fuel is highly flammable and dangerous. Never bring flames near fuel.

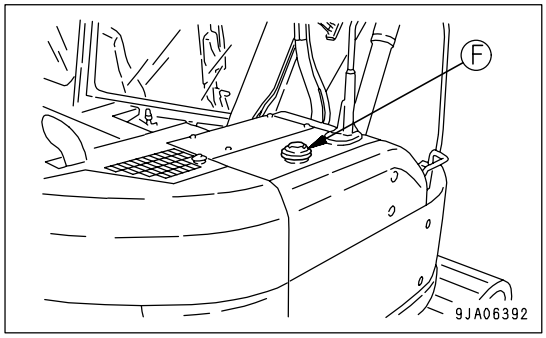
1. Insert the key into engine starting switch (1) and turn it to the ON position to light up monitor (2).

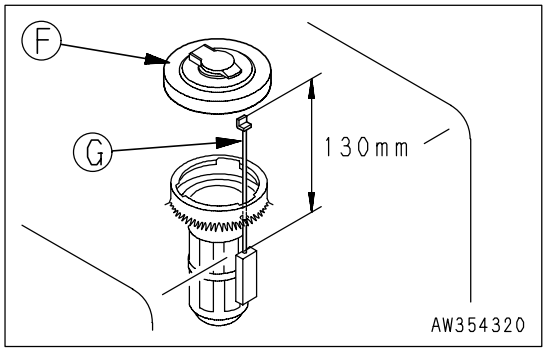


2. Check fuel gauge (3) for the remaining fuel amount.



3. If fuel is found to be low, unscrew fuel filler cap (F) on the fuel tank and add fuel through the filler port until float gauge (G) comes up to the highest point.
   Specified fuel amount in fuel tank: 195 liters (51.52 US gal)
   Position of tip of float gauge (G) when tank is full: Approx. 130 mm (5.1 in) from top surface of fuel tank
4. After adding fuel, push float gauge (G) straight down with fuel filter cap (F). Be careful not to get float gauge (G) caught in the tab (4) of fuel filler cap (F), and tighten fuel filler cap (F) securely.

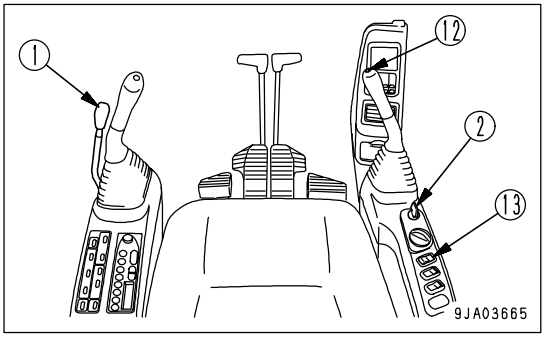




Operations Before Starting Engine

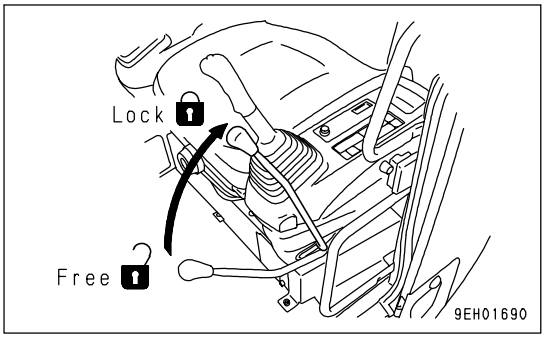
WARNING

When standing up from the operator's seat, always set the safety lock lever to the LOCK position, regardless of whether the engine is running or stopped.



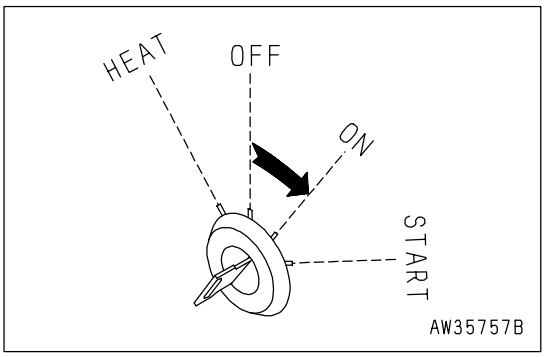
1. Check the lock lever (1) is at the LOCK position.

REMARK
The engine does not start, if the safety lock lever is not in the LOCK position.



2. Check that each control lever is in the NEUTRAL position.

3. Insert the key in starting switch (2), turn the key to the ON position, then carry out the following checks.

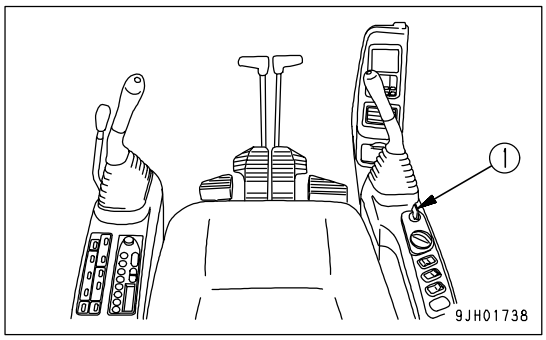


STOPPING THE ENGINE

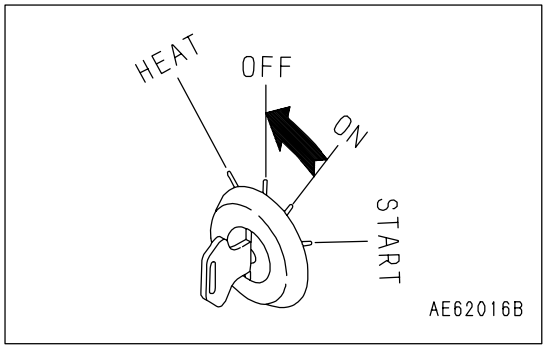
NOTICE

If the engine is stopped abruptly, service life of component parts of the engine may be considerably reduced. Hence do not stop the engine abruptly except in an emergency. If the engine has overheated, do not try to stop it abruptly but run it at medium speed to allow it to cool down gradually, and then stop it.

1. Run the engine at low idle for about 5 minutes to cool down gradually.



2. Turn the key of starting switch (1) to the OFF position to stop the engine.
3. Remove the key from starting switch (1).



WORKING MODE

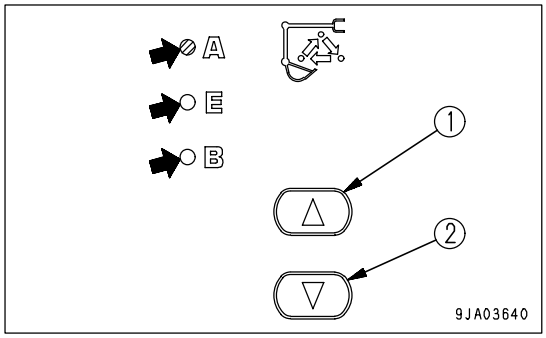
The mode selector switch can be used to switch the mode to match operating conditions and purpose, thereby enabling work to be performed efficiently.
Make effective use of each mode as follows.

NOTICE

Do not use A mode when using a breaker. Otherwise the breaker will likely be damaged.

Every time switch (1) is pressed, the working mode shifts in the sequence of A -> B -> E -> A
Every time switch (2) is pressed, the working mode shifts in the sequence of A -> E -> B -> A
Use the working mode switch to set the mode to the most efficient mode to match the type of work.

Working mode	Applicable operations
A mode	Normal digging, loading operations
E mode	Normal digging, loading operations (For work with stress on fuel consumption ratio)
B mode	Breaker operations



REMARK

- The A mode is automatically selected when starting the engine.
- If you desire automatic setting of E mode or B mode at the time of engine start-up, call your Komatsu distributor for the adjustment.

BUCKET REPLACEMENT AND INVERSION

WARNING

- **When pins are knocked in with a hammer, pieces of metal may fly and cause serious injury. When carrying out this operation, always wear goggles, hard hat, gloves, and other protective equipment.**
- **When the bucket is removed, place it in a stable condition.**
- **If pins are hit with a strong force, there is a hazard that the pin may fly out and injure people in the surrounding area. Make sure that there is no one in the surrounding area before starting the operation.**
- **When removing the pins, do not stand behind the bucket. In addition, be extremely careful not to put your foot under the bucket while standing at the side for the work.**
- **When removing or inserting pins, be extremely careful not to get your fingers caught.**
- **Never insert your fingers into the pin holes when aligning the holes.**

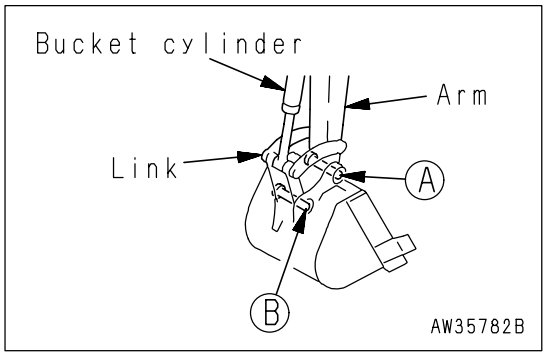
Stop the machine on a firm and flat surface and do the work. When performing joint work, appoint a lead and follow that person's instructions and signals.

Replacement

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

REMARK

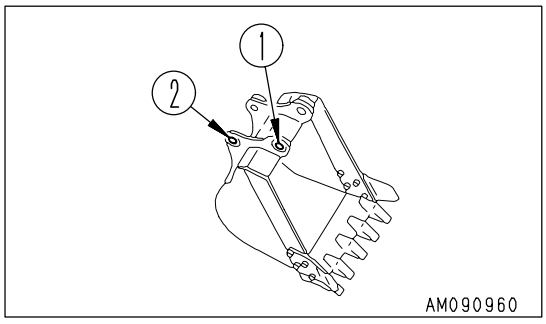
When removing the pins, place the bucket so that it is in light contact with the ground.
If the bucket is lowered strongly to the ground, the resistance will be increased and it will be difficult to remove the pins.



NOTICE

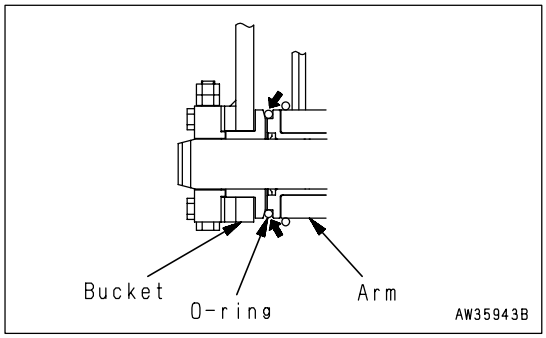
After removing the pins, make sure that mud or sand does not get on them. Dust seals are fitted at both ends of the bushings, so be careful not to damage them.

2. Remove the double nut of 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.
3. Align the arm with holes (1) of the replacement bucket and the link with holes (2), then insert grease-coated pins (A) and (B) into hole (1) and hole (2) respectively.



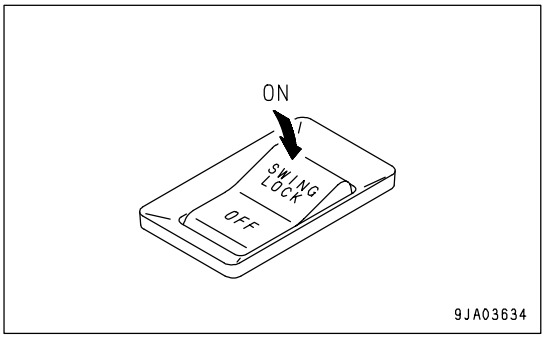
REMARK

- Carry out installation in the reverse order to removal.
- When installing the bucket, the O-rings are easily damaged, so fit the O-rings on the boss of the arm end as shown in the diagram.When knocking the pin, move the O-ring down to the regular groove.



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

13. Turn the swing lock switch ON to apply the swing lock.

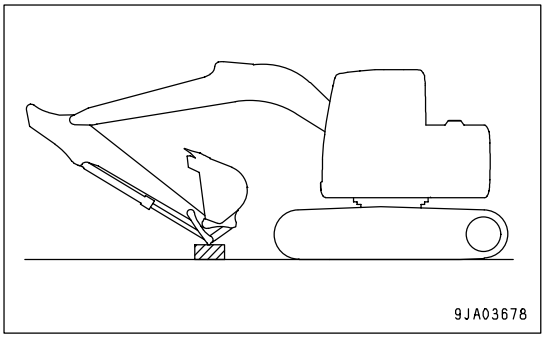


Securing Machine

After placing the machine on the specified position of the trailer, secure it according to the following procedure.

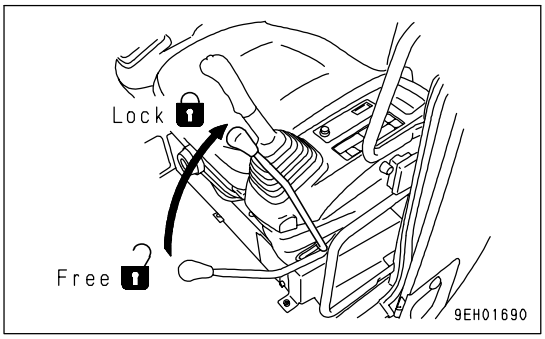
NOTICE

To prevent damage to the bucket cylinder during transportation, fit a wooden block at one end of the bucket cylinder to prevent it from touching the floor.

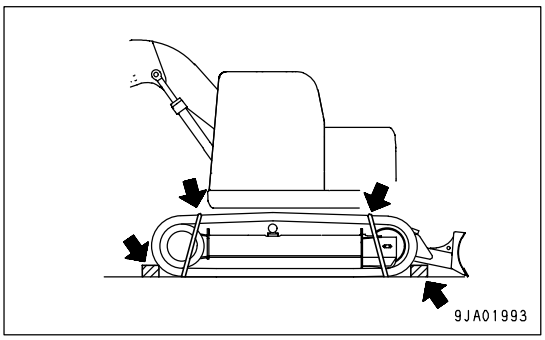


1. Lower the blade. (Only machines with blade specification)
2. Extend the bucket and arm cylinders fully, then lower the boom slowly.
3. Stop the engine, then remove the key from the starting switch.

4. Secure control levers with the work equipment lock lever.



5. Close all doors, windows, and covers.
   Lock the covers, caps, and doors fitted with locks.
6. Place blocks under both ends of the tracks to prevent the machine from moving during transportation, and secure the machine with chains or wire rope of suitable strength.
   Be particulary careful to secure the machine in position so it does not slip to the side.

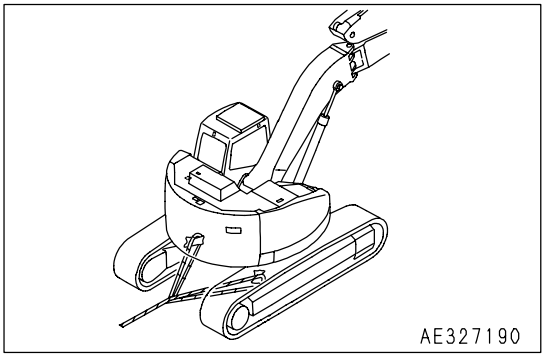


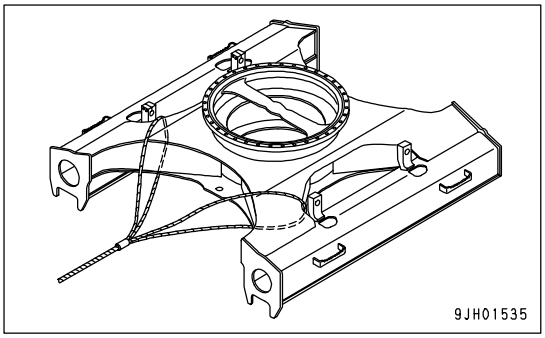
TOWING THE MACHINE

WARNING

- **When towing the machine, use a wire rope that has ample strength for the weight of the machine that is being towed.**
- **Do not apply a sudden load to the wire rope.**

If the machine sinks in mud and cannot get out under its own power, or if the drawbar pull of the excavator is being used to tow a heavy object, use a wire rope as shown in the diagram on the right.
Places pieces of wood between the wire ropes and the body to prevent the wire ropes from damaging the body.



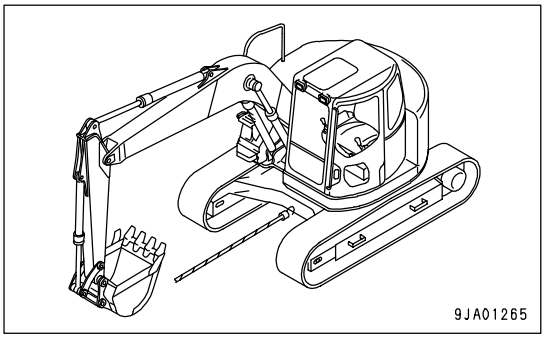


LIGHTWEIGHT TOWING HOOK

WARNING

- **The shackle must always be used.**
- **Hold the rope level and direct it straight to the track frame.**
- **Move the machine slowly in the Lo mode.**

There is a hole in the track frame to fit the shackle when towing light objects.



SEVERE JOB CONDITION

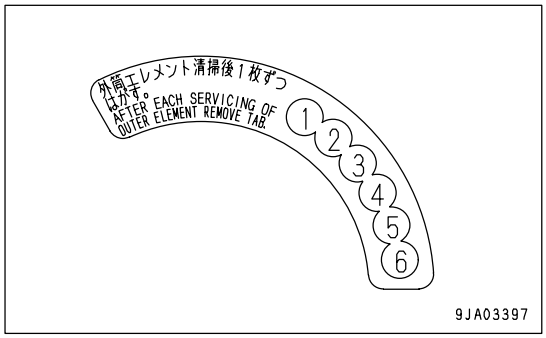
- When carrying out digging operations in water, if the work equipment mounting pin goes into the water, carry out greasing every time the operation is carried out.
- For heavy-duty operations and deep digging, carry out greasing of the work equipment mounting pins every time before operation.
  After greasing, operate the boom, arm and bucket several times, then grease again.

USE OF FUEL, COOLANT AND LUBRICANTS ACCORDING TO AMBIENT TEMPERATURE

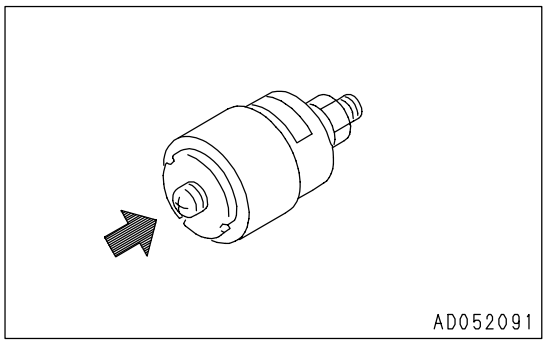
Reservoir	Fluid Type	Ambient Temperature, degrees Celsius -22 -4 14 32 50 68 86 104 122°F -30 -20 -10 0 10 20 30 40 50°C	Recommended Komatsu Fluids
Engine oil pan	Engine oil	SAE10W30DH	Komatsu EO10W30DH
		SAE15W40DH	Komatsu EO15W40DH
		SAE30DH	Komatsu EO30DH
Swing machinery case Final drive case PTO gear case or Damper case	Power train oil (Note.1)	TO30	TO30
Hydraulic System	Power train oil	TO10	TO10
	Hydraulic oil	HO46-HM	HO46-HM
	Engine oil	SAE10W30DH	Komatsu EO10W30DH
		SAE15W40DH	Komatsu EO15W40DH
Grease fitting	Hyperwhite grease (Note.2)	G2-T	G2-T
	Lithium EP grease	G2-LI	G2-LI
Cooling system	Supercoolant AF-NAC	AF-NAC (Note.3)	AF-NAC
Fuel tank	Diesel fuel	No.2-D	ASTM No.2-D
		No.1-D	ASTM No.1-D

		Engine oil pan	Swing machinery case	Final drive case (each)	PTO gear case	Hydraulic system	Cooling system	Fuel tank
Specified capacity	Liters	11.5	2.5	2.5	0.75	120	14.2	195
	US gal	3.04	0.66	0.66	0.20	31.68	3.75	51.48
Refill capacity	Liters	11	2.5	2.5	0.75	69	-	-
	US gal	2.91	0.66	0.66	0.20	18.22	-	-

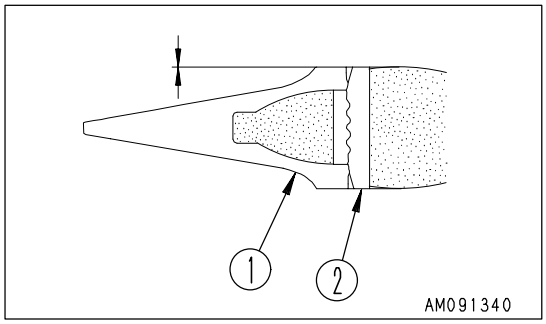
6. Replace the seal attached to cover (3) with new one.

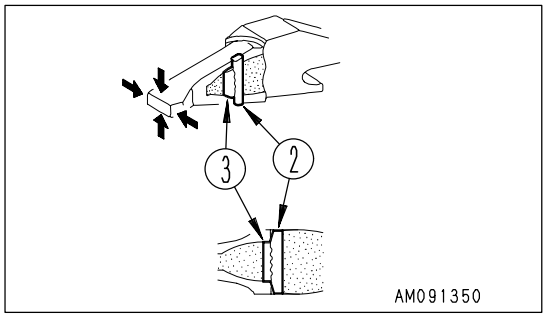


7. Return the red piston in the dust indicator (1) to its original position.



8. Insert lock pin (2) in the hole of the teeth and hit it until its top is the same level as the surface of teeth (1).
9. After replacing a bucket tooth, always check the following.
   1) After the lock pin has been knocked in completely, check that it is secured by the point 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 point 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 shown in the figure.





The life of the teeth can be lengthened and the frequency of its replacement can be reduced by turning it upside down so that it will wear evenly.
Replace the rubber pin lock and locking pin at the same time as replacing the teeth. This makes it possible to prevent the teeth from falling out.

BLEEDING AIR FROM HYDRAULIC SYSTEM

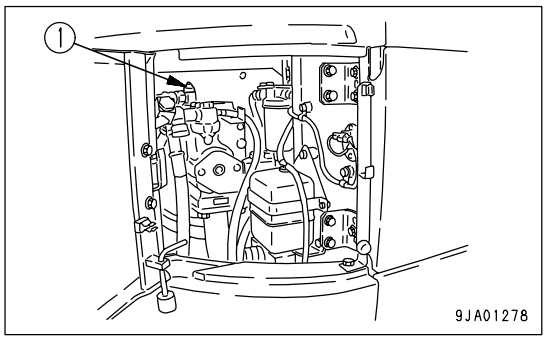
For details, see "STARTING ENGINE (PAGE 3-70)". If it is necessary to refer to the items for starting the engine, moving the machine off, steering, or stopping, see the OPERATION section.

1. Bleeding air from pump

NOTICE

If the pump is operated without filling the pump case with hydraulic oil, there is danger that the pump may be prematurely damaged. Be sure to bleed the air completely.

1) Loosen air bleed plug (1) installed to the drain port and check that oil oozes out.
2) After completion of the air bleeding operation, tighten the air bleed plug (1).



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.

2. Starting engine
   Start the engine, referring to "STARTING ENGINE (PAGE 3-70)".
   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 so that a cylinder is not moved to the end of its stroke. (Stop the cylinder approx. 100 mm (3.9 in) 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.

4. Bleeding air from swing motor
   (only after draining oil from swing motor case)

NOTICE

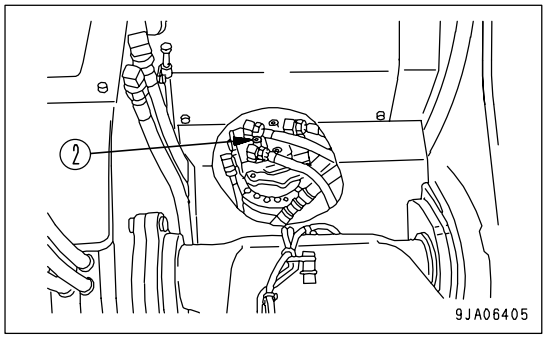
If the air is not bled from the swing motor, the motor bearings may be damaged.

1) Run the engine at low idle, Loosen air bleeding plug (2) and check that oil oozes out from air bleeding plug (2).

NOTICE

When doing this, do not operate the swing.

2) If no oil oozes out, stop the engine, remove air bleeding plug (2), then fill the motor case with hydraulic oil.

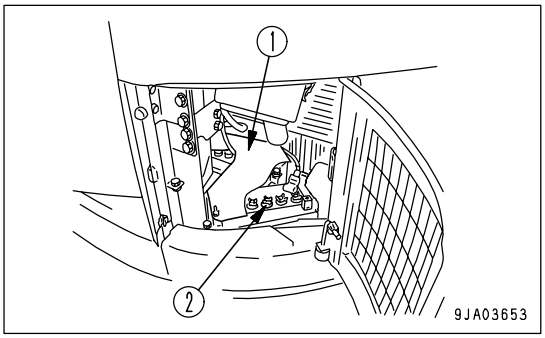


3) After completing the air bleed operation, tighten air bleeding plug (2).
4) Run the engine at low idle, and slowly swing the upper structure at least 2 times uniformly to the left and right.

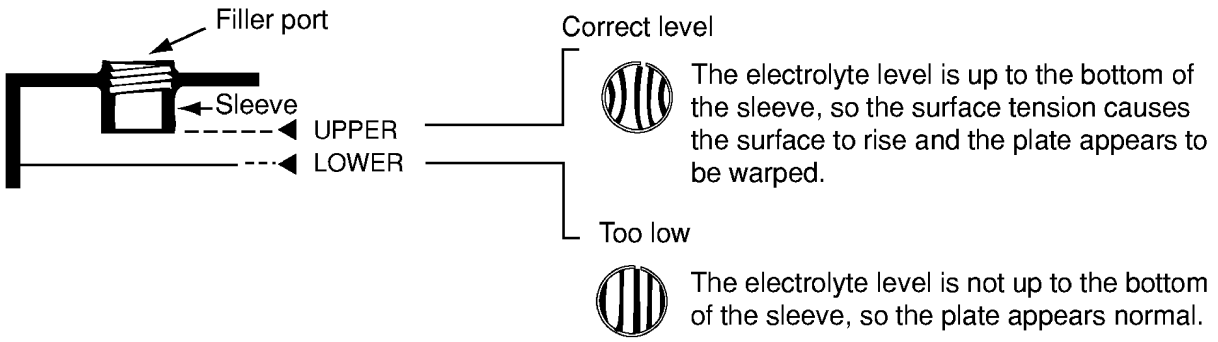
When it is Impossible to Check Electrolyte Level from Side of Battery

If it is impossible to check the electrolyte level from the side of the battery, or there is no display of the UPPER LEVEL line on the side of the battery, check as follows.

1. Open the battery room door and remove sheet (1) installed above the battery.
2. Remove cap (2) at the top of the battery, look though the water filler port, and check the electrolyte surface. If the electrolyte does not reach the sleeve, add distilled water so that the level reaches the bottom of the sleeve (UPPER LEVEL line) without fail.



Use the diagram below for reference, and check if the electrolyte reaches the bottom of the sleeve.



3. After adding distilled water, tighten cap (2) securely.

REMARK

If distilled water is added to above the bottom of the sleeve, use a syringe to lower the level to the bottom of the sleeve. Neutralize the removed fluid with baking soda (sodium bicarbonate), then flush it away with a large amount of water or consult your Komatsu distributor or battery maker.

When it is Possible to Use Indicator to Check Electrolyte Level

If it is possible to use an indicator to check the electrolyte level, follow the instructions given.

EVERY 1000 HOURS MAINTENANCE

Maintenance for every 50, 100, 250 and 500 hours service should be carried out at the same time.

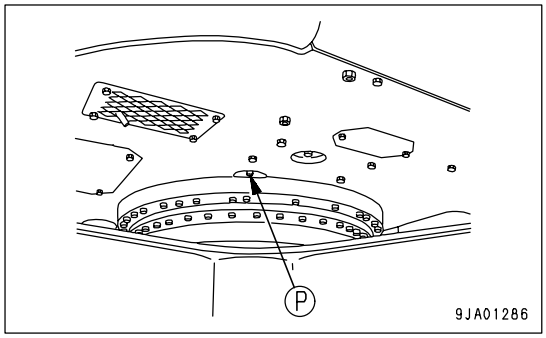
CHANGE OIL IN SWING MACHINERY CASE

⚠ WARNING

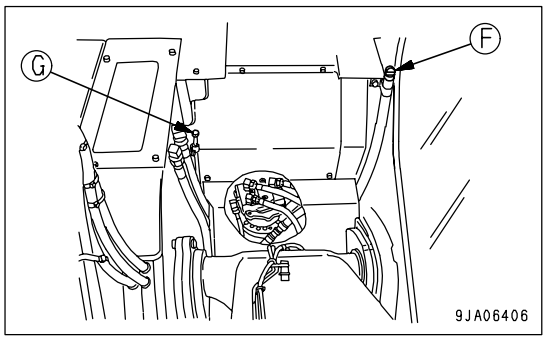
The parts and oil are at high temperature after the engine is stopped, and may cause serious burns. Wait for the temperature to go down before starting the operation.

- Refill capacity: 2.5 liters (0.66 US gal)

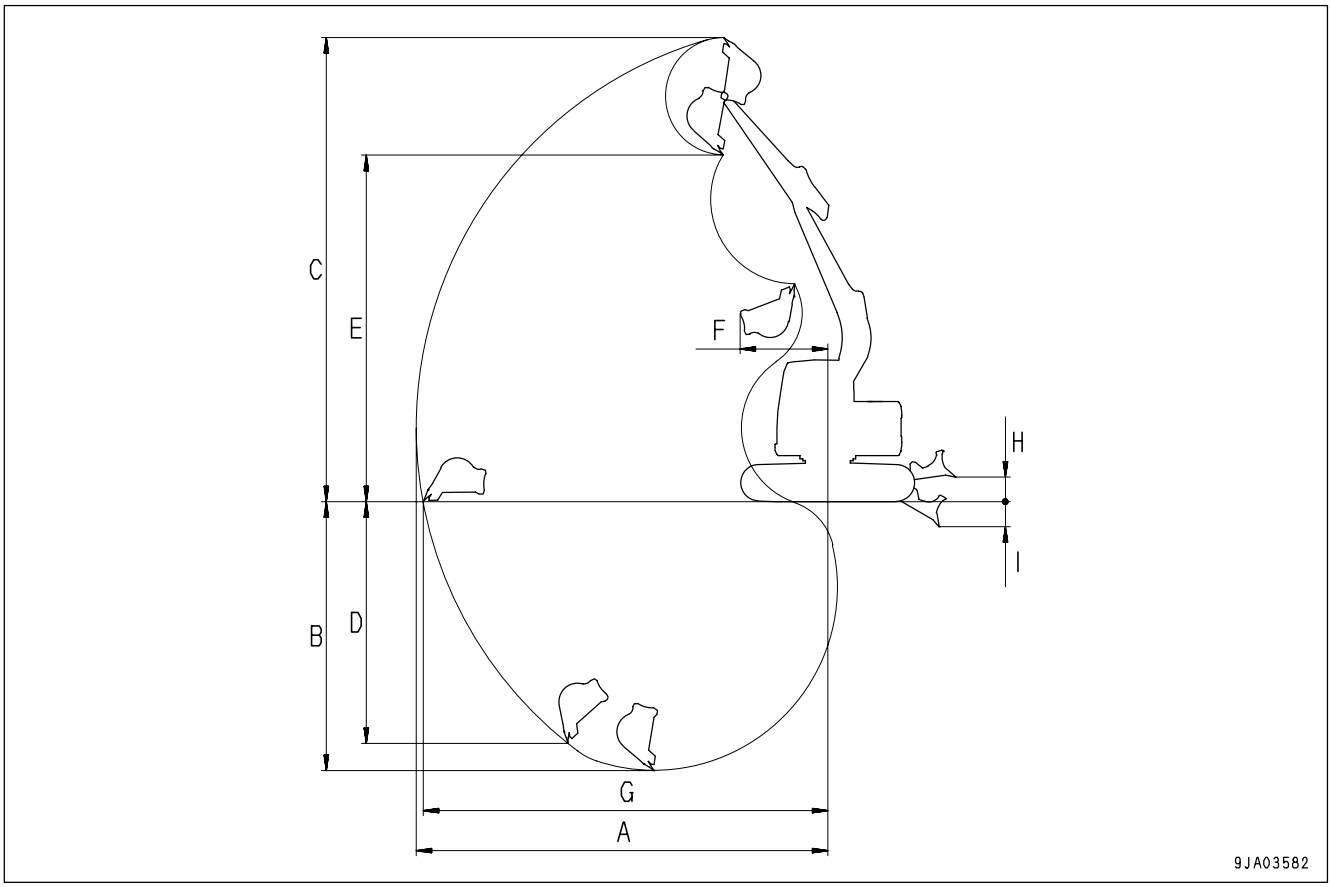
1. Swing the upper structure so that drain plug (P) is between the left and right tracks.
2. Set an oil container under drain valve (P) at the bottom of the machine.
3. Remove drain plug (P) at the bottom of the machine, drain the oil, then tighten the drain plug again.
   Tightening torque for drain plug: 44.1 to 93.1 N·m (4.5 to 9.5 kgf·m, 32.5 to 68.7 lbft)



4. Remove dipstick (G) and the cap of oil filler (F), then add the specified amount of oil from oil filler (F).
5. Wipe off the oil on the dipstick with a cloth.
6. Fully insert dipstick (G) into filler pipe (F), then remove it.
7. The oil level should be between the H and L marks on oil level gauge (G). If the oil level is below the L mark, add oil through oil filler port (F).
8. If the oil is above the H mark, drain the excess oil from drain plug (P), then check the oil level again.



	Working ranges	Unit	PC138US-2	PC138USLC-2
A	Max. digging reach	mm (ft in)	8,300 (27’ 3")	
B	Max. digging depth	mm (ft in)	5,480 (17’ 2")	
C	Max. digging height	mm (ft in)	9,340 (30’ 8")	
D	Max. vertical wall digging depth	mm (ft in)	4,900 (16’ 1")	
E	Max. dumping height	mm (ft in)	6,840 (22’ 5")	
F	Min. swing radius of work equipment	mm (ft in)	1,980 (6’ 6")	
G	Max. reach ground level	mm (ft in)	8,180 (26’ 10")	
H	Max. blade lifting height	mm (ft in)	470 (1’ 7")	
I	Max. blade lowering depth	mm (ft in)	525 (1’ 9")	490 (1’ 7")



AIR CONDITIONER CONTROLS

Cooling

- If you smoke when the air conditioner is on, the smoke may start to hurt your eyes, so open the window and turn the lever to FRESH for a while to remove the smoke while continuing the cooling.

When running the air conditioner for a long time, turn the lever to the FRESH position once an hour to carry out ventilation and cooling.

Cooling with Care

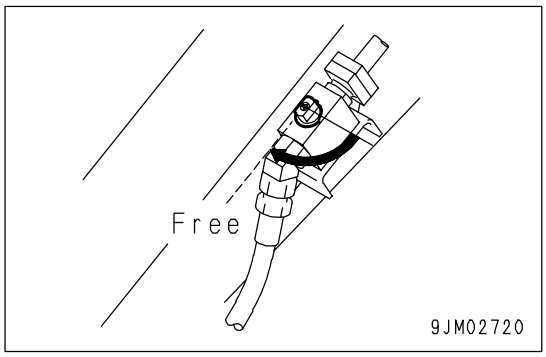
- It is considered suitable for health reasons to set the cooling temperature so that it feels slightly cool when entering the cab (difference from outside temperature: 5 to 6°C (41 to 42.8°F)).

AIR CONDITIONER MAINTENANCE

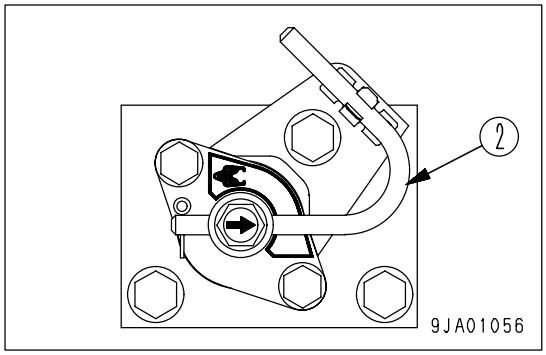
When carrying out inspection of a machine equipped with an air conditioner, see the "MAINTENANCE SCHEDULE CHART (PAGE 4-14)" and carry out inspection according to the table.

Precautions when Using

- Check that the stopper valve is in the FREE position.



- Check that the selector valve is in the position for using the breaker.
- Check that selector valve locking bar (2) is properly installed at the position for breaker application.



- Consult each manufacturer of breaker to decide if an accumulator for the breaker circuit may well be installed in your machine.
- For details of pther precautions when handling the breaker, read and use correctly the instruction manual provided by the breaker manufacturer.
- When breaker is used, the hydraulic oil degrades faster than in normal operation. Shorten the maintenance interval of the hydraulic oil and filter element.
  See "MAINTENANCE INTERVAL FOR HYDRAULIC BREAKER (PAGE 4-15)".