CEAM005902

Operation & Maintenance Manual

PC300LC-8
PC300HD-8

HYDRAULIC EXCAVATOR

SERIAL NUMBERS	PC300LC-8	A90001	and UP
	PC300HD-8	A87001	
ENGINE	SAA6D114E-3		

March 2010

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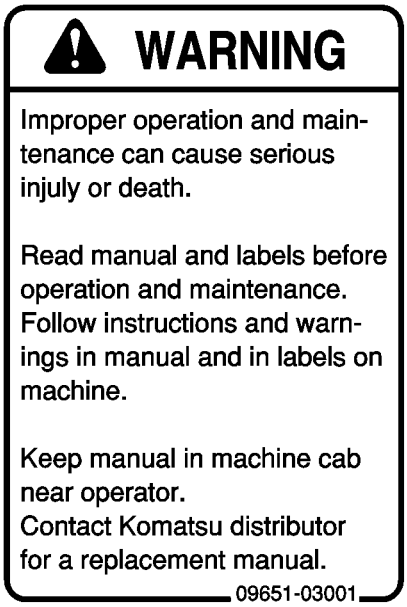
Safety Labels

1. Caution for operation, inspection and maintenance (09651-03001)

   WARNING - Improper operation and maintenance can cause serious injury or death. Read manual and labels before operation and maintenance. Follow instructions and warnings in manual and in labels on machine. Keep manual in machine cab near operator. Contact Komatsu distributor for replacement manual.



2. Caution before operating (09802-03000)

   WARNING - To prevent SEVERE INJURY or DEATH, do the following before moving machine or its attachments:
   - Honk horn to alert people nearby.
   - Be sure no one is on or near machine or in swing area.
   - Rotate cab for full view of travel path, if it can be done safely.
   - Use spotter if view is obstructed.

   Follow above even if machine is equipped with travel alarm and mirrors.

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

   WARNING - To avoid hitting unlocked operation levers, lower equipment to ground and move SAFETY LOCK LEVER (located near seat) to LOCK position before standing up from operator’s seat. Sudden and unwanted machine movement can cause serious injury or death.

SAFETY INFORMATION

Safety Rules

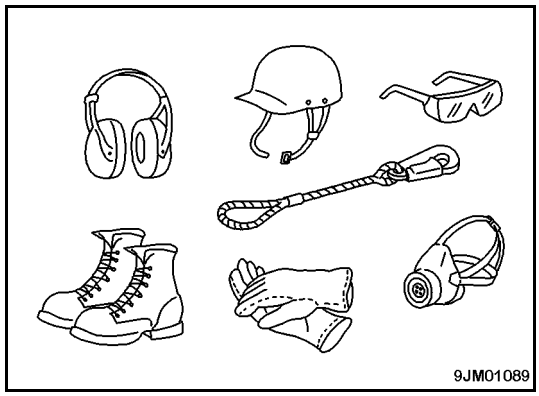
- Only trained and authorized personnel can operate and maintain the machine.
- Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.
- If you are under the influence of alcohol or medication, your ability to safely operate or repair your machine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

If Problems Are Found

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

Working Wear And Personal Protective Items

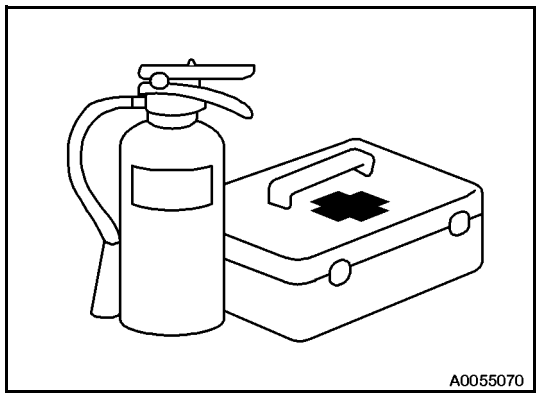
- Do not wear loose clothing and accessories. There is a hazard that they may catch on control levers or other protruding parts.
- If you have long hair and it hangs out from your hard hat, there is a hazard that it may get caught up in the machine, so tie your hair up and be careful not to let it get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



Fire Extinguisher And First Aid Kit

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

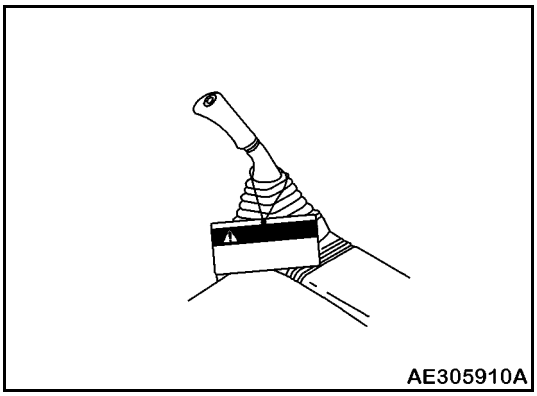
- Be sure that fire extinguishers have been provided and read the labels to ensure that you know how to use them in emergencies.
- Carry out periodic inspection and maintenance to ensure that the fire extinguisher can always be used.
- Provide a first aid kit in the storage point. Carry out periodic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



SAFETY MACHINE OPERATION

Starting Engine

If there is a warning tag hanging from the work equipment control lever, do not start the engine or touch the levers.

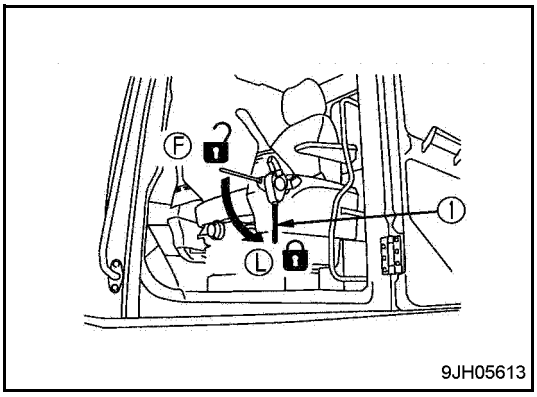


If there is any "DANGER! Do Not Operate!" warning tag (part number 09963-03001) displayed, it means that someone is carrying out inspection and maintenance of the machine. If the warning sign is ignored and the machine is operated, there is danger that the person carrying out inspection or maintenance may be caught in the rotating parts or moving parts and suffer serious personal injury or death. Do not start the engine or touch the levers.

Checks Before Starting Engine

Carry out the following checks before starting the engine at the beginning of the day's work.

- Remove all dirt from the surface of the window glass to ensure a good view.
- Remove all dirt from the surface of the lens of the working lamps, and check that they light up correctly.
- Check the coolant level, fuel level, and oil level in engine oil pan, check for clogging of the air cleaner, and check for damage to the electric wiring.
- Adjust the operator's seat to a position where it is easy to carry out operations, and check that there is no damage or wear to the seat belt or mounting clamps.
- Check the operation of the instruments and gauges, check the angle of the mirror, and check that the control levers are all at the Neutral position.
- Before starting the engine, check that lock lever (1) is in LOCK position (L).
- Adjust the mirrors so that the rear of the machine can be seen clearly from the operator's seat.
- When adjusting, See “Rear View Mirrors” on page 2-128.
- Adjust the rear-view camera so that the area to the rear of the machine can be seen clearly from the operator's seat.
- For details of the method of adjustment, See “Adjusting Angle Of Rear View Camera” on page 2-126.
- Check that there are no persons or obstacles above, below, or in the area around the machine.



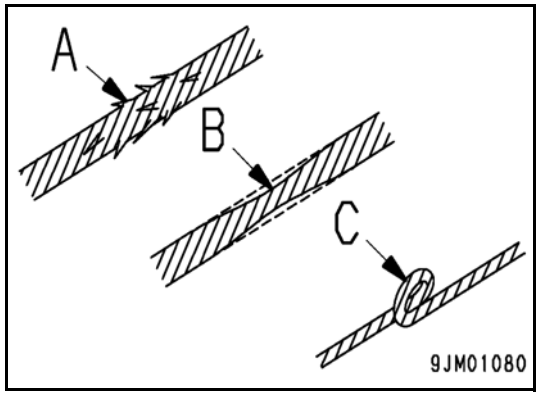
Shipping The Machine

When shipping the machine on a trailer, do as follows.

- The weight, transportation height, and overall length of the machine differ according to the work equipment, so be sure to confirm the dimensions.
- When passing over bridges or structures on private land, check first that the structure is strong enough to support the weight of the machine. When traveling on public roads, check first with the relevant authorities and follow their instructions.
- For details of the shipping procedure, See "TRANSPORTATION" on page 2-179.

TOWING

Safety Rules For Towing



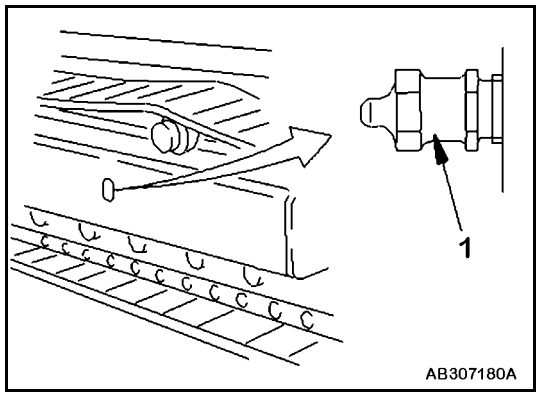
Serious injury or death could result if a disabled machine is towed incorrectly or if there is a mistake in the selection or inspection of the wire rope.

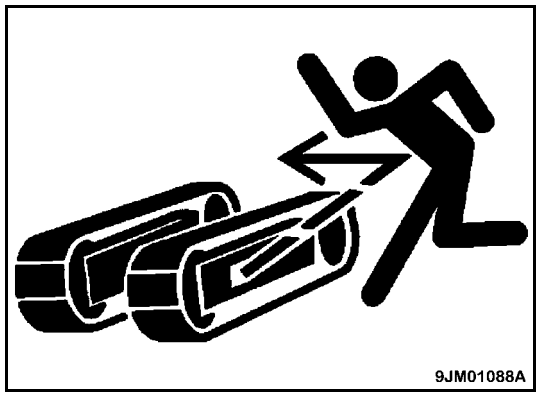
For towing, See "Towing The Machine" on page 2-202.

- Always check that the wire rope used for towing has ample strength for the weight of the machine being towed.
- Never use a wire rope which has cut strands (A), reduced diameter (B), or kinks (C). There is danger that the rope may break during the towing operation.
- Always wear leather gloves when handling wire rope.
- Never tow a machine on a slope.
- During the towing operation, never stand between the towing machine and the machine being towed.
- Operate the machine slowly and be careful not to apply any sudden load to the wire rope.

Safety First When Using High-pressure Grease To Adjust Track Tension

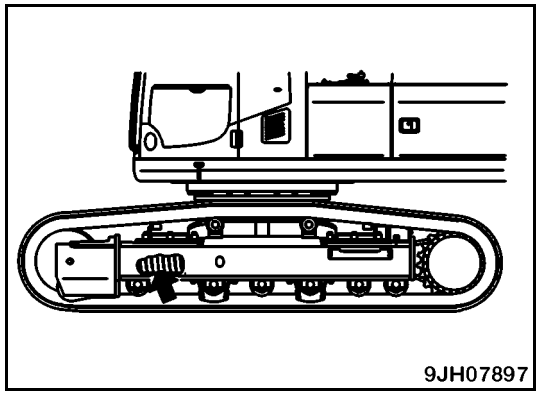
- Grease is pumped into the track tension adjustment system under high pressure.
- If the specified procedure for maintenance is not followed when making adjustment, grease drain plug (1) may fly out and cause serious injury or property damage.
- When loosening grease drain plug (1) to loosen the track 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

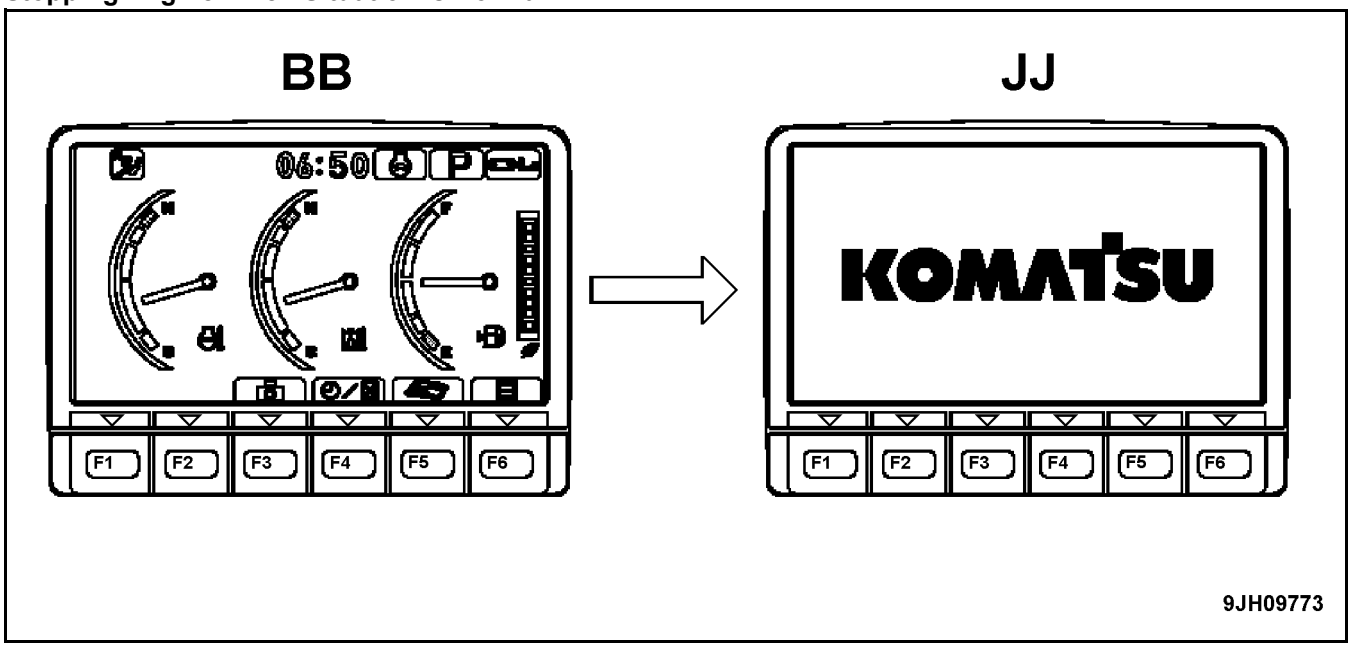
Never attempt to disassemble the recoils spring assembly. It contains a spring under high pressure which serves as a shock absorber for the idler. If it is disassembled by mistake, the spring will fly out and cause serious injury. When it becomes necessary to disassemble it, ask your Komatsu distributor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



Remark

When the engine is started, the battery voltage may suddenly drop depending on the temperature and the battery condition. If this happens, the display on the machine monitor may momentarily go out, but this does not indicate any abnormality.

Stopping Engine When Situation Is Normal

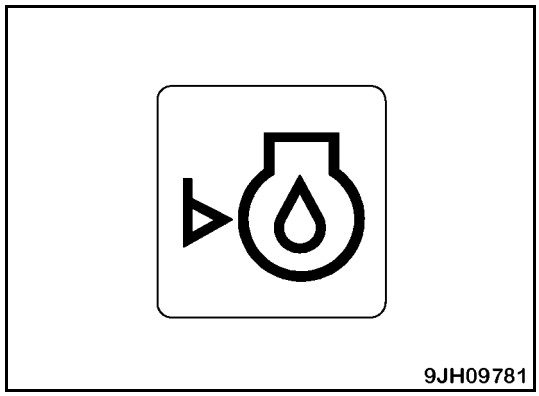


- When the starting switch is turned to the OFF position, ending screen JJ is displayed for 5 seconds, then the display goes out.

Engine Oil Level Monitor

Monitor (2) warns the operator that the oil level in the engine oil pan has dropped.

If oil level in the engine oil pan is low, the lamp lights up red, so check the oil level, and add oil.

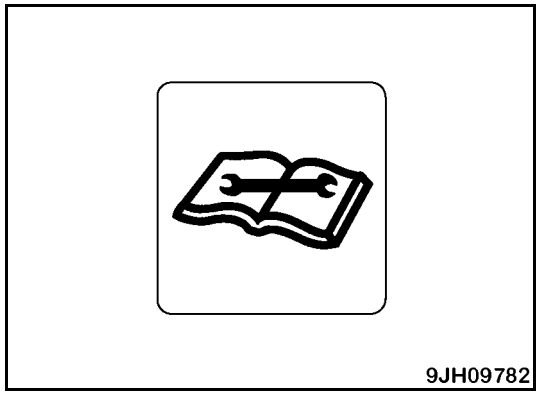


Maintenance Interval Monitor

This monitor (3) lights up when the maintenance time gets close and remains lighted after the maintenance time has already passed.

- Lighted yellow: The maintenance time is due within 30 hours.
- Lighted red: The maintenance time has already passed.

This monitor lights up when the starting switch is turned to the ON position. It goes off after 30 seconds and the display changes to the normal screen.

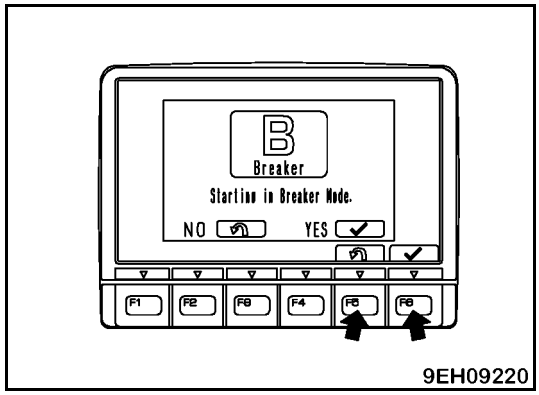


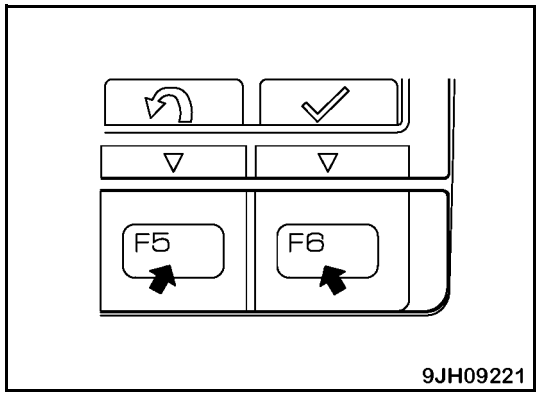
Remark

For details of the method of confirming the maintenance interval, See “Maintenance Selector Switch” on page 2-42.

If it is desired to change settings for the maintenance interval, have your Komatsu distributor change the settings.

- For machines ready for attachment, the attachment mode is added to the display.
  For details of the method for handling machines ready for attachment, See “OPTIONS, ATTACHMENTS” on page 5-1.
- When the monitor starts up, if the working mode setting is B mode, the confirmation message on the right is displayed and the buzzer sounds.
- When starting up and staying in B mode, always press function switch F6 (Yes).
- If you press F5 (No), the system starts up in E mode.



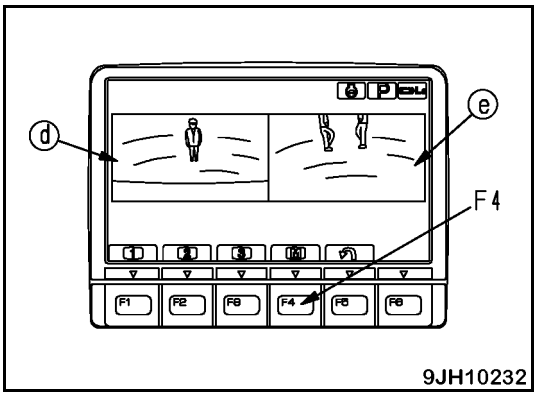


- If you want to have automatic setting of the P, E, L, B or ATT mode when starting (optional default setting), please ask your Komatsu distributor to change the setting.

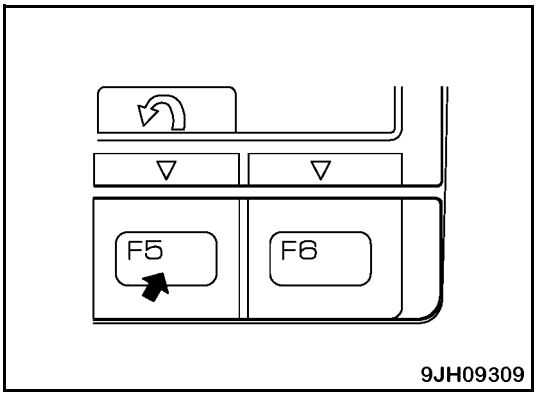
Operation Of Image Display Screen When Two Camera Screens Are Shown Simultaneously.

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

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

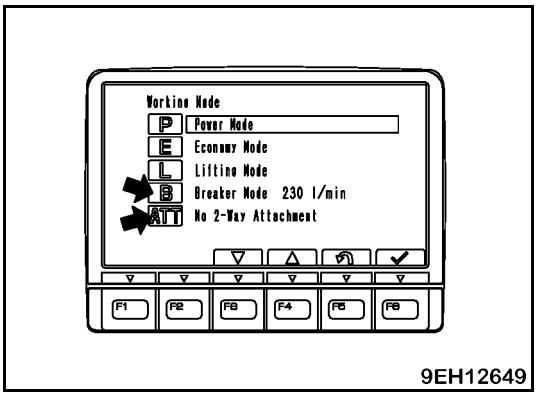


- Press switch F5 to return to the standard screen.



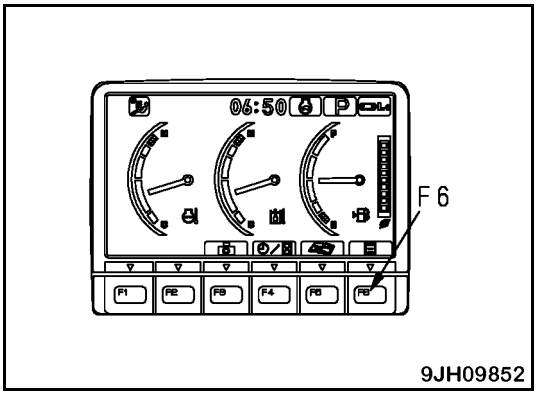
Breaker/attachment Setting

- On machines ready for attachment, it is possible on the breaker/attachment setting menu to adjust the oil flow in B mode and ATT mode to match the attachment.
  For machines that have no attachment, the breaker/attachment setting mode is not displayed.

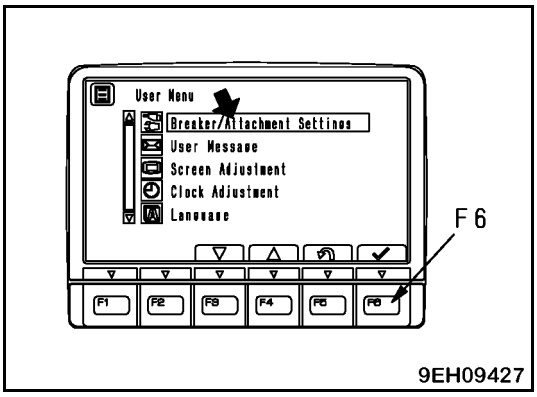


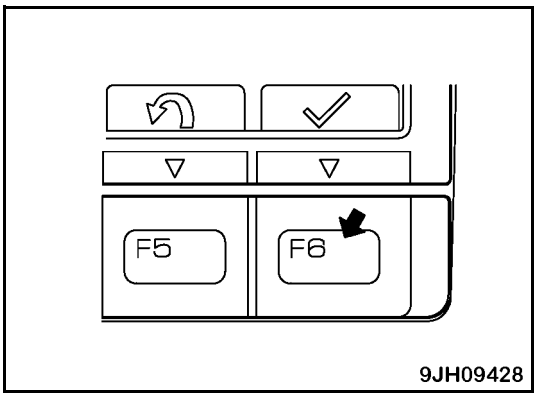
Changing Breaker Mode Setting

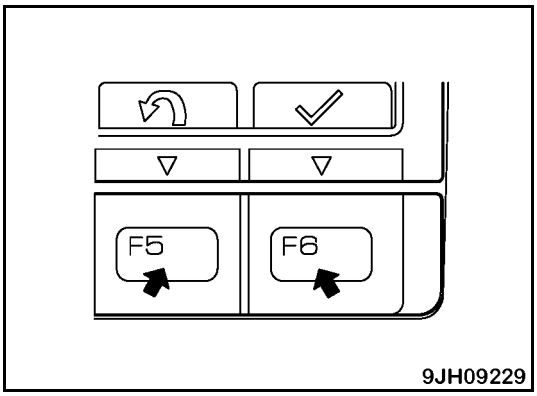
1. On the standard screen, press switch F6.



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

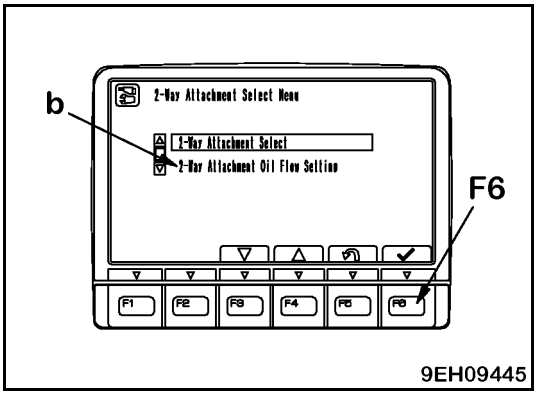


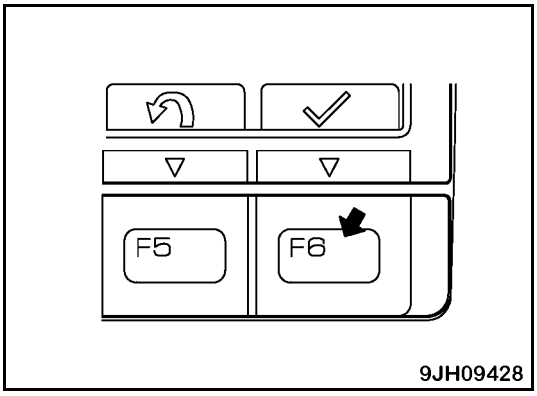




Changing Attachment Flow Setting

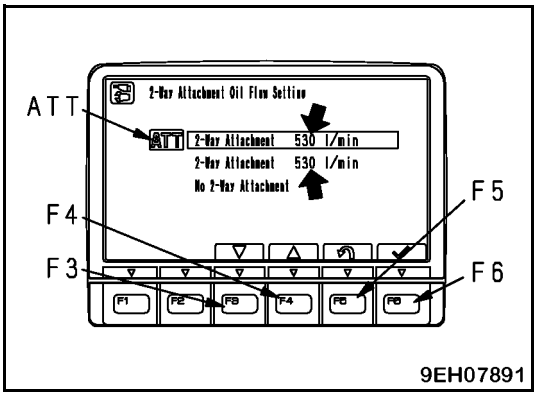
1. Select 2-Way Attachment Oil Flow Setting (b) on the 2-Way Attachment Select menu screen, then press switch F6.





2. On the 2-Way Attachment Select Oil Flow Setting screen, select one of the two set values for the oil flow, then press switch F6.

   - The default values for the oil flow setting are both set to 530 liters/min, as shown in the illustration on the right.
     The present oil flow set for ATT mode is marked with ATT in front of the item.
   - "No 2-Way Attachment" cannot be selected

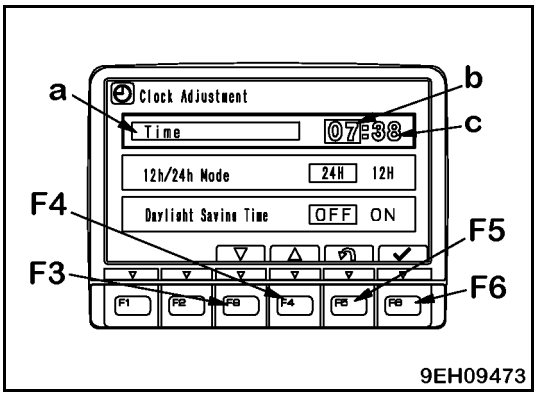


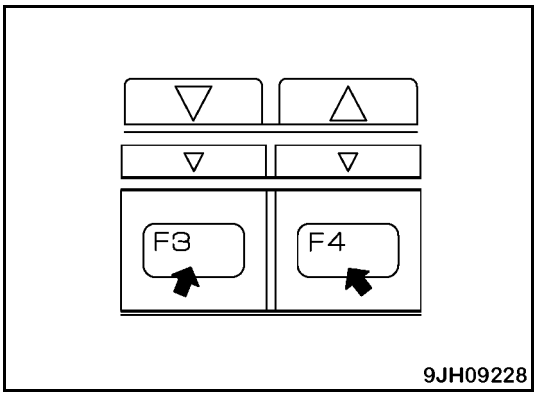
3. On the clock adjustment selection screen, it is possible to carry out the following operations with switches F3 to F6.

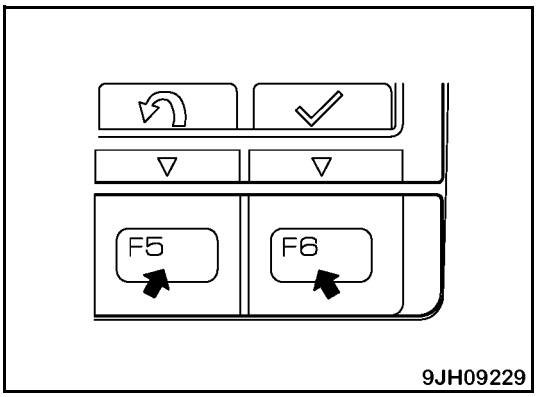
   • Time
   Adjust the hour setting.

   a. If “Time” (a) is not highlighted in yellow, press switch F6 to highlight “Time” (a) in yellow. When this is done, hour display (b) changes to orange.
   Adjust hour display (b) with the switches as follows. If it is not necessary to change the hour setting, press switch F6.

   F3: Time advances 1 hour.
   F4: Time goes back 1 hour.
   F5: Cancels change and returns to user menu.
   F6: Accepts change and goes to setting for minutes.







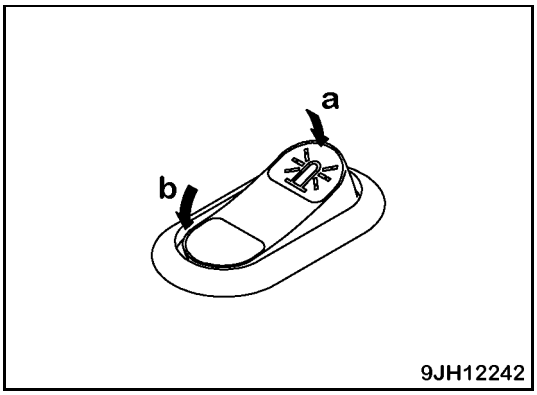
REVOLVING WARNING LAMP SWITCH

(If equipped)

Use this switch (8) to light up the yellow rotating lamp on top of the cab.

(a) ON: Lamps light up

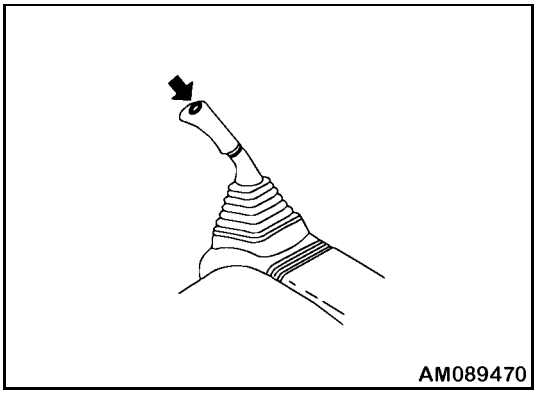
(b) OFF: Lamps go off



HORN SWITCH

Use this switch (9) to sound the horn.

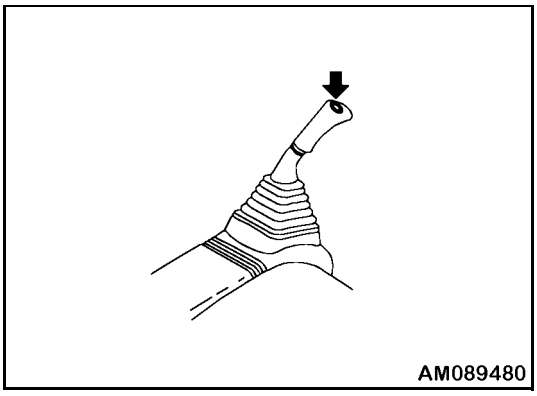
Press the switch on the right work control lever to sound the horn.



ONE-TOUCH POWER MAX. SWITCH

This switch (10) on the left work equipment control lever is used to actuate the power max functions.

Press once (single click) and keep the switch pressed. The one-touch power max. function is actuated for a maximum of 8.5 seconds at P and E mode.



CIGARETTE LIGHTER

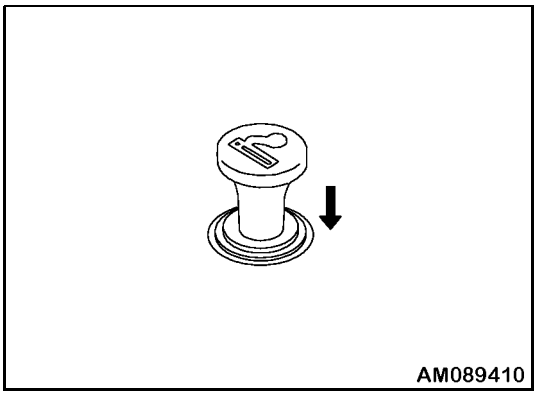
This switch (11) is used when lighting cigarettes.

When the cigarette lighter is pushed in, it will return to its original position after several seconds, so pull it out to use it.

If the cigarette lighter is removed, the socket can be used as an 85W (24V x 3.5A) power source.

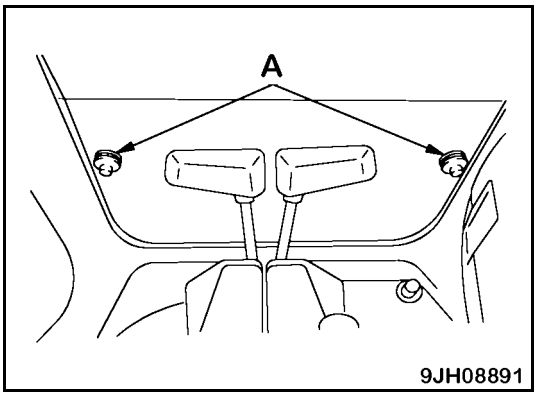
Remark

This cigarette lighter is for 24V. Do not use it as the power source for 12V equipment.

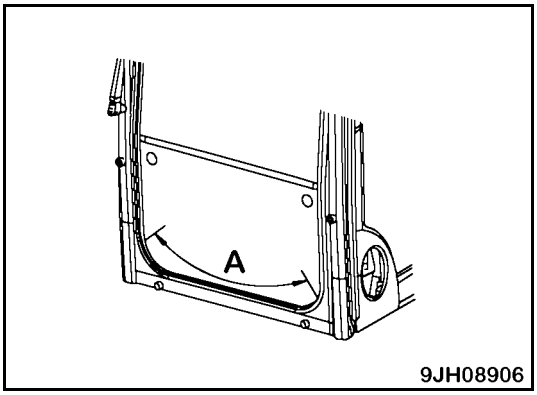


Removing Lower Windshield

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

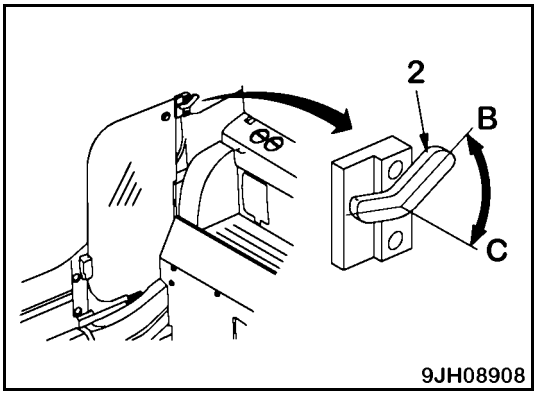


- If sand or dust is collected at the bottom of the front window, it will be difficult to remove the window. In addition, when stowing, the sand and dust stuck to the glass will be carried inside the cab. To prevent this, clean area (A) before removing.



2. After removing the lower windshield, store it at the right rear of the operator's cab, and set lever (2) to lock position (B) to hold it securely in position.

3. When removing it, set lever (2) to release position (C), hold the glass with both hands, and pull it up.



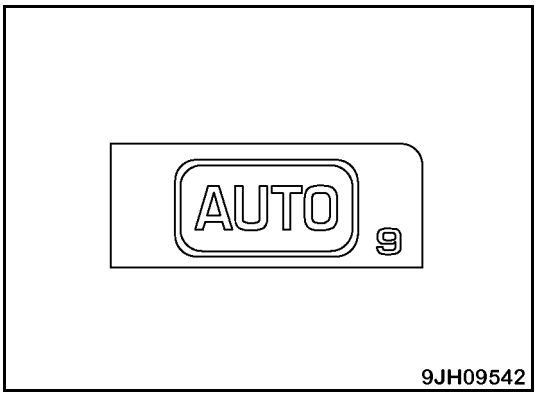
Method Of Operation

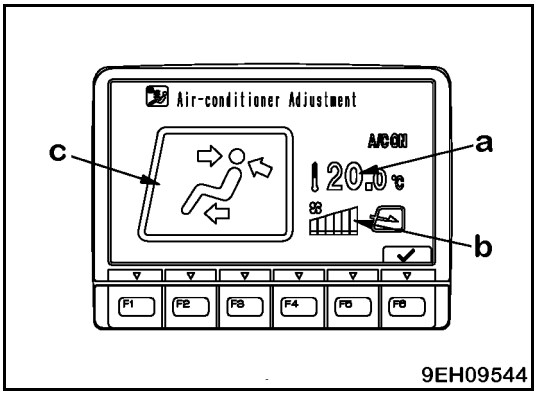
The air conditioner can be operated automatically or manually. Select the method of operation as desired.

Automatic Operation

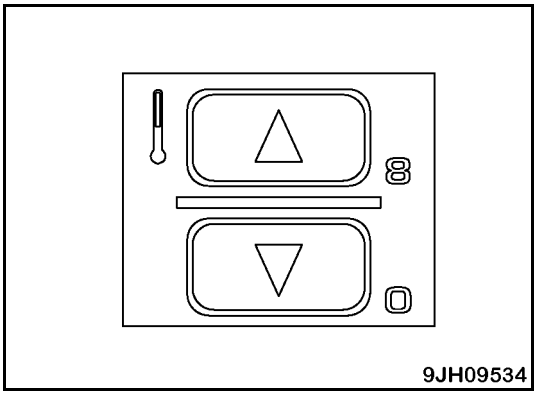
1. Turn auto switch (5) ON.

    - The monitors for the set temperature (a) and air flow (b) are also displayed.



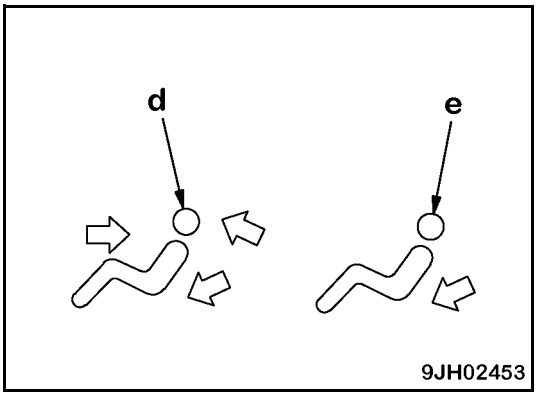


2. Use temperature set switch (3) to set to the desired temperature. The air flow, combination of vents, and selection of fresh or recirculated air is automatically selected according to the set temperature, and the air conditioner is operated automatically to provide the set temperature.



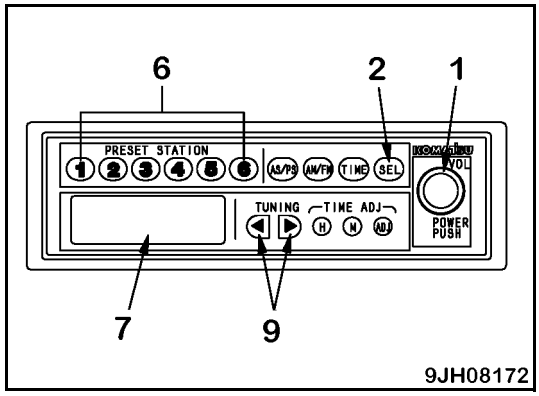
Remark

When vent display monitor (c) displays (d) or (e), and engine coolant temperature is low, the air flow is automatically limited to prevent cold air from blowing out.



Controls Of Radio

Method of Setting with Preset Button



1. Press power switch (1) and display the frequency on display (7).

2. Use tuning button (9) to set to the desired frequency. There are two methods for tuning: auto tuning and manual tuning.

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

Remark

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

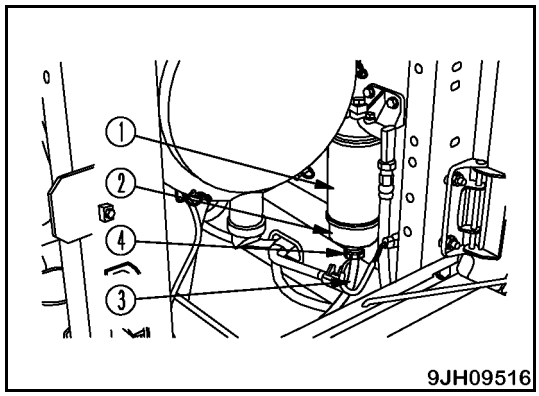
Method of Tuning

1. Press power switch (1) and display the frequency on display (7).

2. Use tuning button (9) to set to the desired frequency. There are two methods for tuning: auto tuning and manual tuning.

- Manual tuning
  Press tuning button (9) until the frequency is displayed on display (7).
  < button: Frequency moves down
  > button: Frequency moves up
  When the frequency reaches the top or bottom frequency, it automatically continues as follows: Top ➡ Bottom, or Bottom ➡ Top.
- Auto tuning
  Press tuning button (9) for at least 3 seconds. When a station is picked up, the tuning automatically stops. To search for the next station, press the tuning button again for at least 3 seconds.
  < button: Frequency moves down
  > button: Frequency moves up
  If this button is pressed during auto tuning, the auto tuning will be cancelled and the setting will return to the frequency in use before the button was pressed.

Check for Water and Sediment in Water Separator, Drain Water

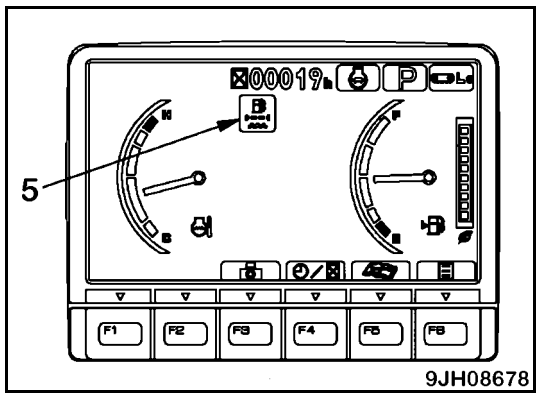


1. Open the cover on the right side of the machine.
   - The water separator forms one unit with fuel pre-filter (1).
2. It is possible to judge the water level and amount of sediment by looking through transparent cap (2). If there is any water or sediment collected at the bottom, set a container to catch the drain water under drain hose (3).
3. Loosen drain valve (4) and drain the water.
4. When fuel starts to drain from drain hose (3), tighten drain valve (4) immediately.

On this machine, a sensor is installed to detect if water is accumulated in transparent cap (2).

When the water separator monitor (5) lights up red on the machine monitor, it indicates that water is accumulated in transparent cap (2).

In this case also, use the procedure above to drain the water.



Remark

When only the water separator monitor lights up, it lights up in the position shown in the diagram on the right.

If other monitors also light up the same time, the water separator monitor lights up at a different position.

Remark

If the water accumulated in transparent cap (2) freezes, the water separator monitor may not light up. After the engine is started, as the temperature around fuel pre-filter (1) increases, the frozen water will melt and the water separator monitor may suddenly light up. In cold areas, even if the water separator monitor does not light up, drain the water frequently.

If the water inside transparent cap (2) freezes, check that the frozen water has melted completely, then use the procedure above to drain the water.

Remark

If transparent cap (2) is dirty or it is difficult to see the inside, clean transparent cap (2) when replacing fuel pre-filter cartridge (1).

When the drain valve (4) has been removed during the cleaning operation, coat the O-ring with grease and tighten until it contacts the bottom.

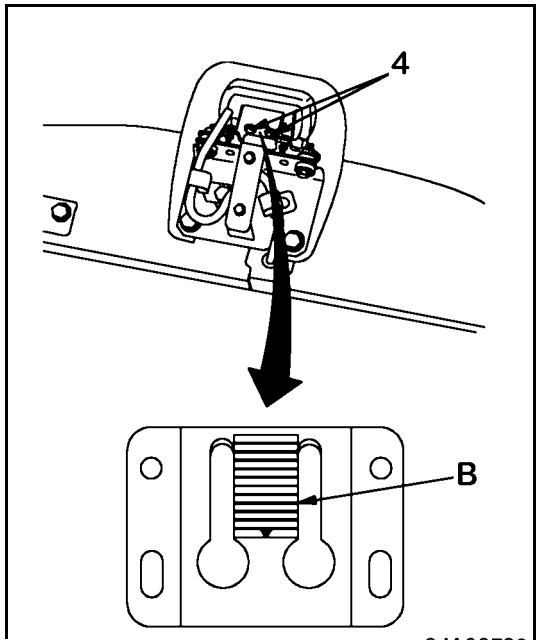
4. Loosen mounting bolt (4) of the camera and adjust mounting angle (A) of the camera so that the center line of mounting bolt (4) is aligned with fourth-from-bottom scale (B).

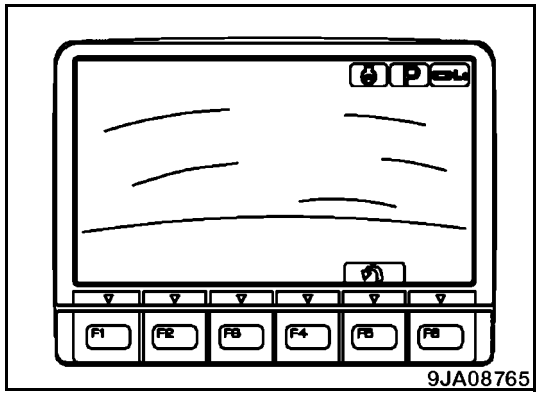
Remark

Part of the machine is shown on the monitor screen.

5. After adjusting, tighten bolt (4).

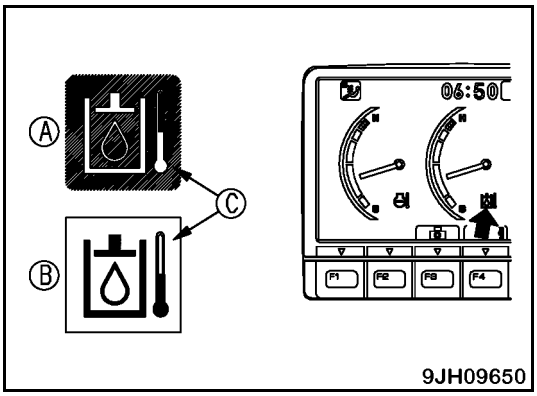
Torque: . . . . . 3-5 N•m (2.2-3.6 lb ft)





6. Install covers (1) and (2).

After Starting Engine



WARNING

- **To stop the engine in emergencies or when the actuation of the engine is abnormal or there is any other trouble, turn the key in the starting switch to the OFF position.**
- **Do not carry out operations or operate the levers or pedal suddenly while the hydraulic oil is at low temperature.**
- **Always carry out the warm-up operation for the hydraulic system until the hydraulic oil temperature monitor indicates that the hydraulic oil has reached the operating temperature range.**
- **Hydraulic oil temperature indicator**
  (A) Display when temperature is within operating range: Monitor background (C) is blue
- **(B) Display when temperature is low: Monitor background (C) is white**
- **Hydraulically activated equipment may be affected if the warm-up process is not carried out completely. The effect may result in delayed control functions causing sluggish and/or jerky operation of the boom, arm, bucket, swing, and travel operations. Do not attempt normal machine operations until the hydraulic temperature indicator shows a blue background (described above as item (A)).**

There are two types of warm-up operations for the machine: 1) engine and 2) hydraulic system.

The warm-up process may differ depending on the environment that the machine is in (ex. method and time required). Always carry out both warm-up operations according to the steps given in the appropriate sections of this manual.

Separate processes must be carried out to ensure that both the engine and hydraulic system are warmed-up and ready for operation.

Breaking-in the New Machine

Remark

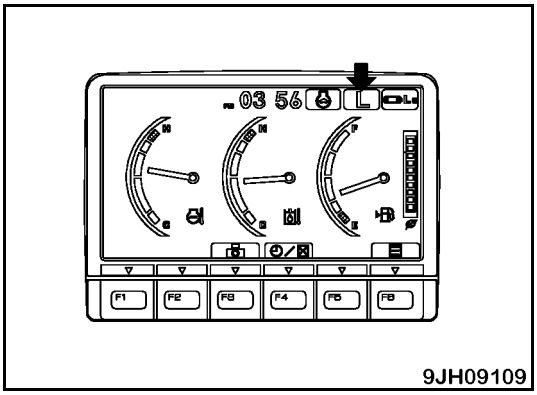
Your Komatsu machine has been thoroughly adjusted and tested before shipment from the factory. However, operating the machine under full load before breaking the machine in can adversely affect the performance and shorten the machine life.

Be sure to break in the machine for the initial 100 hours (as indicated on the service meter).

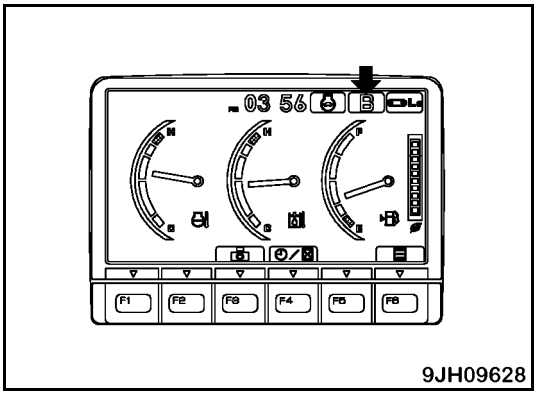
Make sure that you fully understand the content of this manual, and pay careful attention to the following points when breaking in the machine.

- Run the engine at idle for 15 seconds after starting it. During this time, do not operate the control levers or fuel control dial.
- Idle the engine for 5 minutes after starting it up.
- Avoid operation with heavy loads or at high speeds.
- Immediately after starting the engine, avoid sudden starts, sudden acceleration, unnecessary sudden stops, and sudden changes in direction.

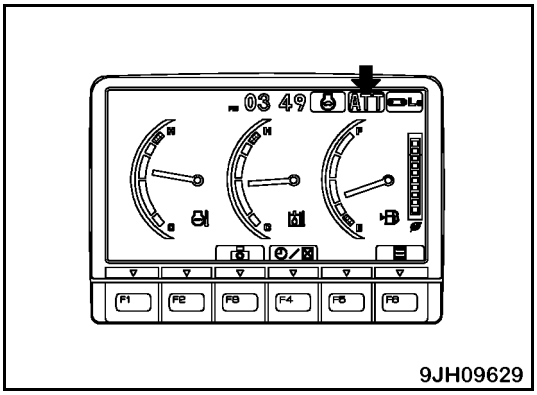
C. L mode
For operations requiring fine control



D. B mode
For breaker operations



E. ATT mode
For operations with crusher or other double-acting action attachment



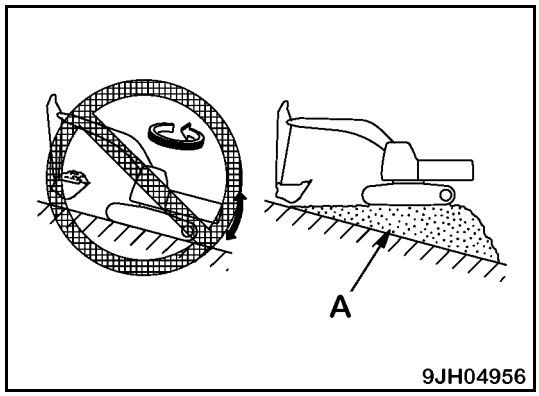
If the work equipment control levers are returned to the neutral position when the machine is stopped, even if the fuel control dial is set to FULL, the auto-deceleration mechanism will act to reduce the engine speed to a mid-range speed.

Remark

The control circuit on this machine is equipped with an accumulator. Even if the engine is stopped, if the starting switch key is turned to the ON position within 15 seconds after stopping the engine, and the lock lever is set to the FREE position, it is possible to use the lever operation to lower the work equipment to the ground.

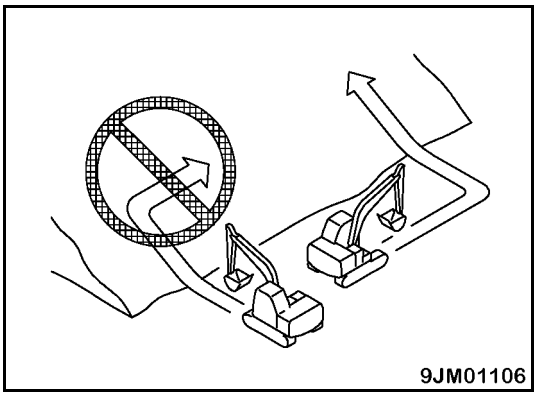
This procedure can also be used for releasing the remaining pressure in the hydraulic cylinder circuits or for lowering the boom after loading the machine onto a trailer.

Traveling On Slopes

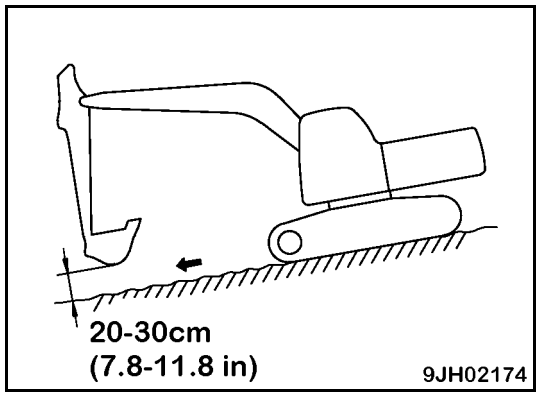


⚠ WARNING

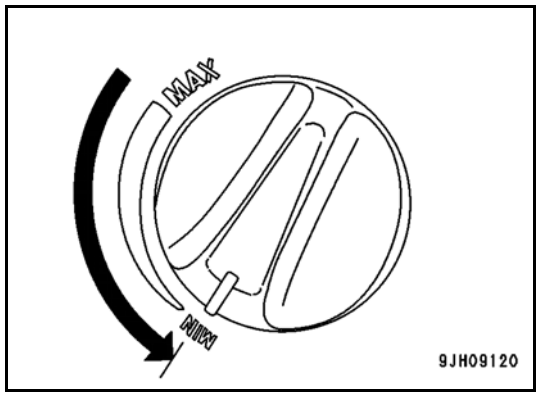
- **Turning or operating the work equipment when working on slopes may cause the machine to lose it balance and turn over, so avoid such operations.**
  It is particularly dangerous to swing downhill when the bucket is loaded.
  If such operations have to be performed, pile soil to make a platform (A) on the slope so the machine is kept horizontal during operation.
- **Do not travel up or down steep slopes. There is a danger that the machine may turn over.**
- **When traveling, raise the bucket approximately 20 to 30 cm (8 to 12 in) from the ground.**
- **Do not travel downhill in reverse.**
- **Never turn on slopes or travel across slopes.**
- **Always go down to a flat place to perform these operations. It may be longer, but it will ensure safety.**
- **Always operate or travel in such a way that it is possible to stop safely at any time if the machine slips or becomes unstable.**
- **When traveling uphill, if the shoes slip or it is impossible to travel uphill using only the force of the tracks, do not use the pulling force of the arm to help the machine travel uphill. There is danger that the machine may turn over.**



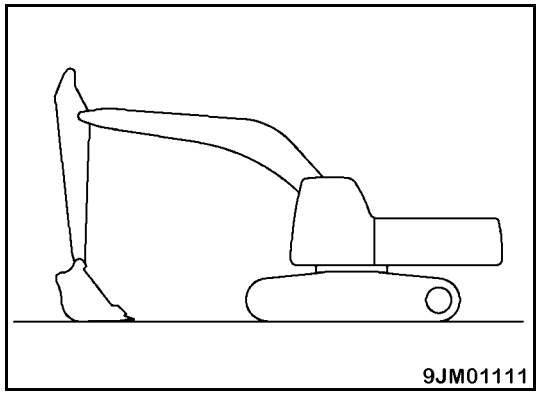
1. When traveling down steep hills, use the travel lever and fuel control dial to keep the travel speed low. When traveling down a steep hill of more than 15°, set the work equipment to the posture shown in the diagram on the right, and lower the engine speed.



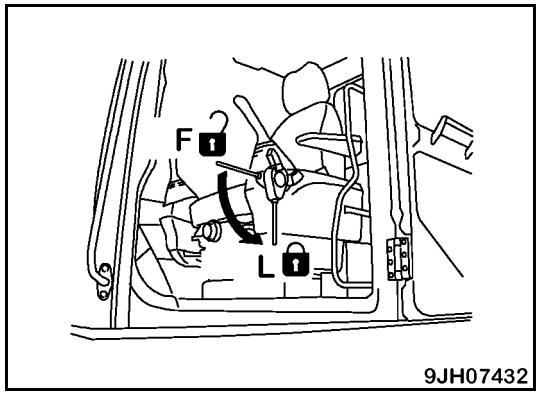
2. Turn fuel control dial (2) to low idling position (MIN) and lower the engine speed.



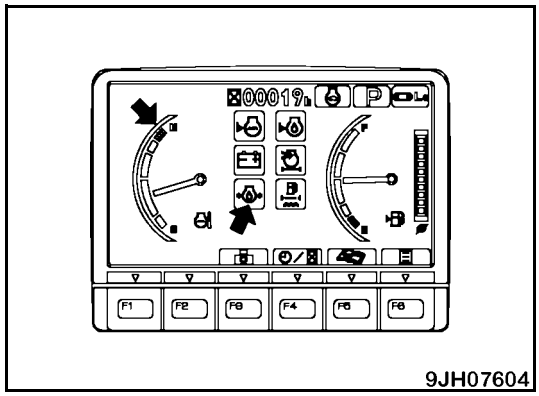
3. Lower the bucket horizontally until the bottom touches the ground.



4. Set lock lever (3) in the LOCK position (L).



5. Check the engine cooling water temperature and engine oil pressure with the machine monitor.
   - If the coolant temperature gauge is in the red range, allow it to cool until the indicator enters the green range, then stop the engine. For details of the inspection and action to take, See "TROUBLES AND ACTIONS" on page 2-200.
   - If the engine oil pressure monitor lights up, stop the engine immediately. For details of the inspection and action to take, See "TROUBLES AND ACTIONS" on page 2-200.
6. Stop the engine. For details on the procedure for stopping the engine, See "Stopping The Engine" on page 2-148.

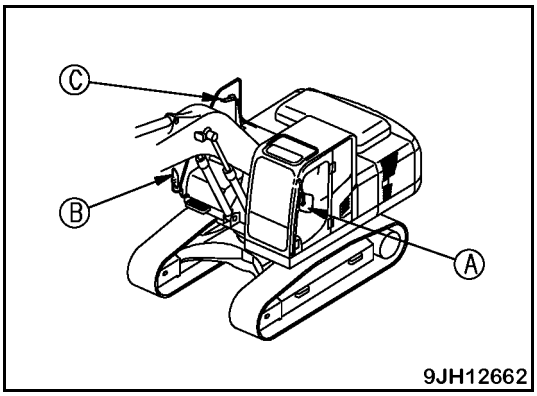


Rear view Mirrors

The mirrors are at the positions shown in the diagram on the right.

If they are damaged, or are to be removed for shipment, or are to be installed again, use the following procedure.

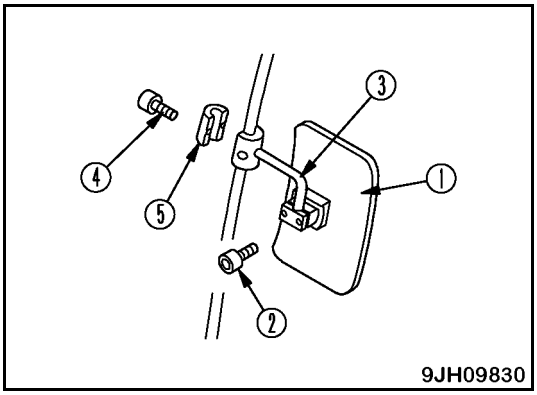
- After installing the mirrors, be sure to adjust them, See “Rear View Mirrors” on page 2-128.



Removal

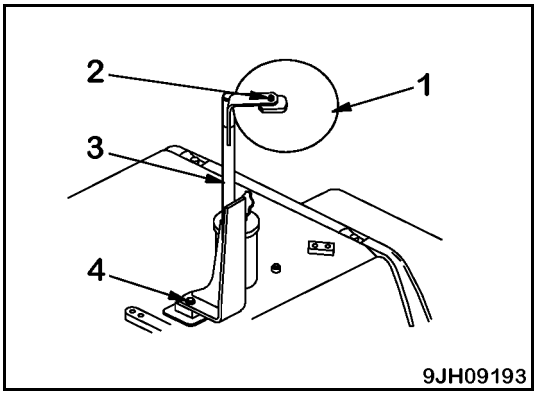
- Mirrors (A), (B)

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



- Mirror (C)

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



AFTER DAILY WORK COMPLETION

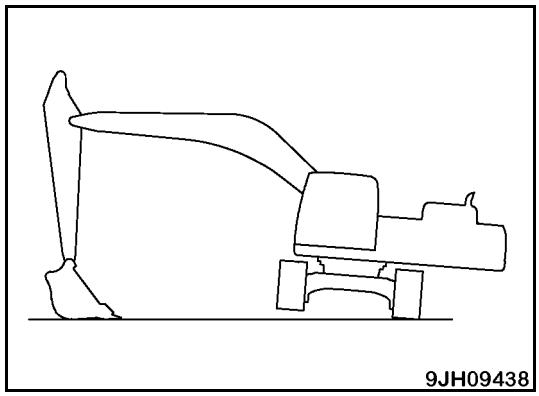
⚠ WARNING

Performing idle-running of the tracks is dangerous, stay well away from the tracks.

To prevent mud, water, or the undercarriage from freezing and making it impossible for the machine to move on the following morning, observe the following precautions.

- Remove all the mud and water from the machine body. In particular, wipe the hydraulic cylinder rods clean to prevent damage to the seal caused by mud, dirt, or drops of water on the rod from getting inside the seal.
- Park the machine on hard, dry ground.
- If this is impossible, park the machine on boards.
- The boards prevent the tracks from freezing to the ground, and allow the machine to be moved the next morning.
- Open the drain valve and drain any water collected in the fuel system to prevent it from freezing.
- Fill the fuel tank to capacity. This minimizes moisture condensation in the tank when the temperature drops.
- After operation in water or mud, remove water from undercarriage as described below to extend undercarriage service life.

1. Swing 90° with engine at low idle and bring the work equipment to the side of the track.
2. Jack up the machine until the track is raised slightly from the ground. Rotate the track under no load. Repeat this procedure on both the left and right sides.



AFTER COLD WEATHER SEASON

When the season changes and the weather becomes warmer, do as follows.

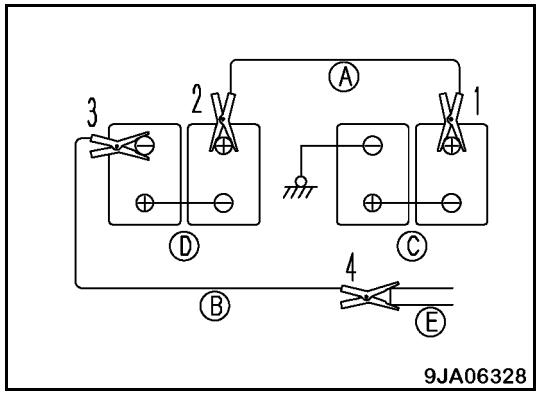
- Replace the fuel and oil for all parts with oil of the viscosity specified.
  For details, See “RECOMMENDED FUEL, COOLANT, AND LUBRICANT” on page 3-9.

Booster Cable Connection

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

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

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



Starting the Engine

⚠ WARNING

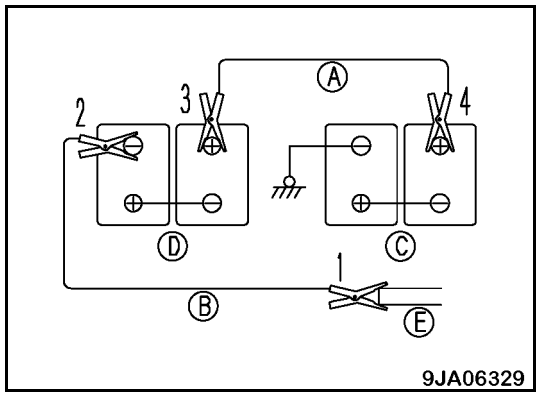
Always check that the lock lever is set to the LOCK position, regardless of whether the machine is working normally or has failed. Check also that all the control levers are in the neutral position.

1. Make sure the clips are firmly connected to the battery terminals.
2. Start engine of the normal machine and run it at high idle speed.
3. Turn the starting switch of the problem machine to the START position and start the engine.
   If the engine doesn't start at first, try again after 2 minutes or so.

Booster Cable Disconnection

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

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



Fuel

- To prevent the moisture in the air from condensing and forming water inside the fuel tank, always fill the fuel tank after completing the day's work.
- The fuel pump is a precision instrument, and if fuel containing water or dirt is used, it cannot work properly.
- Be extremely careful not to let impurities get in when storing or adding fuel.
- Always use the fuel specified for the temperature in the Operation and Maintenance Manual.
  - If the fuel is used at temperatures lower than the specified temperature (particularly at temperatures below -15°C (5°F), the fuel will solidify.
  - If the fuel is used at temperatures higher than the specified temperature, the viscosity will drop, and this may result in problems such as a drop in output.
- Before starting the engine, or when 10 minutes have passed after adding fuel, drain the sediment and water from the fuel tank.
- If the engine runs out of fuel, or if the filters have been replaced, it is necessary to bleed the air from the circuit.
- If there is any foreign material in the fuel tank, wash the tank and fuel system.

Remark

Always use diesel oil for the fuel.

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

Coolant And Water For Dilution

- The coolant has the important function of preventing corrosion as well as preventing freezing.
  Even in the areas where freezing is not an issue, the use of antifreeze coolant is essential.
  Komatsu machines are supplied with Komatsu Supercoolant (AF-NAC). Komatsu Supercoolant (AF-NAC) has excellent anticorrosion, antifreeze and cooling properties and can be used continuously for 2 years or 4000 hours.
  Komatsu Supercoolant (AF-NAC) is strongly recommended wherever available.
  When using Komatsu Supercoolant (AF-NAC), there is no need to use a corrosion resistor. For details, "Clean Inside Of Cooling System" on page 3-24.
- When diluting the antifreeze coolant, use distilled water or tap water (soft water).
  Natural water, such as a river water or well water (hard water), contains large amounts of minerals (calcium, magnesium, etc.), and this makes it easier for scale to form inside the engine or radiator. Once scale is deposited inside the engine or radiator, it is extremely difficult to remove. It also causes overheating due to poor heat exchange, so when you dilute the coolant, we recommend that you use water with an overall hardness of less than 100 PPM.
- When using antifreeze, always observe the precautions given.
- Antifreeze coolant is flammable, so be sure to keep it away from flame.
- The ratio of Supercoolant (AF-NAC) to water differs according to the ambient temperature.
  For details of the ratio when mixing, "Clean Inside Of Cooling System" on page 3-24.
  Supercoolant (AF-NAC) may be supplied in premix. In this case, never add diluting water.
- If the engine overheats, wait for the engine to cool before adding coolant.
- If the coolant level is low, it will cause overheating, and will also cause problems with corrosion due to air entering the coolant.

To maintain the anticorrosion properties of Supercoolant (AF-NAC), always keep the density of Supercoolant between 30% and 68%.

When deciding the ratio of antifreeze to water, check the lowest temperature in the past, and decide from the mixing table given below.

It is actually better to estimate the temperature about 10°C (18°F) lower when deciding the mixing ratio.

The mixing ratio depends on the ambient temperature, but it should always be a minimum of 30% by volume (antifreeze/total amount of coolant x 100).

Even in areas where it is not necessary to prevent freezing, use Supercoolant (AF-NAC) at a mixing ratio of at least 30% to prevent corrosion of the cooling system.

The freezing temperature of undiluted antifreeze is -15°C (5°F). Do not store undiluted antifreeze at a temperature of below -15°C (5°F).

Mixing rate of water and antifreeze

Min. atmospheric temperature	°C	Above -10	-15	-20	-25	-30	-35	-40
	°F	Above 14	5	-4	-13	-22	-31	-40
Amount of antifreeze	liter	9.6	11.5	13.1	14.7	16.0	17.3	18.6
	US gal	2.54	3.04	3.46	3.88	4.23	4.57	4.91
Amount of water	liter	22.4	20.5	18.9	17.3	16.0	14.7	13.4
	US gal	5.92	5.42	4.99	4.57	4.23	3.88	3.54
Volume ratio (%)		30	36	41	46	50	54	58

⚠ WARNING

- **Antifreeze is flammable, so keep it away from flame.**
  Antifreeze is toxic. When opening valve, be careful not to get water containing antifreeze on you. If it gets in your eyes, flush your eyes with large amount of fresh water and see a doctor at once.
- **When changing the coolant or draining the coolant from the radiator before carrying out repairs, ask a specialist company to handle any coolant containing antifreeze, or contact your Komatsu distributor. Antifreeze is toxic, so never pour it into drainage water ditches or drain it onto the ground surface.**

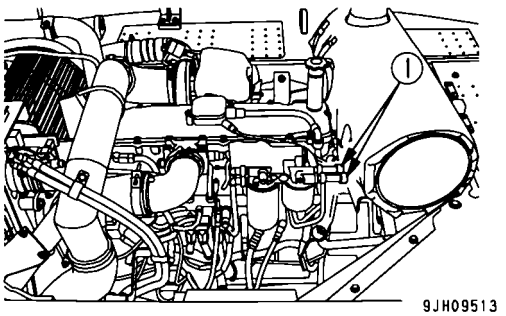
Use antifreeze and appropriate water for diluting. (for details, “Coolant And Water For Dilution” on page 3-5)

We recommend use of an antifreeze density gauge to control the mixing proportions.

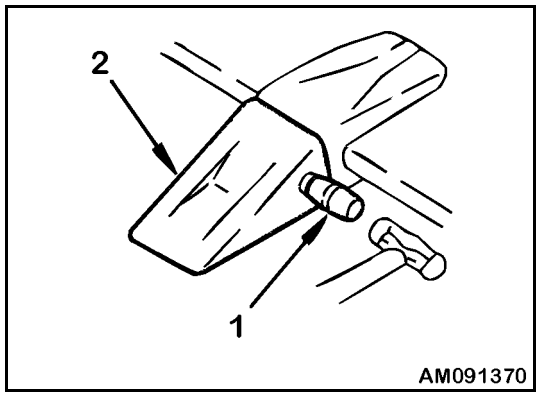
Prepare a container whose capacity is larger than the specified coolant volume to catch drained coolant.

Prepare a hose to supply antifreeze coolant and water.

1. Stop the machine on level ground, then stop the engine.
2. Turn valve (1) of the corrosion resistor fully to the right to close it. (Only machines equipped with corrosion resistor)



4. 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.



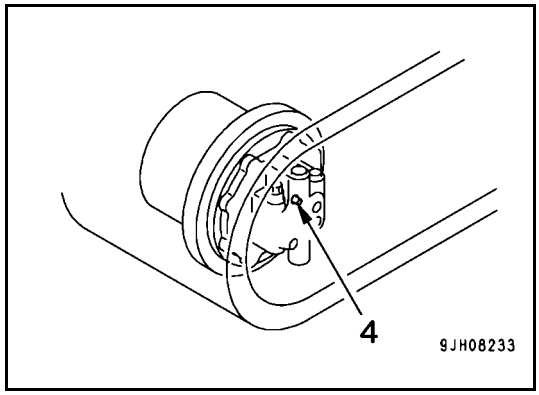
Remark

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

When replacing the travel motor safety valve, please contact your Komatsu distributor to have it replaced and to have the air bled.

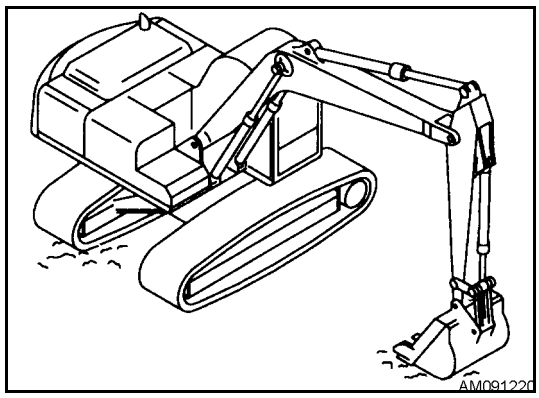
5. Bleeding air from travel motor
   (Bleed the air only when the oil inside the travel motor case has been drained.)

   A. Run the engine at low idling, loosen air bleeder (4), and tighten it when oil flows out.



   B. Run the engine at low idle and swing the work equipment 90° to bring it to the side of the track.

   C. Jack up the machine until the track is raised slightly from the ground. Rotate the track under no load for 2 minutes.
   Repeat this procedure on both the left and right sides.



6. Bleeding air from attachment (when installed)
   If a breaker or other attachment has been installed, run the engine at low idle and operate the attachment pedal repeatedly (approximately 10 times) until the air has been bled from the attachment circuit.

Remark

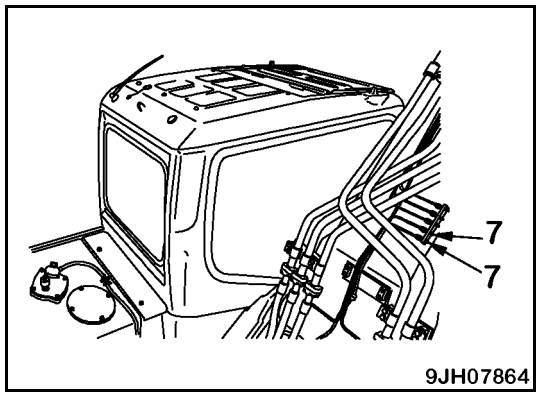
If the method of bleeding the air from the attachment itself is specified by the manufacturer, bleed the air according to the specified procedure.

After completing the air bleeding operation, stop the engine, and leave the machine for 5 minutes before starting operations. This will remove the air bubbles in the oil inside the hydraulic cylinders.

Check that there is no leakage of oil and wipe off any oil that has been spilled.

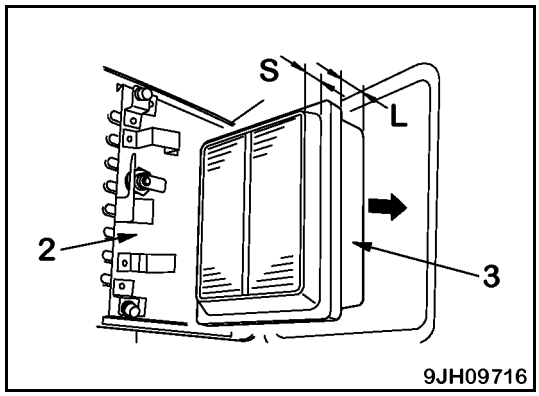
After completing the air bleeding operation, inspect the oil level, and if the oil level is low, add oil.

(7) Boom foot pin (2 places)



Remark

The FRESH filter must be installed facing in the correct direction. When installing, insert the long (L) end of filter (3) into the filter case first. If the short (S) end is installed first, cover (2) will not close.

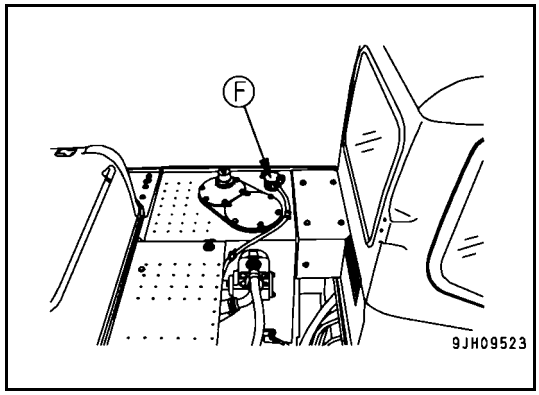


Replace Breather Element In Hydraulic Tank

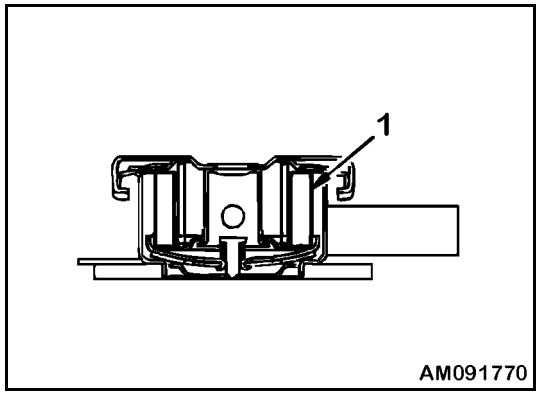
⚠ WARNING

- **The parts and oil are at high temperature immediately after the engine is stopped, and may cause burns. Wait for the temperature to go down before starting the work.**
- **When removing the oil filler cap, turn it slowly to release the internal pressure, then remove it.**

1. Remove the cap of oil filler (F) at the top of the hydraulic tank.



2. Replace element (1) inside the cap.



Checking Charge Pressure Of Nitrogen Gas In Accumulator (For Control Circuit)

⚠ WARNING

The accumulator is charged with high-pressure nitrogen gas, so mistaken operation may cause an explosion, which will lead to serious injury or damage. When handling the accumulator, always do as follows.

- **The pressure in the hydraulic circuit cannot be completely removed. When removing the hydraulic equipment, do not stand in the direction that the oil spurts out when carrying out the operation. In addition, loosen the bolts slowly when carrying out the operation.**
- **Do not disassemble the accumulator.**
- **Do not bring it near flame or dispose of it in fire.**
- **Do not make holes in it or weld it.**
- **Do not hit it, roll it, or subject it to any impact.**
- **When disposing of the accumulator, the gas must be released. Please contact your Komatsu distributor to have this work carried out.**

Remark

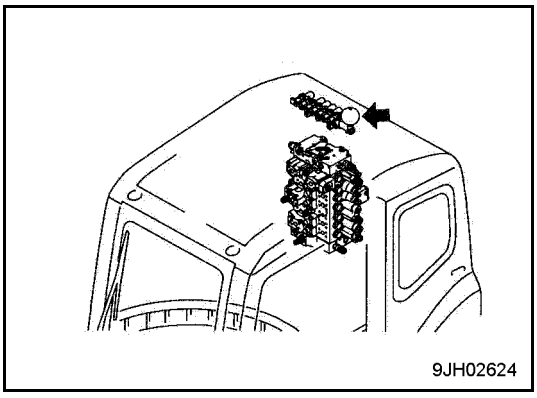
If the nitrogen gas charge pressure in the accumulator is low and operations are continued, it will become impossible to release the remaining pressure inside the hydraulic circuit if a failure occurs on the machine.

FUNCTION OF ACCUMULATOR

The accumulator stores the pressure in the control circuit. Even after the engine is stopped, the control circuit can be operated, so the following actions are possible.

- If the control lever is operated in the direction to lower the work equipment, it is possible for the work equipment to go down under its own weight.
- The pressure in the hydraulic circuit can be released.

The accumulator is installed to the position shown in the diagram on the right.



Every 8000 Hours Maintenance

Maintenance for every 50, 250, 500, 1000, 2000, 4000 and 5000 hours service should be carried out at the same time.

Replace High-pressure Piping Clamp

Contact your Komatsu distributor to have the engine high-pressure clamps replaced.

Replace Fuel Spray Prevention Cap

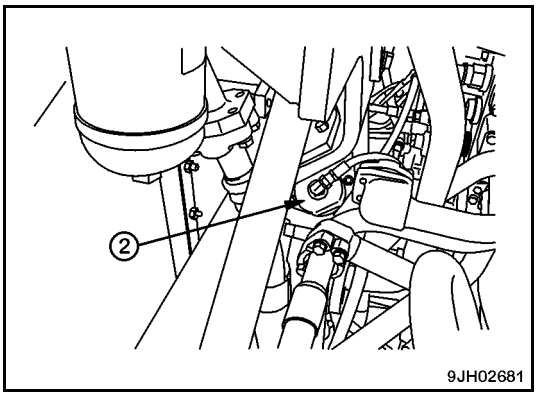
Contact your Komatsu distributor to have the fuel spray prevention cap replaced.

Selector Valve

This valve (2) switches the flow of hydraulic oil.
It is automatically switched according to the selected working mode. It is necessary to switch the working mode to match the attachment that is installed. For details of switching the working mode, See “HYDRAULIC CIRCUIT” on page 5-9.

Remark

If a service circuit from the attachment maker has been added, the return circuit may not switch automatically.



Attachment Control Pedal

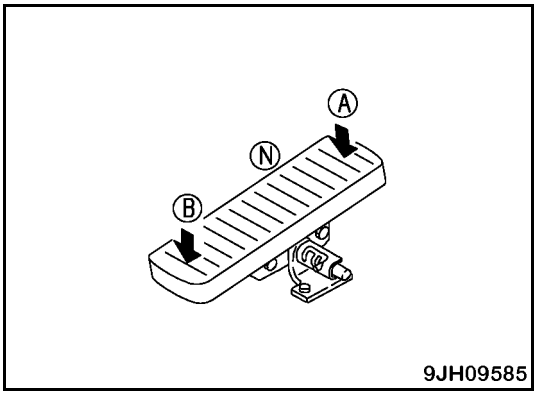
⚠ WARNING

Do not carry out operations with your foot on the pedal. If the pedal is depressed by mistake, the attachment may suddenly move and cause a serious accident. Lock the pedal with the lock pin when you are not operating the attachment.

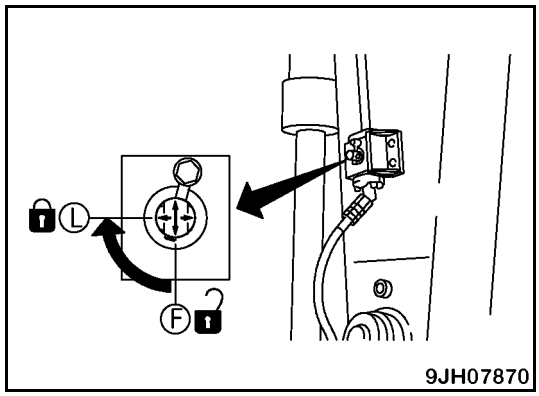
This pedal (3) is used to control the attachment.
When the front, center (neutral), and rear of the pedal are depressed, the movement of the attachment is as follows.

Hydraulic breaker

Front of pedal (A):	Actuated
Center of pedal (N):	Stopped
Rear of pedal (B):	Stopped

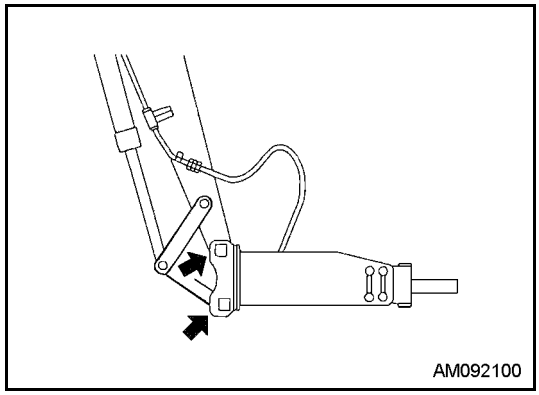


6. After checking that the oil has cooled down, turn the rotor on the stop valve installed to the piping for the inlet port and outlet port on the side face of the arm to the LOCK position (L).



7. Remove the hoses on the attachment side. Install the plugs to the two outlets.
   The plugs are used to prevent the attachment from incorrect operation caused by mixing in of foreign matter. After the plugs are correctly installed, store the attachment.

8. Pull out the mounting pins (2 places), remove the attachment, then install the bucket.
   For details of the procedure for installing the bucket, see “See “BUCKET REPLACEMENT AND INVERSION” on page 2-172.



9. After installing the bucket, check the oil level in the hydraulic tank.