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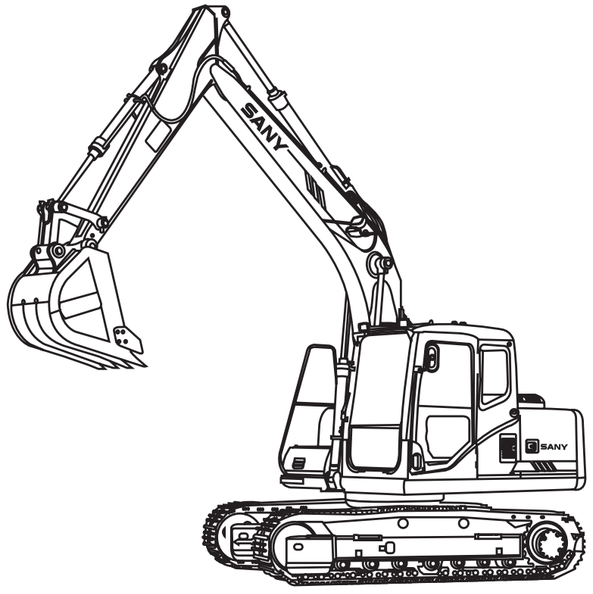

Safety, Operation and Maintenance Manual

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1.2 Your Documentation Package

The documentation for this machine includes the following items:

- Safety, Operation & Maintenance Manual (SOMM) — This manual is in the operator cab seat pocket.
- Parts Book — This publication consists of parts lists and matching drawings for ordering spare parts as-needed. If it was not already shipped with your machine, the parts book for your machine is available directly from Sany.
- CD — Along with this machine you will receive a CD that contains video instructions on safety, operation and maintenance of this machine.

1.2.1 CD system requirements

In order to use the Sany CD, be sure of the following:

Hardware:

- Intel® Pentium II® running at 500 MHz or above
- At least 128 MB RAM
- CD-ROM drive
- Minimum screen resolution of 800 x 600 pixels, high-color depth

Software:

- Windows 2000, XP, Vista or Windows 7 operating systems
- Internet Explorer 6.0 or later version (pop-up blocker disabled)
- Acrobat Reader 7.0 or later version

1.2.2 Recommendations on using the documentation

- This documentation applies only to this machine and should not be used with any other machines.
- Ensure that the documentation is always complete and up to date:
- Keep all pages inside its binder (if shipped loose leaf).
- Insert Sany replacement pages immediately into the appropriate book; destroy old versions of those pages.
- Replace outdated CDs with new ones; destroy the old ones to prevent any confusion in the future.

1.3.5 Table for serial number and distributor information

This location is for you to record information relating to your machine. It is advised that you keep this manual with your machine at all times for reference.	
Machine Serial No.	
Engine Serial No.	
Distributor Name: Address:	
Phone Numbers:	

Before starting operation and maintenance, operator and maintainer shall observe the following items:

- Read and understand the whole manual.
- Read and understand the safety notices contained in this manual and the safety messages on the machine.
- Do not apply or operate your machine under any circumstances in a manner that is prohibited in this manual.
- If the amount of fuel added, content of particulates ,or latitude is beyond the specification of this type of machine, damage could occur and the warranty of your machine would become invalid.

The manual should be kept in the cab all the time for operator to refer to at any time.

Please contact your Sany dealer to obtain a new manual if the original one is missing or cannot be read.

This manual should be regarded as a permanent component of your machine. If the machine is sold to a third party, please give this manual to the new owner.

The machine provided by Sany to its buyer is in line with all specifications and standards of buyer's country. If the machine is purchased from another country or someone of a third country, it might be lacking of some safety devices or technical requirements necessary for using the machine in your country. In case you question whether the machine is in accordance with the standards and specifications of your country, please contact your Sany dealer before operating the machine.

(10) Falling hazard

- Falling hazard.
- Do not step here.

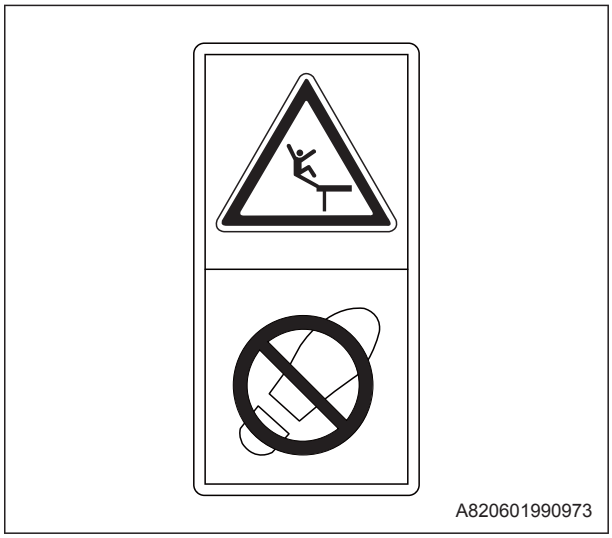

Fig. 2-16

(11) No seating

Fig. 2-14

(12) High pressure fluid

- Read the instruction before removing the cover or cap of any vessel. To prevent squirting, relieve internal pressure first and open the cover or cap slowly.

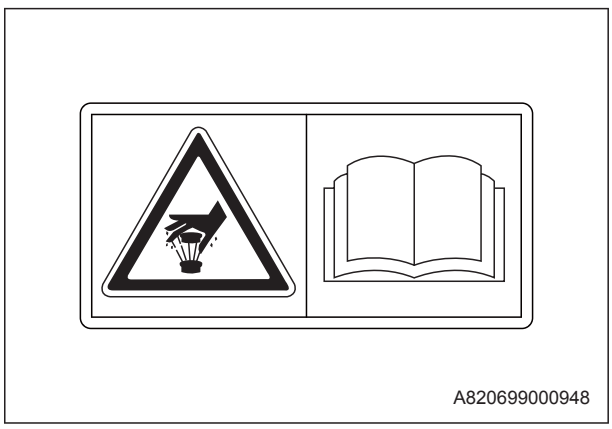

Fig. 2-15

2.3.8 Lock the hydraulic controls before leaving the cab

- Before you rise from the operator seat (e.g. to open or close the front window or to adjust the seat), lower the work equipment to the ground, move the hydraulic lockout control lever [1] from F (free) to L (locked) position, and then stop the engine. If the hydraulic control is not locked, accidental touching of control levers can cause sudden machine movement and serious injury or machine damage.

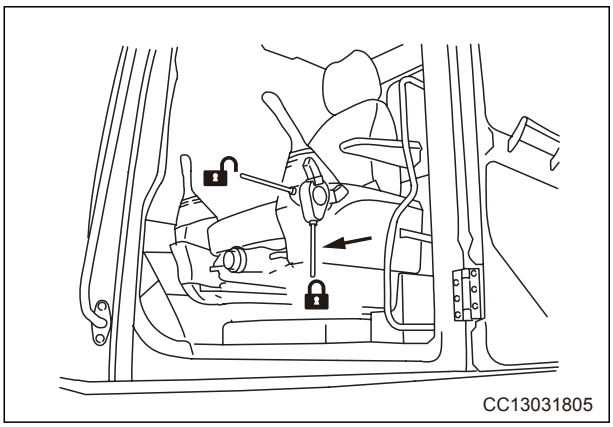

Fig. 2-28

- Before leaving your machine, always lower the work equipment to the ground, place the hydraulic lockout control lever [1] to the L (locked) position, and then shut down the engine. Lock all lockable components and remove the key.

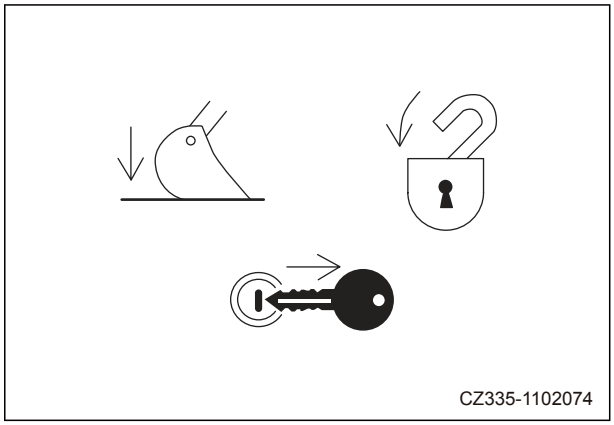

Fig. 2-29

2.3.23 Worksite investigation

- Machine operation near flammable materials (e.g. dry tree leaves) poses a fire hazard. Be careful during operation.
- Check the terrain and ground condition and use the safest operating method. Do not operate in areas with the risk of landslide or falling stones.
- Solidify the ground when operating beside a ditch or on road shoulders. Keep machine a safe distance away from the ditch or road shoulder. Assign a signal man, when necessary, to avoid accidental injury.
- When underground water mains, gas lines, cables or high-voltage electric wires are available on the work site, inform related utilities providers and mark the area. Be careful not to cut or damage any lines.
- Prevent any unauthorized personnel from entering the work site. Assign a signal man and fence the work site when operating on a highway.
- Be especially alert when operating on frozen ground. Increase of ambient temperature may result in soft and slippery ground.
- When traveling or operating in shallow water or soft ground, check the type and condition of rock bed as well as the depth and water flow prior to operation.

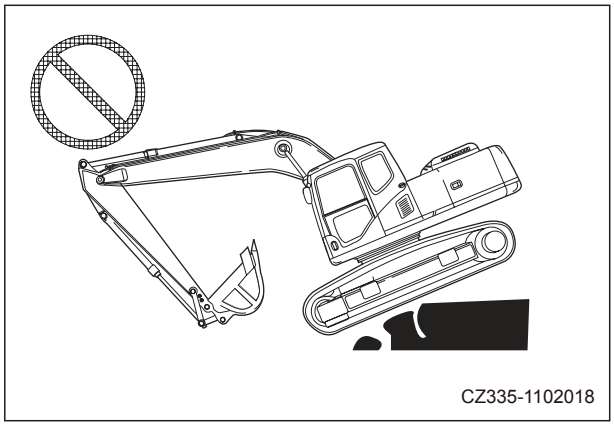

Fig. 2-38

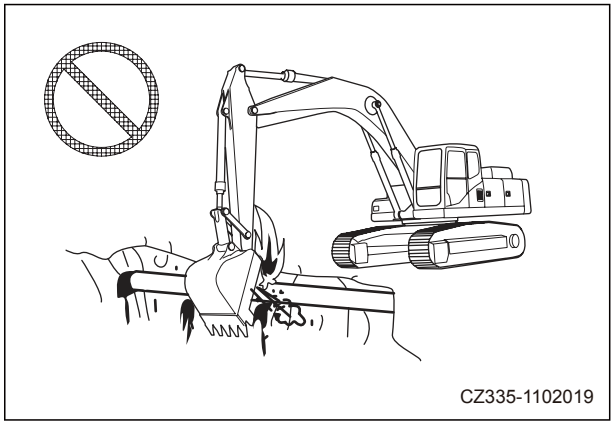

Fig. 2-39

- When disconnecting the jumper cable, take care not to allow the clips of jumper cable to contact with each other or with the machine.
- Ether is a liquid used for cold start, which is extremely flammable and explosive. Read the instructions on the ether container before application.
- Do not use ether if the engine is equipped with a spark-plug preheater or other forms of preheater.

2.4.1.9 After starting the engine

Run the engine at low idle for 3 to 5 minutes after engine startup, and check the running parameters and make sure they are normal and all readings are within normal working range.

2.4.2.9 Restricted operation

- Never dig under an overhang, which may lead to falling stones, collapse of overhang, and accidents.

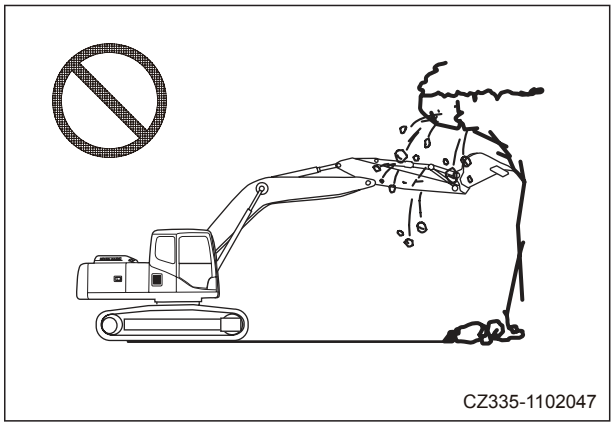

Fig. 2-64

- Never dig too much under the machine, which may cause the ground to collapse due to cave-in, hence the accidents.

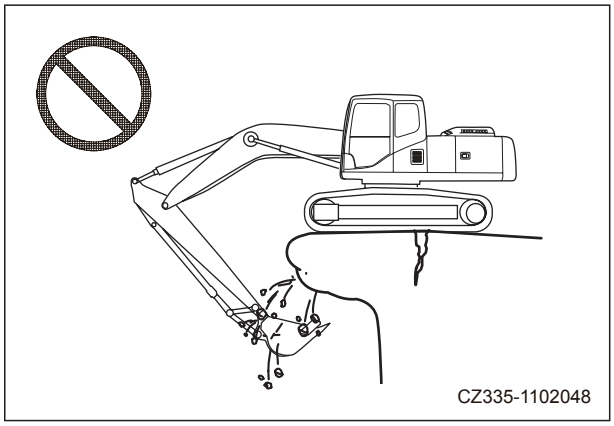

Fig. 2-65

- Never tear down under your machine, which may cause your machine to lose balance and roll over.
- When operating on building or other structures, strength of structure must be checked to avoid collapse of building, thus resulting injury or death.

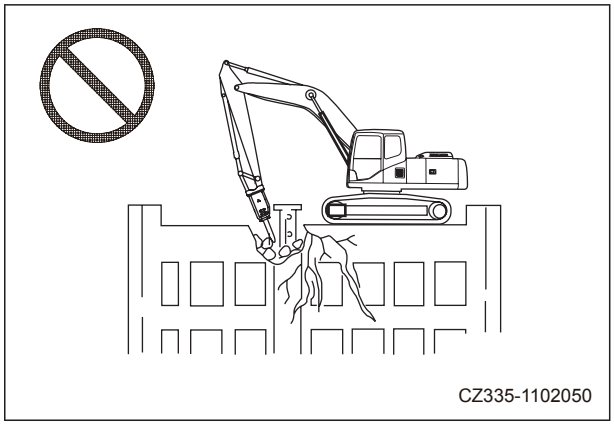

Fig. 2-66

2.5 Precautions for Maintenance

2.5.1 Pre-maintenance precautions

To prevent accidents:

- Understand maintenance procedure prior to operation.
- Keep a clean and dry working area.
- Do not spray water or steam in the cab.
- Never add lubricant and carry out other maintenance work when your machine is moving.
- Keep your hands, feet and clothing away from rotating parts.

2.5.2 Select a working area

- For maintenance work, select a clean and flat area with plenty of space, ample sunlight and good ventilation.
- Clean the working area by removing fuel, lubricant and water, and covering slippery ground with sand or other absorptive materials.
- Do not leave your hammer or other tools at the working area.
- If a clean and tidy working area cannot be guaranteed, there would be danger of tipping, thus resulting in personal injury.

2.5.15 Hot cooling system

⚠ WARNING

- **Touching hot high-pressure coolant may cause serious injury.**

When engine temperature rises, pressure of the cooling system increases. Before removing the radiator cover, stop the engine and let the system cool down. The radiator cover could only be removed after the coolant in it has cooled down.

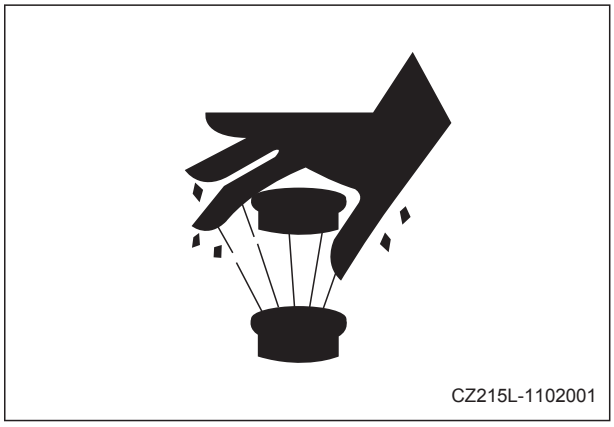

Fig. 2-96

2.5.16 Air-conditioning system maintenance

⚠ WARNING

- **Refrigerant R134 a is a harmless gas under room temperature. It will change into highly toxic gas when burning.**
- **Refrigerant getting into eyes may cause blindness. It may cause frostbite if splashed on your skin.**

- Keep fire source away when servicing air-conditioning system.
- In maintenance of air-conditioning system, observe the instruction on the refrigerant cylinder and use it correctly. The type of refrigerant is R134a. Use of other refrigerants may damage the air-conditioning system.
- Obey local material disposal regulations. Never discharge refrigerant directly into the air.

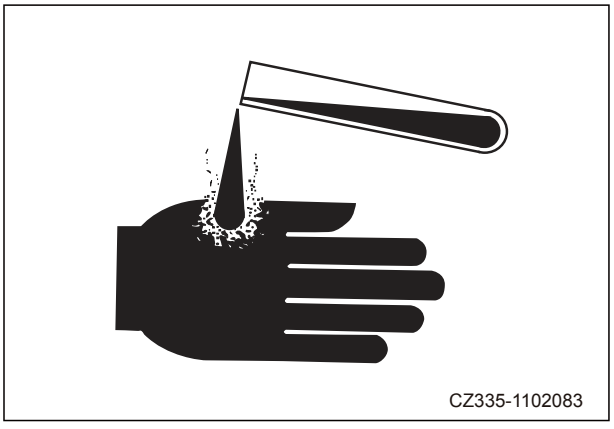

Fig. 2-97

3.2 Monitoring System

3.2.1 Monitor functions

The front side of the machine monitor is made up of three sections:

A. Warning and signal indicators

B. Display screen

C. Key pad

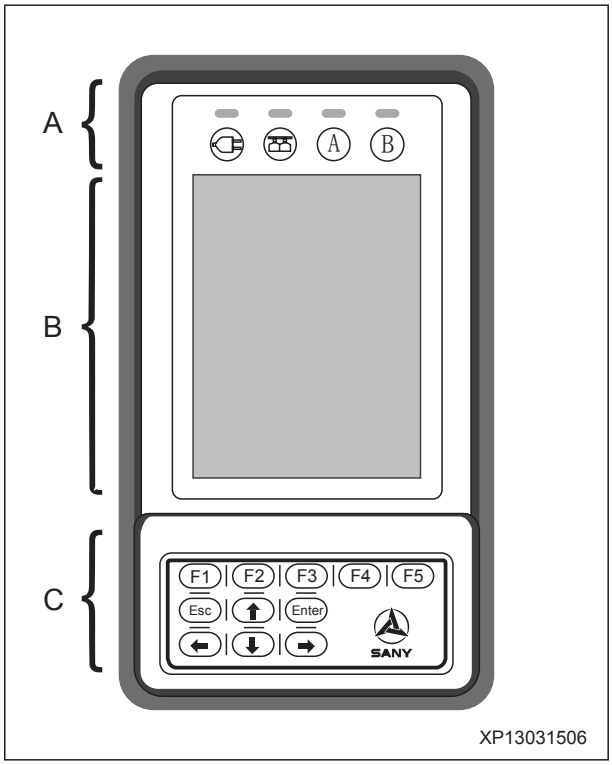

Fig. 3-2

Warning and signal indicators

- When a machine fault occurs, the warning indicator lights up, reminding the user to check and address the fault.

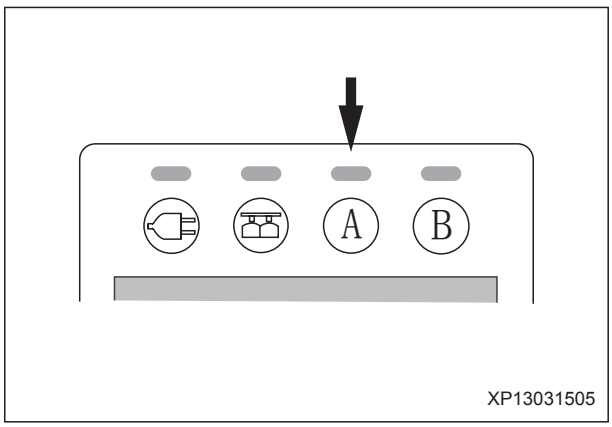

Fig. 3-3

10. System Time Setup

Select “System Time Setup” on the Information Menu page and press F2 or Enter, and the display moves to this page. You can set system time on this page.

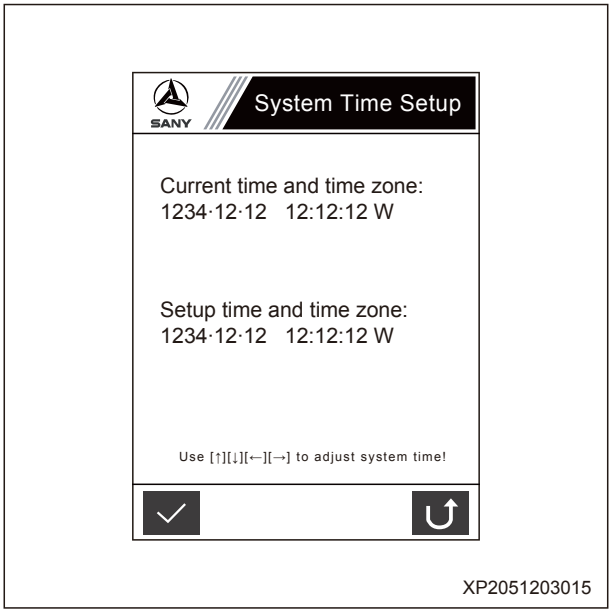

Fig. 3-15

Operation

- Use ↑ and ↓ to change the number where the cursor blinks.
- Use ← and → to move the cursor.
- Press F1 or Enter to save adjusted time.
- Press F5 or ESC to return to the “Information Menu”.

NOTE: When F1 or Enter is pressed, the screen displays “Setup Finished” on the bottom. If system time has been adjusted, it cannot be adjusted again until the system is re-energized.

11. GPS Monitoring

Select “GPS Monitoring” on the Information Menu and press F2 or Enter to view this page.

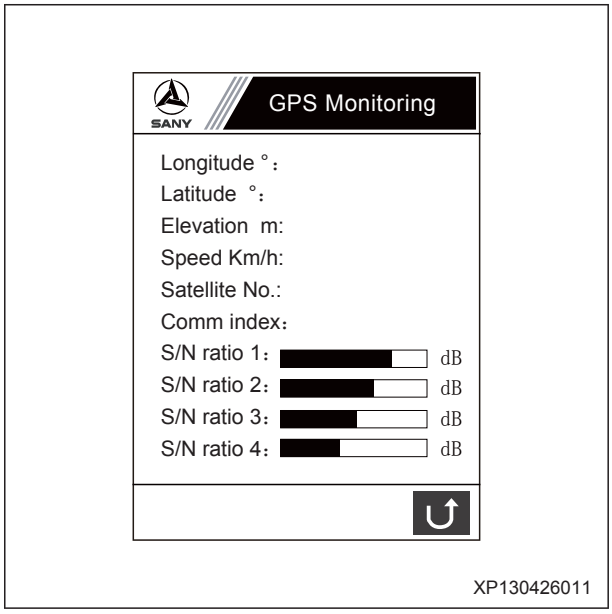

Fig. 3-16

Operation

- Press F5 or ESC to return to the “Information Menu”.

Remark:

- Longitude: “E” stands for “East”, while “W” for “West”.
- Latitude: “N” stands for “North”, while “S” for “South”.
- Altitude: “P” means “Above Sea Level”, while “N” means “Below Sea Level”.

3.3 Switches

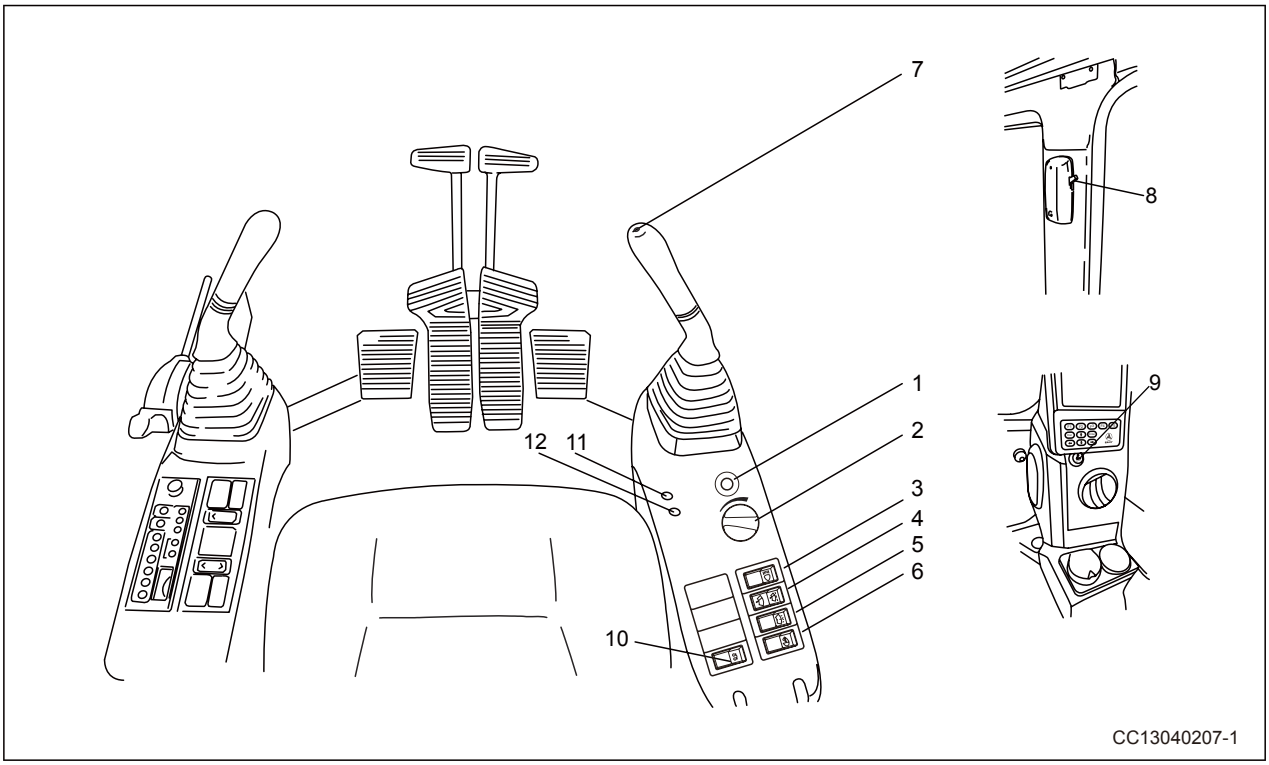

Fig. 3-29

1) Start switch
2) Fuel control dial
3) Work lamp switch
4) Wiper switch
5) Washer switch
6) Head lamp switch
7) Horn switch
8) Cab lamp switch
9) Cigarette lighter
10) Preheat switch*
11) Charging indicator (Red)
12) Preheat indicator (Yellow)

***NOTE:** Preheat switch is available on machines equipped with MITSUBISHI 6D34-TL and SANY D06S2 engines.

3.4.1 Hydraulic lockout control

⚠ WARNING

- **When leaving the operator cab, always place the hydraulic lockout control to the LOCKED position.**
- **If the hydraulic lockout control lever is not placed in the LOCKED position, inadvertent touching of any of the control levers may cause serious injury or even death.**
- **When moving the hydraulic lockout control lever, be careful not to touch the joysticks.**

The hydraulic lockout control is used to lock the work equipment controls, swing and travel systems and the attachment (if equipped).

- LOCKED position (🔒): Push the lever downward to apply the lock. With the lockout lever in the LOCKED position, the machine will not move when the joysticks are operated.
- FREE position (🔓): When the lockout lever is at FREE position, the machine will move as you operate the joysticks.

When all control levers are neutralized and the lockout lever is placed in the FREE position, any movement of any part of your machine is indicative of an error on the machine. In this case, place the lockout lever to the LOCKED position immediately, and stop the engine.

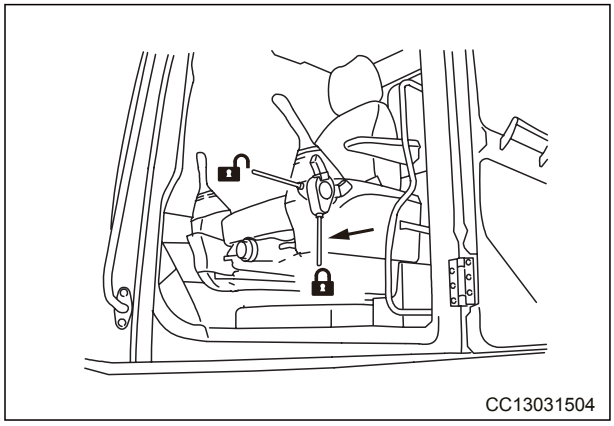

Fig. 3-46

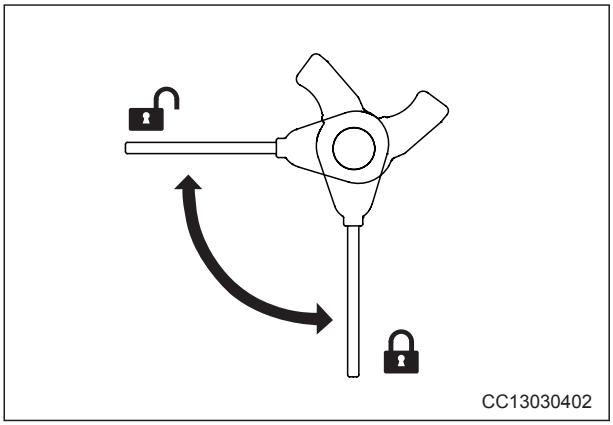

Fig. 3-47

6. Check the lever [B], which shall be secured in the LOCKED position.
   - Check the arrow on the catch [F], which shall be aligned with the arrow on lever [B]. The lock is engaged.
   - If the arrow on the catch [F] is not aligned with the arrow on lever [B], the lock is not engaged. Repeat step 5 to engage the lock.

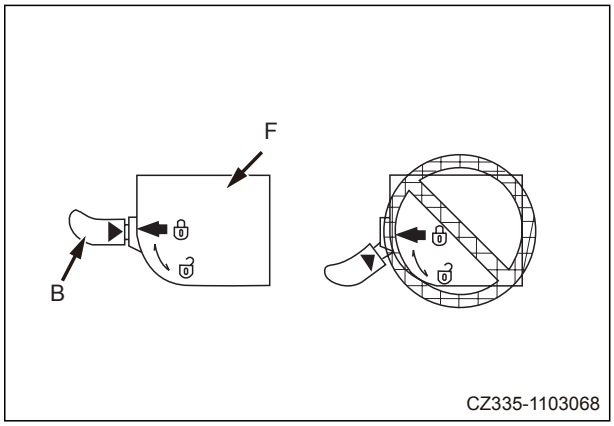

Fig. 3-68

Removing bottom front window

1. Raise the front window.
2. Hold the hand grips and pull to remove the bottom glass of the front window.

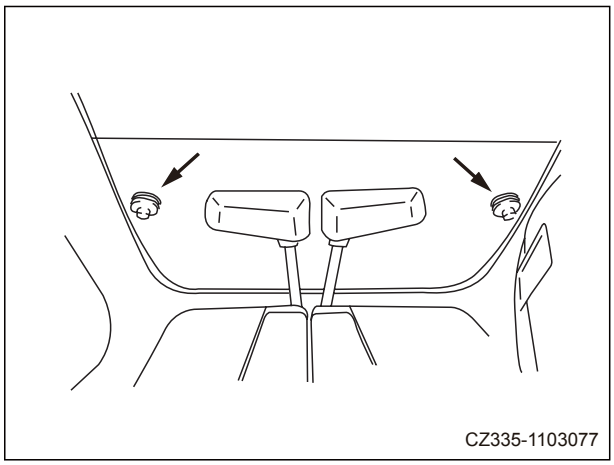

Fig. 3-69

- Removal of the bottom glass may be difficult if sand or dust if built up at the bottom. The sand or dust may be brought into the cab along with the glass when storing the glass. To avoid this, the area [A] shall be cleaned before removing the bottom glass.

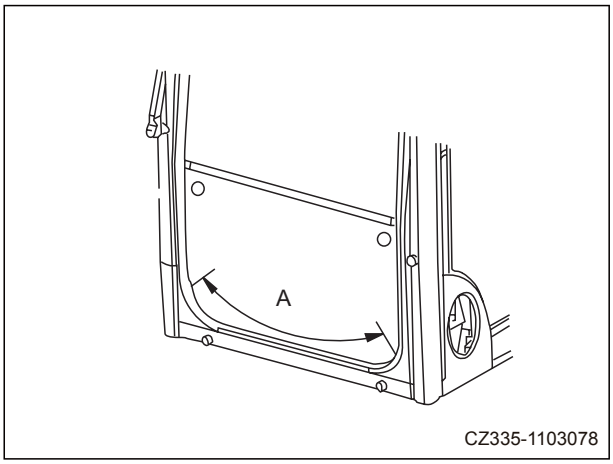

Fig. 3-70

7. LCD display

LCD display shows preset temperature [a], air flow [b] and air outlet mode [c] during operation.

- When the OFF switch is pressed, the LCD display goes off and the A/C operation stops.

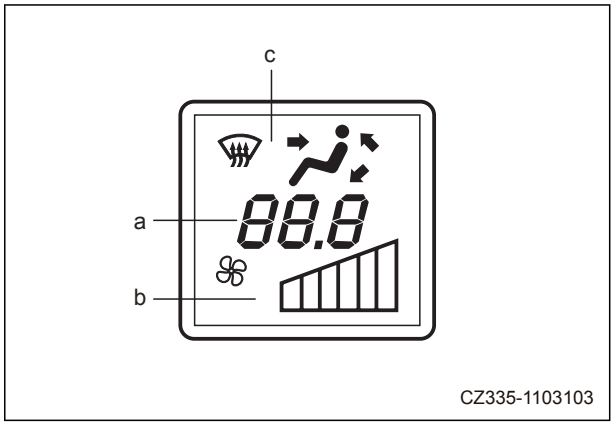

Fig. 3-90

8. A/C switch

This switch is used to activate and deactivate air conditioner operation (heating, defrosting and cooling).

- When the fan is working (LCD displays [b]), press the A/C switch to activate the air conditioner. The indicator above it will light up. Press this switch again to deactivate the air conditioner. The indicator goes out.
- The air conditioner is disabled when the fan is switched off (air flow symbol on the LCD disappears).

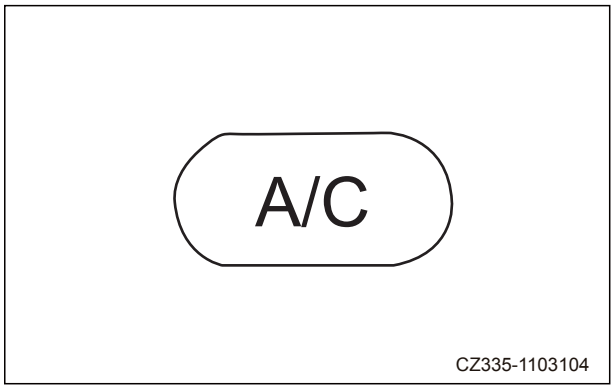

Fig. 3-91

Antenna

A fully extended radio antenna may collide with other overhead objects. To prevent antenna damage, retract it before moving the machine into or out of a building.

1. Loosen the mounting bolt [1] and retract the antenna to position [A].
2. Fasten the bolt [1] after retracting the antenna.

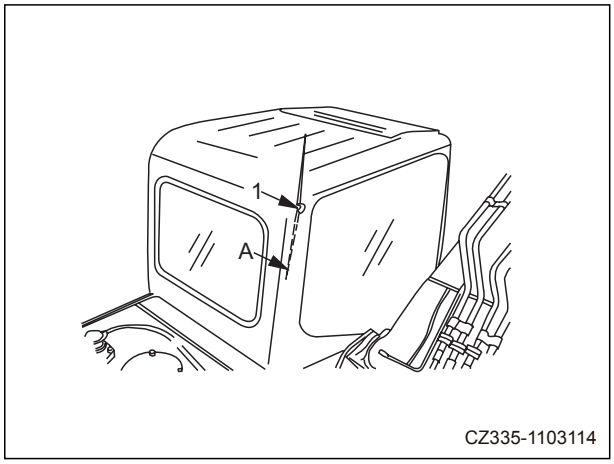

Fig. 3-101

Radio operation precautions

- Keep radio volume at a proper level so that you can hear the outside sound during operation.
- Water penetration may cause dysfunction of the loud speaker and the radio. Be careful not to splash water on the radio.
- Do not use benzol, diluent or other solvent to clean the control panel and the buttons. Soft dry cloth shall be used for cleaning. If the device is too dirty, wipe it with alcohol-soaked cloth.
- Preset stations and radio time setup will be cleared when the battery is disconnected. Radio setting need to be done once again.

⚠ WARNING

Read and understand all safety precautions and instructions in this manual before reading any other manuals provided with this machine and before operating or servicing the machine. Also read the safety information on machine decals before performing any operations. Failure to do so can cause machine damage, personal injury or death.

4.1.2.7 Fuel level - Check and add

⚠ WARNING

- **Be careful not to splash fuel on the tank when filling the fuel tank to reduce fire risk.**
- **Clean splashed fuel completely if any. Remove contaminated earth or sand if fuel flows onto the ground.**
- **Fuel is flammable and dangerous. No open fire is allowed in the vicinity of fuel.**

1. Turn the engine start switch to the ON position and check the fuel level on the monitor screen. Turn the switch to the OFF position after checking.

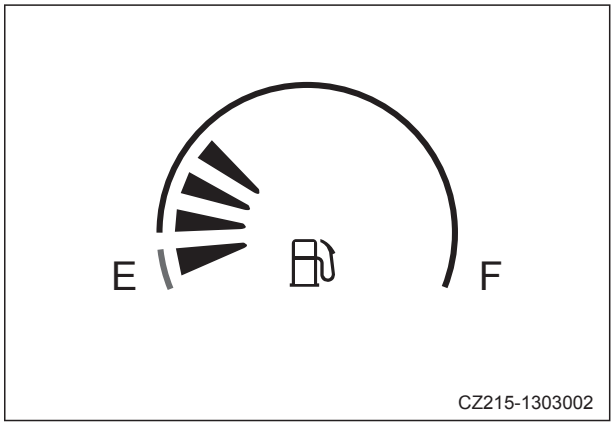

Fig. 4-13

2. When fuel level is low, remove the fuel tank cap (F) and fill the tank till the float meter (G) reaches the highest point.
   - Fuel tank capacity: 340L
   - When the fuel tank is full, top (a) of the float level meter (G) is positioned at about 50mm.
   - When fuel level is below 10%, alarm on the monitor will sound.

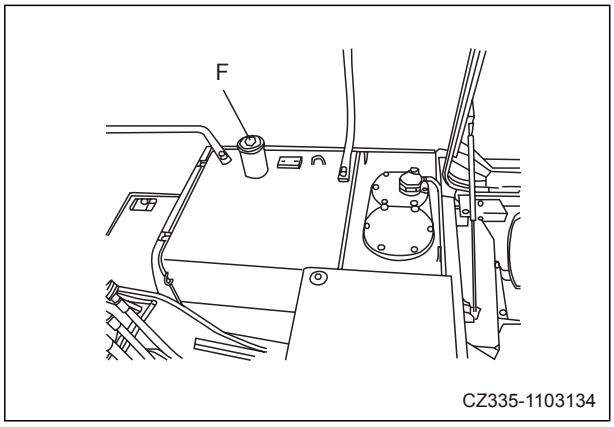

Fig. 4-14

4.2 Engine Startup

⚠ WARNING

- **Only start the engine from the operator seat.**
- **Never start the engine by shorting the starter circuit, which may cause serious injury or fire.**
- **Sound the horn and start the engine after confirming that the machine surroundings are clear of personnel or obstacles.**
- **Never use any aerosol starting aid, which may cause an explosion.**
- **Exhaust gas is poisonous. Provide adequate ventilation when starting the engine in a confined space.**

- Before starting the engine, check if the fuel control dial is in MIN position for low idling speed. If it is in MAX position, starting the engine can lead to sudden acceleration and machine damage.

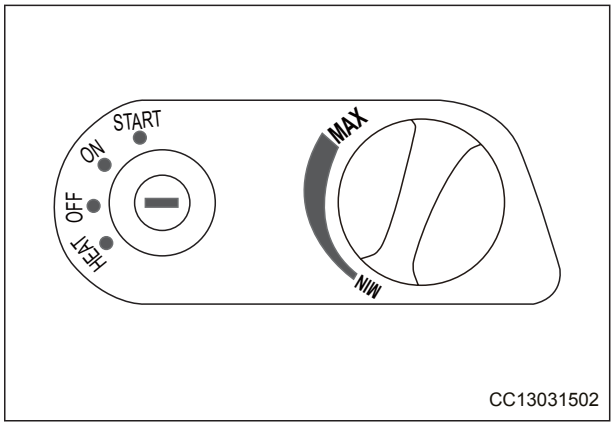

Fig. 4-30

1. Check that the hydraulic lockout lever is in the LOCKED position. If it is in the FREE position, do not start the engine.

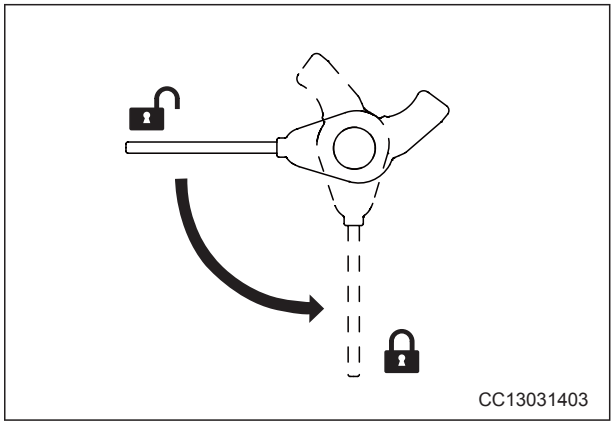

Fig. 4-31

4.5 Machine Turning

- Check the direction of the track frame before operating the travel control. If the sprockets are in front of the cab, when the travel controls are operated, machine movement is opposite to that when machine direction is normal.

- Avoid sudden change of direction. Stop the machine before turning, especially for a pivot turn.

4.5.1 Direction change when the machine is stopped

Left turn

- Push the right travel control lever, or press the upper part of the right control pedal. The machine turns left as the right side track moves forward;

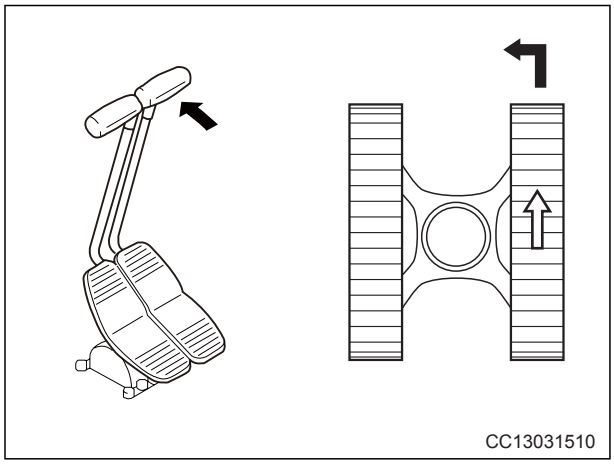

Fig. 4-45

or,

- Pull the left travel control, or press the lower part of the left control pedal. The machine turns left as the left side track moves backward.

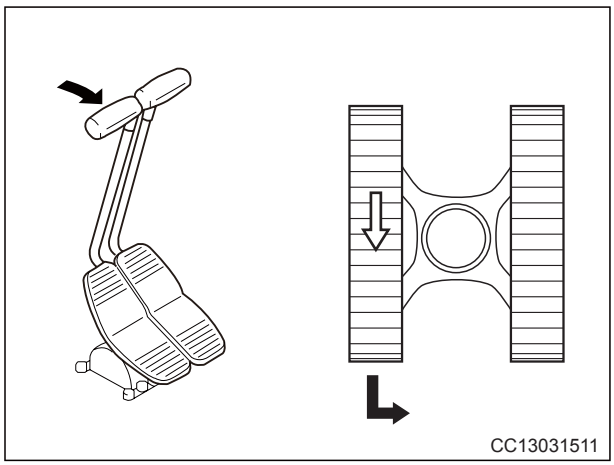

Fig. 4-46

2. When driving the machine up a steep slope, move the work equipment to the forward direction. Keep the work equipment about 20-30cm above the ground and travel at a low speed.

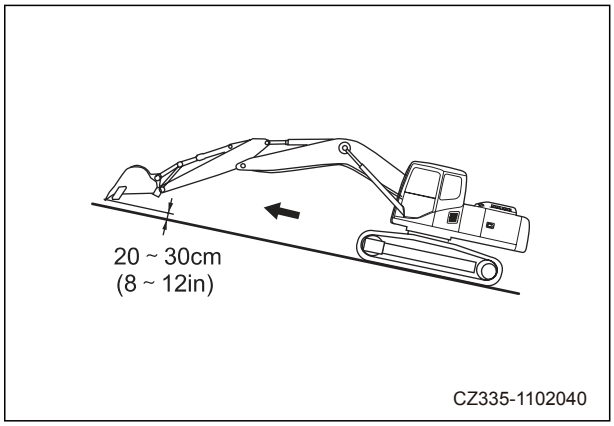

Fig. 4-66

4.9.1 Traveling downhill

Place the travel control levers to the neutral position, which can make the brake function automatically.

4.9.2 When engine stalls on a slope

If the engine stops while traveling on a slope, place the travel control lever to its neutral position, lower the bucket to the ground and park the machine before restarting the engine.

4.9.3 Cab door on a slope

- If the engine stalls out on a slope, do not perform swinging operation with the left joystick. The upper turntable will swing naturally under its weight.
- When the machine is on a slope, do not open or close your cab door because it would cause sudden change of force applied on the machine. Always secure the cab door in either open or closed position.

4.15.4 After operation in cold weather

When temperature is very low, mud and water on the undercarriage may freeze at night, which may make the machine hard to move the next day. Observe the following instructions:

- Remove all mud and water from the machine. Clean especially the piston rods of hydraulic cylinders in order to prevent mud, dirt or water from penetrating the cylinders and spoiling the seals.
- Park the machine on a hard, level ground. Park it on wood planks if possible, which can prevent the machine from being frozen unto the ground.
- Open the drain valve to discharge accumulated water of the fuel system so as to prevent it from freezing.
- Refill the fuel tank to tis maximum level to reduce condensation in the tank when ambient temperature drops.

To remove the mud and water on the track:

1. Run the engine at idle speed and swing the upper structure 90º so that the work equipment is at the track side.
2. Lift one side of the tracks just above the ground and move the travel control lever to rotate the track.
3. Repeat the steps above and remove the mud on the other track.

⚠ CAUTION

- **It is dangerous to run the track freely.**
- **Keep people a safe distance away from the track when running it freely.**

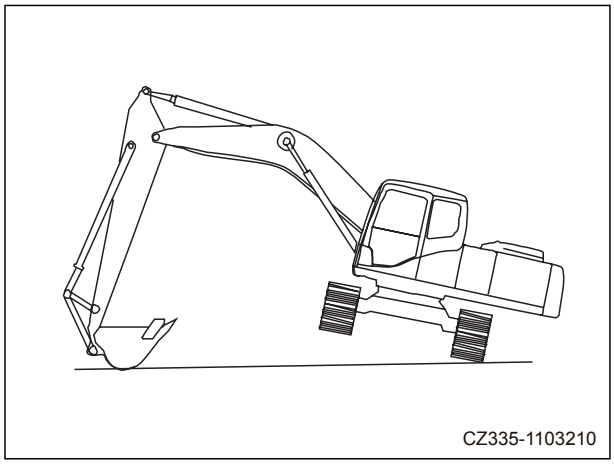

Fig. 4-82

8. Raise the work equipment, retract the arm below the boom, and drive the machine slowly.
9. Stop the machine when it comes to the rear wheels of the trailer and is positioned horizontally.

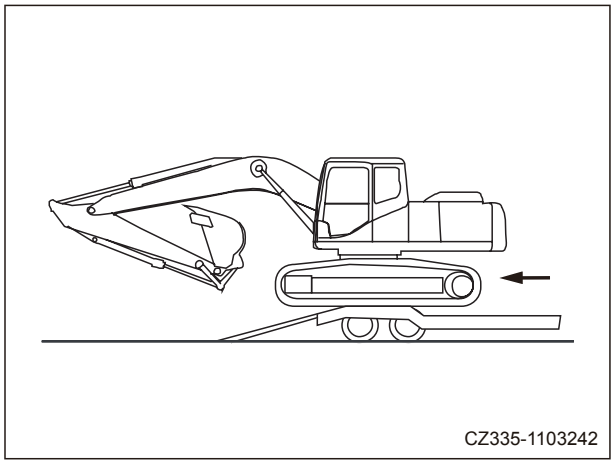

Fig. 4-100

NOTE:

- Keep an angle of 90 - 110° between the arm and the boom when unloading the machine.
- The machine could be damaged if it is unloaded with retracted arm.
- When the machine runs on the access ramp, do not penetrate the bucket into ground, which could damage the hydraulic cylinder.

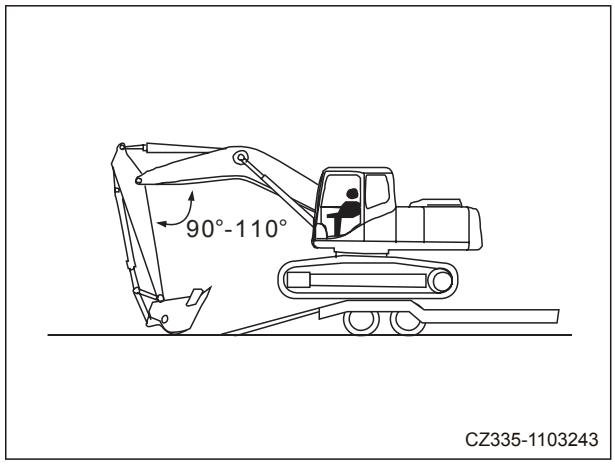

Fig. 4-101

10. While the machine is on the ramps, keep an angle of 90 - 110º between the arm and the boom. Lower the bucket to the ground and move the machine slowly.
11. When the machine is going down the ramps, slowly operate the boom and arm, and carefully drive the machine off the ramps.

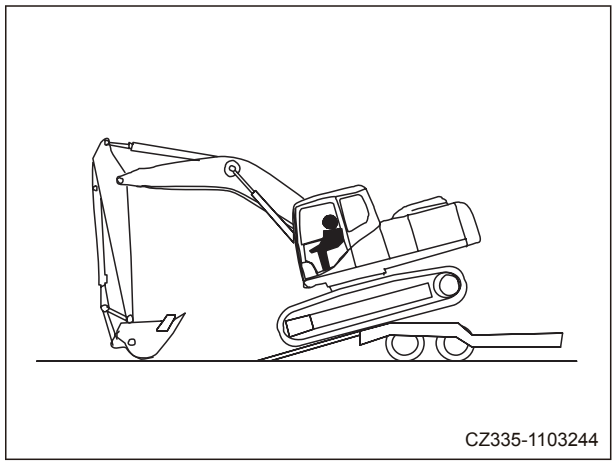

Fig. 4-102

5.2 Oil, fuel and coolant

5.2.1 Oil

- The oils in engine and hydraulic units keep deteriorating when operating the machine under extreme conditions, such as high pressure and high temperature.
- Always use recommended type of oil which shall also be applicable under extreme ambient temperatures.
- Within the specified oil change interval, the oil must be changed even if it is not dirty.
- Lubricant shall be handled carefully in order to prevent impurities such as water, metal particles and dust.
- Most troubles of the machine are caused by impurities. Pay special attention to the prevention of any impurities when storing or filling the oil.
- Fill the amount of oil as specified. Failure to do so could result in abnormality.
- Do not mix oils of different grades or brands together.
- Contact your Sany dealer when the oil in your work equipment has been contaminated by water or air.
- To know the condition of the machine, regular oil quality analysis is recommended. Contact your Sany dealer if you need such service.
- Related filter elements must be replaced when changing the oil. In replacement of machine oil filter element, acceptable clean oil shall be filled into the new filter element prior to installation.
- Please use the oils approved by Sany.
- Do not use the hydraulic oil that has not been approved by Sany, which can block filter cartridge.
- Remove the remaining oil as much as possible from the lines and cylinders when changing the hydraulic oil. A small amount of different residual is acceptable.

5.2.2 Fuel

- To prevent the moisture in air from condensing in the fuel tank, the tank must be fully refueled after each workday.
- The fuel injection pump is a precise component, which may not work normally if the fuel contains water or other foreign substances.
- The sediment and water in the fuel tank must be drained before starting the engine or after 10 minutes since injection of oil.
- Flush the fuel tank and the fuel system in case of any impurities found in the fuel tank.

- Hydraulic hoses are tightened according to the torques given in the following table.

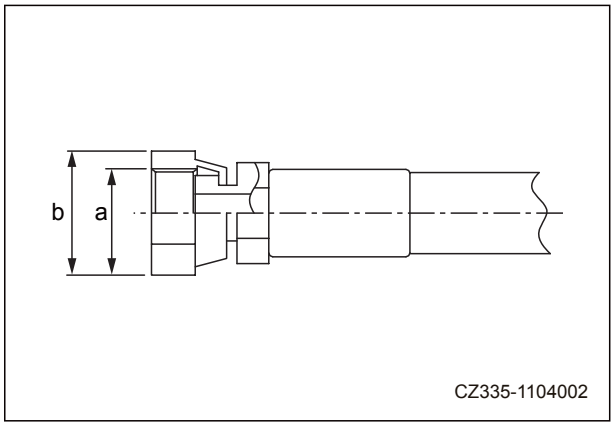

Fig. 5-2

Nominal Thread Number (a)	Square Size (b) (mm)	Tightening Torques					
		Target Values			Permissible Range		
		N·m	kgf·m	lbft	N·m	kgf·m	lbft
9/16-18UNF	19	44	4.5	32.5	35~63	3.5~6.5	25.3~47
11/16-16UN	22	74	7.5	54.2	54~93	5.5~9.5	39.8~68.7
13/16-16UN	27	103	10.5	75.9	84~132	8.5~13.5	61.5~97.6
1-14UNS	32	157	16.0	115.7	128~186	13.0~19.0	94~137.4
13/16-12UN	36	216	22.0	159.1	177~245	18.0~25.0	130.2~180.8
*1 -7/16 - 12UN - 2B	41	215	22.0	159.1	176~234	18.0~24.0	130.2~180.8

Note: The item marked with * is used for tightening the hose on top of the swivel joint.

Table 5-8

2. Remove the nuts on the bolts of the retaining plate of arm pin (A) and link pin (B). Remove the bolts and take out arm pin (A) and link pin (B), and then remove the bucket.

NOTE:

- Make sure the pin roll is free from mud or sand after removal.
- Both ends of the bushing are installed with seals against dust. Be careful not to damage them.

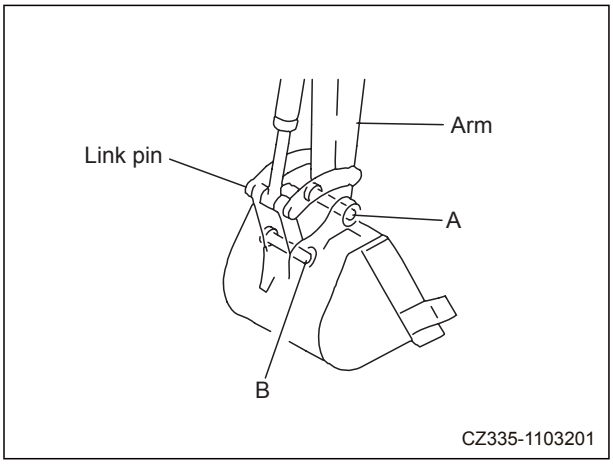

Fig. 5-15

3. Align the arm with the pin hole (1) of the replacement bucket as well as the link rod with the hole (2). Insert the greased pin rolls (A) and (B) into hole (1) and hole (2) respectively.

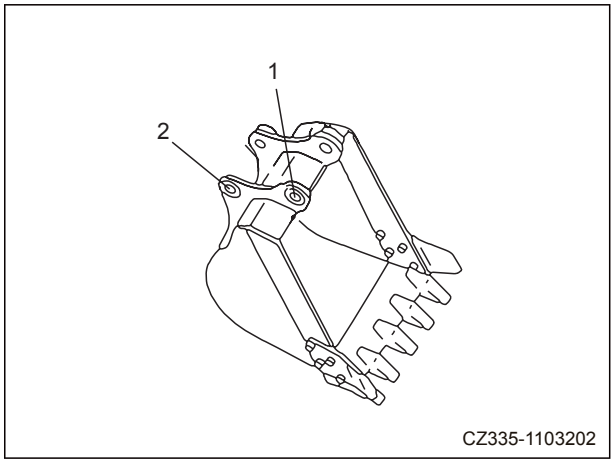

Fig. 5-16

How to release pressure in the hydraulic circuit

⚠ WARNING

- **The hydraulic circuit is always under pressure. Relieve the pressure in hydraulic circuit when checking or replacing the hoses or fittings.**
- **When the engine is stopped, oil and engine components are still hot and can cause serious burns. Wait until they have cooled down before operating.**
- **Oil may squirt out when removing the oil filler cap. Therefore, slowly remove the cap in order to release the internal pressure.**

1. Park the machine on a hard, level ground.

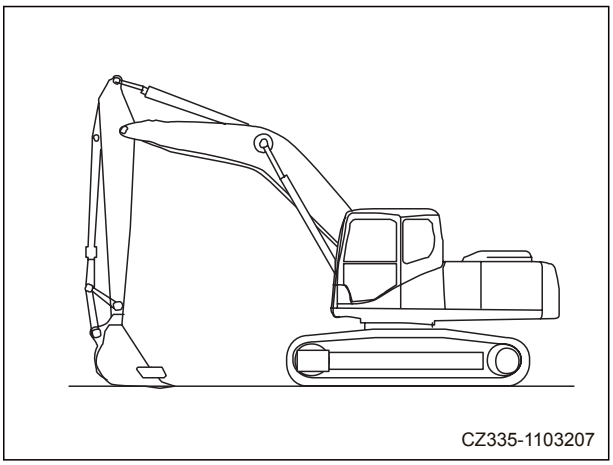

Fig. 5-28

2. Turn the start switch to ON position within 15 seconds after engine shutdown and move the hydraulic control lever to FREE position.
3. Move the joysticks and the travel control levers in all directions to relieve the internal pressure.
4. Remove the butterfly nut (1) on the breather valve of the hydraulic tank and press the air vent to relieve the internal pressure.

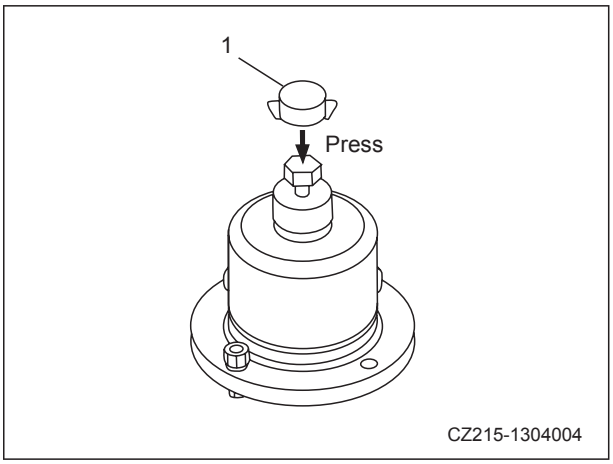

Fig. 5-29

5.8.6.3 Fan belt tension - inspect/adjust

⚠ CAUTION

- **Stop the engine before inspecting or adjusting fan belt tension.**
- **Over-tightened fan belt may cause damage to the belt itself or to the bearings.**

Inspection

1. Press the middle section of the belt between the fan belt pulley and the alternator belt pulley with a force of about 98N {10kgf} with your finger.
2. Measure the deflection (A). Standard value of size A shall be 7~10mm {0.28~0.30in}.

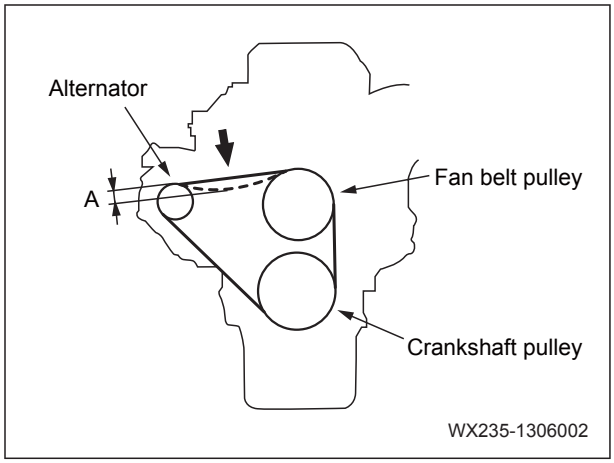

Fig. 5-47

Adjustment

1. Loosen the mounting bolt [1] and adjusting nut [2].
2. Loosen the adjusting bolt [3] and adjust the belt tension of the alternator as specified. Then, tighten the mounting bolt [1] and the adjusting nut [2].
3. Start and run the engine at low idle for about 5 minutes. Stop the engine and check belt tension once again.

   The second check if especially necessary when a new belt is installed. Belt tension may change when a new belt seats into the belt pulley.

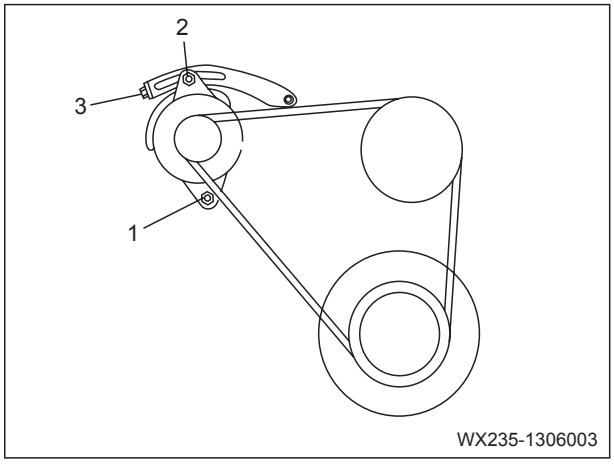

Fig. 5-48

1. Open the engine hood.
2. Place a container under the filter element.
3. Turn counterclockwise the filter cartridge [1] with the filter element spanner to remove it.
4. Clean the filter element seat. Apply a film of oil to the surface of the new filter cartridge before mounting it to the filter element seat.

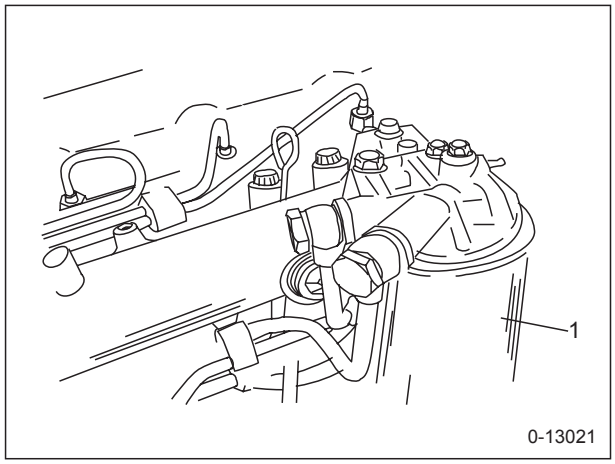

Fig. 5-58

Note:

- Do not fill the new filter cartridge with fuel.
- Remove the cover [B] and install the cartridge.

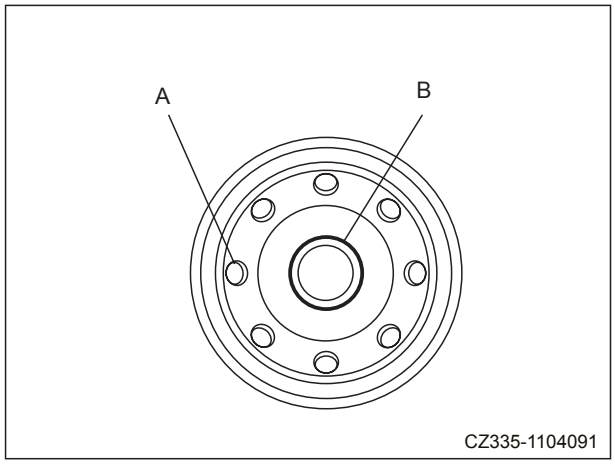

Fig. 5-59

5. Replace the internal seal [2] with a new one.
6. During installation, tighten the filter cartridge until its sealing surface contacts that of the filter seat. Then, tighten it further by 3/4 turn.

   If the filter cartridge is over-tightened, the seals may be broken and oil leakage could result. If the cartridge is too loose, fuel will leak from the sealing location. Therefore, the filter element must be tightened to a suitable torque.
7. Bleed the air after filter element replacement.

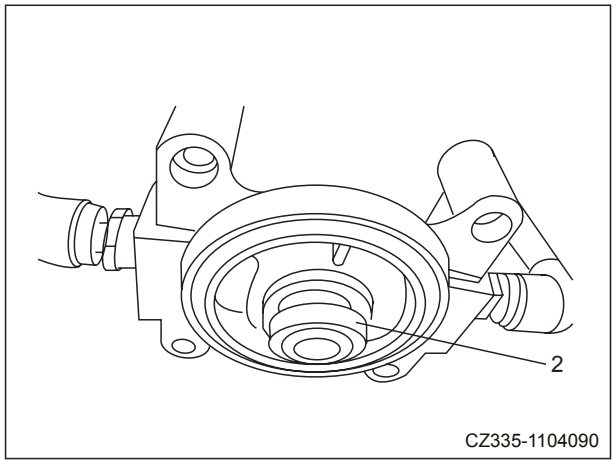

Fig. 5-60

5.8.8 Every 1000 service hours

The 100-, 250- and 500-hour services shall be carried out in the meantime.

5.8.8.1 Hydraulic oil filter element - replace

⚠ CAUTION

- **When the engine has just been stopped, the parts and oil are still hot and can cause serious burns. Wait for them to cool down before you proceed.**

Note:

For machines equipped with a hydraulic breaker, the hydraulic oil deteriorates faster than that of machines operating with a bucket. For more information, see "Hydraulic oil and filter - change/replace" on page 8-15.

1. Park the machine on a hard and level ground. Adjust the work equipment to an attitude ready for service. Lower the work equipment to ground and stop the engine.

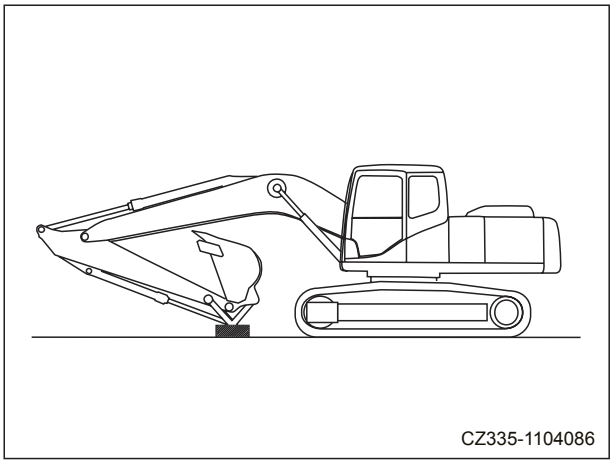

Fig. 5-81

2. Remove the butterfly nut [1] of the breather valve on top of the hydraulic tank. Press the vent valve to release internal pressure.

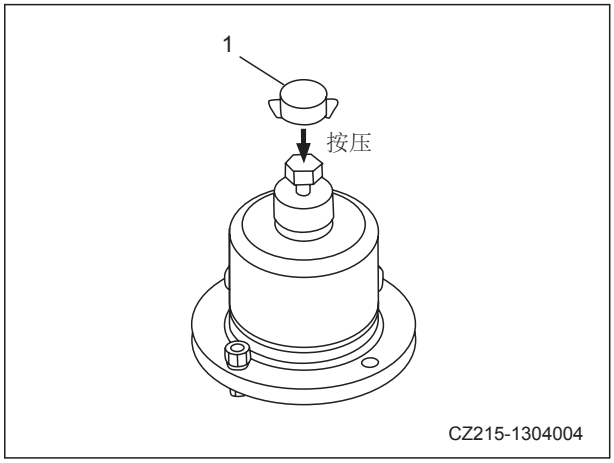

Fig. 5-82

5.8.9.3 Nitrogen pressure in accumulator (control oil circuit) - check

⚠ WARNING

- **The accumulator contains pressurized nitrogen, which may explode due to improper operation and result in machine damage and personal injury.**
- **Be away from fire sources.**
- **Do not bump or roll the accumulator. Keep it free from any impacts.**
- **Vent the air completely when handling the accumulator. Consult your Sany dealer to do this job.**

Note:

In continuous operation with low nitrogen pressure in the accumulator, the remaining pressure in hydraulic circuit will not be released once failure occurs to the machine.

Functions of the accumulator

The accumulator stores the pressure of the control circuit. Even if the engine is turned off, the control oil circuit allows you to achieve the following operations:

- Operate the control lever to lower the work equipment. The work equipment will fall due to gravity.
- The pressure in hydraulic circuit can be released.

The installation location of the accumulator is shown in the right illustration.

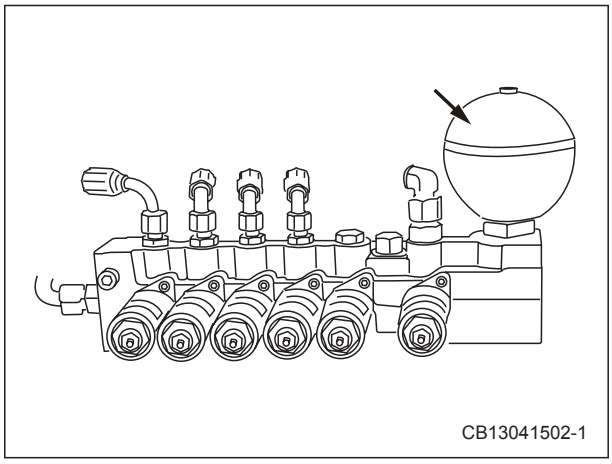

Fig. 5-96

5.8.10.3 Accumulator - replace

Replace the accumulator every two years or 4000 service hours, whichever occurs first.

⚠ WARNING

- **The accumulator contains pressurized nitrogen, which may explode due to improper operation and result in machine damage and personal injury.**
- **Be away from fire sources.**
- **Do not bump or roll the accumulator. Keep it free from any impacts.**
- **Vent the air completely when handling the accumulator. Consult your Sany dealer to do this job.**

If the machine is kept operating when the performance of accumulator decreases, the pressure in the hydraulic system will not be released. Consult your Sany dealer to replace the accumulator.

The accumulator's installation location is shown in the right illustration.

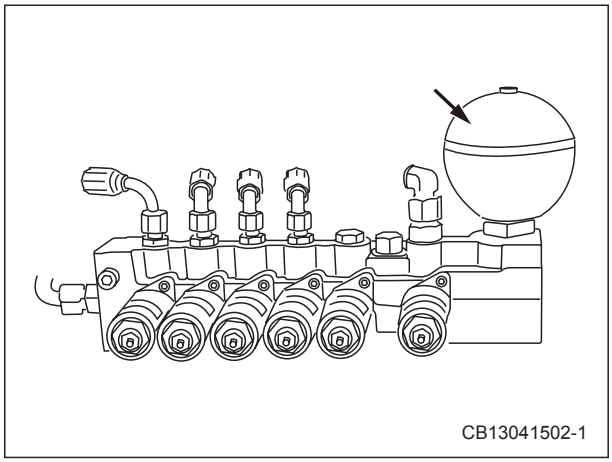

Fig. 5-109

6.1.3 Electrical circuits troubleshooting precautions

1. Always turn the power off before disconnecting or connect connectors.
2. Before carrying out troubleshooting, check that all the related connectors are properly inserted.
   - Disconnect and connect the related connectors several times to check.
3. Always connect any disconnected connectors before going on to the next step.
   - If the power is turned ON with the connectors still disconnected, unnecessary abnormality displays will be generated.
4. When carrying out troubleshooting of circuits (measuring the voltage, resistance, continuity, or current), move the related wiring and connectors several times and check that there is no change in the reading of the tester.
   - If there is any change, there is probably defective contact in that circuit.

Failure	Causes	Remedy
Excessive consumption of fuel	• Fuel leaks. • Air cleaner plugged • Low idle improper • Fuel injector activating pressure low, or bad injection effect • Fuel injection timing incorrect • Fuel drips after injection due to damage of fuel injection pump delivery valve. • Air leaks from the intake side of turbocharger. • Turbocharger assembly damaged • Bad valve clearance • Soft or broken valve spring • Broken cylinder gasket, worn cylinder liner, stuck or ruptured piston ring, or defective contact between air valve and its seat	• Repair/replace related parts of the fuel system. • Clean/replace air cleaner element. • Readjust low idle. • Adjust/replace fuel injector. • Readjust fuel injection timing. • Replace fuel delivery valve. • Repair the intake side of turbocharger. • Replace turbocharger assembly. • Readjust valve clearance. • Replace valve spring. • Replace relevant parts.
Excessive consumption of oil	• Bad oil • Excessive oil • Oil leaks through oil seal and/or gasket. • No preheating operation • Defective valve oil seal, or wear of valve stem and valve guide tube • Wear, rupture or improper setup of piston ring • Scratch or wear of cylinder liner	• Use suitable oil. • Drain excessive oil. • Replace oil seal and/or gasket. • Follow the procedure specified • Replace related parts. • Replace piston ring or reset it properly. • Replace cylinder liner.
Oil pressure low	• Oil insufficient • Bad oil viscosity • Oil leaks through oil seal and/or gasket. • Oil filter element plugged • Stuck safety valve and/or soft bypass valve spring • Oil pump screen plugged • Wear of oil pump related parts	• Refill oil. • Use lubricant with proper viscosity. • Replace oil seal and/or gasket. • Replace oil filter element or cartridge. • Replace spring of safety valve and/or bypass valve. • Clean the screen of oil pump. • Replace related parts of oil pump.

Failure	Causes	Remedy
All devices fail.	• Hydraulic lockout control failure • Short circuit of wire (grounding failure) • Failure of internal coil of pilot lockout valve	• Repair/replace • Check/repair • Replace
Boom slow and weak	• Sensor failure • Short circuit of harness (grounding failure) • Open circuit of harness • Controller failure	• Replace • Check/repair • Check/repair • Replace
Arm slow and weak	• Sensor failure • Short circuit of harness (grounding failure) • Open circuit of harness • Controller failure	• Replace • Check/repair • Check/repair • Replace
Bucket slow and weak	• Sensor failure • Short circuit of harness (grounding failure) • Open circuit of harness • Bucket confluence solenoid valve failure • Controller failure	• Replace • Check/repair • Check/repair • Replace • Replace
Travel slow and weak	• Sensor failure • Short circuit of harness (grounding failure) • Open circuit of harness • Controller failure	• Replace • Check/repair • Check/repair • Replace
Monitor black-out	• Fuse failure • Open circuit of wire • Short circuit of wire (grounding failure) • Monitor failure	• Replace • Check/repair • Check/repair • Replace
Monitor displays nothing.	• Resistor failure • Open circuit of wire • Short circuit of wire (grounding failure) • Monitor or controller failure	• Replace • Check/repair • Check/repair • Replace
Dual-travel speed failure	• Dual travel speed solenoid valve failure • Open circuit of wire • Short circuit of wire (grounding failure)	• Replace • Check/repair • Check/repair
Engine coolant temperature reading incorrect	• Coolant temperature sensor failure • Open circuit of wire • Short circuit of wire (grounding failure) • Wire short-circuited with 24V	• Replace • Check/repair • Check/repair • Check/repair

6.6 Failures of the Hydraulic System

- Trouble-shoot the hydraulic system according to the following tables. Contact your Sany dealer to solve the problem.
- Set the working mode to S and the fuel control dial to position 10 before troubleshooting

Failure	Causes	Remedy
Work equipment moving slowly, or travel and swing speed slow	• Bad adjustment or main relief valve failure • Pilot relief valve failure • Regulator failure • Plunger pump failure	• Replace • Replace • Repair/replace • Check/repair
Work equipment, final drive or swing drive not functioning	• Pilot pump relief valve failure • Hydraulic pump failure • Coupling failure	• Replace • Check/repair • Check/repair
Abnormal noise in hydraulic pump	• Hydraulic oil level low • Bad hydraulic oil • Hydraulic tank cap vent plugged • Hydraulic tank filter screen plugged • Plunger pump failure	• Refill hydraulic oil • Use suitable hyd oil • Clean/replace • Clean/replace • Check/repair
Auto idle not functioning	• Sensor failure • Pilot valve failure • Controller failure	• Replace • Replace • Repair/replace
Boom speed slow	• Right pilot valve (boom circuit) failure • Pressure sensor failure • Boom control valve (spool) failure • Boom control valve (retaining valve) failure • Boom control valve (Safety valve and feed valve) seal failure • Boom cylinder failure	• Check/repair • Replace • Repair/replace • Repair/replace • Repair/replace • Check/repair
Arm speed slow	• Left pilot valve (arm circuit) failure • Pressure sensor failure • Arm control valve (spool) failure • Arm control valve (regeneration valve) failure • Arm control valve (Safety valve and feed valve) or seal failure • Arm cylinder failure	• Check/repair • Replace • Repair/replace • Repair/replace • Repair/replace • Check/repair

⚠ WARNING

Read and understand all safety precautions and instructions in this manual before reading any other manuals provided with this machine and before operating or servicing the machine. Also read the safety information on machine decals before performing any operations. Failure to do so can cause machine damage, personal injury or death.

8.2.1.1 Stop valve

The stop valve is used to stop the flow of hydraulic oil.

- FREE position (a) allows flow of the hydraulic oil.
- LOCK position (b) stops flow of the hydraulic oil.

Switch the valve to LOCK position when removing or installing an attachment.

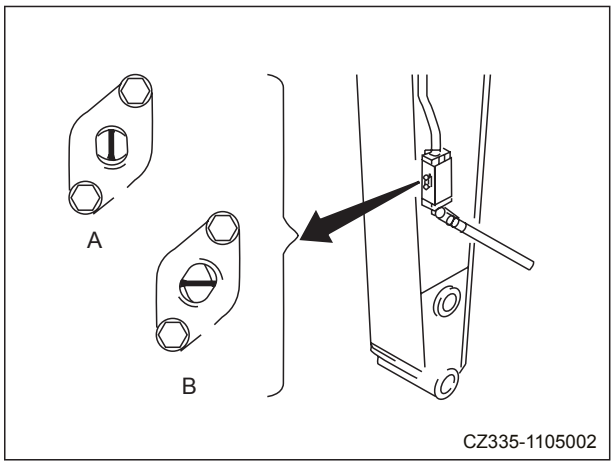

Fig. 8-2

8.2.1.2 Selector valve

The selector valve is used to change the flow direction of hydraulic oil.

The change of direction is made according to the working mode selected. The working mode must be applicable to the installed attachment. For more information, see "Hydraulic circuit" on page 8-8.

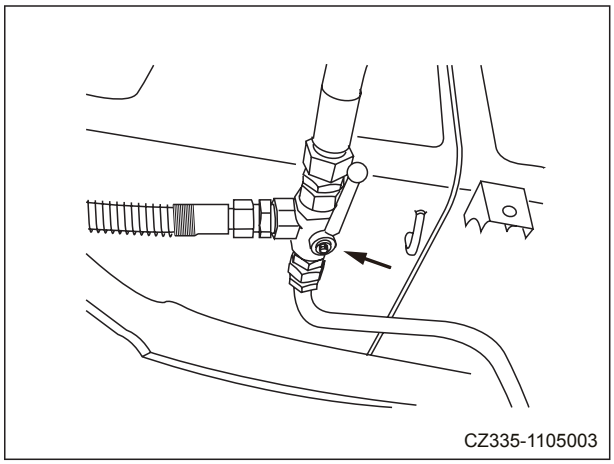

Fig. 8-3

8.2.5 Long-term storage

The following procedures shall be followed when the equipment is to be stored for a long period of time.

- Turn the stop valve to LOCK position.
- Screw the plug on the valve.
- Place the latch pin to LOCK position.

Operating the pedal with no breaker or general attachment installed may cause overheating or other problems.

8.5 Quick Coupler

8.5.1 Quick coupler control

1. Remove the safety pin of the quick coupler.

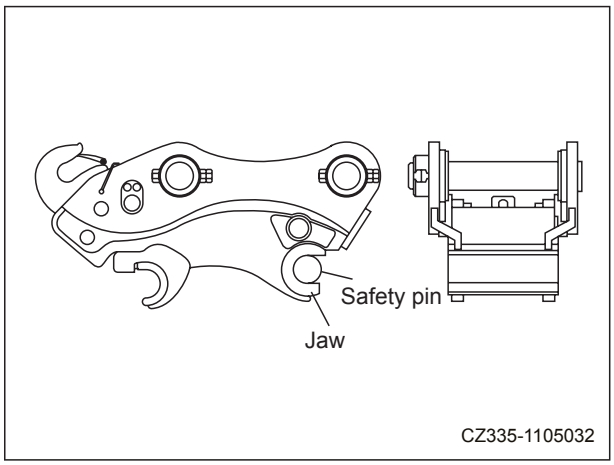

Fig. 8-35

2. Depress the quick coupler button [1] (auto reset) on the left joystick to reduce the opening of the flexible jaw and the fixed jaw slowly.

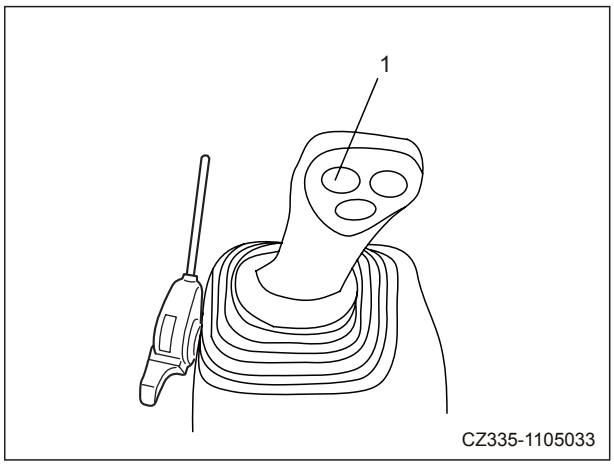

Fig. 8-36

3. Allow the fixed jaw to slowly grip the support pin [2] of the bucket, as shown in the right illustration.

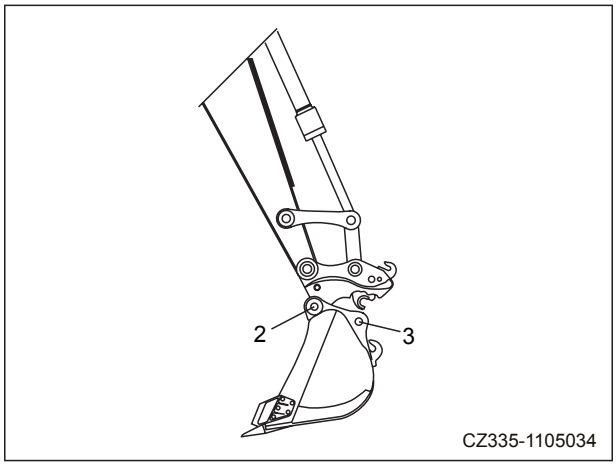

Fig. 8-37