Operation and Maintenance Manual

SY75 Excavator

service@sanyamerica.com

SANY Part Number SSY005081688

SY75 Excavator

Operation and Maintenance Manual

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 maintaining it. Failure to do this could result in death or injury.

This manual and its contents prepared by SANY Technical Publications while deemed to be accurate, is based upon technical information provided, and for equipment designed, manufactured and tested by:

SANY HEAVY INDUSTRY CO., LTD
NO.8 Beiqing Road,
Huilongguan, Changping District,
Beijing, China, 102206

It is the responsibility of the owner, user, properly trained operator and lessor to be knowledgeable of, and comply with, all industry standards, government regulations, workplace rules and other directives that may govern and/or apply to this equipment as well as its environment/conditions of use.

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WARNING!

CALIFORNIA PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

WARNING!

CALIFORNIA PROPOSITION 65 WARNING

The battery posts, terminals, and related accessories contains chemical lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Wash hands after handling.

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Introduction

WARNING!

To prevent death or injury:

- **Avoid unsafe operation and maintenance.**
- **This machine must be operated and maintained by trained and experienced personnel. SANY is not responsible for qualifying these personnel.**
- **Do not operate or work on this machine without first reading and understanding this Operation and Maintenance Manual supplied with the machine.**
- **Store this Operation and Maintenance Manual in the operator cab.**

If the Operation and Maintenance Manual is missing or damaged, do not use the machine until a replacement has been obtained from your SANY dealer. Failure to have and to refer to an available copy of the manual can result in damage to the machine or improper operation.

ABOUT THIS MANUAL

This manual provides safety, operation, maintenance and technical specification information. A copy must be kept in the cab at all times. If you sell the machine, a copy of this manual must be provided to the new owner.

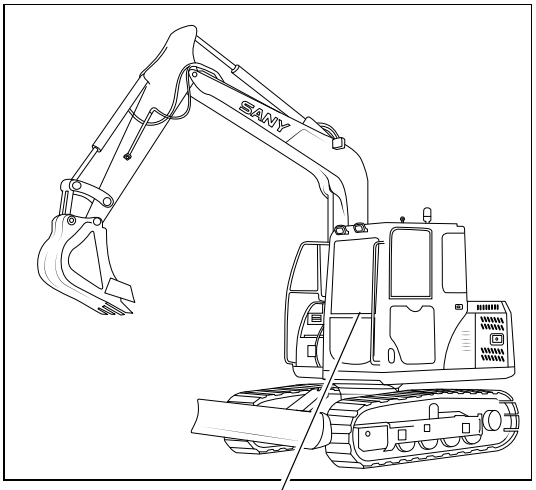

Fig. 1-1

It is important to read this manual carefully before beginning any operation or maintenance. All personnel involved with this machine must read this manual periodically to remain knowledgeable about its operation and maintenance.

Items addressed in this manual are designed to help you:

- Understand the different systems and performance of your machine.
- Reduce improper operation.
- Point out possible hazardous situations when operating and maintaining the machine.
- Increase machine efficiency during operation.
- Prolong the service life of your machine.
- Reduce maintenance costs.

Continuing improvements in the design of this machine can lead to changes in detail which may not be covered in this manual. Always consult your SANY dealer for the latest available information on your machine or if you have questions regarding information in this manual.

YOUR DOCUMENTATION PACKAGE

This documentation applies only to this machine and should not be used with any other machine. The documentation for this machine includes the following items:

Operation and Maintenance Manual

A copy of this Operation and Maintenance manual must always remain in the operator cab (a) at all times.

A copy of this manual should be made available to maintenance personnel when maintaining the machine.

Parts Manual

The Parts Manual consists of parts lists and matching drawings used for ordering spare parts as needed. The Parts Manual is best left in the workshop area or office. It should be available to the maintenance and service personnel.

Maintenance Log

The Maintenance Log lists regularly scheduled maintenance to be performed by the operator or maintenance personnel. All maintenance performed upon the machine must be recorded in the Maintenance Log.

ORGANIZATION OF THIS MANUAL

Table of Contents

List of the general topics that are contained in this manual along with the page number each starts on.

NOTE: There is also a table of contents at the start of each section in this manual.

Introduction

Overview of what is covered in the rest of this manual, including serial number information and SANY contact information.

Safety

General and product-specific safety information relating to this machine. It describes what the hazard alerts that are used throughout the manual mean.

Machine Controls

Overview of all controls and operating systems.

Machine Operation

Detailed perstart checks, operating procedures, and end-of-day checks and storage information.

Maintenance

Routine maintenance procedures and fluid specifications.

Specifications

Dimensions and weight of the machine, and systems/components performance information.

Optional Equipment

Information on the function and operation of optional equipment that can be used with this machine.

SERIAL NUMBER LOCATION

The product identification (a) plate with the machine serial number is located on the right side of the cab.

This serial number will be needed by your SANY dealer when ordering replacement parts or providing assistance for your machine. Record this information in this manual for future use.

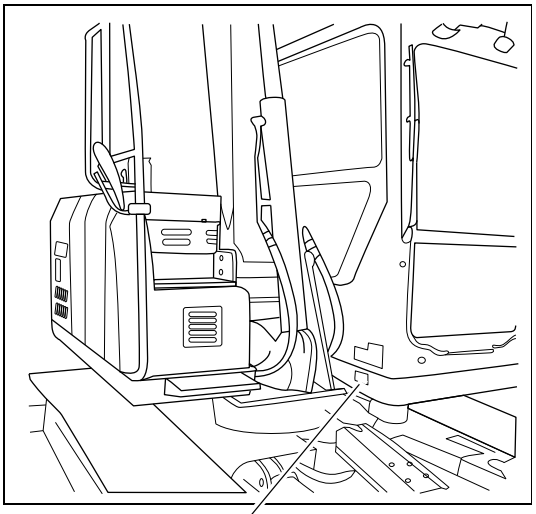

Fig. 1-2

Record of Serial Number and Dealer Information

This location is for you to record information relating to your machine. It is required that you keep this manual with your machine at all times for reference.	
Machine Serial No.	
Engine Serial No.	
Right Final Drive Motor Serial No.	
Left Final Drive Motor Serial No.	
Swing Gearbox Motor No.	
Hydraulic Pump No.	
Dealer Name: Address:	
Phone Numbers:	

CORRECTION REQUEST FORM

If you find a problem with this manual, make a copy of this page, complete the form below and send it to us, attention Technical Publications. You can also email us at techpubs@sanyamerica.com.

Date of This Request
Your Name
Company Name
Your Department
Street Address
City, State and ZIP
Phone
E-mail
Machine Model and Serial No.
Description of Problem (wrong information, unclear or erroneous procedure, etc.)
Corrective Action by You (if any)

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Safety

GENERAL PRECAUTIONS

The safety information in this manual provides basic guidelines for safe operation of the machine. SANY is unable to foresee all risks on work sites, so workers, operators and owners must consider if there are other safety concerns that must be addressed for specific job situations.

All procedures and precautions outlined in this manual apply only to intended use of this machine. If the machine is used for any unintended use that is not specifically prohibited, be sure that it is safe. In no event should the machine be used for any prohibited uses or actions as described in this manual.

This machine complies with all applicable regulations and standards of the country to which the machine has been shipped. If there is any question about whether your machine complies with the applicable standards and regulations of your country, contact your SANY dealer before operating this machine.

Hazard Alerts in This Manual

Hazard alerts in this manual are used to alert operators, job supervisors, maintenance staff and job site workers to hazardous operating practices and maintenance procedures, hazard alerts are used throughout this manual. Each hazard alert contains a hazard alert symbol and a signal word to identify the hazard's degree of consequence if the message is ignored.

The following signal words are used to inform that there is a potentially hazardous situation that may lead to damage, personal injury or even death. In this manual and on the machine decals, different signal words or illustrations are used to express the potential level of hazard.

DANGER!

Indicates a hazardous situation which, if not avoided, will result in death or injury.

WARNING!

Indicates a hazardous situation which, if not avoided, could result in death or injury.

CAUTION!

Indicates a hazardous situation which, if not avoided, could result in injury.

NOTICE!

Indicates a situation which can cause damage to the machine, personal property and/or the environment, or cause the equipment to operate improperly.

This symbol is used within a graphic to alert the user not to do something.

Preparations for Work

SANY cannot foresee every circumstance that might involve a potential hazard in operation or maintenance. Therefore, hazard alerts in this manual and on the machine may not include all possible safety precautions.

If any procedure or action not specified, recommended or allowed in this manual is used, be sure that such procedures and actions can be safely performed without damaging the machine or causing injury. When unsure about the safety of some procedures, contact your SANY dealer.

Before carrying out any repair, read all the safety messages on the machine and associated with the specific procedure.

Choose a place in the repair shop to keep tools and parts. Keep the tools and parts in their correct places and keep the working area clean, especially the floor.

Wear and use the proper Personal Protective Equipment (PPE). PPE includes and is not limited to safety shoes, hard hat and goggles.

When carrying out any operation with two or more workers, always agree on the operating procedure before starting. Always inform your fellow workers before starting any step of the operation. Before starting the work, hang Lockout/Tagout tags in the operator's cab.

Keep all tools in good condition, know how to use them, and use the correct one. Thoroughly check all tools before starting any procedure.

Before adding oil or making any repairs, park the machine on a hard and level surface, and block the tracks to prevent the machine from moving.

Before starting work, lower the work equipment (breaker, bucket, etc.) to the ground. Install Lockout/Tagout tags where necessary.

When disassembling or assembling the machine, support the machine with blocks, jacks, or stands before starting work.

Remove all mud and oil from the steps or other places used to get on and off the machine. Always use the handrails, ladders or steps when getting on or off the machine. Never jump on or off the machine. If it is impossible to use the handrails, ladders or steps, use a stand to provide safe footing.

Precautions During Work

Relieve the pressure before disconnecting or removing components of the hydraulic or coolant systems. When removing the oil filler cap, a drain plug, or an oil pressure measurement plug, loosen it slowly to prevent the fluids from squirting out.

The coolant and oil in the circuits may be hot after the engine is stopped, so be careful not to get scalded. Wait for the oil and coolant systems to cool before carrying out any work on them.

When checking the machine with the engine running (i.e. measuring oil pressure, revolving speed, temperature, etc.), take extreme care not to get caught in rotating parts or moving parts.

Disconnect electrical power from the machine unless needed for the procedure.

When lifting a heavy component, use a hoist or crane. Before starting work, check that the slings (wire ropes, chains, and hooks) are free from damage. Always use slings which have enough capacity and attach them to proper places. Operate the hoist or crane slowly to prevent the component from hitting any other part. Do not work on any component suspended by the hoist or crane.

When removing a cover which is under internal pressure or under pressure from a spring, always leave two bolts in diagonal positions. Loosen those bolts gradually and alternately to release the pressure, and then remove the cover.

When removing components, be careful not to break or damage electrical wiring.

When removing hoses or lines, stop fuel or oil from spilling out. If any fuel or oil drips onto the floor, clean it up immediately.

Do not use gasoline to clean parts or any part of the machine.

When installing high pressure hoses, make sure they are not twisted. Damaged hoses are dangerous, so be extremely careful when installing hoses for high pressure circuits. Make sure fittings are correctly installed.

When assembling or installing parts, always tighten them to the specified torques. When installing protective parts such as guards, or parts which vibrate violently or rotate at high speed, be particularly careful to check that they are installed correctly.

When aligning two or more parts, never insert your fingers or hand where they might be caught.

When measuring hydraulic pressure, ensure that the test equipment is properly assembled.

Take care when removing or installing the tracks. The track can snap apart suddenly when it is being separated. Never let anyone stand at either end of the track when removing it.

Keep windows and doors open to provide enough ventilation in the shop, to vent outside, when operating the engine.

Lifting Precautions

One worker should give signals and co-workers must be able to communicate with each other as needed. The appointed signal person must signal clearly from a place where he can be seen from the operator's seat and where he can see the work area. The signal person must always stand in front of the load and guide the operator.

- Do not stand under the load.
- Do not stand on the load.

Check slings before using them.

Wear appropriate PPE (i.e. leather gloves) when handling chains or slings.

Verify the weight of all loads before lifting them.

Use the correct sling according to the weight of the load and method used to lift the load.

WARNING!

Never sling a load with only one rope. Slinging with one rope could cause the load to slip away from the sling which could cause death or injury.

Operator Safety Information

No one other than the operator is to be anywhere on the machine while it is in operation.

The operator's first priority is to ensure his safety and the safety of those around him.

Only qualified personnel who have been specially trained are permitted to operate and/or work on this machine.

Operator aids such as warning lights, horns, or buzzers, along with displays on the monitors are designed to alert the operator to potential problems. Any faults found shall be reported to your SANY dealer. Stop all work immediately if any operator aid is found to not be working properly. Sole reliance on these operator aids, in place of good operating practices, can lead to an accident. Inspect the operator aids of this machine daily and make sure each operator aid is in normal working condition.

Mount and Dismount the Machine

Mounting or dismounting could pose some hazards. Observe the following:

- Always be sure the machine is at a full stop before attempting to access the machine. Never jump onto or off of the machine.
- Never exit or enter the operator cab or deck by any other means than the provided steps (a) and grab handles (b).

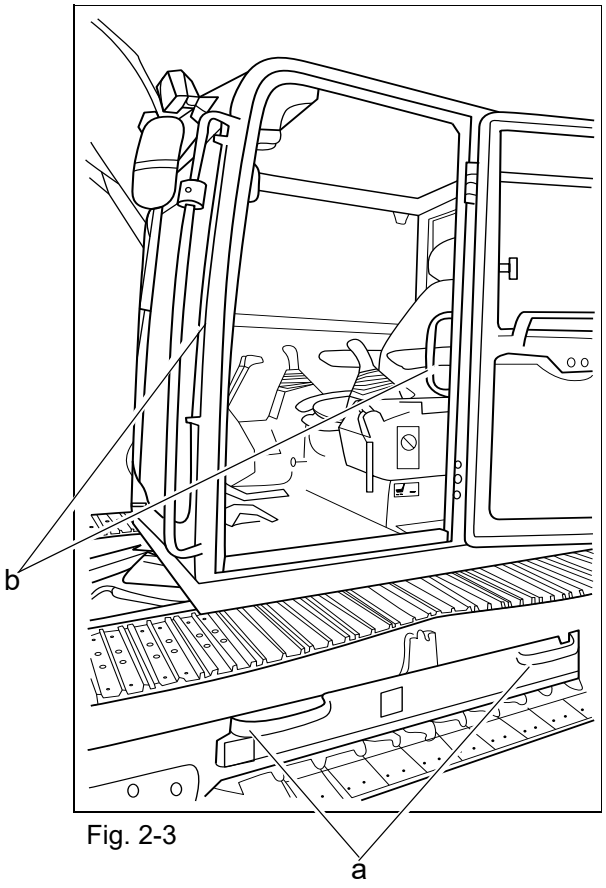

Fig. 2-3

- Always maintain a three-point contact (both feet and one hand or one foot and both hands) with the grab handles, steps and deck to ensure proper support. Face the machine when mounting and dismounting.

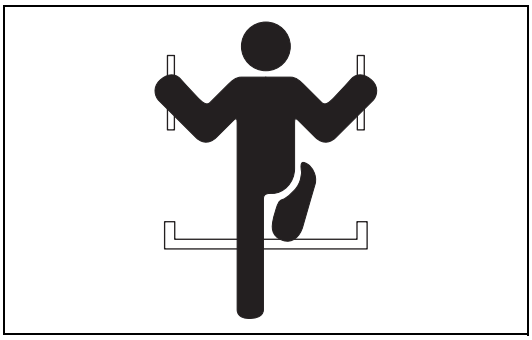

Fig. 2-4

- Wear shoes with a highly slip-resistant sole. Clean any mud or debris from shoes before entering the machine cab or climbing onto the machine.

- Do not walk on a surface of the machine if slip-resistant material is missing or excessively worn. Do not step on surfaces of the machine that are not approved or suitable for walking and working. Keep all walking and working surfaces of the machine clean, dry and slip-resistant.

- Always keep grab handles, steps and walkway areas clean and clear of mud, oil, grease or debris. If these areas are damaged, have them repaired or replaced immediately.

Unauthorized Machine Modifications

Do not make any unauthorized modifications to the machine.

Job Safety

Review each of these carefully:

- It is the owner’s and/or operator's responsibility to replace any safety decals if they are defaced or removed from the machine.

- Never leave the machine running and unattended. Always park the machine in a safe, level area, lower any work equipment to a safe position, lock the controls to secure the machine to prevent tampering by unauthorized personnel and shut down the engine before exiting the machine even for a moment.

- Before starting any work operations, travel or maintenance procedures, be sure all personnel are at a safe distance from the machine. Never allow anyone to stand near the machine while it is in operation, under maintenance or repair. Remember, the larger the machine, the more restricted the visibility will be.

- It is the responsibility of the operator’s employer to conduct periodic safety training and familiarize all personnel with emergency procedures.

- If pedestrians are in the area, proceed slowly and sound the horn. Pedestrians have the right of way; a loaded or smaller machine has the right away over an unloaded or larger machine.

- Never drive up to anyone standing in the path of travel. Always be sure all personnel are standing to the side when approached and they acknowledge the approach.

- When working with another person on a job site, ensure that all personnel involved understand all industry standard hand signals that are to be used.

- The operator shall respond to operating signals only from the proper signal person only, but shall obey a stop signal at any time from anybody.

- The operator must always be able to see the point of work location. If this is not possible then a signal person must be used. If visibility becomes blocked for any reason, stop operation immediately.

Personal Protective Equipment (PPE)

Wear close fitting clothing and safety equipment appropriate for the job.

Before using personal protective equipment, be sure it is in good condition and will be able to perform its task.

Fire Safety

Fuel, oil and some coolants are flammable. Always observe the following:

- Keep open flames, airborne sparks and burning embers away from the machine.
- Shut down the engine and do not smoke when refueling or servicing the machine.
- Adding oil, fuel, or coolant should be done in a well-ventilated area.
- Clean up any spilled fluids or coolant immediately.
- Check the machine daily for excess debris buildup.

Dust and Chemical Hazards

Performing operations and/or encountering hazardous materials on the job site may release substances that could pose a hazard. Exposure to hazardous chemicals or dusts poses a danger when they are released or mishandled. All workers involved should use approved personal protective equipment and follow all environmental safety regulations.

Weld, Drill, Cut or Grind on the Machine

NOTE: Contact your SANY dealer for proper guidance before any welding is attempted.

Personnel who weld on the machine must be fully qualified and certified to use the processes and equipment they may operate in making these repairs. Customers are responsible for the structural integrity of any completed repair. Components should be replaced if they are damaged.

Disconnect the battery prior to welding. Failure to do so may damage the machine or cause personal injury.

Oil Systems

Add Oils to the Machine

When oil must be added to the machine, be aware that the oil systems may be pressurized and hot.

Refuel

Shut down the machine before removing the fuel tank cap. Failure to do so may result in burns or a sudden loss of fuel.

Fuel spills pose a hazard if not cleaned up immediately.

Refuel only in a well-ventilated area. Never smoke or allow open flames nearby while refueling the machine.

Never mix gasoline with diesel fuel. Gasoline is extremely flammable and could cause an explosion.

Always allow room for the fuel to expand when filling the fuel tank.

High-Pressure Oil Lines

Never perform inspections or replace items while the system is under pressure. Working on a system still under pressure could lead to injury.

Never use any body part to check or feel for leaks. Always wear safety glasses and leather gloves when checking for leaks and use a piece of wood or cardboard when checking leaks from small holes.

Check for cracks in the piping or hoses and for swelling in the hoses.

If there is any leakage from a line or hose, the surrounding area will be wet.

Replace a line or hose if a leak is found or failure occurs.

If high-pressure oils penetrate skin or get into eyes, seek medical attention immediately.

Accumulator

This machine is equipped with an accumulator charged with high-pressure nitrogen gas. Do not disassemble the accumulator.

- Never expose the accumulator to high heat or open flames.
- Never weld on the accumulator.
- Never drill or cut on the accumulator.
- Never strike the accumulator.

If the accumulator needs maintenance, contact your SANY dealer.

Electrical System

Always clean the electrical system using only approved electrical cleaners.

Never use caustic soaps, high-pressure water or steam cleaners to clean the electrical system, as these could damage the system or cause intermittent system failures.

Environmental Precautions

Recycling used oil, coolants and filters conserves a natural resource and is good for the environment. Engine oils poured onto the ground, in bodies of water, into storm drains, or tossed into trash cans (even in a sealed container) can contaminate and pollute the soil, groundwater, streams, and rivers. Recycling used oils reduces this pollution threat.

Always drain oils from the machine into an appropriate container. Drain, crush and dispose of all filters properly.

Obey all local regulations when disposing of harmful items such as oil, fuel, filters, batteries, hydraulic oil or used parts. Failure to do so may result in fines or punishment.

Lockout/Tagout Procedures

Lockout/tagout the machine in accordance with local regulations.

MACHINE DECALS

All safety, alert and warning decals must be in place, undamaged, and not covered. You must be thoroughly familiar with the location and content of all decals on the machine. Walk around the machine and review each of them. Decals provide important instructions and warnings and must be read prior to any operational or maintenance function. Do not remove any decal from this machine.

NOTE: Your SANY distributor can supply you with new replacement decals if needed. Never modify or change existing decal information unless authorized by your SANY distributor.

When replacing decals, be sure they are placed in the proper locations. Please note that the decals shown in this manual may not exactly match what you have on your machine. Contact your SANY dealer if you have any questions as to meaning and placement.

NOTE: Additional safety or warning decals may be added to your machine if necessary.

Location and Meaning

1. Back-up warning

   - Located on the back/rear of the machine.
   - Informs and warns to stay clear of the machine moving in reverse and/or the upper structure rotates.

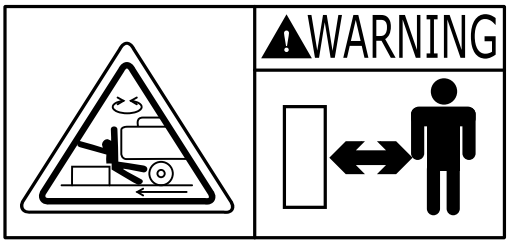

Fig. 2-5

2. Crush Hazard

- Located on either side of the arm, centered between the top and the bottom of the length of the arm.
- Warns against being crushed by the machine arm or objects being lifted. Advises to stay clear of overhead objects and machine components.

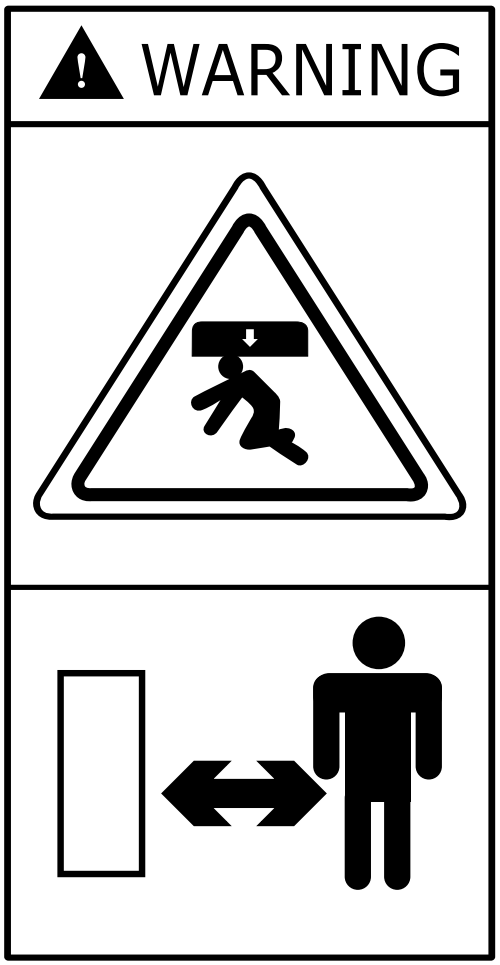

Fig. 2-6

3. Exit

- Located on the inside rear window of the cab, centered toward the top.
- Identifies an emergency exit out the back window.

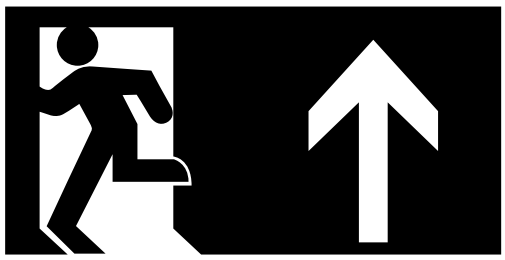

Fig. 2-7

4. Fall warning

    - Located on the deck of the machine near the boom base.
    - Warns personnel against the hazard of falling from the machine. and to stay clear of the edge of the machine.

Fig. 2-8

5. Fan belt warning

    - Located in the engine compartment near the fan belt.
    - Warns to turn the engine off to avoid getting caught in rotating parts.

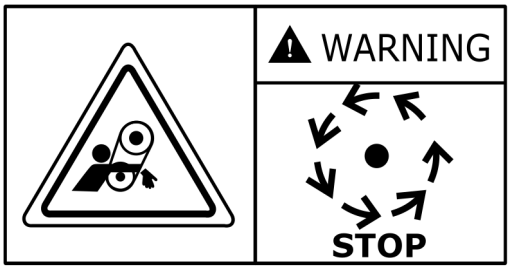

Fig. 2-9

6. Fan warning

    - Located in the engine compartment near the fan belt.
    - Warns about the rotating fan within the engine compartment. Keep hands clear of the fan and all rotating components.

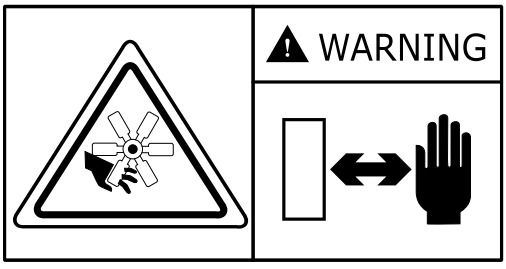

Fig. 2-10

7. Fire extinguisher

   - Located inside the cab on the upper level of the back window.
   - Shows the location of the fire extinguisher on the machine.

Fig. 2-11

8. Front window warning

   - Located on the upper right corner of the front window.
   - Gives warning to make sure the front window is locked in place.

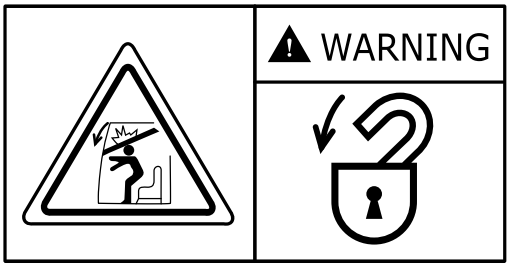

Fig. 2-12

9. Grease point pressure warning

   - Located next to the opening for the track tensioning grease point on either side of the tracks.
   - Warns about grease spraying out under pressure from the track tensioner.

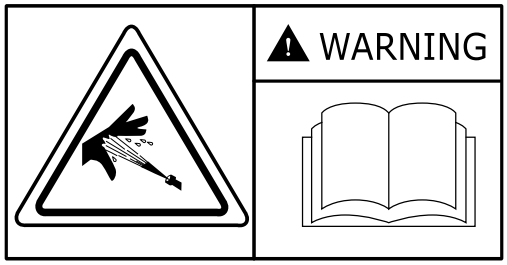

Fig. 2-13

10. High temperature warning

    - Located in the engine compartment near the exhaust piping.
    - Warns about high temperature areas, keep away from hot components and the possibility of burns.

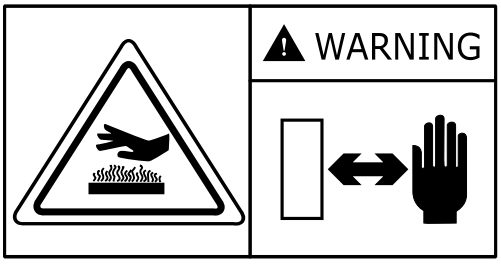

Fig. 2-14

11. High Voltage

    - Located inside the cab on the right side of the operator on the window.
    - Identifies the danger of coming in contact with high voltage electrical wires - stay away.

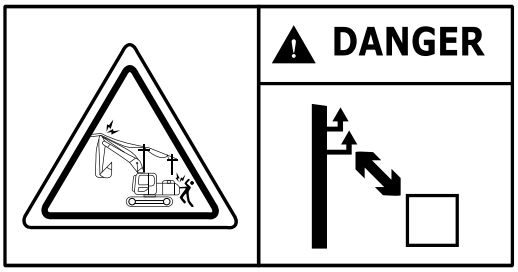

Fig. 2-15

12. No step warning

    - Located on top of the engine hood.
    - Warns against falling off the machine and to not walk or step in this area.

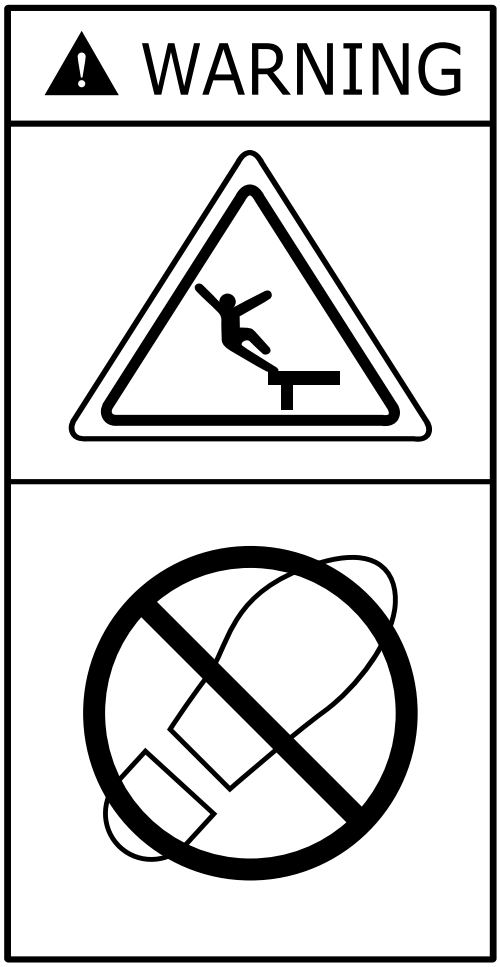

Fig. 2-16

13. One-way two -way valve

- Located near the valve.
- Warns to read the manual before attempting to change the position of the valve.

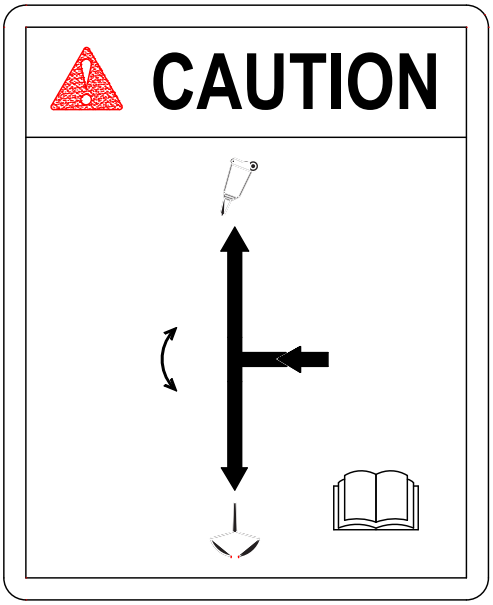

Fig. 2-17

14. Pattern Change

- Located next to the SAE/BHL Selector located behind the left rear access panel.
- Gives guidance on how to switch the machine from SAE to BHL mode. Warns about stopping the engine before switching modes.

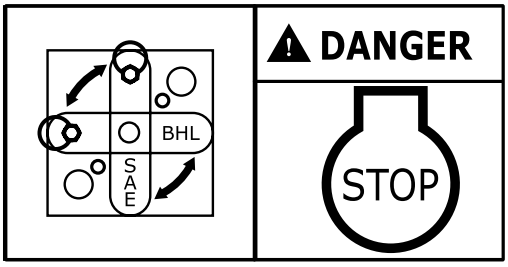

Fig. 2-18

15. Pattern change instruction

- Located inside the cab on the window to the right of the operator.
- Explains how the controls will react in SAE or BHL mode.
- Be sure to know what mode the machine is in before operating to prevent unintended movement.

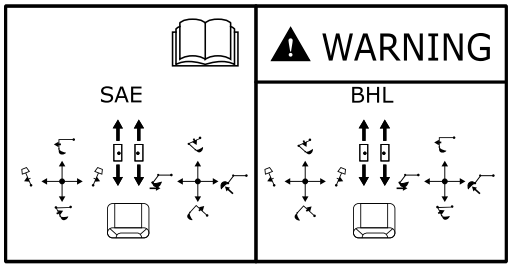

Fig. 2-19

16. Quick coupler caution

    - Located inside the cab on the window to the right of the operator.
    - Cautions against releasing the quick coupler holding the bucket while the bucket is off the ground.

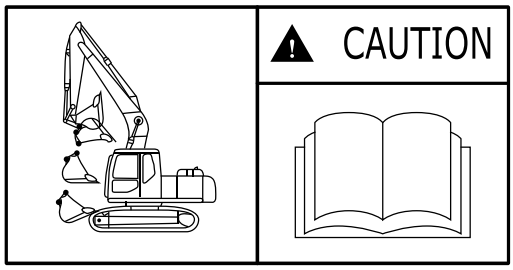

Fig. 2-20

17. Radiator cap warning

    - Located in the engine compartment on the radiator cap.
    - Warns against opening the radiator when it is hot and under pressure.

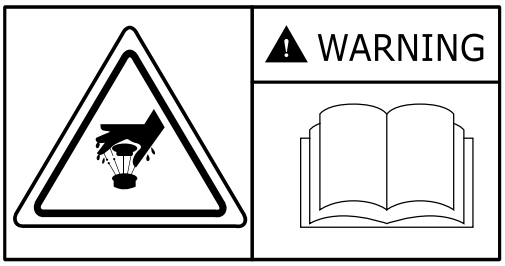

Fig. 2-21

18. Seat belt

    - Located inside the cab on the widow to the right of the operator.
    - Warns to fasten the seat belt before operating the machine.

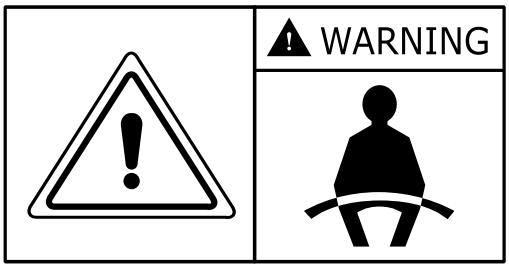

Fig. 2-22

19. Track tension

    - Located on the track frame.
    - Warns to read the manual before attempting to adjust track tension.

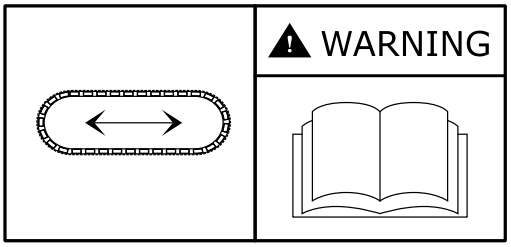

Fig. 2-23

20. Swing bearing grease

    - Located in the front bottom right corner of the cab near the swing bearing.
    - Warns to read the manual before attempting to add grease to the swing bearing.

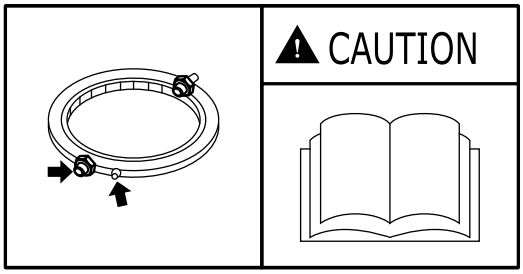

Fig. 2-24

TOW OR LIFT THE MACHINE

injury or death could result if a disabled machine is towed or lifted incorrectly or if there is a mistake in the selection of cable or towing locations. Adhere to the following:

- Use only the designated lift points to lift the machine and designated tow points to tow the machine. Be sure the lift and tow points are undamaged and in good working order.
- Always tow or lift in the direction indicated by the decal. If the decal is missing or damaged, contact your SANY dealer for the proper procedures.
- Always wear leather gloves when handling wire rope.
- During the towing operation, never stand between the towing machine and the machine being towed.
- Never tow a machine on a slope. Never use towing equipment that is damaged, stretched or overstressed.

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SANY

Machine Controls

EXTERIOR COMPONENTS.

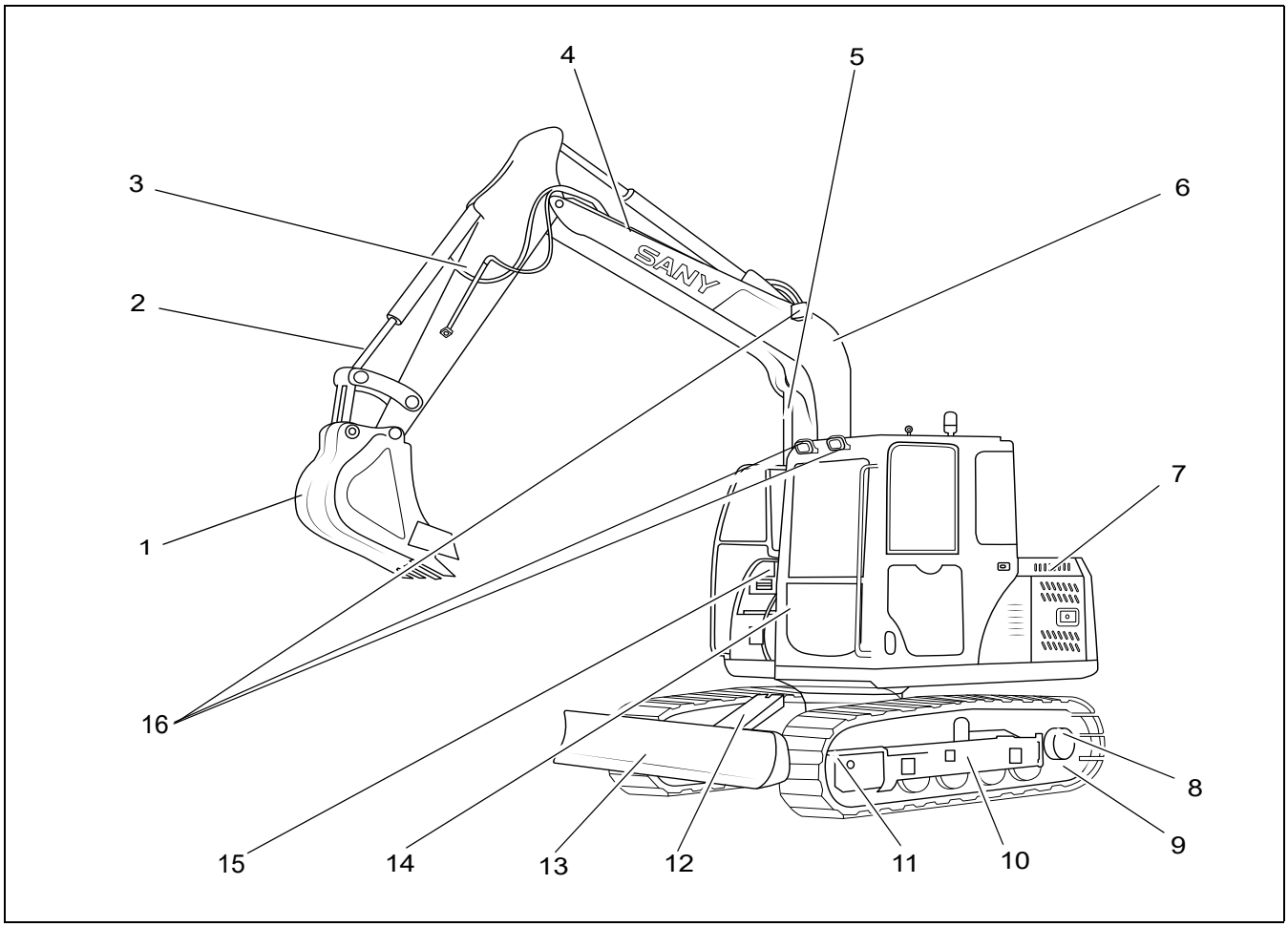

Fig. 3-1

1. Bucket	9. Track shoe
2. Bucket cylinder	10. Track frame
3. Arm	11. Idler
4. Arm cylinder	12. Dozer blade cylinder
5. Boom cylinder	13. Dozer blade
6. Boom	14. Cab
7. Engine compartment	15. Windshield wiper
8. Drive Sprocket	16. Work Lamps

CAB INTERIOR

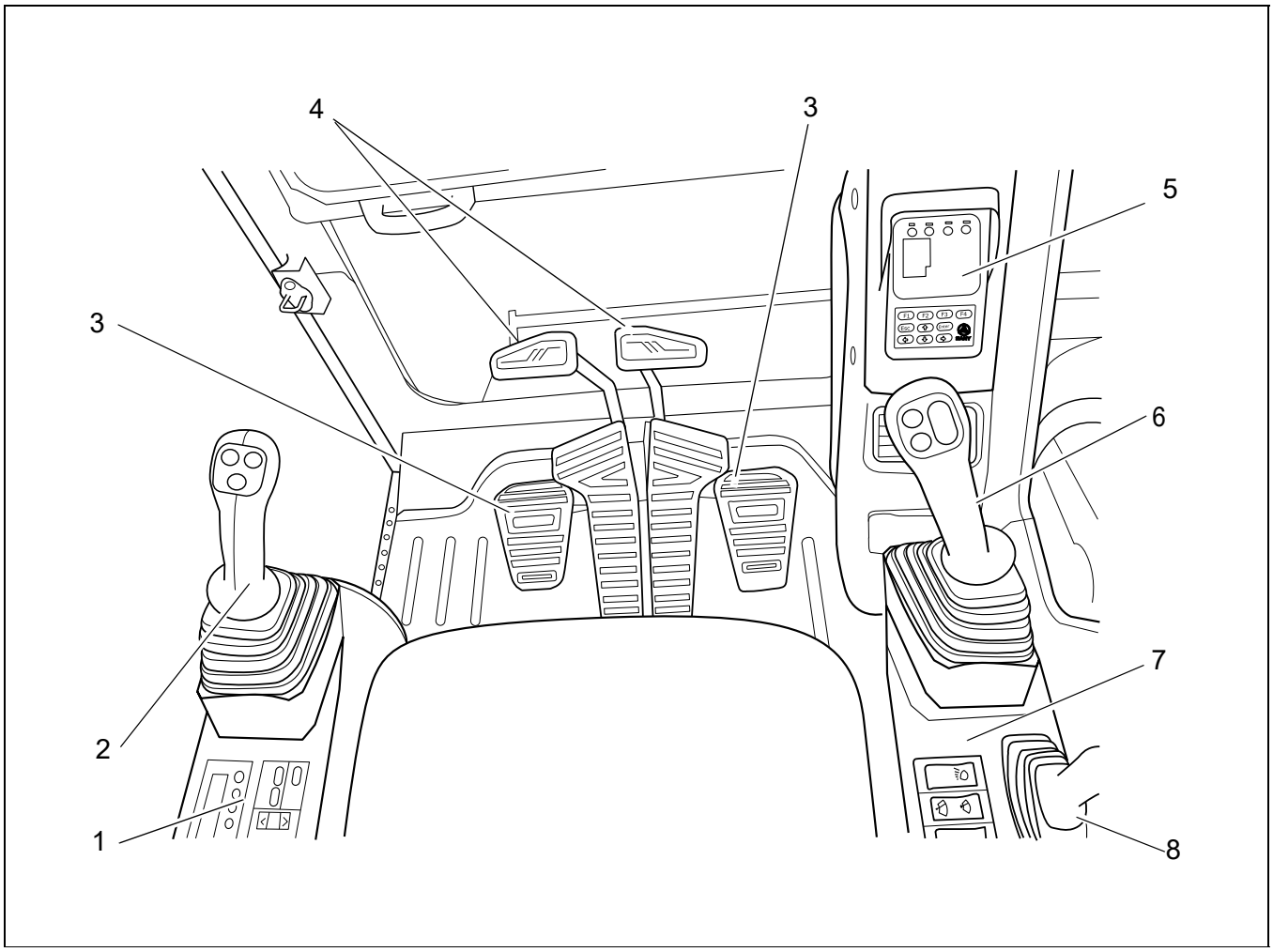

Fig. 3-2

1. Left control console	5. Display
2. Left joystick	6. Right joystick
3. Foot rest	7. Right control console
4. Travel controls	8. Dozer blade control

Seat and Seat Belt

A multi-position, adjustable seat is provided for operator comfort. The front/rear positions, up/down positions, and the front/rear incline angle seat back can be adjusted.

- The headrest (a) can be raised and lowered.
- The seat has two armrests (b).
- A seat belt (c) is provided to keep the operator securely in the operator's seat.
- Slider lever (d) adjusts the seat forward or backward relative to the control consoles.
- The adjusting lever (e) adjusts the seat suspension.
- Weight adjustment knob (f).

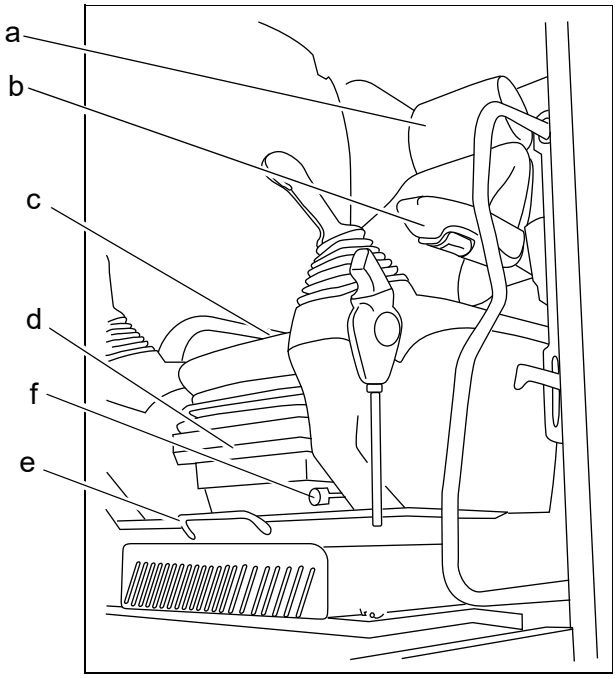

Fig. 3-3

Hydraulic Lockout Control Lever

WARNING!

Always place the hydraulic lockout control lever in the LOCKED position before leaving the operator cab. If this lever is not in the LOCKED position, any unintended movement of the joysticks or travel control levers may cause death or injury.

Avoid moving either joystick or travel control lever when you pull (up) or push (down) the hydraulic lockout control lever. Failure to observe and follow this warning could result in death or injury.

NOTICE!

If any part of the machine moves when the hydraulic lockout control lever is at the LOCKED position, shut down the engine immediately. Failure to do so can result in damage to the machine.

The hydraulic lockout control lever is used to turn off the functions.

- Push the hydraulic lockout control lever down into the LOCKED position. The machine will not move, even if you maneuver the controls.
- Pull the hydraulic lockout control lever up into the UNLOCKED position. The machine will now move in accordance with the joysticks and other control levers.

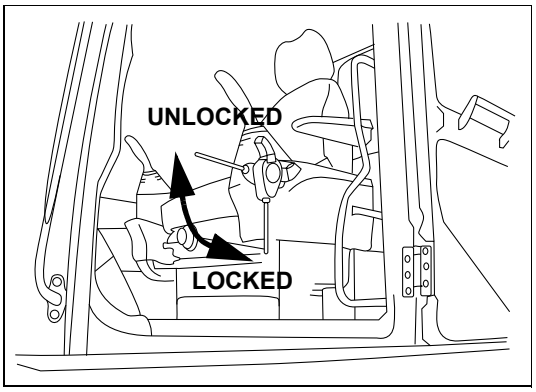

Fig. 3-4

Left Control Console

The left control console is to the left of the operator when seated.

The left control console contains the following items:

- Left joystick (a)
- Hydraulic lockout control (b)
- Radio control panel (c)
- Climate control panel (d)

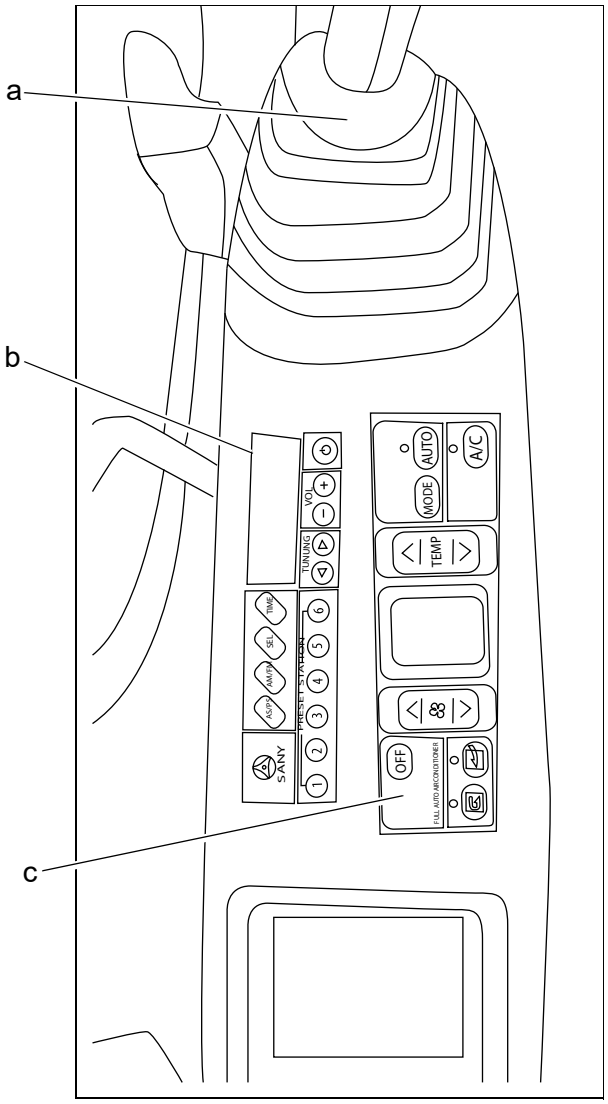

Fig. 3-5

Climate Control Panel

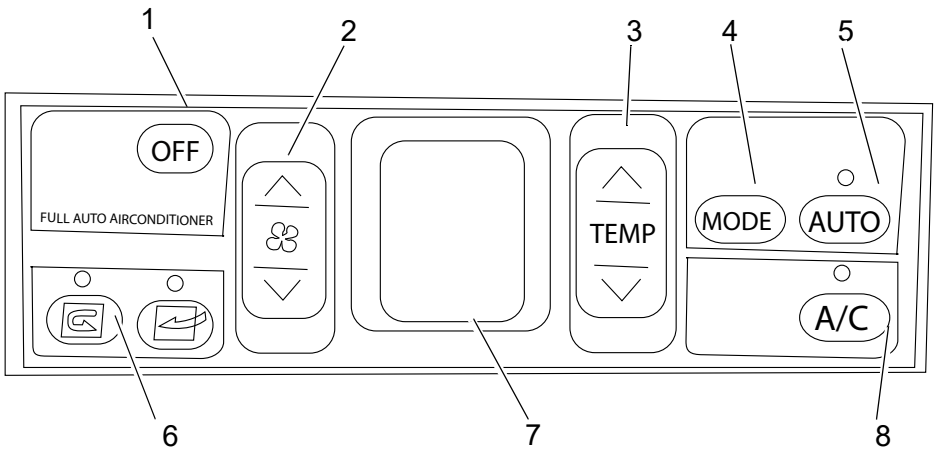

Fig. 3-6

1. OFF	5. Automatic temperature control selection
2. Fan speed control	6. Fresh air/recirculation selection
3. Temperature setup	7. Display screen
4. Vent mode setup	8. A/C On/Off

OFF (1) - Press this key to stop the fan and shut off the display screen (7).

Fan speed control (2) - Press this key to set the fan speed to any of six levels.

Temperature selection (3) - Press this key to set the inside cab temperature between 65° F (18° C) and 90° F (32° C).

NOTE: With the A/C on, press and hold both the up and down arrows for 3 seconds to toggle between Fahrenheit (F) and Celsius (C) temperature display.

Vent mode selection (4) - Press this key to select which vent or vents should be used for air flow inside the cab:

- Windshield vent only
- Upper body vent only
- Upper body and rear window vents
- Foot vent (located under the operator seat), upper body and rear window vents
- Foot vent only
- Windshield and foot vents

Automatic temperature control (5) - Press this key to use the selected fan speed, vent outlets and fresh air/ recirculation mode to automatically maintain the selected temperature.

NOTE: With automatic temperature control selected, the fan HIGH speed will remain on until the selected temperature is reached.

Fresh air/recirculation selection (6) - Press these keys to choose either recirculated air inside the cab or fresh air from outside.

Display screen (7) - Shows the preset temperature, fan speed and vent selection during operation.

A/C power (8) - Press this key to switch the air conditioner compressor either on or off.

Sunlight sensor (a) - Located above the air conditioning duct, adjusts the air flow to match the variation of temperature caused by direct sunlight.

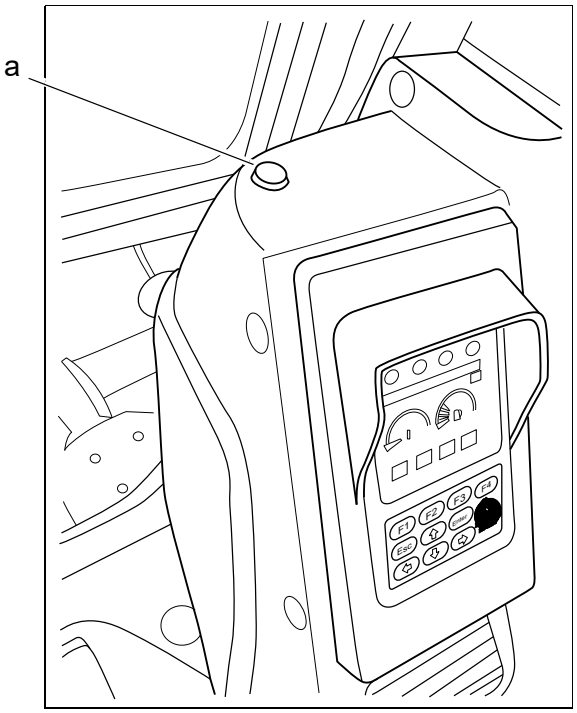

Fig. 3-7

A/C Operation Precautions

NOTICE!

When running the air conditioning system, always start with the engine running at a low speed. Starting the air conditioner when the engine is running at a high speed can result in damage to the machine or cause the machine to operate improperly.

If water gets on the control panel or sunlight sensor, a failure may result. Always keep these components clear and dry. Failure to do so can result in damage to the machine or cause the machine to operate improperly.

"A/C controller failure" will be displayed on the air conditioner display screen if there is a problem with the a/c unit. If this occurs, contact your SANY dealer to investigate and repair it.

Radio Control Panel

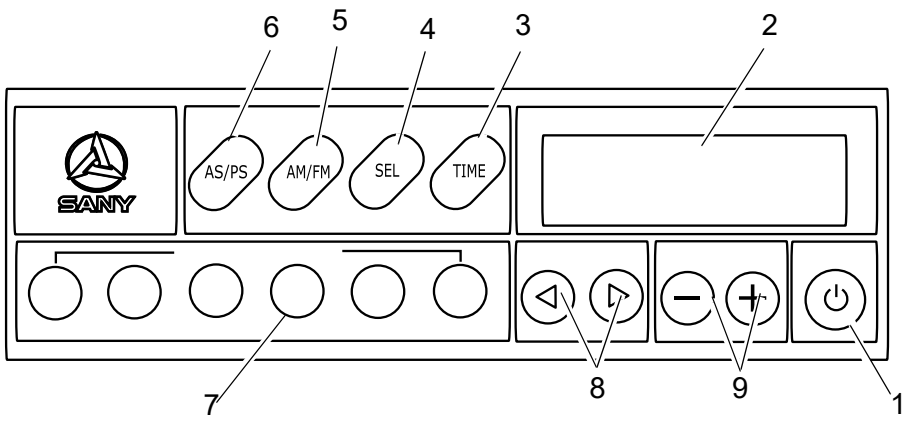

Fig. 3-8

1. Power	6. AS/PS
2. Display screen	7. Preset stations
3. Audio selection	8. Tuning keys
4. Time display	9. Time adjusting keys
5. AM/FM selector	10. Volume control

Power (1) - Press this key to turn on the radio on or off. The currently selected radio station frequency will appear on the display screen when the radio is turned on.

Display screen (2) - The band (either AM or FM), currently tuned radio station frequency, preset station number and current time will be shown on the display screen.

Audio selection (3) - Press this key to adjust the sound quality. Pressing the key at first allows for setting the bass level. Pressing it once more allows for setting the treble, pressing it once more allows for setting the balance (between the in-cab speakers) and pressing it again allows for setting the volume. The current radio station frequency displays if the button is not pressed within 5 seconds.

NOTE: Use the VOL keys to increase and decrease the setting of the selected audio category.

Time display (4) - Press this key to display the local time for 5 seconds. The current radio station frequency displays when the button is not pressed within 5 seconds.

AM/FM selector (5) - Press this key to toggle between AM and FM bands.

AS/PS key (6) - Use this key to automatically scan (AS) through the preset stations (PS) and also to remain at the desired radio station.

NOTE: Pressing the AS/PS key (6) once begins the auto scan feature where each preset station will play for 10 seconds with the station frequency blinking on and off on the display screen. Press the AS/PS key (5) once more to remain on the current station.

Preset Stations (7) - Press and hold any of these six keys to assign the current radio station to that key. Afterwards, press and release any of the keys to select its preselected station. Pressing the ASPS key (5) longer than 2 seconds activates the auto scanning of all preselected stations. The six radio stations with the strongest signal will be stored to the six Preset Station keys (1-6).

Tuning key (8) - Press this key to move either back to the previously set radio station or on to the next previously set radio station.

Time adjusting (9) - Use these keys to set the time:

- H: Hour
- M: Minute
- ADJ: Set to 00 minute

Volume control (10) - Use these keys to set the volume:

- Press the key “+” (10) to increase sound volume.
- Press the key “-” to decrease sound volume.

Right Control Console

The right control console is to the right of the operator when seated. It contains switches, indicator lights, throttle control dial, dozer blade control, and a joystick.

The right control console contains the following items:

- Right joystick (a)
- Dozer blade control (b)
- Indicator lights (c) (not shown)
- Work lamp switch (d)
- Windshield wiper switch (e)
- Windshield washer switch (g)
- Throttle control dial (h)
- Key switch (k)

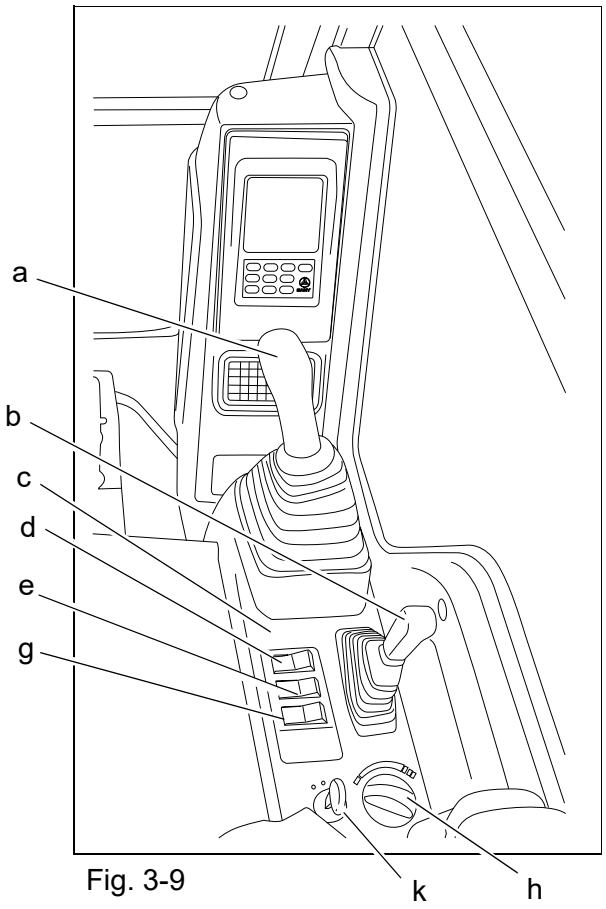

Fig. 3-9

Indicator Lights

Preheat indicator (a) - The preheat indicator is normally off. It will light when the keyswitch is set to the preheat position.

Charging indicator (b) - The charging indicator is normally off to indicate the excavator is free from charging failure. If this light starts to flash frequently there is a system failure and you will need to turn the machine off and notify your SANY dealer.

NOTE: Machines with serial number 15SY0075R0328 going forward do not have indicator lights. Preheat and Charging indications are shown on the monitor.

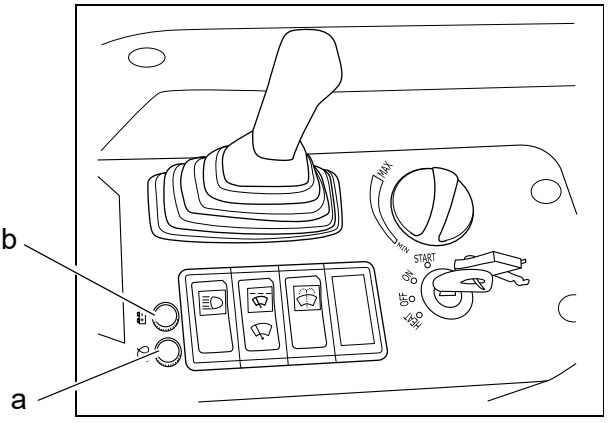

Fig. 3-10

Key Switch

NOTICE!

Except for emergencies, never shut off the engine while it is running at high speed. Stopping the engine at high speed can cause damage to the machine or cause the machine to run improperly.

Key switch (a) is used to activate the following functions:

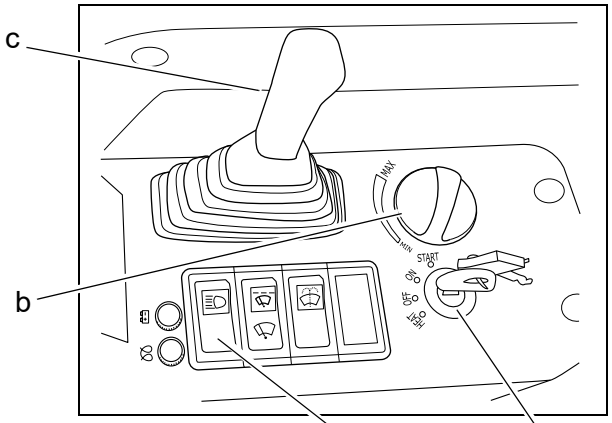

Fig. 3-11

- OFF - This position allows you to insert and remove the key. The engine is shut down (or remains off) and there is no electrical current to any of the electrical system switches (except for work lamps).
- HEAT - Hold the key at this position to preheat the engine for cold-weather starting as required. The key returns to the OFF position when released.
- ON - This position allows the engine to remain running (if already started) and also allows electrical current to all of the various electrical system switches.
- START - Hold the key at this position to start the engine, then immediately release it after the engine has started. The key returns to the ON position when released.

Throttle Control Dial

Throttle control dial (b) is used to adjust engine speed and output power. Turn the dial clockwise to increase speed and counterclockwise to decrease speed.

- Low Idle (MIN): Turn it counterclockwise to the end.
- Full Speed (MAX): Turn it clockwise to the end.

Dozer Blade Control

Dozer blade control (c) is a lever located on the right console. Push the lever forward to lower the dozer blade. Pull the lever backwards to raise the dozer blade.

Work Lamp Switch

Switch (d) is used to turn the work (boom and chassis) lamps on/off.

Windshield Wiper Switch

Switch (a) is used to activate the wiper.

NOTICE!

Ensure that the windshield of the cab is closed before activating the windshield wiper. Damage to the wiper blade, wiper arm or wiper motor may result if the wiper is activated with the windshield open.

Use the windshield washer switch before using the wiper switch on a dry windshield to prevent damaging the wiper blade due to friction.

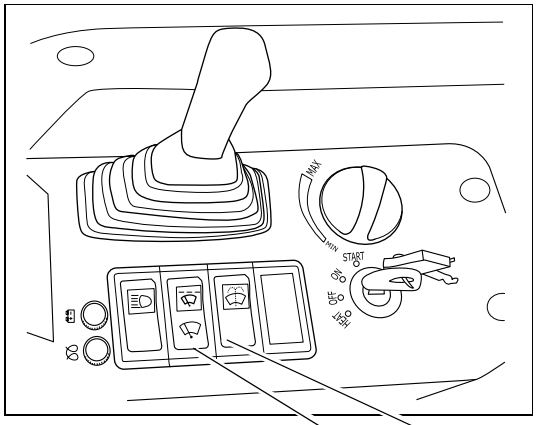

Fig. 3-12

Windshield Washer Switch

Press switch (b) to eject fluid. Hold the switch down to keep ejecting fluid. The flow of fluid stops and the switch returns to its off position when released.

12V Power Supply

This 12 volt socket (a) can be used to charge your mobile phone or other 12 volt items of equipment.

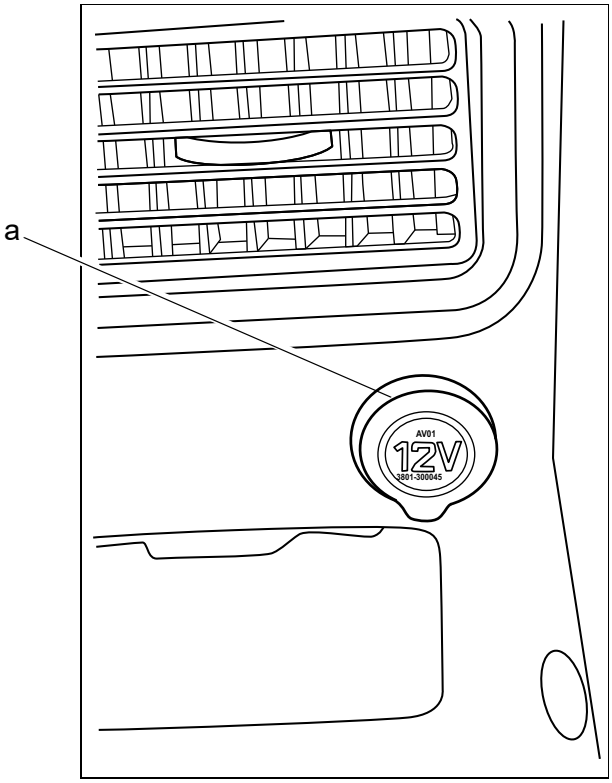

Fig. 3-13

Emergency Stop

There is an emergency stop (a) switch below the right console near the floor. Pull the Emergency Stop switch if necessary to stop the machine in an emergency.

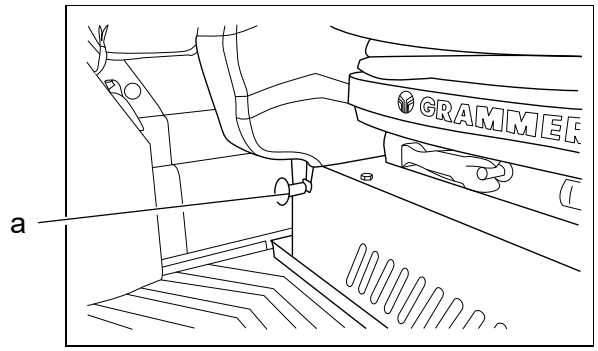

Fig. 3-14

Joystick Controls

WARNING!

Never extend any part of your body outside the operator cab window while the machine is running. Know the positions and functions of each joystick. Failure to observe and follow this warning may cause unexpected movement of the machine which could result in death or injury.

SAE/BHL Joystick Operating Modes

There are two operating modes available for joysticks (a):

- SAE (Society of Automotive Engineers) mode
- BHL (Backhoe Loader) mode

SAE/BHL Selector

NOTICE!

Shut down the engine before adjusting the SAE/BHL selector. Failure to do so can cause damage to the machine, personal property and/or the environment, or cause the machine to operate improperly.

The SAE/BHL selector switch (a) is located on the forward wall inside the left front door.

The SAE/BHL selector (a) changes control of the boom and the arm from one joystick to the other. The position shown is the SAE mode position (b). To change to the BHL position, pull up on the pin and rotate the bar to the right (c). Release the pin to lock the bar in place.

- In SAE (Society of Automotive Engineers) mode, the arm is controlled using the left joystick and the boom using the right joystick.

- In BHL (Backhoe Loader) mode, the arm is controlled using the right joystick and the boom is controlled using the left joystick.

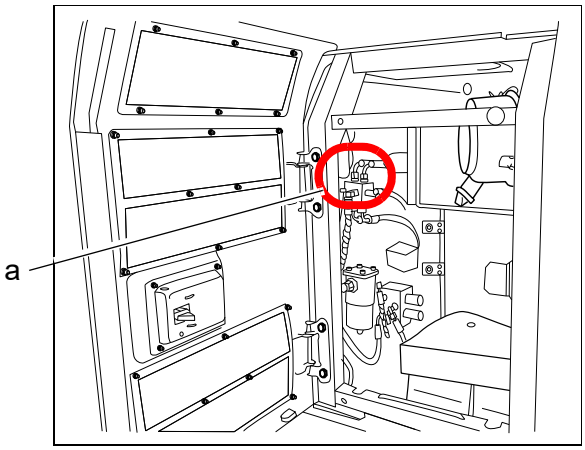

Fig. 3-15

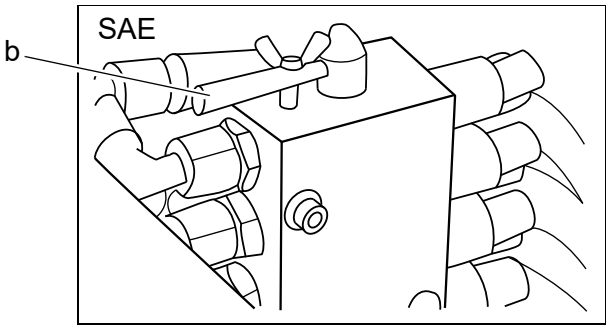

Fig. 3-16

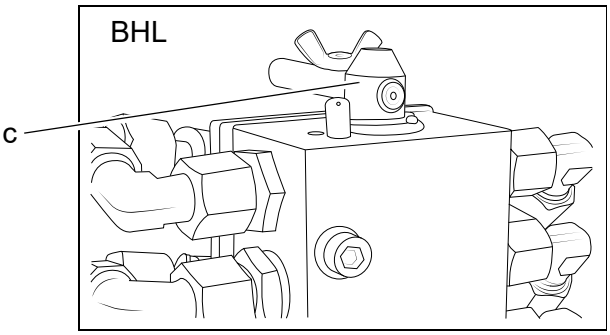

Fig. 3-17

SAE Mode

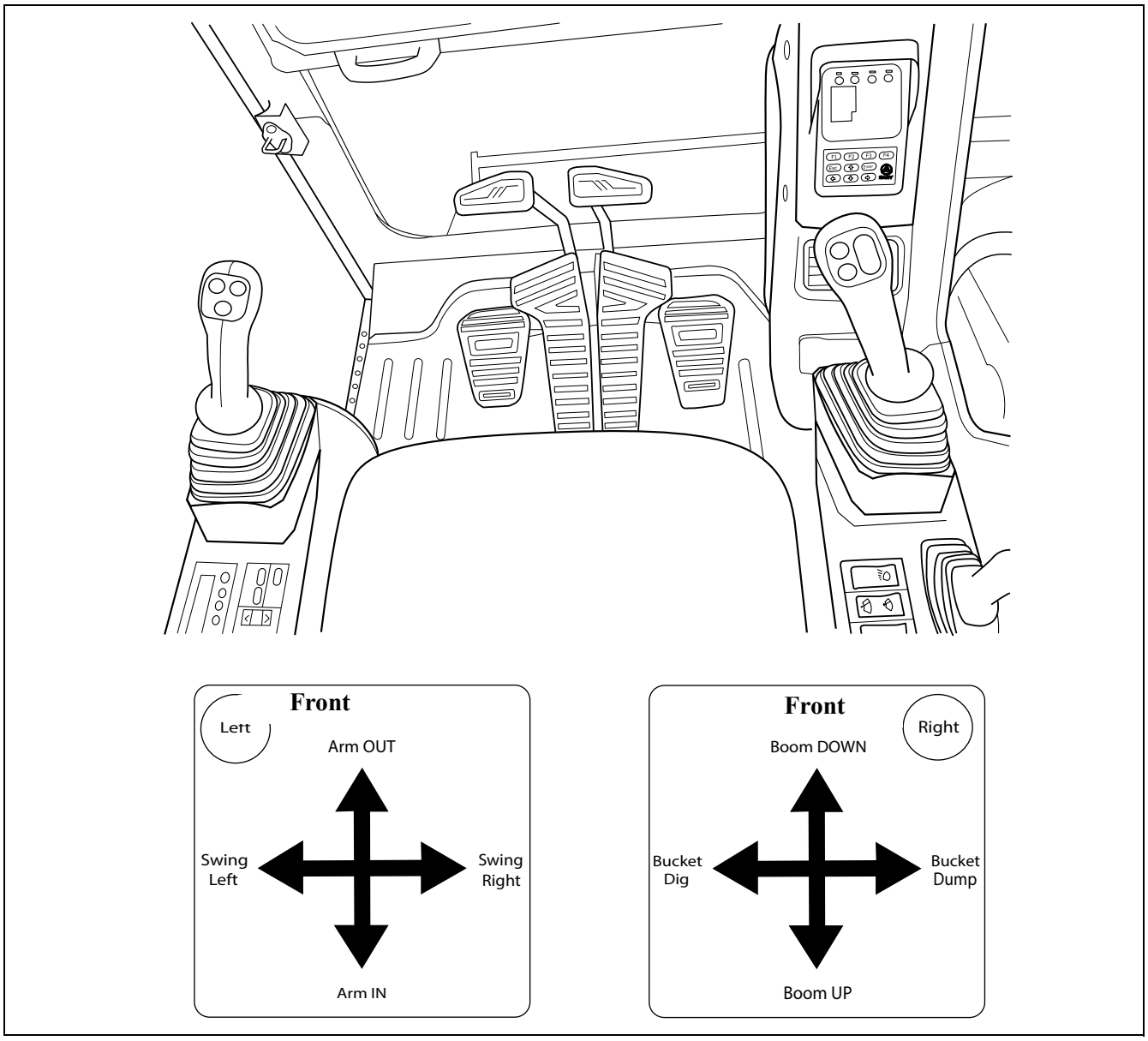

Fig. 3-18

NOTE: When the joystick is released, it returns to neutral and machine movement stops.

BHL Mode

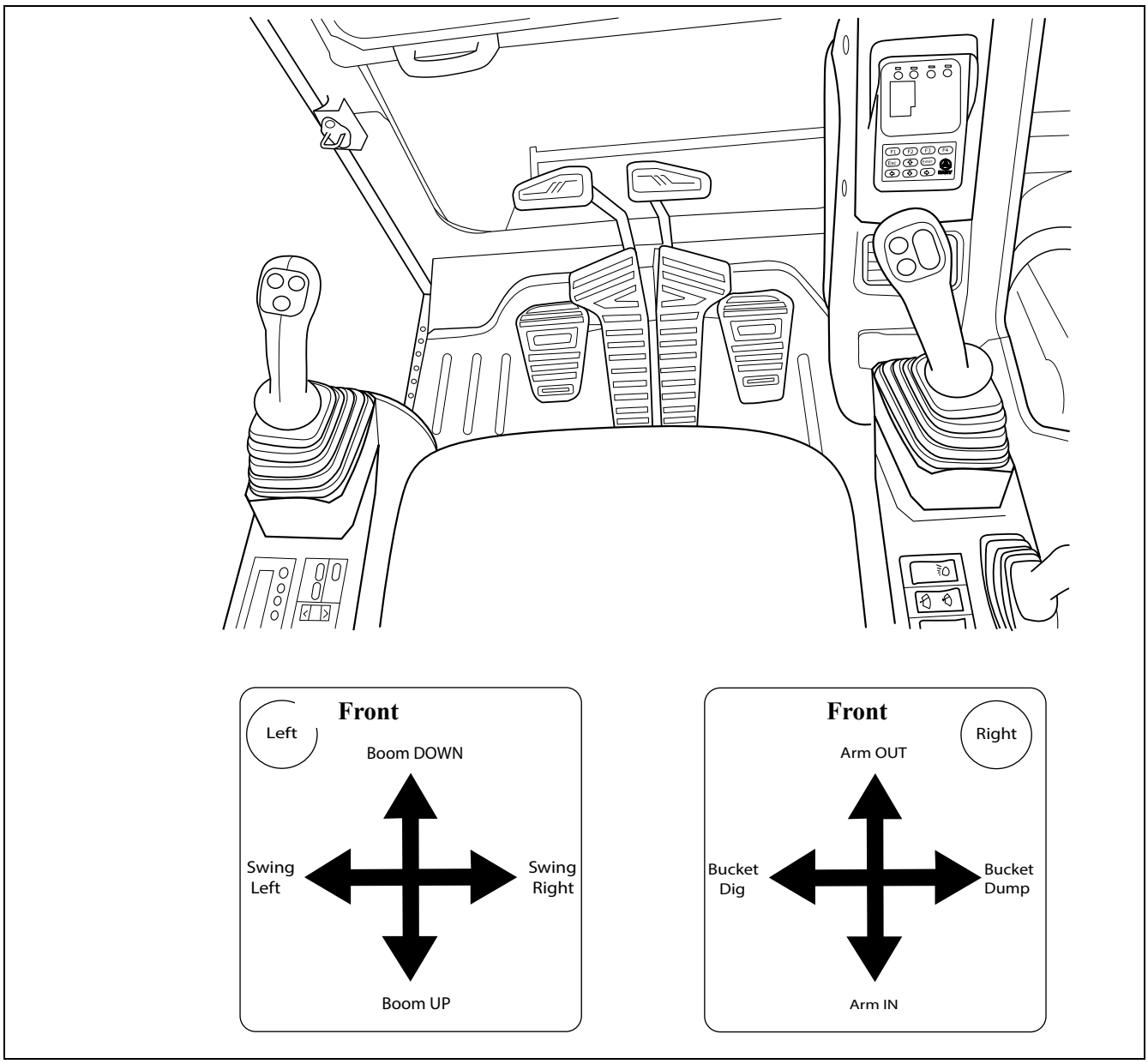

Fig. 3-19

NOTE: When the joystick is released, it returns to neutral and machine movement stops.

Left Joystick Buttons

The left joystick contains two buttons which are being reserved for future use.

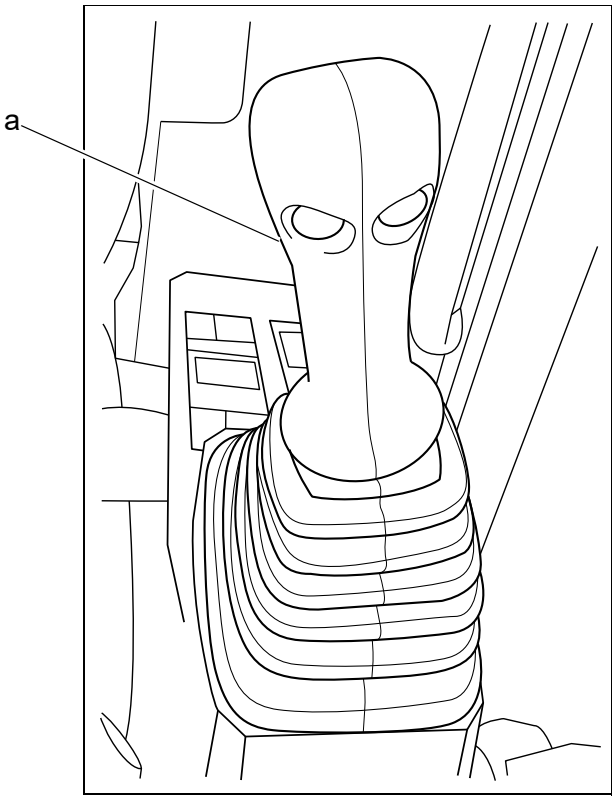

Fig. 3-20

NOTE: Starting with serial number 15SY0075R0618 left joystick (a) has been replaced with a different joystick (b). Button functionality has not changed, none of the buttons are operational.

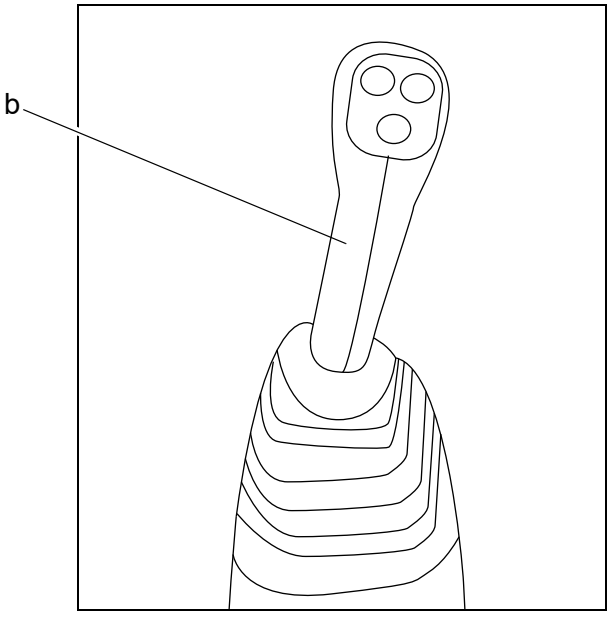

Fig. 3-21

Right Joystick Buttons

The right joystick contains two buttons:

- Button (a) activates the horn.
- Button (b) is a spare and is not used.

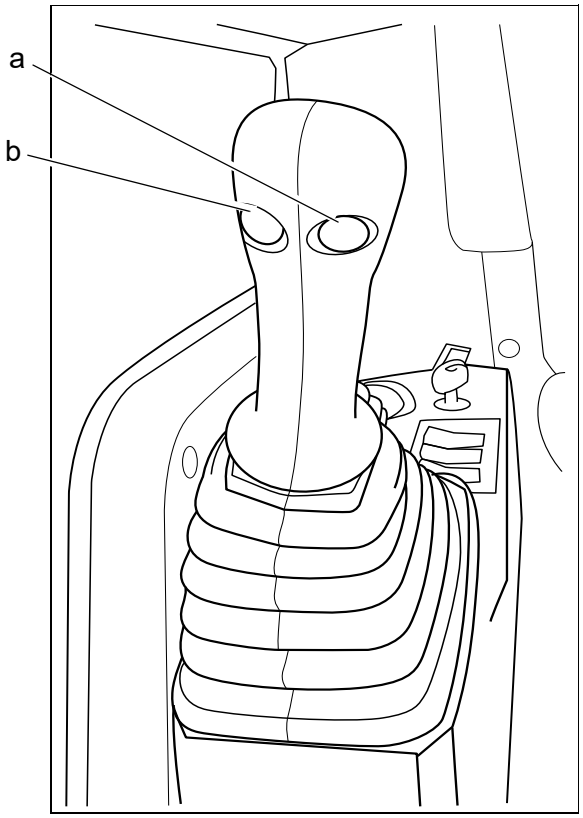

Fig. 3-22

NOTE: Starting with serial number 15SY0075R0618 right joystick has been replaced with a different joystick (c). Button (d) activates the horn, button (e) is not operational, and button (f) is used to control optional equipment.

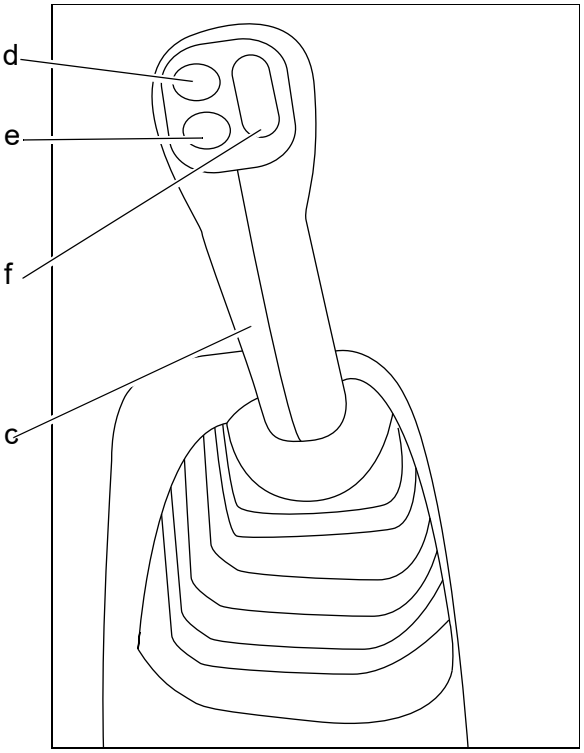

Fig. 3-23

Travel Controls

WARNING!

Take extra care when using the pedals to steer the machine. Never rest your foot on a pedal unless you are driving or steering the machine. Failure to observe and follow this warning could cause an unexpected movement of the machine which could result in death or injury.

WARNING!

The center of gravity position and boom length is different on machines with a long arm. Take extra care when traveling with this machine and be aware of the extra clearances needed when turning the machine and operating a long arm. Failure to do so could result in death or injury.

Always note the following before operating the travel controls:

- Directional arrow (a) on each of the two track frames indicates the forward direction of the lower structure. Check these arrows before using the travel control levers. When possible, face the cab in this direction.
- When the cab faces backward, the travel direction will be the reverse of the figure shown here. (Machine moves forward when you pull control levers and backward when you push them.)

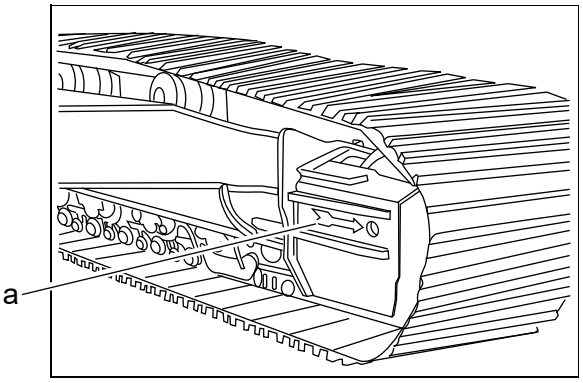

Fig. 3-24

The steering controls consist of the following:

- Steering control levers (b)
- Steering control pedals (c)

NOTE: Footrests (d) is not a control device.

NOTE: When a steering control lever or joystick is released, it returns to neutral position and machine movement stops.

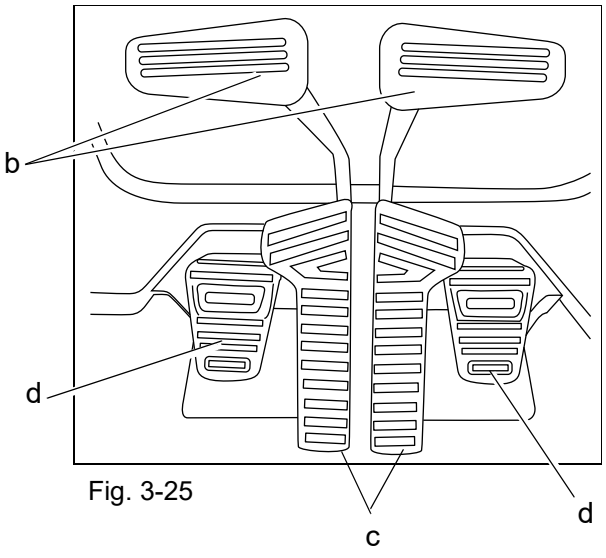

Fig. 3-25

The travel control levers and pedals are used to change travel direction of the machine:

- Forward travel (1) - Push the control lever (pedal tilts forward).
- Backward travel (2) - Pull the control lever (pedal tilts backward).
- Neutral Position (N) - Machine stops.

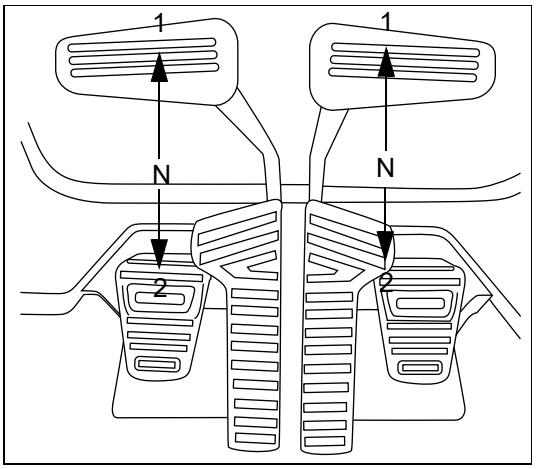

Fig. 3-26

Auto Deceleration Function

The auto deceleration function automatically activates when the machine engine is started and acts to reduce fuel consumption and noise levels.

With the engine running, the auto deceleration function works as described below:

- If the joysticks and travel controls remain in their neutral positions for at least 5 seconds, the engine speed drops from the current speed to the factory set auto idle speed (approximately 1,350 ±50 rpm).

NOTE: If the engine speed is set to below the factory set auto idle speed, the auto deceleration function will not change the engine speed.

- If either of the joysticks or travel controls are operated or the throttle control dial is adjusted while the engine is at the lower, factory-set auto idle speed, the engine speed automatically returns to its higher, previously set level or the newly set level.
- If the engine is shut down and then restarted, the auto deceleration function is automatically re-activated.

Fuses

The fuses are located in the cab behind the operators seat behind panel (a).

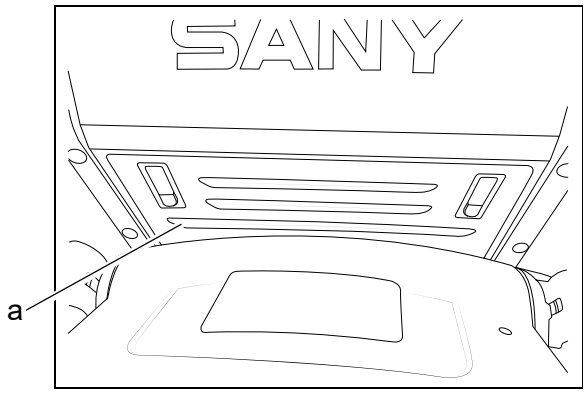

Fig. 3-27

Open the panel to access fuses (b).

Fuse Locations, Circuits and Ratings	
F2. Charging circuit, 20A	F1. Starting Circuit, 20A
F4. Work lamp, 30A	F3. Horn, cab lamp, access lamp, 10A
F6. Wiper, washer, speaker, 10A	F5. GPS, 10A
F8. A/C control, 5A	F7. 12V Power supply, 15A
F10. A/C fan, 15A	F9. Travel and swing alarm, 10A
F12. A/C Compressor, 10A	F11. Cab rear light, 10A
F14. Monitor controller, 15A	F13.Power converter, 15A
F16. Solenoid, 20A	

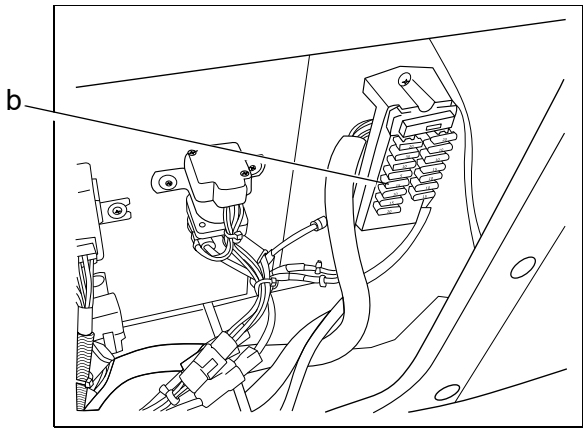

Fig. 3-28

NOTICE!

When performing a battery disconnect, wait for at least one full minute before disconnecting the battery so the machine ECM can complete the shutdown procedure.

Before replacing a fuse, make sure that the key switch is in the OFF position and the batteries disconnected.

Always replace a fuse with one of the same capacity. Never replace a fuse with one of a higher capacity.

Failure to observe and follow this notice can result in damage to the machine or cause the machine to operate improperly.

MONITOR

When the key switch is turned to the ON position, the monitor is energized. A display of the monitor home screen is shown below:

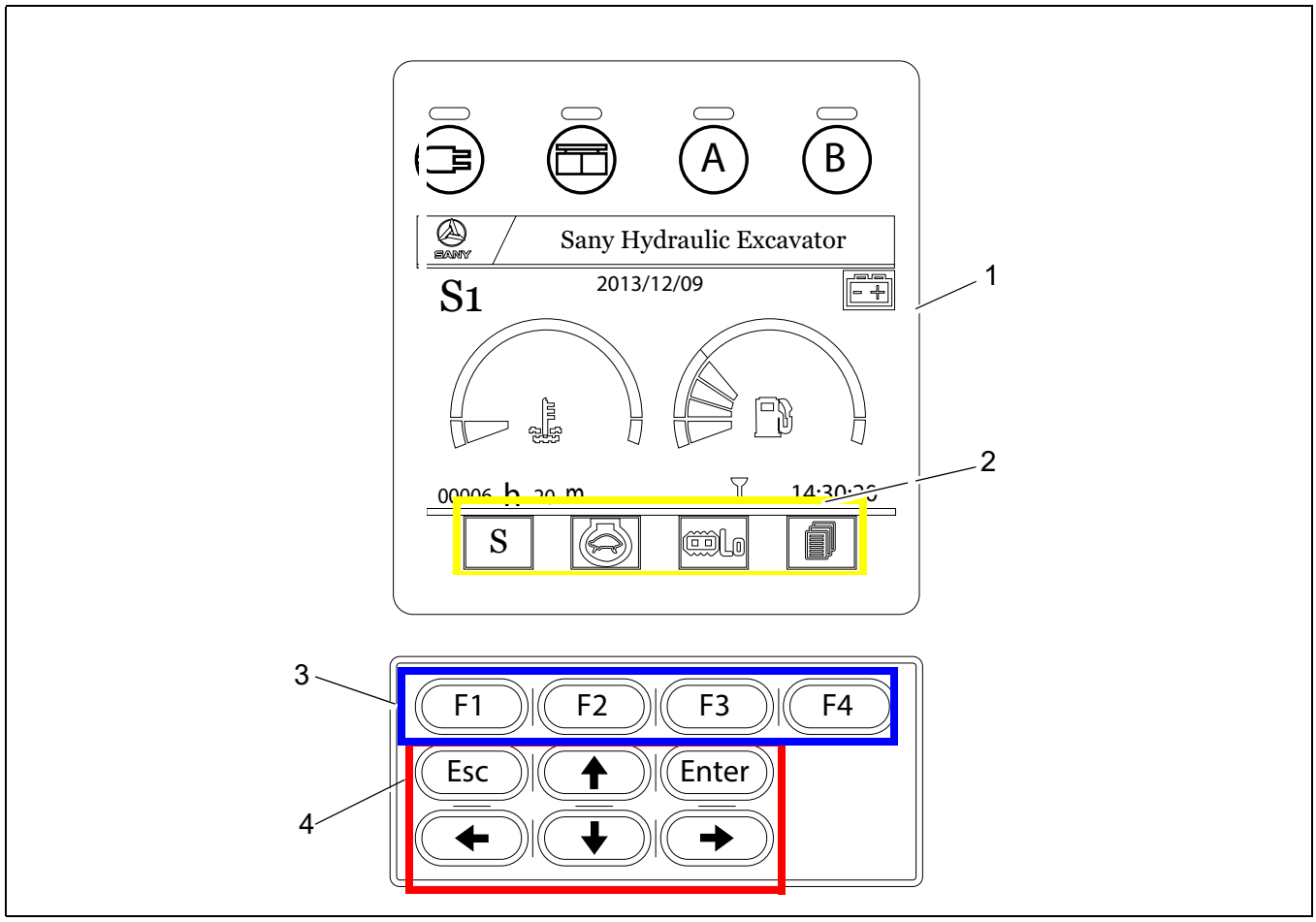

Fig. 3-29

1. LCD display	3. Function keys
2. Function icons	4. Navigation keys

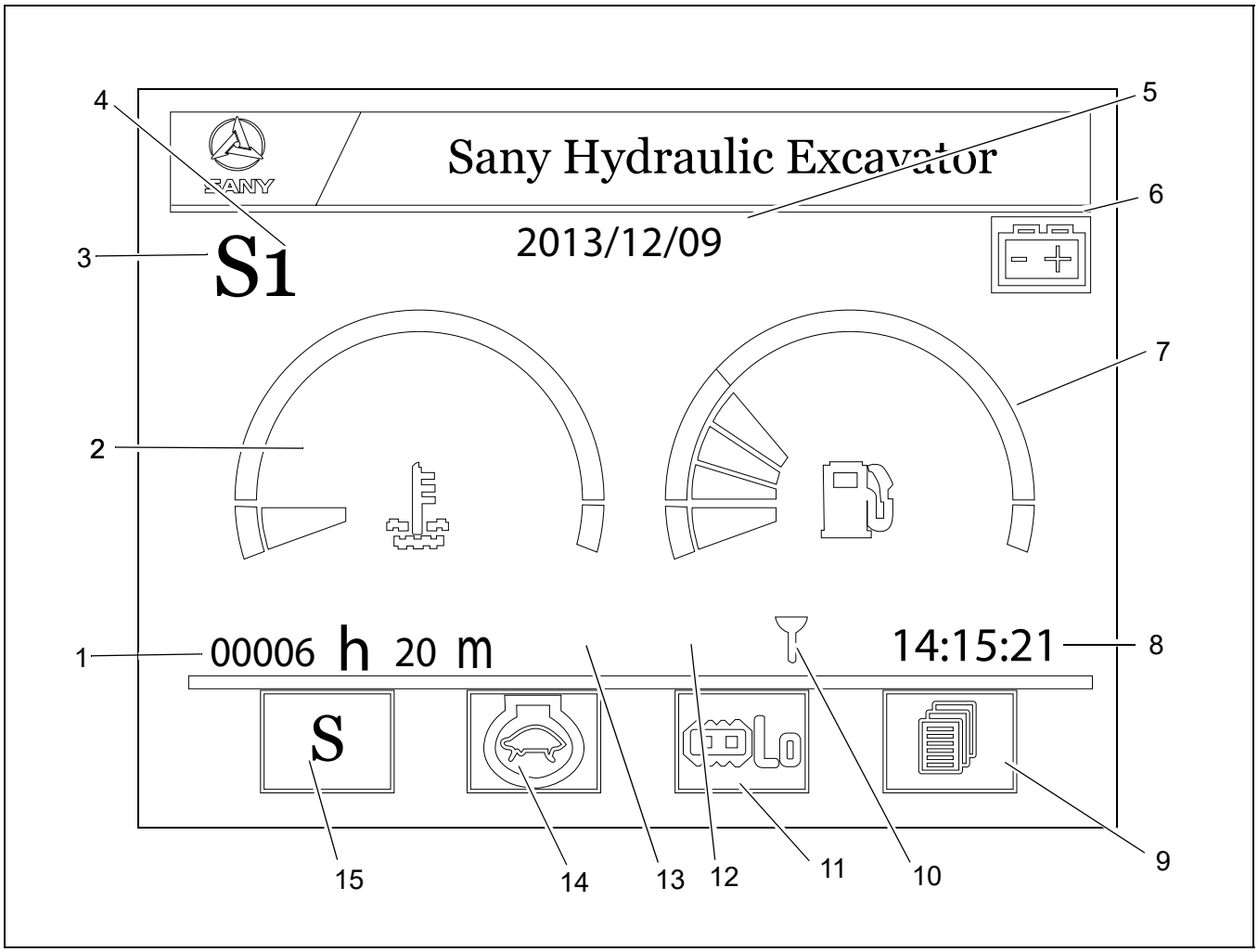

Fig. 3-30

1. Total service hours	9. System information (F4)
2. Coolant temperature	10. GPS signal indicator
3. Working mode	11. High/Low speed shift (F3)
4. Throttle position prompt (location)	12. Maintenance prompt (location)
5. Local date	13. Fault code (location)
6. Battery indicator	14. Auto deceleration function - Off/On (F2)
7. Fuel level	15. Working mode (F1)
8. Local time	

Screen Displays

Main Operator Screen

This is the default screen after the machine has been started:

- •Working mode: S
- •Auto deceleration: Off
- •Travel speed (high/low): Low
- •Fuel: shows current level
- •Coolant temperature: low

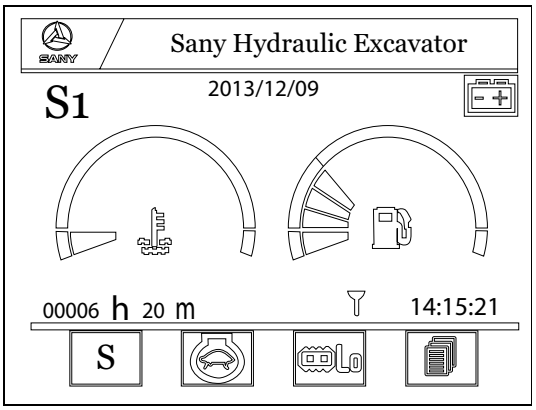

Fig. 3-31

Press F1 to cycle through the three working modes S, L, and B.

Press F2 to toggle the Automatic Deceleration Function ON and OFF.

Press F3 to toggle between the low and high travel modes.

Press F4 to display the Password screen.

Press the down arrow key to display the Failure Codes screen when a code is shown.

Press the up arrow key to display the Service Call screen.

Press the right arrow key to display a maintenance screen only when the maintenance icon is displayed.

Password Screen

Enter the password before accessing the system information screens. Attempting to display any screen other than the Failure Codes screen will display the Password screen.

Each digit is indicated by an asterisk (*) standing for a value from 0 to 9. A number appears at the digit where the cursor is located, while the other four digits remain as asterisks.

Press the up or down arrow to increase/decrease the number displayed.

Press the right or left arrow to move between positions.

Press Enter or F3 to enter the password into the system.

Press F4 to return to the previous screen.

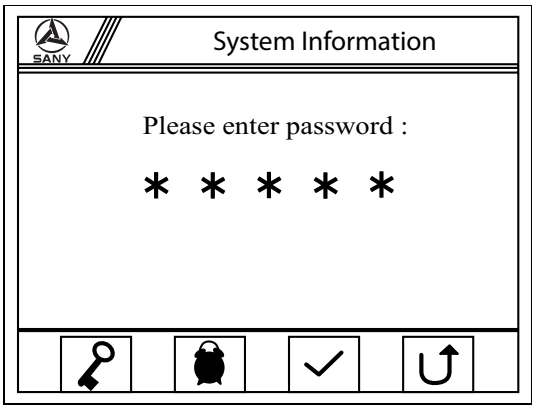

Fig. 3-32

Main Menu Screen

Once the password is entered Main Menu displays. The options includes:

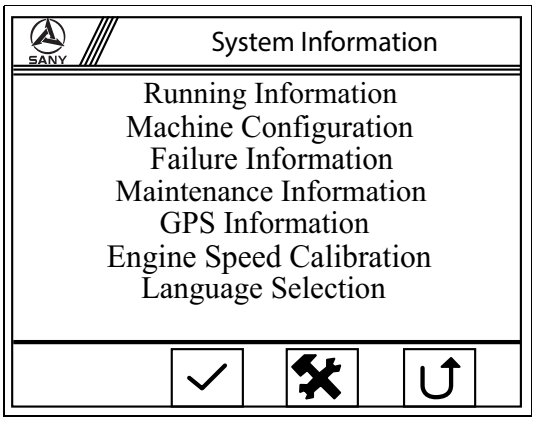

Fig. 3-33

- Running Information
- Machine Configuration
- Failure Information
- Maintenance Information
- GPS Information
- Engine Speed Calibration
- Language Selection

Press the up or down arrows to scroll through the list of display options.

Press F2 or Enter to select the highlighted option and displays the corresponding screen.

Press F3 to display the System Set Up screen.

Press F4 to display the Main Operator screen.

Details of each of the displays follow.

Running Information Screens

There are two separate Running Information screens; the Engine and Throttle Signals and the Switch Signals screen. To toggle between these screens press F1 or press the up or down arrows.

Engine and Throttle Signals Screen

The Engine Signals screen displays:

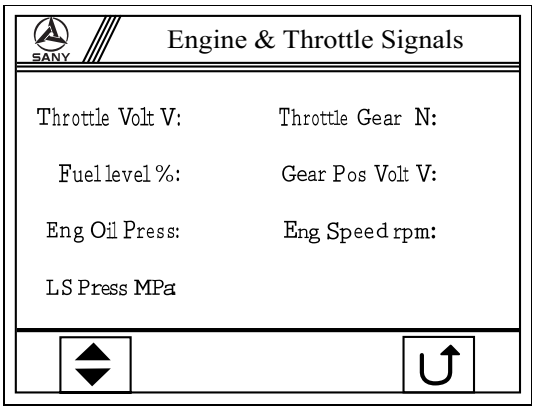

Fig. 3-34

- Throttle Volt V- Displayed volts
- Fuel level%- Displayed as% full
- Engine oil press- Pressure displayed in PSI or Kg depending on settings made on the Unit Selection screen.
- LS Press MPa - Load sensing pressure displayed in MPa.
- Throttle Gear N - Throttle setting from 1 to 11
- Gear Pos Volt- Displayed in volts

- Eng Speed - Displayed in rpm

Press F1 or the up or down arrows to toggle between this and the Switch Signals screens.

Press F4 to display the main operator screen.

Switch Signals Screen

The Switch Signals screen displays:

- Start Input
- Air Cleaner Plugged
- Shutdown Input
- Hi/Lo Speed Input
- Start Output
- Preheat Output
- Shutdown Output
- Hi/Lo Speed Output

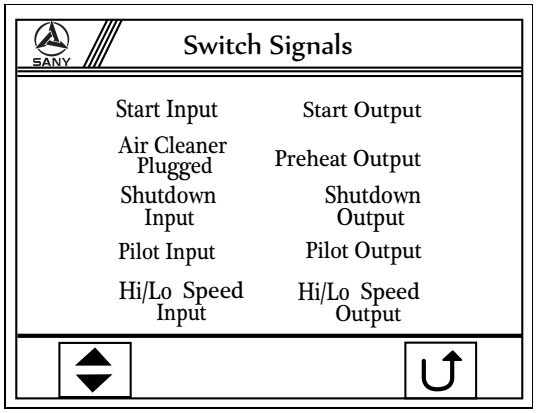

Fig. 3-35

Press F1 or the up or down arrows to cycle through the running parameter screens.

Press F4 to display the main operator screen.

Machine Configuration Screen

The Machine Configuration screen displays:

- Machine Model
- Machine S/N
- Control System

Press F4 to display the main operator screen.

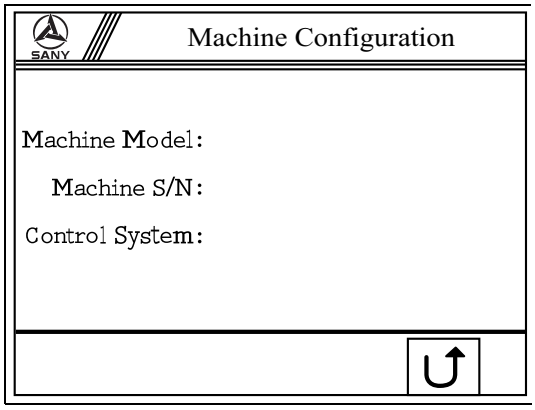

Fig. 3-36

Failure Codes Screen

The Failure Codes screen displays the seven failure codes that could display:

- E201 Voltage low
- E202 Voltage high
- P101 Engine oil pressure low
- P104 Engine racing
- P301 Coolant temperature high (clean radiator)
- P401 Fuel level low
- P501 Air cleaner plugged (replace air filter)

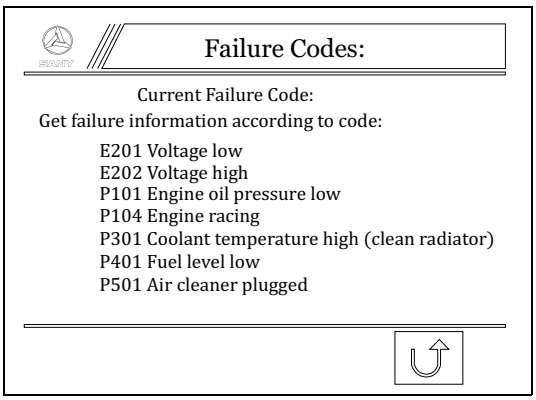

Fig. 3-37

Press F4 to display the main operator screen.

Maintenance Information Screens

The machine maintenance system has a pop up notice that will display during start-up when scheduled maintenance is required. The pop up block will disappear after one minute. The popup will not display during operation.

There are six Maintenance Information screens, one each for the six maintenance intervals (Daily, 50 Hours, 250 Hours, 500 Hours, 1000 Hours and 2000 Hours of service) that list the scheduled maintenance procedures on the maintenance information screens.

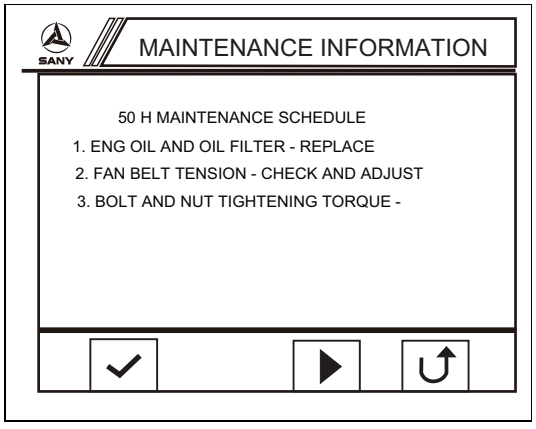

Fig. 3-38

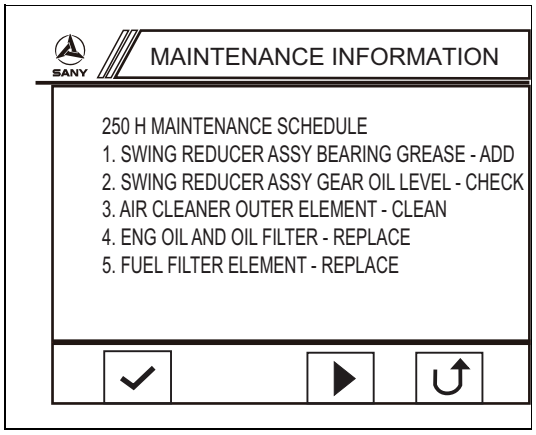

Fig. 3-39

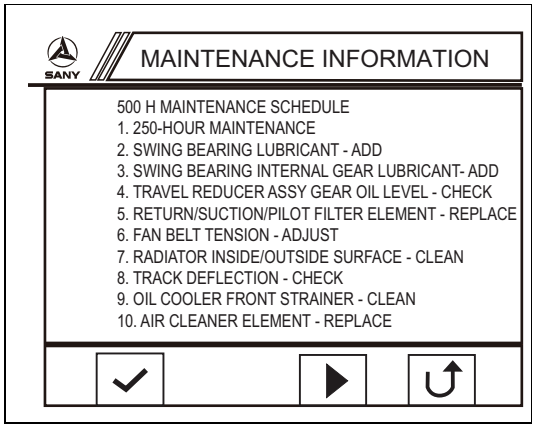

Fig. 3-40

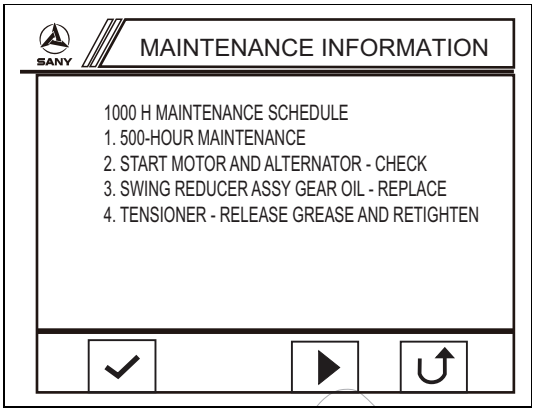

Fig. 3-41

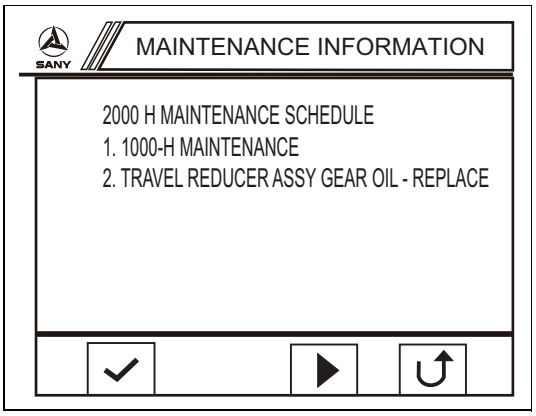

Fig. 3-42

GPS Information Screen

NOTE: This system may or may not be active on your machine.

The GPS Information screen displays:

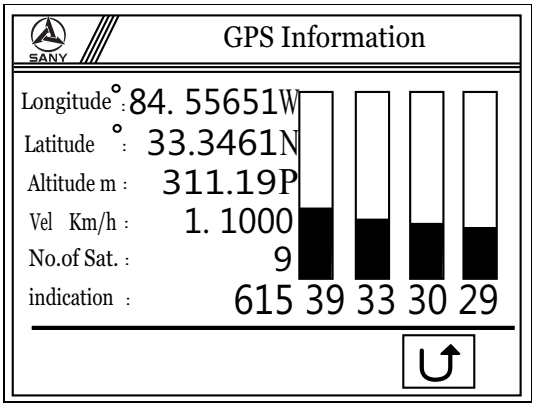

Fig. 3-43

- Longitude - E indicates for east of the prime meridian and W indicates west of the prime meridian
- Latitude - N indicates north of the equator and S indicates south of the equator
- Altitude - P indicates above sea level and N indicates below sea level
- The bars and numbers indicate the signal to noise ratio 0-99
- Velocity in Km/h - Speed
- No. of Sat. - Number of satellites the system is receiving
- Indication - Displays 1023 when GPS is normal and 615 when GPS is abnormal

Press F4 to display the main operator screen.

NOTE: When the altitude display is not zero and both the longitude and latitude display 0 the system is processing the signals to provide a precise location.

NOTE: When Indication changes to 0 from 7, it means that there is a connection loss in the SIM card or the antenna may be inoperative. When the Indication changes to 0 from 15, it means that the GPS service is not available, the SIM card replacement is overdue, or the GPS system is inoperative.
When the Indication changes to 0 from 31, it means that the monitoring system is inoperative.

Language Selection Screen

The Language Selection screen displays the available languages.

Press F1 to set the system to Chinese.

Press F2 to set the system to English.

Press F4 to display the main operator screen.

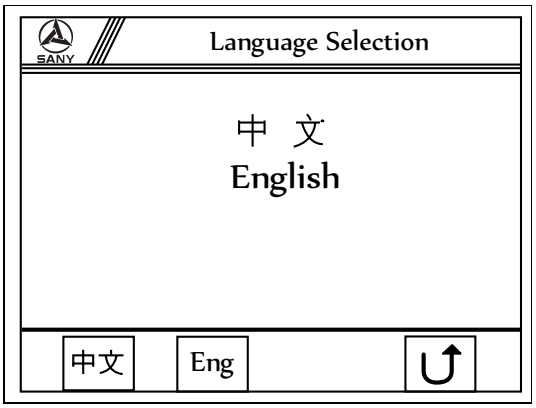

Fig. 3-44

Date and Time Setup Screen

The Date and Time Setup screen displays the current date and time.

Press the up and down arrows to change the digits shown in the display.

Press the right and left arrows to move between positions.

Press F3 or Enter to accept the information inputted.

Press F4 to display the Main Menu.

NOTE: User entered time will be corrected by GPS.

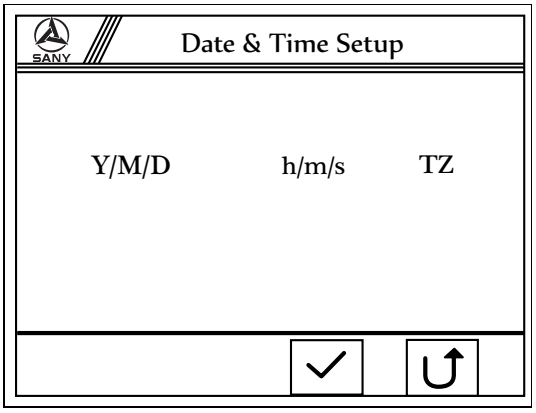

Fig. 3-45

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SANY

Machine Operation

WORK AREA

The “work area” is where the actual job function is being performed. Included within the work area are “hazard areas”, that is, areas immediately surrounding the machine where personnel may be at risk due to machine operation or movement.

WARNING!

Do not move the machine onto a surface or area that has not been approved for the machine. The machine is heavy and could possibly break through surfaces that are not strong enough to support the machine. Failure to observe and follow this warning could result in death or injury.

Those within the work area must wear personal protective equipment.

The safety of all personnel within the hazard area is the responsibility of the machine operator.

General Job Safety

NOTE: See “Job Safety” on page 2-6.

WORK CREW

Operator

Operator responsibilities include but are not limited to:

- Reject the work site if they have doubts regarding safety.
- Become familiar with the work area and surroundings before beginning work.
- Read and completely understand the instructions in this manual prior to operation.
- Know and obey the operating procedures, relevant laws and regulations.
- Know and follow the requirements for safe operation.
- Know and use the required safety precautions and protective devices.
- Know basic information about the systems of this machine.
- Know and use the correct hand signals between the machine operator and a signal person.
- Stop machine operations in case any defects endangering safety are found.
- The operator must control the machine to protect the personnel or other facilities in the vicinity of the machine.
- Ensure that all control devices are set to neutral or idle position before supplying power to the drive components.
- Ensure that the control devices are set to neutral or idle position and the power supply is shut off before leaving the operator cab.
- The operator must give warning signals when necessary.
- The operator must be use personal protective equipment.
- Always wear the seat belt when operating the machine.

NEW MACHINE RUN-IN

Your machine has been thoroughly adjusted and tested before shipment. However, initial operation of the machine under severe conditions can adversely affect the performance of the machine or shorten the machine life. Therefore, SANY recommends that you allow a run-in period of 100 operating hours for a new machine.

Properly running in a new machine is crucial for guaranteeing a long service life of the machine by allowing time for new cylinder piston rings and other internal engine parts to wear in properly. Ensure that the machine is in a normal working condition before proceeding with the running-in.

Refer to the applicable engine manual for details on running-in the engine.

The following points are not limitations but instead guidelines for the machine running-in period:

- Operate as much as possible in the half to three-quarters throttle or load range.
- Keep the engine speed at or near idle until the engine reaches its normal operating temperature.
- Avoid long periods of operation with the engine at idle or continuous maximum horsepower levels.
- Avoid sudden starts, movements or stops.
- Manage engine power to a point that allows acceleration to governed speed when conditions require more power. Do not over rev the engine.
- Monitor the instruments frequently — especially the engine oil and coolant pressures. Shut down the machine at the first indication of an abnormal reading.
- Shift down to a lower speed setting before climbing up a slope to keep the engine speed elevated.
- Check all components frequently for proper operation, unusual noises, and excessive heating.
- Frequently check all operating temperatures. Determine the cause if overheating occurs and perform adjustments or repairs immediately.
- Always let the system cool down before turning off the engine at the end of the working day.
- Frequently check the bolts and screws for tightness.
- After running-in has been completed, check “Track Bolts - Check” on page 5-86, “Top Roller Bolts - Check” on page 5-85, and “Track Tension - Check and Adjust” on page 5-86.

PRE-START CHECKS

CAUTION!

Perform this inspection and have needed issues resolved before operation. Failure to observe and follow this caution could result in minor or moderate injury.

Always complete a walk-around visual inspection of the machine with special attention to structural damage, loose equipment, leaks or other conditions that require immediate correction for safe operation.

Daily Maintenance Record

Check the Maintenance Log to verify that all required maintenance checks have been performed before operating the machine. If the checks and actions have not been performed, notify your supervisor.

Clean

1. Make sure these items are cleaned:
   - Windows (a)
   - Mirrors (b)
   - Grab handles (c)
   - Steps (d)
2. Remove all trash from inside the cab to avoid interference with operation of the machine.

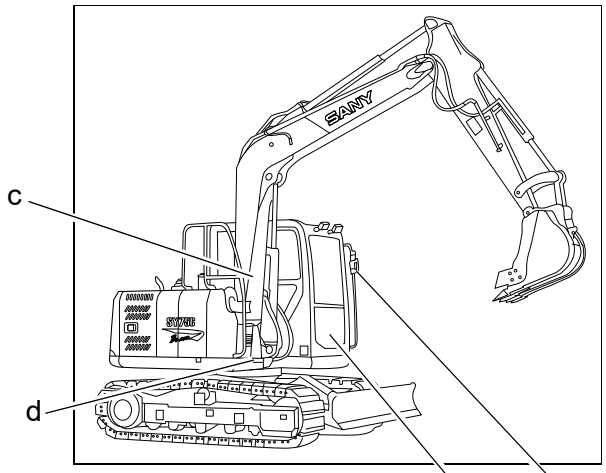

Fig. 4-1

CAUTION!

Never allow other personnel to ride with you inside the operator cab. Never bring objects into the operator cab that could restrict your movement or vision in any manner. Failure to observe and follow this caution could result in minor or moderate injury.

MONITOR SETTINGS

Monitor (a) is mounted in the front right of the cab.

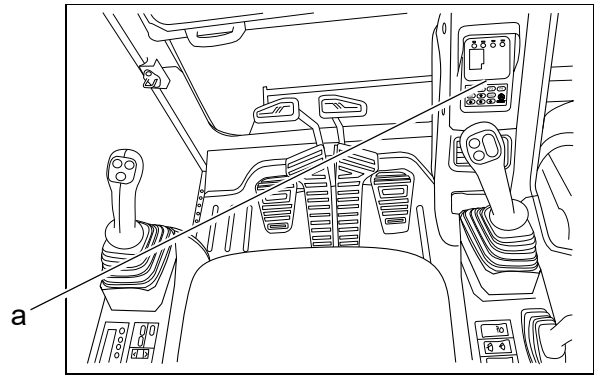

Fig. 4-2

First-Time Setup

Access the Main Menu

1. Turn ignition key (a) to the ON position.

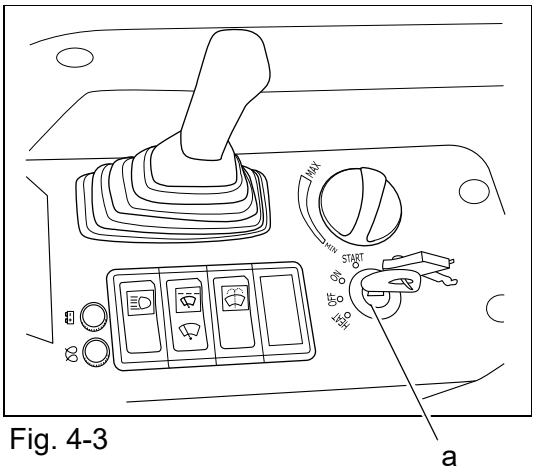

Fig. 4-3

NOTE: Main Screen displays.

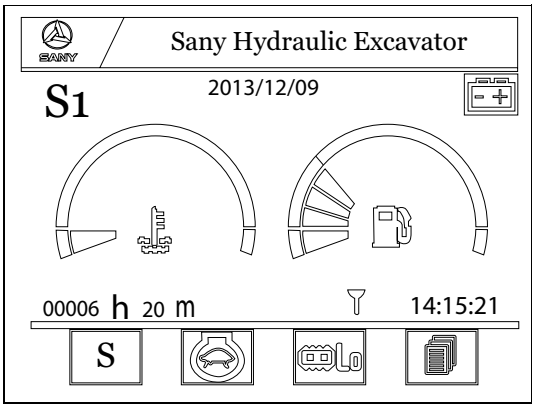

Fig. 4-4

2. Press F4 (b) and the System Information screen displays.

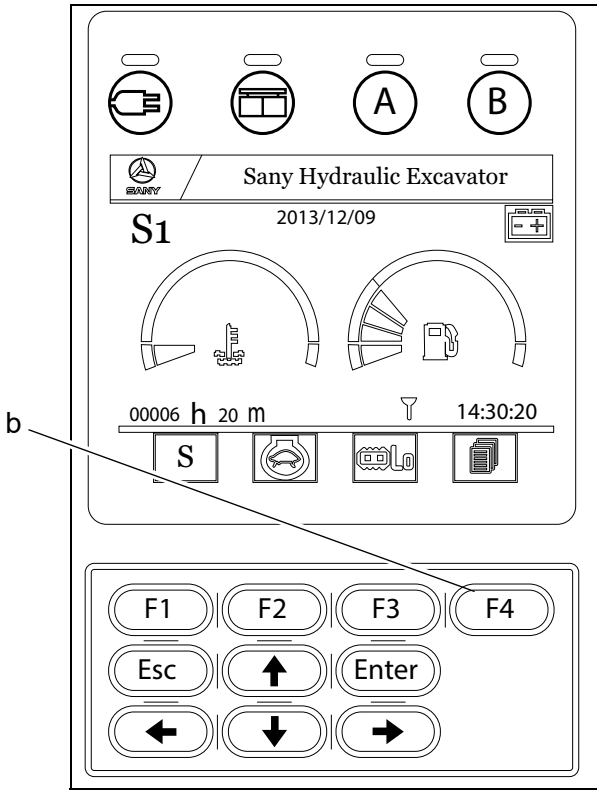

Fig. 4-5

3. Enter the password digits.

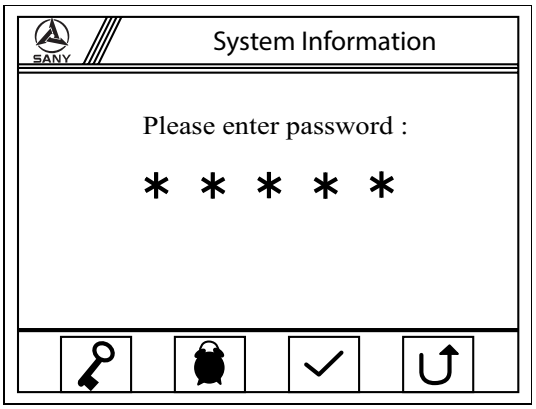

Fig. 4-6

4. Press Enter to accept Password and then F4 to access the Main Menu.

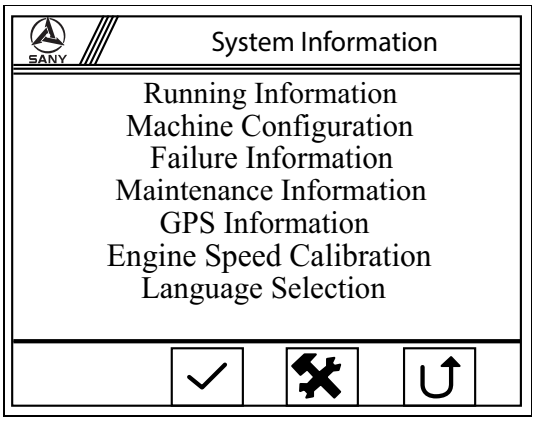

Fig. 4-7

Language Selection

NOTE: See “Language Selection Screen” on page 3-32.

Time and Date Display

NOTE: See “Date & Time Setup Screen” on page 3-32.

ENGINE PROCEDURES

WARNING!

Never attempt to start the machine if it has been locked out by maintenance personnel. If in doubt, contact the maintenance supervisor. Failure to observe and follow this warning could result in death or injury.

Check the work area to be sure all personnel and equipment are clear from your machine. Before starting the machine, sound your horn to warn others you are about to start the machine.

Start-up and shut-down procedures for most diesel engines are generally the same. Therefore, use the following procedures except where specific differences are noted. (Refer to the OEM engine manual for detailed procedures.)

WARNING!

Diesel engine exhaust can be harmful to your health or even fatal. Operate the engine only in a well-ventilated area or vent the exhaust to the outside. Failure to observe and follow this warning could result in death or injury.

Cold Weather Operation

The following recommendations are for operating SANY excavators in very low (i.e., sub-zero) temperatures.

NOTE: See “Key Switch” on page 3-12 for details on using the ignition key to preheat the engine for cold-weather starting.

NOTE: Detailed cold weather starting and operating procedures are covered in the engine manual.

The correct grade of oil for the prevailing temperature must be used in the crankcase. Diesel fuel must have a pour point of 10° F (6° C) less than the lowest expected temperature.

This machine must have appropriate hydraulic oil, lubricants and other auxiliary items required for operation in sub-zero temperatures. Individual machine functions should be operated to ensure they are sufficiently warmed prior to performing work.

Operation of machine at full-rated capacities in temperatures between 0° F (-18° C) and -40° F (-40° C) or lower should be accomplished only by competent operators who possess the skill, experience and dexterity to ensure smooth operation. Shock-loading must be avoided.

Cold weather operation requires additional cautions:

- Do not touch metal surfaces that could cause you to be frozen to them.
- Keep the machine clear of all ice and snow.
- Allow sufficient time for the hydraulic oil to warm up.
- Park the machine in an area where it cannot freeze to the ground.

Jump-Start the Engine

WARNING!

When working with any open electrical power circuit, ensure that your hands are free of any metal objects (rings, watches, jewelry, etc.) that could come in contact with electrical power points. Failure to observe and follow this warning could result in death or injury.

CAUTION!

Before proceeding with any battery maintenance procedure, remember and follow these points:

- **Battery gases are explosive. Never smoke around batteries or expose them to sparks or open flames.**
- **Wear personal protective equipment when working with batteries.**
- **Work in a well-ventilated area.**
- **If battery acid contacts your skin or your eyes, flush the area immediately with fresh water and seek medical attention.**

Failure to observe and follow this caution could result in injury.

NOTICE!

The starting system voltage and the battery voltage in the boosting machine should be no more than 24V. Never use a welder or equipment with a higher voltage system to jump-start the machine. Using a higher voltage to jump-start the engine may damage the electrical system or cause an unexpected explosion or fire. Always jump-start the engine with equal voltages.

The jumper cables and their clamps must be undamaged, have no corrosion and be suitable for the amperage. All clamps must be securely attached to their jumper cable ends.

Set all controls to their neutral positions.

Be careful when disconnecting jumper cables after both engines are running. Never allow the jumper cable clamps to touch each other.

Failure to observe and follow this notice could result in damage to the machine or cause the machine to operate improperly.

1. Ensure that the key switches of both machines are in the OFF position.
2. Clamp one end of a jumper cable to the positive red terminal (+) of the drained battery.
3. Clamp the other end of the same jumper cable to the positive red terminal (+) of the charged battery.
4. Clamp one end of a second jumper cable to the ground black terminal (-) of the charged battery.
5. Clamp the other end of the second jumper cable to the negative terminal of the battery or a non painted part of the structure of the machine with the drained battery.

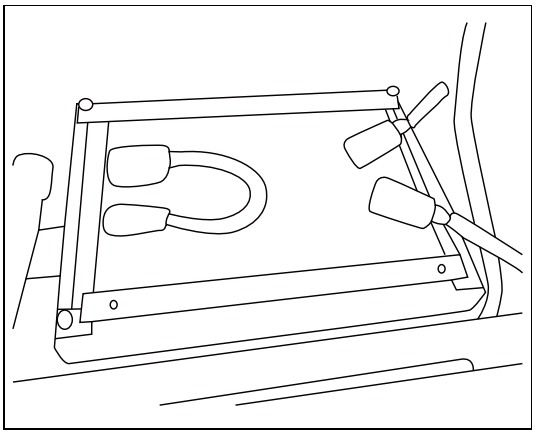

Fig. 4-46

NOTICE!

Ensure that all jumper cables are clamped to their connections securely. Failure to observe and follow this notice can result in damage to the machine or cause the machine to operate improperly.

6. Start the engine of the machine with the charged battery and run it at medium speed.
7. Attempt to start the engine of the machine with the drained battery. Retry every three minutes if the engine will not start.

   NOTE: Contact your SANY dealer if the engine will not start after five attempts.
8. Disconnect the jumper cables from the machine that had the drained battery in reverse order as shown above.
9. Disconnect the cables from the machine with the charged battery in the same way.

Engine Start Procedure

CAUTION!

Do not spray starting fluid into the air inlet. The spray will contact the heater elements and could explode. Failure to observe and follow this caution could result in injury.

1. Place hydraulic lockout control lever (a) in the LOCKED position.

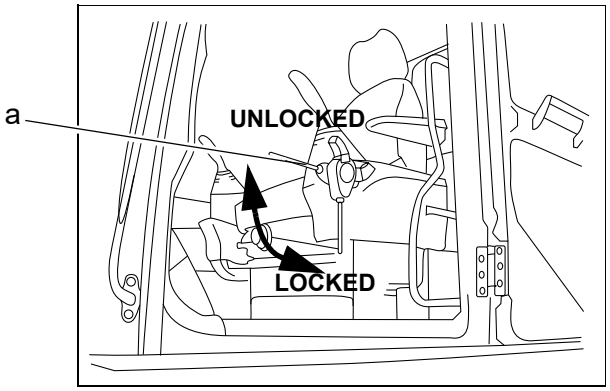

Fig. 4-8

WARNING!

If any part of the machine moves when the lockout control lever is in the LOCKED position contact your SANY dealer to solve this problem. Failure to observe and follow this warning could result in death or injury.

2. Set throttle (b) to the MIN position.

3. Turn ignition key (c) from OFF to ON.

   NOTE: Monitor (d) displays the home screen a few seconds after the key is turned to the ON position.

4. Turn the ignition key to START and release it immediately when the engine starts.

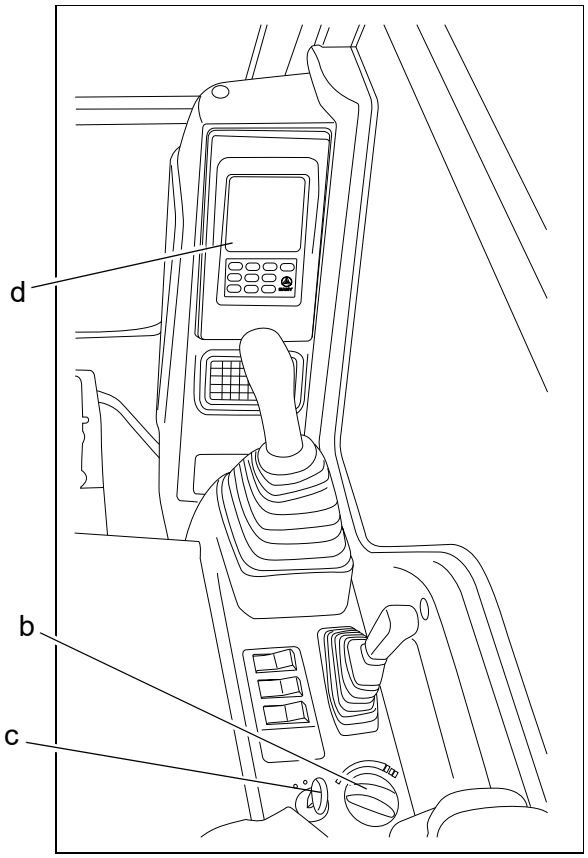

Fig. 4-9

NOTICE!

Never crank the engine for more than 15 seconds. If the engine fails to start after 15 seconds, stop and allow the starter motor to cool for at least 10 seconds before attempting another start. Failure to observe and follow this notice can cause damage to the machine or cause the machine to operate improperly.

NOTE: If the engine fails to start after five attempts, correct the malfunction before attempting further starts.

5. Immediately check for black exhaust smoke, very loud noise, or excessive vibration. If found, shut down immediately and notify your SANY dealer for assistance.

6. Check the engine instruments and monitor for any alarm codes after starting. Shut down the engine if a failure code is displayed on the display screen.

Idle the Engine

Idling the engine for long periods of time wastes fuel. Unburned fuel causes carbon formation, oil dilution, formation of lacquer or gummy deposits on the valves, pistons, and rings, and rapid accumulation of sludge in the engine.

Engine Shutdown Procedure

1. Park the machine on a flat, level, stable surface away from people, traffic or other machines
2. Lower the work equipment to the ground.

NOTICE!

Except for emergencies, never shut down the engine while it is running at high speed. Stopping the engine at high speed can cause damage to the machine or cause the machine to operate improperly.

3. Run the engine at idle speed (about 1,050 rpm) for about 5 minutes.
4. Turn the ignition key (a) to the OFF position.

NOTICE!

If performing a battery disconnect, wait for at least one full minute before disconnecting the battery cables so the machine ECM can complete its updating procedure. Failure to observe and follow this notice can cause damage to the machine or cause the machine to operate improperly.

MACHINE WARM UP

NOTICE!

Do not begin machine operation immediately after starting the engine. Perform the following warm-up procedures to prepare the system for operations. Failure to do so can cause damage to the machine, personal property and/or the environment, or cause the machine to operate improperly.

1. Start the engine.
2. Immediately check for black exhaust smoke, very loud noise, or excessive vibration. If found, shut down immediately and notify your SANY dealer for assistance.
3. Adjust the throttle to run the engine unloaded at low speed (about 1,050 rpm) for about five minutes.

NOTICE!

Never race the engine during the warm-up period and never operate the engine beyond the design levels. Engine bearings, pistons, and valves may be damaged if these precautions are not taken. Failure to observe and follow this notice can cause damage to the machine or cause the machine to operate improperly.

4. Place the hydraulic lockout control lever in the UNLOCKED position.
5. Adjust the throttle to run the engine at moderate speed (about 1,400 rpm), then slowly operate the bucket for five minutes.
6. Adjust the throttle to run the engine at high speed (about 2,000 rpm), then operate the boom, arm and bucket for 5-10 minutes.
7. Cycle each action of the machine several times.

8. Continue to warm-up the machine until the coolant temperature reaches the middle of display (a) on the monitor.

9. Press F1 (b) to select the desired working mode (c).

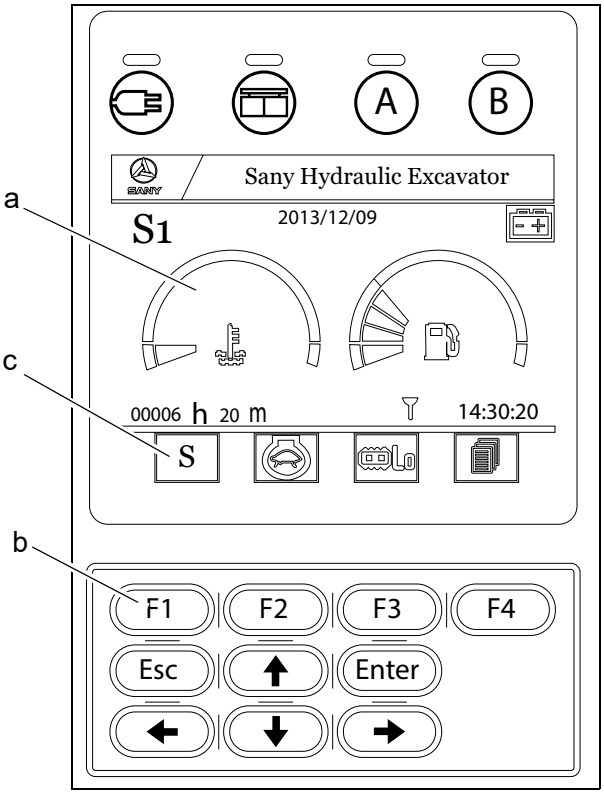

Fig. 4-10

TRAVEL OPERATIONS.

WARNING!

Never allow any personnel to be within 26 ft. (8 m) of the machine while it is moving.

Be aware of all crush points on the machine and ensure that all personnel keep clear of these areas.

Avoid moving any control lever or pedal to abruptly change the direction of the machine.

Avoid stopping the machine suddenly by releasing the lever or pedal while traveling at high speed.

Failure to observe and follow these warnings could result in death or injury.

Before Travel

1. Turn throttle control dial (a) clockwise to increase the engine speed.

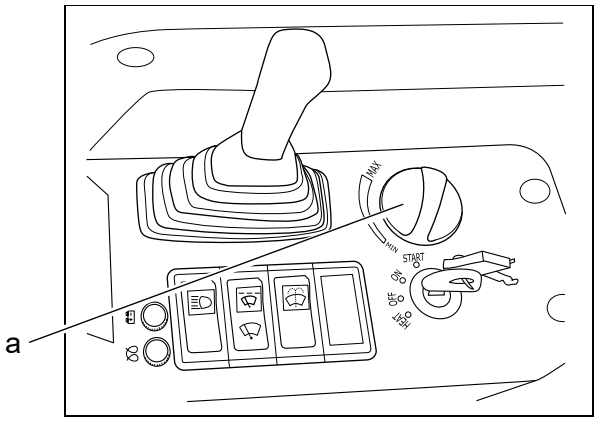

Fig. 4-11

2. Place hydraulic lockout control lever (b) in the UNLOCKED position.

3. Ensure good visibility.

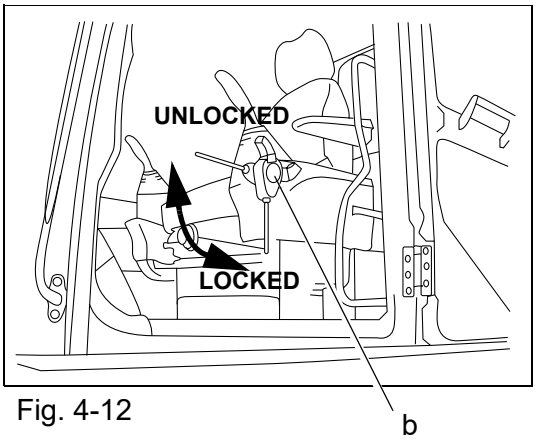

Fig. 4-12

Track Direction

Directional arrow (a) on each of the two track frames indicates the forward direction of the machine. Check these arrows before using the travel control levers. When possible, face the cab in this direction. his is the normal position.

When traveling in areas where the machine will be exposed to surrounding hazards, rough surfaces or tight maneuvering, travel with the carriage in the normal position.

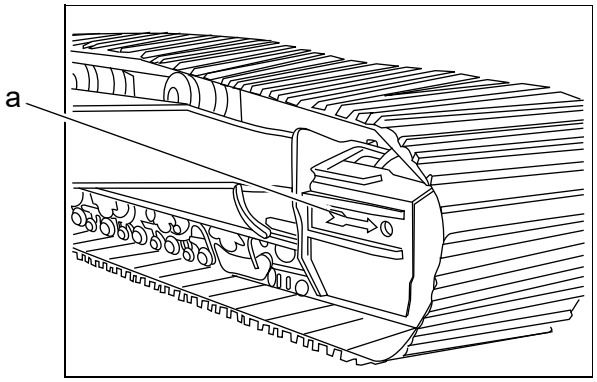

Fig. 4-13

Travel With Carriage Reversed

When the cab faces backward, the machine moves forward when you pull control levers and backward when you push them.

SANY does not recommend traveling with the carriage reversed.

Always keep in mind the travel lever controls will be working in the opposite direction from normal travel.

CAUTION!

Travel with the lower structure reversed could pose a hazard. Failure to observe and follow this caution could result in injury.

Right Turn

Move the left travel control lever to cause the left track to move forward or backward depending on which direction the control is moved.

NOTE: Forward direction of the left track is shown in the illustration.

The further the control is moved in either direction the faster the left track moves.

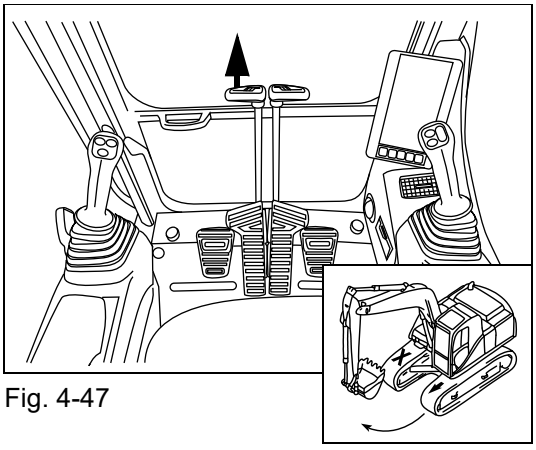

Fig. 4-47

Left Turn

Move the right travel control lever to cause the right track to move forward or backward depending on which direction the control is moved.

NOTE: Forward direction of the right track is shown in the illustration.

The further the control is moved in either direction the faster the right track moves.

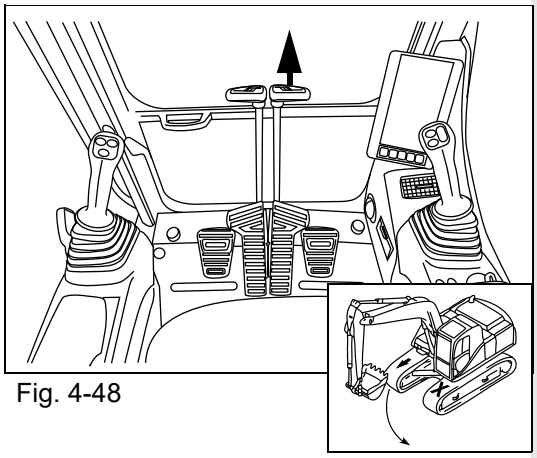

Fig. 4-48

Straight Travel

Move both controls at the same time to cause both tracks to move forward or backward, depending on which direction the control is moved.

NOTE: Forward direction of both tracks is shown in the illustration.

The further the controls are moved in either direction, the faster each track moves.

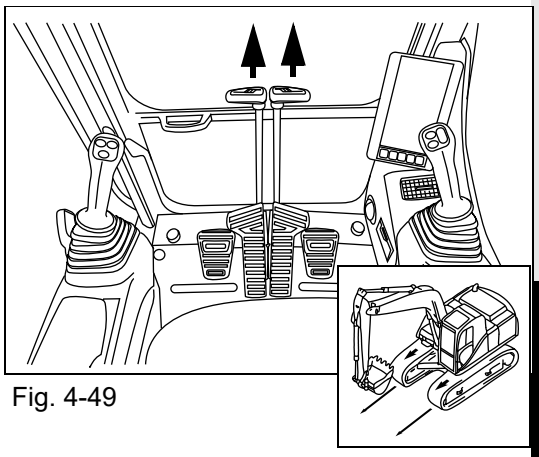

Fig. 4-49

Left Zero Radius Turn

Push the right lever forward and pull the left lever rearward to cause a left zero radius turn.

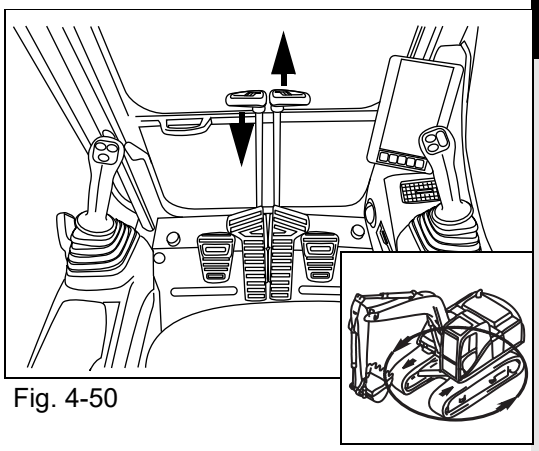

Fig. 4-50

Right Zero Radius Turn

Push the left lever forward and pull the right lever rearward to cause a right zero radius turn.

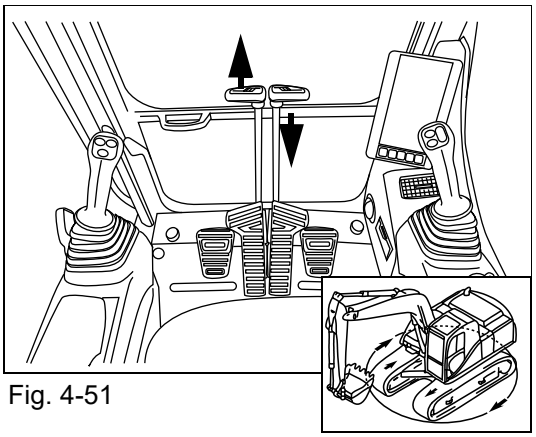

Fig. 4-51

Slopes

Observe the following when operating a machine on a slope:

- Do not travel on a slope exceeding 15° (26.8%) side-to-side or 35° (70%) fore-and-aft.
- The hydraulic tank must be over half full.
- Avoid holes, rocks, extremely soft surfaces, and other obstacles that might subject the machine to undue stresses and possible tipover.
- Position the bucket 16 - 20 in. (20 - 30 cm) above the ground while traveling.
- Always set the throttle control dial to maintain a slow speed while traveling up or down a slope.
- Do not turn the machine while on a slope.
- Do not travel in reverse on a slope.

Operations in Water

Observe the following when operating the machine in water:

- Do not drive the machine into water where the water level could reach the center of the carrier rollers (a).
- Do not operate the machine in water unless the work site foundation is strong enough to properly support the machine.
- An escape tool is available for use in emergencies.

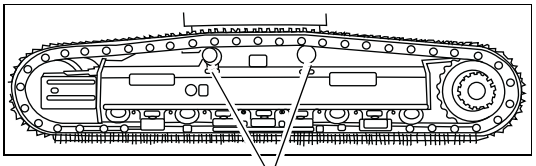

Fig. 4-52

NOTICE!

If the swing bearing and swing gearbox have been submerged in water, the swing gearbox drain plug should be removed to drain mud and water. Refill the swing gearbox and lubricate the swing bearing. Failure to follow this notice can cause damage to the machine, the environment, or cause the machine to operate improperly.

Release Machine from Mud

If the machine becomes stuck in the mud, drive it out of the mud using the following methods:

One Track Stuck

1. Position the boom and arm at an angle between 90° and 110°.
2. Pivot the upper structure to position the boom over the track that is stuck.
3. Curl the bucket so that the back of the bucket contacts the ground.

   NOTE: Use cribbing to provide a firm surface if necessary.
4. Lower the boom to lift the track.
5. Place cribbing under the track.
6. Drive the machine out of the mud.

Two Tracks Stuck

1. Position the boom and arm at an angle between 90° and 110°.
2. Pivot the upper structure to position the boom over the front of the machine.
3. Curl the bucket so that the back of the bucket contacts the ground.

   NOTE: Use cribbing to provide a firm surface if necessary.
4. Lower the boom to lift the front of the tracks.
5. Place cribbing under the tracks.
6. Cut the bucket into the ground in front of the machine.
7. Retract the arm as done with normal excavating while driving the machine forward out of the mud.

CONTROL WORK EQUIPMENT

WARNING!

Never allow any personnel to be within 26 ft. (8 m) of the rear of the machine while it is moving.

Be aware of all crush points on the machine and ensure that all personnel keep clear of these areas.

Failure to observe and follow these warnings could result in death or injury.

SAE Control Pattern

NOTE: “SAE Mode” on page 3-17.

Swing

Move the left joystick to the left to swing the work equipment to the left. Move the left joystick to the right to swing the work equipment to the right.

NOTE: The swing function is the same for SAE and BHL.

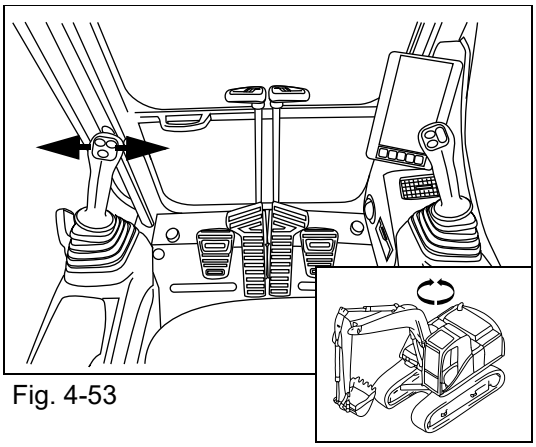

Fig. 4-53

Arm

Move the left joystick forward to extend the arm. Move the left joystick rearward to retract the arm.

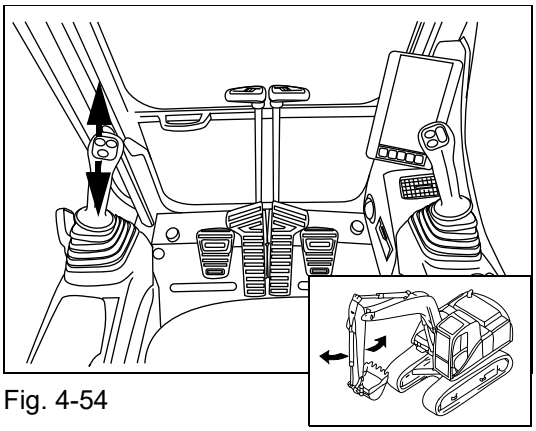

Fig. 4-54

Boom

Move the right joystick forward to lower the boom. Move the right joystick rearward to raise the boom.

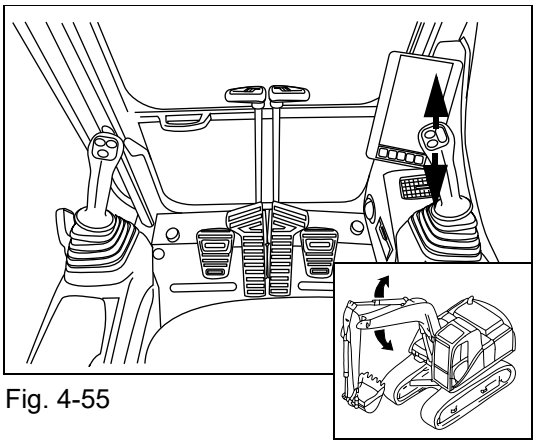

Fig. 4-55

Bucket

Move the right joystick to the left to curl the bucket. Move the right joystick to the right to dump the bucket.

NOTE: The bucket function is the same for SAE and BHL.

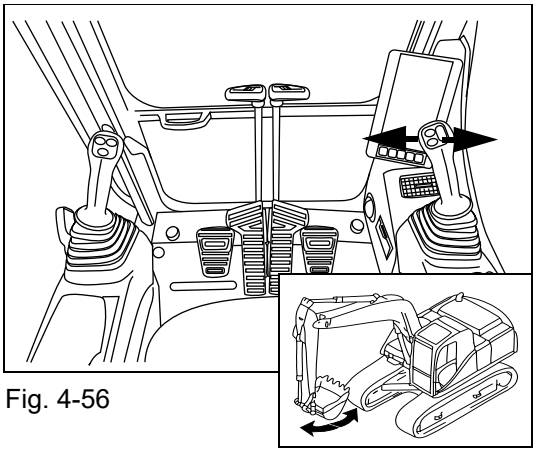

Fig. 4-56

BHL Control Pattern

NOTE: “BHL Mode” on page 3-18

Swing

Move the left joystick to the left to swing the work equipment to the left. Move the left joystick to the right to swing the work equipment to the right.

NOTE: The swing function is the same for SAE and BHL.

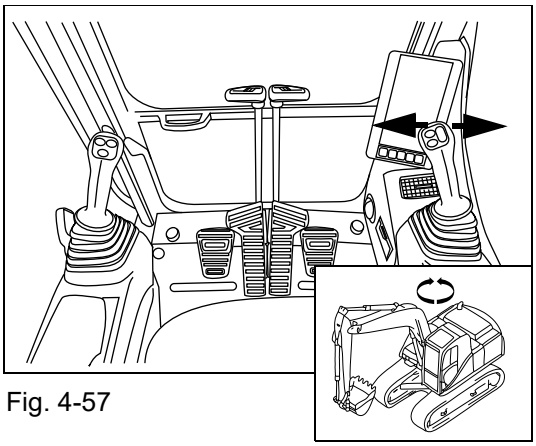

Fig. 4-57

Arm

Move the right joystick forward to extend the arm. Move the right joystick rearward to retract the arm.

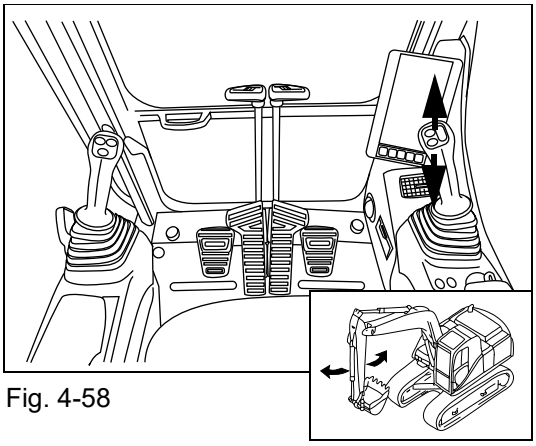

Fig. 4-58

Boom

Move the left joystick forward to lower the boom. Move the left joystick rearward to raise the boom.

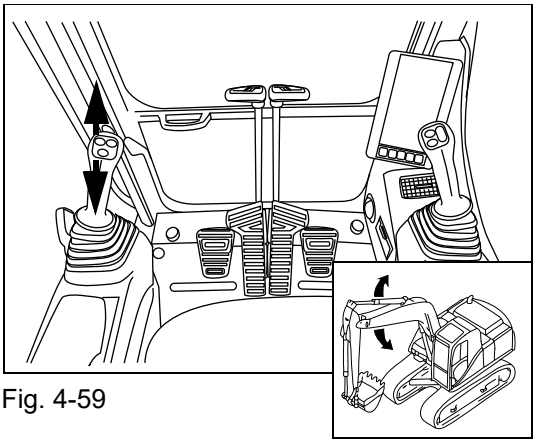

Fig. 4-59

Bucket

Move the right joystick to the left to curl the bucket. Move the right joystick to the right to dump the bucket.

NOTE: The bucket function is the same for SAE and BHL.

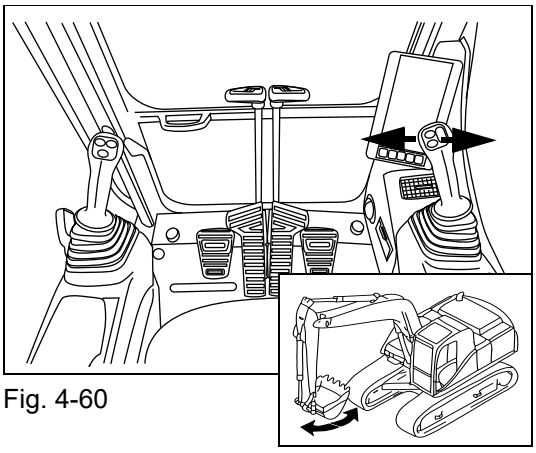

Fig. 4-60

RECOMMENDED APPLICATIONS

WARNING!

Contact the site supervisor before any digging to ensure that all underground hazards have been located. Failure to observe and follow this warning could result in death or injury.

Never allow any personnel to be within 26 ft. (8 m) of the machine while it is moving.

Be aware of all crush points on the machine and ensure that all personnel keep clear of these areas.

Avoid moving any control lever or pedal to abruptly change the direction of the machine.

Failure to observe and follow these warnings could result in death or injury.

Backhoe Operation

Backhoe operation is for digging an area lower than the machine. The digging range of the arm is from 30° and 45°. The angle may vary according to the digging depth.

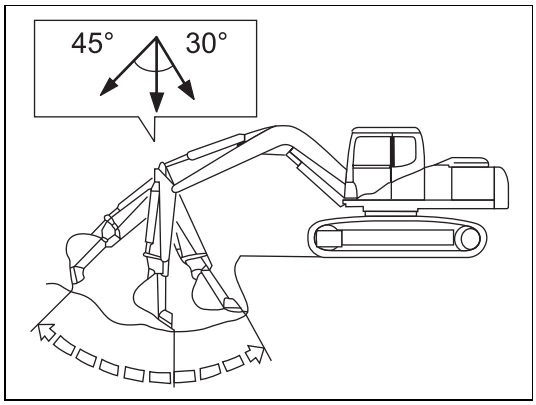

Fig. 4-61

Maximum digging force can be obtained when the angle between the boom and the arm and the bucket cylinder and the bucket linkage are both 90°.

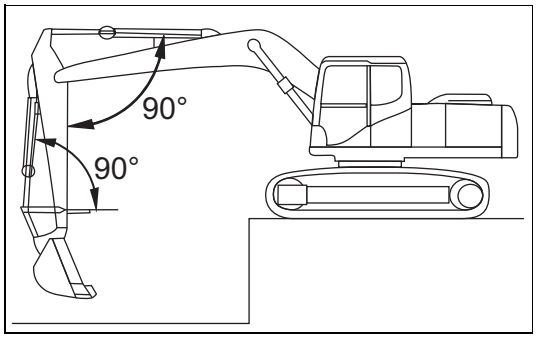

Fig. 4-62

Digging a Trench

Trench work can be done efficiently by using a suitable bucket and positioning the tracks parallel to the trench line. When digging a wider trench, excavate the sides first then remove the middle.

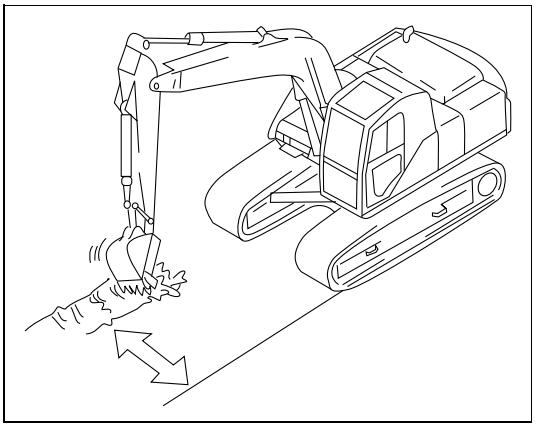

Fig. 4-63

Loading Operations

It is more convenient to load material if the truck is loaded from the rear than from the side.

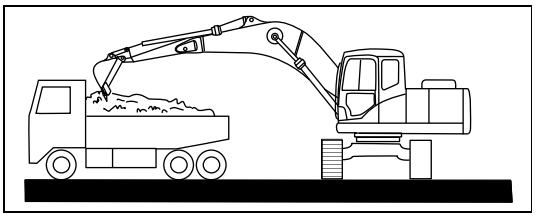

Fig. 4-64

END-OF-WORKDAY CHECKS

1. Collect any trash or debris from the cab and deposit it into a trash can.

2. Remove all built-up mud or debris on the lower structure and machine exterior.

3. Inspect the machine work equipment, machine exterior, and lower structure for signs of fluid leaks or damage.

4. Near ocean (salt air) environments, thoroughly wash away any salt residue, apply grease where rust is found and perform maintenance on the electrical components to prevent corrosion.

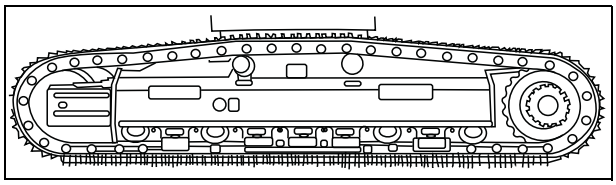

Fig. 4-65

PARK AND STORE THE MACHINE

Overnight Storage

1. Park the machine on a flat, level and stable surface away from people, traffic or other machines.
2. Lower the work equipment to the ground.
3. Run the engine at low idle speed (1,050 rpm) for about five minutes to allow for heat dissipation. Extend this cool-down time in hot weather.
4. Turn the ignition key to the OFF position.
5. Remove the ignition key when the engine comes to a complete stop.
6. Place hydraulic lockout control lever (a) in the LOCKED position.
7. Close and lock the windows.
8. Exit the cab and lock the cab door.

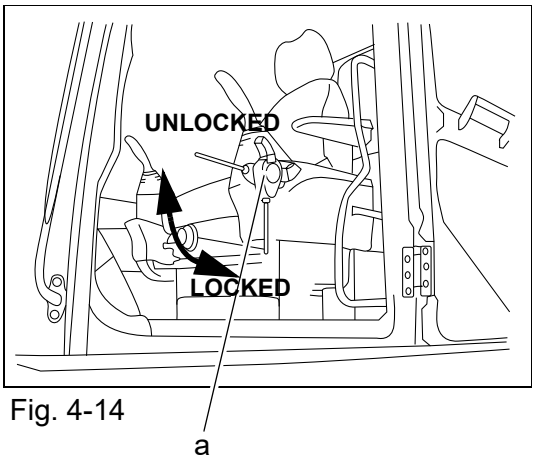

Fig. 4-14

NOTICE!

If performing a battery disconnect, wait for at least one full minute before disconnecting the battery cables so the machine ECM can complete its shutdown procedure. Failure to observe and follow this notice can cause damage to the machine or cause the machine to operate improperly.

9. Fill the fuel tank.
10. Ensure that the following items are secured and locked.
    - Cab door (c)
    - A/C fresh air inlet door (d)
    - Left rear door (e)

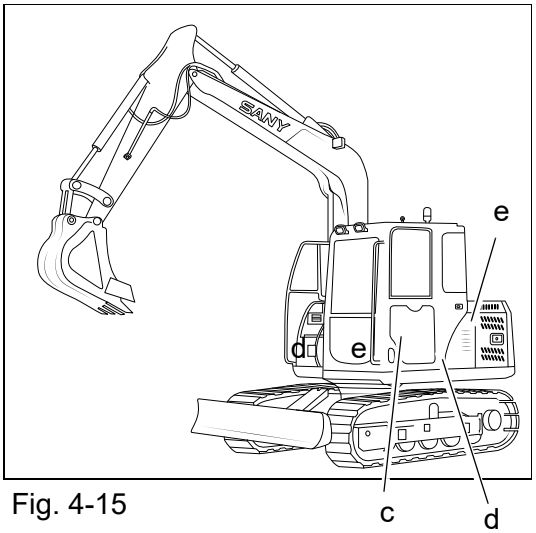

Fig. 4-15

- Fuel tank cap (f)
- Right rear door (h)
- Engine compartment (k)

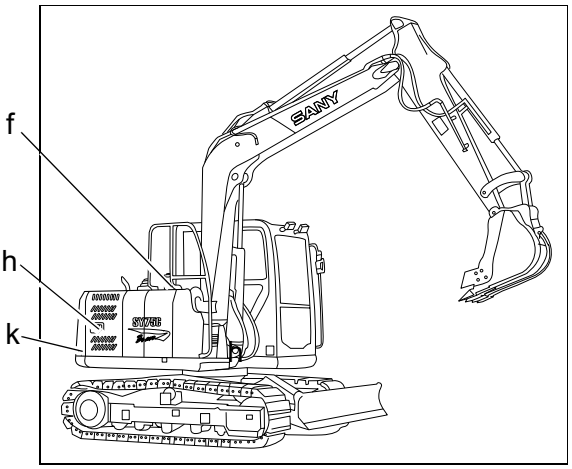

Fig. 4-16

Short Term Storage

Complete the “Overnight Storage” procedure (see page 4-29), and then:

- Clean the machine.
- Keep it dry.
- Keep it fully lubricated.
- Protect it from dust.

NOTE: Short-term storage is defined as a storage period of 30 days or less.

Long Term Storage

Proper preparation for long term storage will reduce the chances for damage or deterioration of the machine.

NOTE: Long-term storage is defined as a storage period of more than 30 days.

Preparation

1. Park the excavator in a secure location and position the work equipment with the arm and bucket fully extended.
2. Run the engine at idle speed for about five minutes to avoid increasing internal temperatures and to allow for heat dissipation. Extend this cool-down time in hot weather.
3. Shut down the engine.

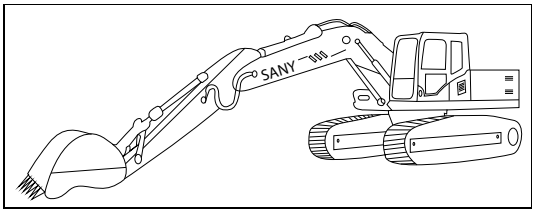

Fig. 4-17

4. Place hydraulic lockout control lever (a) in the LOCKED position.

5. Close and lock the windows.

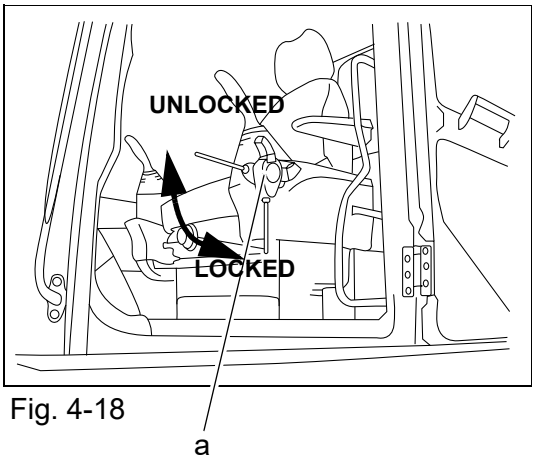

Fig. 4-18

6. Exit cab (b).

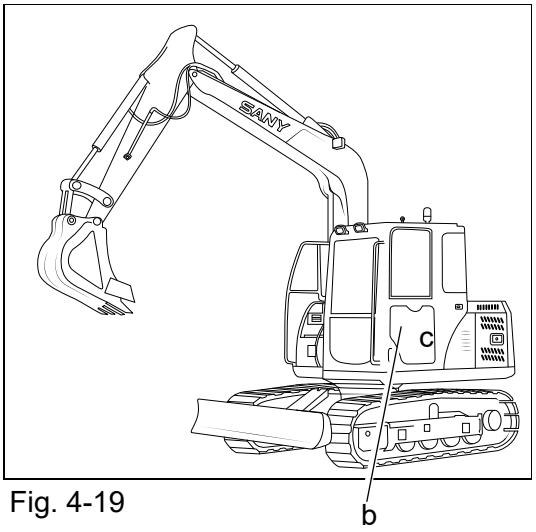

Fig. 4-19

7. Turn both of the outside rear view mirrors inward so that they are within the perimeter of the machine.

   NOTE: Mirror (d) is cab-mounted. The other mirror is attached to the right-side of the upper structure; see "Exterior Components." on page 3-3 for mirror locations.

8. Fill the fuel tank.

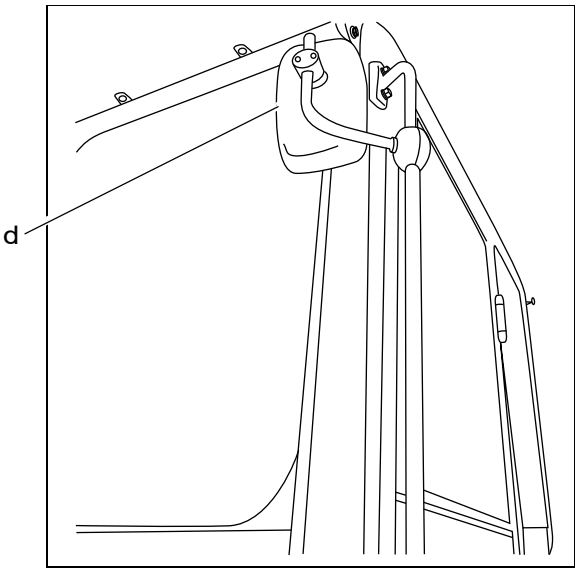

Fig. 4-20

9. Ensure that the following items are secured and locked:

    - Cab door (e)
    - A/C fresh air inlet door (f)
    - Left rear door (g)

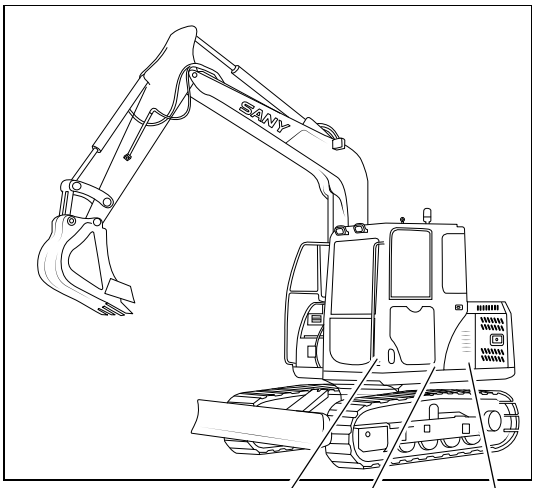

Fig. 4-21

    - Fuel tank cap (h)
    - Right rear door (i)
    - Engine compartment (j)

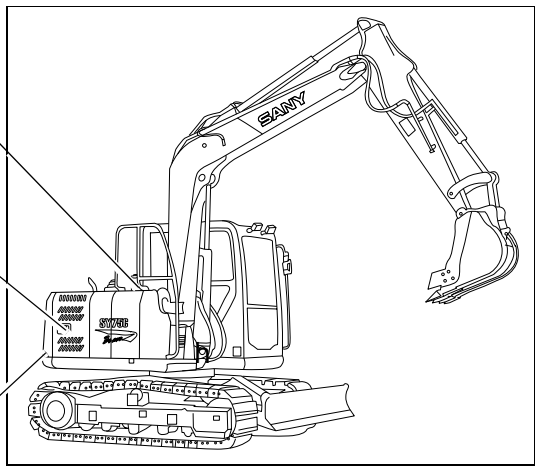

Fig. 4-22

10. Apply spray lubricant to any exposed cylinder rods.
11. Change the engine oil.
12. Turn the battery disconnect switch to the OFF position or remove the batteries and store them in a separate location.

NOTICE!

When performing a battery disconnect, wait for at least one full minute before disconnecting the battery cables so the machine ECM can complete its updating procedure. Failure to observe and follow this notice can cause damage to the machine or cause the machine to operate improperly.

During Storage

WARNING!

When operating the machine inside a building, it is necessary to open doors and windows to provide adequate ventilation to prevent asphyxiation. Failure to observe and follow this warning could result in death or injury.

Once a month:

1. Start the machine.

2. Drive the machine a short distance.
3. Cycle each cylinder a few times to coat cylinder rods with oil and exercise the seals.
4. Coat the exposed parts of the cylinder rods with spray lubricant to prevent corrosion.
5. Turn on the air conditioner and allow it to run for 3 to 5 minutes to lubricate the compressor and related parts.
6. Return the machine to the proper storage location and condition.

Return to Service

1. Check the fuel and engine oil for water contamination. Drain water or replace fluids as necessary.
2. Examine the exterior of the machine for signs of rust or damage and repair as necessary.
3. Start the machine and test all operations.

TRANSPORT THE MACHINE

Follow all local, state, and federal regulations and laws regarding transporting the machine.

WARNING!

To avoid a machine tip-over condition, do the following when loading or unloading:

- **Select a firm and level location a safe distance from any road or structure.**
- **Ensure that the trailer wheels are properly chocked to prevent any movement.**
- **Use an access ramp with enough length, strength and width to properly support the machine. The ramp grade should not exceed 15°.**
- **Drive slowly at the junction of the ramp and the trailer.**
- **Use a signal person to observe and alert the operator of any potential hazards.**

Failure to observe and follow these warnings could result in death or injury.

Lift the Machine

To lift the machine use lift/tie-down points (a) identified on both sides of the machine. The center of gravity point (b) is identified on both sides of the machine to assist in rigging and lifting.

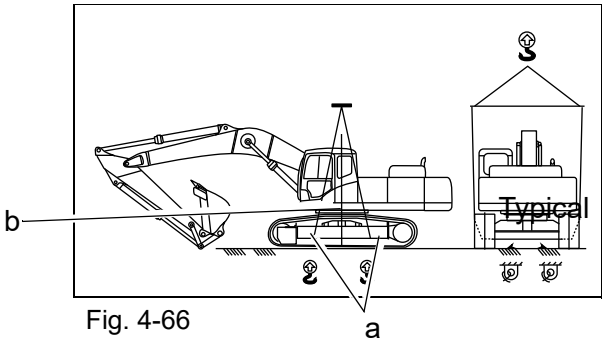

Fig. 4-66

Load the Machine

1. Clean track undercarriage.
2. Verify that the vehicle wheels are properly chocked.
3. Verify that the ramp to the vehicle has adequate strength and width and has a slope of 15 degrees or less.
4. Position the machine so that the centerline of the machine matches the centerline of the trailer.
5. Set auto deceleration to OFF.

   NOTE: See “Main Operator Screen” on page 3-25.

6. Set travel speed mode to slow.

NOTE: See “Throttle Control Dial” on page 3-12.

7. Maintain control of the machine while driving it onto the vehicle.
8. Lower the work equipment to the floor of the vehicle.
9. Run the engine at low idle speed for about five minutes to allow for heat dissipation if necessary.

   NOTE: Extend this cool-down time in hot weather.

10. Turn the key switch to the OFF position.
11. Remove the key from the key switch when the engine comes to a complete stop.
12. Place the hydraulic lockout control lever in the LOCKED position.
13. Close and lock the windows.
14. Exit the cab and lock the cab door.
15. Ensure that the following items are secured and locked:

    - Cab door (a)
    - Engine hood (b)
    - Left rear door (c)
    - A/C fresh air inlet door (d)
    - DEF tank compartment (e)

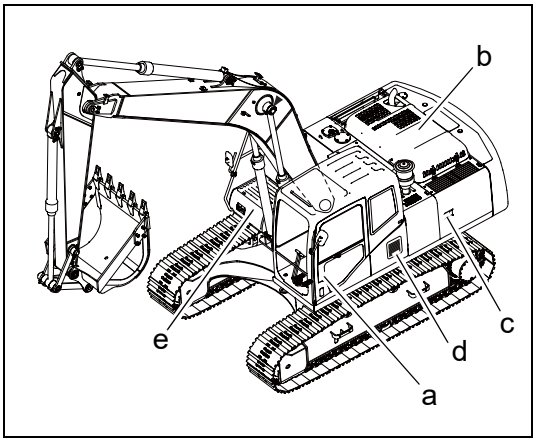

Fig. 4-67 Typical

    - Fuel tank filler cap (f)
    - Right rear door (g)

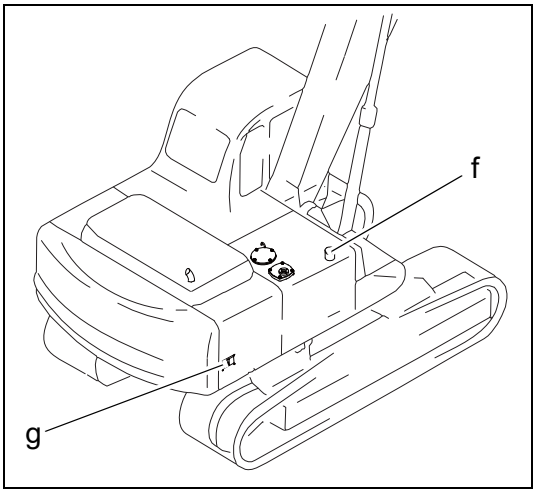

Fig. 4-68 Typical

16. Turn both of the outside rear view mirrors inward to their storage position.

    NOTE: Mirror (h) is cab-mounted. The other mirror is attached to the right-side of the upper structure.

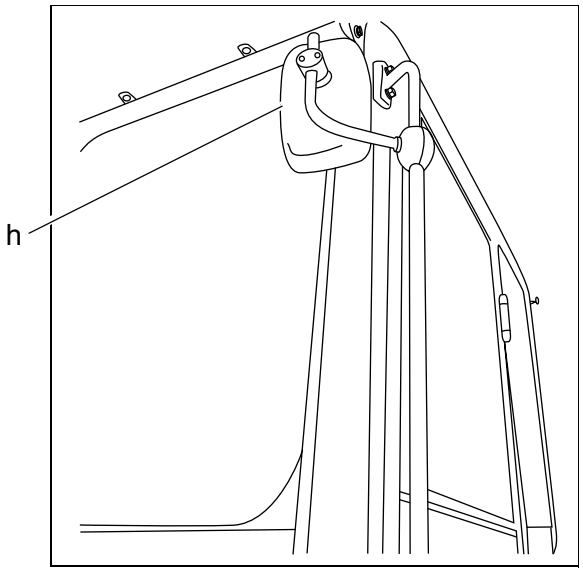

Fig. 4-69 Typical

17. Cover exhaust opening (i).

18. Secure the machine to the vehicle with suitable tie-downs in accordance with all applicable laws and regulations.

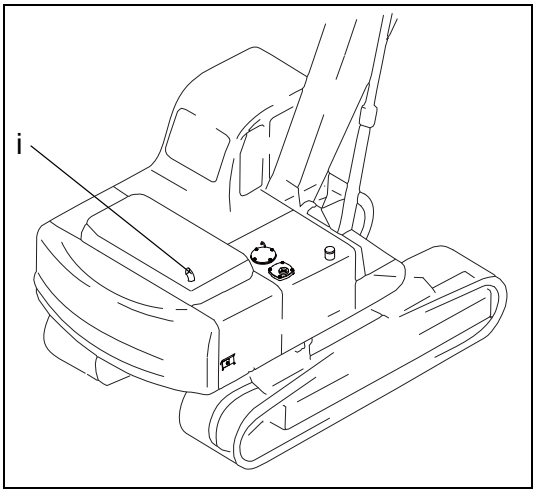

Fig. 4-70 Typical

Unload the Machine

1. Verify that the vehicle wheels are properly chocked.
2. Verify that the ramp to the vehicle has adequate strength and width and has a slope of 15 degrees or less.
3. Remove all tie-downs securing the machine to the vehicle.
4. Turn the exterior rear view mirrors.
5. Remove the exhaust covering.
6. Unlock and start the machine and allow it to warm-up fully.

   NOTE: See “Travel Operations.” on page 4-17.

7. Set auto deceleration to OFF.

   NOTE: See “Main Operator Screen” on page 3-25.

8. Set travel speed mode to slow.

   NOTE: See “Throttle Control Dial” on page 3-12.

9. Place the hydraulic lockout control lever in the UNLOCKED position.
10. Raise the work equipment to clear the trailer.
11. Drive the machine slowly off the trailer.
12. Keep the work equipment as low as possible as the machine moves forward off the ramp.
13. Park the machine at the desired location.
14. Shut down the engine.

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SANY

Maintenance

MAINTENANCE INFORMATION

Do not perform any maintenance and/or repairs not authorized in this Operation and Maintenance Manual. Always observe and follow all safety precautions.

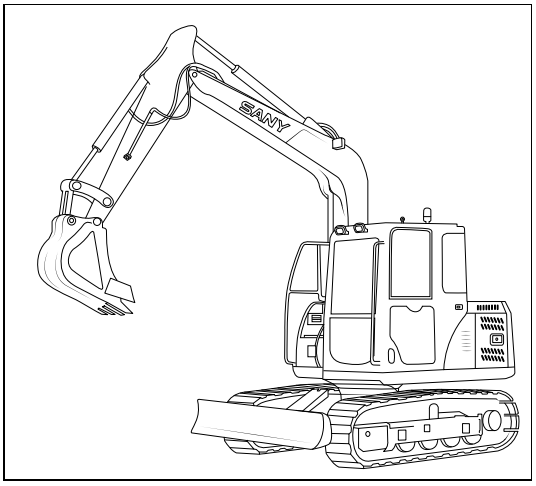

Fig. 5-1

Checks Before Maintenance

Read and understand the Safety section of this manual before proceeding with any inspection or maintenance procedures.

NOTE: Lockout/Tagout the machine in accordance with local regulations.

Review the Maintenance Log and follow these points to ensure your safety:

- Do not perform any maintenance unless authorized in this manual's Maintenance section for this machine.
- Avoid working on the machine while the engine is running unless required to do so in the procedure. If the engine must remain running during a procedure, always have a person in the cab who can correctly operate the machine and who is in clear contact with you at all times.
- Contact your SANY dealer if you are unable to perform the procedures listed in this manual or if additional procedures are required.
- Always use the proper tools when performing any maintenance procedures.

Checks After Maintenance or Repairs

Always do the following after performing any maintenance to the machine.

- Ensure all steps listed in this book have been followed.
- If necessary, have a coworker inspect your work for correct and proper completion.
- Complete the Maintenance Log for this machine and return it to its storage location.
- Follow the Lockout/Tagout procedure for returning the unit to service.
- Check for leaks in the system you have maintained.
- Be sure there are no abnormal sounds coming from the engine or hydraulic system.
- Check for any loose or abnormal movement in the system you have maintained.
- Check for any overheating in the system you have maintained.

After performing maintenance or repairs to the machine, always take time to inventory your tools, parts used and nuts and bolts to be sure none of these items were left on or inside the machine.

Hour Meter Reading

Keep track of the hour meter reading on a daily basis. Confirm meter readings with the required maintenance intervals listed in this manual.

Genuine SANY Replacement Parts

Use genuine SANY replacement parts when repairing or replacing a part on the machine. Failure to do so may result in premature system or part failure.

SANY Approved Lubricants

Always use SANY approved lubricants and coolants. Never mix different lubricant brands or viscosities. The use of unapproved lubricants and coolants or mixing different lubricant brands or viscosities may result in shortened service life or system failure of the machine.

Collect Oil Samples

Collect and send oil samples for testing in accordance to the maintenance schedule. Obtain and follow the instructions within an Oil Analysis Sample Kit from a SANY dealer.

Weld, Drill, Cut or Grind on the Machine

NOTE: Contact your SANY dealer for proper guidance on any welding being attempted.

CAUTION!

Disconnect the battery prior to welding. Failure to disconnect the battery could result in minor or moderate injury.

NOTICE!

Failure to disconnect the battery frame ground could result in damage to the machine, personal property, or cause the machine to operate improperly.

Personnel welding on the machine must be fully qualified and certified to use the processes and equipment they may operate in making these repairs. Owners are responsible for the structural integrity of any completed repair.

Clean Parts or the Machine

Never clean the machine with caustic chemicals or steam cleaners. Instead, use mild soaps and a pressure washer to clean the machine. Always protect electrical parts when cleaning the machine. Never flood or pressure wash the inside of the operator's cab. Use only nonflammable cleaning solvents. Never use flammable liquids to clean parts or systems.

NOTICE!

Failure to protect the electrical system when cleaning the machine may damage the machine or cause it to operate improperly.

Covers and Locks

When servicing the machine with the doors open, be sure they are properly supported in place. Also be sure the doors close tightly and latch securely in place. If a lock is present, be sure the lock is properly latched for security.

Inspection and Maintenance in Adverse Environments

If the machine will be operating under adverse conditions:

- Check and clean any electrical components to avoid any accumulated corrosion.
- Check and clean any areas where extreme heat is present, such as the exhaust system, manifold and turbocharger.

For heavy load operation and deep excavation, add grease to the pins of the work equipment prior to each operation. Cycle the operation of the boom, arm and bucket several times before refilling with additional grease.

Mud, Rain or Snow Conditions

After operating the machine, clean the machine, inspect for missing or loose bolts and nuts. Add oil and lubricating grease as needed.

Near Ocean (Salt Air) Environments

Before operating the machine, inspect the machine for signs of corrosion. Apply grease where rust is found.

After operating the machine, thoroughly wash away the salt residue, apply grease where rust is found, and perform maintenance carefully on the electric components to prevent corrosion.

Dusty Environments

Clean the following components:

- Engine air filter: Clean the dust evacuator frequently.
- Radiator: Clean the radiator core frequently to prevent blockage.
- Fuel equipment: Clean the filter parts frequently.
- Fresh air and recirculation filters: Clean the filters frequently.

Rocky Ground Surface

Tracks should be set slightly loose from what is required for other environments. While track tension is normally 0.75 - 1.75 in. (20 - 45 mm), SANY recommends that you loosen the track track tension to 1.75 in. (45 mm) for rocky ground surfaces. Inspect the tracks for damage, such as cracks, or loose or missing bolts or nuts.

NOTE: This applies to metal track only, SANY does not recommend using rubber track on rocky ground surface.

Cold Environments

In extremely cold environments (below 32° F (0° C)), lubricate only with the oils shown in "Engine Oil Viscosity/ Temperature Data" on page 5-9. SANY recommends the use of fuels identified in "Fluids and Lubricants" on page 5-8 for extremely cold environments. Prior to starting the engine, ensure that the battery is fully charged and that the battery case and the cables have not cracked.

Other Weather Environments

NOTE: If there is evidence of overheating of bearings or bushings, loose parts or rust during regular inspection, increase the frequency of lubrication.

Based on past experience and suggestions by lubricating oil suppliers, the lubricating intervals listed in the following tables apply only to normal operating conditions. In harsh environments, including dusty and corrosive air, abnormal external temperature, extremely heavy overload, frequent operating times, long time duty cycle, etc., lubricating intervals should be shortened.

FLUIDS AND LUBRICANTS

Always use SANY recommended lubricants, coolants and filters. SANY is not responsible for damage caused by using unauthorized lubricants and coolants.

NOTICE!

Never mix fluids of different brands or viscosities (weights) and never overfill the system you are servicing. Failure to follow these standards can cause damage to the machine or cause the machine to operate improperly.

Location, Capacity, Type

Location	Approx. Capacity*	Lubricant/Coolant
Engine: Isuzu AU-4LE2XCUAA-01	2.6 gal. (10 L)	See “Engine Oil Viscosity/Temperature Data” on page 5-9. Oils of this type are manufactured by Isuzu, Caltex/Chevron, Shell, Elf, Total, Castrol, BP, Idemitsu and Exxon/Mobil.
Fuel system	39.6 gal. (150 L)	#2 Diesel Fuel or mixtures of #2 Diesel and #1 Diesel Fuels in cold weather conditions.
Engine Cooling System	3.2 gal (12 L)	See “Hydraulic Oil/Ambient Temperature Data” on page 5-10. SANY recommends brands that include Isuzu, Zerox and Valvoline.
Swing gearbox	1.06 gal. (4.0 L)	See “Industrial Gear Oil/Temperature Data” on page 5-10 for additional information. Recommended brands are produced by Mobil, Chevron and others.
Final Drive	1.45 gal. (5.5 L)	
Hydraulic system	31.7 gal. (120 L)	See “Hydraulic Oil/Ambient Temperature Data” on page 5-10 for additional data. Recommended brands are produced by Conoco, Mobil, Shell, Chevron, Exxon and Texaco.
Swing bearing	75 lb (34 kg)	See “Lubricating Grease/Temperature Data” on page 5-10 for further details.
Anaerobic sealant	NA	Any anaerobic sealant having properties similar to LOCTITE 243 (Blue).
Spray lubricant	NA	Any lithium grease based spray lubricant

NOTE: The capacities in the above table are approximations. For exact capacities, use the inspection points, inspection plugs, dipsticks, and sight glasses.

Fuel

DANGER!

Never maintain the fuel system near an open flame or while smoking. Failure to follow this rule will result in death or injury.

SANYrecommends the use of No. 2 ultra low sulfur diesel (ULSD) fuel for all normal operations. Use of No. 1 diesel fuel in a blend with No. 2 diesel fuel is permitted in cold weather environments (below 32° F (0° C)).

NOTE: SANY does not recommend the use of any diesel fuel with a cetane level less than 40.

NOTE: Do not use gasoline, kerosene or any unapproved fuels in the fuel system.

NOTE: If fuel waxing or bacteria should occur in the fuel system, contact your SANY dealer.

Be sure that there is no water or any foreign material in the fuel.

Take appropriate precautions to prevent fuel contamination during refueling.

NOTICE!

Never dilute fuels. Damage to the injection system can result which causes the machine to operate improperly.

NOTE: B5 Biodiesel blend has been approved by Isuzu® for Tier 4i engines.

Engine Oil Viscosity/Temperature Data

Temperature ° F (° C) / Oil Type	-22 (-30)	-4 (-20)	5 (-15)	32 (0)	50 (10)	68 (20)	86 (30)	104 (40)	122 (50)
SAE 15W-40									
SAE 10W-30									
SAE 5W-30									
SAE 5W-40									
SAE 40W									

NOTE: For engine oil, use API grade: CD,CE,CF,CF-4,CH-4,CI-4,CI-4 plus or ACEA grade: A3/B3,A3/B4,A5/B5,E2,E3,E4,E5,E7 or JASO grade: DH-1.

Lubricating Grease/Temperature Data

Temperature ° F (° C) Grease Type	Summer	Winter
NGLI #2 molybdenum disulfide lithium based grease		
NGLI #1 molybdenum disulfide lithium based grease		
NOTE: Always use clean EP (extreme pressure) grease when greasing the machine. Avoid using low viscosity greases. SANY recommends Chevron Starplex® Grease EP 2 or equivalent. See “Grease” on page 5-11.		

Industrial Gear Oil/Temperature Data

Temperature ° F (° C) Oil Type	-4 (-20)	14 (-10)	32 (0)	50 (10)	68 (20)	86 (30)	104 (40)	122 (50)
220 LS2 (85W-140)								
NOTE: Any brand meeting AGMA standard 9005-D94, ISO 3448 grade 220 is acceptable. Short term use of low viscosity engine oil in cold temperatures (below 23° F / -5° C) promotes engine life; long term use of low viscosity engine oil can reduce engine life.								

Hydraulic Oil/Ambient Temperature Data

Temperature ° F (° C) Oil Type	-22 (-30)	-4 (-20)	14 (-10)	32 (0)	50 (10)	68 (20)	86 (30)	104 (40)	122 (50)
ISO VG 46 antiwear hydraulic oil									
ISO VG 32 low temperature antiwear hydraulic oil									
NOTE: Selection of the proper hydraulic oil is based on local operating climate and conditions: • Use ISO VG 46 antiwear hydraulic oil in generally temperate climates. • Use ISO VG 32 low temperature antiwear hydraulic oil (pour point is -43.6° F (-42° C)) in generally arctic areas where ambient temperatures can reach -22° F (-30° C) during operation.									

NOTICE!

To prevent damage to the hydraulic system, perform the following warm up procedure in ambient temperatures below 32° F (0° C):

Start the engine and run it at idle speed for 7 - 10 minutes; then increase the engine speed to 1,000 - 1,200 rpm and perform only no load traveling for at least 30 minutes or until the hydraulic oil temperature is at least 68° F (20° C).

Proceed with normal operation only after completing warm up as described above or else adjust the warm up period according to the ambient temperature. During normal construction operation, take care to operate the controls slowly and observe the traveling system for any signs of trouble. Operation with oil temperature of 68° F (20° C) or below may damage the hydraulic system.

Engine Coolant

Engine coolants used can be any brand meeting ASTM-6210 standard. Brands meeting these requirements include Isuzu Long Life or Pre Mixed Antifreeze, Zerox G 05, Valvoline HD Extended Life and others.

Lubricants

SANY recommends using only those lubricants listed in “Fluids and Lubricants” on page 5-8.

NOTICE!

Use only those lubricants recommended in this manual. Using other lubricants can cause damage to the machine and could cause the machine to operate improperly.

Contact your SANY dealer for assistance if the machine will be operated in subzero temperatures where the aid of an auxiliary heating device is needed.

Grease

Always use clean EP (extreme pressure) grease when greasing the machine. Avoid using low viscosity greases. SANY recommends Chevron Starplex® Grease EP 2 or equivalent designed for:

- Heavy duty bearings and general industrial lubrication.
- Heavy duty plain and rolling element bearings operating under severe conditions, including shock loading in wet environments.

Windshield Washer Fluid

Use clean automotive windshield washer fluid only. Do not mix concentrates into the windshield washer fluid.

NOTICE!

Never use tap water, dirty water or fluids that could freeze, clog or damage the system. Using these fluids could result in damage to the machine and improper machine operation.

MAINTENANCE SCHEDULE

NOTICE!

Failure to perform the following procedures when and how directed could result in machine damage and improper machine operation.

Secure the Machine for Maintenance

1. Obtain the Maintenance Log for this machine and complete it at the close of all maintenance procedures.
2. Read and understand all of the tasks listed in this section.
3. Follow the local Lockout/Tagout procedure.
4. Proceed with the maintenance procedures indicated below:

As Required

- Air Conditioning Fresh Air Filter - Check (See page 5-19.)
- Hydraulic System Breather Filter - Replace (See page 5-64.)
- Radiator, Oil Cooler, and A/C Condenser Fins - Check (See page 5-77.)

Daily or 10 Hour

- Decals - Check (See page 5-24.)
- Sheet Metal - Check (See page 5-80.)
- Idler - Check (See page 5-67.)
- Primary Fuel Filter - Drain (See page 5-75.)
- Pump Mounting Bolts - Check (See page 5-76.)
- Hydraulic Oil Tank Level - Check (See page 5-61.)
- Hydraulic Line Connections - Check (See page 5-52.)
- SAE/BHL Selector Switch - Set (See page 5-78.)
- Engine Coolant Level - Check (See page 5-35.)
- Engine Oil Level - Check (See page 5-41.)
- Air Conditioner Compressor Belt - Check and Adjust (See page 5-18.)

- Engine V Belts - Check (See page 5-42.)
- Swing Drive - Check (See page 5-81.)
- Escape Tool - Check (See page 5-43.)
- Fire Extinguisher - Check (See page 5-48.)
- Front Window Locks - Check (See page 5-48.)
- Mirrors - Adjust (See page 5-68.)
- Electrical System - Check (See page 5-25.)
- Fuel Level - Check (See page 5-49.)
- Operator Controls - Check (See page 5-71.)
- Operating Functions - Check (See page 5-71.)
- Air Conditioner - Check (See page 5-17.)
- Operation and Maintenance Manual - Check (See page 5-72.)

Weekly or 50 Hour

- Engine Oil and Filter - Replace (See page 5-37.)
- Work Equipment - Lubricate (See page 5-91.)
- Engine Air Intake System - Check (See page 5-29.)
- Batteries - Check (See page 5-21.)
- Hydraulic Hoses - Check (See page 5-51.)
- Final Drive Motor Mounting Bolts - Check (See page 5-45.)
- Final Drive Gearbox Oil Level - Check (See page 5-44.)
- Top Roller Bolts - Check (See page 5-85.)
- Track Bolts - Check (See page 5-86.)
- Track Tension - Check and Adjust (See page 5-86.)
- Muffler and Exhaust System - Check (See page 5-69.)
- Swing Bearing - Lubricate (See page 5-80.)

Monthly or 250 Hour

- Doors and Locks - Check (See page 5-24.)
- Grab Handles and Steps - Check (See page 5-51.)
- Hydraulic Oil - Change (See page 5-56.)
- Hydraulic Tank Return Filter - Replace (See page 5-65.)
- Hydraulic Pilot Line Filter Element - Replace (See page 5-63.)
- Track Assemblies - Check (See page 5-85.)
- Track Tension - Check and Adjust (See page 5-86.)
- Windshield Washer and Windshield Wiper - Check (See page 5-90.)
- Electrical System - Check (See page 5-25.)
- Air Conditioner Compressor Belt - Check and Adjust (See page 5-18.)

3 Months or 500 Hour

- Upper Structure and Lower Structure - Check (See page 5-89.)
- See “Swing Bearing - Lubricate” on page 5-80
- Final Drive - Check (See page 5-44.)
- Hydraulic Hoses - Check (See page 5-51.)
- Radiator, Oil Cooler, and A/C Condenser Fins - Check (See page 5-77.)
- Hydraulic System Breather Filter - Replace (See page 5-64.)
- Air Conditioning Fresh Air Filter - Check (See page 5-19.)
- Hydraulic System Breather Filter - Replace (See page 5-64.)
- Engine Air Filter - Replace (See page 5-27.)
- Engine Oil and Filter - Replace (See page 5-37.))
- Primary and Secondary Fuel Filters - Replace (See page 5-73.)
- Swing Drive Oil - Change (See page 5-82.)
- Swing Drive Oil - Change (See page 5-82.)

- SAE/BHL Selector Switch - Set (See page 5-78.)
- Collect engine oil sample. (See page 5-36.)
- Collect hydraulic oil sample. (See page 5-55.)
- Collect final drive oil sample (both). (See page 5-45.)

6 Month or 1,000 Hour

- Accumulator Function - Check (See page 5-17.)
- Fuel Tank Strainer - Check (See page 5-50.)
- Hydraulic Pilot Line Filter Element - Replace (See page 5-63.)
- Hydraulic Tank Return Filter - Replace (See page 5-65.)
- Fuel Lines - Check (See page 5-49.)
- Engine Exhaust Pipe Clamps - Check (See page 5-36.)

Annually or 2,000 Hour

- Upper Structure and Lower Structure - Check (See page 5-89.)
- Swing Bearing Bolts - Check (See page 5-81.)
- Final Drive Oil - Change (See page 5-46.)
- Hydraulic Oil - Change (See page 5-56.)
- Engine Coolant - Change. (See page 5-32.)

At the completion of the maintenance tasks, record the completion of all maintenance tasks and fully activate the machine and, if authorized, remove all lockout/tagout warnings and machine securing elements. Return the machine to operation.

MAINTENANCE PROCEDURES

Accumulator Function - Check

CAUTION!

Hydraulic oil is hot and under pressure. Always wait for the machine to cool down before proceeding. Failure to do so could result in minor or major injury.

1. Lower the work equipment to a point 12-18 (300-457mm) inches above the ground.
2. Shut down the engine.
3. Turn the ignition key to the ON position.
4. Place hydraulic lockout control lever (a) in the UNLOCKED position.
5. Fully cycle each pedal, joystick and control lever two to three times within 15 seconds in order to release the internal pressure remaining in the hydraulic lines.

   NOTE: If the machine does not move after cycling the pedal, joystick and control lever, contact your SANY dealer.
6. Start the engine and let it run for about five minutes to pressurize the accumulator.

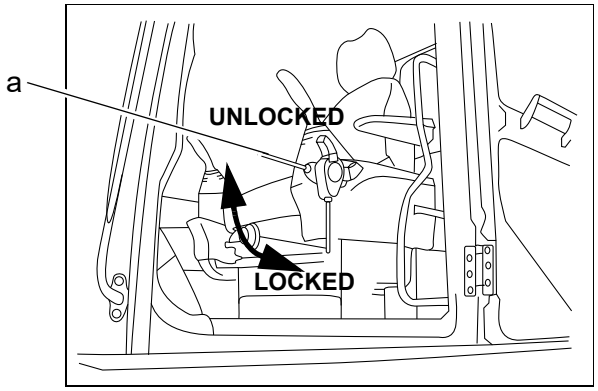

Fig. 5-2

Air Conditioner - Check

CAUTION!

This system is under pressure and working on it could cause a hazardous situation which, could result in minor or moderate injury. Contact your SANY dealer for repairs.

With the engine running, press air conditioning fan switch (a) inside the cab to check startup, air flow and fan speed control.

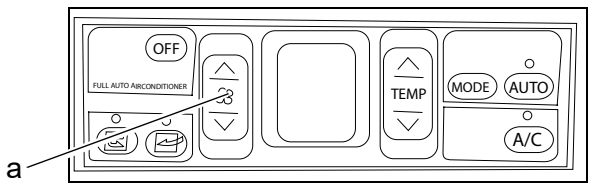

Fig. 5-3

Air Conditioner Compressor Belt - Check and Adjust

Air Conditioner Compressor Belt - Check

1. Open engine cover (a).

   NOTE: The air conditioner compressor is located on the lower left of the engine compartment near the radiator.

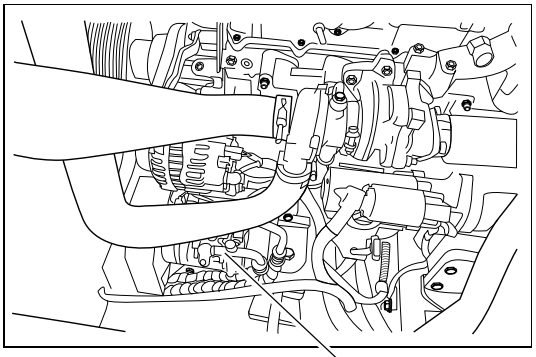

Fig. 5-4

CAUTION!

Ensure that the engine is off and that all rotating parts inside the engine compartment have stopped moving. Failure to do so could result in minor or moderate injury.

2. Remove bolts (b) securing the shroud around the compressor and drive belt.

3. Examine the belt for signs of damage.

4. Using a tensioning gauge, press down on the belt halfway between the drive belt pulley and the compressor belt pulley with a force of 143 lbf. (637 N) for a new belt and a force of 99 lbf. (441 N) for a used belt. The belt must deflect (1) 0.20 in.– 0.31 in. (5 mm–8 mm).

5. Adjust belt tension if necessary.

6. Replace the shroud and secure in place.

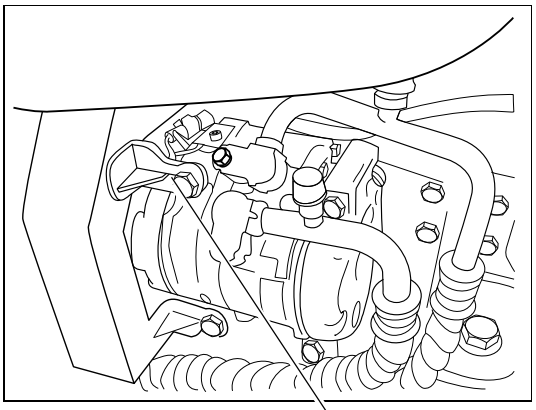

Fig. 5-5

Air Conditioner Compressor Belt - Adjust

1. Remove the shroud

2. Loosen adjustment screw (a) and adjust the compressor belt until the desired belt tension is reached.

3. Tighten adjustment screw (a).

4. Check each pulley (b) for breaks, cracks and wear.

Replace the belt if:

- It has stretched and there is little margin left for adjustment.

- Cuts or cracks are found in the belt.

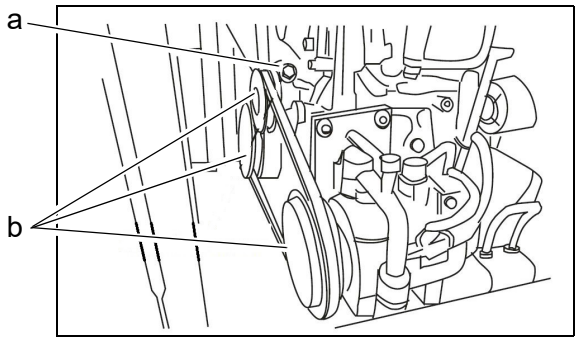

Fig. 5-6

- The belt slips or squeals.

  NOTE: Newly installed V belts need to be readjusted after the first hour of operation.

5. Reinstall the shroud and secure it in place.

Air Conditioning Fresh Air Filter - Check

1. Unlock and open fresh air filter door (a).

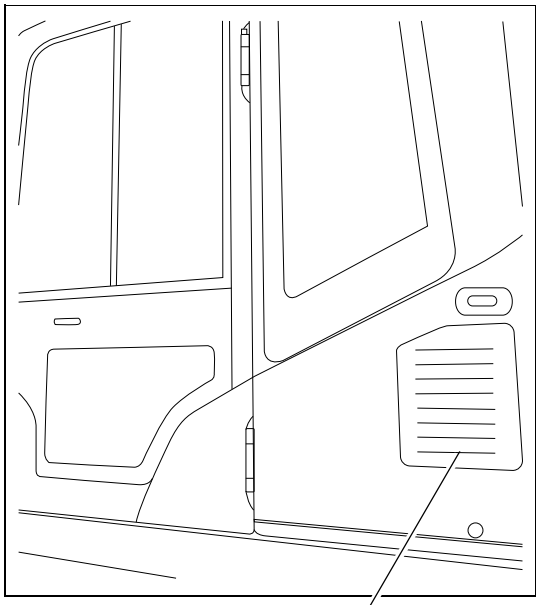

Fig. 5-7

2. Remove the nuts securing fresh air filter (b) in place.
3. Remove filter (b)
4. Clean filter (b) using compressed air.

   NOTE: After cleaning the filter five times or if the filter cannot be cleaned replace the filter with a new one.

5. Reinstall filter (b).
6. Reinstall the nuts securing the filter in place.
7. Close and lock the door.

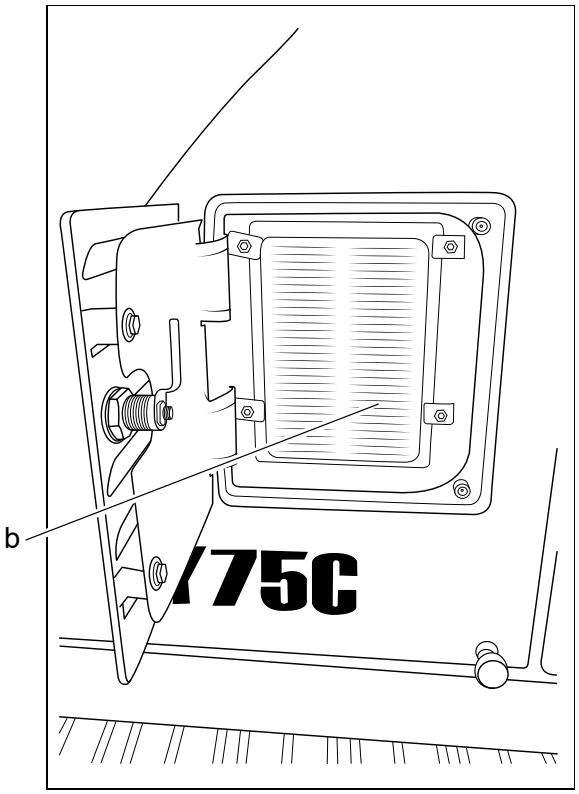

Fig. 5-8

Batteries - Check

CAUTION!

Before proceeding with any battery maintenance procedure, follow and remember these points:

- **Battery gases are explosive. Never smoke around batteries or expose them to sparks or open flames.**
- **Wear personal protective equipment when working with batteries.**
- **Work in a well ventilated area.**
- **If battery acid contacts your skin or your eyes, flush the area immediately with fresh water and seek medical attention.**

Failure to observe and follow this caution could result in minor or moderate injury.

1. Locate the batteries under cover (a) behind the left rear door.
2. Remove two nuts and washers (b) securing the cover over the batteries.

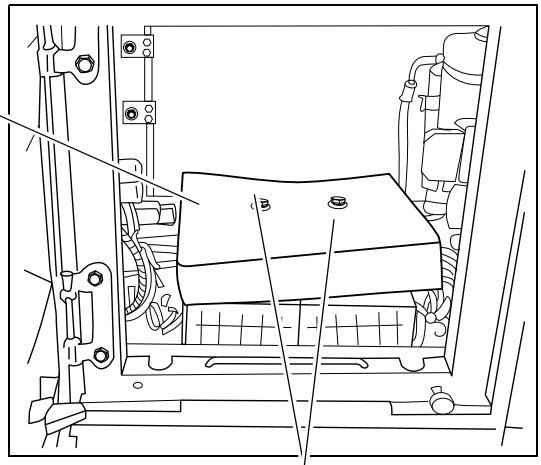

Fig. 5-9

3. Check the top surfaces and all battery connections (c) for signs of corrosion or dirt build up. Use a clean rag to wipe any dirt from the batteries.

   NOTE: If corrosion is found, flush the area with a battery cleaning solution.

4. Remove any trash, tools, parts or debris from the battery compartment.
5. Check the battery cables for looseness, tighten as necessary.
6. Reinstall cover (a) and the fasteners.
7. Close the left rear door.

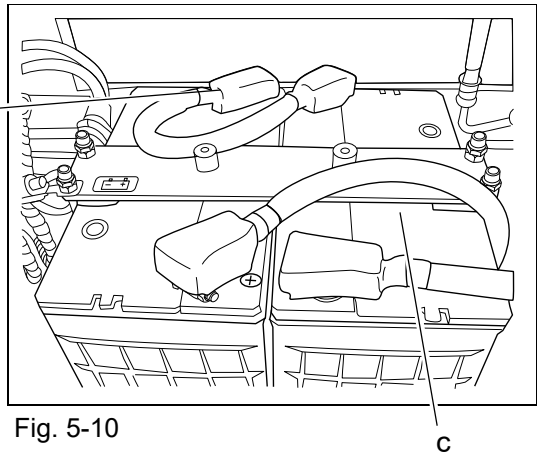

Fig. 5-10

Battery - Replacement

1. Remove two nuts and washers (b), then remove cover (a).

2. Disconnect black ground (-) battery cables (c) first, then disconnect red positive (+) cables (d) last.

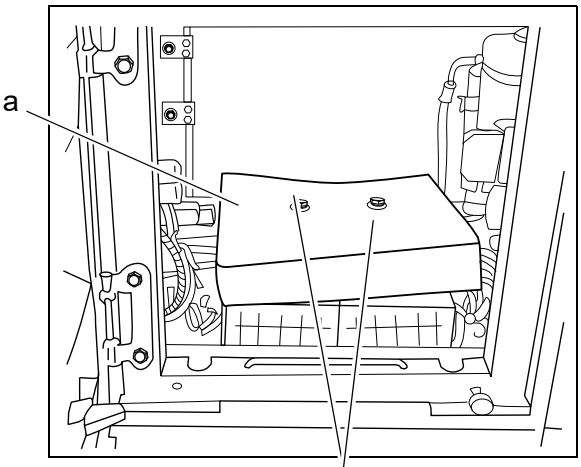

Fig. 5-11

3. Remove the nuts from the retaining bolts and lift battery hold down bracket (e) off of the battery.

4. Remove the failed battery (or batteries).

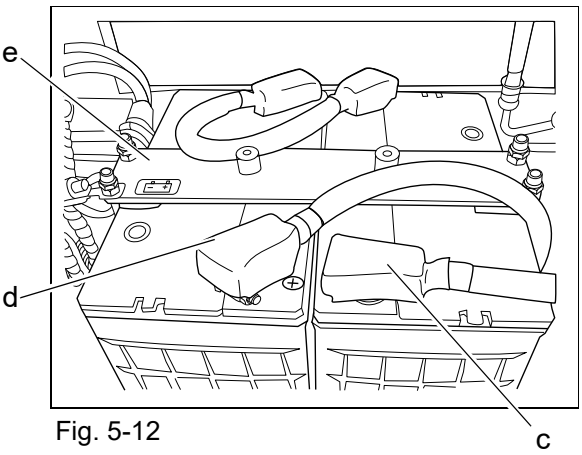

Fig. 5-12

5. Install the new battery (or batteries).
6. Connect red positive (+) cables first. Connect black ground (-) cables.

   NOTE: Both 12 volt batteries are attached in series. Be sure they are installed in the same manner.

   NOTE: Dispose of the old batteries properly.

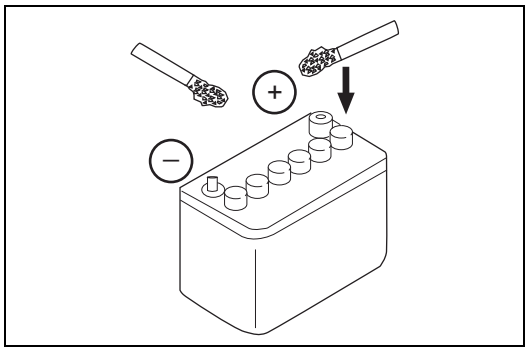

Fig. 5-13

NOTICE!

Dispose of batteries in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

7. Replace battery hold down (a) bracket over the battery and secure in place with nuts.
8. Reinstall cover (a) and two nuts and washers (b).

Bucket - Replace

CAUTION!

Driving a pin with a hammer can cause metal pieces to fly off, leading to severe injuries. Wear adequate personal protective equipment during these operations.

Make sure that the surrounding area is clear of personnel when hammering any of the pins; the pins could fly out and cause personal injury.

Do not stand behind the bucket when removing pins.

Do not to place your foot under the bucket.

Do not put your finger into the bore during alignment.

Failure to observe and follow these cautions could result in minor or moderate injury.

1. Park the machine on hard, level ground.
2. Lower bucket (a) to where it just contacts the ground.

   NOTE: If downward force is used, pin removal could become difficult.
3. Remove the nuts and bolts on the plate retaining the bucket pin and link pin. (Pin installed (b))
4. Remove the bucket pin and link pin, and then remove the bucket. (Pin removed (c))

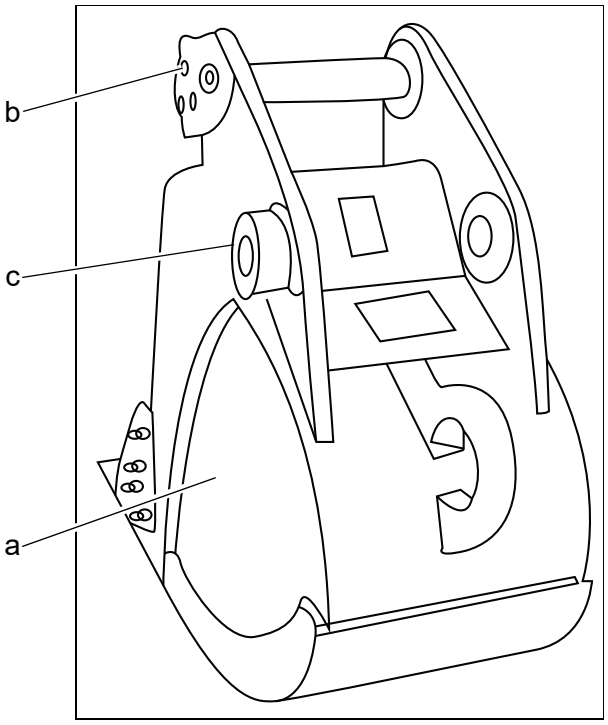

Fig. 5-14

5. Align arm (d) and link (e) with bore (f).

6. Insert the greased pins into bore (g) and bore (h) respectively.

   NOTE: Make sure the pins are free of mud or sand during installation. Both ends of the bushing are equipped with dust seals. Be careful not to damage them.

7. Install the nuts and bolts onto the plate retaining the pins.

8. Add grease to the pins.

9. Pump grease until it is squeezed out around the pins.

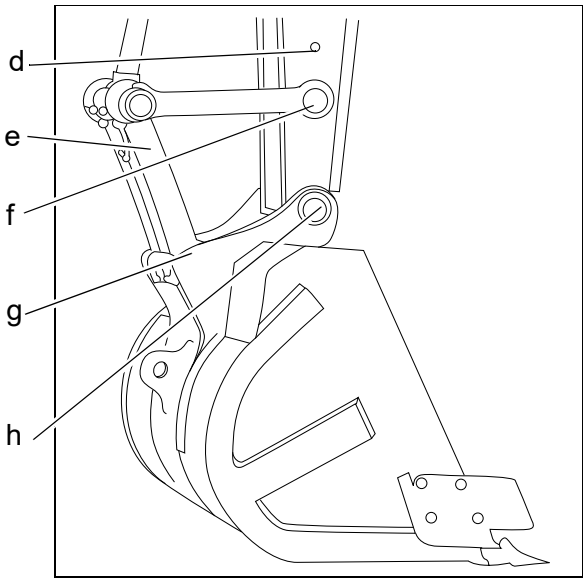

Fig. 5-15

NOTICE!

Replace any broken seals when replacing a bucket. Usage with broken seals could allow sand or dust to penetrate through to the seals and cause abnormal wear. Failure to follow this notice can cause damage to the machine or cause the machine to operate improperly.

Decals - Check

All safety decals (b) should be visible and complete.

Doors and Locks - Check

1. Inspect cab door (a), rear doors (b) and locks (c) to be sure they close and lock properly.

2. Repair or replace any damaged doors, doors, or locks immediately.

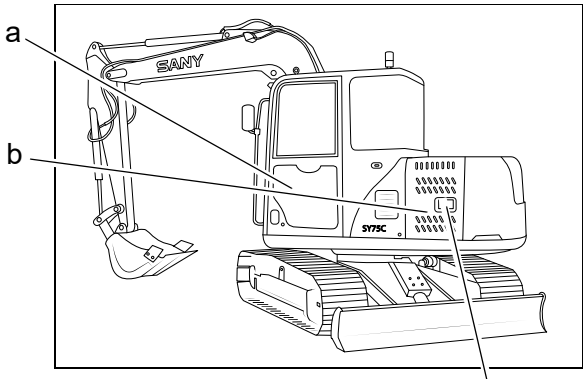

Fig. 5-16

Electrical System - Check

1. The fuse box is located in the rear of the cab behind the seat.

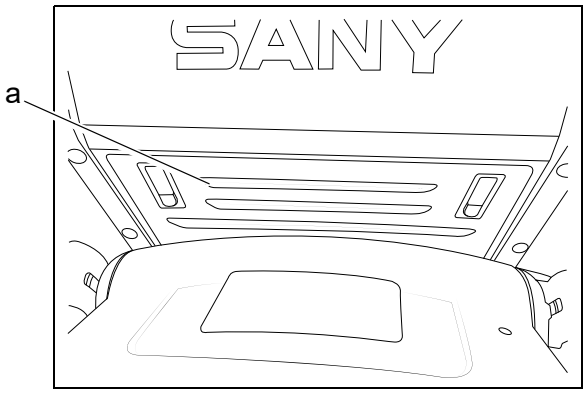

Fig. 5-17

2. Remove back panel (a) to access fuse box (b) on the right.

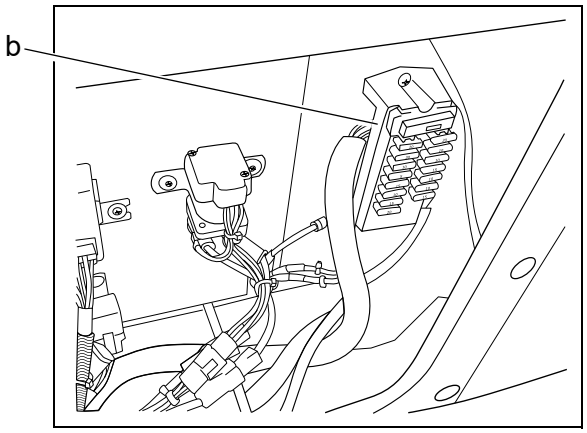

Fig. 5-18

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Fuse locations, circuits and Ratings	
F2. Charging circuit, 20A	F1. Starting Circuit, 20A
F4. Work lamp, 30A	F3. Horn, cab lamp, access lamp,10A
F6. Wiper, washer, speaker, 10A	F5. GPS,10A
F8. A/C control, 5A	F7. 12V Power supply, 15A
F10. A/C fan, 15A	F9. Travel and swing alarm, 10A
F12. A/C Compressor,10A	F11. Cab rear light,10A
F14. Monitor controller,15A	F13.Power converter,15A
F16. Solenoid, 20A	

3. Check fuses for corrosion or black marks indicating a blown fuse.

   NOTE: Replace any fuse with corrosion.

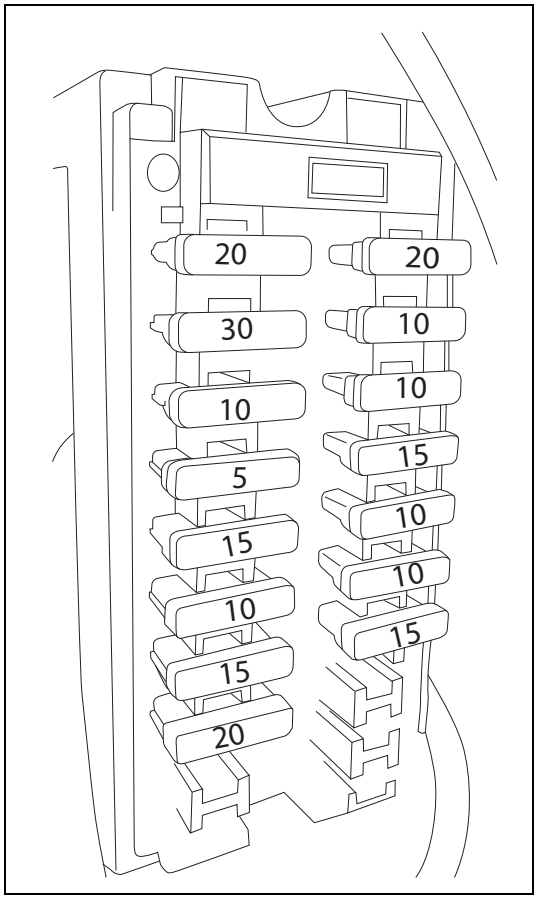

Fig. 5-19

NOTICE!

Before replacing a fuse, make sure that the ignition key is in the OFF position and the battery disconnected. A fuse should be replaced if it is corroded, produces white powder, has a black mark, or becomes loose in the fuse panel.

Always replace a fuse with one of the same capacity. Never replace a fuse with one of a higher capacity. Doing this may cause the machine to catch on fire.

- Inspect all electrical equipment and circuitry regularly; if necessary, remove and replace all faulty items, including loose connectors, worn or degraded wiring, cables, etc.
- Locate and remove the cause of any electrical faults.
- Use only genuine SANY parts and fuses as specified here.
- Shut off the machine immediately if a fault occurs with the power supply.
- Do not modify the electrical system without authorization.

Engine Air Filter - Replace

NOTE: Depending on the work environment and the degree of contamination, the filter may need to be replaced more frequently than every 500 hours.

1. Locate the air intake system behind the left rear door.

2. Squeeze dust evacuator (a) mounted the end cap of filter housing (b) to release any dust.

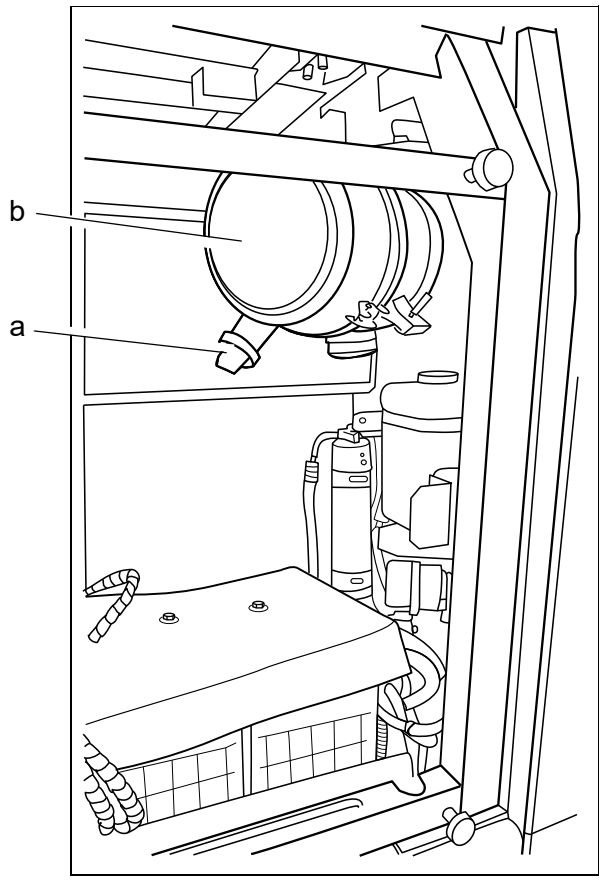

Fig. 5-20

3. Open air filter housing (c) and remove primary air filter (d).

4. Inspect the air filter for damage, dampness or dust.

NOTICE!

Do not attempt to clean the air filter. Failure to replace a damaged, damp or clogged air filter could result in machine damage and improper machine operation.

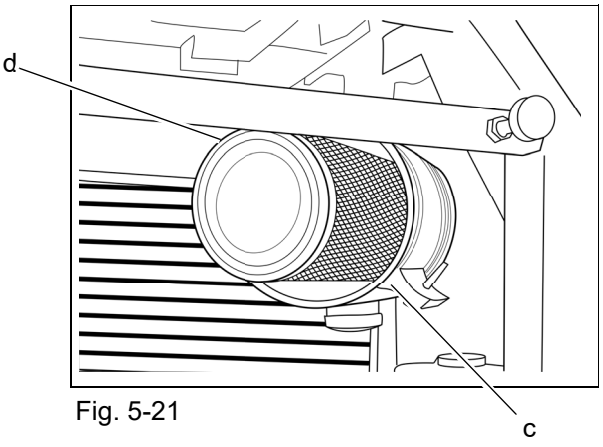

Fig. 5-21

5. Clean the inside of air filter housing (e) with a clean cloth before you replace the primary air filter.

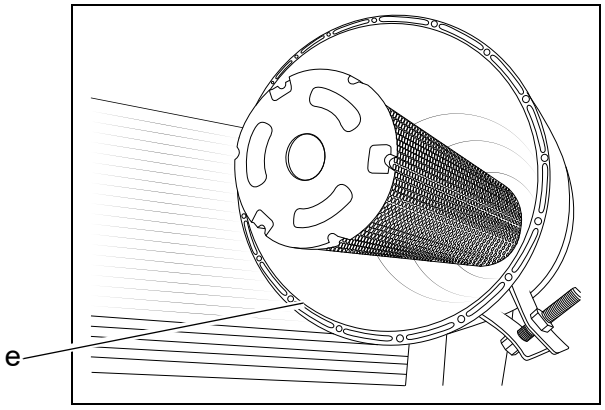

Fig. 5-22

6. Close air filter housing (a), making sure that dust evacuator (b) is pointing down.

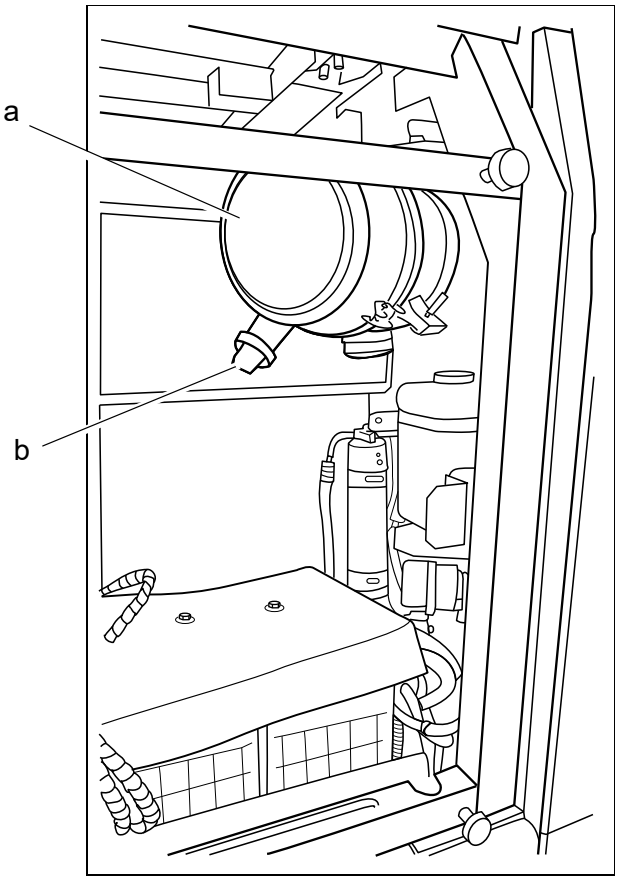

Fig. 5-23

Engine Air Intake System - Check

1. Locate the air intake system behind the left rear door.

2. Squeeze dust evacuator (a) mounted the end cap of filter housing (b) to release any dust.

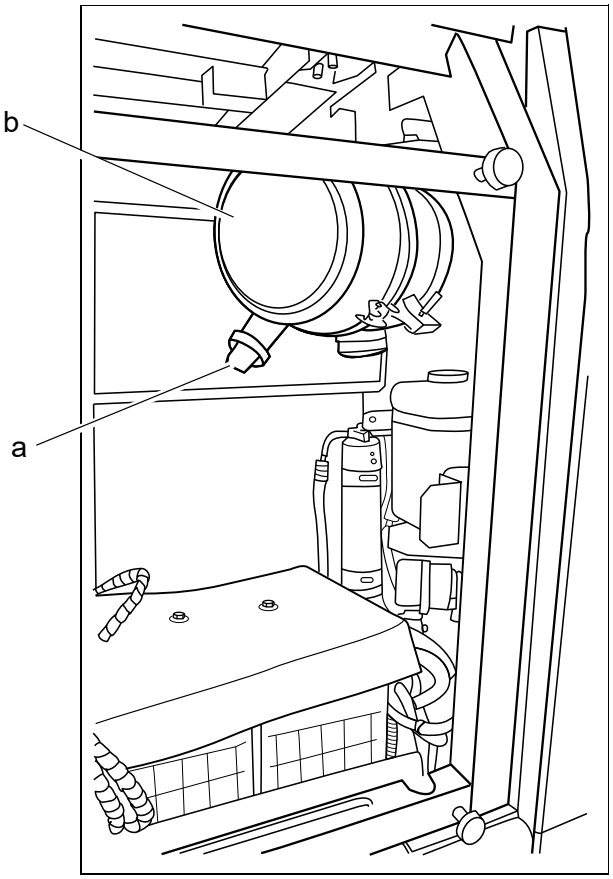

Fig. 5-24

3. Check the condition of dust evacuator (c) and replace if required.

   NOTE: If the dust evacuator is cracked, torn, remains open or is missing, dust particles that are normally expelled can deposit themselves onto the filter and will shorten air filter service life.

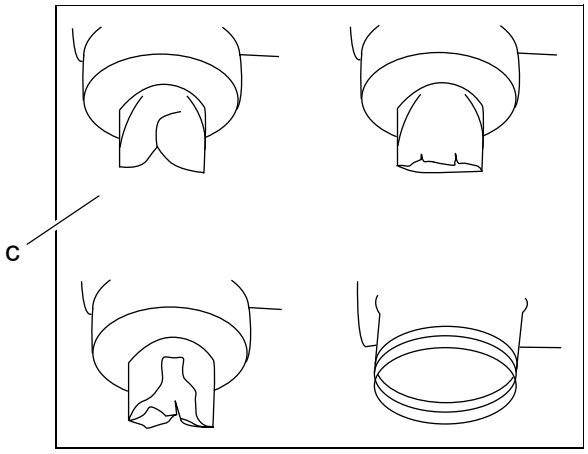

Fig. 5-25

4. Open air filter housing (c) and remove primary air filter (d).

5. Inspect the air filter for damage, dampness or dust.

   NOTE: If you find any damage, moisture or dust in the filter replace it.

NOTICE!

Do not attempt to clean the air filter. Failure to replace a damaged, damp or clogged air filter could result in machine damage and improper machine operation.

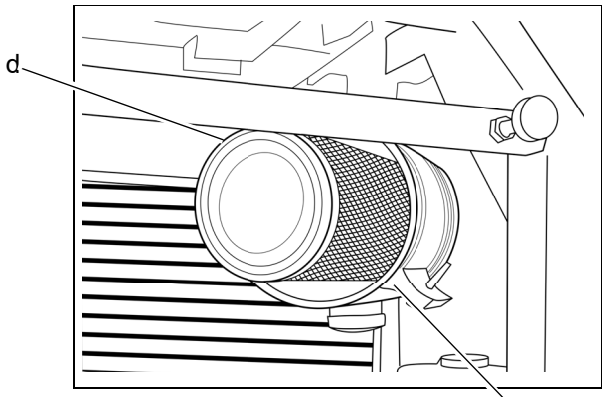

Fig. 5-26

6. Clean the inside of air filter housing (e) with a clean cloth before you replace the primary air filter.

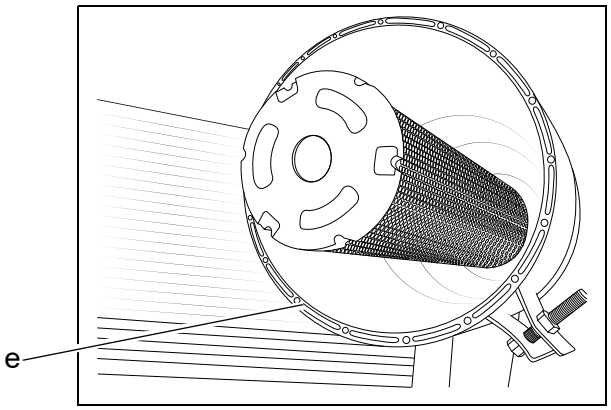

Fig. 5-27

7. Close air filter housing (b), making sure that dust evacuator (a) is pointing down.

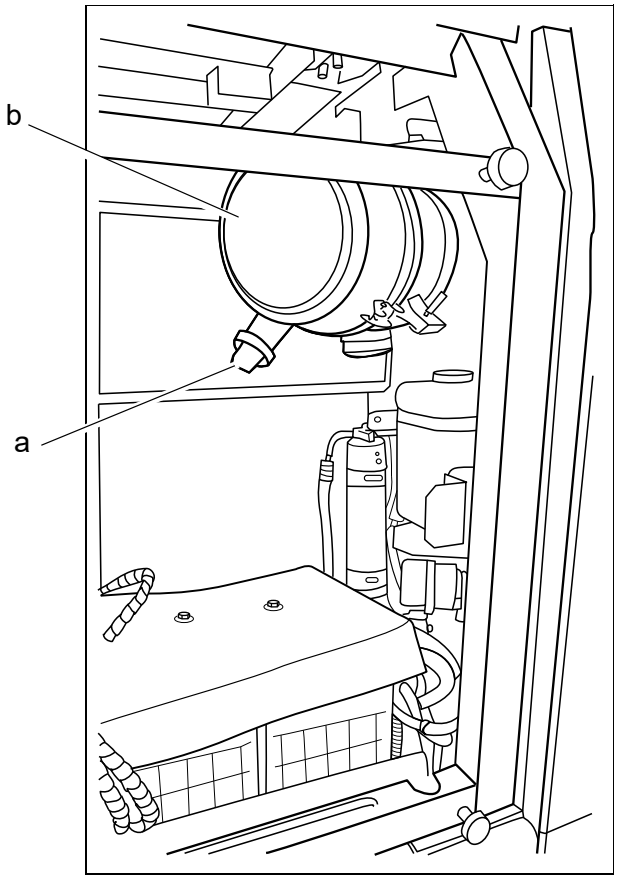

Fig. 5-28

Engine Coolant - Change.

DANGER!

Inhaling or ingesting coolant is toxic. If not avoided, this will result in death or injury.

CAUTION!

Do not remove the filler cap while the engine is hot. Engine coolant is under pressure when hot and will spurt out. Always wait for the engine to cool before removing the filler cap. Failure to follow this warning will result in creating a hazardous situation which could result in minor or moderate injury.

1. Swing upper structure (a) to position the drain valve beneath the radiator for better access.

2. Shut down the engine.

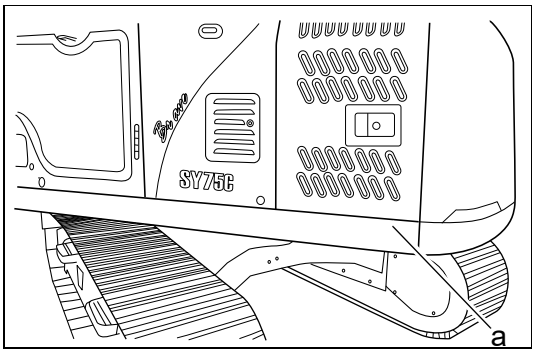

Fig. 5-29

3. Open engine cover (b).

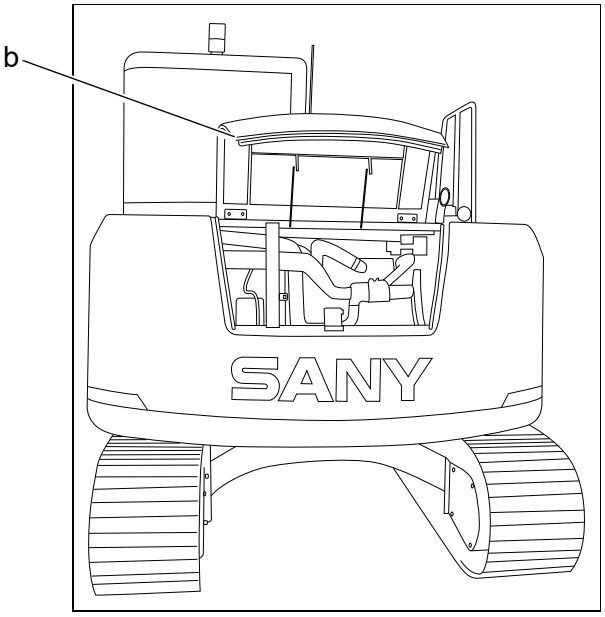

Fig. 5-30

4. Slowly open radiator filler cap (c) to release the cooling system pressure.

5. Remove radiator fill cap (c) when all pressure has been relieved.

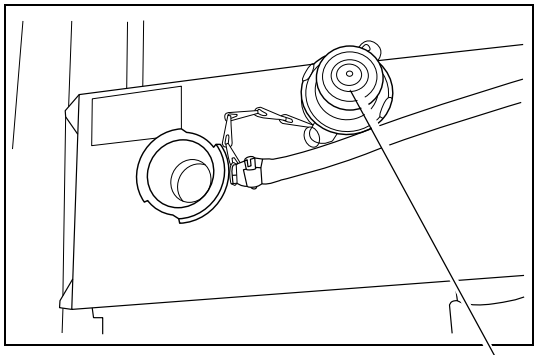

Fig. 5-31

6. Remove radiator tank bottom cover (d).

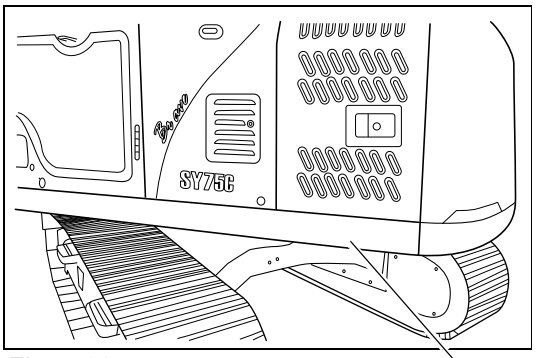

Fig. 5-32

7. Place an appropriate sized container under radiator drain hose (e).

8. Open radiator drain valve (f).

9. Allow the coolant to completely drain into the catch container.

NOTICE!

Dispose of drained coolant in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

10. Close drain valve (f) after the cooling system is empty.

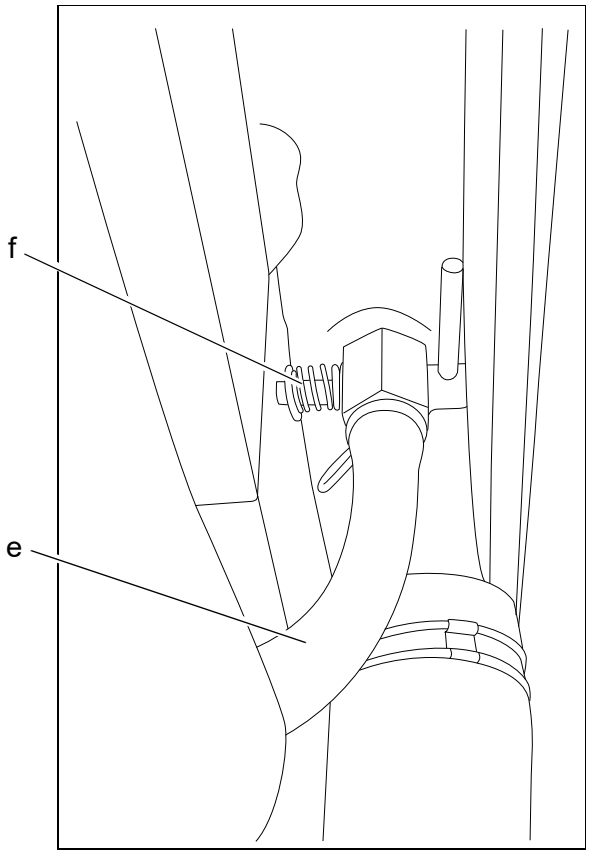

Fig. 5-33

11. Add new coolant directly into radiator filler neck (g) until the coolant level reaches the bottom of the filler neck inspection hole.

12. Start the engine and run it at idle speed (1,050 rpm) for about 5 minutes and allow the coolant level to drop.

13. Shut down the engine.

14. Check the fluid level.

15. Add coolant directly into radiator filler neck (g) until the coolant level again reaches the bottom of the filler neck inspection hole.

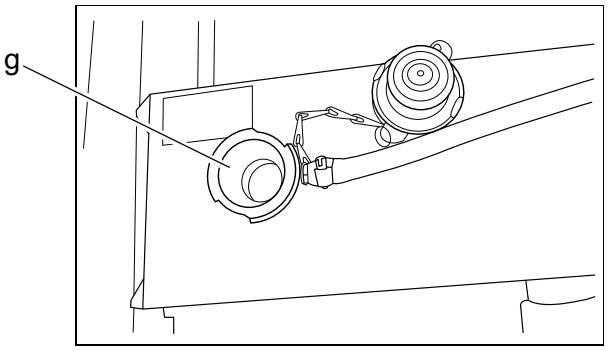

Fig. 5-34

16. Add new coolant to expansion tank (h) until the coolant level is between the Full and Low marks on the expansion tank.

17. Reinstall the expansion tank filler cap.

18. Reinstall radiator filler cap (c).

19. Reinstall radiator tank bottom cover (d).

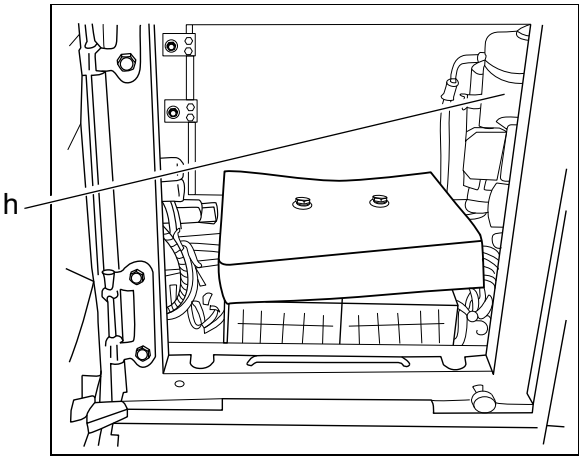

Fig. 5-35

Engine Coolant Level - Check

DANGER!

Inhaling or ingesting coolant is toxic. If not avoided, this will result in death or injury8.

WARNING!

Do not remove the radiator cap while the engine is hot. Engine coolant is under pressure when hot and will spray out. Always wait for the engine to cool before removing the radiator cap. Failure to follow this warning could result in death or injury.

NOTICE!

Dispose of the coolant oil in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

1. Locate coolant recovery tank (a) behind the left rear door.
2. Verify that the coolant level is between the L and H marks on the coolant recovery tank.
3. Add coolant as necessary to a level between the L and H marks on recovery tank (a).
4. Start the engine and run it at low idle speed (1,050 rpm) for five minutes.
5. Shut down the engine.
6. Recheck the coolant level.
7. Add more coolant if necessary

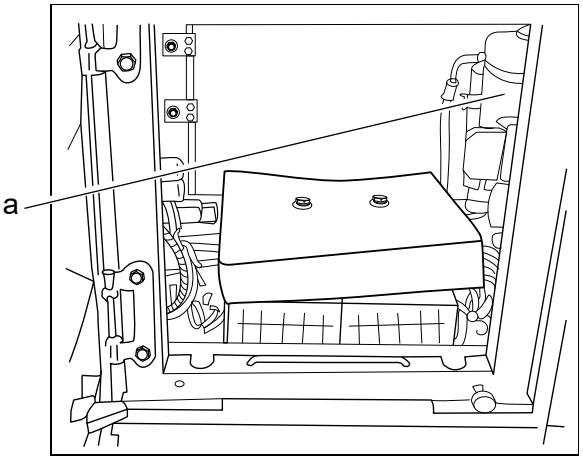

Fig. 5-36

Engine Exhaust Pipe Clamps - Check

1. Open right rear door (a).

CAUTION!

Ensure that the engine is shut down and that the exhaust has cooled down to a point where it can be touched without burning. Failure to do so could result in minor or moderate injury.

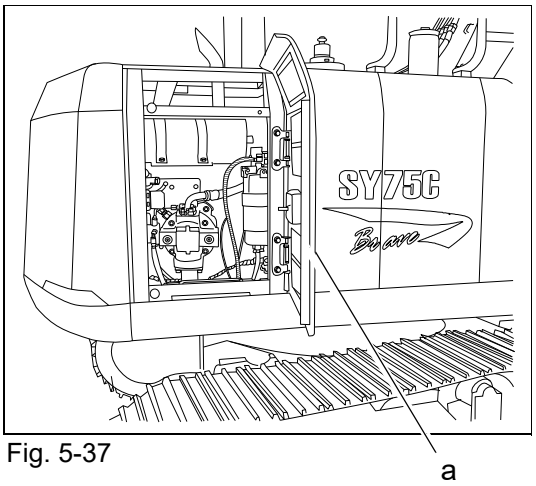

Fig. 5-37

2. Check clamps (b) on the exhaust system for tightness.
3. Tighten as required.
4. Replace damaged or missing clamps.
5. Close the right side door when complete.

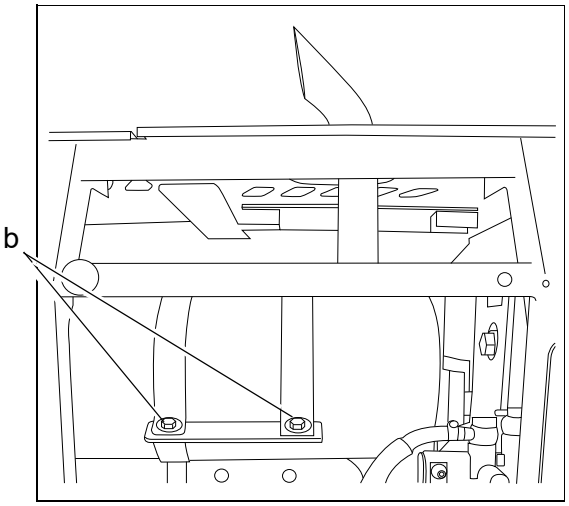

Fig. 5-38

Collect Engine Oil Sample

1. Obtain an Oil Analysis Sample Kit from a SANY dealer.
2. Operate the machine until the engine oil is up to normal operating temperature.
3. Prepare the machine for service.

NOTICE!

It is critical that all material used to collect the sample is absolutely clean. Failure to adhere to this warning can cause equipment damage and contaminate the sample.

4. Clean the area around the engine oil dipstick and remove the dipstick.
5. Insert the oil sample tube into the dipstick tube and collect a sample of engine oil. Replace the dipstick.
6. Send the sample for testing in accordance

Engine Oil and Filter - Replace

WARNING!

Do not perform this task when the engine is hot. Wait for the engine to cool before proceeding. Failure to do so could result in burns or other injury.

NOTE: Replace engine oil after the initial 50 hours of service, then every 500 hours.

NOTE: See “Collect Engine Oil Sample” on page 5-36.

1. Remove bottom cover (a) below the engine compartment.

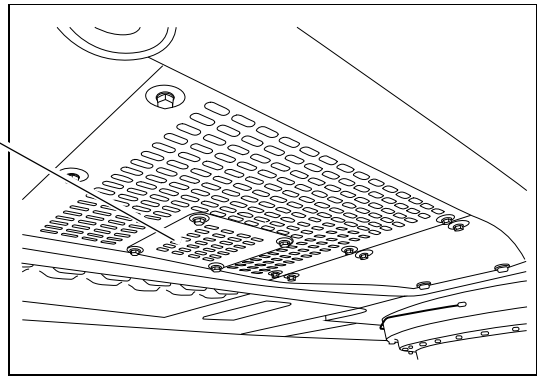

Fig. 5-39

2. Open engine cover (b).

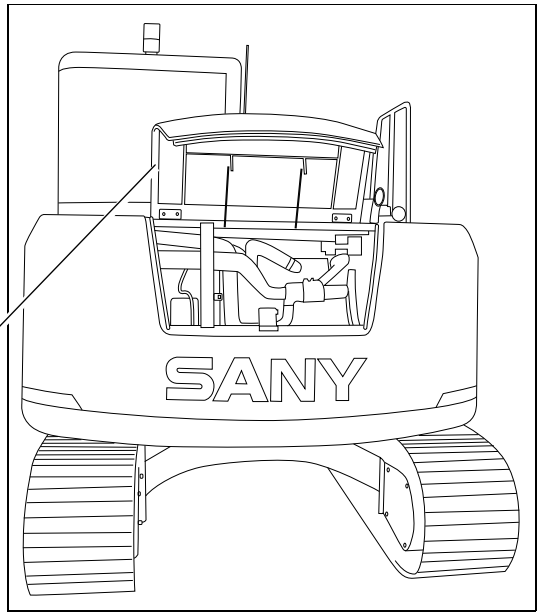

Fig. 5-40

3. Loosen engine oil filler cap (c).

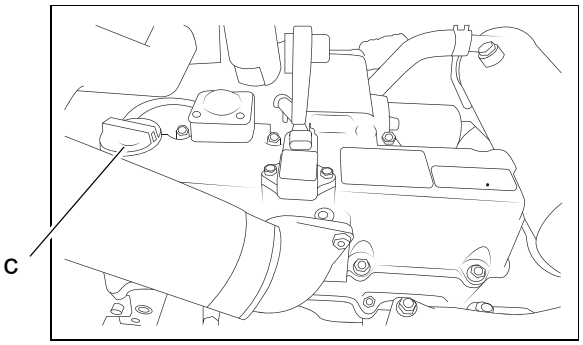

Fig. 5-41

4. Place an appropriately sized container under drain valve (d).

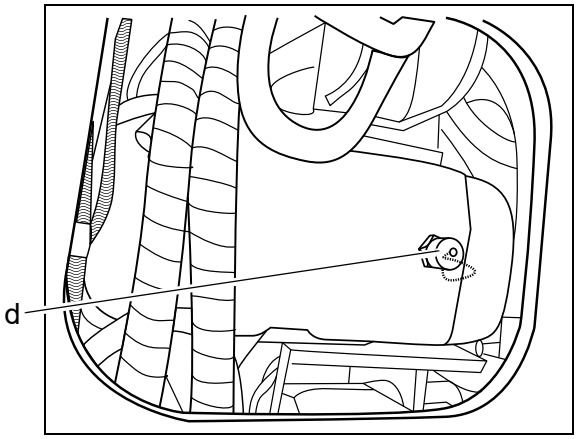

Fig. 5-42

5. Remove the cap from the drain valve.
6. Attach engine oil drain adapter (e) to the engine drain (d).
7. Drain all of the oil.
8. Remove the drain adapter when all of the oil has drained from the engine.
9. Replace the drain valve cap.
10. Replace bottom cover (a).

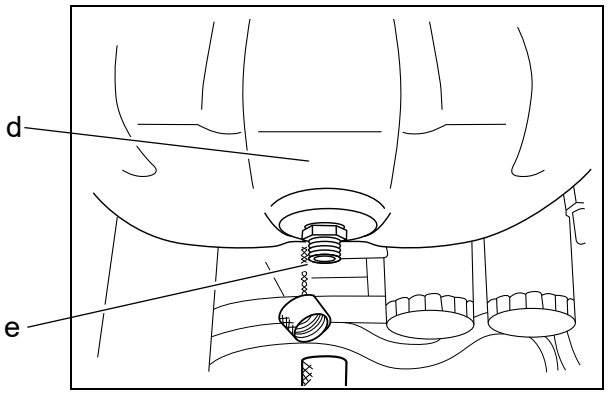

Fig. 5-43

NOTICE!

Dispose of the drained oil in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

11. Locate engine oil filter (f) in the engine compartment.

12. Place a container under the engine oil filter.

13. Remove oil filter (f).

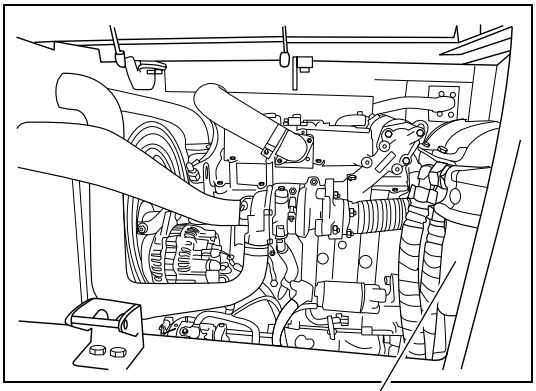

Fig. 5-44

14. Clean engine oil filter mount (g).

15. Coat the new filter seal ring with a thin layer of engine oil.

16. Thread the new filter into place on its mount (f) until the filter gasket contacts the filter mount, then tighten the filter 3/4 turn more.

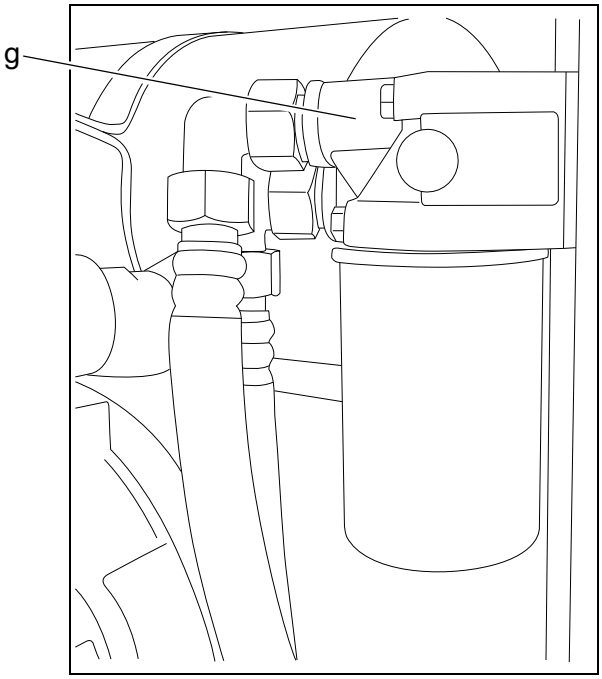

Fig. 5-45

17. Remove engine oil filler cap (h).

18. Add oil as needed.

NOTICE!

Do not overfill the engine with oil. Failure to observe and follow this could result in machine damage and improper machine operation.

19. Reinstall engine oil filler cap (h).

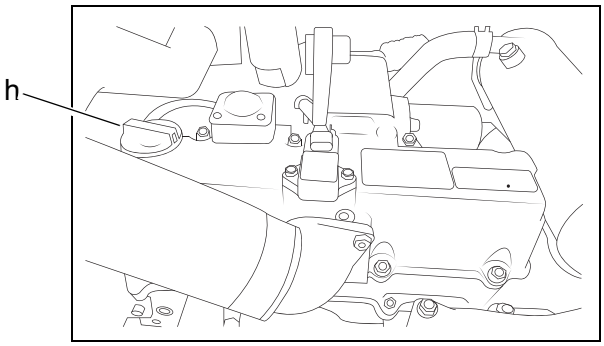

Fig. 5-46

20. Locate engine oil dipstick (k) in the engine compartment.

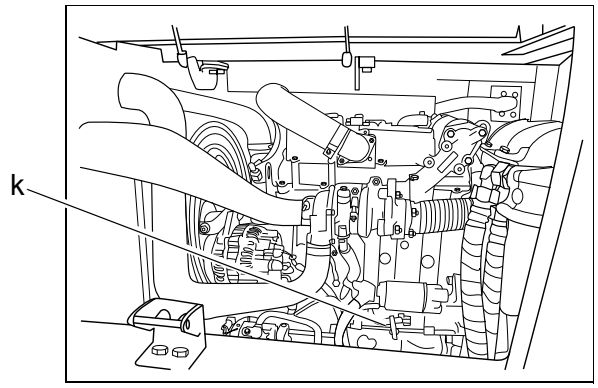

Fig. 5-47

21. Remove the dipstick from the engine and note the oil level.

    NOTE: The oil level should be within the area shown (k).

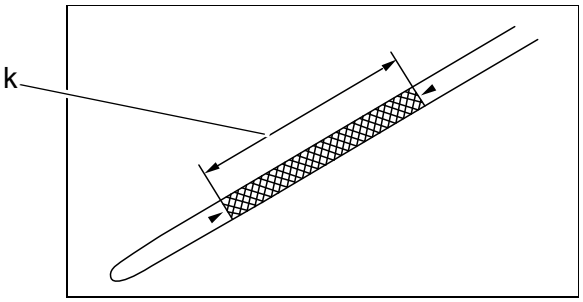

Fig. 5-48

22. Start and run the engine at idle speed (1,050 rpm) for a short time and check for oil leaks.

23. Shut down the engine, wait for several minutes, then remove dipstick (k) from the engine and note the oil level.

    NOTE: The oil level should be within the area shown (k).

24. Remove the oil filler cap, add oil as needed, then reinstall the cap.

Engine Oil Level - Check

1. Open engine cover (a).

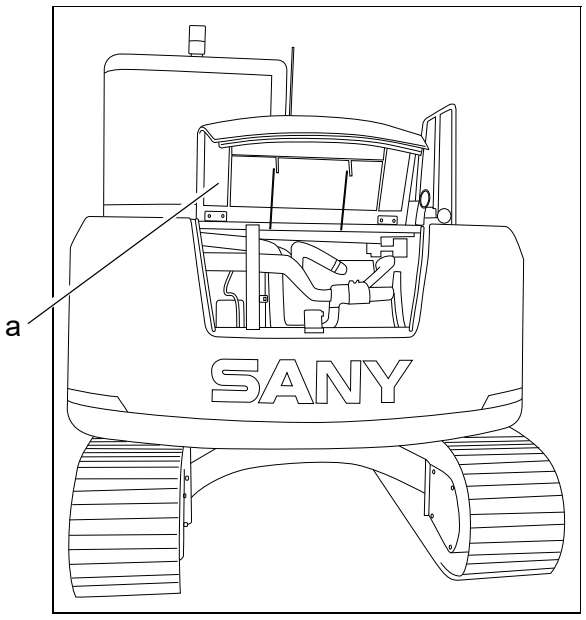

Fig. 5-49

2. Locate engine oil dipstick (b).

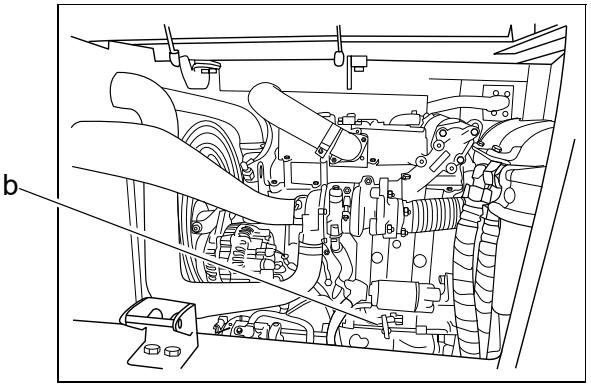

Fig. 5-50

3. Remove the dipstick from the engine and note the oil level on the dipstick.

   NOTE: The oil level should be within area (c) marked on the dip stick surface.

4. Replace the dipstick.

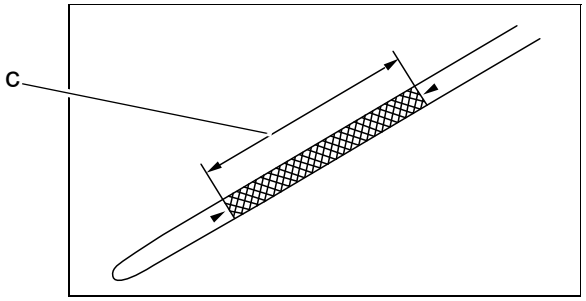

Fig. 5-51

5. If necessary remove oil filler cap (d), add oil as needed, then reinstall the cap.

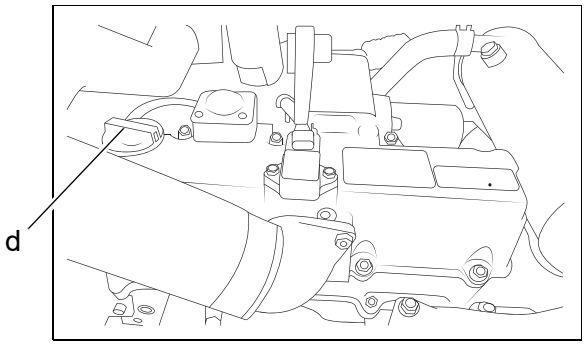

Fig. 5-52

NOTICE!

Do not overfill the engine with oil. Failure to observe and follow this directive may result in severe damage to the engine.

6. Close the engine cover.

Engine V Belts - Check

1. Open engine cover (a).

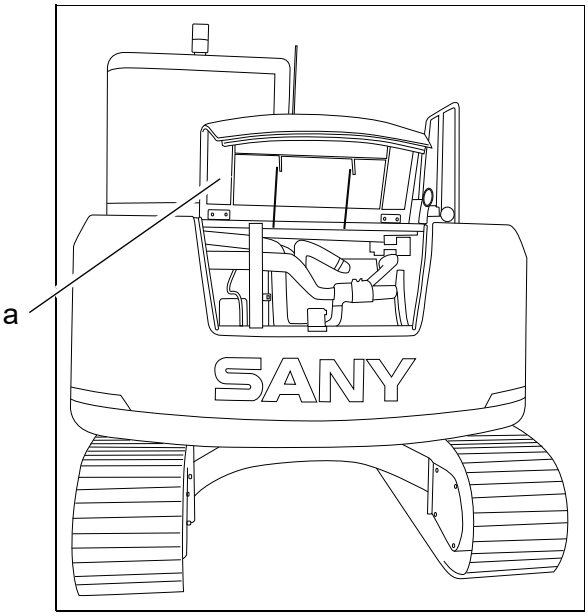

Fig. 5-53

2. Locate V belts (b).

NOTE: There are two V belts, one driving the alternator and the other driving the air conditioning compressor.

3. Compare the information here with the actual belt.

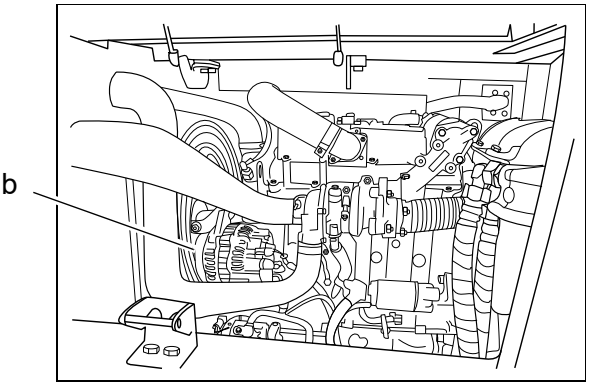

Fig. 5-54

a. Abrasion: The belt appears shiny, glazed or fabric is exposed. This is a sign that the belt is in contact with an object such as a flange or bolt.

b. Chunk out: Chunks of rubber material have broken off from the belt. At this stage, the belt can fail at any moment. Heat, age and stress are the primary contributors.

c. Pulling: Belt material is sheared off from the ribs. Lack of tension, misalignment, worn pulleys or a combination of these are factors.

d. Uneven rib wear: Belt shows damage to the side with the possibility of breaks in the tensile cord or jagged edged ribs. A thumping/grinding noise may also be heard when running.

e. Improper installation: A belt rib begins separating from the strands. If left unattended, the panel will often separate, causing the belt to unravel.

f. Cracking: Small visible cracks along the length of a rib or ribs. With continuous exposure to high temperatures, the stress of bending around the pulley leads to cracking.

g. Misalignment: Sidewalls of the belt may appear glazed or the edge cord may become frayed. A noticeable noise may result.

h. Gravel penetration: Small pinholes are visible on the backside of the belt. Bumps may be visible and fabric around the holes can be frayed, indicating damage from foreign objects such as dirt, gravel or similar debris.

Escape Tool - Check

Check that escape tool (a) is mounted on the right side of the back wall of the cab.

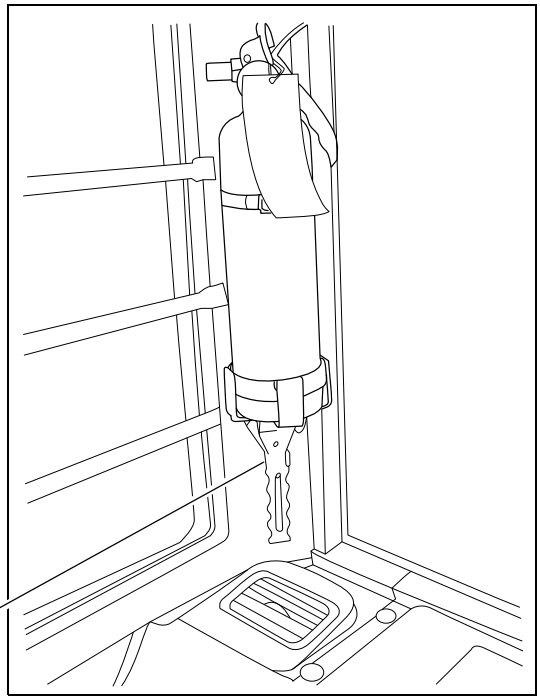

Fig. 5-55

Final Drive - Check

1. Locate final drive covers (a).
2. Remove covers (a).

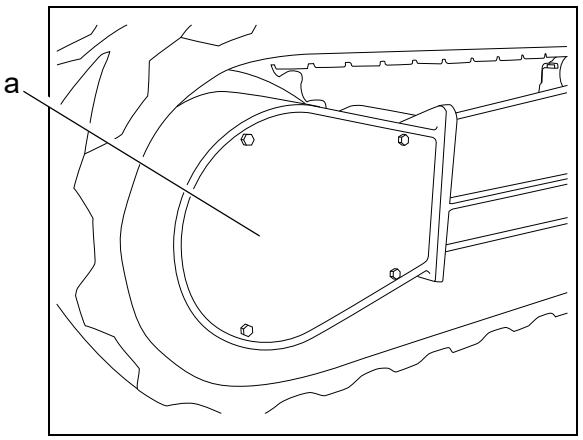

Fig. 5-56

3. Inspect final drive (b) to ensure all hoses are connected tightly.
4. Ensure all bolts are present and tight.
5. Replace any damaged or defective bolts and tighten any loose bolts.

   NOTE: Use anaerobic thread sealant when reinstalling loose bolts and installing new bolts.

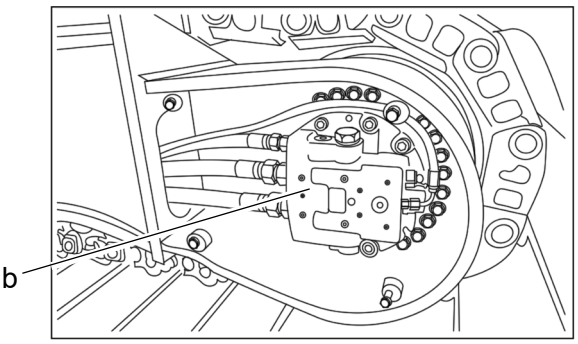

Fig. 5-57

6. Check for leaks.

Final Drive Gearbox Oil Level - Check

1. Drive the machine onto a flat, level surface, placing the final drive cover so that the line (a to c) is perpendicular to the ground.
2. Shut down the engine.
3. Remove filler plug (c) first to relieve system pressure.
4. Remove check plug (b) and visually check to be sure the oil level is within 0.4 in. (10 mm) of the bottom of check plug hole (b).

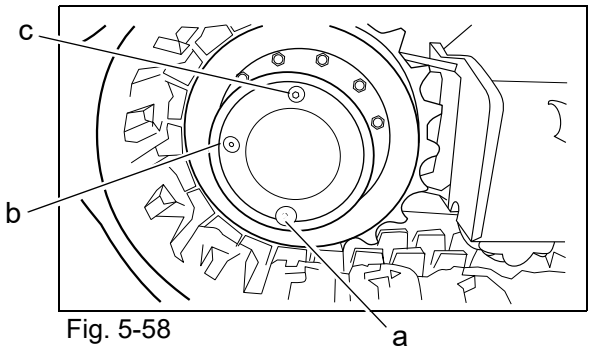

Fig. 5-58

5. If the oil level is low, add oil through filler plug hole (c) until the level is within 0.4 in. (10 mm) of the bottom of check plug hole (b).

NOTICE!

Overfilling the final drive case may damage the case seals. This could result in machine damage and improper machine operation.

6. Replace the O-ring on all removed plugs.

7. Reinstall and tighten both plugs.

8. Check for external leaks.

NOTICE!

If oil leaks are found during the oil level inspection, stop the inspection, locate and repair the cause of the oil leaks. Failure to avoid doing this could result in machine damage and improper machine operation.

Collect Final Drive Oil Sample

1. Obtain an Oil Analysis Sample Kit from a SANY dealer.

2. Operate the machine to normal operating temperature.

3. Prepare the machine for service.

NOTICE!

It is critical that all material used to collect the sample is absolutely clean. Failure to adhere to this warning can cause equipment damage and contaminate the sample.

4. Remove the final drive check plug. See “Final Drive Gearbox Oil Level - Check” on page 5-44.

5. Insert the oil sample tube into the final drive and collect a sample of final drive oil. Install the final drive check plug.

6. Send the sample for testing in accordance with the instructions packaged with the sample kit.

Final Drive Motor Mounting Bolts - Check

1. Locate final drive motor (a) on one of the track assemblies.

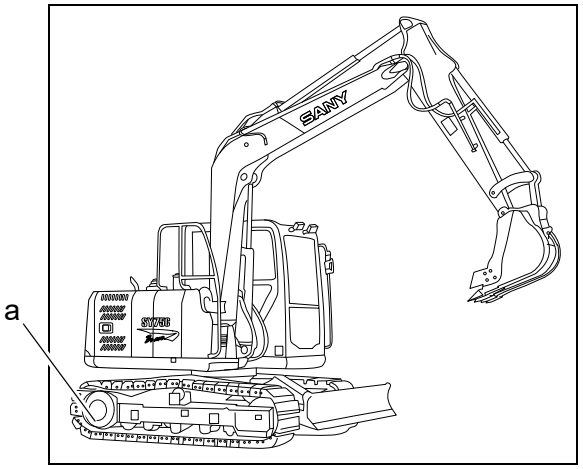

Fig. 5-59

2. Remove travel motor cover (b).

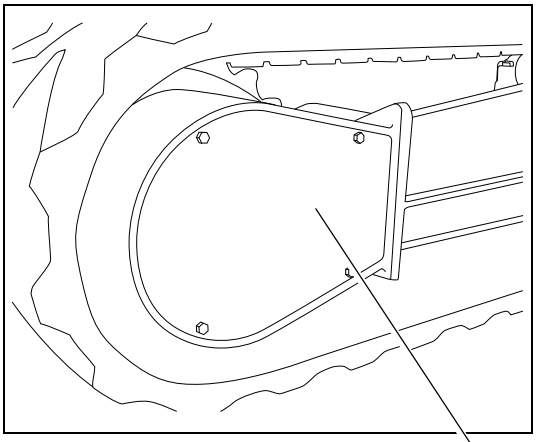

Fig. 5-60

3. Inspect all of travel motor mounting bolts (c) for rust, damage or looseness.

4. Replace any damaged, defective, or missing bolts and tighten any loose bolts.

   NOTE: Use anaerobic thread sealant when re tightening loose bolts and installing new bolts.

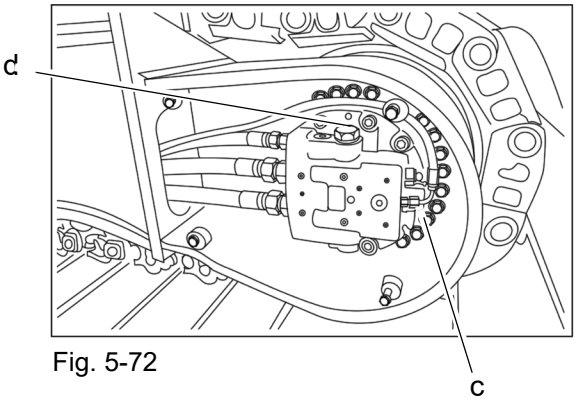

Fig. 5-72

Final Drive Oil - Change

CAUTION!

When the engine has just shut down, the oil and final drive components are still hot and can cause burns. Wait until the oil in the final drive has cooled before servicing.

Residual pressure in the final drive can cause oil to squirt out or the screw plug to fly out with extreme force. Slowly loosen the screw plug in order to gradually release the pressure. Failure to follow this process could result in minor or moderate injury.

NOTE: See “Collect Final Drive Oil Sample” on page 5-45.

1. Drive the machine on to a flat level surface placing the final drive such that word OIL (a) is parallel to the ground.

2. Remove any dirt from the hexagonal socket of plugs (b-c-d) in order to avoid damage to the bolts.

3. Loosen plug (b) first to relieve pressure within the final drive.

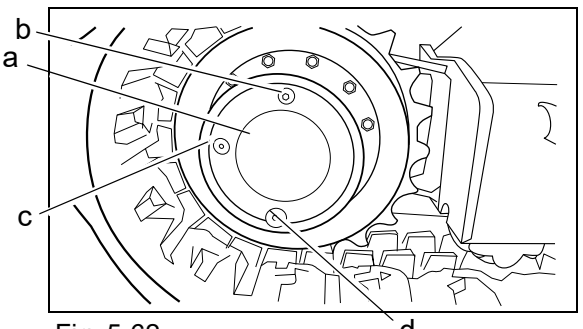

Fig. 5-62

4. Place an appropriate sized container under drain plug (d).
5. Remove drain plug (d) slowly taking care not to stand in front of the drain plug.
6. Remove plugs (b) and (c).
7. Allow the oil to drain completely.

NOTICE!

Dispose of drained oil in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

8. Replace O-ring (e) on each plug.
9. Replace and tighten drain plug (d)

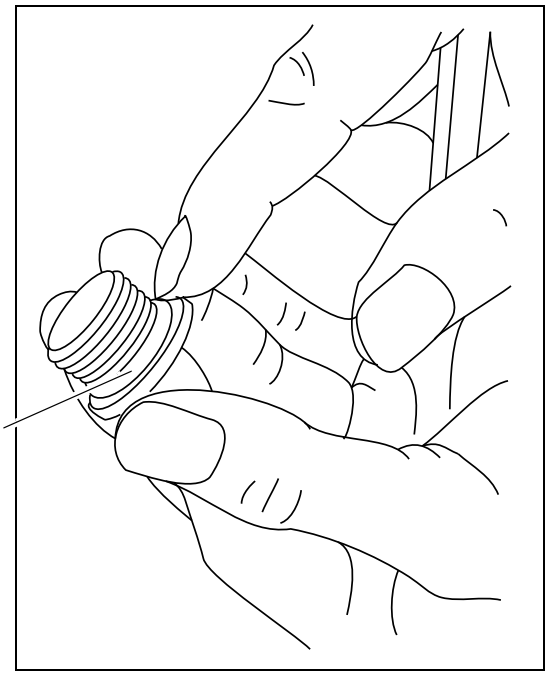

Fig. 5-63

10. Add new oil through filler cap plug (b) to a point 0.4 in. (10 mm) below the bottom of screw plug opening (c).
11. Tighten all plugs.
12. Repeat this process for the other final drive, dispose of all used oil.

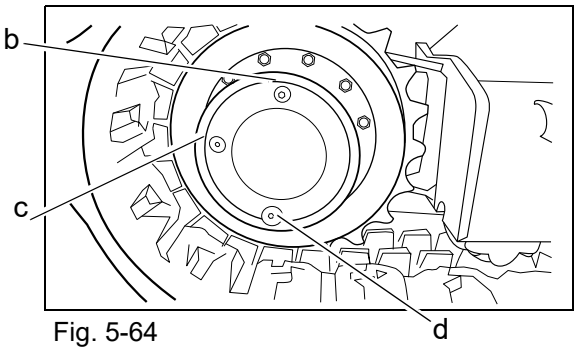

Fig. 5-64

Fire Extinguisher - Check

Check to be sure fire extinguisher (a) is installed on the machine.

Check to be sure fire extinguisher (a) is in proper working order. Follow the instructions on the extinguisher to test the operation and condition.

NOTE: Be sure the fire extinguisher is a minimum of a three pound “A, B, C” fire rated extinguisher which meets NFPA 10 Standard for Portable Fire Extinguishers.

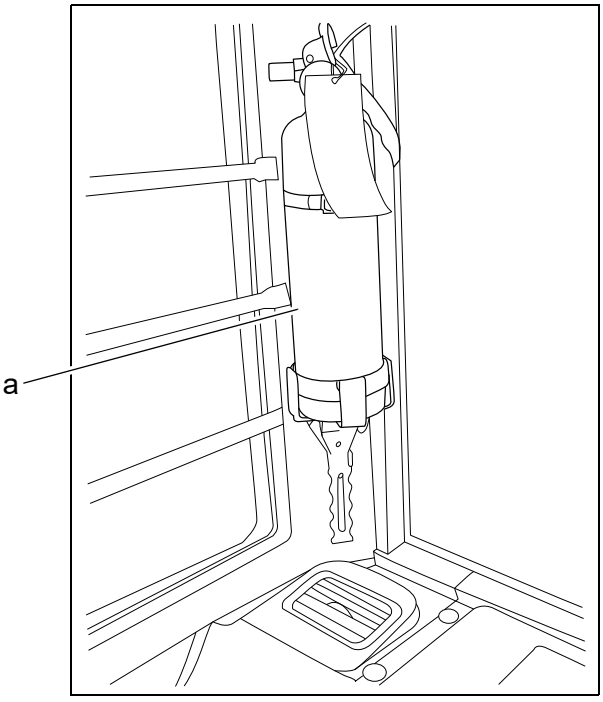

Fig. 5-65

Front Window Locks - Check

Push up on handles (a) to make sure that the front window is fully upright. Engage window locks (b) to make sure the window does not open up while operating the machine.

WARNING!

Failure to lock the front window in place could cause the window to open without warning. Failure to observe and follow this warning could result in death or injury.

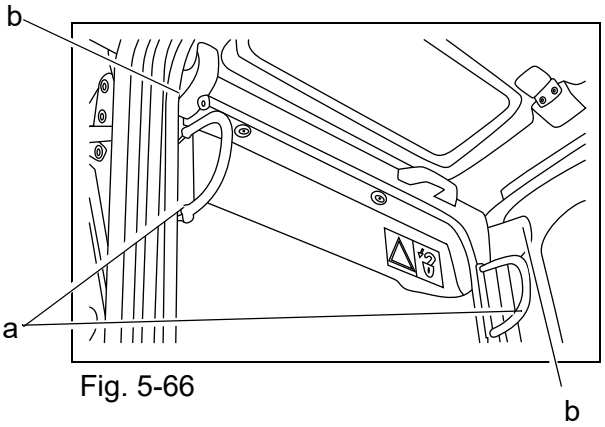

Fig. 5-66

Fuel Level - Check

1. Turn the ignition key to the ON position.
2. Check fuel level display (a) on the system monitor.
3. Add fuel as necessary.

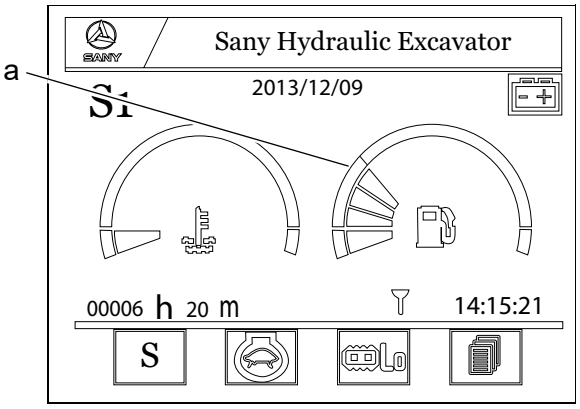

Fig. 5-67

Fuel Lines - Check

Inspect all steel, plastic and rubber fuel lines including those on the engine.

CAUTION!

Failure to perform this procedure as directed could result in a fire during operation which could result in minor or moderate injury.

NOTE: Replace any fuel lines which show signs of deterioration, wear, damage or leaks.

Fuel Tank - Drain

1. Locate drain valve (a) for the fuel tank below the fuel tank on the right side of the machine.
2. Place an appropriately sized container under drain valve (a).
3. Open drain valve (a).
4. Close valve (a) when the fuel flow is free of water and contaminants.

.

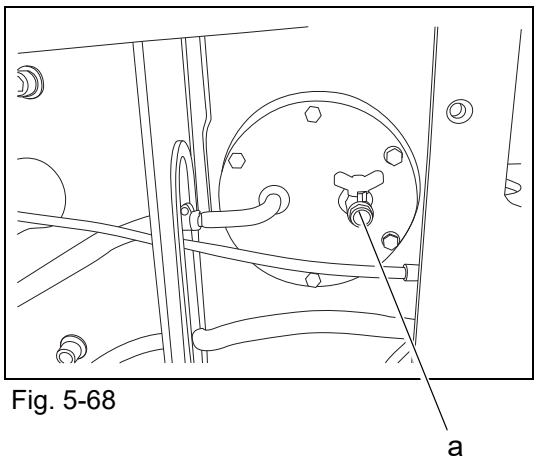

Fig. 5-68

NOTICE!

Dispose of the contaminated fuel in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

5. Add fuel to the system as necessary
6. Start the engine and allow it to run at idle speed.

7. Check for leaks in the fuel system.
8. Repair any leaks.
9. Close and lock the door.

Fuel Tank Strainer - Check

1. Unlock and remove fuel tank filler cap (a).

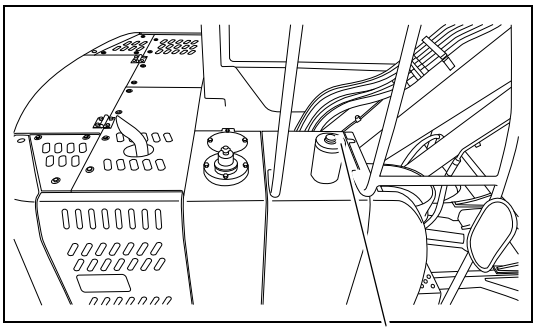

Fig. 5-69

2. Lift fuel tank strainer element (b) out of the tank filler neck.
3. Clean and inspect the fuel tank strainer.

   NOTE: Replace a damaged or missing fuel strainer with a new one.

4. Install the new or newly cleaned fuel tank strainer.
5. Reinstall and lock the fuel tank filler cap.

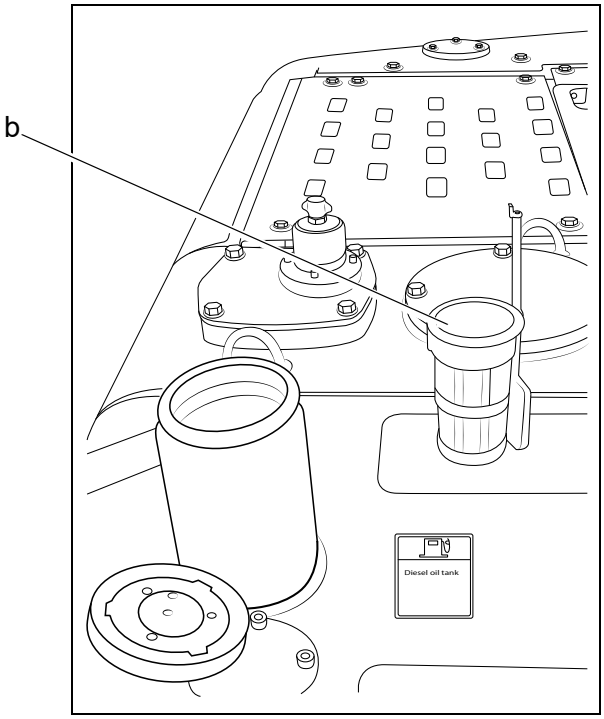

Fig. 5-70

Grab Handles and Steps - Check

1. Check mounting bolts (a) on the grab handles.
2. Replace any missing or damaged mounting bolts and tighten any loose bolts.
3. Remove any tools, lubricants or debris from steps (b).

   NOTE: Never allow loose items to remain on the machine.

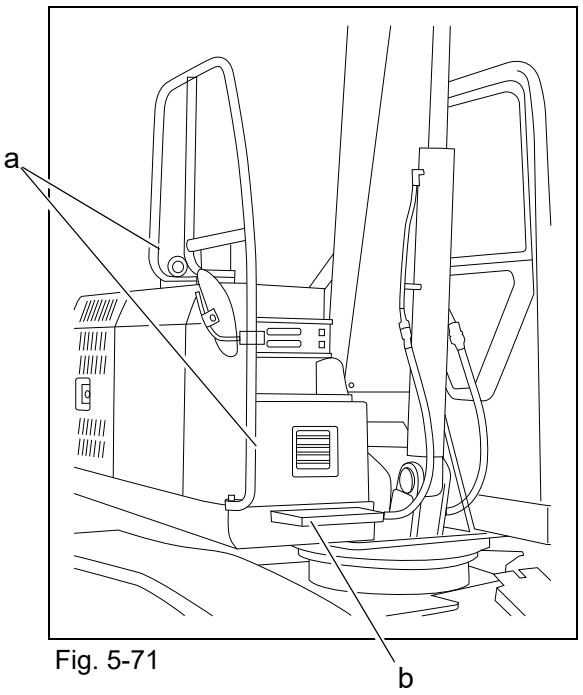

Fig. 5-71

Hydraulic Hoses - Check

Check all hoses for leaks and replace damaged or leaking hoses immediately.

Ensure that there is a sufficient distance between all lines and hoses and high temperature engine components (for example, the exhaust system) and that there is no friction between them.

Examine hoses for the following:

- Hose couplings that are cracked or become loose.
- Damage, cuts or abrasions in the external rubber layer.
- Hardening, chapping or burning of hose.
- Cracks, damage or serious corrosion on the couplings.
- Leaks at the hose couplings.
- Twisted, broken, flat or distorted hose.
- Blisters or softness in the external hose layer.

Hydraulic Line Connections - Check

1. Open right rear door (a).

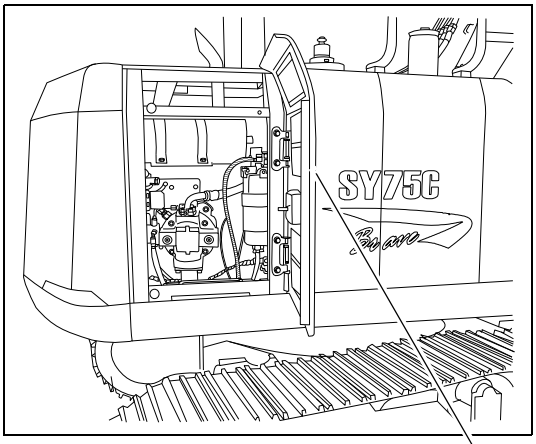

Fig. 5-72

2. Examine hydraulic hose (b) between the tank and the hydraulic pump for cracks, damage, or abnormal wear.

   NOTE: Replace the hose if it cracked, damaged or worn.

3. Check fittings (c) at both ends of all flexible hoses.

4. Inspect all bolt locations.

5. Replace any damaged or defective bolts.

6. Tighten any loose bolts.

   NOTE: Do not use thread sealant when reinstalling loose bolts or installing new bolts.

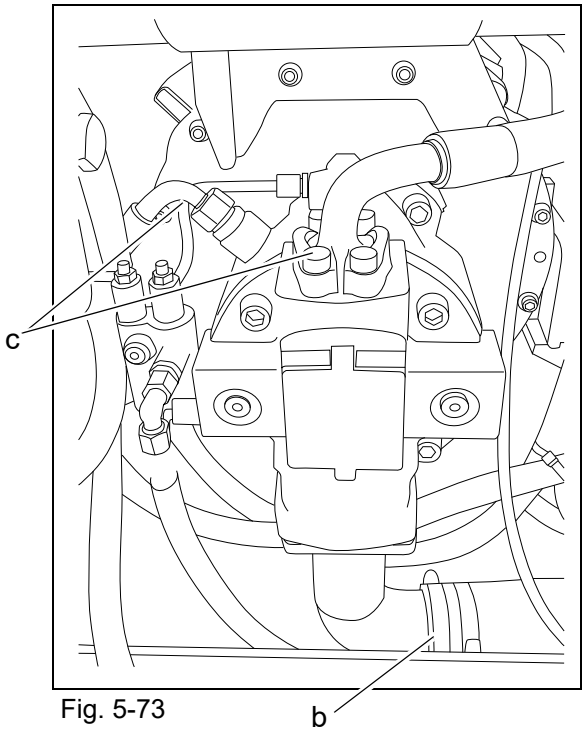

Fig. 5-73

NOTICE!

These bolts/screws at each end of the hoses may loosen occasionally due to vibration. Leaks at the angled seals will eventually result in pump failure.

Hydraulic Oil - Add

CAUTION!

Hydraulic oil may be hot and under pressure. Always wait for the machine to cool down before attempting to open the hydraulic oil system. Failure to follow this process could result in minor or moderate injury.

1. Position the machine work equipment as shown on the hydraulic oil tank decal.

2. Run the engine at idle speed for about 5 minutes.

3. Shut down the engine.

4. Place hydraulic lockout control lever (a) in the LOCKED position.

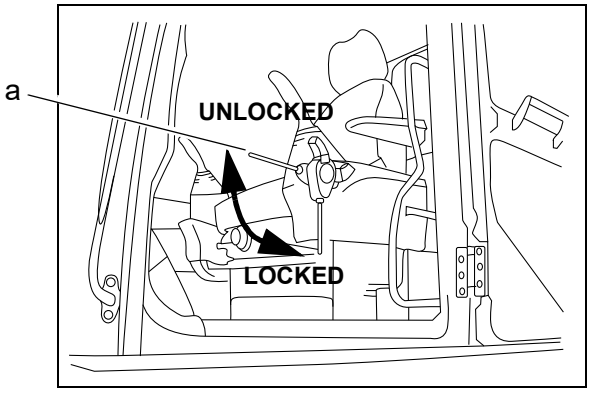

Fig. 5-74

5. Remove butterfly nut (b) from the breather valve.

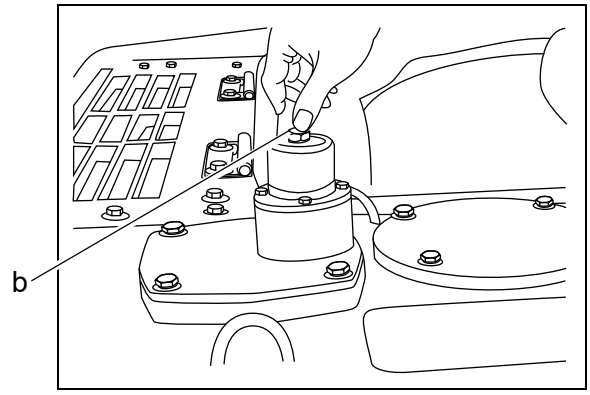

Fig. 5-75

6. Press hydraulic tank vent button (c) to relieve pressure in the hydraulic tank.

7. Reinstall butterfly nut (b).

8. Clean the top of the hydraulic tank.

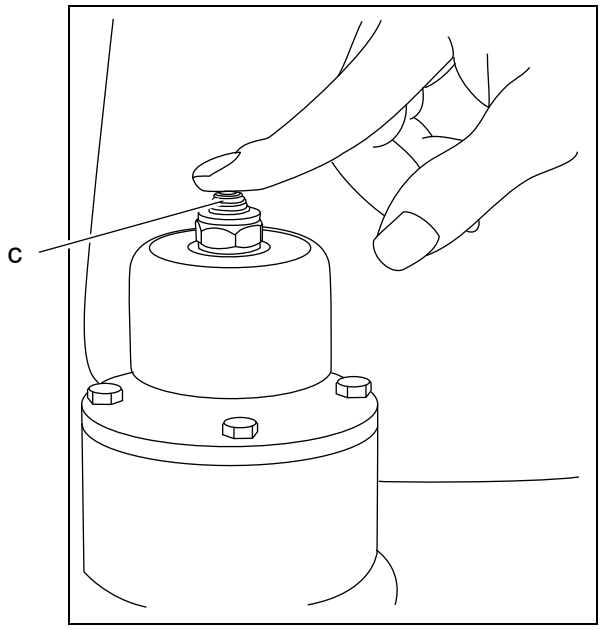

Fig. 5-76

9. Remove hydraulic suction strainer cover (d).

CAUTION!

Hydraulic oil may be hot and under pressure. Always use caution when opening the hydraulic system.

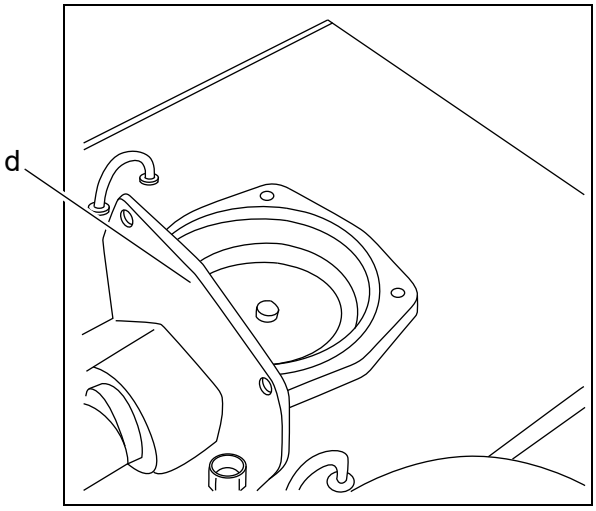

Fig. 5-77

10. Add hydraulic oil through the suction strainer opening until the hydraulic oil level shows full according to decal (e) and sight gauge (f) on the hydraulic tank.

11. Replace the suction strainer O-ring.

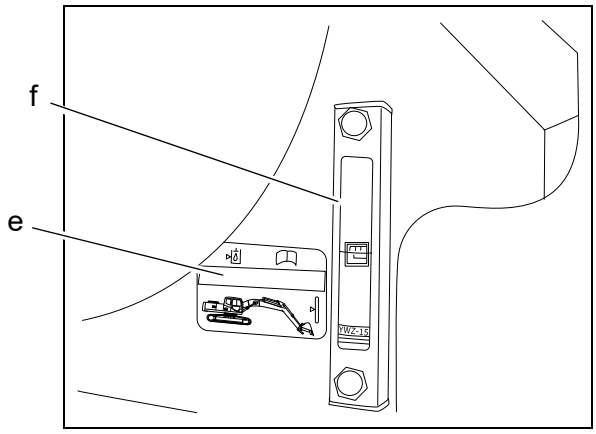

Fig. 5-78

12. Reinstall suction strainer filter cover (d).

13. Start the engine.

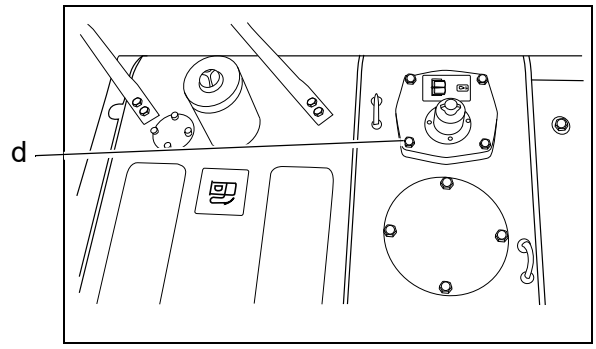

Fig. 5-79

14. Place hydraulic lockout control lever (a) in the UNLOCKED position.

15. Run the engine at low idle speed for 10 minutes to vent the air from the hydraulic system.

16. Shut down the engine.

17. Recheck the hydraulic oil level at the sight glass decal.

18. If necessary, remove the suction strainer cover and repeat steps 9 through 12.

19. When the hydraulic oil level is correct, reinstall the cover over the breather valve.

20. Check for leaks.

21. Tighten connections if leaks are found.

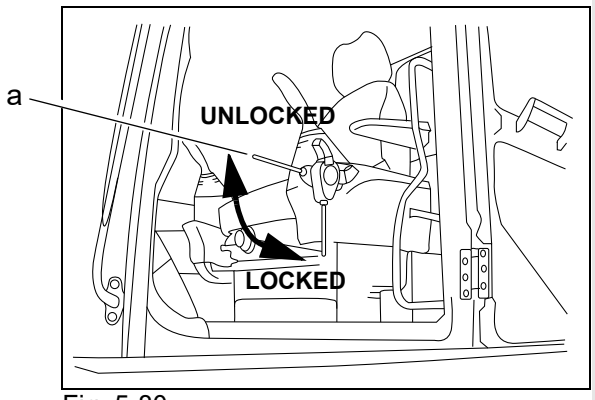

Fig. 5-80

Collect Hydraulic Oil Sample

1. Obtain an Oil Analysis Sample Kit from a SANY dealer.

2. Operate the machine until the hydraulic oil is up to normal operating temperature.

3. Prepare the machine for service.

NOTICE!

It is critical that all material used to collect the sample is absolutely clean. Failure to adhere to this warning can cause equipment damage and contaminate the sample.

4. Remove the hydraulic suction strainer cover. See “Hydraulic Oil - Add” on page 5-52.

5. Insert the oil sample tube into the hydraulic tank and collect a sample of hydraulic oil.

6. Install the hydraulic suction strainer cover.

7. Send the sample for testing in accordance with the instructions packaged with the sample kit.

Hydraulic Oil - Change

NOTICE!

If used or using the breaker attachment, note that you need to change hydraulic oil every 500 hours to avoid damage to the machine.

NOTE: Perform this procedure on machines with optional equipment every 3 months (500 hours of service).

NOTE: Perform this procedure on machines with a bucket annually (2,000 hours of service).

1. Swing the upper structure to position hydraulic tank bottom cover (a) between the tracks.
2. Position the work equipment as shown on the hydraulic tank decal.
3. Shut down the engine.
4. Clean the top of the hydraulic tank.

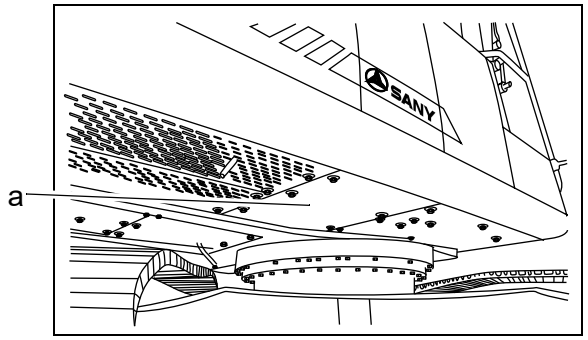

Fig. 5-81

5. Remove butterfly nut (b) from the breather valve.

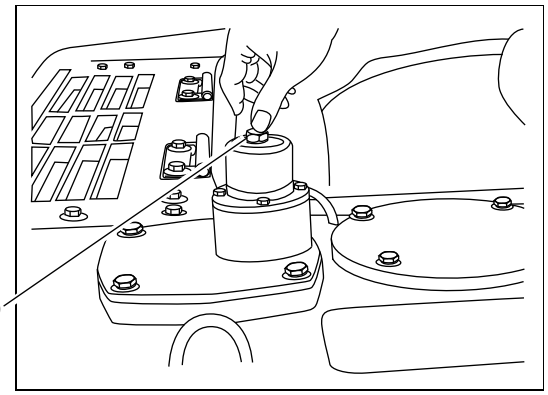

Fig. 5-82

6. Press hydraulic tank vent button (c) to relieve pressure in the hydraulic tank.

7. Reinstall butterfly nut (b).

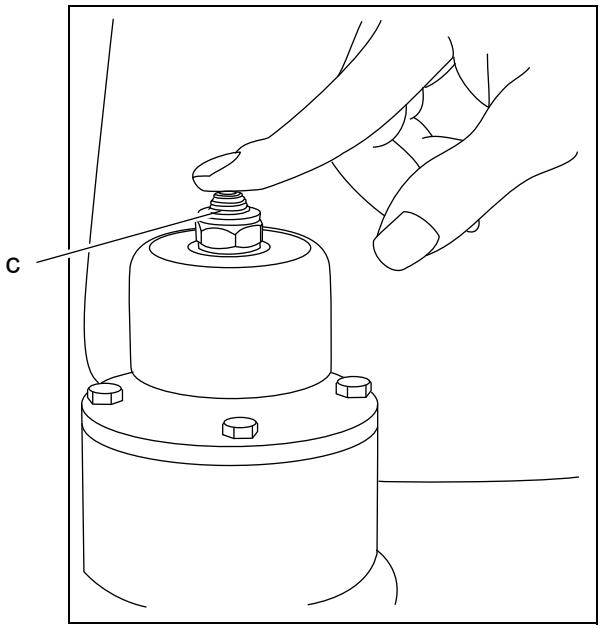

Fig. 5-83

8. Remove hydraulic suction strainer cover (d).

9. Obtain a hydraulic oil sample.

10. Place the suction strainer cover back over the opening, but do not secure it in place.

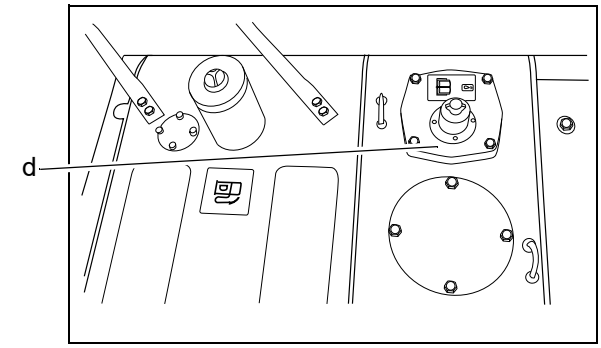

Fig. 5-84

11. Remove bottom cover (a) to access the hydraulic tank drain plug.

12. Clean the area around the hydraulic tank drain plug.

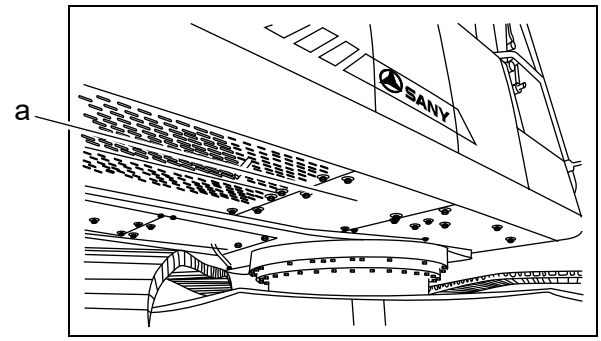

Fig. 5-85

13. Place an appropriately sized container under drain plug (f).

14. Remove the drain plug and allow the tank to completely drain.

NOTICE!

Dispose of drained hydraulic oil properly. Failure to do so could result in damage to the environment.

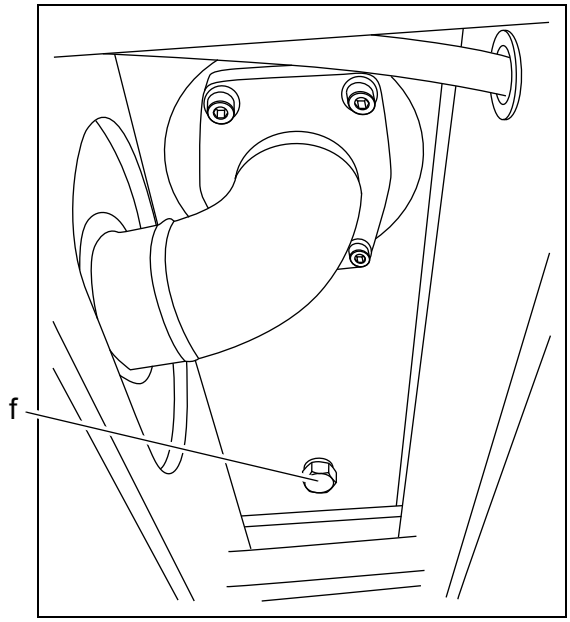

Fig. 5-86

15. Replace O-ring (g) on the drain plug.

16. Reinstall and tighten the drain plug after the tank has completely drained.

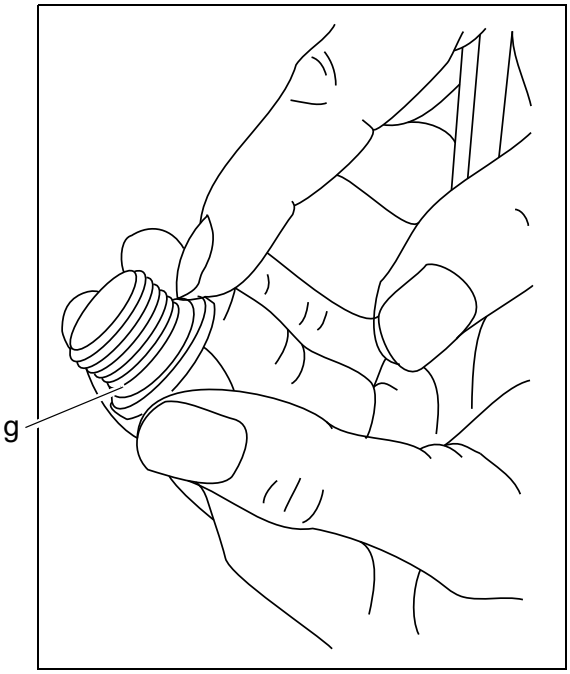

Fig. 5-87

17. Remove hydraulic return filter cover (h).

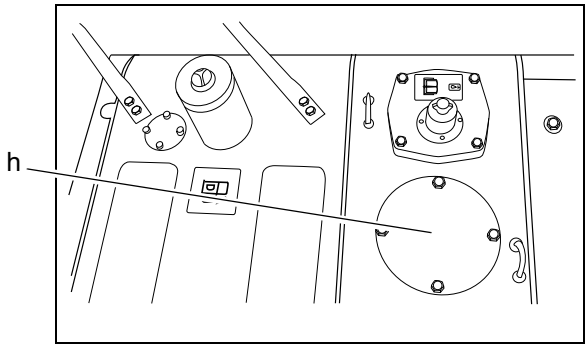

Fig. 5-88

18. Remove spring (i), then withdraw filter (j).

19. Check the bottom of the return filter housing and remove any debris.

20. Insert a new filter in the return filter housing.

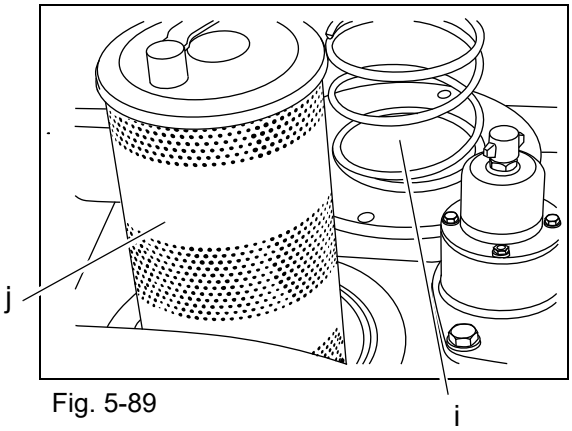

Fig. 5-89

21. Replace O-ring (k).

22. Position spring (i) on top of filter (j).

23. Reinstall hydraulic return filter cover (h) and tighten the bolts.

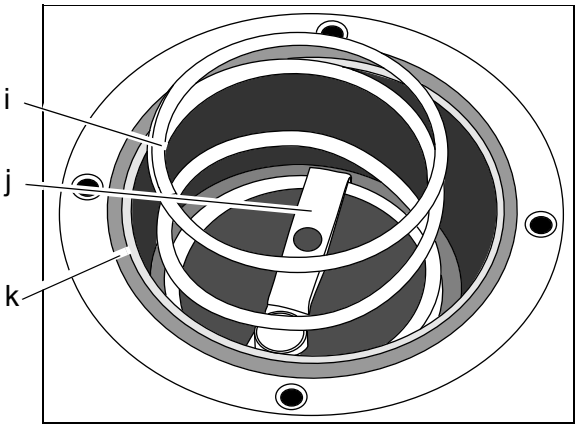

Fig. 5-90

24. Remove hydraulic suction strainer cover (d), then pull rod (l) to remove strainer assembly (m).

25. Clean the strainer of all debris.

    NOTE: Replace the strainer if damaged.

26. Replace O-ring (n).

27. Reinstall the strainer.

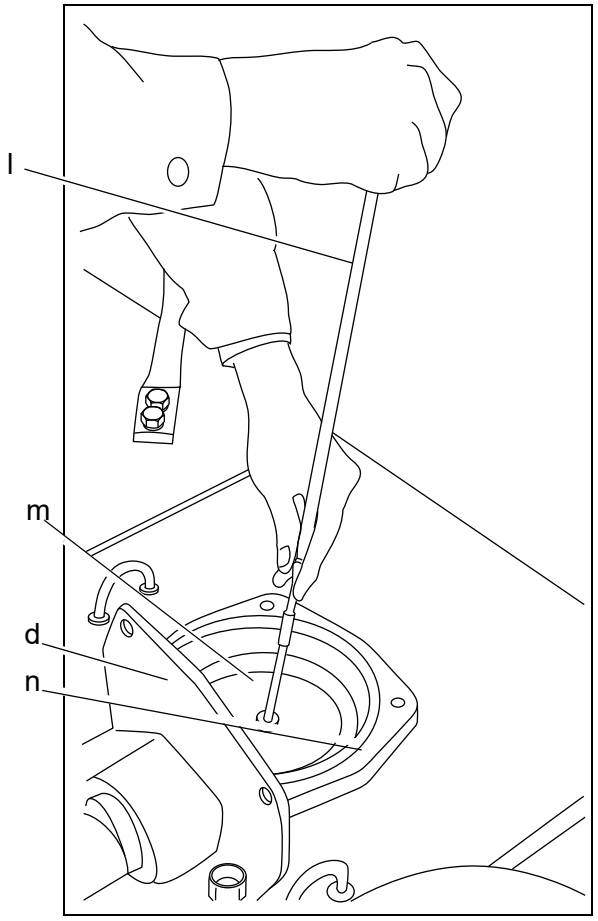

Fig. 5-91

28. Add hydraulic oil through the suction strainer opening until the hydraulic oil level shows full according to decal (o) and sight gauge (p) on the hydraulic tank.

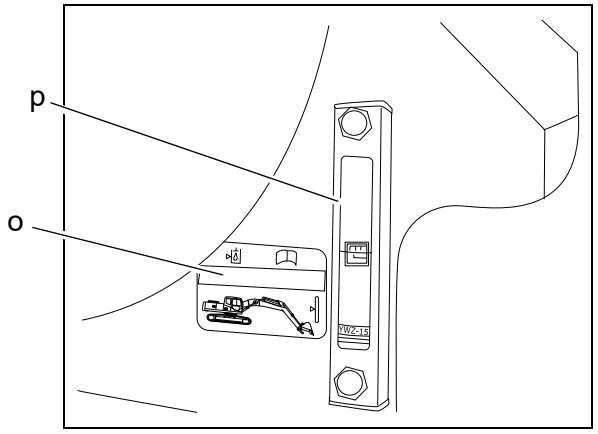

Fig. 5-92

29. Reinstall suction strainer cover (d) and bolts.

30. Start the engine.

31. Run the engine for 10 minutes to circulate oil in the hydraulic system.

32. Recheck the oil level in the tank and add oil through the suction strainer opening if needed.

33. Check for leaks.

34. Tighten connections if leaks are found.

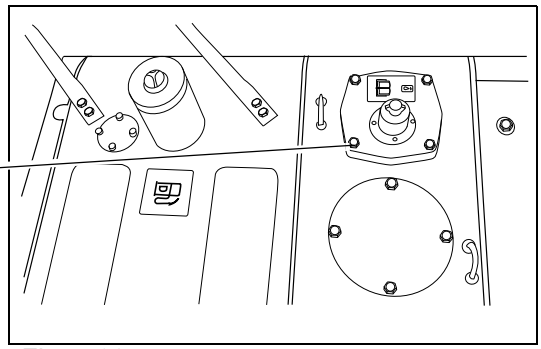

Fig. 5-93

Hydraulic Oil Tank Level - Check

CAUTION!

Hydraulic oil may be hot and under pressure. Always wait for the machine to cool down before attempting to open the hydraulic oil system. Failure to follow this process could result in minor or moderate injury.

1. Position the work equipment as shown on the decal on the hydraulic tank.

2. Open right rear door to access (a) the hydraulic oil tank.

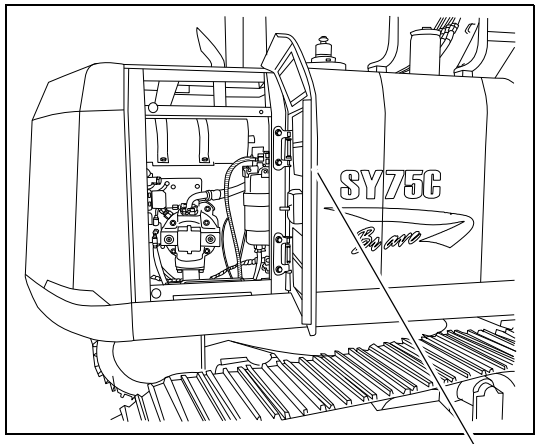

Fig. 5-94

3. Check the fluid level using sight glass (b) on the side of the tank. Ensure that the fluid level is between the level marks on sight glass decal (c).

4. If necessary, add hydraulic oil to the system.

5. Check tightness of the various hydraulic fittings.

6. Check the tank for leaks, exterior rust, and other damage.

7. Replace any fittings that are defective.

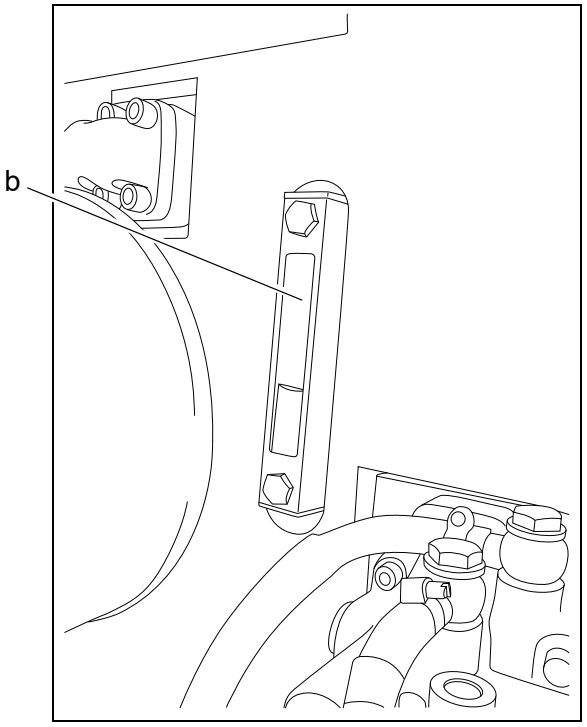

Fig. 5-95

Hydraulic Pilot Line Filter Element - Replace

NOTE: Perform this procedure after the first month (250 hours) and then every 1,000 service hours or at least once each year, whichever occurs first.

NOTE: Ensure that the machine is on flat, level ground before proceeding.

1. Locate hydraulic pilot line filter (a) behind the right rear door

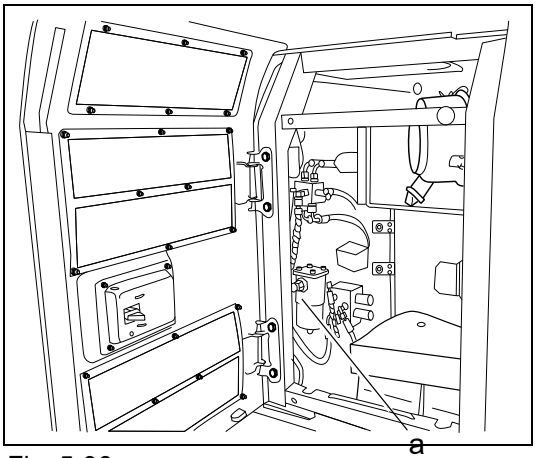

Fig. 5-96

2. Loosen lower housing (b).

3. Place an appropriate sized container underneath the filter lower housing.

NOTICE!

Dispose of the drained oil in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

4. Remove filter lower housing (b).

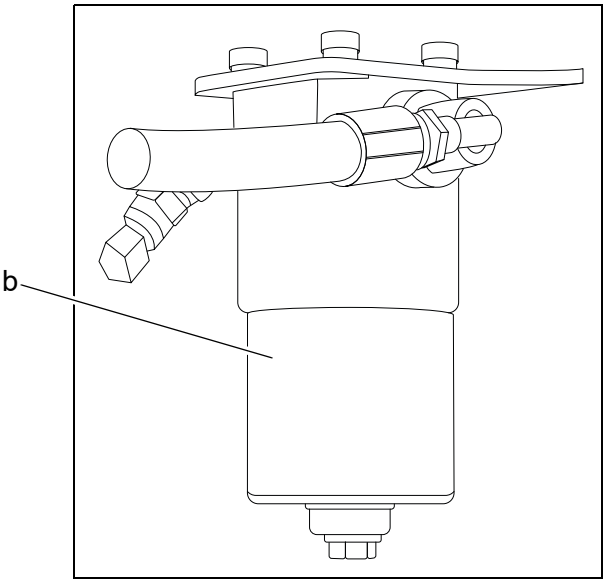

Fig. 5-97

5. Remove filter element (c) from housing (d).
6. Install a new gasket and O-ring.
7. Clean the inside of the filter lower housing.
8. Install a new filter element inside the lower housing.
9. Reinstall the casing.

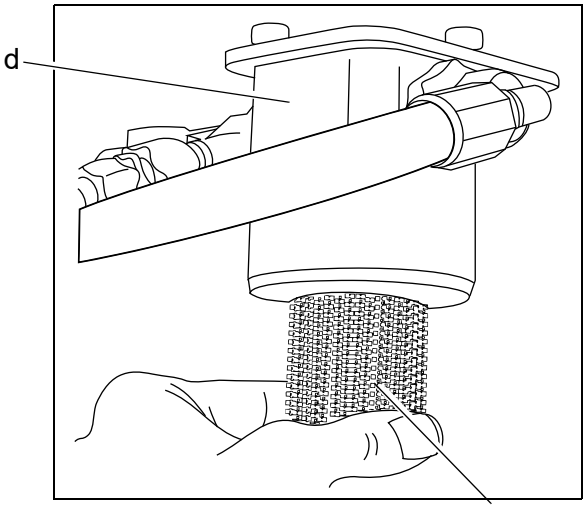

Fig. 5-98

Hydraulic System Breather Filter - Replace

NOTE: Dependent upon the work environment and the degree of contamination the filter may need to be replaced more frequently than 500 hours.

1. Locate breather valve (a).
2. Clean the top area around breather valve (a).

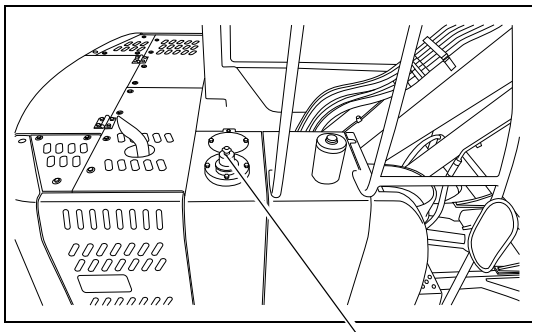

Fig. 5-99

3. Remove butterfly nut (b) and spacer from the top of the breather valve.
4. Unscrew and remove filter element cover (c) off of filter (d).
5. Pull filter (d) up and free from the valve body.

NOTICE!

Dispose of the filter in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

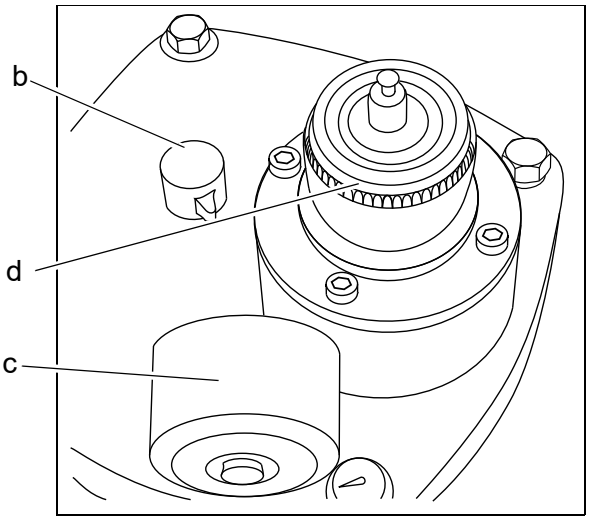

Fig. 5-100

6. Install new breather filter (d).
7. Reinstall breather filter cover (c).
8. Secure it in place with the spacer and butterfly nut (b).

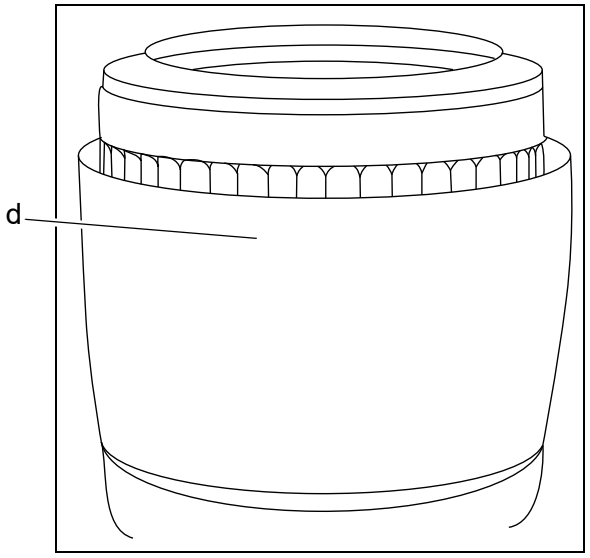

Fig. 5-101

Hydraulic Tank Return Filter - Replace

NOTE: Perform this procedure after the first month (250 hours) of service, then annually (every 2,000 hours of service) thereafter.

CAUTION!

Hydraulic oil is hot and under pressure. Always wait for the machine to cool down before attempting to open the hydraulic oil system. Failure to do so could result in injury.

1. Position the work equipment as shown on the hydraulic tank decal.
2. Shut down the engine.
3. Remove butterfly nut (a) from the breather valve.

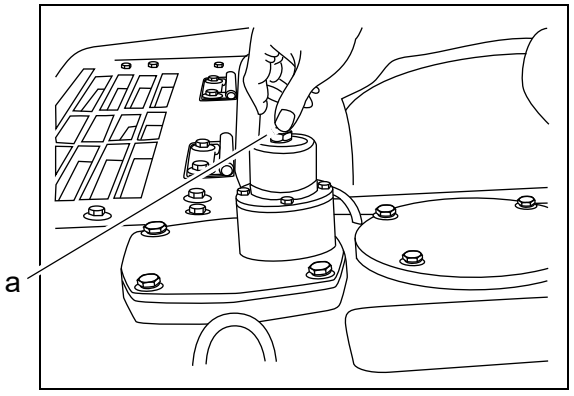

Fig. 5-102

4. Press hydraulic tank vent button (b) to relieve pressure in the tank.

5. Reinstall butterfly nut (a).

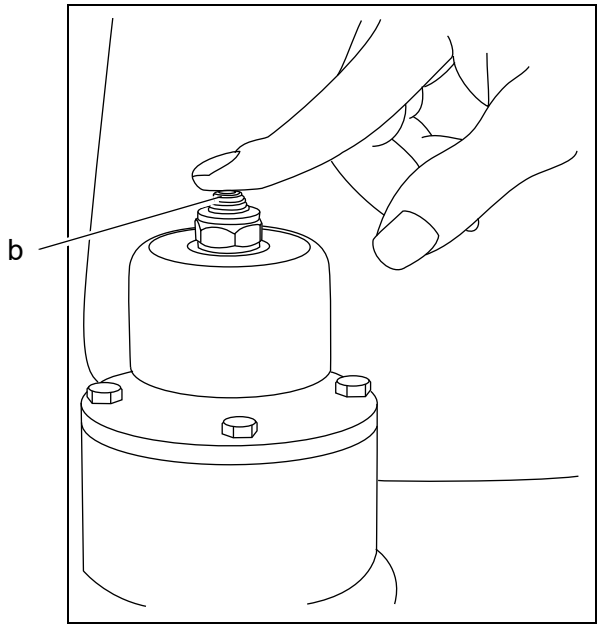

Fig. 5-103

6. Remove hydraulic return filter cover (c).

CAUTION!

Hydraulic oil may be hot and under pressure. Always use caution when opening the hydraulic system.

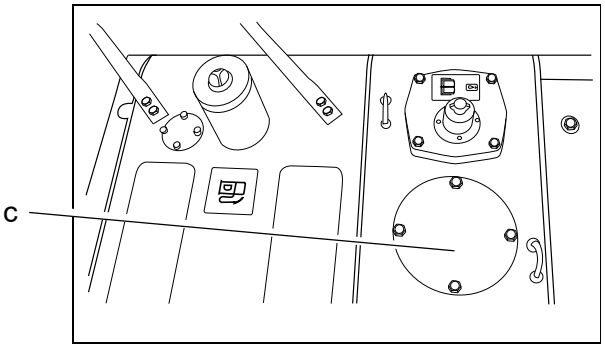

Fig. 5-104

7. Remove spring (d), then withdraw filter (e).

8. Check the bottom of the return filter housing and remove any debris.

9. Install a new filter in the return filter housing.

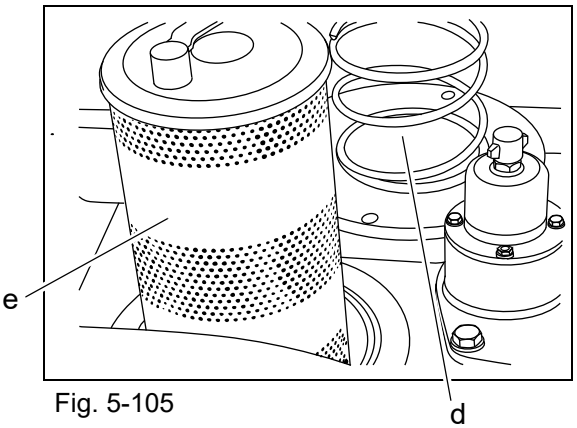

Fig. 5-105

10. Replace O-ring (f).

11. Position spring (d) on top of filter (e).

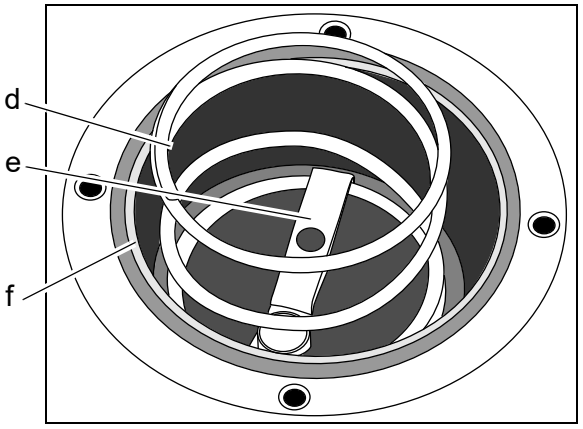

Fig. 5-106

12. Reinstall return filter cover (c) and the bolts.

13. Start and run the engine for 10 minutes to circulate the oil in the hydraulic system.

14. Recheck the oil level in the tank and add oil if needed.

15. Check for leaks.

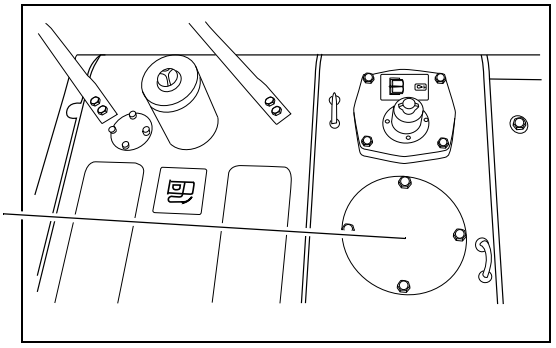

Fig. 5-107

Idler - Check

Check idler (a) for cracks and distortion.

NOTE: Contact your SANY dealer for replacement if the idler is cracked or distorted.

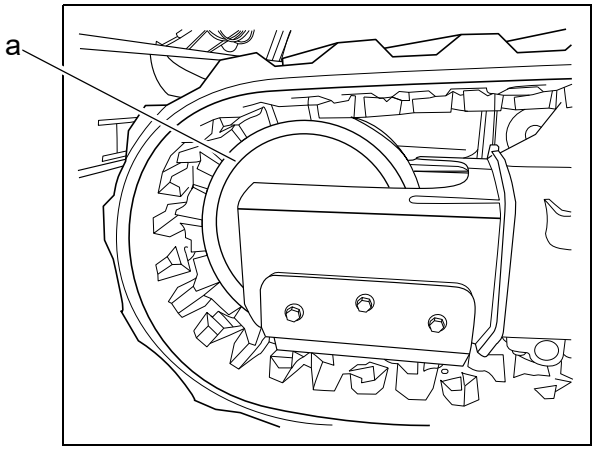

Fig. 5-108

Lamps and Warning Devices - Check

Check the following for proper operation with ignition key (a) set to the ON position:

- Work lamps (b)
- Horn (c)

NOTE: On some configurations of the machine, the horn button is located on the left joystick.

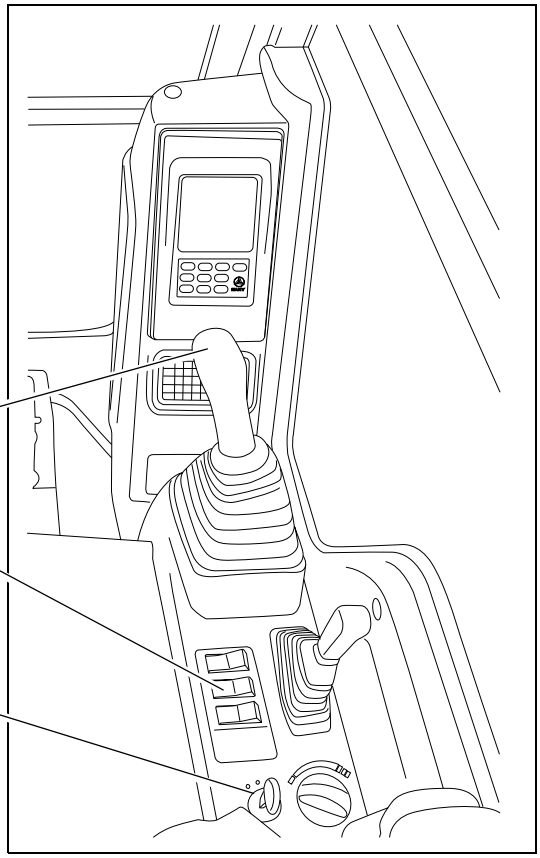

Fig. 5-109

Mirrors - Adjust

Adjust both of the outside rear view mirrors for clear vision and safe driving.

NOTE: This mirror (a) is cab mounted. The other mirror is attached to the right side of the upper frame. See “Exterior Components.” on page 3-3 for mirror locations.

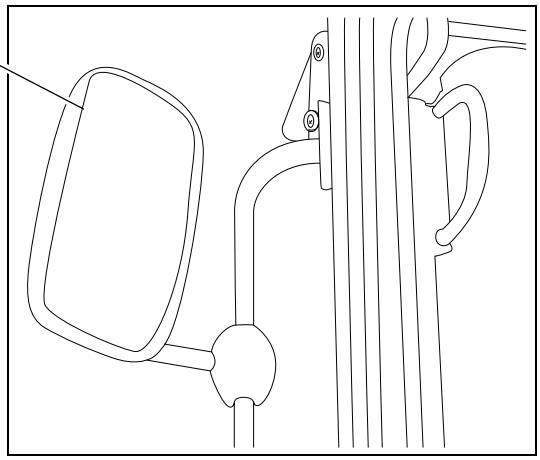

Fig. 5-109

Muffler and Exhaust System - Check

CAUTION!

Ensure that the engine is off and that the exhaust components have cooled down to a point where they can be touched without burning. Failure to avoid this could result in minor or moderate injury.

1. Open right rear door (a).

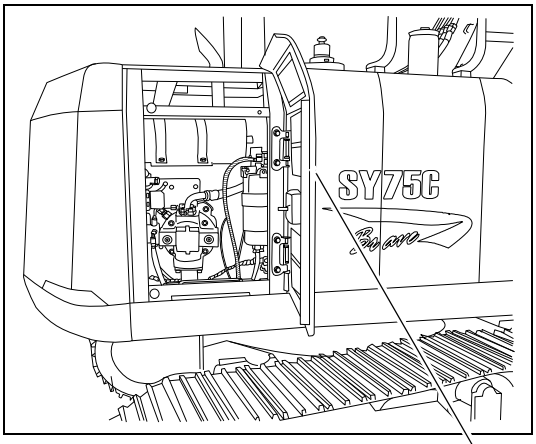

Fig. 5-110

2. Locate muffler (b) and exhaust pipe.

3. Inspect the muffler and its mount for leaks or signs of damage. Be sure the exhaust pipe is clear and not restricted.

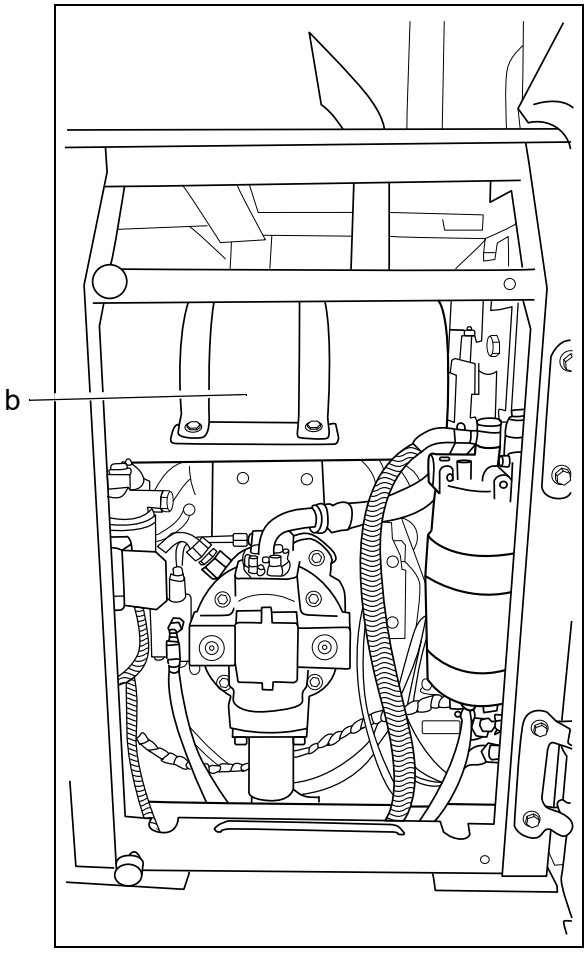

Fig. 5-111

4. Check the connection to expansion pipe (c) for leaks or signs of damage.

WARNING!

Never operate a machine with a defective exhaust system. Exhaust leaks or a restricted or damaged exhaust system could result in death or injury.

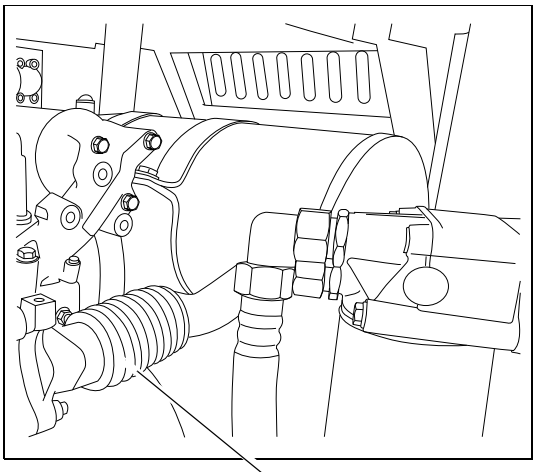

Fig. 5-112

Operator Controls - Check

Check all operator control lever movements for smooth operation with the ignition key at the OFF position. The control levers should return to neutral freely and there should not be any excessive play in the control levers.

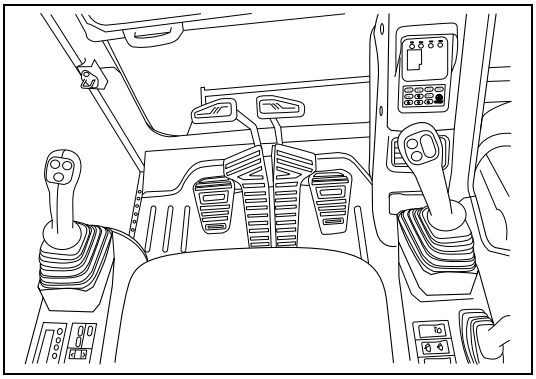

Fig. 5-113

Operating Functions - Check

1. Turn the ignition key to the ON position to provide power to the machine and check that all functions in the operator cab work correctly.

   NOTE: Do not start the engine.

2. Ensure that the following lamps and other devices work properly:

- Horn (a)
- Chassis work lamp (b)

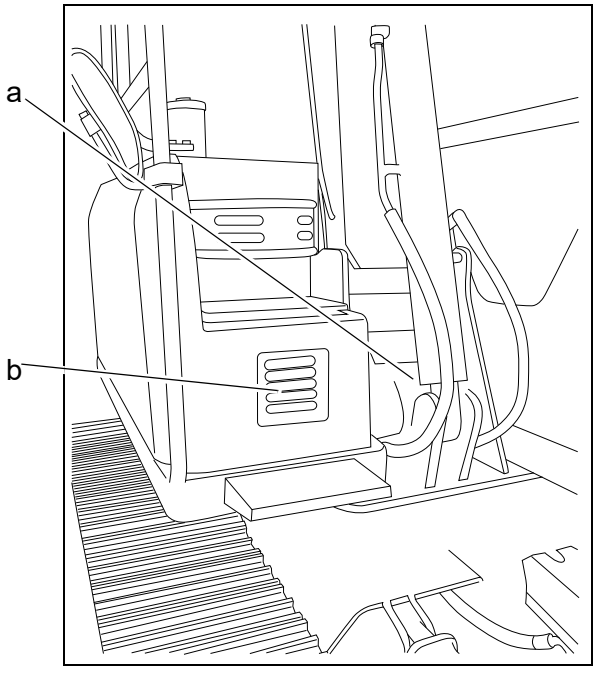

Fig. 5-114

- Cab head lamps (c)
- Boom work lamps (d)

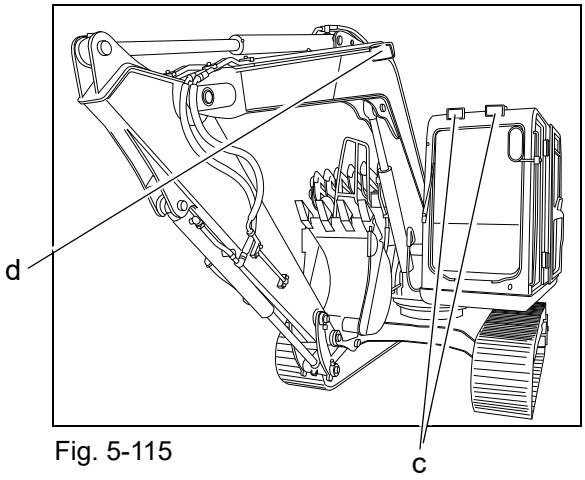

Fig. 5-115

- Windshield wiper and washer (e).

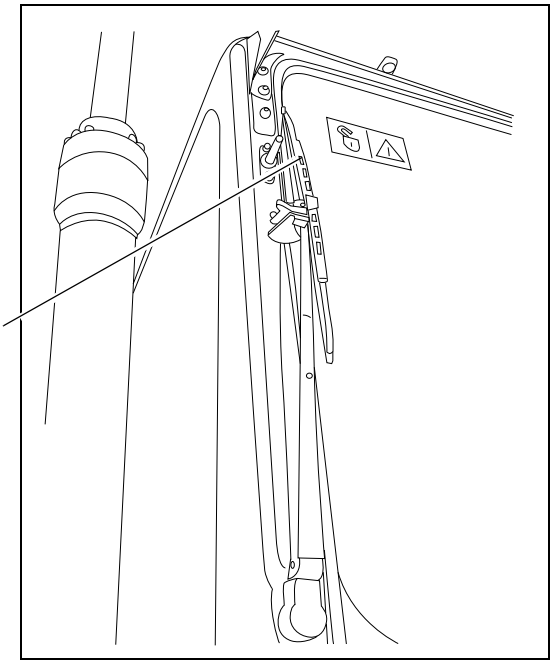

Fig. 5-116

Operation and Maintenance Manual - Check

Be sure the Operation and Maintenance manual is in operator cab.

NOTE: If damaged or missing, contact your SANY dealer.

Primary and Secondary Fuel Filters - Replace

DANGER!

Never smoke or service the fuel system near open burning locations. Doing so will result in fire, explosion, injury or death.

1. Locate filter (a) behind the right rear door.

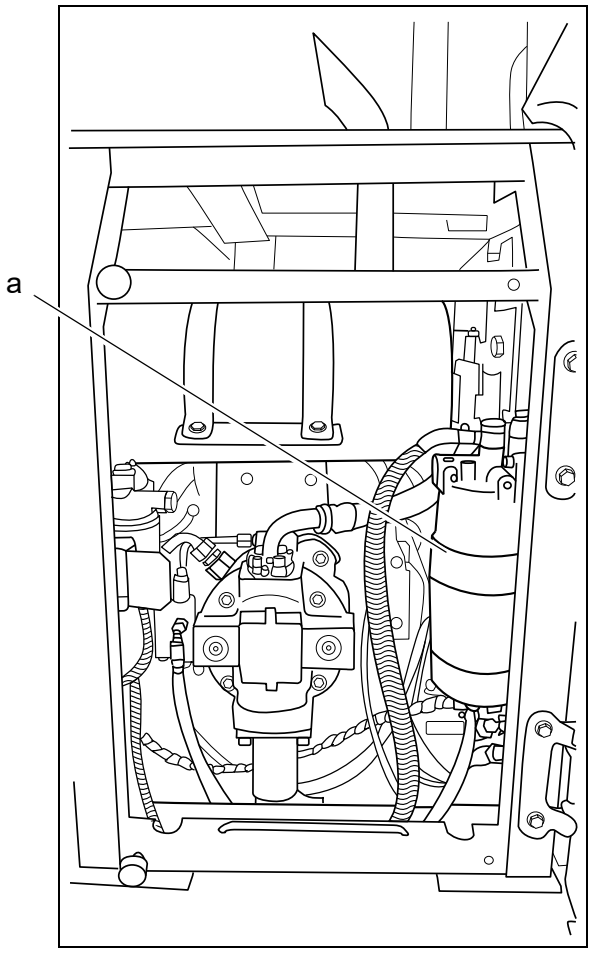

Fig. 5-117

2. Place an appropriately sized container under the fuel filter.

3. Open drain valve (b), to drain all water and fuel from the filter.

4. Remove filter canister (c) by turning it counterclockwise.

5. Remove the filter element from the filter body and dispose of properly.

NOTICE!

Dispose of the filter and fuel in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

6. Replace the filter ensuring that it is securely seated within the filter body.

7. Reinstall the new filter and canister.

8. Place a container under secondary fuel filter (d).

9. Remove the secondary fuel filter.

10. Replace the secondary fuel filter.

11. Start the engine and allow it to run at idle speed (1,050 rpm).

12. Check for leaks in the fuel system.

13. Shut down the engine.

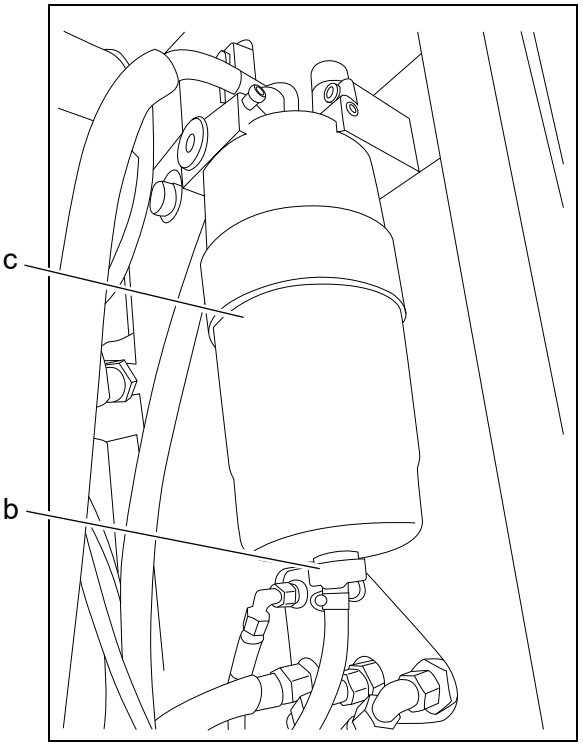

Fig. 5-118

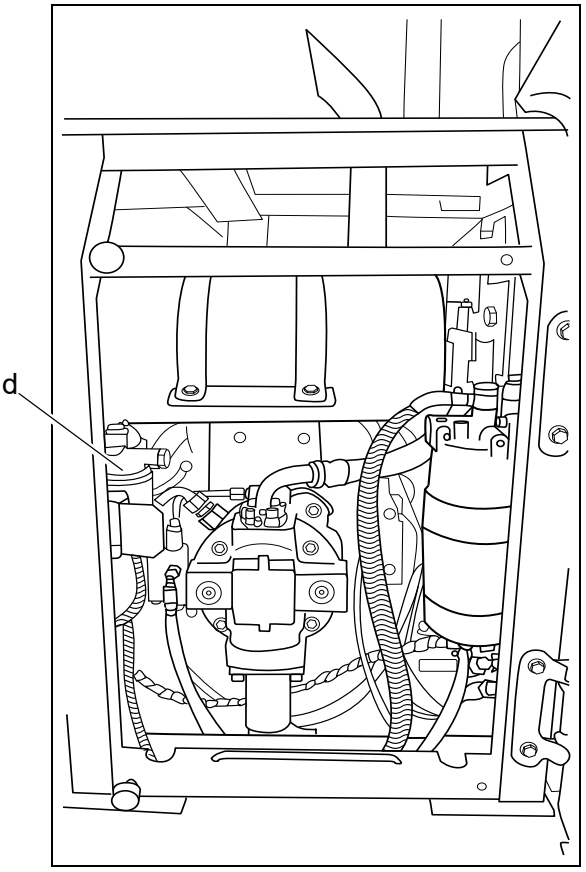

Fig. 5-119

Primary Fuel Filter - Drain

DANGER!

Never maintain the fuel system near an open flame or while smoking. Failure to follow this rule will result in death or injury.

1. Locate primary fuel filter (a) behind the right rear door.

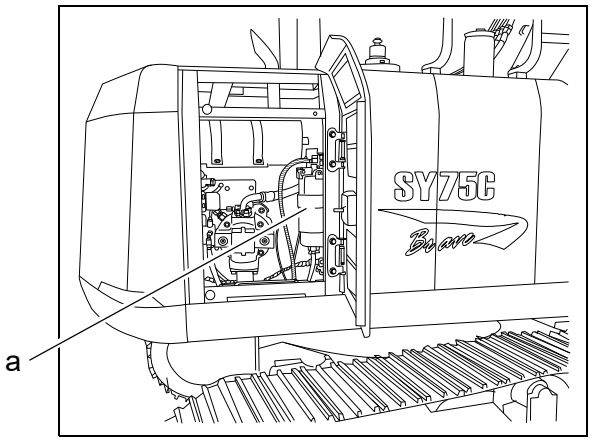

Fig. 5-120

2. Place an appropriately sized container beneath the fuel filter drain hose.

3. Open drain valve (b) to allow all water and/or contaminated fuel to drain from the filter.

NOTICE!

Dispose of the contaminated fuel in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

NOTE: Avoid draining the fuel filter completely. Air could enter the fuel system.

4. Close drain valve (b) when the flow from the primary fuel filter is free of water or contamination.

NOTE: If an excessive amount of water or contaminant was found while draining the fuel filter, SANY recommends draining the fuel tank.

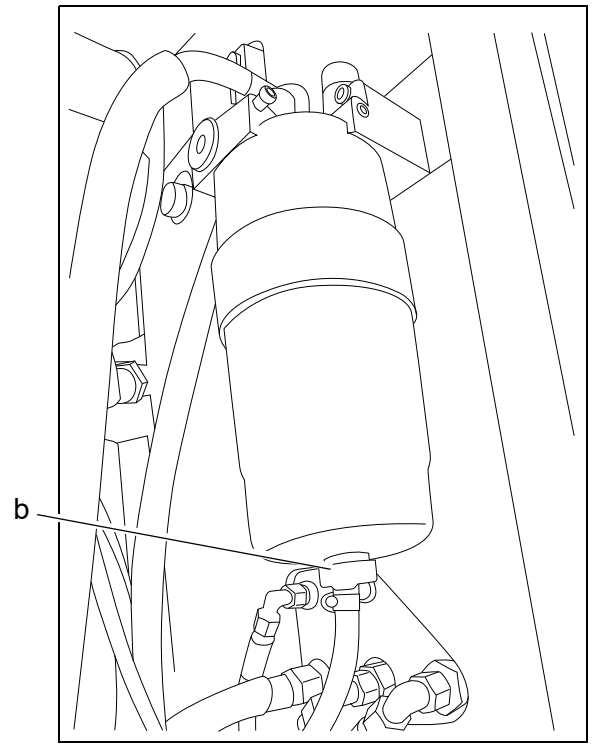

Fig. 5-121

Pump Mounting Bolts - Check

1. Locate hydraulic pump (a) behind right rear door (b).

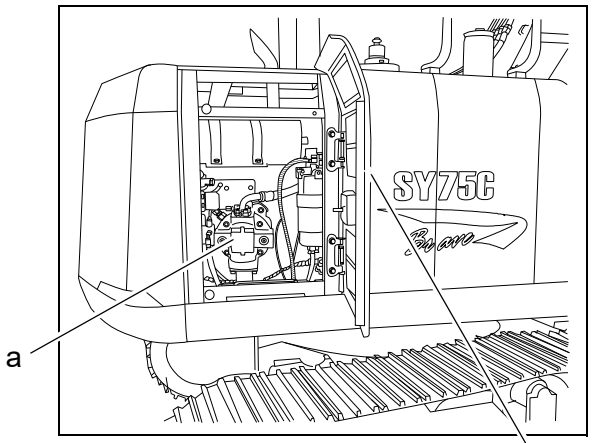

Fig. 5-122

2. Inspect hydraulic pump (a) for loose, broken or missing pump mounting bolts (c).

3. Inspect for leaks or cracking at these mounting bolt locations.

   NOTE: Not all pump mounting bolts are shown here. Be sure to inspect all pump mounting bolt locations.

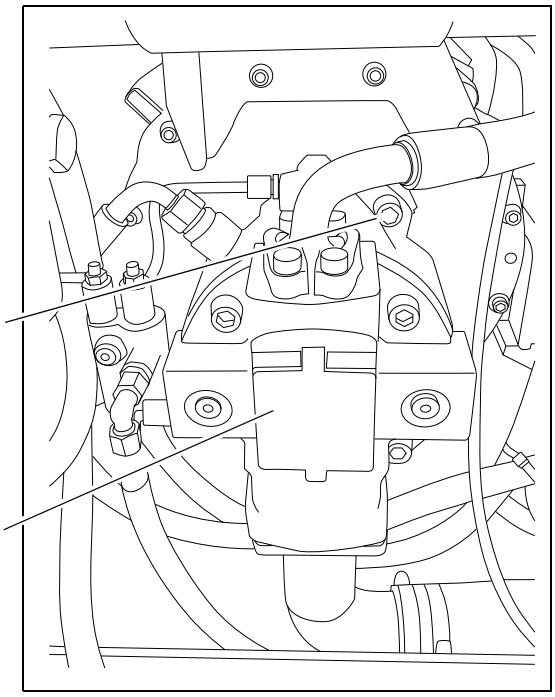

Fig. 5-123

Radiator, Oil Cooler, and A/C Condenser Fins - Check

1. Open left rear door (a).

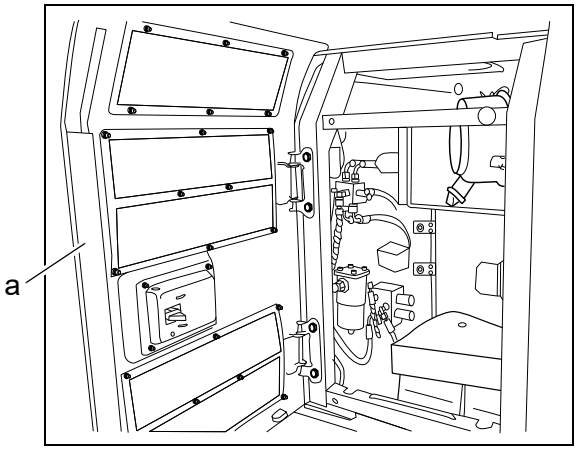

Fig. 5-124

2. Clean all cooler fins using compressed air.

NOTICE!

Use low pressure compressed air and keep the nozzle away from the radiator fins to avoid damaging the fins or causing other engine damage.

3. Remove the panels below the coolers and clean out any debris that has accumulated during operations and cleaning.

4. Replace the panels and secure them in place.

5. Close the left rear door.

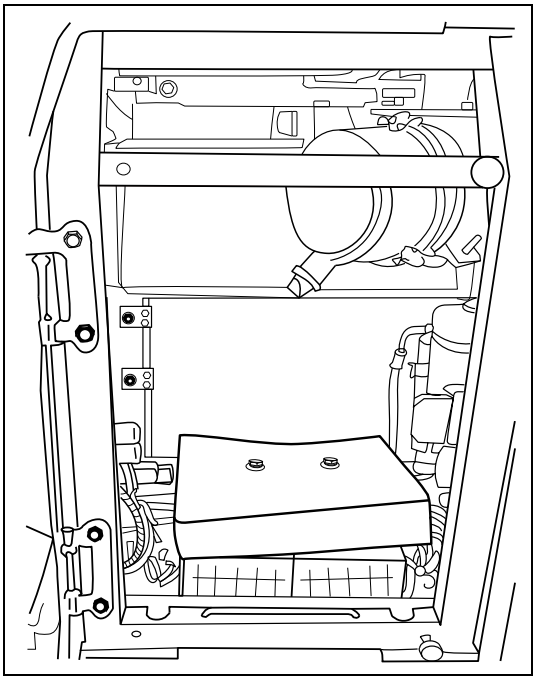

Fig. 5-125

SAE/BHL Selector Switch - Set

NOTICE!

Shut down the engine before adjusting the SAE/BHL selector. Failure to do so can cause damage to the machine, personal property and/or the environment, or cause the machine to operate improperly.

1. Locate SAE/BHL selector valve (a) behind the left side door.

2. Loosen butterfly bolt (b) and rotate bar (c) to the desired position.

3. Tighten the butterfly bolt in to lock the bar in place.

   NOTE: The SAE/BHL selector swaps the control of the boom and the arm from one joystick to the other.

   - In SAE (Society of Automotive Engineers) mode, the arm is controlled using the left joystick and the boom using the right joystick.
   - In BHL (Backhoe Loader) mode, the arm is controlled using the right joystick and the boom is controlled using the left joystick.

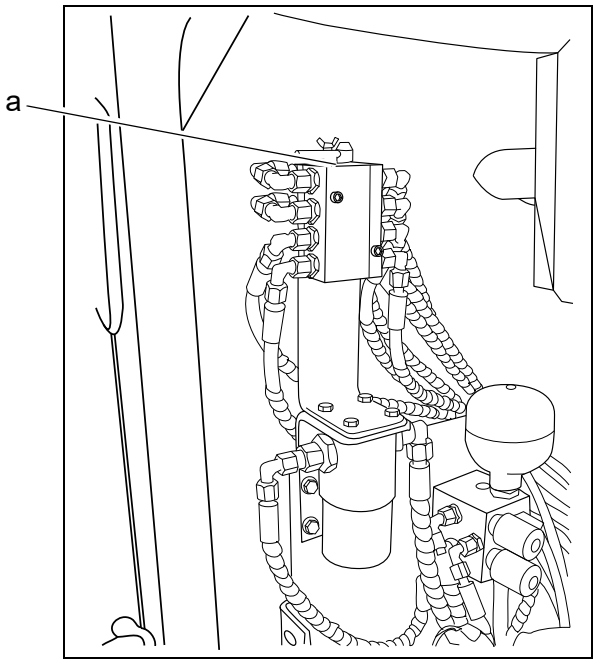

Fig. 5-126

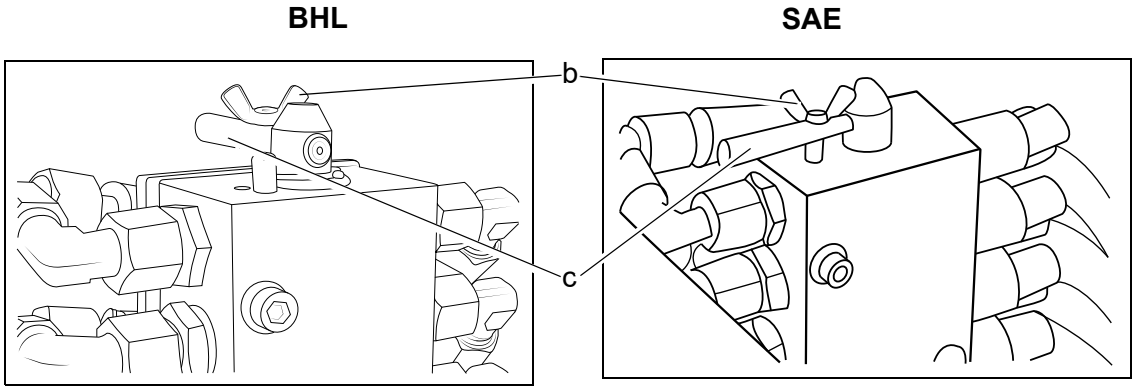

Fig. 5-2

NOTE: Two patterns are printed on a card posted in the cab and on a decal on the right hand window. Make sure the card matches the machine operation. If it does not turn the card over to show the correct pattern.

4. Close door.

Seat Belt - Check

1. Check the seat belt by fastening it snuggly around your waist.

2. Ensure latch plate (a) and buckle (b) connect together and click.

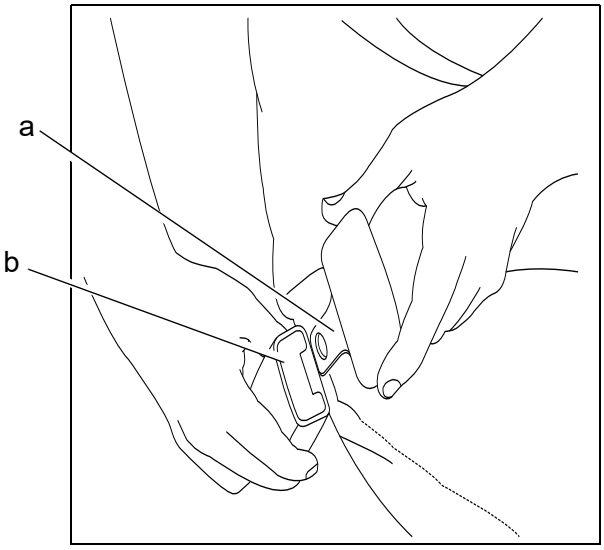

Fig. 5-3

3. Check that the belt fits securely and that there is no slack in belt (c).

WARNING!

Keep any belt slack to no more than 1 in. (25 mm). Belt slack beyond this amount could significantly reduce your protection in an accident. Failure to observe and follow this warning could result in death or injury.

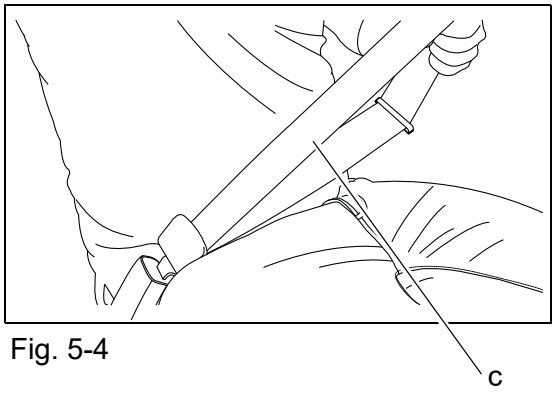

Fig. 5-4

4. Ensure that the latch releases when red button (d) is pressed.

   NOTE: Seat belt assemblies are maintenance free; however, they should be inspected every 500 hours to ensure that they are not damaged and are in proper operating condition, especially if they have been subjected to severe stress.

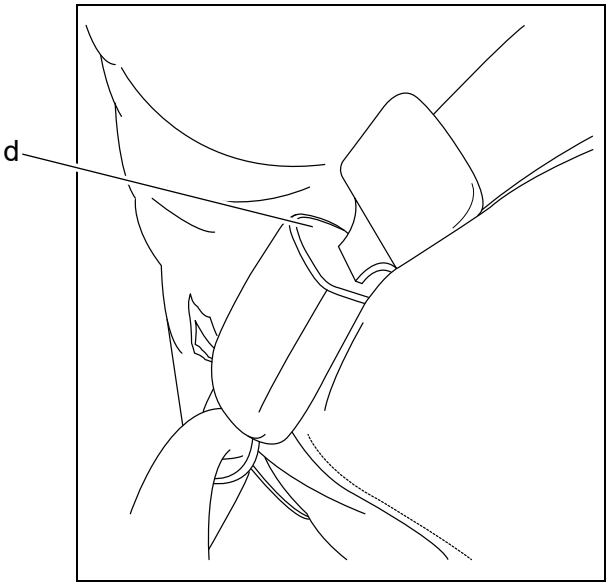

Fig. 5-5

WARNING!

Contact your SANY dealer if the seat belt fails any of these checks or fails to fasten or unfasten. Failure to observe and follow this warning could result in death or injury.

Sheet Metal - Check

Check sheet metal for loss, damage, loose connections or missing bolts.

NOTE: Repair or replace sheet metal parts as needed using SANY approved parts.

Swing Bearing - Lubricate

WARNING!

Ensure that this procedure is followed exactly. Failure to do so could result in death or injury.

1. Pump lubricating grease at fittings (a) on the swing bearing until the grease seeps out of seal (b).
2. Check seal (b) condition.
3. Start the engine.
4. Lift the arm off the ground.
5. Rotate the upper structure 90° and repeat steps 1 and 2.
6. Repeat until a full 360° rotation has been made.
7. Shut down the engine.

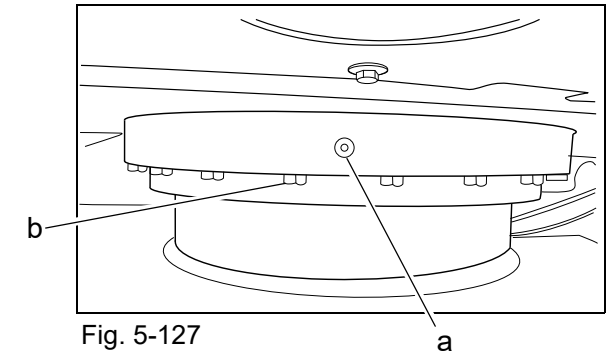

Fig. 5-127

Swing Bearing Bolts - Check

1. Locate and inspect swing bearing mounting bolts (a) for presence and physical damage of any kind.
2. Turn the engine on, turn the cab 90° to the right.
3. Turn the engine off.
4. Repeat step 1 through 3 until you have inspected all of the bolts.

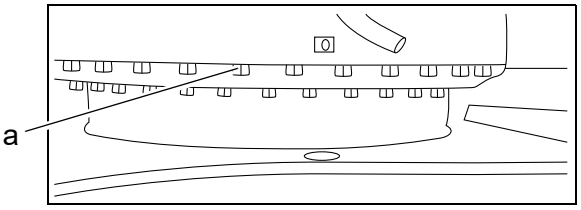

Fig. 5-128

Swing Drive - Check

1. Locate and inspect swing drive (a) for physical damage of any kind.

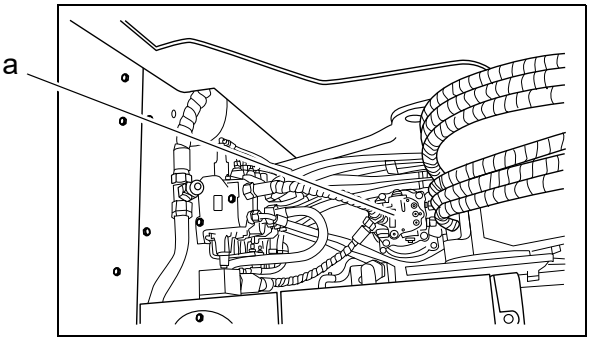

Fig. 5-129

2. Remove check/fill plug (b) from the swing gearbox and note the oil level.

   NOTE: The oil level should be within 1/4 in. (6 mm) of the top of the inspection hole.

3. Add oil as needed.
4. Reinstall the plug.

NOTICE!

Do not overfill. This could result in machine damage and improper machine operation.

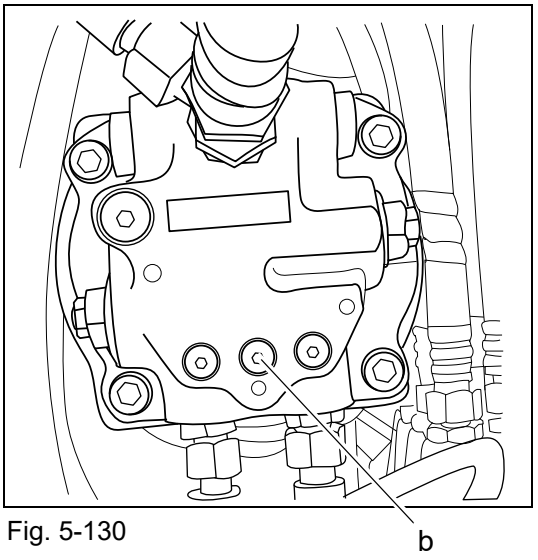

Fig. 5-130

Swing Drive Oil - Change

1. Start the engine.

2. In an open area, rotate the upper structure 90° in both directions five times to warm the oil. If cold weather conditions 0° F (-18° C) exist, rotate the upper structure 90° in both directions 10 times.

CAUTION!

Because the engine and oil are hot, be sure to wear protective clothing. Failure to observe and follow this caution could result in minor or moderate injury.

3. Shut down the engine.

4. Locate swing gearbox (a).

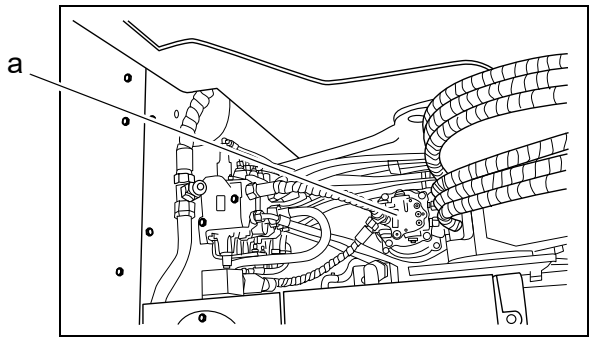

Fig. 5-131

5. Loosen gearbox oil fill plug (b).

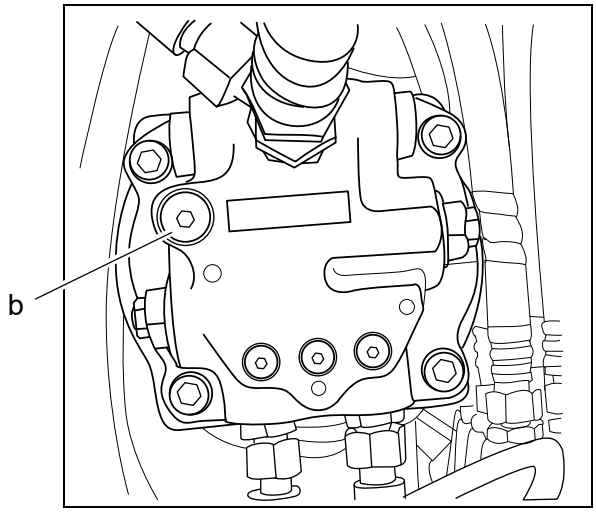

Fig. 5-132

6. Remove bottom cover (c) to allow access to the drain hose.

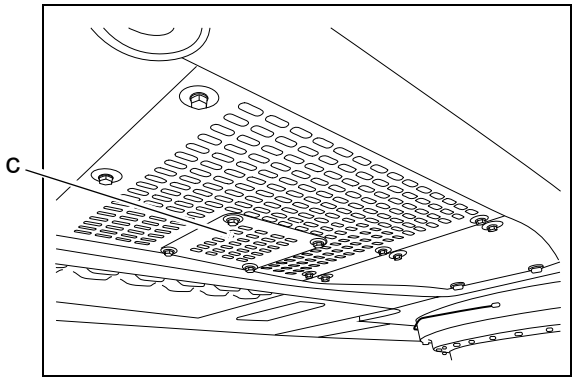

Fig. 5-133

7. Place an appropriately sized container beneath the oil drain hose.

8. Open drain valve (d) and allow all of the oil to drain into the container.

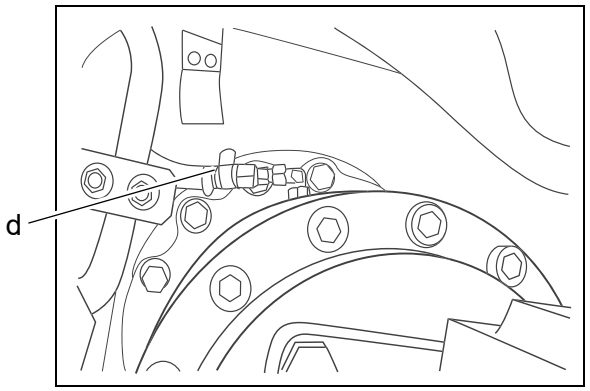

Fig. 5-134

NOTICE!

Dispose of the drained oil in accordance with local environmental regulations. Failure to do so could result in damage to the environment.

9. Close drain valve (d) after oil stops draining from the gearbox.

10. Reinstall the bottom cover.

11. Remove gearbox oil fill cap (b).

12. Fill the swing gearbox with clean oil through the oil fill plug hole.

NOTICE!

Do not overfill the gearbox with oil. Failure to observe and follow this notice could result in damage to the gearbox.

13. Check the gearbox oil level.

    NOTE: The fluid level should be no more than 1/4" (25mm) below the seat of the plug.

14. Replace the gearbox fill plug O-ring.

15. Reinstall and tighten the gearbox oil fill plug.

NOTICE!

If oil leakage is found during the oil level inspection, stop the inspection, locate and repair the cause of the oil leakage. Failure to do this may result in low oil level during operation and component failure.

Swing Gearbox Bearing - Lubricate

Pump grease into swing gearbox bearing fitting (a).

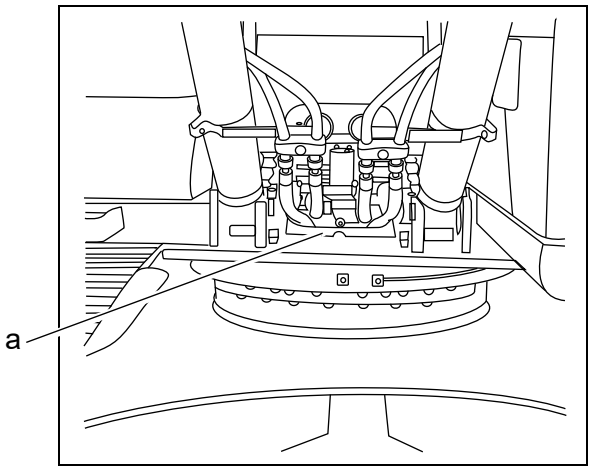

Fig. 5-135

Swing Grease Bath Level - Check

1. Locate swing pinion gear grease check point (a).

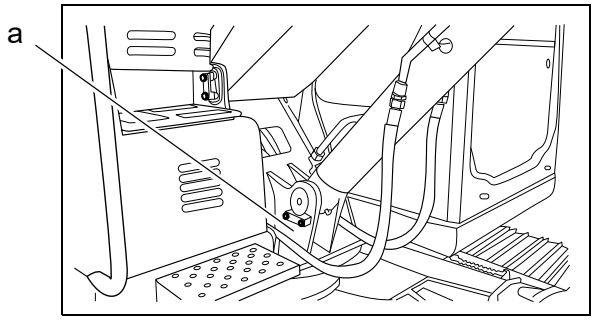

Fig. 5-136

2. Remove cover (b) to open the inspection/filler hole.
3. Check the grease level.

   NOTE: The minimum level is 0.6 in. (14 mm).

4. If the grease level is low, add grease through the inspection/filler hole as needed.
5. Check the grease to see whether it is milk white.

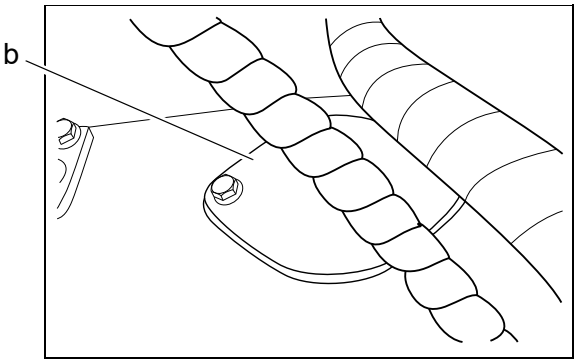

Fig. 5-137

NOTE: Milk white grease indicates that the grease has been contaminated. Consult your SANY dealer in order to change the grease.

6. Reinstall cover (b).

Top Roller Bolts - Check

1. Inspect mounting bolts (a) that secure the support roller to the side frame for rust, damage or looseness.

2. Replace any damaged or defective bolts and tighten any loose bolts.

   NOTE: Use anaerobic sealant when tightening loose bolts and installing new bolts.

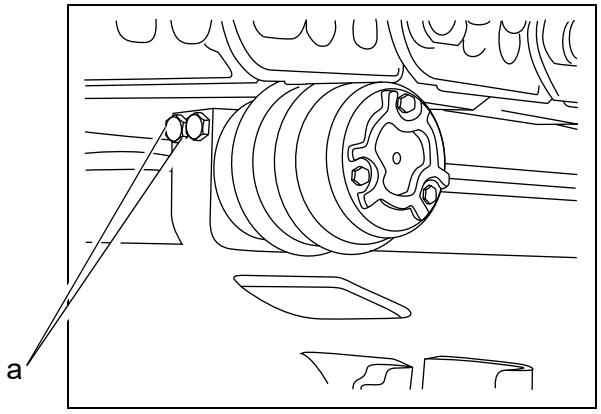

Fig. 5-138

Track Assemblies - Check

NOTE: Step 2 applies to metal track only.

NOTE: Use a pry bar to shift and/or lift the track shoes as needed to perform this procedure.

1. Remove as much accumulated dirt as possible from the track assemblies. Excess dirt requires more energy to operate the crawlers and causes severe wear of moving parts of the track.

2. Check track pads (a) for damage, wear, unevenness, looseness, raised sections, and tightening of crawler pads or any other abnormality.

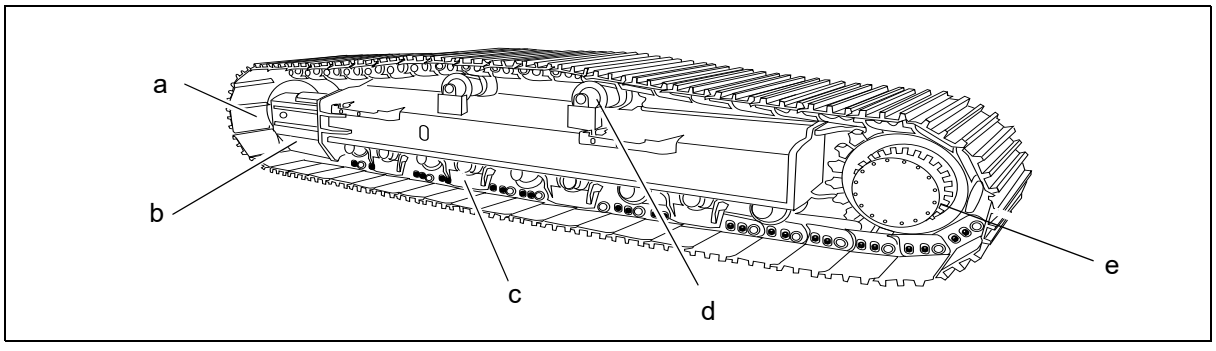

Fig. 5-139

3. Check idler (b) track roller (c) and supporting rollers (d) for wear, leaks, lubrication and proper operation.

4. Check crawler final drive motors (e) for wear and lubrication of the gearbox.

Track Bolts - Check

NOTE: This section applies only to those machines with metal track.

1. Ensure that all track bolts are properly in place at each pair of track shoes (a) and not broken, bent, damaged or loose.

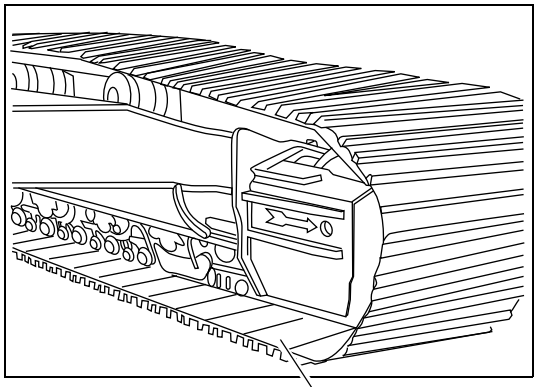

Fig. 5-140

2. Replace any bolts that are broken, bent or damaged.

3. Re tighten any bolts that are loose.

   NOTE: Tighten the bolts in sequence (b), ensuring that the nuts and track shoe are in close contact with the link mating surface.

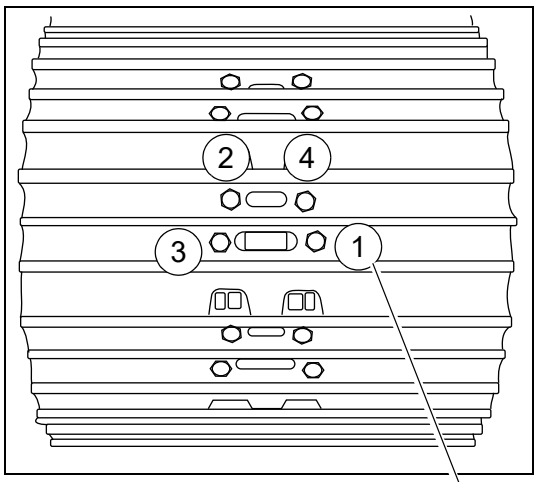

Fig. 5-141

Track Tension - Check and Adjust

Track Tension - Check

NOTE: With new rubber track, check track tension between 5-30 hours of usage to make sure the track does not come off the machine.

1. Clean the track, rollers and frame of accumulated dirt, mud and other debris.

2. Travel forward two machine lengths on a flat, level surface.

3. Lay a taut string or straight edge from the forward carrier roller to the idler.

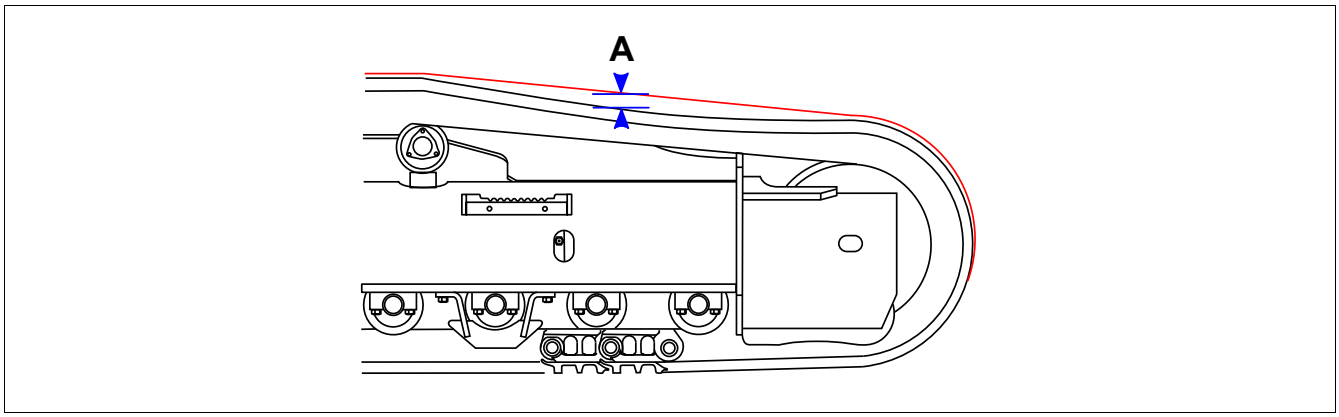

Fig. 5-1

4. Measure the gap at location “A” (to the top of the grouser).

5. Lay a taut string or straight edge from the rear carrier roller to the sprocket.

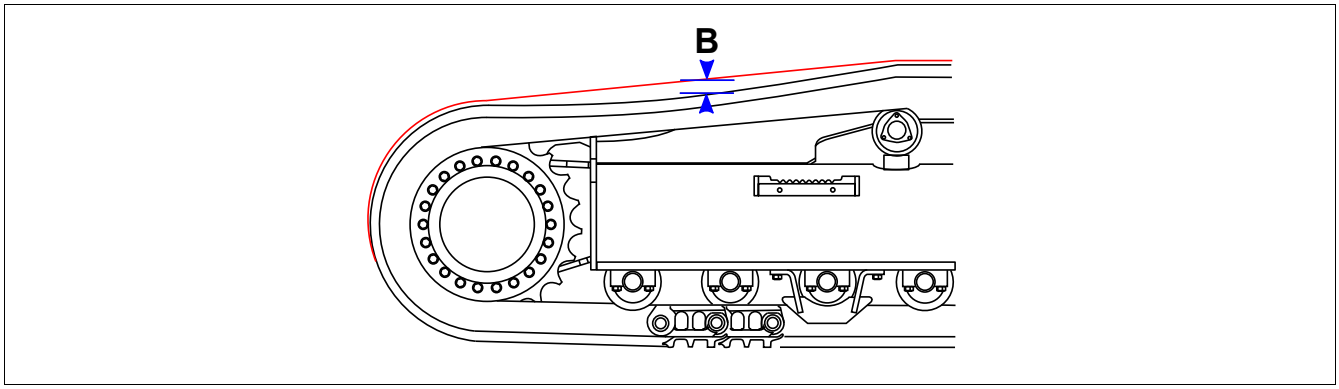

Fig. 5-2

6. Measure the gap at location “B” (to the top of the grouser).

7. Dimensions “A” and “B” should be 0.4 - 1.2 in. (10 - 30 mm).

8. Adjust track tension as needed to obtain this dimension.

Track Tension - Increase

1. Pump grease into fitting (a).

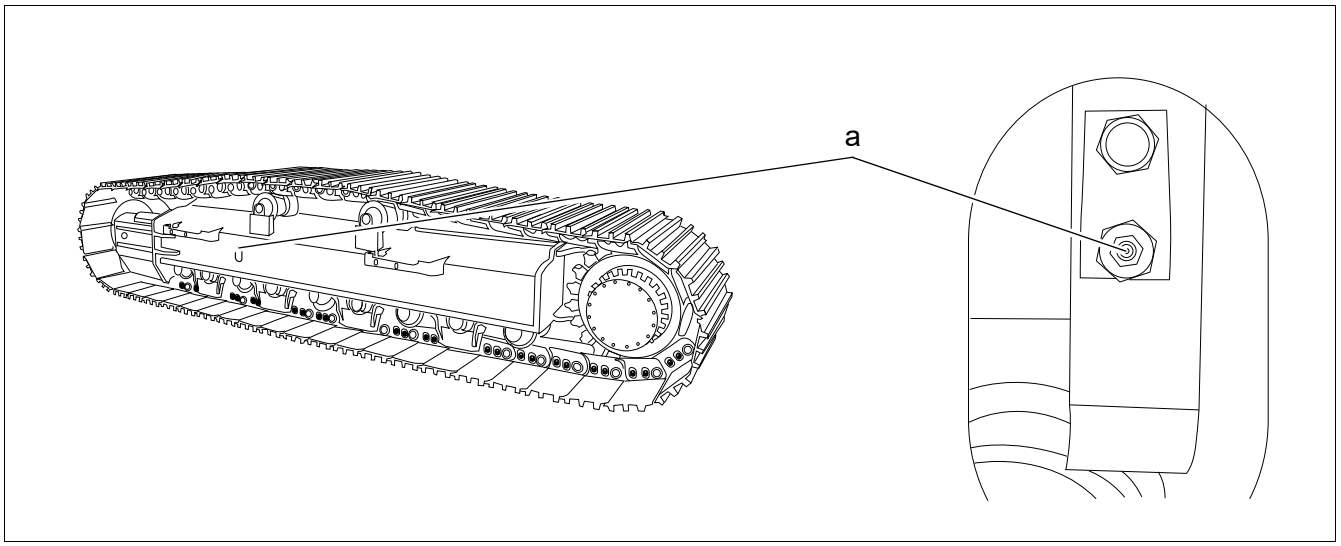

Fig. 5-142

2. Slowly move the machine forward two machine lengths, then stop the machine.
3. Recheck the track tension.
4. Pump additional grease through into fitting (a) if the tension is still out of the acceptable range.

   NOTE: Contact your SANY dealer if the acceptable tension adjustment cannot be completed.

Track Tension - Reduce

WARNING!

Do not loosen the grease fitting (a)! The grease fitting is under extreme pressure and can exit the grease valve (b) quickly and forcefully.

Do not place yourself or others directly in front of the grease valve (b) when loosening the valve.

Wear suitable personal protective equipment in the form of protective clothing, gloves, safety glasses and head protection to protect against the sudden release of pressurized grease.

Failure to observe and follow these warnings could result in death or injury.

1. Ensure that there is no gravel or mud between the sprocket and the track link before decreasing track tension.
2. Position yourself off to the side, not in front of grease valve (b).
3. Slowly turn grease valve (b) counterclockwise in 90° increments (one quarter turn) to release grease and decrease track tension.

   NOTE: The grease will come out from behind the grease valve.

   NOTE: Do NOT remove the grease valve.

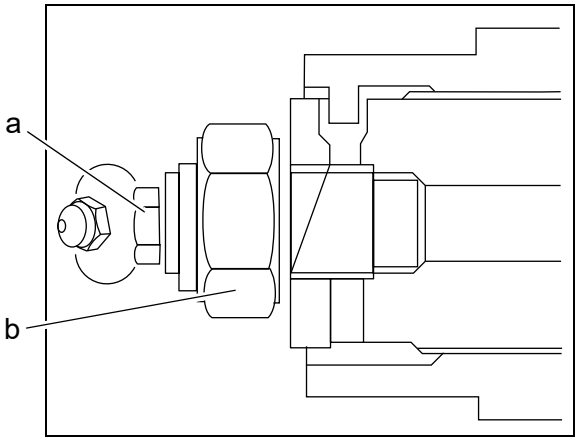

Fig. 5-143

4. If grease does not come out smoothly, move the machine back and forth for a short distance, then repeat step 3.
5. Check track tension.

   NOTE: When the correct track tension has been achieved, turn the grease valve clockwise in 90° increments until it is tightened to a torque of 35 lb-ft (47 N·m).

6. Move the machine forward at idle speed for a distance that is equivalent to the length of an unfolded track.
7. Check track tension again and repeat this procedure as needed until the correct track tension is achieved.

Upper Structure and Lower Structure - Check

This machine consists of two major component groups:

- The lower structure with its various components and assemblies.
- The upper structure with its various components and assemblies.

1. Throughly wash the exterior of the machine.

2. Check the entire structure of the machine for cracks or distortion.

Windshield Washer and Windshield Wiper - Check

1. Check the washer fluid level inside windshield washer tank (a) located behind the left front door.

2. Remove cap (b) and add windshield washer fluid as necessary.

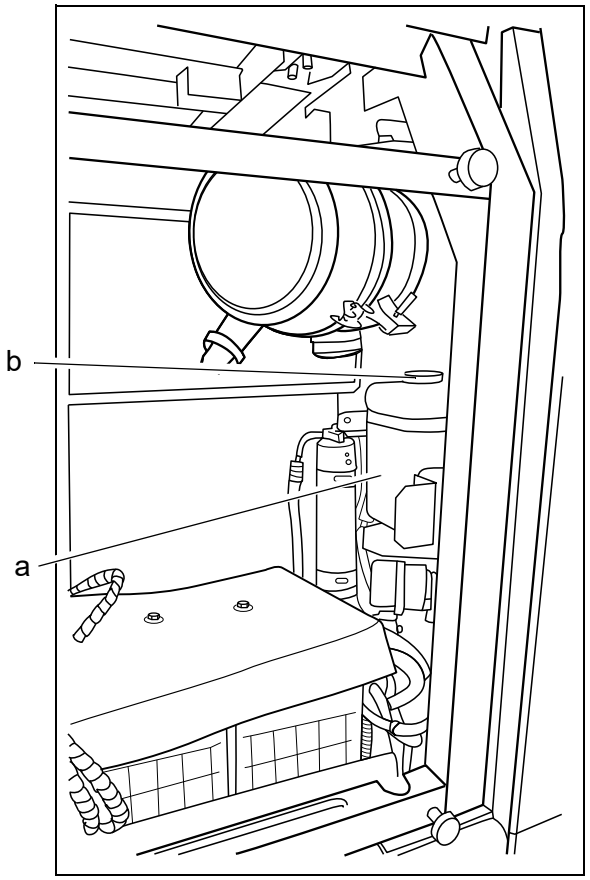

Fig. 5-144

3. Check the operation of windshield washer nozzle and wiper (c) to ensure there is no smearing across the windshield during operation. Replace the wiper blade with a new one if smearing does occur.

4. If necessary, adjust spray nozzle (d) to ensure that the fluid spray is properly directed.

NOTICE!

Do not operate the wiper on a dry window. Failure to observe and follow this could result in machine damage and improper machine operation.

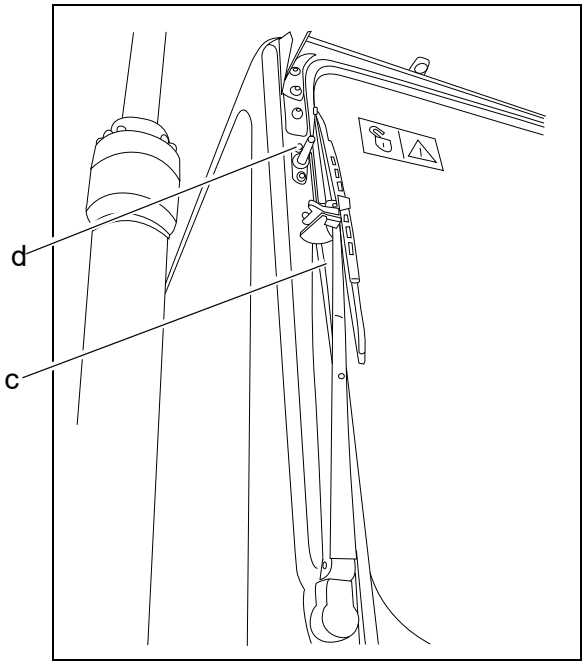

Fig. 5-145

Work Equipment - Lubricate

Pump grease through the work equipment greasing points as indicated in the following illustration and as shown in the decal next to the cab door.

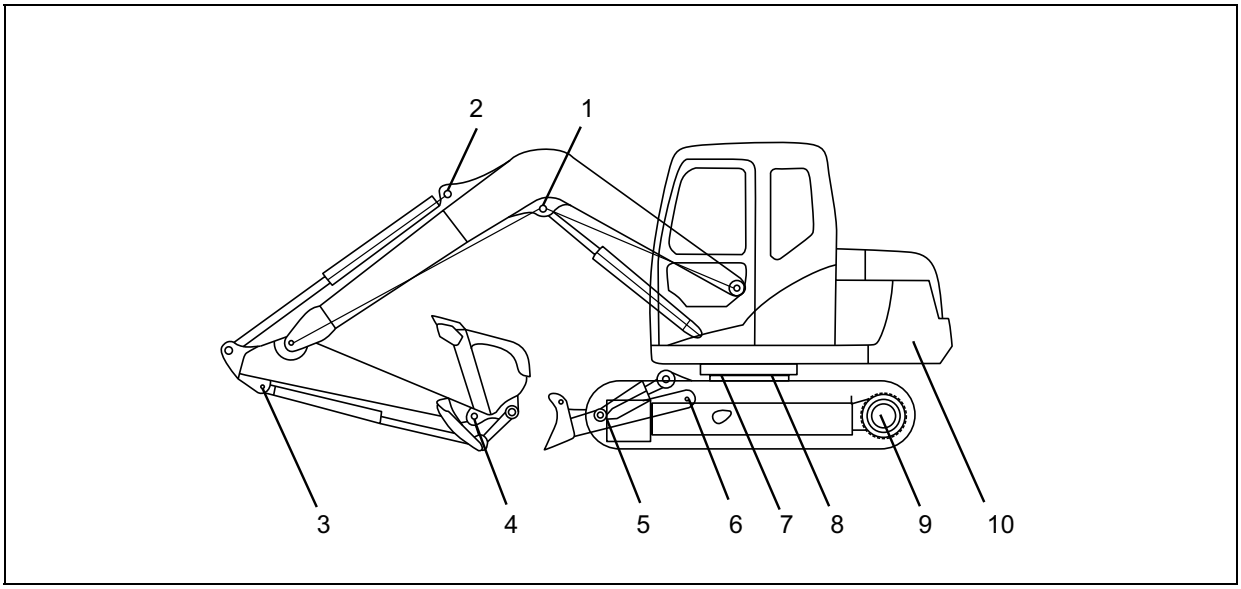

Fig. 5-146

1. Boom cylinder foot pin	5. Dozer pin
2. Arm cylinder foot pin	6. Dozer pin
3. Bucket cylinder pin	7. Swing bearing
4. Bucket pin	8: Swing gear

The following pages provide additional information on each lubrication point. The additional information is presented in the same order as appears on the figure above.

1. Pump grease into boom cylinder root pin fitting (a).

2. Pump grease into two boom pin fittings (b).

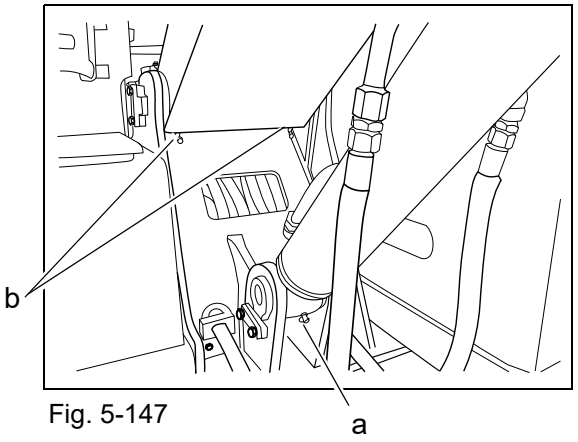

Fig. 5-147

3. Pump grease into boom cylinder rod fitting (c).

4. Pump grease into arm cylinder root pin (d) fitting.

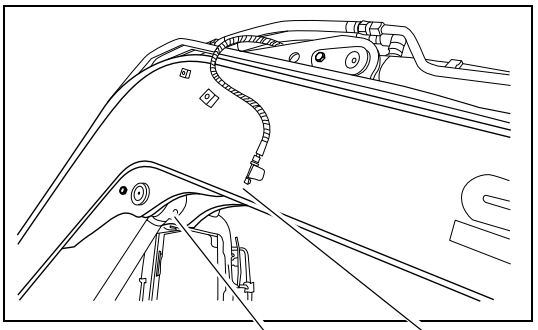

Fig. 5-148

5. Pump grease into two boom arm joining pin fittings (e).

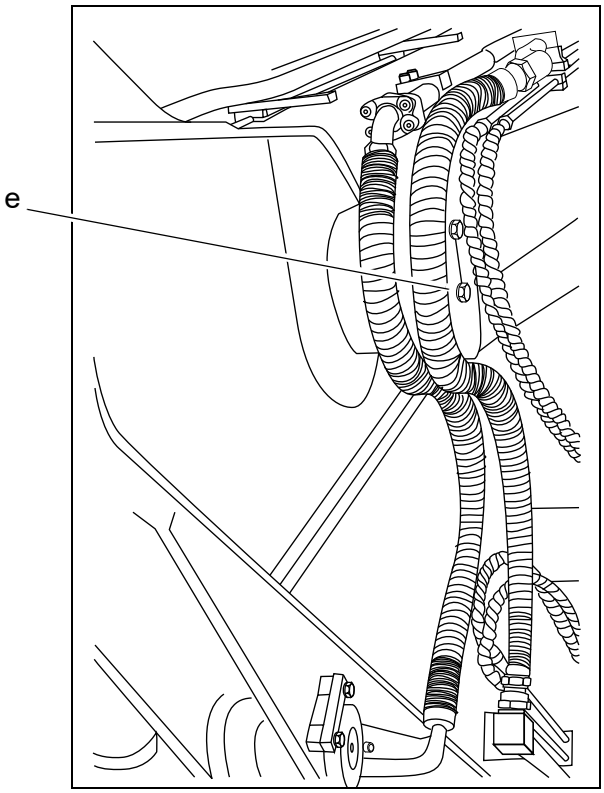

Fig. 5-149

6. Pump grease into arm cylinder rod end fitting (f).

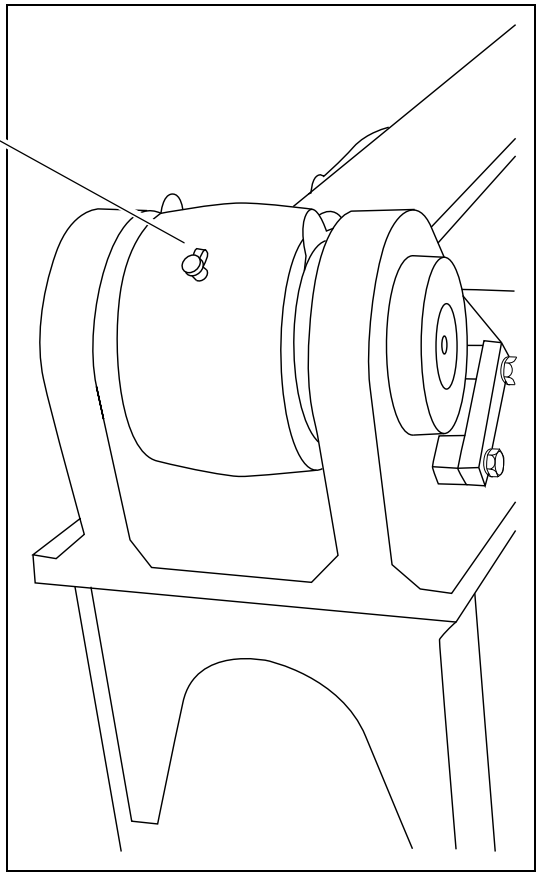

Fig. 5-150

7. Pump grease into bucket cylinder foot pin fitting (g).

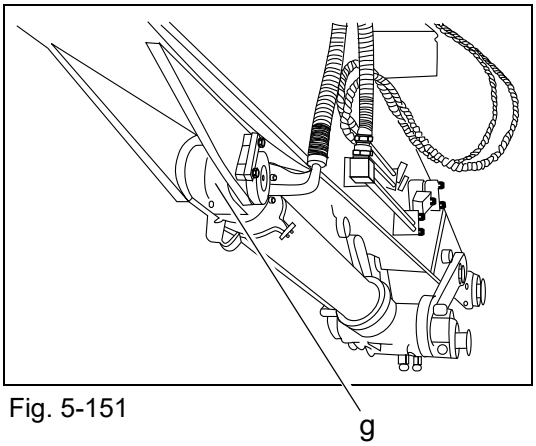

Fig. 5-151

8. Pump grease into arm bucket joining pin fitting (h) and bucket rod joining pin fitting (k).

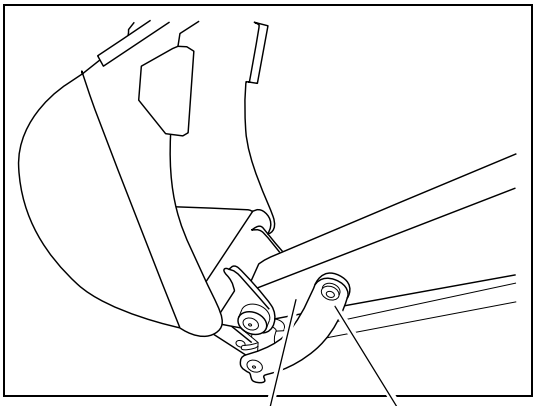

Fig. 5-152

9. Pump grease into two rod joining pin fittings (m).

10. Pump grease into bucket cylinder piston rod end fitting (n).

11. Pump grease into and bucket rod joining pin fitting (o).

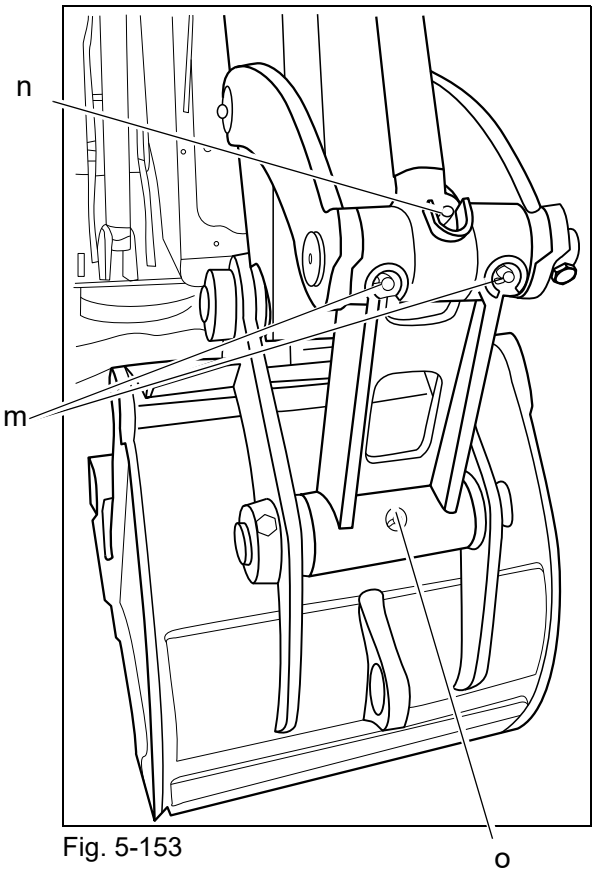

Fig. 5-153

12. Pump grease into dozer blade cylinder (p).

13. Pump grease into pivot fittings (q).

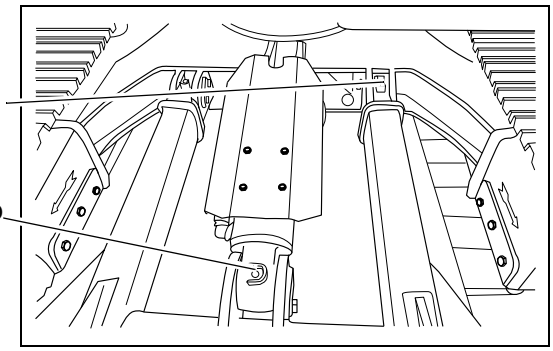

Fig. 5-154

MACHINE STORAGE

Follow these procedures when placing the machine in storage. Store the machine in a secure area free of public access. If your storage area is near the ocean or other salt water environment, it is important to be aware of salt damage. Contact your SANY dealer for additional storage procedures if this is case.

Short Term Storage (Less than 30 days)

NOTE: See “Short Term Storage” on page 4-30.

Long Term Storage (Longer than 30 days)

NOTE: See “Long Term Storage” on page 4-30

Specifications

MACHINE DIMENSIONS

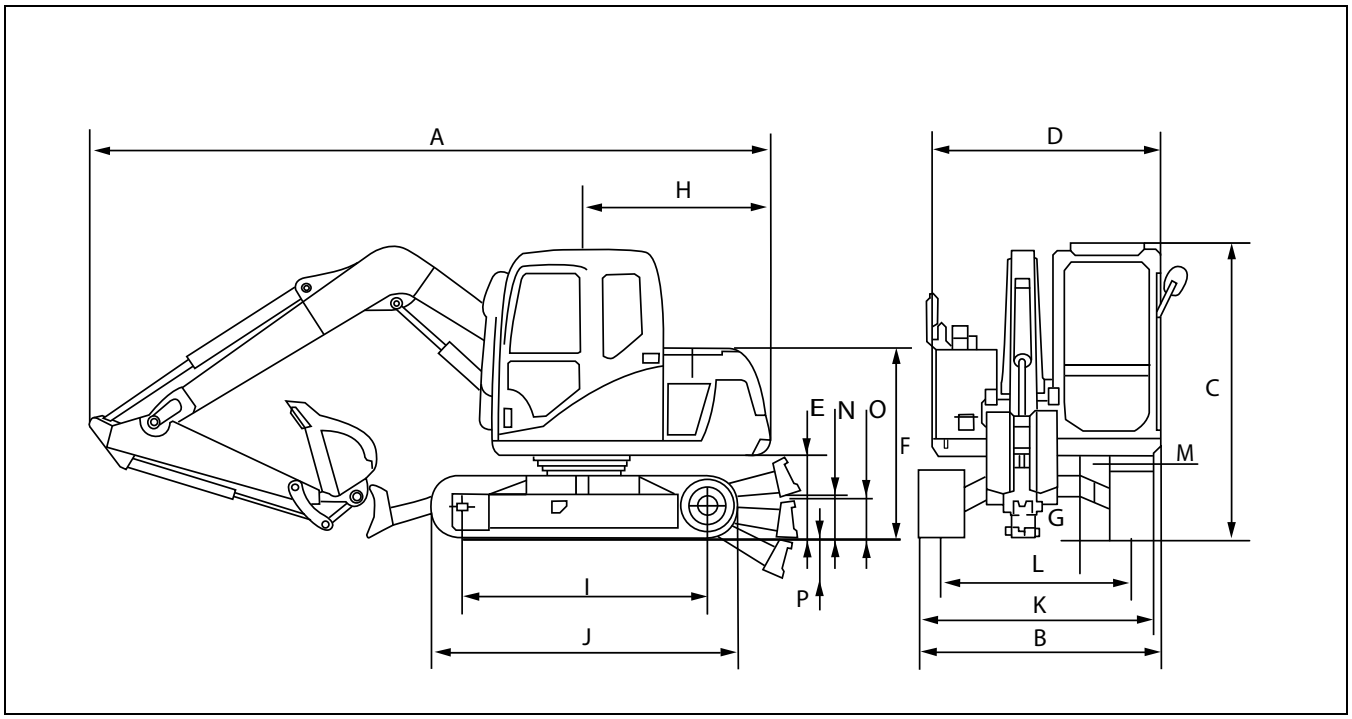

Fig. 6-1

Dimensions

Weight (unloaded)	16,050 lb (7,280 kg)
A. Transport Length	20 ft. (6.095 m)
B. Transport Width	7 ft. 3 in. (2.22 m)
C. Transport Height	8 ft. 7 in. (2.61 m)
D. Upper Width	6 ft. 8 in. (2.04 m)
E. Cab Height	9 ft. 7 in. (2.93 m)
F: Blade Plate Height	1 ft. 4 in. (0.405 m)
G. Minimum Ground Clearance	1 ft. 3 in. (0.38 m)
H. Tail Swing Radius	5 ft.11 in. (1.8 m)
I. Length Center Idler to Center Sprocket	7 ft. 2 in. (2.195 m)
J. Track Length	9 ft. 3 in. (2.815 m)
K. Chassis Width	7 ft. 3 in. (2.2 m)
L. Track Gauge	5 ft. 9 in. (1.75 m)
M: Std. Track Shoe Width	1 ft.6 in. (0.45 m)
N: Dozer Blade height	1 ft. 4 in. (0.405 m)
O: Dozer Blade Maximum Lifting Height	1 ft. 3 in. (0.39 m)
P: Dozer Blade Maximum Digging Depth	1 ft. 1 in. (0.33 m)
Boom Length	12 ft. 3 in. (3.72 m)
Std Arm Length	6 ft.9 in. (2.05 m)

OPERATING RANGE

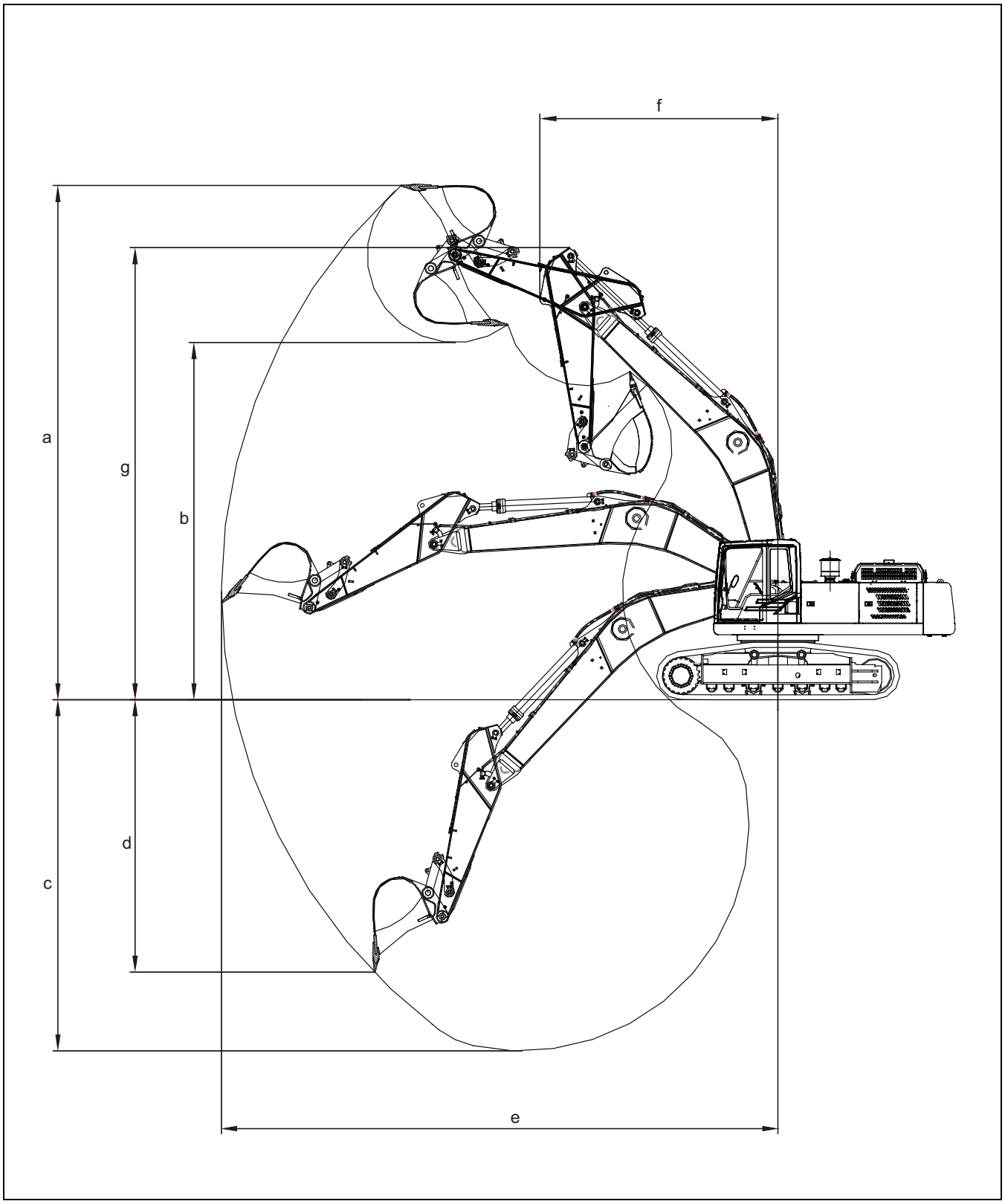

Fig. 6-2

Operating Range

a	Maximum Digging Height	24 ft. 4 in. (7.42 m)
b	Maximum Dumping Height	18 ft. 0 in. (5.495 m)
c	Maximum Digging Depth	14 ft. 7 in. (4.45 m)
d	Maximum Vertical Wall Digging Depth	12 ft. 7 in. (3.84 m)
e	Maximum Digging Reach	21 ft. 11 in. (6.66 m)
f	Minimum Swing Radius	5 ft.8 in. (1.72 m)
g	Maximum Height at Minimum Swing Radius	18 ft. 2 in. (5.55 m)

LIFTING RANGE

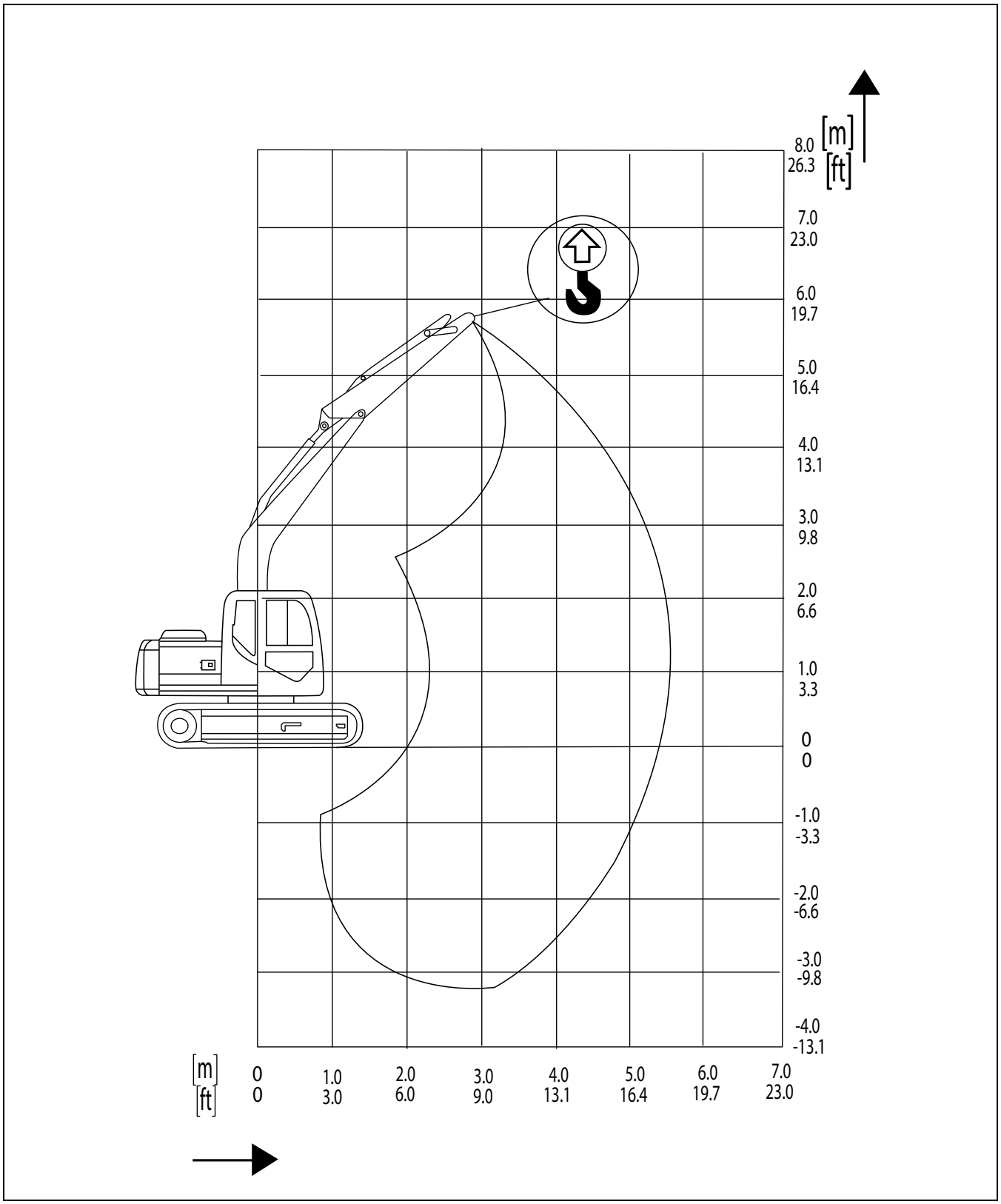

Fig. 6-3

Lift Chart: Blade Down

LPH in feet (m)	Rated capacity in pounds (kg)											
	LPR in feet(m)											
	3 (1)		7 (2)		10 (3)		13 (4)		16 (5)		Lift capacity at max radius	
	End	Side	End	Side	End	Side	End	Side	End	Side	End	Side
20 (6.0)					*3,050 (*1,385)	*3,050 (*1,385)					*2,670 (*1,210)	*2,670 (*1,210)
16 (5.0)							*2,975 (*1,350)	*2,975 (*1,350)			*2,250 (*1,020)	*2.250 (*1,020)
13 (4.0)					*2,900 (*1,315)	*2,900 (*1,315)	*2,985 (*1,335)	*2,985 (*1,335)	*2,335 (*1,060	*2,335 *1,060)	*2,095 (*950)	*2,095 (*950)
10 (3.0)			*4,650 (*2,110)	*4,650 (*2,110)	*3,770 (*1,710)	*3,770 (*1,710)	*3,385 (*1,535)	*3385 (*1,535)	*3,220 (*1,460)	2,700 (1,225)	*2,050 (*930)	*2,050 (*930)
7 (2.0)					*5,015 (*2,275)	*5,015 (*2,275)	*3,925 (*1,780)	3,660 (1,660)	3,495 (1,585)	2,625 (1,190)	*2,095 (*950)	*2,095 (*950)
3 (1.0)					6,150 (2,790)	5,290 (2,400)	*4,550 (*2,065)	3,305 (1,590)	*3,780 (*1,715)	2,545 (1,155)	*2,115 (*960)	2,095 (950)
0.0			*4,820 (*2,185)	*4,820 (*2,185)	*6,800 (*3,085)	5,100 (2,315)	*4,970 (*2,255)	3,375 (1,530)	*4,000 (*1,815)	2,480 (1,125)	*2,435 (*1,105)	2,160 (980)
-3 (-1.0)	*4,640 (*2,105)	*4,640 (*2,105)	*7,500 (*3,405)	*7,500 (*3,405)	6,920 (3,138)	5,015 (2,275)	*5,105 (*2,315)	3,320 (1,505)	*3,980 (*1,805)	2,460 (1,115)	*2,870 (*1,300)	2,360 (1,070)
-7 (-2.0)	*7,530 (*3,415)	*7,530 (*3,415)	*9,390 (*4,260)	*9,390 (*4,260)	*6,515 (*2,955)	5,025 (2,280)	*4,805 (*2,180)	3,330 (1,510)			*3,705 (*1,680)	2,810 (1,275)
-10 (-3.0)					*5,280 (*2,395)	5,160 (2,340)					*4,155 (*1,885)	4,010 (1.820)

Capacities marked with an asterisk (*) are limited by hydraulic capacities. (See Note 2)

NOTE 1	Lift capacities shown are without power boost feature.
NOTE 2	Lift capacities shown do not exceed 75% of minimum tipping loads or 87% of hydraulic capacities.
NOTE 3	Least stable position is over the side.
NOTE 4	Lift capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer
NOTE 5	Included in this mass are triple grouser shoes, 3,720 mm boom, 2,050 mm stick, all operating fluids, and a 75 kg operator.
NOTE 6	Lift capacities are in compliance with ISO 10567:2007
NOTE 7	The load point is the centerline of the bucket pivot mounting pin on the arm.
NOTE 8	No bucket

Lift Chart: Blade Up

LPH in feet (m)	Rated capacity in pounds (kg)											
	LPR in feet (m)											
	3 (1)		7 (2)		10 (3)		13 (4)		16 (5)		Lift capacity at max radius	
	End	Side	End	Side	End	Side	End	Side	End	Side	End	Side
20 (6.0)					*3,050 (*1,385)	*3,050 (*1,385)					*2,670 (*1,210)	*2,670 (*1,210)
16 (5.0)							*2,975 (*1,350)	*2,975 (*1,350)			*2,250 (*1,020)	2.250 (1,020)
13 (4.0)					*2,900 (*1,315)	*2,900 (*1,315)	*2,985 (*1,355)	*2,985 (*1,335)	*2,335 (*1,060)	*2,335 (*1,060)	*2,095 (*950)	*2,095 (*950)
10 (3.0)			*4,650 (*2,110)	*4,650 (*2,110)	*3,770 (*1,710)	*3,770 (*1,710)	*3,385 (*1,535	*3385 *1,535)	2,890 (1,310)	2,700 (1,225)	*2,050 (*930)	*2,050 (*930)
7 (2.0)					*5,015 (*2,275)	*5,015 (*2,275)	*3,935 (*1,785)	3,660 (1,660)	2,810 (1,275)	2,625 (1,190)	*2,095 (*950)	*2,095 (*950)
3 (1.0)					5,800 (2,630)	5,290 (2,400)	37,70 (1,710	3,305 (1,590	2,722 (1,235)	2,545 (1,155)	*2,115 (*960)	2,095 (950)
0.0			*4,820 (*2,185)	*4,820 (*2,185)	5,600 (2,540	5,100 (2,315)	3,640 (1,655)	3,375 (1,530)	2,650 (1,205)	2,480 (1,125)	2,315 (1,050)	2,160 (980)
-3 (-1.0)	*4,640 (*2,105)	*4,640 (*2,105)	*7,500 (*3,405)	*7,500 (*3,405)	5,510 (2,500)	5,015 (2,275)	3,580 (1,625)	3,320 (1,505	2,635 (1,195)	2,460 (1,115	2,535 (1,150)	2,360 (1,070)
-7 (-2.0)		*7,530 (*3,415)	*9,390 (*4,260)	*9,390 (*4,260)	5,530 (2,510)	5,025 (2,280)	3,590 (1,630)	3,330 (1,510)			3,020 (1,370)	2,810 (1,275)
-10 (-3.0)			*7,580 (*3,440)	*7,580 (*3,440)	*5,280 (*2,395)	5,160 (2,340)					*4,155 (*1,885)	4,010 (1.820)

Capacities marked with an asterisk (*) are limited by hydraulic capacities. (See Note 2)

NOTE 1	Lift capacities shown are without power boost feature.
NOTE 2	Lift capacities shown do not exceed 75% of minimum tipping loads or 87% of hydraulic capacities.
NOTE 3	Least stable position is over the side.
NOTE 4	Lift capacities apply only to the machine as originally manufactured and normally equipped by the manufacturer
NOTE 5	Included in this mass are triple grouser shoes, 3,720 mm boom, 2,050 mm stick, all operating fluids, and a 75 kg operator.
NOTE 6	Lift capacities are in compliance with ISO 10567:2007
NOTE 7	The load point is the centerline of the bucket pivot mounting pin on the arm.
NOTE 8	No bucket

SANY

Optional Equipment

OPTIONAL EQUIPMENT SAFETY

NOTICE!

The following precautions must be strictly observed when selecting, installing and operating optional equipment. Failure to observe and follow this notice can cause damage to the machine or cause the machine to operate improperly.

Optional Equipment Selection

Consult your SANY dealer before installing any optional equipment on your machine. Depending on the type of optional equipment selected, protective structures (such as front guards or top guards) may need to be installed on the machine.

Only install SANY-approved optional equipment. SANY America assumes no responsibility for accidents, loss or failures caused by any optional equipment that has not been provided by SANY.

Read Equipment Instructions

Read an understand the optional equipment optional equipment manual before installing and operating any optional equipment. Do not exceed the manufacturer's specifications for maximum flow of optional equipment.

If the optional equipment manual is missing or damaged, contact the manufacturer of the optional equipment to obtain a replacement.

Removal and Installation Precautions

NOTICE!

The following precautions must be strictly observed when selecting, installing, and operating optional equipment. Failure to follow this notice can damage the machine or cause it to operate improperly.

When removing or installing optional equipment, observe the following:

- Follow the instructions in this manual and the optional equipment manual.
- Remove and install equipment only on a hard, level surface.
- Use an appropriate lifting device when handling heavy objects weighing more than 55 lb. (25 kg).
- Never stand under a suspended load.
- Ensure your machine is well-balanced and supported whenever you add or remove an optional equipment.
- For more information about removal and installation, consult your SANY dealer.

Optional Equipment Operation Precautions

Keep the following procedures in mind when operating any optional equipment:

- Prior to the operation, move your machine to a safe area and test its operation.
- Become aware of how it will move with an optional equipment, the machine's center of gravity, and working range.
- Ensure the machine is well-balanced and does not lean to one side.
- Maintain a safe distance from all surrounding barriers during machine operations.
- In order to prevent the machine from tipping over, never swing, lower or stop your machine suddenly.

In order to prevent impact that may cause the machine to tip over, never raise or lower the boom suddenly.

OPTIONAL EQUIPMENT CONTROLS

There are a variety of optional one-way flow and two-way flow equipment that can be used on this machine. A hydraulic breaker is an example of a one-way flow equipment, while a hydraulic shear is an example of a two-way flow equipment.

Component Location and Function

Auxiliary Line Caps

The auxiliary line caps (a) cover the attachment points located on each side of the arm near the bucket end.

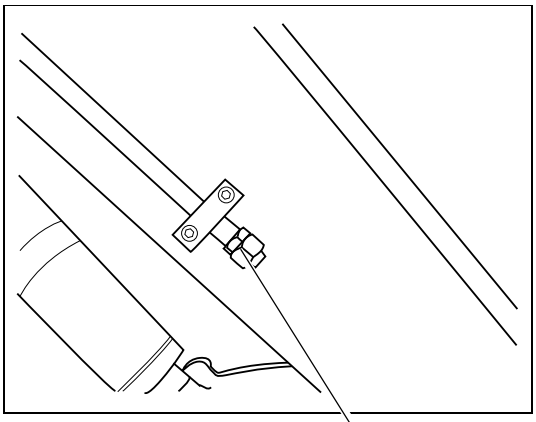

Fig. 7-1

Monitor

The operating mode must also be applicable to the installed equipment. There are four different work modes:

- H: Heavy duty - Provides 100 percent of the machine's rated power.
- S: Standard duty - Provides 90 percent of the machine's rated power.
- L: Light duty - Provides 80 percent of the machine's rated power.
- B: Breaker - Provides 70 percent of the machine's rated power.

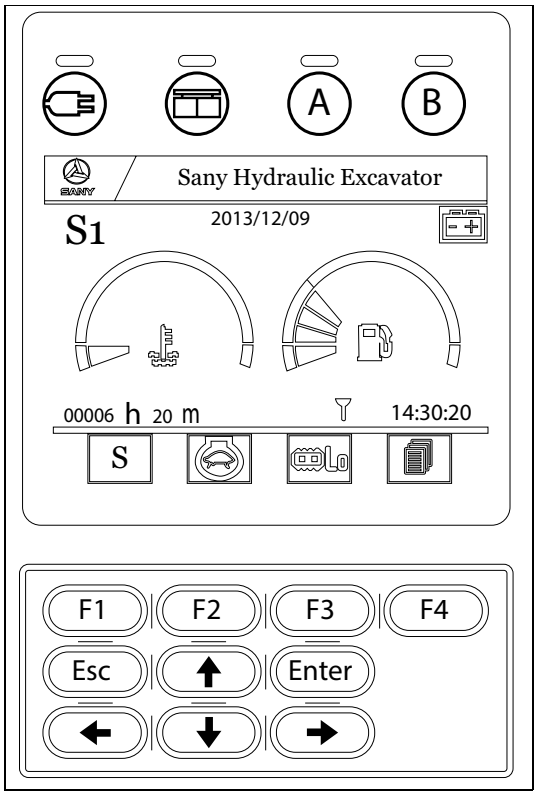

Fig. 7-2

Right Joystick

The optional equipment is controlled using slide switch (a) on the right joystick.

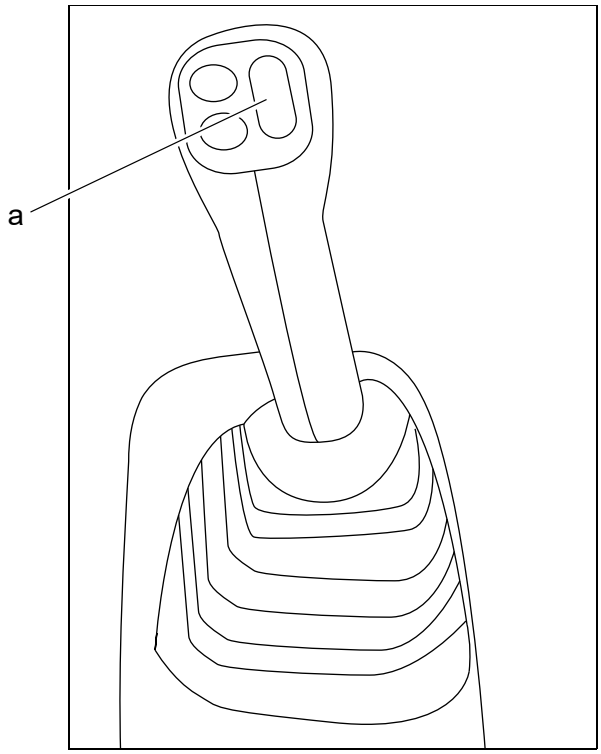

Fig. 7-3

OPTIONAL EQUIPMENT OPERATION

Attach Optional Equipment

1. Lower the work equipment to the ground.

CAUTION!

Do not release equipment unless it is on the ground or on a solid supportive surface. Failure to observe this could result in damage to the equipment and or personal injury.

2. Shut down the engine.

3. Turn the key switch to the ON position.

4. Place the hydraulic lockout control lever in UNLOCKED position (a).

5. Fully cycle each pedal, joystick and control lever 2 - 3 times within 15 seconds in order to release the internal pressure remaining in the hydraulic lines.

6. Place the hydraulic lockout control lever in LOCKED position (b).

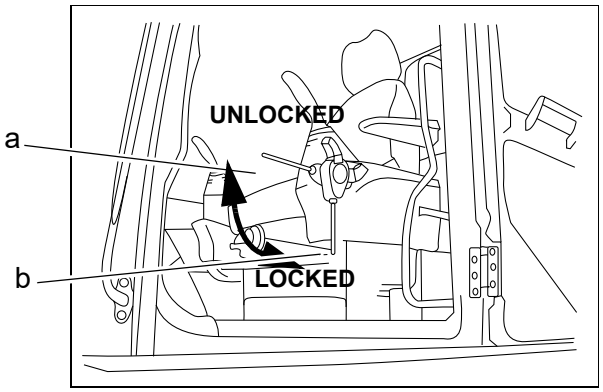

Fig. 7-4

7. Remove butterfly nut (c) from the breather valve.

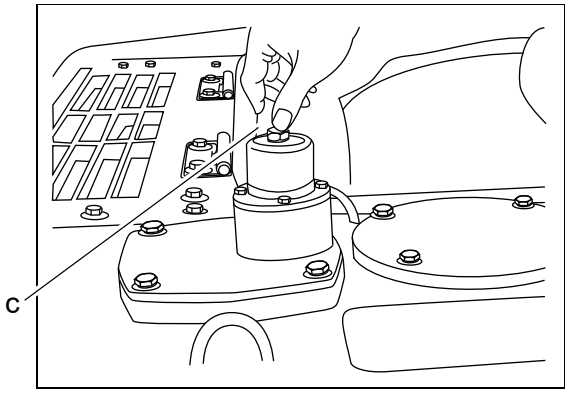

Fig. 7-5

8. Press hydraulic tank vent button (d) to relieve pressure in the hydraulic tank.

9. Reinstall butterfly nut (c).

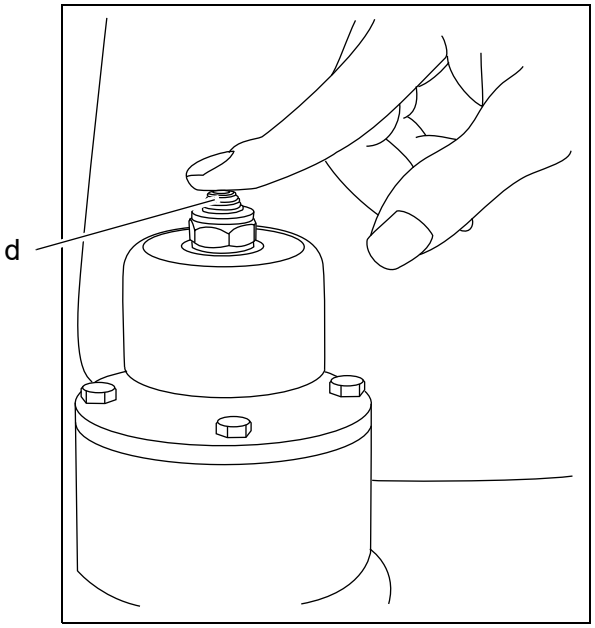

Fig. 7-6

10. Place a catch container under one of the screw caps to catch any residual hydraulic oil.

11. Remove screw cap (d) from the end of the line and allow any residual hydraulic oil to drain into the container.

12. Repeat steps 10 and 11 on the other screw cap.

NOTICE!

Dispose of drained hydraulic oil properly. Failure to do so could result in damage to the environment.

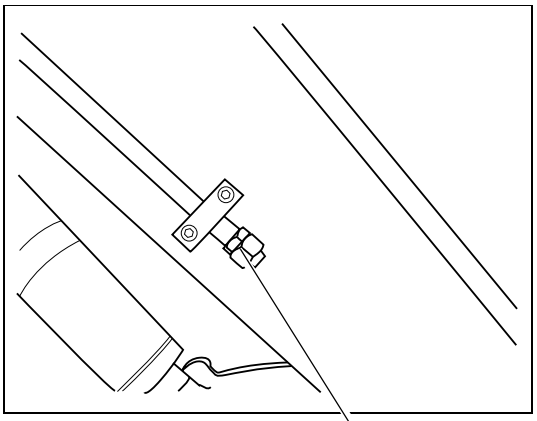

Fig. 7-7

13. Remove existing optional equipment.

14. Mount the new attachment.

15. Connect the optional equipment and its hydraulic lines in accordance with the manufacturer's instructions.

    NOTE: Connection sizes may vary.

16. Set the monitor to the correct working mode and attachment.

Optional Equipment Controls

WARNING!

Do not touch the joystick control buttons when you are not operating the attachments. Accidental operation of an attachment could result in death or injury.

The control switch and buttons on top right joystick are used to control equipment operation.

Switch (a) on the right joystick is used to control flow in the main auxiliary lines.

Press the upper part of switch (a) on the right joystick to send flow down right side of the arm.

Press the lower part of switch (a) on the right joystick to send flow down the left side of the arm.

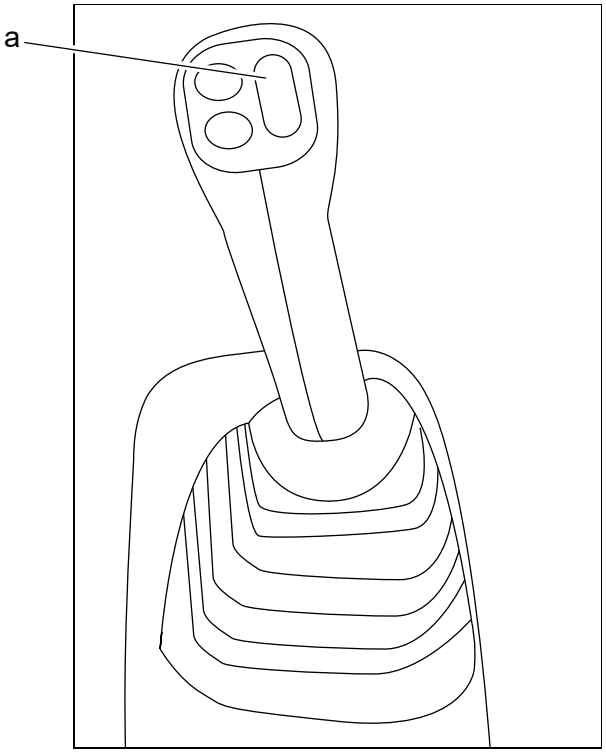

Fig. 7-8

Blade Control

Blade control (a) is located on the right side console. Push joystick forward (b) to lower the blade and pull it back (c) to raise the blade.

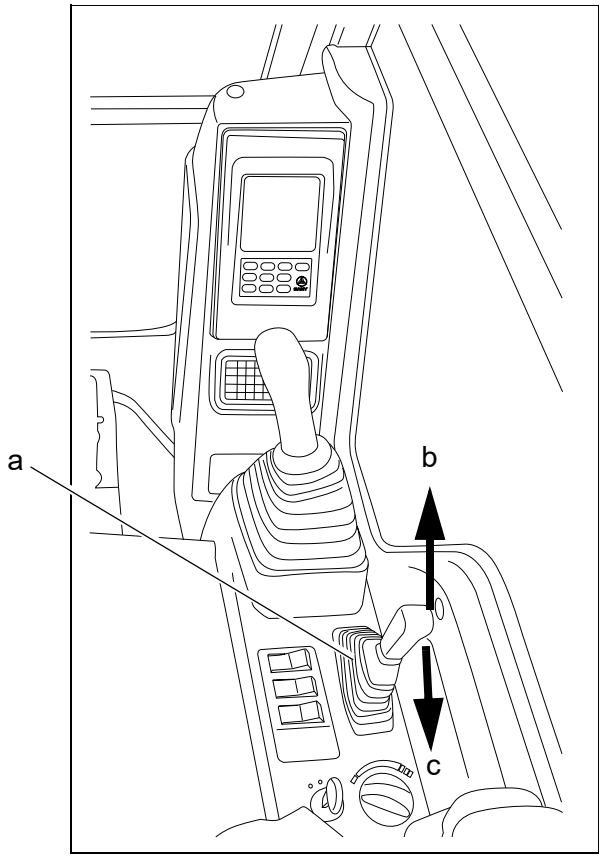

Fig. 7-9

Disconnect Optional Equipment

1. Lower the work equipment to the ground.
2. Shut down the engine.
3. Turn the key switch to the ON position.
4. Place the hydraulic lockout control lever in UNLOCKED position (a).
5. Fully cycle each pedal, joystick and control lever 2 - 3 times within 15 seconds in order to release internal pressure in the hydraulic lines.
6. Place the hydraulic lockout lever in LOCKED position (b).

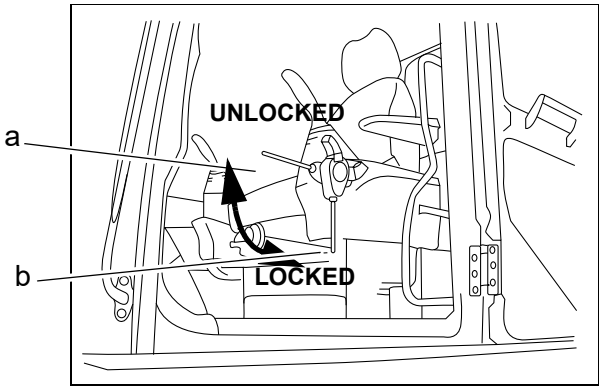

Fig. 7-10

7. Remove butterfly nut (c) from the breather valve.

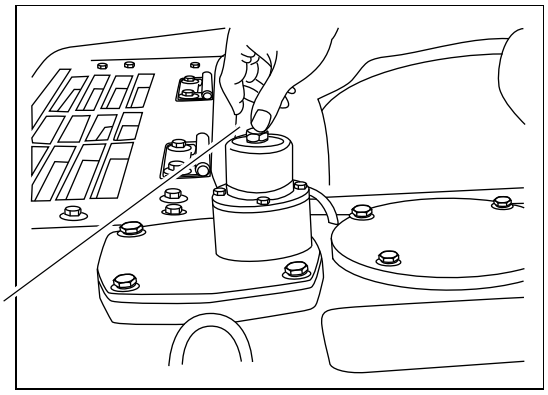

Fig. 7-11

8. Press vent button (d) to relieve the pressure in the hydraulic tank.

9. Reinstall butterfly nut (c).

10. Place a suitably sized container under the first attachment hose to be disconnected to catch any residual hydraulic oil.

11. Disconnect the attachment hose from this line and allow any residual hydraulic oil to drain into the container.

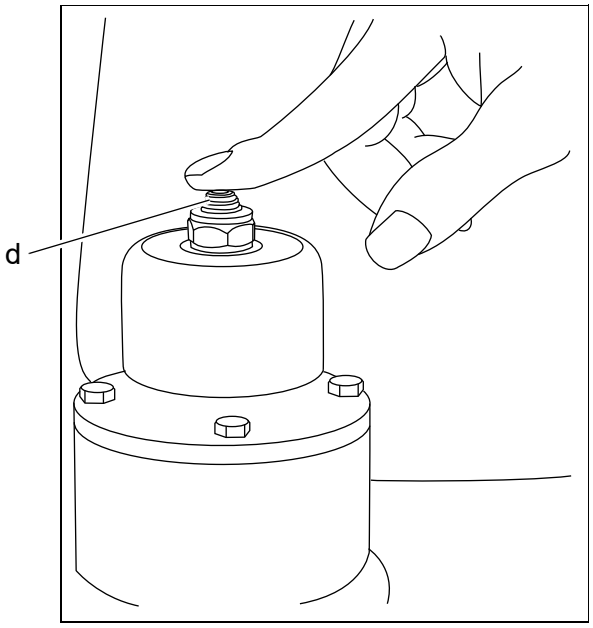

Fig. 7-12

12. Reinstall cap (e).

13. Repeat steps 10 through 12 on the other line.

NOTICE!

Dispose of drained hydraulic oil properly. Failure to do so could result in damage to the environment.

14. Remove the attachment in accordance with the manufacturer's instructions.

15. Check the oil level in the hydraulic tank and top off as necessary.

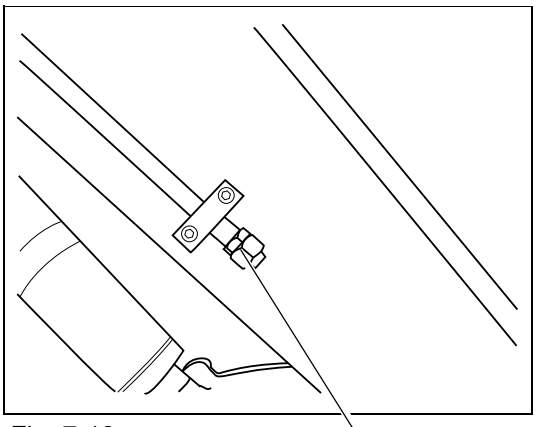

Fig. 7-13

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318 Cooper Circle

Peachtree City, Georgia 30269

Find a Dealer: sanyamerica.com/find-a-dealer

Sales E-mail: sales@sanyamerica.com

Service E-mail: service@sanyamerica.com

Service Hotline: 470 552 SANY (7269)

SANY Part Number SSY005081688