# Operation and Maintenance Manual


# SY265C LC/SY265C LR  Excavator

service@sanyamerica.com

SANY Part Number  SSY005080427

Page Intentionally Blank

SANY

# SY265C LC/SY265C LR Excavator

## Operation and Maintenance Manual


**WARNING!**

**Read and understand all safety precautions and instructions in this manual and on the machine labels before operating or maintaining it. Failure to follow safety messages could result in death or serious injury. Keep this manual with the machine for future reference.**

This manual is prepared by SANY Technical Publications,
deemed to be accurate, is based upon technical information provided.

This manual provides safety and basic information for operation and maintenance of the machine.

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.

SANY
318 Cooper Circle
Peachtree City, Georgia 30269
www.sanyamerica.com
Phone: 470 552 SANY (7269)
www.sanyamerica.com/find-a-dealer

**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 contain 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.**

# Table of Contents

## Introduction



## Safety

## Machine Controls

## Machine Operation

## Maintenance

## Specifications



## Optional Equipment

# This Page Intentionally Left Blank

SANY

# Introduction

# ABOUT THIS MANUAL

This manual provides operation and maintenance information for the SY265C LC/SY265C LR excavator.

**WARNING!**

**Unsafe operation and maintenance of this machine could result in death or serious injury. This machine must be operated and maintained by trained and experienced personnel. Do not operate or work on this machine without first reading and understanding this Operation and Maintenance Manual supplied with the machine.**

It is important to read and understand this manual before beginning any operation or service. All personnel involved with this machine should read this manual periodically to remain knowledgeable on its operation and service.

Items addressed in this manual are designed to help the operator or service personnel:

- Understand the controls and the operation of the machine.
- Point out possible hazardous situations when operating or maintaining the machine.
- Increase machine efficiency during operation.
- Prolong the service life of the machine.
- Reduce maintenance costs.

Continuing improvements in the design of this machine can lead to changes which may not be covered in this manual. Contact a SANY dealer for the latest available information on the machine or to answer any questions regarding information in this manual.

# 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 manual must be stored in the machine or be accessible to the operator at all times. If the machine is sold, a copy of this manual must be provided to the new owner.

A copy of the Operation and Maintenance Manual should be made available to maintenance personnel when servicing the machine.

## Parts Manual

The parts manual consists of parts lists and matching drawings used for ordering parts as needed. The parts manual must be made available to all service personnel.

## Maintenance Log

The Maintenance Log lists regularly scheduled maintenance that should be performed by the operator or service personnel. All maintenance performed on the machine must be recorded in the Maintenance Log.

# ORGANIZATION OF THIS MANUAL

## Introduction

Contains an overview of this manual, serial number information, and SANY contact information.

## Safety

Hazard alerts used throughout the manual are explained. General and product-specific safety information is provided for this manual.

## Machine Controls

An overview of controls and the operating systems is provided in this section.

## Machine Operation

Detailed prestart checks, operating procedures, end-of-day checks, general operating instructions, and storage information.

## Maintenance

Provides routine maintenance procedures and fluid specifications.

## Specifications

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

## Optional Equipment

Provides general hydraulic installation and removal information on the optional equipment.

# MACHINE APPLICATIONS

This excavator is a multipurpose construction machine used primarily for digging or loading earth and stones. It can also be used for lifting, breaking, demolishing, and trenching. It can perform the functions of a loader and a crane.

The excavator can also operate a variety of optional equipment.

SANY assumes no responsibility for any consequence caused by use outside this specified range.

## Machine Directions

In this manual, the front, back, left, and right directions indicate the moving direction when viewed from the operator seat (see Fig. 1-1).

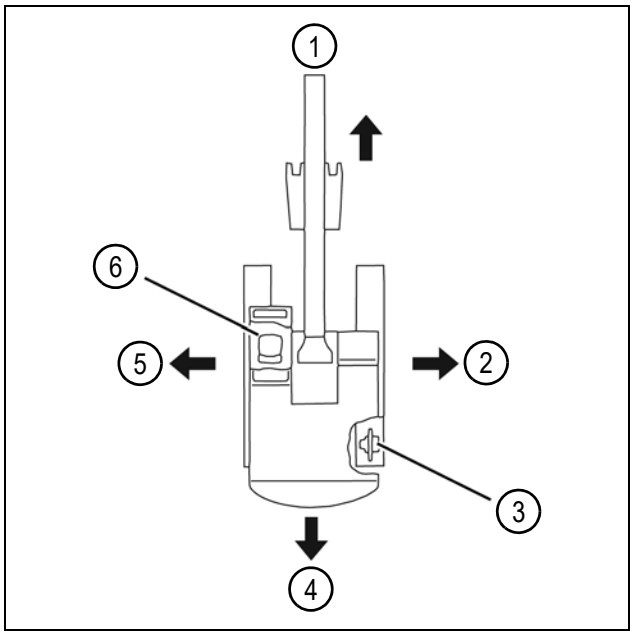



Fig. 1-1 0003137

1) Front
2) Right
3) Sprocket
4) Back
5) Left
6) Operator seat

# SERIAL NUMBER LOCATION

Identification plates are located in various places on the excavator. These list model and serial numbers that will be needed by a SANY dealer when ordering replacement parts or providing assistance for your machine.

## Machine Identification Plate

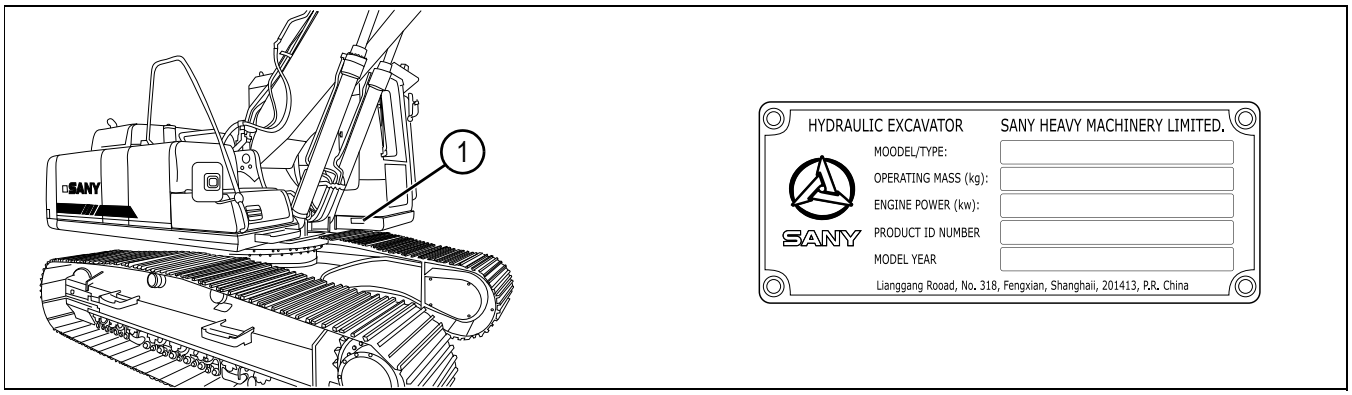



Fig. 1-2 0005197

The machine identification plate (1) is on the lower right side of the cab.

## Frame Serial Number

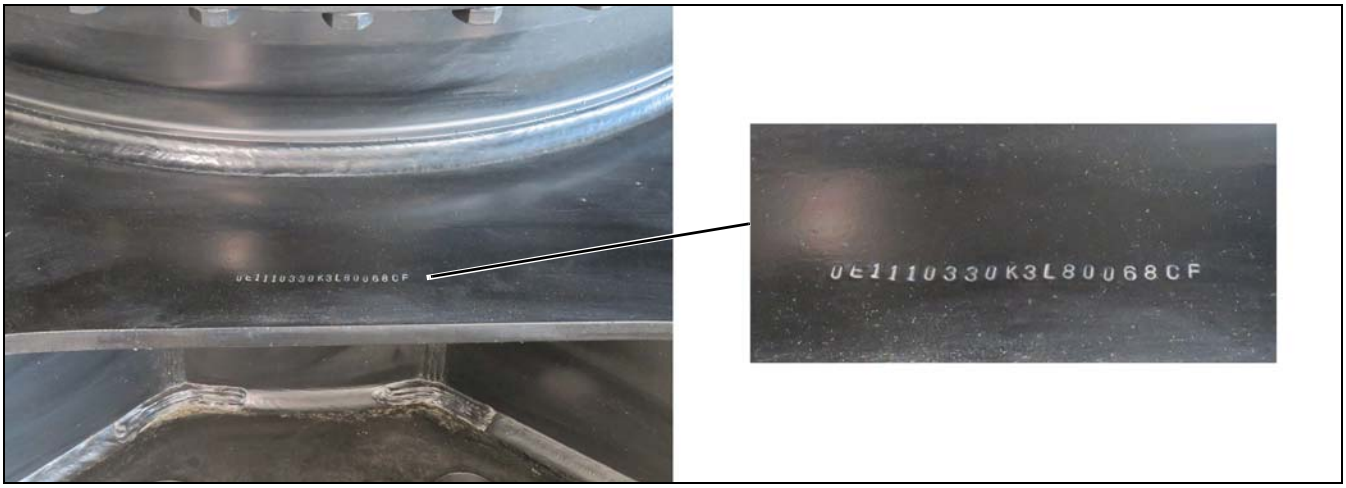



Fig. 1-3 0005198

The frame serial number is stamped on the front of the travel carriage frame.

## Swing Motor Identification Plates

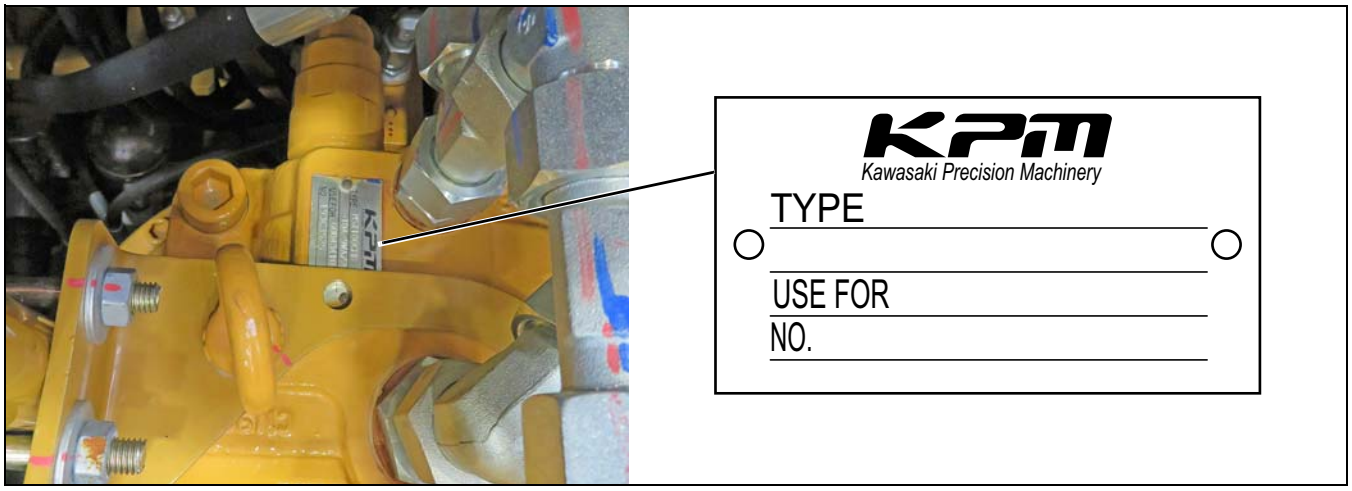



Fig. 1-4 0005199

The swing motor identification plate is on top of the swing motor.

## Engine Identification Plate

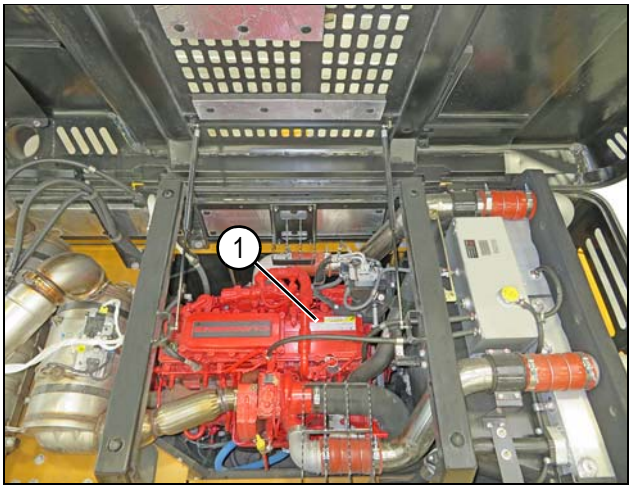



Fig. 1-5 0005185

The engine identification plate (1) is on the top of the engine.

## Hydraulic Pump Identification Plate

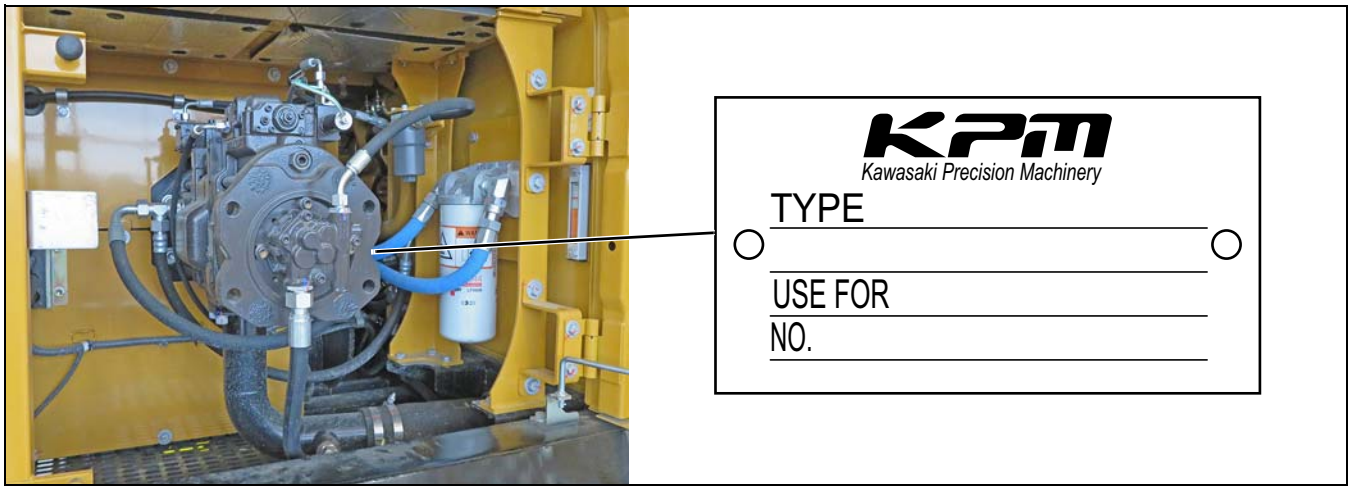



Fig. 1-6 0005200

The hydraulic pump identification plate is located on the side of the hydraulic pump.

## Travel Motor Identification Plate

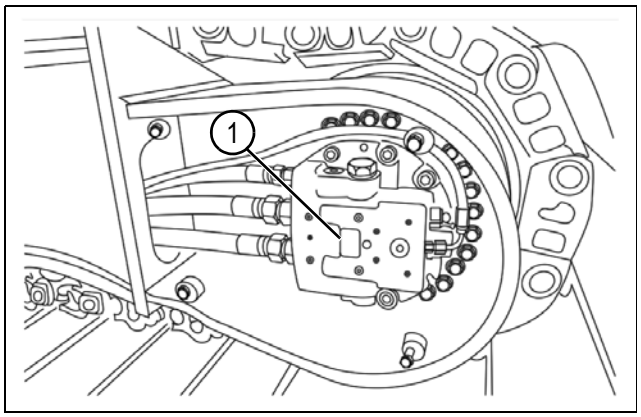



Fig. 1-7 0000802

A travel motor identification plate (1) is located on each travel motor. Remove the cover plate to access the travel motor.

# SANY CONTACT INFORMATION

SANY
318 Cooper Circle
Peachtree City, GA 30269
www.sanyamerica.com
Phone: 470-552-SANY (7269)
To find a dealer, go to: www.sanyamerica.com/find-a-dealer

# RECORD OF SERIAL NUMBER AND DEALER INFORMATION

| Use this table to record the product information related to this machine. | |
|---|---|
| Machine Serial Number | |
| Engine Serial Number | |
| Right Travel Motor Serial Number | |
| Left Travel Motor Serial Number | |
| Swing Motor Serial Number | |
| Hydraulic Pump Serial Number | |
| | |
| | |
| Dealer Name:<br><br>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 SANY.

| Correction Request Form | |
|---|---|
| Date of this Notification: | |
| Owner/Operator Name: | |
| Company Name: | |
| Department: | |
| Address: | |
| Phone: | |
| Email: | |
| MachiNe Model and Serial Number | |
| Description of Problem (wrong information, unclear or erroneous procedure, etc.) | |
| Corrective Action Taken (if any) | |

# GLOSSARY OF ACRONYMS

ANSI – American National Standards Institute

BHL – Backhoe Loader

CCTV – Closed-Circuit Television

DEF – Diesel Exhaust Fluid

DPF – Diesel Particulate Filter

DVR – Digital Video Recorder

EAT – Exhaust Aftertreatment

ECM – Engine Control Module

GPS – Global Positioning System

HEST – High Exhaust System Temperatures

HCU - Hydraulic Control Unit

ISO – International Organization for Standardization

KD – Kickdown

LCD – Liquid Crystal Display

LED – Light-emitting Diode

OEM – Original Equipment Manufacturer

OSHA – Occupational Safety and Health Administration

PPE – Personal Protective Equipment

PQR – Procedure Qualification Report

ROPS – Rollover Protective Structure

SAE – See SAE International

SCA – Supplemental Coolant Additive

SDS – Safety Data Sheet

VDC – Volts Direct Current

WPS – Weld Procedure Specification

**This Page Intentionally Left Blank**

SANY

# Safety

# GENERAL SAFETY

This section provides detailed information on basic safety precautions and preventive measures that should be followed during the operation and maintenance of 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 American National Standards Institute (ANSI) and International Organization for Standardization (ISO) signal words are used to warn of potentially hazardous situations that may lead to damage, personal injury, or even death. In this manual and on the machine decals, signal words or illustrations are used to express the potential level of hazard.

**DANGER!**

**DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.**

**WARNING!**

**WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.**

**CAUTION!**

**CAUTION indicates a hazardous situation which, if not avoided, could result in injury.**

**NOTICE!**

***NOTICE* is used to address practices not related to personal injury.**

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

## Machine Decals

All safety and warning decals must be in place, undamaged, and visible. Become 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 and understood prior to any operational or maintenance function.

Contact a SANY dealer for replacement decals if needed.

**NOTE:** When replacing decals, make sure they are placed in the proper locations. Contact a SANY dealer if you have any questions about their meaning and placement.

# OPERATOR SAFETY INFORMATION

It is impossible to compile a list of safety precautions that covers every situation. However, there are basic principles which must be followed when operating this machine:

- Only qualified personnel who have been specifically trained on this machine are permitted to operate and/or work on this machine.
- The seat belt must be worn by the operator at all times.
- Operator aids such as warning lights, horns, or buzzers, along with displays on the monitors, are designed to alert the operator to potential problems. 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. Any faults found shall be reported to a SANY dealer. Stop all work immediately if any operator aid is not working properly.
- All accident prevention guidelines, operating instructions, etc., are based on the intended usage of the machine.
- Read and understand this manual and any accompanying manuals before operating this machine.
- This manual must be readily available to the operator at all times and must remain in the cab while the machine is in use.
- Make sure all personnel in the working area around the machine are thoroughly familiar with the safe operating practices stated in this manual.
- Review the local, state, and federal regulations and standards regarding this machine and its operation. Work practice requirements may vary among government regulations, industry standards, and employer policies. A thorough knowledge of all such relevant work rules is required before operating this machine or performing maintenance on it.
- Check the Maintenance Log before the start of each workday shift. Make sure routine maintenance has been performed as stated in this manual. Do not operate a damaged or improperly maintained machine.
- Only the operator is to be on the machine while it is in operation.
- Be sure all underground utilities have been marked before excavating.

## Mount and Dismount the Machine

Mounting or dismounting the machine presents hazards.

Observe the following:

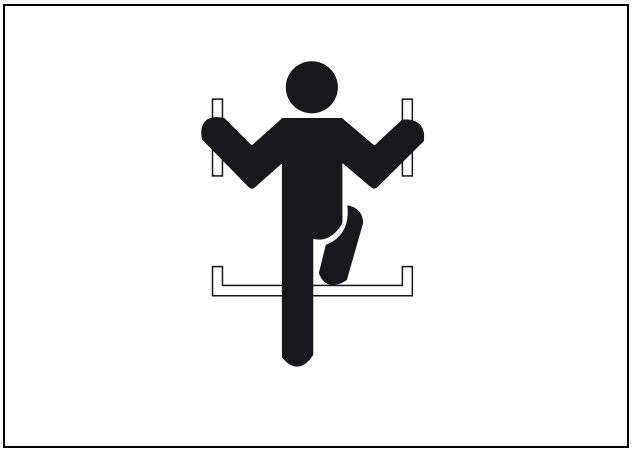


Fig. 2-1 0003054

- Always make sure the hydraulic lockout control lever is in the locked (closed) position before entering or exiting the machine.
- Always make sure the machine is at a full stop before entering or exiting the machine. Never jump on or off the machine.
- Never exit or enter the operator cab by any other location on the machine other than the provided grab handles and steps.
- Always face the machine as you mount and dismount.
- Always maintain three-point contact (both feet and one hand, or one foot and both hands) with the grab handles, steps, and deck for proper support.
- Wear safety shoes with slip-resistant soles.
- Do not walk on any surface of the machine if its slip-resistant material is missing or excessively worn. Do not step on surfaces of the machine that are not approved for walking or 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 similar debris. If these areas are damaged, have them repaired or replaced immediately.

# MACHINE SAFETY

## Authorized Use of This Machine

This excavator is a multipurpose construction machine used primarily for digging or loading earth and stones. It can also be used for lifting, breaking, demolishing, and trenching. It can perform the functions of a loader and a crane. SANY assumes no responsibility for any consequence caused by use outside this specified range.

## Unauthorized Use of This Machine

Unauthorized uses include, but are not limited to, the following:

- Transporting people on the machine or in the cab.
- Towing or pushing other equipment.

## Unauthorized Machine Modifications

Do not perform any unauthorized machine modifications.

Do not add weight (attachments, etc.) to the machine. Do not exceed the gross weight.

## Escape Tool

**NOTE:** Inspect the escape tool periodically. Replace the escape tool if it appears damaged or unable to break the cab window for an emergency exit.

As a precaution, always keep an escape tool in the cab.

## Fire Safety

Fuel, oil, and some engine coolants are flammable. 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.
- Add oil, fuel, or engine coolant in a well-ventilated area.
- Clean up any spilled fluids immediately.
- Check the machine daily for debris buildup.

## Electrical Fires

Short circuits, damaged wiring, or overcharged batteries can cause fires. Observe the following:

- Check the wiring on the machine for damage when doing a prestart check. Contact a SANY dealer to repair or replace any damaged wiring.
- Make sure the battery is operating in its recommended range.
- Never install aftermarket electrical equipment without approval from a SANY dealer.

## Fire Extinguisher

Always keep a fire extinguisher on the machine. Read the instructions on the fire extinguisher carefully, and know how to use it in an emergency.

Inspect the condition of the fire extinguisher daily. If damaged, replace the fire extinguisher immediately.

Make sure the fire extinguisher is within the listed inspection period. Replace the fire extinguisher immediately if it has reached its expiration date.

The fire extinguisher must be at least a 2.5 lb. Class ABC rated fire extinguisher (National Fire Protection Association [NFPA] 10 Standard for Portable Fire Extinguishers).

## In Case of Fire

If a fire occurs on the machine:

1. Immediately press the emergency stop to shut down the machine. Never continue operating the machine.
2. Get clear of the machine and immediately call for help. Always have a list of emergency phone numbers available.
3. Exit the area and remain clear of the machine until the fire response team gives permission to come near the machine.
4. If using a fire extinguisher, always aim the extinguisher nozzle at the base of the fire.

## Crushing Hazard

Keep your body inside the cab during operation or travel.

Keep all guards in place on the machine.

Never remove the side windows of the machine. If a window becomes damaged or broken, replace it immediately.

Block off the area where the machine is being operated and keep all unnecessary personnel out of the work area.

# MAINTENANCE SAFETY

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

Make sure all procedures and actions can be safely performed without damaging the machine or causing injury. When unsure about the safety of a procedure, contact a SANY dealer.

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

Wear and use the proper personal protective equipment (PPE), including (but not limited to) safety shoes, a hard hat, gloves, and goggles.

When carrying out any operation with two or more workers, always agree on the operating procedure before starting.

Park the machine on a hard, level surface, lower the work equipment, shut down the engine, and block the tracks to prevent the machine from moving before performing any maintenance or repairs.

Always perform the lockout/tagout procedure before servicing the machine.

Always inform fellow workers before starting any step of the operation.

Before disconnecting or removing components of the hydraulic system, relieve system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.

The engine coolant and oil in the machine may be hot even after the engine is stopped. Wait for the engine cooling and oil systems to cool before working on them.

When checking the machine with the engine running (e.g., measuring oil pressure, rpm, or temperature), take extreme care to avoid rotating or moving parts.

**NOTE:** The electrical circuit remains active to a few components even when the battery disconnect is in the OFF position.

Turn the battery disconnect switch to OFF unless electrical power is needed for the procedure.

When removing hoses or lines, close all openings using caps and plugs. If any fuel or oil leaks, clean it up immediately.

When installing high-pressure hoses, make sure they are not twisted. Damaged hoses are dangerous and should be replaced. Take extreme caution when installing hoses for high-pressure circuits. Make sure fittings are correctly installed and tightened.

When assembling or installing parts, always tighten them to the specified torque. When installing protective parts (such as guards), or parts that vibrate or rotate at high speed, make sure they are installed correctly.

## Lockout/Tagout Procedure

Always perform the lockout/tagout procedure before servicing the machine.

## Cleaning the Machine

Always use hot water and mild, nonflammable, grease-cutting soaps or cleaning agents to clean the machine.

Never use flammable or caustic cleaning agents.

Never use high-pressure steam cleaners to clean the machine.

Always lubricate the machine thoroughly after cleaning to remove any water or soap residue.

Keep the cab, windows, mirrors, and lights clean.

## Fluid Systems

### Adding Fluids to the Machine

When adding fluids to the machine, be aware that fluid systems may be under pressure and hot.

### Refueling

When adding fuel, shut down the machine before removing the fuel tank cap.

Fuel spills present 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.

Do not top off the fuel tank.

### High-Pressure Fluid Lines

**WARNING!**

- **Never perform inspections or replace items while any system is under pressure.**
- **Never use your hands to check or feel for leaks. Always wear personal protective equipment (PPE), and use a piece of wood or cardboard to check for leaks.**
- **If high-pressure fluids penetrate skin, seek medical attention immediately.**

**Failure to follow these warnings can result in death or serious injury.**

Check for cracks in the lines or hoses, and for swelling in the hoses.

**NOTE:** If there is any leakage from a line or hose, the surrounding area may be wet or have an accumulation of dust and dirt at the site of a leak.

Replace lines and hoses immediately if leaks, swelling, or cracking are found or if failure occurs.

### Accumulator

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

Never expose the accumulator to temperatures over 140ºF (60ºC) or to open flames.

Never weld on the accumulator.

Never strike the accumulator.

If the accumulator needs service, contact a SANY dealer.

## Electrical System

Always clean the electrical system using industry-approved electrical cleaners.

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

### Battery Safety

When working with batteries, always work in a well-ventilated area. Batteries present a hazard, especially when they have been in use for a long time. Here are some basic precautions for working around batteries:

- Always wear personal protective equipment (PPE).
- Battery gases are extremely explosive. Smoking, sparks, or open flames could cause an explosion. When opening a battery compartment, always allow ample time for battery gases to escape.
- If the battery is corroded, clean it with a mixture of warm water and baking soda.
- If battery acid gets on skin or in eyes, flush the area immediately with fresh water and seek medical attention.

Check the battery's condition only with proper test equipment.

### Disconnect the Battery

When disconnecting the battery, always disconnect the negative (-) cable first. Then disconnect the positive (+) cable.

**NOTE:** Disconnecting the cables between the batteries may not completely interrupt the electrical system.

# JOB SAFETY

It is the owner's/operator's responsibility to replace any safety decals that are damaged or missing from the machine.

Never leave the machine running while it is unattended. Always park the machine in a safe, level area, lower any work equipment to the ground, move the hydraulic lockout control lever to the locked (closed) position, and shut down the engine before exiting. Secure the machine to prevent tampering by unauthorized personnel.

Before starting any work operations, travel, or maintenance procedures, make sure all personnel are a safe distance from all points of the machine. Never allow anyone to stand near the machine while it is in operation or under maintenance or repair.

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, sound the horn and proceed slowly.

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

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

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

If the machine is equipped with operator aids, the Occupational Safety and Health Administration (OSHA) requires this equipment to be used when operating the machine.

## Personal Protective Equipment (PPE)

Before using personal protective equipment (PPE), make sure it is in good working condition.

## Hearing Protection

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protection to protect against loud noise.

## Travel and Operation Precautions

Confirm the relative positions of the undercarriage and operator before operating the machine.

Traveling with the machine may present hazards. When traveling, always move in a safe, controlled manner and remain alert at all times. Be sure the areas around the machine are clearly visible.

When traveling over rough ground, move at a low speed and steer carefully. Whenever possible, avoid traveling over obstacles or raised areas. Traveling over obstacles or raised areas could result in loss of control or damage to the machine. When traveling over raised areas, always travel at a low speed.

During travel, always maintain a safe distance from people and surrounding objects. Always check to make sure

areas such as bridges and roadways will support the weight of the machine before attempting to cross.

Before traveling in public areas, always gain approval from the local authorities and follow their instructions.

Raise work equipment 8 in.–12 in. (20 cm–30 cm) above the ground when traveling.

When traveling or operating in shallow water, be aware of its depth and current. Check the firmness of the ground under the water.

### Inclined Areas

Traveling on an incline can be dangerous. To prevent tipping, loss of control, or a rollover, it is important to follow these rules:

- Always check the firmness of the inclined surface before attempting to travel on it.
- Always travel straight up or straight down an incline.
- Avoid turning on an incline.
- Avoid sudden stops.

### Snow or Frozen Surfaces

Be careful when traveling or operating the machine on frozen or snow-covered surfaces. The ability to maneuver the machine is seriously affected. The machine may not respond as expected when turning.

Other precautions:

- Avoid any rapid movement, acceleration, or quick stopping. Always be aware of the increased stopping distance required on these surfaces.
- Avoid deep snow or frozen bodies of water.
- Even a slight incline may cause the machine to slip. Be extra careful when working on an inclined surface covered with snow or ice.
- When traveling or moving the machine on a snow-covered incline, allow the machine to come to a stop slowly.

## Avoid Backup Accidents

Keep the windows, mirrors, and lights clean and in good condition.

Before moving the machine, make sure all bystanders are clear of the intended path.

Before moving the machine, warn others with the horn.

Use a signalman if the view is obstructed when backing up. Keep the signalman in view at all times.

## Dust and Chemical Hazards

Hazardous dust or chemicals present a serious danger when they are released or mishandled. All workers involved should use approved personal protective equipment (PPE) and follow all environmental safety regulations.

Consult the Safety Data Sheet (SDS) for guidelines on personal protective equipment (PPE), proper handling and cleanup, and correct reporting agencies if needed.

## Environmental Precautions

Oil and coolants poured onto the ground, into 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 oil, coolants, and filters helps conserve natural resources and is good for the environment.

Obey all regulations when disposing of harmful items such as oil, fuel, filters, batteries, hydraulic oil, and used parts.

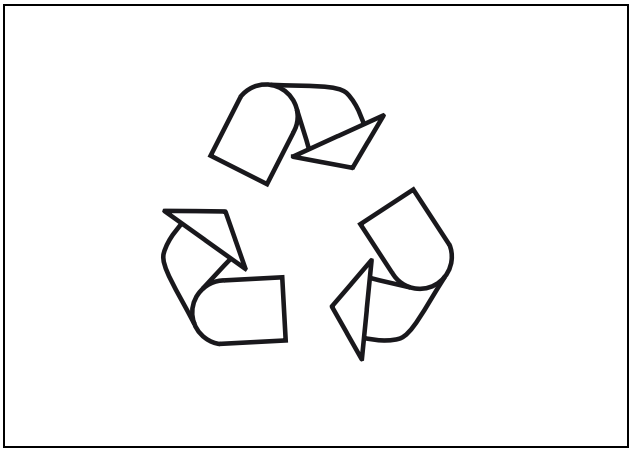


Fig. 2-8 0003055

## Precautions in High-Voltage Areas

**WARNING!**

**Overhead power lines carry high-voltage electricity that can discharge to the ground through the machine, even without direct contact with the machine's structure. Avoid direct contact with high-voltage power lines while operating. High-voltage contact could result in equipment damage, death, or serious injury.**

Stay clear of overhead power lines. They are an electrical hazard. Treat all overhead power lines as being energized and not insulated.

Be sure all underground utilities have been marked before excavating.

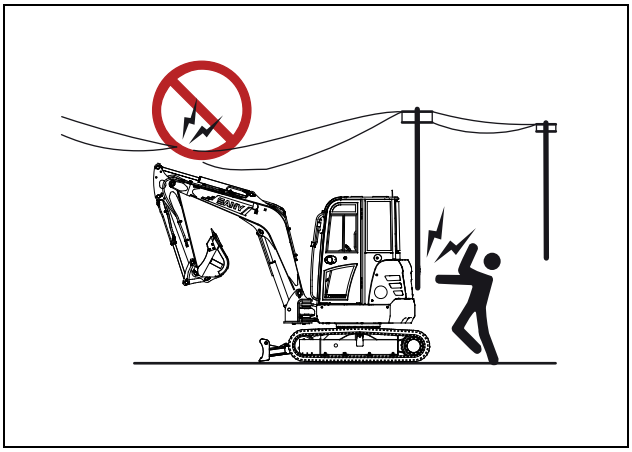


Fig. 2-9 0003056

## Diesel Engine Exhaust

**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**

**Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, use an exhaust pipe extension to vent the exhaust to the outdoors. If an exhaust pipe extension is not available, open doors and use fans to supply fresh air into the area.**

SANY

# Machine Controls

# MACHINE OVERVIEW

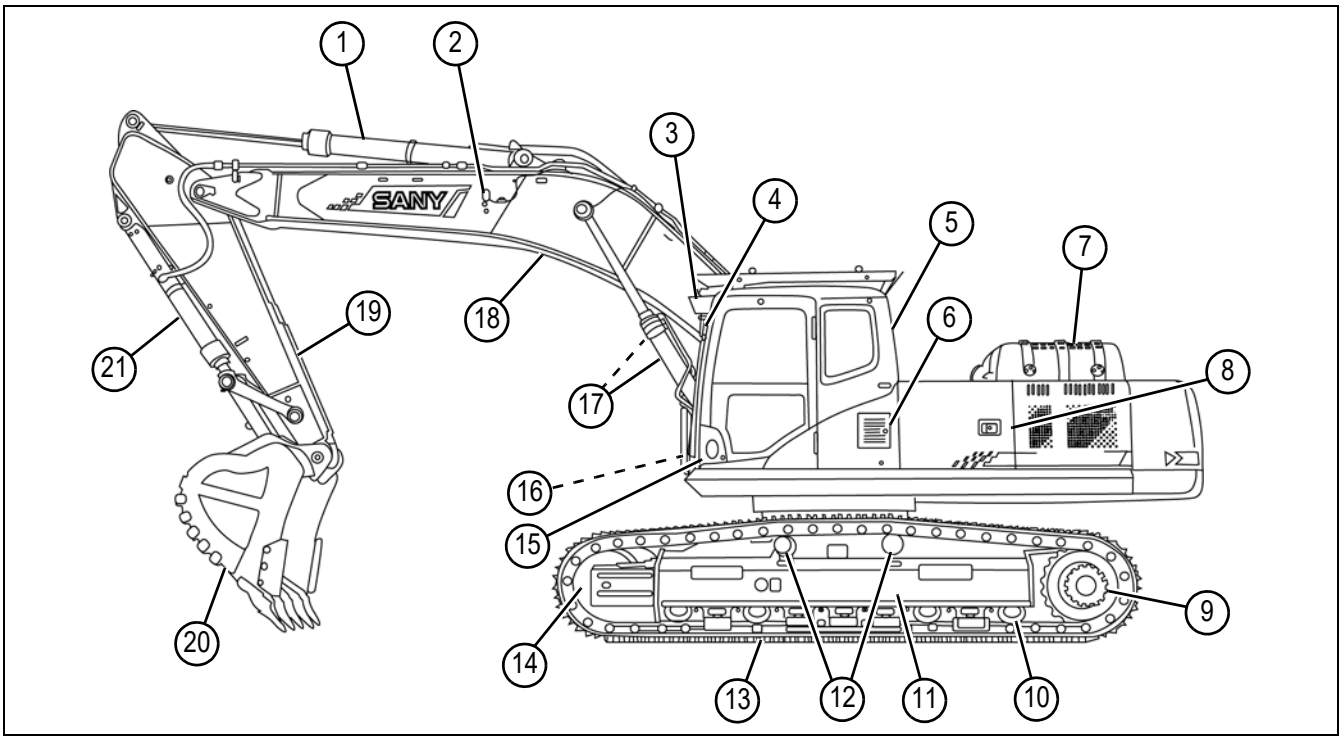



Fig. 3-1

0004071

1 Arm cylinder
2 Boom-mounted work light
3 Cab-mounted headlights
4 Mirror
5 Cab
6 Fresh-air filter access door
7 Engine cover
8 Electrical/air cleaner compartment access door
9 Final drive
10 Track roller
11 Track frame
12 Carrier rollers
13 Track
14 Idler
15 Door
16 Work light
17 Boom cylinders
18 Boom
19 Arm
20 Bucket
21 Bucket cylinder

# CONTROLS

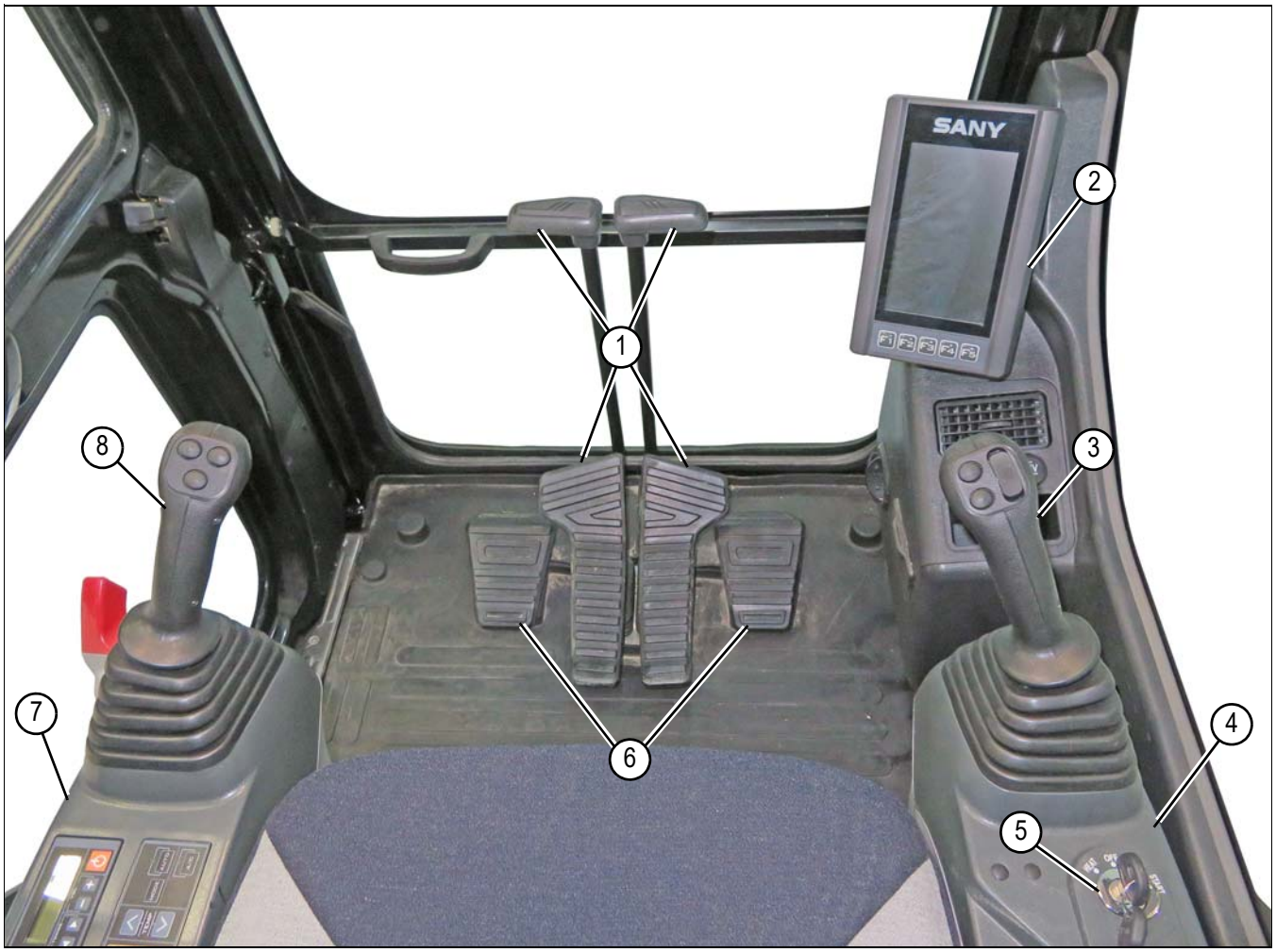



Fig. 3-2 0005255

1 Travel control levers/pedals (page 3-22)
2 Monitor (page 3-34)
3 Right joystick (page 3-8)
4 Right control console (page 3-8)
5 Key switch (page 3-14)
6 Footrests
7 Left control console (page 3-6)
8 Left joystick (page 3-7)

## Hydraulic Lockout Control Lever

**WARNING!**

- **Always place the hydraulic lockout control lever in the locked (closed) position before leaving the cab. When this lever is not in the locked (closed) position, any unintended movement of the joysticks or travel control levers may cause death or injury.**

- **Avoid moving the joysticks or travel control levers when moving 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 in the locked (closed) position, shut down the engine immediately. Failure to follow this notice could damage the machine or cause improper operation.**

The hydraulic lockout control lever (1) disables or enables the hydraulic function for work equipment, swing and travel control, and optional equipment.

Move the hydraulic lockout control lever to the locked (closed) position (2). The machine will not move, even if the controls are moved.

Use the hydraulic lockout control lever when parking the machine, leaving the cab, or performing routine service procedures and inspections, to prevent accidental movement of the machine.

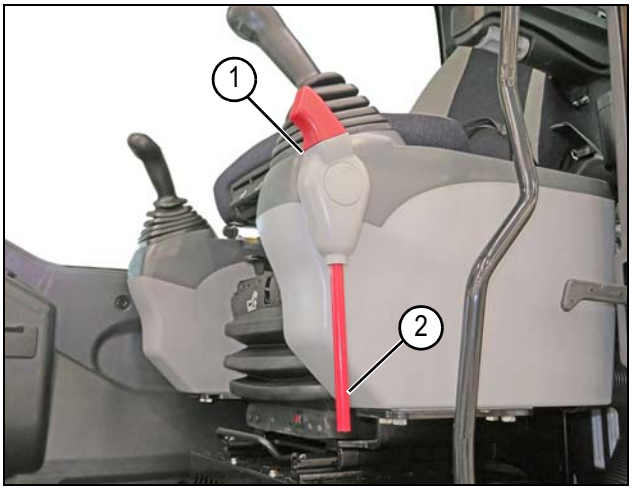



Fig. 3-3 0005234

Move the hydraulic lockout control lever to the unlocked (open) position (3) to enable the hydraulic system. The machine will now respond to the commands sent by the joysticks and other controls.

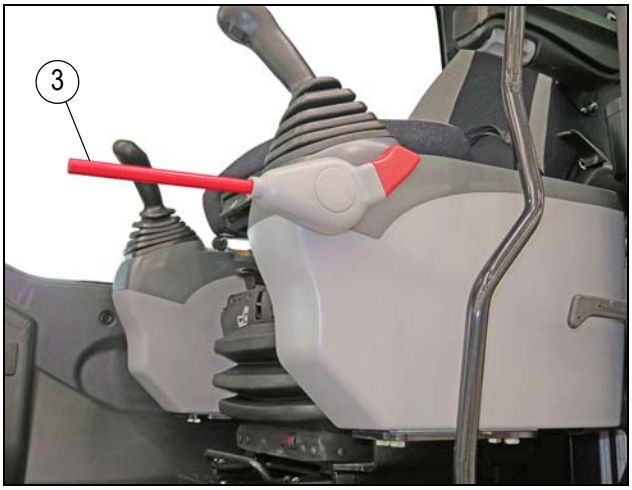



Fig. 3-4 0005235

## Left Control Console

The left control console contains the following:

- Left joystick (1).
  See “Travel Controls” on page 3-22.
- Left joystick buttons (2).
  See “Left Joystick Buttons” on page 3-7.
- Hydraulic lockout control lever (3). See “Hydraulic Lockout Control Lever” on page 3-5.


Fig. 3-5 0005230

- Radio control panel (4). See “Radio” on page 3-24.
- Climate control panel (5). See “Climate Control Panel” on page 3-29.


Fig. 3-6 0005258

## Left Joystick

### Left Joystick Buttons

**WARNING!**

**To prevent unexpected movement of the machine, know the positions and functions of the joysticks before operation. Failure to follow this warning could result in death or serious injury.**

**NOTE:**

- Joystick buttons on the machine may be configured differently from the following description. Review the decals inside the cab to determine the joystick button functions.
- Read and understand the optional equipment manual for information specific to the work equipment selected.

The left joystick contains 3 buttons:


Fig. 3-7 0005230

- Use the left button (1) and right button (2) to control optional equipment that rotates. See “Equipment Controls” on page 7-4 for additional information.
- Press the horn button (3) to sound the horn.

## Right Control Console

The right control console contains the following:

- Right joystick. See “Right Joystick” on page 3-8.
- Machine switches. See “Switches” on page 3-14.
- Key switch. See “Key Switch” on page 3-14.
- Throttle control dial. See “Throttle Control Dial” on page 3-15.

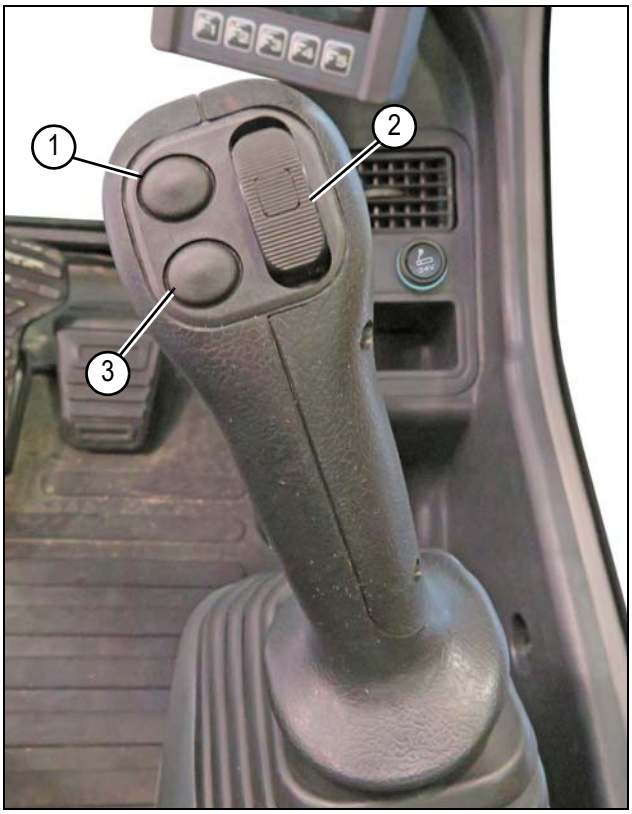


Fig. 3-8 0005350

### Right Joystick

#### Right Joystick Buttons and Switch

**WARNING!**

**Prevent unexpected movement of the machine. Know the positions and functions of the joysticks before operation. Failure to follow this warning could result in death or serious injury.**

**NOTE:** Machines may differ from the one shown below. Review the decals inside the cab to determine the joystick buttons and switch functions.

The right joystick contains two buttons and a switch:

- The top left button (1) is used for power boost. The power boost button provides temporary extra hydraulic pressure.
- The toggle switch (2) is used to operate optional equipment with one-way or two-way hydraulic flow.
- The bottom left button (3) is not used.

# JOYSTICK MODES

**WARNING!**

**Prevent unexpected movement of the machine. Know the positions and functions of the joysticks before operation. Failure to follow this warning could result in death or serious injury.**

There are two operating modes available for the joysticks:

- Society of Automotive Engineers (SAE) mode. See “SAE Mode” on page 3-10.
- Backhoe loader (BHL) mode. See “BHL Mode” on page 3-11.
- The swing and bucket functions are the same for the SAE and BHL modes.

The joystick operating modes are set with the pattern change valve. See “Pattern Change (SAE/BHL) Valve” on page 3-12.

## SAE Mode

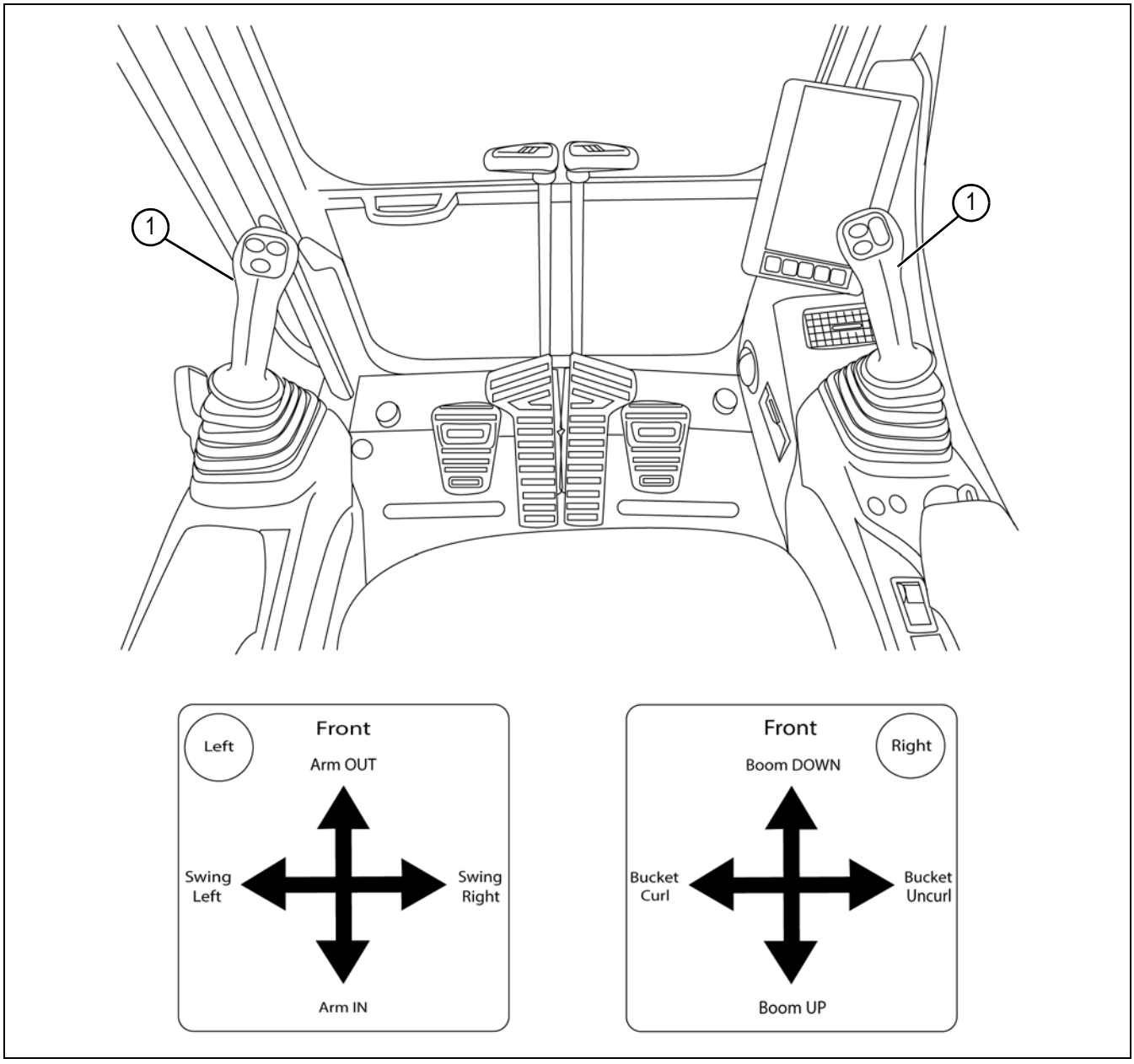



Fig. 3-9

0000140

**NOTE:** When a joystick (1) is released, it returns to the neutral position and the machine movement stops.

## BHL Mode

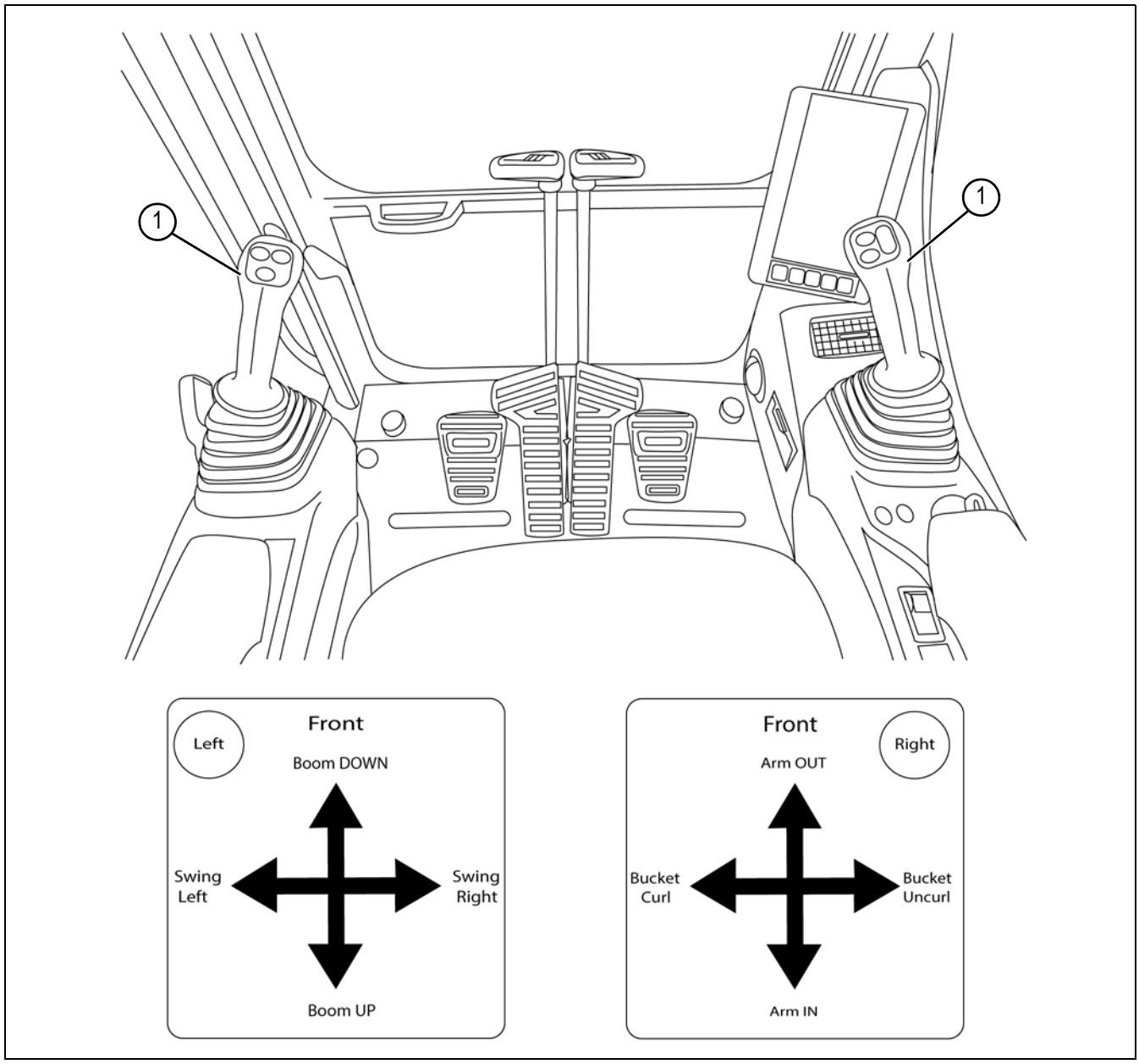



Fig. 3-10

0000141

**NOTE:** When a joystick (1) is released, it returns to the neutral position and the machine movement stops.

## Pattern Change (SAE/BHL) Valve

**NOTICE!**

**Shut the engine down before adjusting the pattern change (SAE/BHL) valve. Failure to do so can damage the machine, personal property, or cause the machine to operate improperly.**

The pattern change SAE (Society of Automotive Engineers)/BHL (Backhoe Loader) valve (1) is behind the left front access door. See “Opening the Left Access Doors” on page 4-10.

The pattern change valve changes control of the boom and arm from one joystick to the other.


Fig. 3-11 0005246

To change the operating mode, pull up on the pin (3) and rotate the bar (6) 90°. Release the pin into the hole (2) to lock the bar in place:

- In SAE mode (position 1) (5), the arm is controlled using the left joystick, and the boom is controlled using the right joystick.

  **NOTE:** See “SAE Mode” on page 3-10 for additional information.

- In BHL mode (position 2) (4), the arm is controlled using the right joystick, and the boom is controlled using the left joystick.

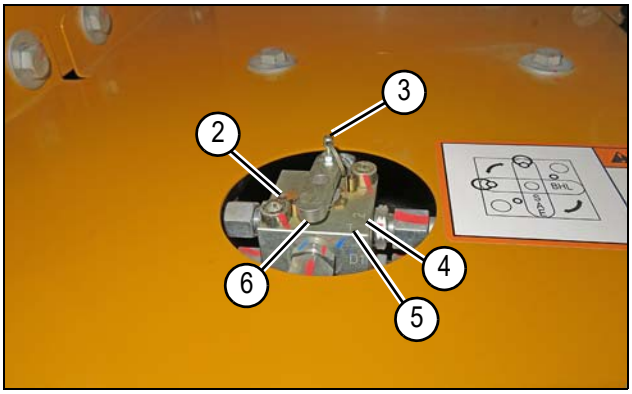



Fig. 3-12 0005248

**NOTE:** See “BHL Mode” on page 3-11 for additional information.

## Return Flow Selector Valve

The return flow selector valve (1) has a one-way (2) or two-way (3) position for operating optional equipment. It is on the side of the fuel tank.

A variety of optional one-way and two-way flow equipment is available for use on this machine. A hydraulic breaker is an example of one-way flow equipment. A tilt bucket is an example of two-way flow equipment.

**NOTE:** Check the work tool operator manual for hydraulic flow rate information.

| One-Way Hydraulic Attachment | Two-Way Hydraulic Attachment |
|---|---|
| Lever position shown for shear attachment use. | Lever position shown for breaker attachment use. |

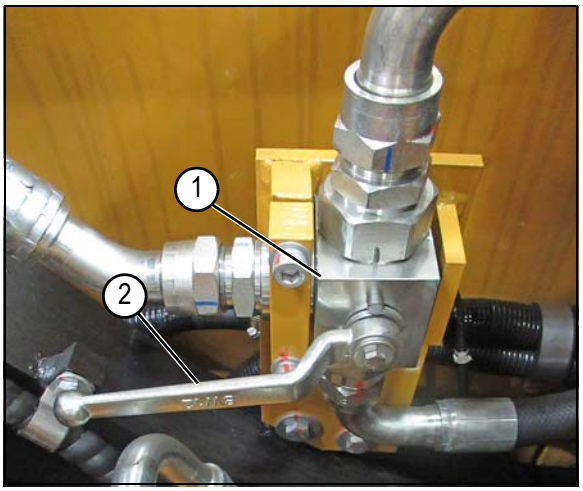



Fig. 3-13 0005328

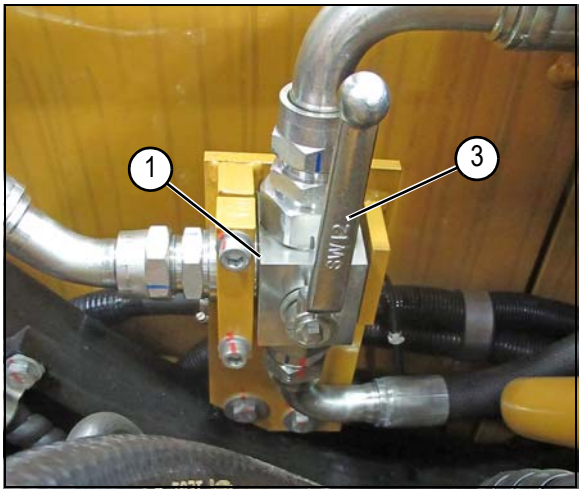



Fig. 3-14 0005329

# SWITCHES

The following are on the right control console:

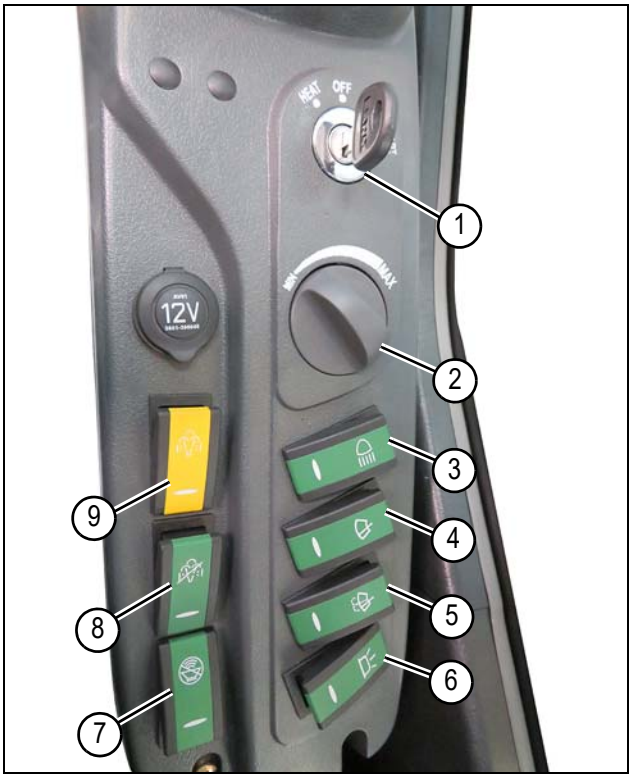



Fig. 3-15 0005311

- Key switch (1). See “Key Switch” on page 3-14.
- Throttle control dial (2). See “Throttle Control Dial” on page 3-15.
- Work light switch (3). See “Work Light Switch” on page 3-15.
- Windshield wiper switch (4). See “Windshield Wiper Switch” on page 3-16.
- Windshield washer switch (5). See “Windshield Washer Switch” on page 3-17.
- Beacon light switch (6). See “Beacon Light Switch” on page 3-17.
- Travel alarm silence switch (7). The travel alarm silence switch will silence the travel alarm until travel is stopped. This switch does not cancel or reset any machine alarm. See “Travel Alarm Silence Switch” on page 3-17.
- Regeneration inhibit switch (8). See “Regeneration Inhibit Switch” on page 3-18.
- Stationary regeneration switch (9). See “Stationary Regeneration Switch” on page 3-19.

## Key Switch

**NOTICE!**

**Except for an emergency, never shut down the engine while it is running at high idle. Stopping the engine at high idle can damage the machine or cause it to run improperly.**

The key switch is used for the following functions:

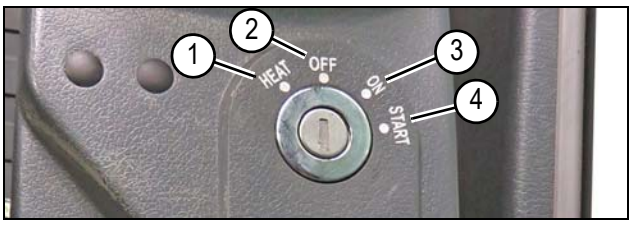



Fig. 3-16 0005356

- HEAT (1) — Hold the key to HEAT to preheat the engine for cold weather starting as required. The key returns to OFF when released.
- OFF (2) — The OFF position allows the operator to insert and remove the key. The engine is shut down, and there is no power to any of the electrical system switches (except for work lights).

- ON (3) — The ON position allows the engine to remain running (if already started) and also allows electrical current to all of the electrical system switches.

- START (4) — Hold the key to START to start the engine, then immediately release it after the engine has started. The key returns to ON when released.

## Throttle Control Dial

Use the throttle control dial (1) to adjust engine speed and output power. Turn the dial clockwise to increase engine speed, and counterclockwise to decrease engine speed.

- MIN (low idle): Turn the throttle control dial fully counterclockwise.

- MAX (high idle): Turn the throttle control dial fully clockwise.


Fig. 3-17 0005312

## Work Light Switch

Use the work light switch (1) to turn the work lights on and off.


Fig. 3-18 0005313

There are three work lights:

- Two work lights (2) are on the boom. The left side is shown. The right side is similar.

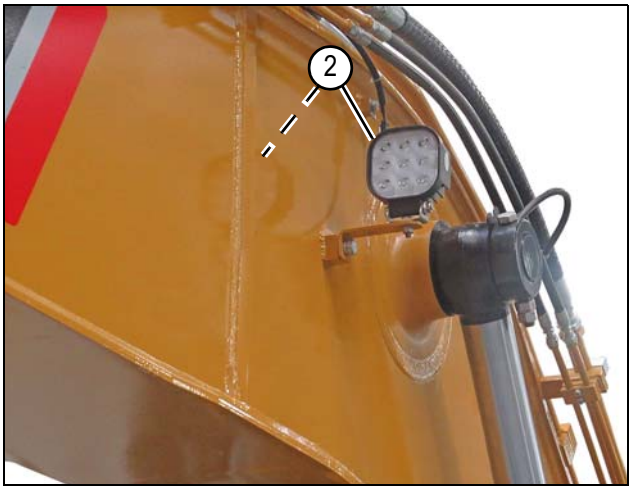



Fig. 3-19 0005260

- One work light is on the frame (3).


Fig. 3-20 0004679

## Windshield Wiper Switch

**NOTICE!**

**Use the windshield washer before using the windshield wiper on a dry windshield. Failure to follow this notice could damage the windshield.**

The windshield wiper switch (1) activates the windshield wiper.


Fig. 3-21 0005313

## Windshield Washer Switch

Press the windshield washer switch (1) to spray windshield washer fluid on the windshield. Hold down the switch to continue spraying. When the switch is released, the flow of windshield washer fluid stops and the wiper returns to the off position.

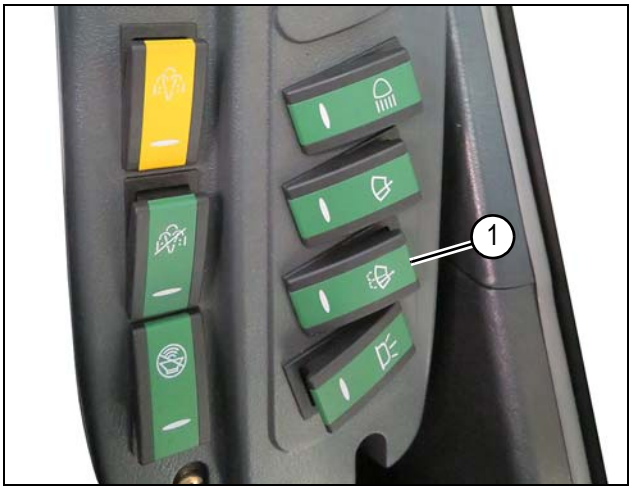



Fig. 3-22 0005313

## Beacon Light Switch

Use the beacon switch (1) to turn the cab-mounted beacon on and off.


Fig. 3-23 0005313

## Travel Alarm Silence Switch

The travel alarm silence switch (1) silences the travel alarm. This switch does not cancel or reset any machine alarm.


Fig. 3-24 0005313

## Regeneration Inhibit Switch

**NOTICE!**

**Operating the machine with the regeneration inhibit switch turned on for an extended period of time will cause the soot level to increase and can damage the exhaust aftertreatment system.**

Use the regeneration inhibit switch (1) to deactivate automatic regeneration. The exhaust system regeneration inhibited icon (2) on the monitor will illuminate when regeneration is being inhibited. See “Home Screen Notification Icons” on page 3-36.

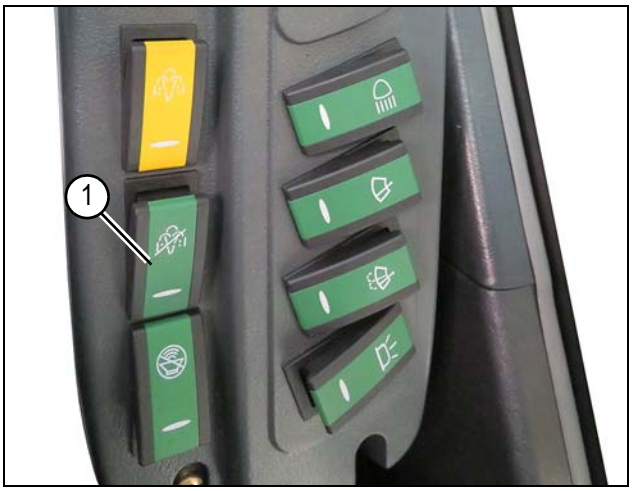



Fig. 3-25 0005313

Use the regeneration inhibit switch when the machine is operating in an environment not suitable for regeneration, such as in confined areas, near flammable materials, or other areas that could create a safety hazard.

The operator should turn off the regeneration inhibit switch as soon as possible to avoid soot buildup. If the operator inhibits automatic regeneration for an extended period of time, the DPF system will become clogged, causing the machine to operate in a derated power mode where engine rpm and power will be reduced and the machine will require a stationary regeneration.

**NOTE:** When the regeneration inhibit switch is off, the exhaust system regeneration inhibited icon (2) is off. The engine will perform a regeneration automatically when needed.


Fig. 3-26 0004607

## Stationary Regeneration Switch

The stationary regeneration switch (1) enables the diesel particulate filter (DPF) regeneration system.

**NOTICE!**

**If the red stop engine icon illuminates, shut down the engine as soon as it is safe to do so and contact a SANY dealer for additional information. Failure to follow this notice could damage the machine or cause it to operate improperly.**

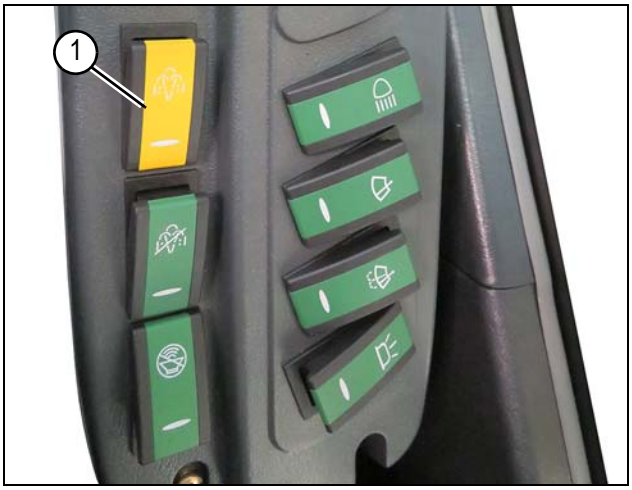



Fig. 3-27 0005313

Stationary regeneration is required if the yellow diesel particulate filter icon (3) on the monitor home screen is on or flashing, or if the yellow check engine icon (4) on the monitor home screen is on, which indicates an increasing level of soot buildup in the exhaust system. The red stop engine icon (5) will illuminate when the engine should be shut down immediately. Soot buildup occurs after continued operation with the regeneration inhibit switch set to the on position, and the regeneration inhibit icon (2) will illuminate.

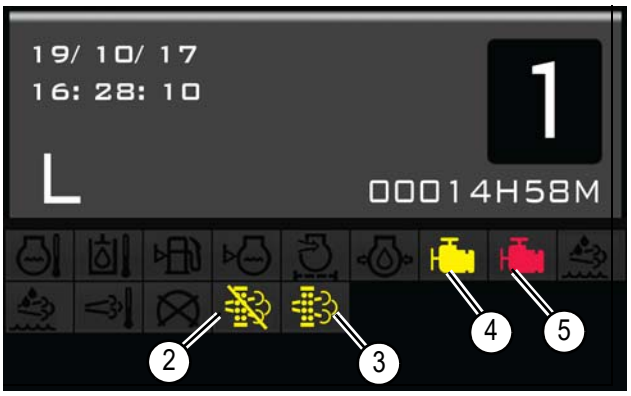



Fig. 3-28 0004592

## Emergency Stop Switch

The emergency stop switch (1) is at the left side of the base of the seat.

The emergency stop toggle switch is normally in the start position with the red cover down.

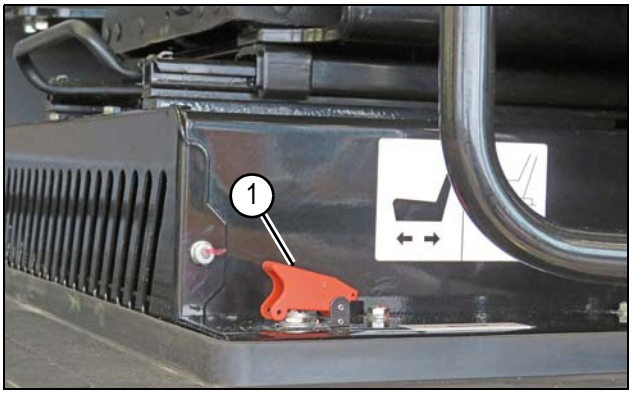



Fig. 3-29 0005256

In case of an emergency, raise the red cover (2) and move the emergency stop toggle switch (3) backward to shut down the engine and turn off power to the engine control module (ECM).

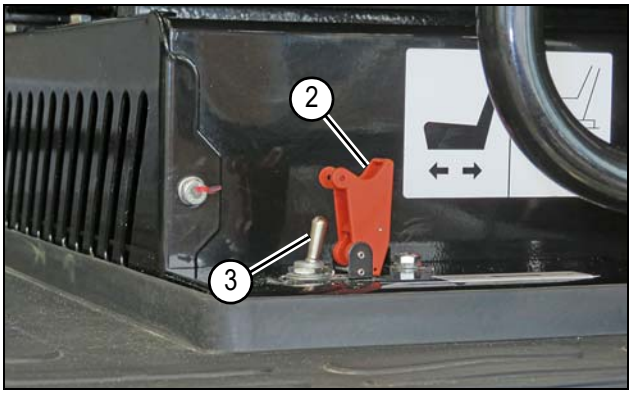



Fig. 3-30 0005257

## Battery Disconnect Switch

**NOTICE!**

- **Never turn the battery disconnect switch to OFF while the engine is running.**
- **After machine shutdown, wait at least 2 minutes for the engine control module (ECM) to complete its shutdown before turning the battery disconnect switch to OFF.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

The machine is equipped with a battery disconnect switch (1). When the switch is moved to the OFF position, electrical power is disconnected from all machine systems. Turn the power off when securing the machine for the day, or as needed for maintenance tasks.

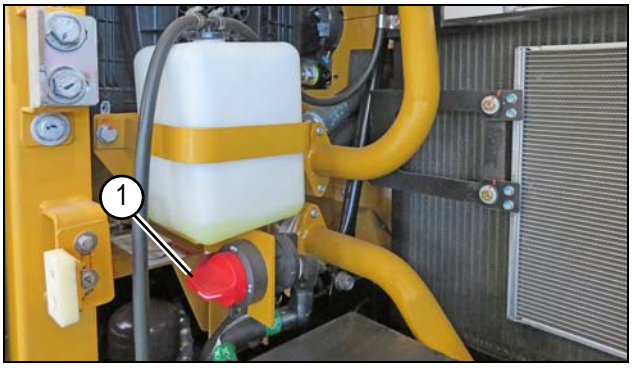



Fig. 3-31 0005348

To disconnect the battery power from the machine:

1. Move the key switch to OFF and wait 2 minutes for the ECM to complete its shutdown.
2. Open the left rear access door. See “Opening the Left Access Doors” on page 4-10.
3. Turn the battery disconnect switch to the OFF position.
4. Close the left rear access door.

## Auxiliary Outlet (12V)

Use the auxiliary outlet (12V) socket (1), next to the throttle control dial, to power or charge 12V electronic devices.


Fig. 3-32 0005312

## Cigarette Lighter (24V)

Press the cigarette lighter (1) in to activate the lighter. The lighter will pop out when ready to be used.

With the lighter removed, the power outlet (24V) can be used to charge or operate 24V electronic devices.


Fig. 3-33 0005349

# TRAVEL CONTROLS

**WARNING!**

- **Take extra care when using the travel control pedals to steer the machine.**
- **Never place your feet on the travel control pedals unless you are driving or steering the machine, which could cause unexpected movement.**

**Failure to follow these warnings could result in death or serious injury.**

**NOTE:** Check the direction of the track frame (directional arrow) before operating the travel control levers/pedals. The track frame is facing forward when the drive sprocket is to the rear of the operator. All travel controls are reversed when the machine is facing rearward (drive sprocket is forward of operator). See “Directional Arrow” on page 3-22.

The travel control levers (3) or pedals (4) are used to change the machine’s traveling direction:

- Forward travel: Push the control levers (3) or pedals (4) forward (1).
- Backward travel: Pull the control levers or pedals backward (2).
- Neutral position (N): When the travel control levers/pedals are released, they return to the neutral position and machine movement stops.

**NOTE:** The footrests (5) are not control devices.

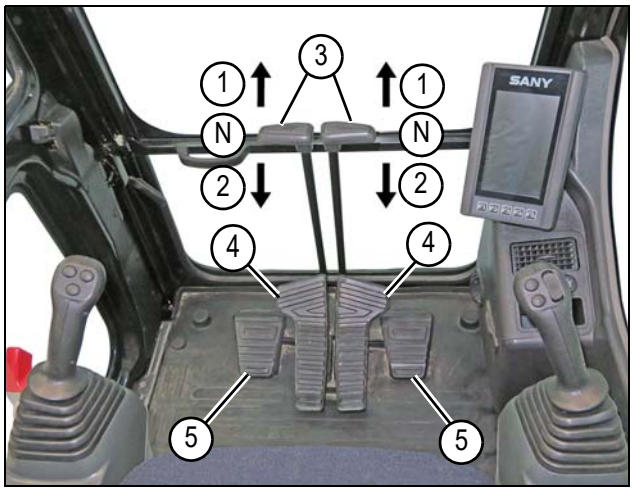



Fig. 3-34 0005262

## Directional Arrow

The directional arrow (1) on the inboard side of each of the track frames indicates forward movement of the machine. The drive sprocket is at the rear of the track frame, and the idler is at the front of the machine. Check these arrows before using the travel control levers/pedals.

If the directional arrow is pointing backward, the travel direction will be opposite the maneuvering direction of the travel control lever/pedal. The machine will move forward when you pull the control levers backward, and backward when you push them forward. Left and right control directions are also reversed when the track frame faces backward.

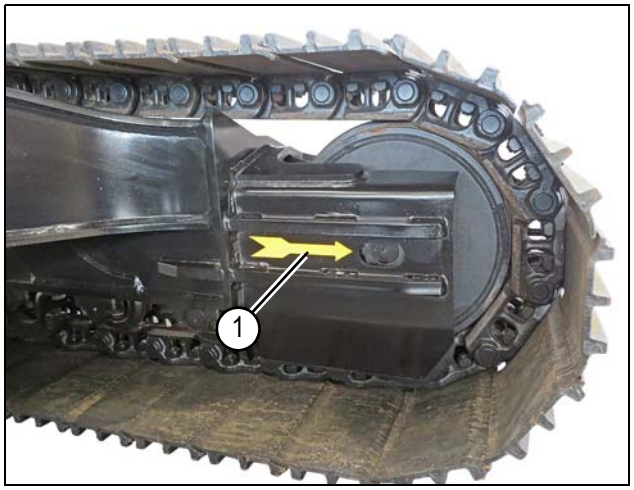



Fig. 3-35 0005213

**NOTE:** The left side directional arrow is shown. The right side is similar.

## Auto Idle Function

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

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

- If the joysticks and travel controls remain in their neutral positions for 5 seconds or longer, the engine idle speed drops from the currently set idle speed to the factory-set auto idle speed (approximately 1300 rpm–1400 rpm).
- If the engine idle speed is set to below the factory-set auto idle speed, the auto idle function will not change the engine speed.
- If either of the joysticks or travel controls is operated, or if the throttle control dial is adjusted while the engine is idling 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 idle function is automatically reactivated.

**NOTE:** Auto idle can be switched on or off using the F2 key on the home screen. See “Home Screen” on page 3-34.

# RADIO

## Radio Control Panel

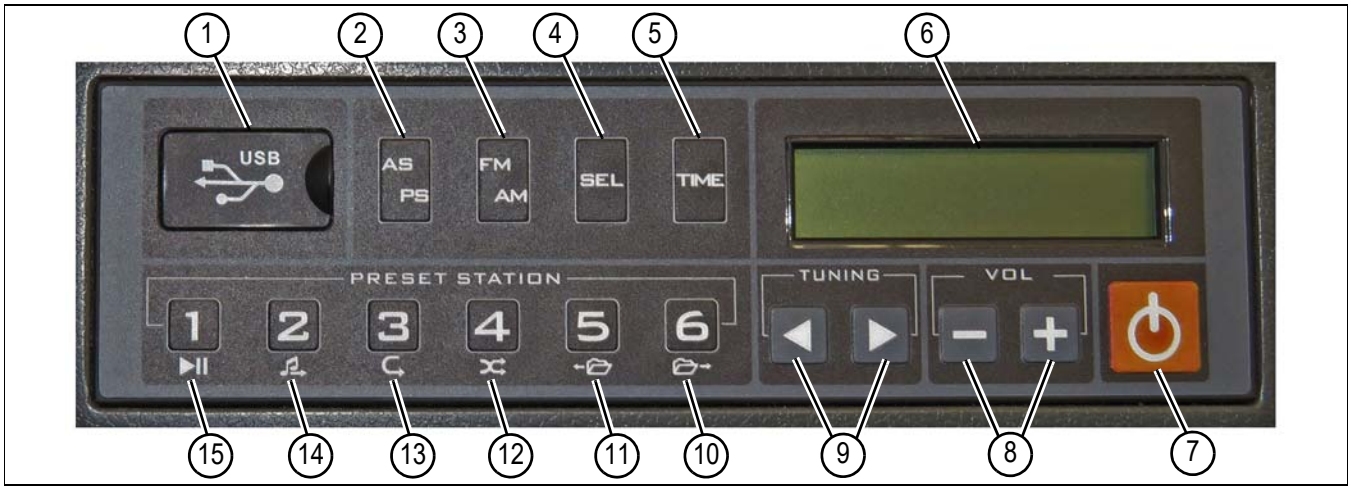



Fig. 3-36 0005263

1 USB input

2 Automatic scan/preset station (AS/PS) selector button

3 AM/FM selector button

4 Audio selector (SEL) button

5 TIME display button

6 Liquid crystal display (LCD)

7 Power button

8 Volume (VOL) + and – control buttons

9 Tuning ◄ and ► control buttons

10 Preset radio station 6: USB function—select the next folder

11 Preset radio station 5: USB function—select the previous folder

12 Preset radio station 4: USB function—shuffle playback

13 Preset radio station 3: USB function – replay

14 Preset radio station 2: USB function—browse selections

15 Preset radio station 1: USB function–play/pause

## Radio Operation

**WARNING!**

**Turn the radio volume down to a level that allows you to hear traffic signals such as a horn, siren, and bystanders. Failure to follow this warning could result in death or serious injury.**

**NOTICE!**

**The radio could be easily damaged if penetrated by water. When washing the machine, take care to prevent water from getting on the radio. If water does get on the radio, wipe the radio using a dry cloth.**

## USB Input

Use the USB input (1) to insert a USB device (memory and other electronics) to be read/played in the device. When a USB device is plugged into the USB input, press the SRC button to toggle between the USB port and the radio.

**NOTE:** MP3 and WMA audio files, USB 1.1 format, and FAT16/FAT32 files are supported.

## Auto Scan/Preset Station (AS/PS) Button

Use the AS/PS button (2) to begin the automatic scan (AS) feature through the preset stations (PS), or to automatically load the preset station buttons.

Press and release the AS/PS button once to begin the auto scan feature. Each preset station will play for 10 seconds with the station frequency blinking on the LCD (6). Press the AS/PS button once more to remain on the current station.

Press and hold the AS/PS button for 2 seconds to activate the auto programming feature. In auto programming, the six radio stations with the strongest signals are stored in the six preset station buttons (10–15).

## AM/FM Selector Button

Press the AM/FM selector button (3) to toggle between AM and FM bands.

## Audio Selector (SEL) Button

Press and release the audio selector (SEL) button (4) to toggle between the USB input and the radio.

Press and hold the SEL button to access the bass level adjustment.

Press the button again to access the treble adjustment.

Press the button once more to adjust the balance (between the in-cab speakers).

When a sound mode setting is selected, use the VOL + and – buttons (8) to adjust the level for the selected setting.

**NOTE:** The current radio station frequency displays if the button is not pressed within 5 seconds.

## Time Button

Press the TIME button (5) to display the local time for 5 seconds. The display reverts to the current station after 5 seconds. Set the current time by holding the button and using the tuning buttons to change the displayed time.

## Liquid Crystal Display (LCD)

The radio band (AM or FM), the currently tuned radio station frequency, the preset station number, and the current time are shown on the liquid crystal display (LCD) (6).

## Power Button

Press and release the power button (7) to turn the radio on. Press and hold it to turn the radio off. Press and release the button when the radio is on to mute the volume. The time of day will display on the LCD when the radio is turned off and the key switch is ON. The radio band and station number will be displayed when the radio is on.

## Volume Control Buttons

Press the plus (+) or minus (–) buttons (8) to set the volume.

## Tuning Buttons

Press the left ◄ or right ► TUNING buttons (9) to search for the next available radio station frequency.

## Preset Radio Station 6: USB Function—Select Next Folder

Radio mode:

Press and hold the PRESET STATION button 6 (10) to assign the current radio station to that button. Afterwards, press and release the button to select its preset station.

USB function:

Press and release the preset radio station 6: USB function—select next folder button to select the next folder of available songs.

## Preset Radio Station 5: USB Function—Select Previous Folder

Radio mode:

Press and hold the PRESET STATION button 5 (11) to assign the current radio station to that button. Afterwards, press and release the button to select its preset station.

USB function:

Press and release the preset radio station 5: USB function—select previous folder button to select the previous folder of available songs.

## Preset Radio Station 4: USB Function—Shuffle Playback

Radio mode:

Press and hold the PRESET STATION button 4 (12) to assign the current radio station to that button. Afterwards, press and release the button to select its preset station.

USB function:

Press and release the preset radio station 4: USB function—shuffle playback button to randomly play songs in the selected folder.

## Preset Radio Station 3: USB Function—Replay

Radio mode:

Press and hold the PRESET STATION button 3 (13) to assign the current radio station to that button. Afterwards, press and release the button to select its preselected station.

USB function:

Press and release the preset radio station 3: USB function—replay button to replay a selected song.

## Preset Radio Station 2: USB Function—Browse Selections

Radio mode:

Press and hold the PRESET STATION button 2 (14) to assign the current radio station to that button. Afterwards, press and release the button to select its preselected station.

USB function:

Press and release the preset radio station 2: USB function—browse selections button to browse from one song to the next until the desired selection is heard.

## Preset Radio Station 1: USB Function—Play/Pause Button

Radio mode:

Press and hold the PRESET STATION button 1 (15) to assign the current radio station to that button. Afterwards, press and release the button to select its preselected station.

USB function:

Press and release the preset radio station 1: USB function—play/pause button to toggle between the play and pause mode as necessary.

## Antenna

**NOTE:** When transporting the machine or parking it in a building, lower the antenna to prevent breakage.

If the signal received is weak or noisy, raise the antenna (1).

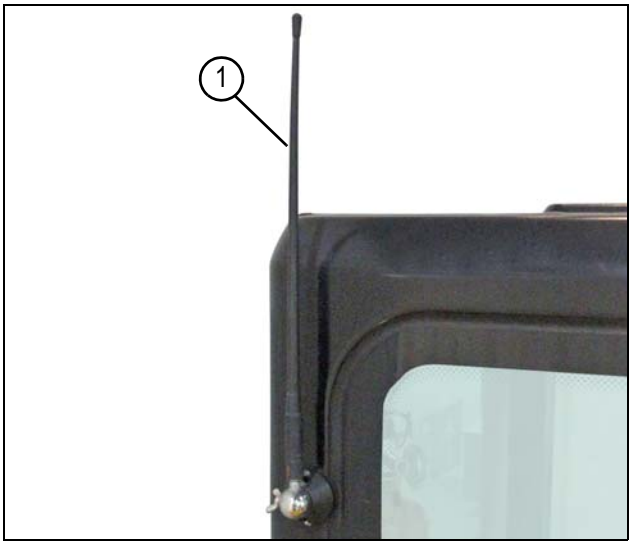



Fig. 3-37 0005309

# CLIMATE CONTROL PANEL

**NOTICE!**

**If water gets on the control panel, a failure may result. Always keep this component free from water. Failure to follow this notice could damage the machine, personal property, or cause the machine to operate improperly.**

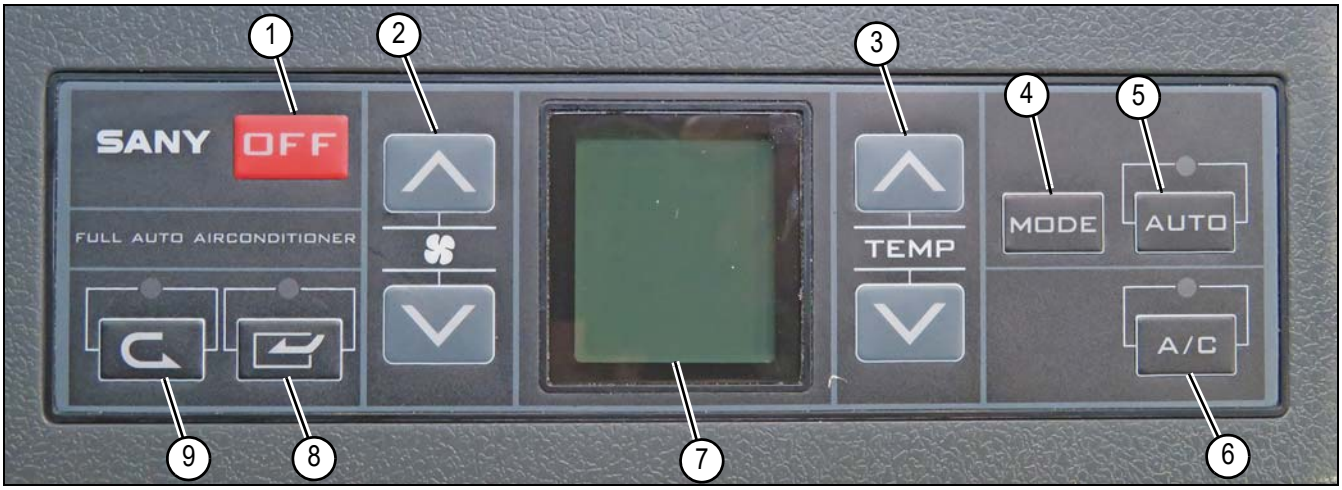



Fig. 3-38 0005208

| Item | Control | Operation | Function |
|---|---|---|---|
| 1 | OFF button | Press and release | Press the OFF button to stop the fan and shut off the LCD screen. |
| 2 | Fan speed control buttons | Press and release the top button | Increases the fan speed incrementally each time the button is pressed. |
| | | Press and release the bottom button | Decreases the fan speed incrementally each time the button is pressed. |
| 3 | Temperature adjustment buttons | Press and release the top button | Increases the temperature inside the cab incrementally each time the button is pressed. |
| | | Press and release the bottom button | Decreases the temperature inside the cab incrementally each time the button is pressed. |
| 4 | MODE (vent mode) button | Press and release | Press this button to toggle between vents used for airflow inside the cab. (See “Vent Mode Selection” on page 3-30.) |
| 5 | AUTO (automatic temperature selection) button | Press and release | Press this button to use the selected fan speed, vent outlets, and fresh-air/recirculated-air mode to automatically maintain the selected temperature. |
| 6 | A/C (air conditioner) button | Press and release | Press the button to turn the air conditioning system on (indicator lamp is on). |
| | | | Press the button again to turn the air conditioning system off (indicator lamp is off). |

| Item | Control | Operation | Function |
|---|---|---|---|
| 7 | Liquid crystal display (LCD) | - | Displays the preset temperature, fan speed, radio frequency, error codes, and time. |
| 8 | Fresh-air button | Press and release | Indicator lamp on—fresh-air mode |
| 9 | Recirculated-air button | Press and release | Indicator lamp on—recirculated-air mode |

## Heating and Cooling System Operation

**NOTICE!**

**If water gets in the control panel or the sunlight sensor, a failure may result. Always keep these components clear and free of water. Failure to follow this notice could damage the machine or cause it to operate improperly.**

**NOTE:**

- Press the TEMP up or down arrow (3) to control the inside cab temperature between 65°F and 90°F (18°C and 32°C).
- To change the display between Fahrenheit (F) and Celsius (C), press the A/C power button and hold both the up and down arrows on the temperature control for 3 seconds. See “Climate Control Panel” on page 3-29.
- A sunlight sensor adjusts the airflow of the climate control system when the cab is in direct sunlight. See “Sunlight Sensor” on page 3-31.

### Auto Mode

Press the AUTO button (5) to turn on the automatic temperature control function. The cab temperature will be maintained at the set temperature displayed on the LCD.

### Cooling Mode

Press the A/C (air conditioner) power button (6) to turn the air conditioning system on (A/C indicator lamp is on). Adjust the temperature by pressing the temperature adjustment buttons (3) up or down to the desired level. See “Climate Control Panel” on page 3-29.

### Heating Mode

Press the air conditioner power button to turn the air conditioning system off (A/C indicator lamp is off). Adjust the temperature by pressing the temperature adjustment buttons (3) up or down t the desired level. See “Climate Control Panel” on page 3-29.

### Vent Mode Selection

There are multiple air vents that direct airflow inside the cab:

- Windshield vent

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

### Ventilation

When the air conditioning is run for extended periods, the recirculated-air mode should be switched to fresh-air mode every hour to ventilate the cab.

## Sunlight Sensor

**NOTICE!**

**Never place objects around the sunlight sensor, and keep it clean to make sure the automatic functions of the air conditioning system operate properly.**

Located on the front of the air conditioner duct, the sunlight sensor (1) adjusts the airflow to match the variation of temperature caused by direct sunlight.


Fig. 3-39 0005229

# FUSES

The fuse and relay panel is behind the left rear access door, inside the electrical panel (1).

**NOTICE!**

- **A fuse should be replaced if it is blown, corroded, or becomes loose in the fuse block.**
- **Before replacing a fuse, make sure the key switch is in the OFF position and the batteries are disconnected.**
- **Always replace a fuse with one of the same capacity. Never replace a fuse with one of a higher capacity, which could damage the machine or cause it to operate improperly.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

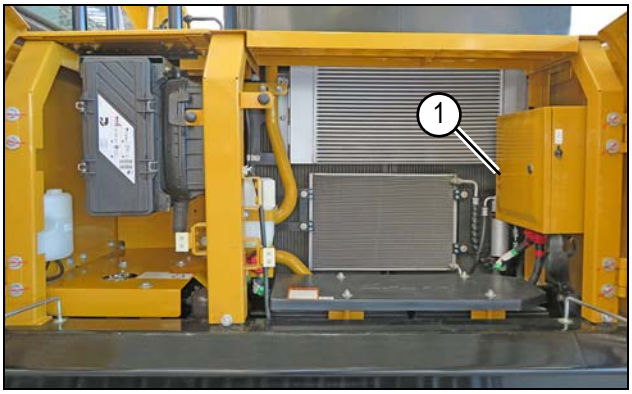



Fig. 3-40 0005267

Open the fuse box door (1) to access the fuses.

| No. | Circuit | Amperage |
|---|---|---|
| F1 | Pilot circuit | 10A |
| F2 | Turn alarm | 5A |
| F3 | Horn | 5A |
| F4 | Quick coupler valve | 10A |
| F5 | Lifting alarm | 10A |
| F6 | E12V converter | 15A |
| F7 | Seat heat | 10A |
| F8 | Work light | 15A |
| F9 | ECM power | 30A |
| F10 | Start circuit | 10A |
| F11 | Travel alarm | 10A |
| F12 | Windshield washer and wiper | 10A |
| F13 | Fuel filter | 20A |
| F14 | Air conditioning | 20A |
| F15 | DEF sensor | 10A |
| F16 | Service lamp | 5A |
| F17 | DEF power | 5A |
| F18 | Controller | 20A |
| F19 | Radio | 10A |

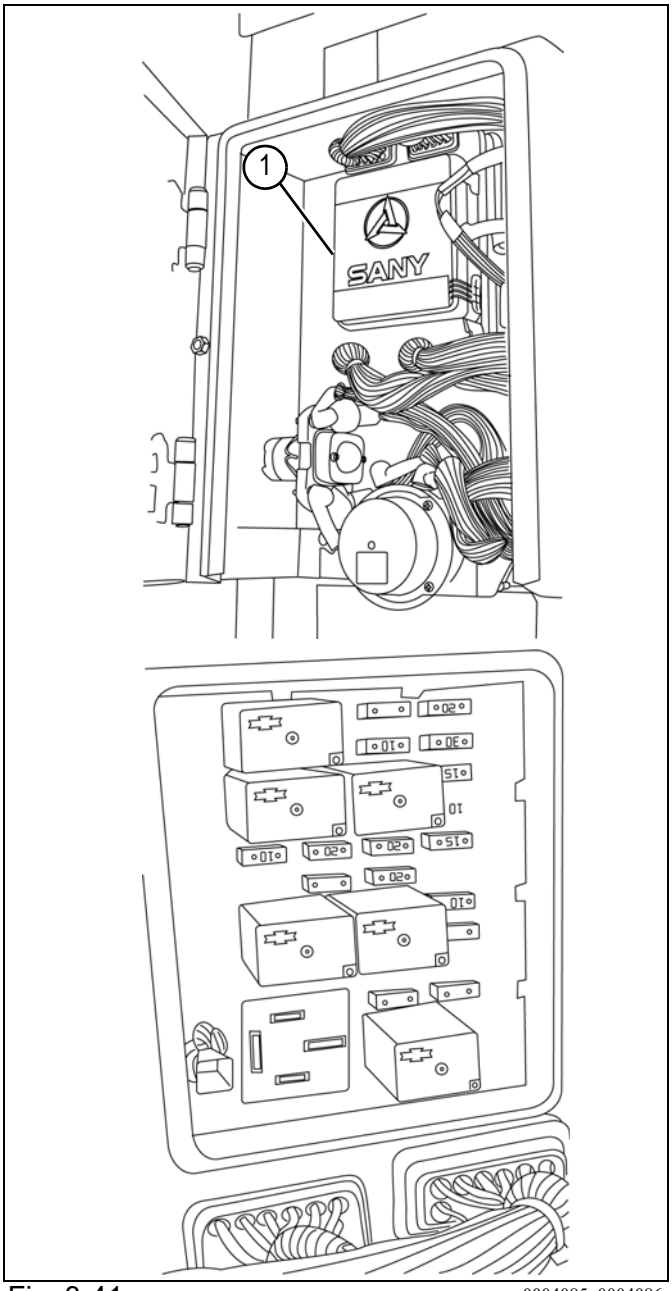



Fig. 3-41 0004085, 0004086

# MONITOR

## Home Screen

When the key switch is turned to ON, the monitor is energized and the home screen is displayed.

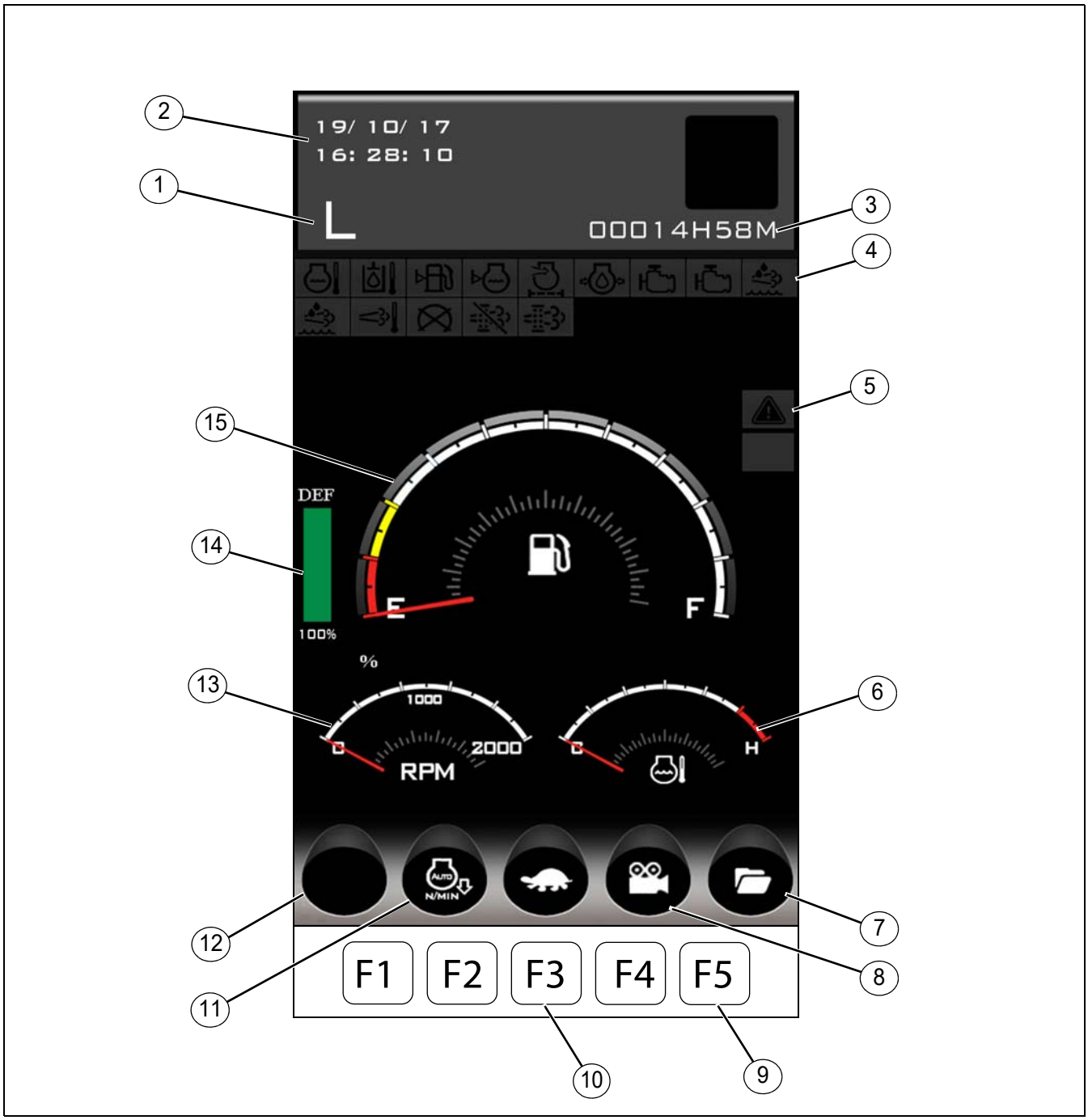



Fig. 3-42

0004595, 0004622

| Item | Home Screen Display | Function |
|---|---|---|
| 1 | Work mode (S, H, L,) | Indicates the current work mode. See “Tool Select Screen” on page 3-49. |
| 2 | Current time and date | Displays current time and date. |
| 3 | Operating hours | Displays the total number of hours the machine has been in operation. |
| 4 | Notification icons | Alerts the operator that a specific system requires attention:<br>• Yellow indicates that service should be obtained as soon as possible.<br>• Red indicates that the machine should be shut down and serviced immediately. |
| 5 | Machine fault indicator icon | Displays if there is a failure code. To see the specific error code:<br>1. Press button F5 to access the Main Menu screen.<br>2. Press button F1 to navigate to the Error Codes icon.<br>3. Press button F3 to confirm selection. |
| 6 | Engine coolant temperature gauge | Displays the engine coolant temperature (120°F–248°F [49°C–120°C]).<br>The engine coolant temperature will display in degrees Fahrenheit (°F) or Celsius (°C), depending on which unit of measure was selected (metric or Imperial) in the System Setup screen. |
| 7 | Main Menu (folder) icon | Press the function button below the icon to access the Main Menu interface. |
| 8 | Rearview camera | Displays the area behind the vehicle. |
| 9 | Function buttons (F1–F5) | Press a function button below a desired icon to select or enter various screen options. The action of the function buttons will vary depending on the screen. See “Home Screen Notification Icons” on page 3-36 for additional information. |
| 10 | Travel speed icon | Indicates the current travel speed mode:<br>• Turtle = slow<br>• Rabbit = fast |
| 11 | Auto idle | Indicates the status of the auto idle mode. Red = off. |
| 12 | Work mode (S, H, L) icon | Displays the optional equipment. See “Tool Select Screen” on page 3-49. |
| 13 | Engine speed (tachometer) | Displays the engine revolutions per minute (rpm). |
| 14 | Diesel exhaust fluid (DEF) level | Indicates the level of DEF in the tank as a percentage.<br>The number “100” is displayed beneath a solid bar when the DEF tank is full. The number gradually decreases and the bar gradually lowers as the DEF level lowers. |
| 15 | Fuel level gauge | Indicates the level of diesel fuel in the fuel tank. |

## Home Screen Notification Icons

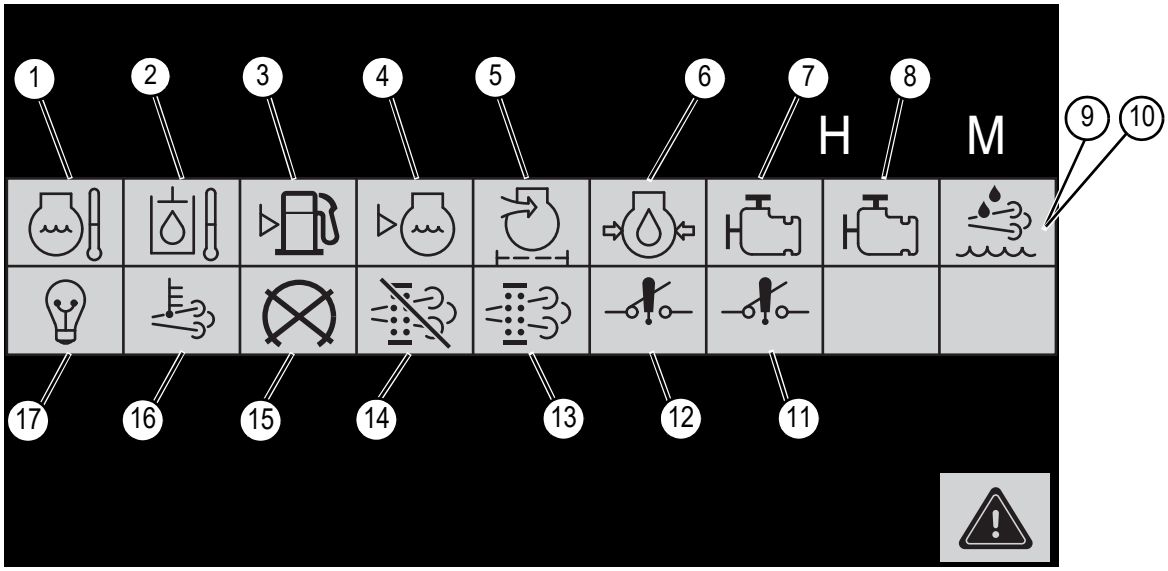
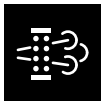



Fig. 3-43 0003275

| Item | Notification Icon | Description |
|---|---|---|
| 1 |  | High engine coolant temperature. |
| 2 |  | High hydraulic oil temperature. |
| 3 |  | Low diesel fuel level. |
| 4 |  | Low engine coolant level. |
| 5 |  | Blocked engine air filter. |
| 6 |  | Low engine oil pressure. |
| 7 |  | Stop engine. |

| Item | Notification Icon | Description |
|---|---|---|
| 8 |  | Check engine. |
| 9 |  | Diesel Exhaust Fluid (DEF) alarm – first level. |
| 10 |  | Diesel Exhaust Fluid (DEF) alarm – second level. |
| 11 |  | Not used. |
| 12 |  | Not used. |
| 13 |  | Exhaust system regeneration. |
| 14 |  | Exhaust system regeneration inhibited. |
| 15 |  | Wait to start the engine. |
| 16 |  | High Exhaust System Temperature (HEST). |
| 17 |  | Battery not charging. |

## Home Screen Function Icons and Buttons

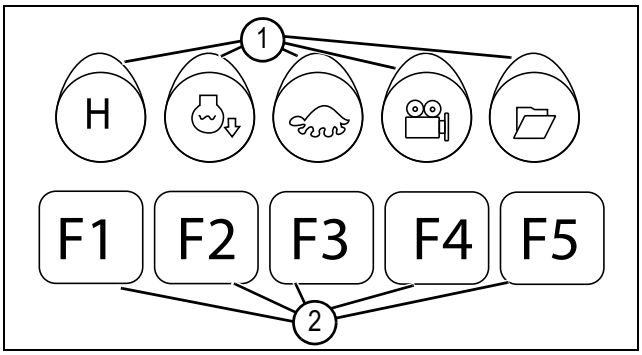



Fig. 3-44 0000031

Use the home screen icons (1) and function buttons (2) as follows:

- F1 – is not enabled on this screen.
- F2 – enable/disable auto idle.

**NOTE:** The icon above F2 changes to red when auto idle is disabled.

- F3 – used to toggle between slow travel speed mode (turtle icon) and fast travel speed mode (rabbit icon).

**NOTE:** Use the turtle mode when more power but less travel speed is required. Use the rabbit mode when more travel speed but less power is required.

- F4 – activates the rearview camera. Once activated, press F5 (ESC) to exit the camera mode.
- F5 – proceed to the Main Menu screen.

## Main Menu Screen

The Main Menu screen displays icons for various options that can be accessed via the function icons and function buttons at the bottom of the screen. Each icon will be highlighted as it is selected.

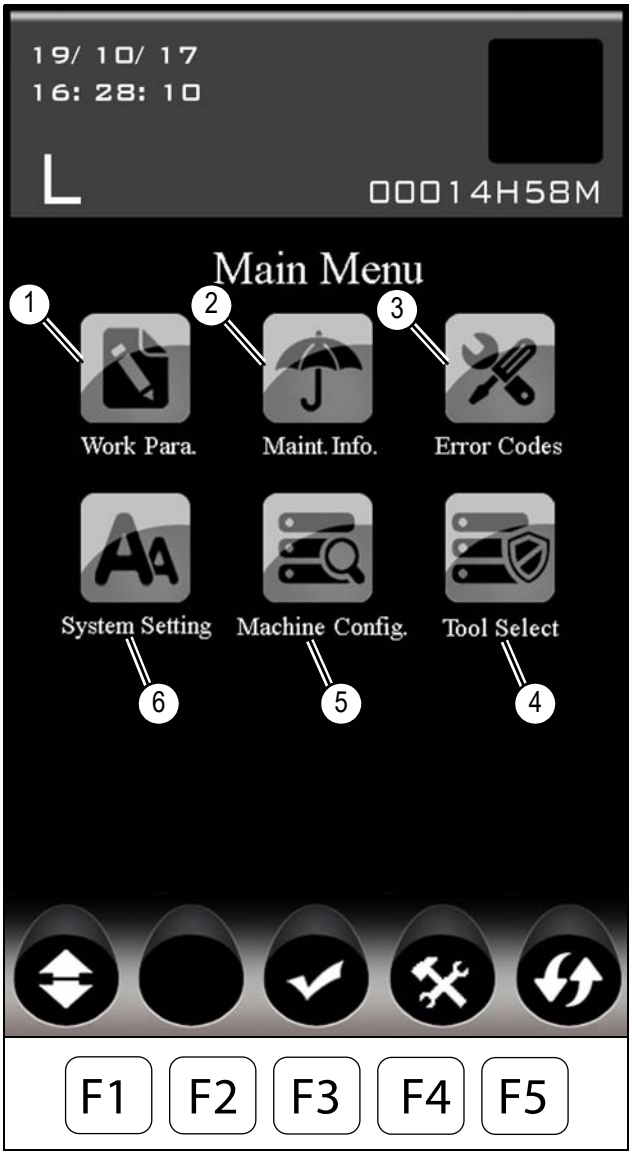



Fig. 3-45 0004549, 0004622

1. Press F5 on the home screen to access this screen See “Home Screen” on page 3-34.

   - Work Parameters (1) is password-protected. Provides access to informational screens that show data about the various machine systems.

     **NOTE:** See “Password Screen” on page 3-40.

   - Maintenance Information (2) – Viewable only when maintenance is required. See “Maintenance Information Screen” on page 3-41.

   - Error Codes (3) – Shows active error codes. See “Error Codes Screen” on page 3-42.

   - Tool Select (4) – Accesses screens for the adjustment of hydraulic oil flow to attached equipment. See “Tool Select Screen” on page 3-49.

   - Machine Configuration (5) – For SANY technician use only requires a password.

   - System Setting (6) – Allows the operator to change the language, units of measure, time, and date. See “System Setting Screen” on page 3-43.

2. Press F1 to select the desired icon.

3. Press F3 to confirm the selection and proceed to the next screen.

4. Press F5 to return to the home screen without selecting any icon.

   **NOTE:** F4 is for use only by SANY-authorized technicians.

## Password Screen

To access the Work Parameters or Machine Configuration screen, perform the following steps:

1. Enter the five-digit password 31868 in the password field (1). Each digit is indicated by an asterisk (*) standing for a value from 0-9. A number initially appears where the cursor is located, and then changes to an asterisk when the cursor is moved to the next field.
2. Press F1 to increase the digit.
3. Press F2 to move horizontally between digits.
4. Press F3 after keying in the five-digit password to proceed to the selected menu screen.
5. Press F5 to return to the Main Menu screen without entering a password.

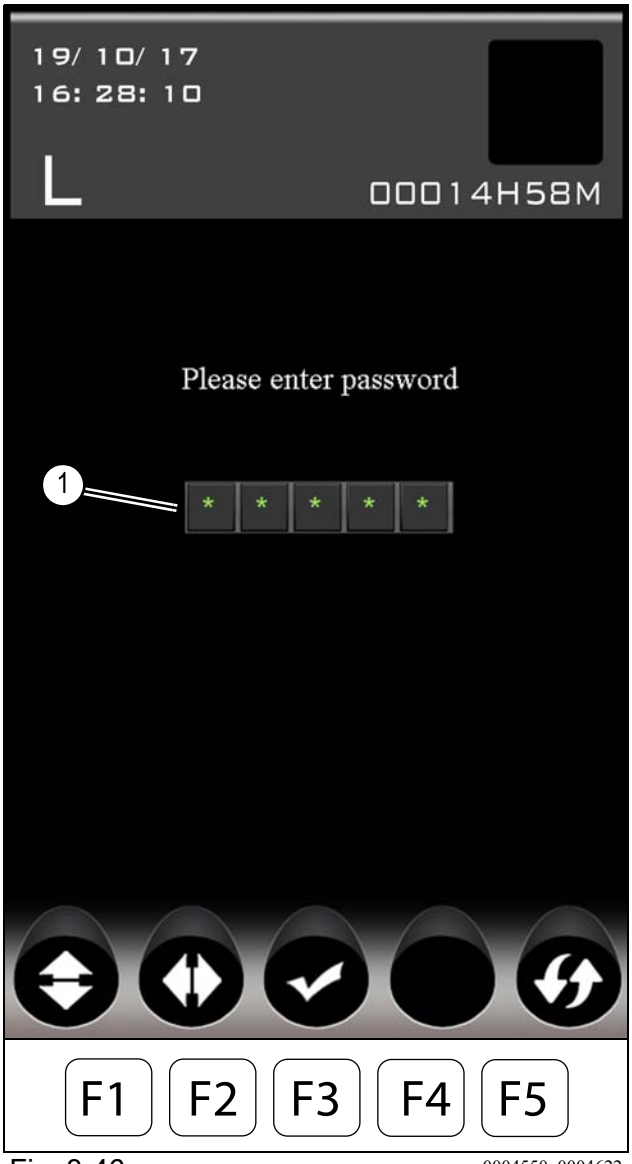



Fig. 3-46 0004550, 0004622

## Maintenance Information Screen

Use this screen to view which procedures are required for the machine when the periodic maintenance umbrella icon illuminates on the home screen.

1. Press F1 once at the Main Menu screen to navigate to the Maintenance Info icon.

   **NOTE:** No password is required for this screen.

2. Press F3 to access the maintenance information screen.

   - The maintenance screen only displays if the umbrella icon is on and periodic maintenance is required.

   - The screen on the right is typical, in this case a 50-hour maintenance schedule.

   - Consecutive screens will display if extensive periodic maintenance is required.

3. Press F3 and enter the password (53188) after completion of the maintenance procedure. Turn the key switch to OFF, and then back to ON to confirm the selection and clear the umbrella icon from the home screen.

4. Press F5 to return to the Main Menu screen without making any changes.

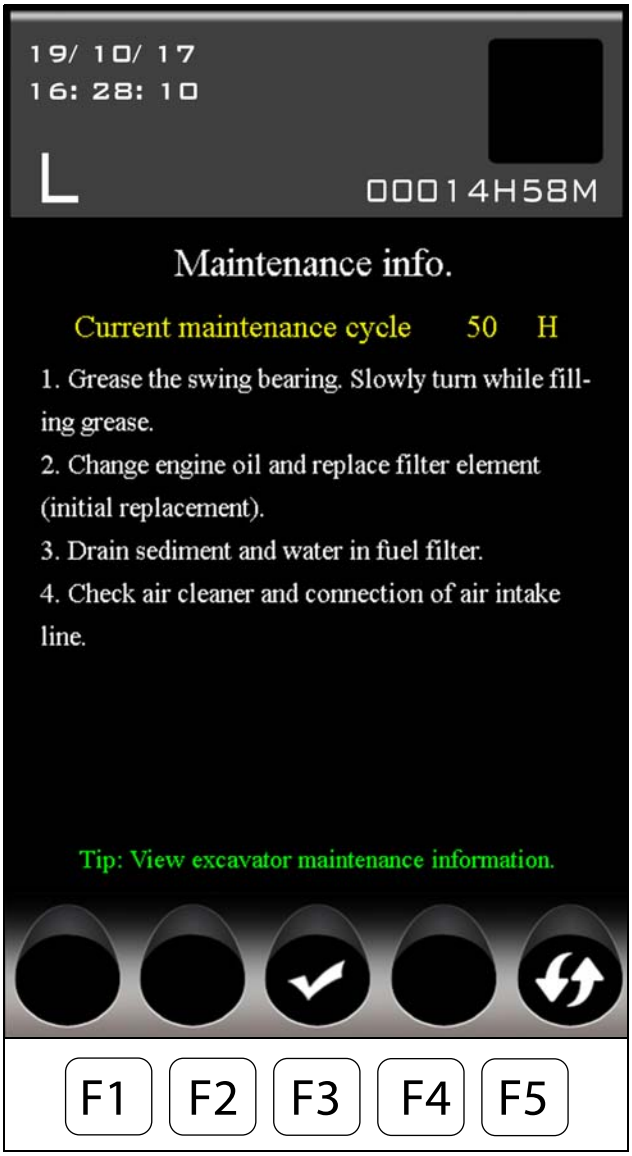



Fig. 3-47 0004551,0004622

## Error Codes Screen

The Error Codes screen displays error codes for the machine when the machine fault icon illuminates on the home screen. See “Home Screen” on page 3-34.

1. Press F1 twice at the Main Menu screen to navigate to the Error Codes icon.

2. Press the function button F3 to see the Error Codes screen showing the specific error code (or codes) and descriptions.

   **NOTE:** No error codes will display if the Machine Fault icon on the home screen is off.

3. Contact a SANY dealer for more information about specific error codes and what actions to take.

4. Press F5 to return to the Main Menu screen.

   **NOTE:** The Machine Fault icon on the home screen is self-resetting and goes out when the fault condition is corrected.


Fig. 3-48 0004564 0004622

## System Setting Screen

Use this screen to access operator settings.

1. Press F1 three times at the Main Menu screen to navigate to the System Setting icon, then press F3.
2. Press F1 to scroll through the list of choices.
3. Press F3 to confirm your selection and proceed to the next screen.
4. Press F5 to return to the Main Menu screen without choosing any option.

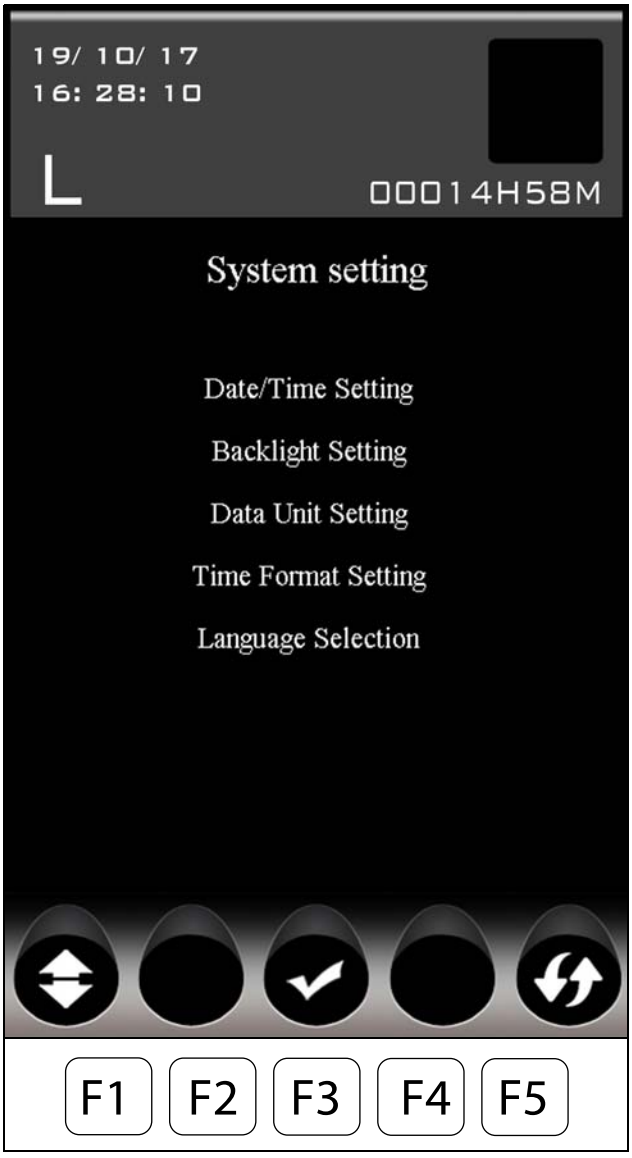



Fig. 3-49 0004556 0004622

### Date/Time Setting Screen

Navigate to this option on the System Setting screen, then press F3.

5. Press F1 or F2 to increase or decrease the value in the blinking year category.

6. Press F4 to advance to the next blinking category (month).

   **NOTE:**

   - Repeat steps 2 and 3 to set and advance through the remaining categories.

   - Contact a SANY dealer if you do not have the time zone information (number of time zones east or west of 0° longitude).

7. Press F3, then turn the key switch to OFF, and then back to ON, to confirm the selection.

8. Press F5 to return to the System Setting screen without making any changes.

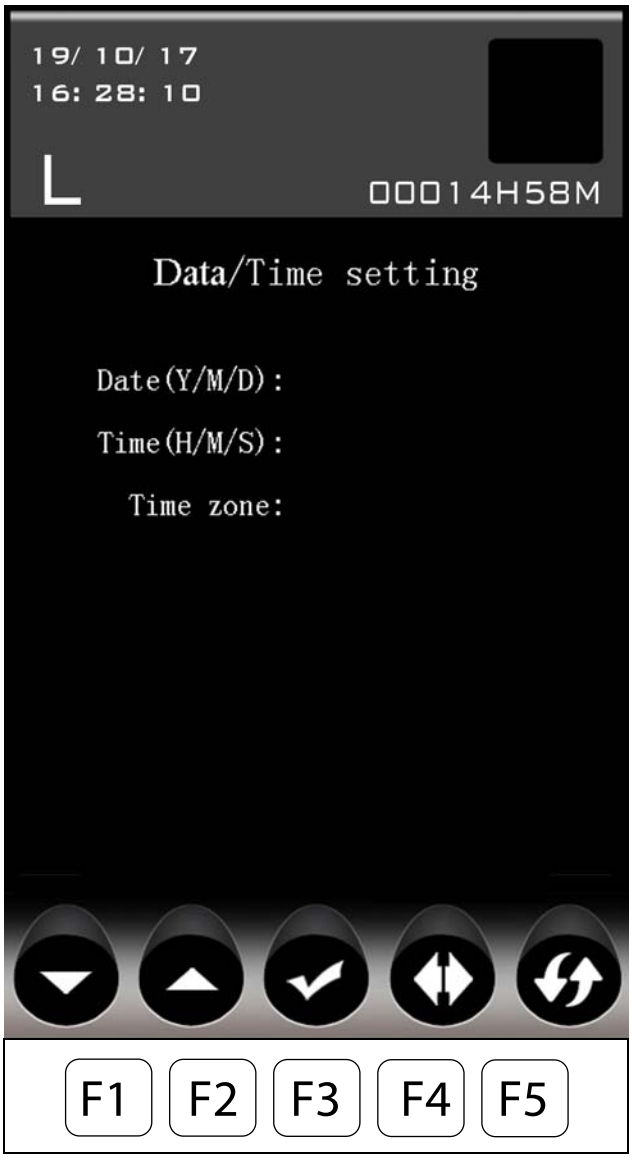



Fig. 3-50

0004557,0004622

### Backlight Setting Screen

Use this screen to adjust the screen brightness for better readability.

1. Navigate to this option on the System Setting screen, then press F3. See “System Setting Screen” on page 3-43.

   **NOTE:** When F1 and F2 are pressed, the bar indicator will fill and empty to indicate the screen brightness percentage from 10% to 100%.

2. Press F1 to decrease the screen brightness.

3. Press F2 to increase the screen brightness.

4. Press F3, then turn the key switch to OFF, and then back to ON, to confirm the selection.

5. Press F5 to return to the Main Menu screen without making any changes.

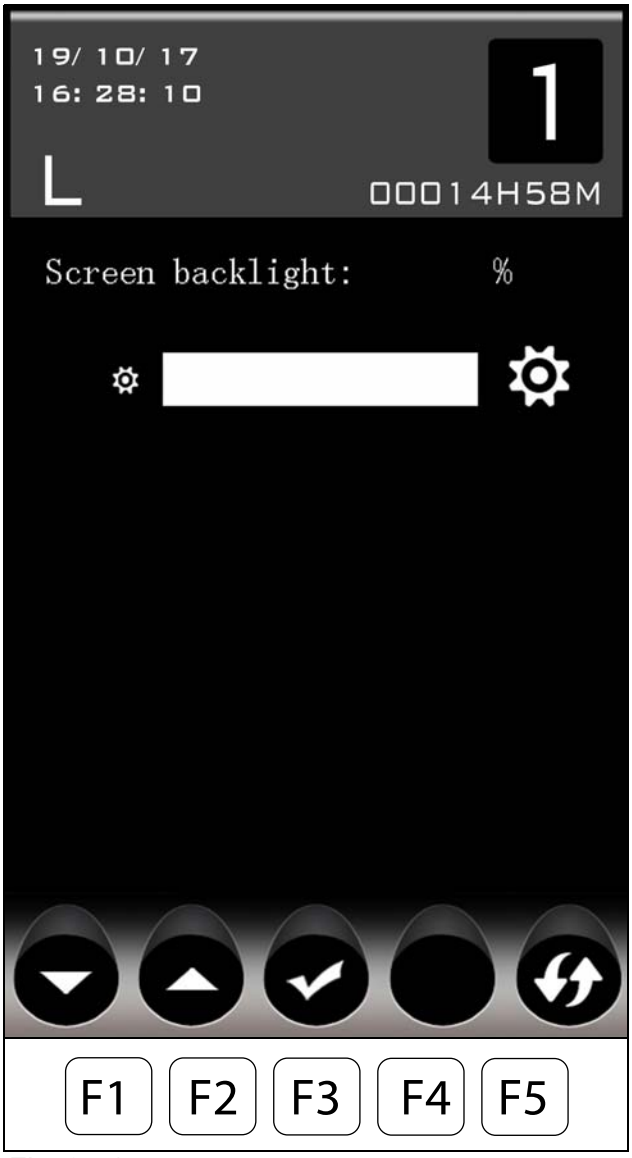



Fig. 3-51 0004559, 0004622

### Data Unit Setting Screen

Use this screen to select which units of measure (metric or Imperial) are displayed on the monitor:

**NOTE:** This screen defaults to highlight the metric data unit option, even with the Imperial unit format in effect.

1. Navigate to this option on the System Setting screen, then press F3.
2. Press F1 to move between the two options.
3. Press F3, then turn the key switch to OFF, and then back to ON, to confirm the selection.
4. Press F5 to return to the System Setting screen without making any changes.

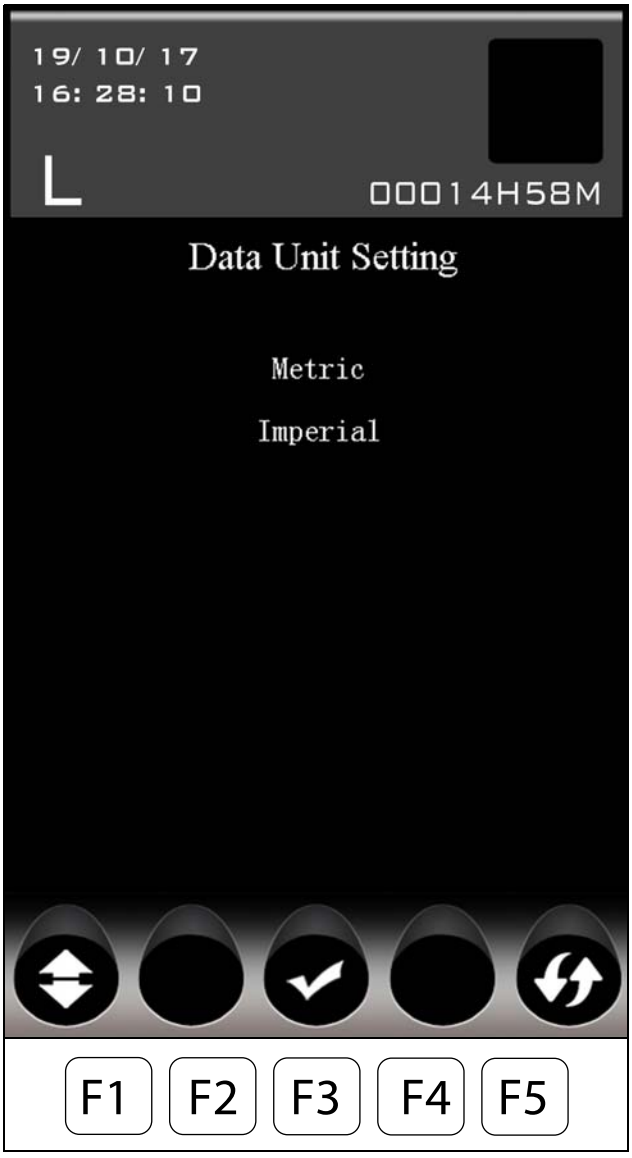



Fig. 3-52 0004560, 0004622

### Time Format Screen

Use this screen to select how the current time is displayed.

1. Navigate to this option on the System Setting screen, then press F3.
2. Press F1 to select between the options.
3. Press F3, then turn the key switch to OFF, and then back to ON, to confirm the selection.
4. Press F5 to return to the System Setting screen without making any changes.

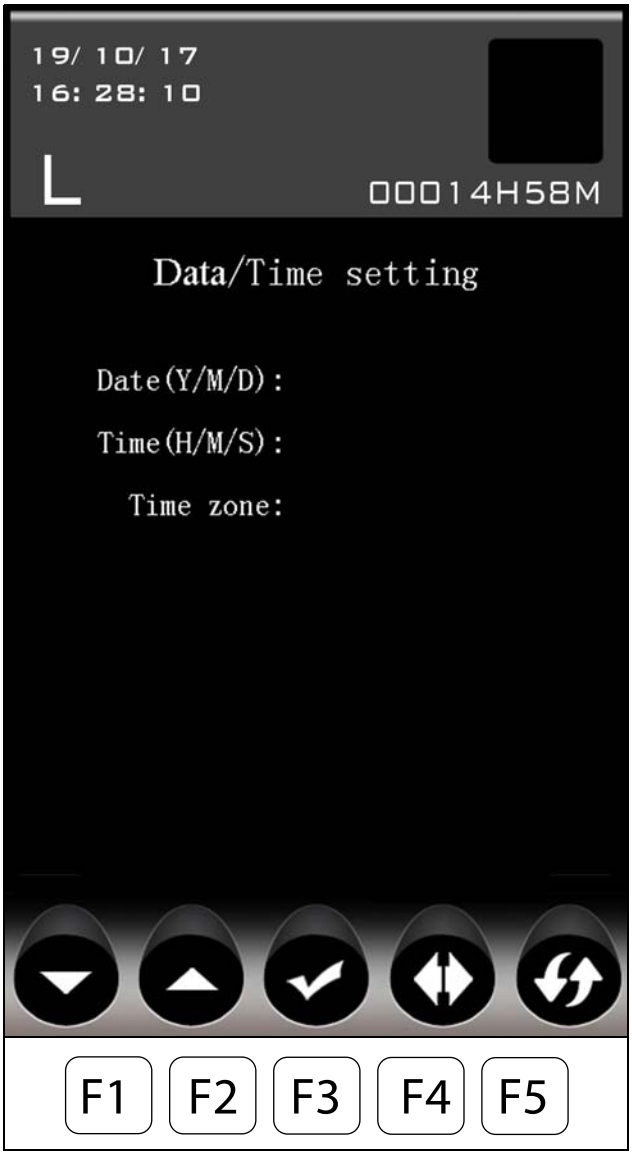



Fig. 3-53 0004557, 0004622

### System Language Setup Screen

The System Language Setup screen is accessed from the System Setting selection on the Main Menu screen.

Select a language for the monitor display:

1. Press F1 and F2 to scroll through the list of language options.

2. Press F3, then turn the key switch to OFF, and then back to ON, to confirm the selection.

3. Press F5 to return to the System Setting screen without making any changes.

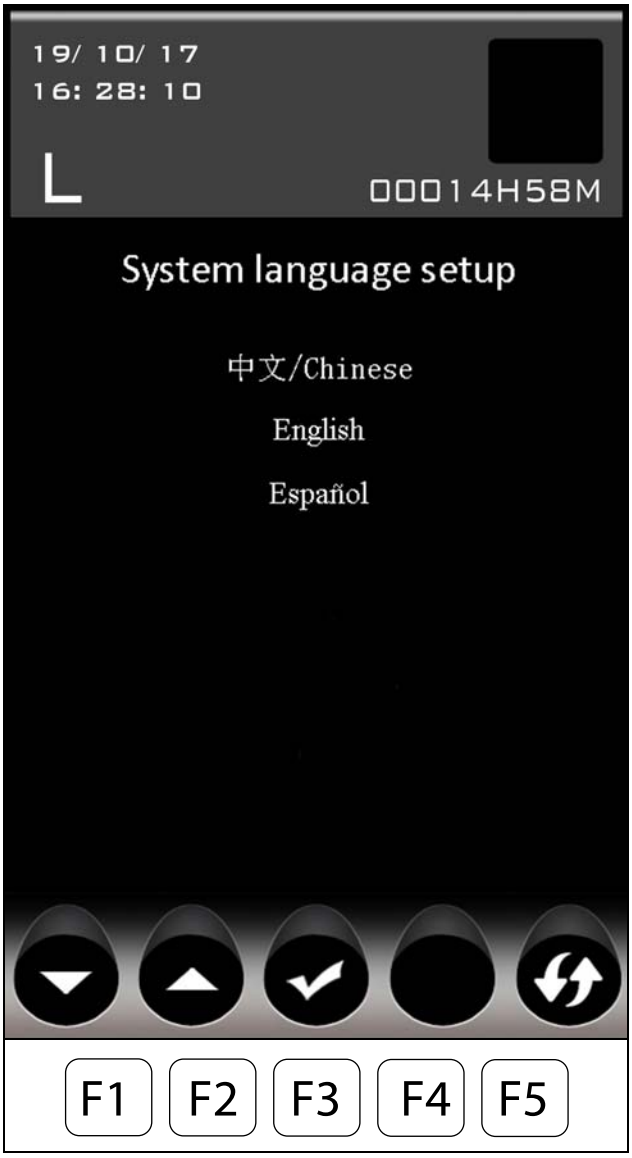



Fig. 3-54 0004567, 0004622

## Tool Select Screen

Use the Tool Select screen to specify the work tool attached to the machine and, if needed, adjust the hydraulic oil flow for the tool.

To choose the desired work tool:

1. Press F1 five times at the Main Menu screen to navigate to the Tool Select option, then press F3.
2. Press F1 and F2 to scroll up and down the displayed list.
3. Then do either of the following:
   - Press F3 to confirm the selection and proceed to the next screen.
   - Press F5 to return immediately to the Main Menu screen without specifying any tool.

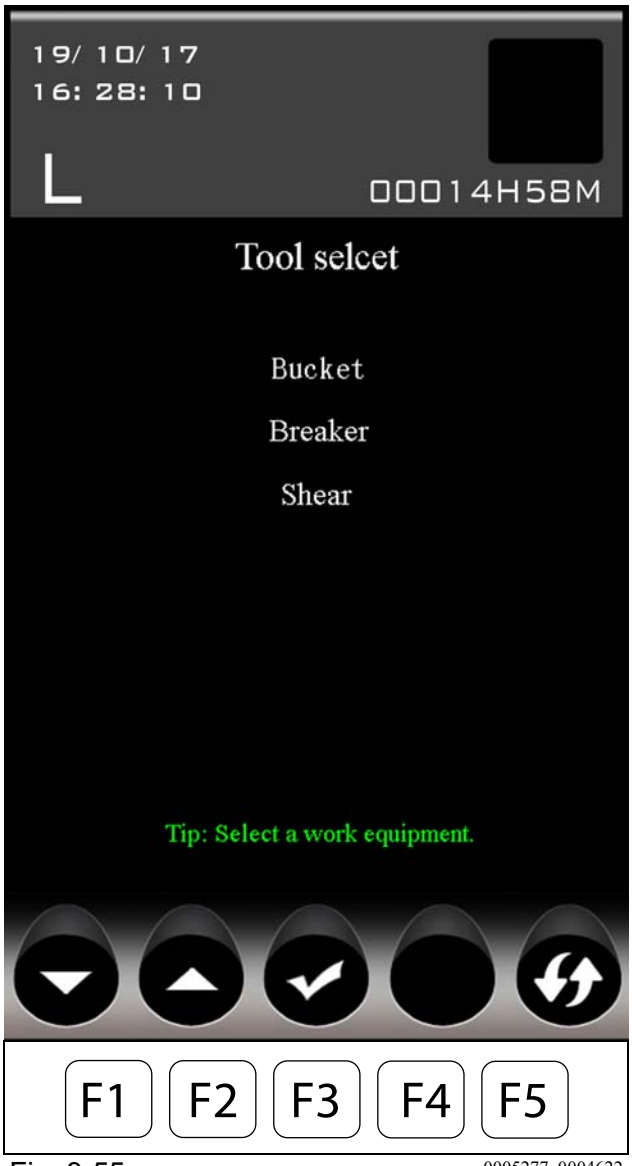



Fig. 3-55 0005277, 0004622

### Bucket

Selecting the bucket option returns you to the Main Menu screen and places the bucket icon (1) on the home screen.

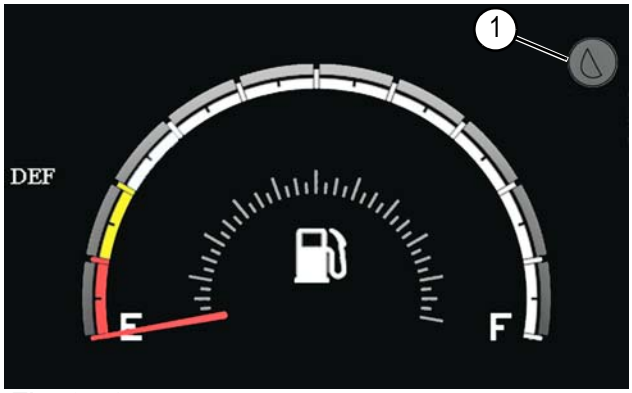



Fig. 3-56 0004596

### Breaker Screen

Use the Breaker screen to enable the right joystick rocker switch for breaker or other one-way flow work tool operation, and to adjust the hydraulic oil flow for this tool.

1. Press F2 to increase or F1 to decrease the hydraulic oil flow rate as needed.

   **NOTE:**

   - The available range is 13.2 gpm–105.6 gpm (50 Lpm–400 Lpm).
   - The numeric values for liters per minute and gallons per minute will change and the bar indicator (1) will fill and empty to graphically display the hydraulic oil flow rate.

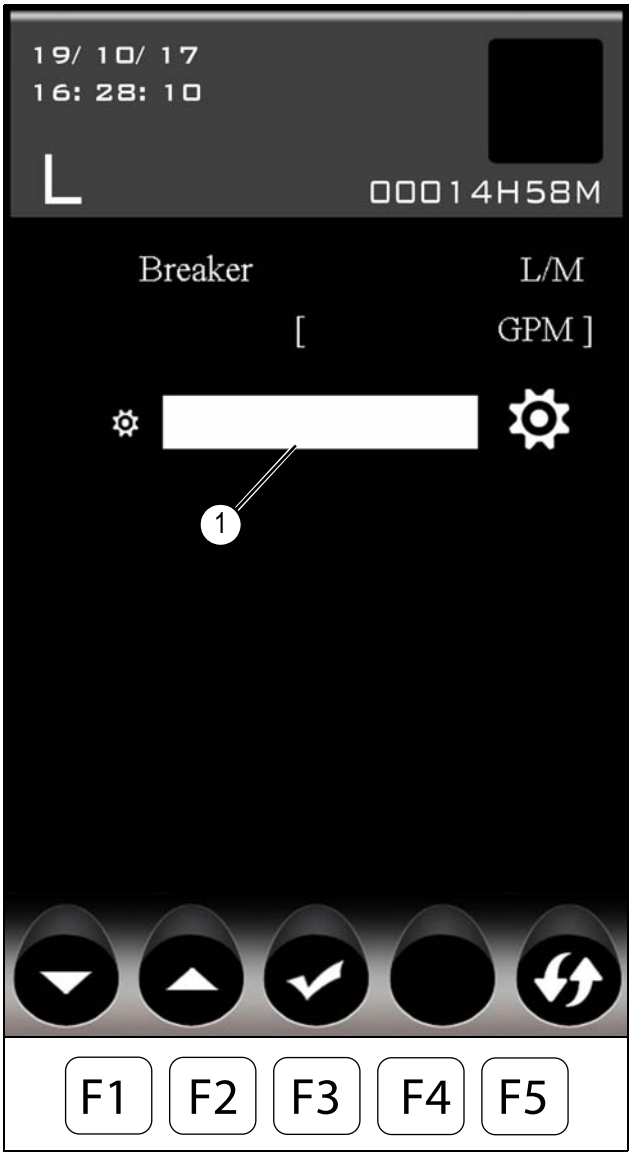



Fig. 3-57 0004562, 0004622

2. Press F3 to confirm the setting and place the breaker icon (2) on the home screen.
3. To return to the Tool Select screen without making any changes, press F5.
4. Turn the key switch to OFF and back to ON. The rocker switch on the right joystick is now enabled for one-way flow work tool operation.

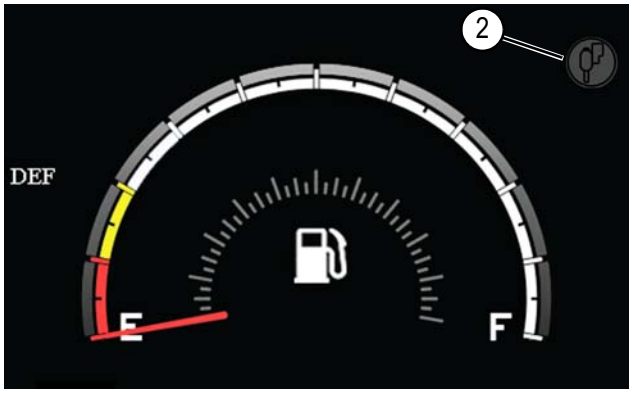



Fig. 3-58 0004597

## Shear Screen

Use the Shear screen to enable the joystick switches for shear or other two-way flow tool operation, and to adjust the hydraulic oil flow for the selected tool.

**Set the Shear Rotational Flow Rate**:

1. Press F4 to select the shear rotational flow rate adjustment.
2. Press F1 to decrease or F2 to increase the hydraulic oil flow rate for rotation of this tool.

   **NOTE:** The available range is 0 gpm–53 gpm (0 Lpm–200 Lpm).

As the numeric values for liters per minute and gallons per minute change, the bar indicator (1) will graphically show the hydraulic oil flow rate.

**Set the Shear Open/Close Flow Rate:**

1. Press F4 to select the shear O/C flow rate adjustment.
2. Press F1 to decrease or F2 to increase the hydraulic oil flow rate for the open/close function of the shear.

   **NOTE:** The available range is 0 gpm–132 gpm (0 Lpm–500 Lpm).

As the numeric values for liters per minute and gallons per minute change, the bar indicator (2) will graphically show the hydraulic oil flow rate.

3. Press F3, then turn the key switch to OFF, and then back to ON, to enable the joystick switches for two-way flow tool operation, confirm the hydraulic oil flow rates, and place the shear icon (3) on the home screen.
4. Press F5 to return to the Tool Select screen without making any changes.

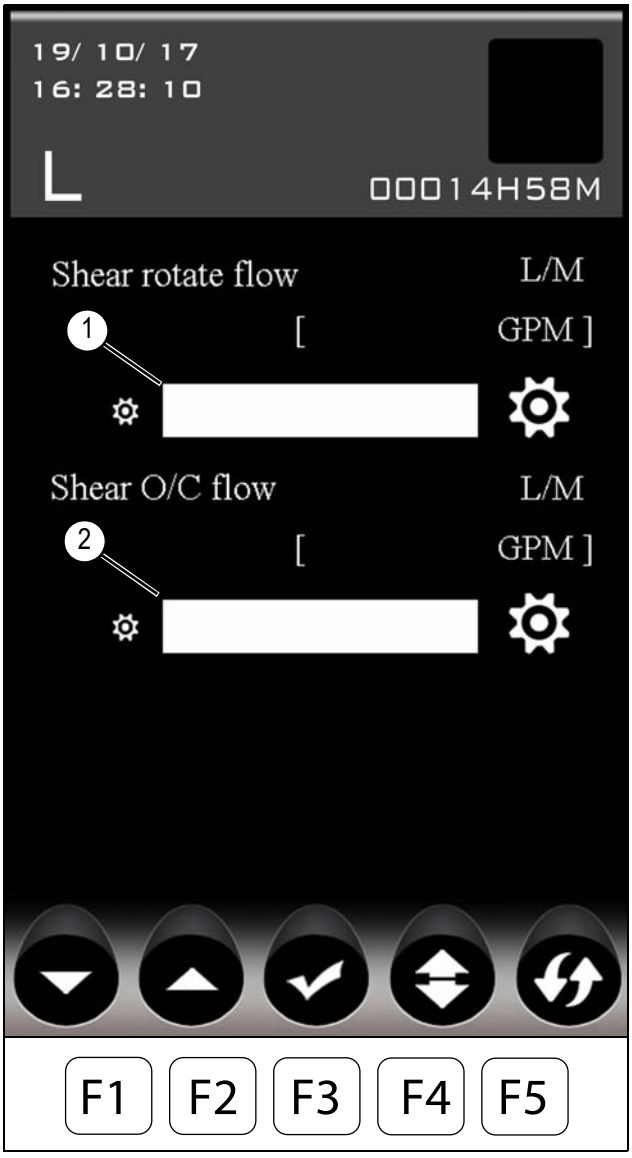



Fig. 3-59 0004563, 0004622

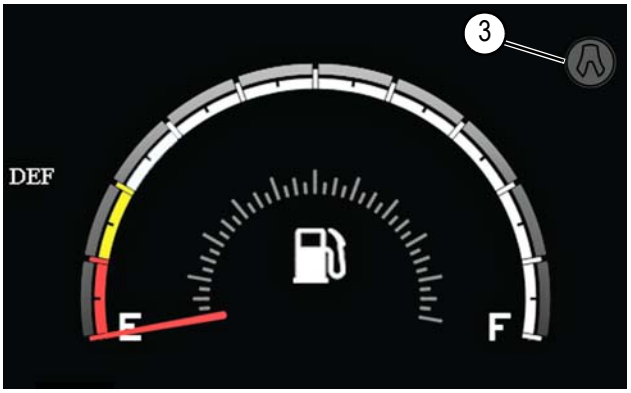



Fig. 3-60 0004598

**This Page Intentionally Left Blank**

SANY

# Machine Operation

# WORK AREA

The work area is where the actual job function is to be performed. Within the work area are hazard areas. Hazard areas are areas immediately surrounding the machine where personnel may be at risk due to machine operation or movement.

All personnel within the work area must wear appropriate personal protective equipment (PPE).

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

**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 it. Failure to follow this warning could result in death or serious injury.**

# GENERAL JOB SAFETY

See “Job Safety” on page 2-11.

## Operator Responsibilities

The machine operator must perform the following:

- Reject the job site if there are doubts regarding safety.
- Become familiar with the work area and surroundings before beginning work.
- Read and understand the instructions in this manual prior to operation.
- Know and obey the operating procedures, applicable laws, and regulations.
- Know and follow the requirements for safe operation.
- Know and use the required safety precautions and protective devices.
- Know and use the correct hand signals between the machine operator and a signal person.
- Stop machine operations immediately if any defects endangering safety are found.
- Maintain complete control of the machine at all times.
- Before leaving the cab, make sure all controls are set to neutral and the engine is shut down.
- Give warning signals when necessary.

## Seat Belt Usage

Always wear the seat belt when operating the machine.

**WARNING!**

**The seat belt is designed to protect the operator from danger, especially when the machine is traveling. Failure to wear a seat belt when operating the machine could result in death or serious injury.**

## Operation and Maintenance Manual Check

Make sure this Operation and Maintenance Manual remains in the cab.

## Daily Maintenance Record Check

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

**NOTE:** See “Maintenance Log” on page 1-3 and “Maintenance Information” on page 5-5.

## Cleaning the Machine

**NOTE:** Clean the grab handles and steps of any grease or debris to allow a firm grip when entering or exiting the cab area.

Make sure the following items are clean before operating the machine:

- Mirrors (1)
- Windows (2)
- Steps (3)
- Grab handles (4)

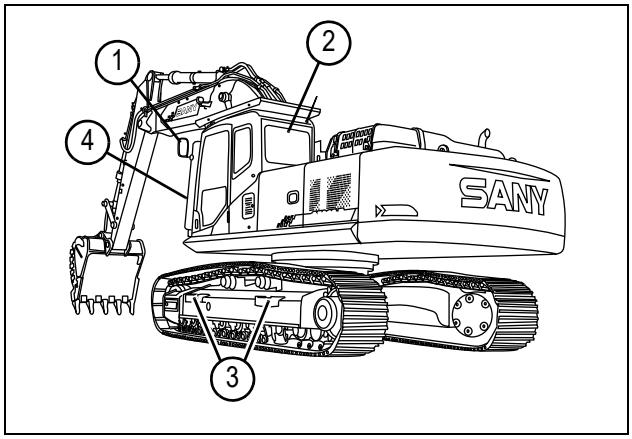



Fig. 4-1 00004350

## Cleaning the Cab Interior

**CAUTION!**

**Never allow passengers to ride inside or on the machine. Never bring objects into the cab that could restrict your movement or vision in any manner, which could result in injury.**

Remove all debris from inside the cab to prevent interference with machine operation.

Check that the escape tool and fire extinguisher are present. See “Escape Tool” on page 4-23 and “Fire Extinguisher” on page 4-23.

# DOORS, ESCAPE HATCH, AND FILLER CAPS

## Cab Door

The cab door (1) can be locked from the outside when closed using the cab door lock (4). To open the cab door from the outside, unlock and pull the handle (5). Swing the cab door open until the catch (3) engages the cab door latch (2), securing it in the opened position.

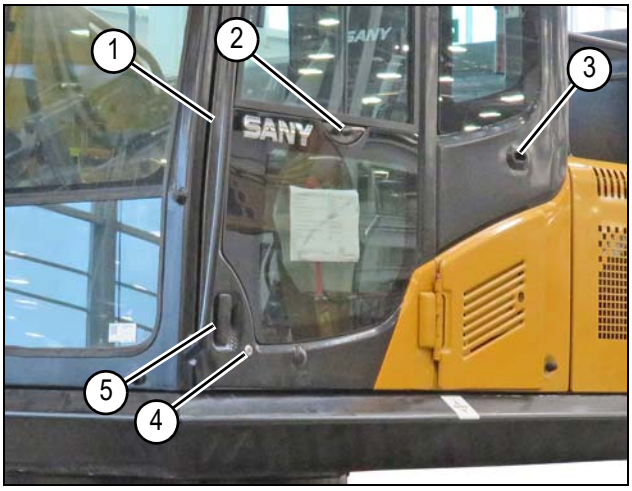



Fig. 4-2 0005355

From inside the cab, press down on the cab door release lever (6) to open the cab door.

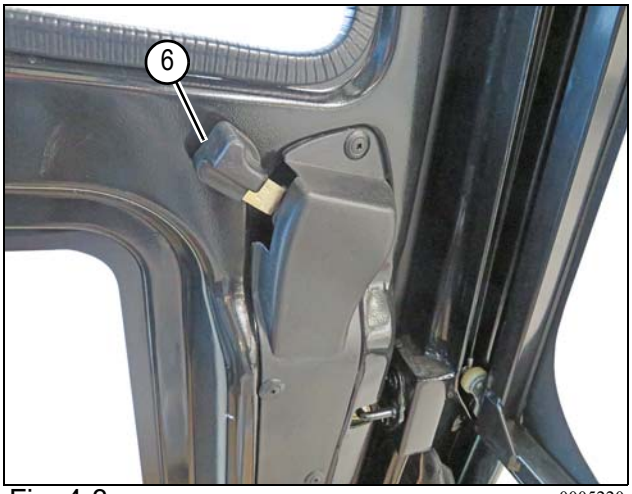



Fig. 4-3 0005220

Swing the door fully open until the cab door catch (not shown) engages the cab door latch (not shown). To release the door from the opened position, push down on the release lever (7).

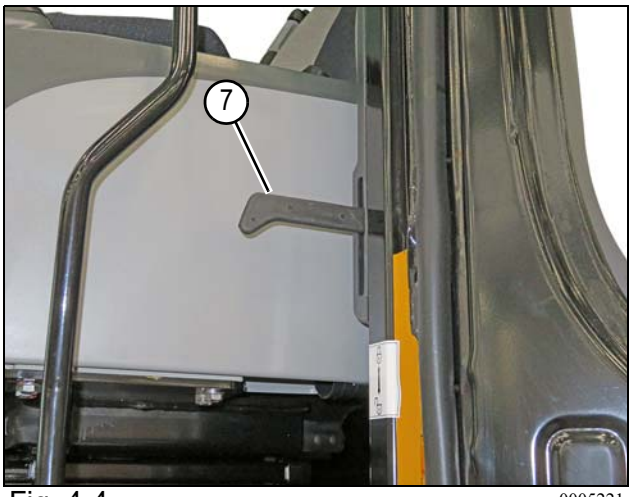



Fig. 4-4 0005221

## Emergency Escape Hatch

The emergency escape hatch (1) can be used to exit the machine if the cab door or windshield cannot be opened during an emergency.

To open the emergency escape hatch, press the left and right latches (2) and push up. The emergency escape hatch is supported in the open position by two pneumatic cylinders (not shown).

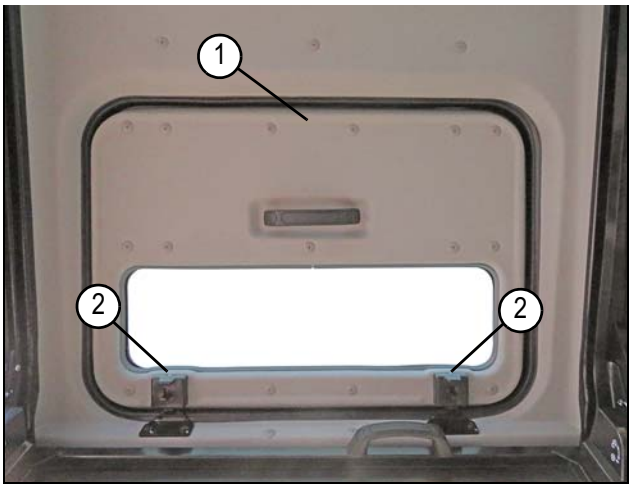



Fig. 4-5 0005222

## Door Support Rod

The left and right access doors and top engine compartment doors use a support rod (1) and support bracket (2) to prevent them from closing unexpectedly. Guide the support rod into the appropriate support bracket slot to secure a door in the open position. Move the support rod out of the slot on the support bracket to close a door.

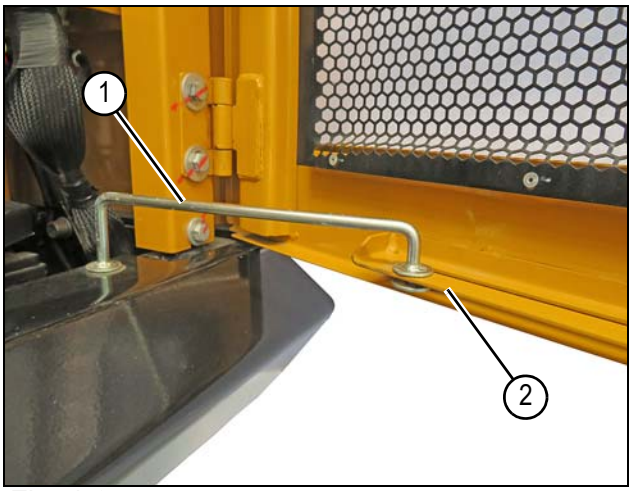



Fig. 4-6 0005225

## Right Front Access Door

The right front access door (1) provides access to the diesel exhaust fluid (DEF) tank.

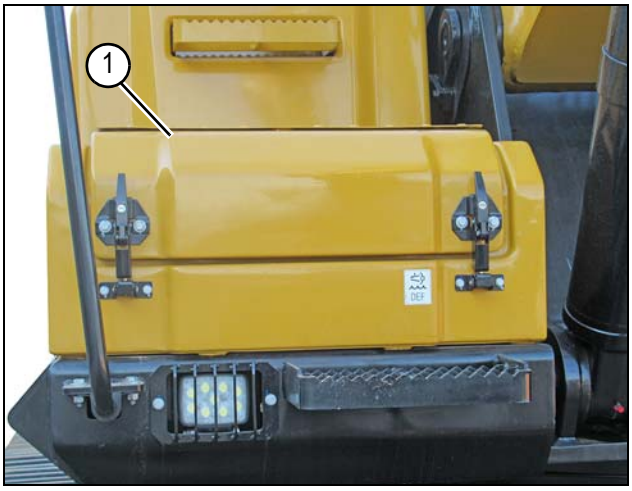



Fig. 4-7 0004734

### Opening and Closing the Right Front Access Door

To open the access door (1), unlock the door latches (3), pull the tops of the latch assembly arms away from the access door, and unhook the latches. Lift the access door to open it.

**NOTE:** The access door has a pneumatic cylinder (2) to maintain the weight of the door and allow it to stay in the open position.

To close the access door, pull the door down, hook the door latch onto the door, and secure it by locking the door latch.

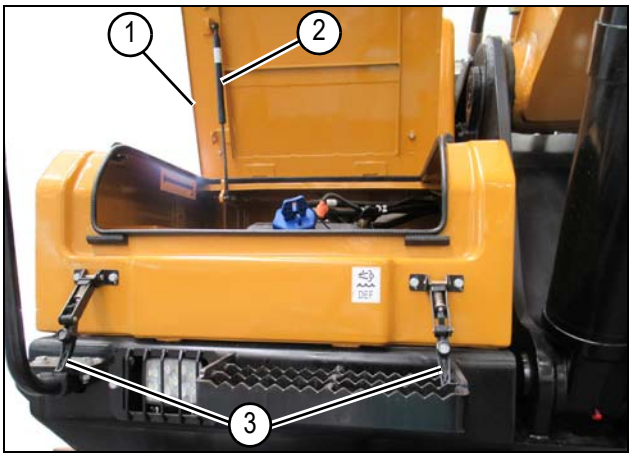



Fig. 4-8 0004829

# Right Rear Access Door

The right rear access door provides access to these components:

- Hydraulic pumps (2)
- Engine oil filter (4)
- Hydraulic pilot line filter (3)
- Fuel filters (1)

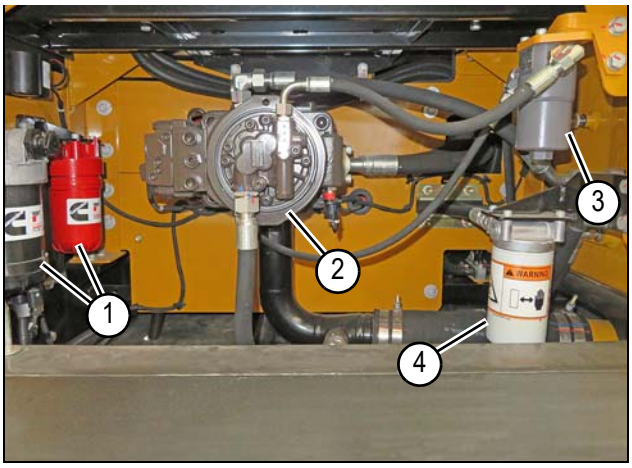



Fig. 4-9 0005321

## Opening the Right Rear Access Door

To open the right rear access door (2), unlock and pull the latch (1). When fully open, place the access door support rod (not shown) in the support bracket slot to prevent it from closing unexpectedly. See “Door Support Rod” on page 4-6.

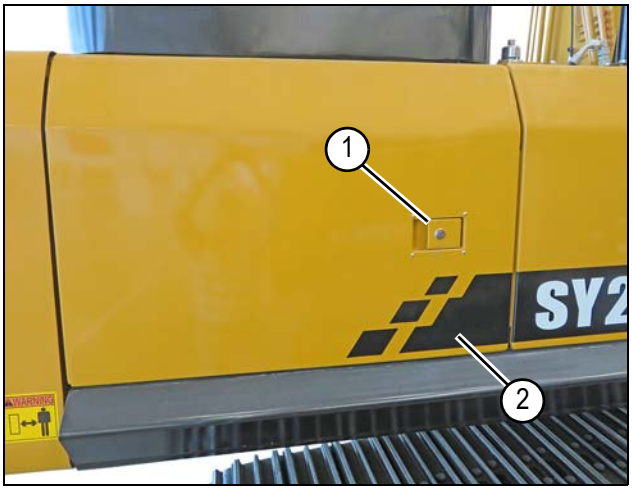



Fig. 4-10 0005240

## Closing the Right Rear Access Door

Move the support rod out of the slot in the support bracket to close the access door. See “Door Support Rod” on page 4-6. Close the access door until it is latched.

## Left Access Doors

The left access door provides access to these components:

- Air filter (1).
- Hydraulic oil cooler (3), engine coolant radiator (4), charge air cooler (2), and air conditioner condenser fins (5).
- Fuse and relay panel (6).
- Batteries (7)
- Battery disconnect switch (8)
- Pattern Change (SAE/BHL) valve (9)

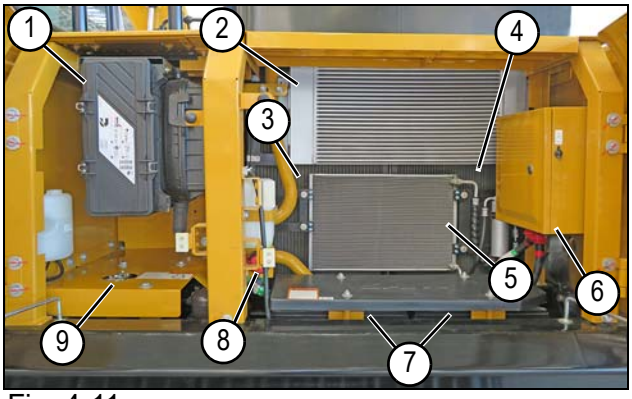


Fig. 4-11 0005246

### Opening the Left Access Doors

1. To open the left rear access door (1), unlock and pull the latch (2). When fully open, place the access door support rod in the support bracket slot to prevent the door from closing unexpectedly.
2. Open the left front access door and place the access door support rod in the support bracket slot to prevent the door from closing unexpectedly.

   **NOTE:** See “Door Support Rod” on page 4-7.

Fig. 4-12 0005358

### Closing the Left Access Doors

1. Move the support rod out of the slot in the support bracket to close the left front access door.

2. Move the support rod out of the slot in the support bracket to close the left rear access door. Close the access door until it is latched to secure both left access doors. See “Door Support Rod” on page 4-7.

## Fresh-Air Filter Access Door

Unlock and open the fresh-air filter access door (1) to access the fresh-air filter. When closed, the fresh-air access door should be locked.


Fig. 4-13 0005355

## Engine Compartment Door

The engine compartment door (1) provides access to:

- Engine oil dipstick and filler tube
- Engine coolant sight glass
- Cooling system expansion tank
- Engine belts and adjusters
- Exhaust aftertreatment components

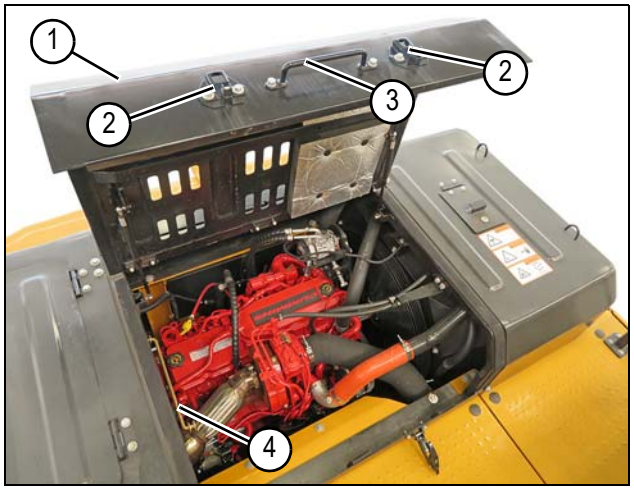



Fig. 4-14 0005357

### Opening the Engine Compartment Door

To open the engine compartment door (1), unlock and pull up on the latches (2). Use the handle (3) to pull the door open. When fully open, place the access door support rod (4) in the support bracket slot (not shown) to prevent the door from closing unexpectedly. See “Door Support Rod” on page 4-7.

**NOTE:** The engine access door has two pneumatic cylinders (3) to help maintain the weight of the door.

### Closing the Engine Compartment Door

Move the support rod out of the slot in the support bracket to close the access door. Pull the door down and hook each door latch onto the door. Secure each door latch by locking them. See “Door Support Rod” on page 4-7.

## Fuel Tank Filler Cap

**NOTICE!**

- **Make sure the O-ring on the fuel tank filler cap is clean. If the O-ring is contaminated by dirt or debris, it could be damaged and not seal properly.**
- **Inspect the O-ring for wear or damage. Replace if necessary.**
- **Make sure the fuel tank filler cap is fully seated before turning the key to lock or open the cap.**
- **Close the lock shield when not in use to prevent dirt and debris from entering the lock.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

### Remove the Fuel Tank Filler Cap

1. Slide open the lock shield (1) on the fuel tank filler cap (2).
2. Insert the key into the lock.
3. Turn the lock and key clockwise from the locked position (3) to open position (4) and remove the fuel tank filler cap.
   - Lock position (3)
   - Open position (4)

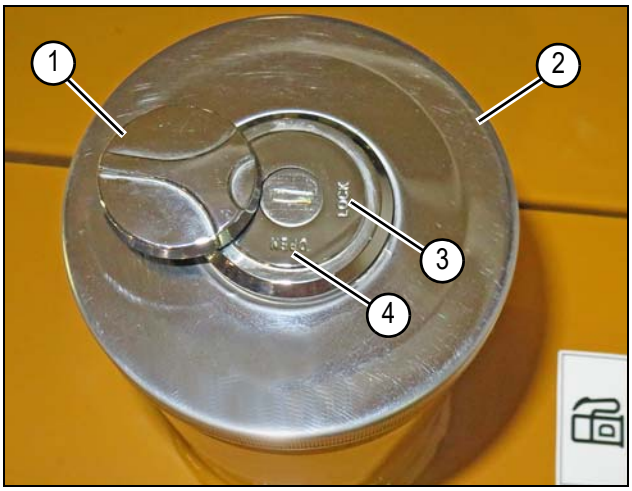


Fig. 4-15 0003.017

### Install the Fuel Tank Filler Cap

1. Install the fuel tank filler cap (2) onto the filler tube.
2. Insert the key into the lock.
3. Turn the key from the open position (4) counterclockwise to the lock position (3).
4. Remove the key.
5. Close the lock shield (1).

## Diesel Exhaust Fluid (DEF) Tank Filler Cap

1. Open the right front access door. See “Right Front Access Door” on page 4-8.
2. If dirty, wipe the area around the DEF tank filler cap (1).
3. Remove the DEF tank filler cap, then add DEF through the filler neck as needed.
4. Install the DEF tank filler cap, close, and lock the right front access door.

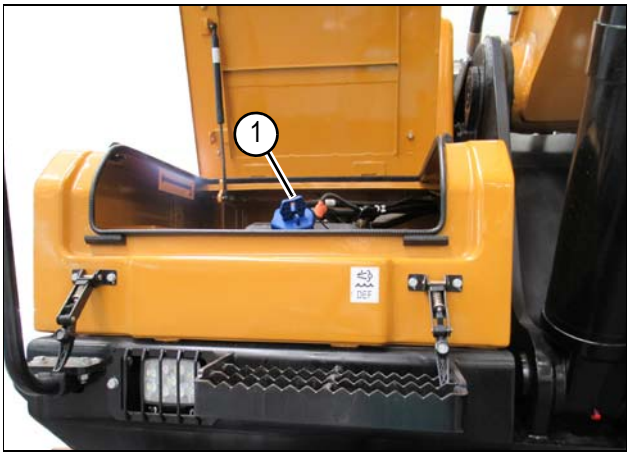



Fig. 4-16 0004829

# SEAT AND SEAT BELT

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

- The headrest (1) can be raised and lowered.
- The seat has two armrests. The armrest angle can be adjusted by rotating dials (2).
- Lever (3) adjusts the backrest forward or backward.
- The seat belt (4) is provided to keep the operator securely in the operator seat.
- Seat bottom lever (5) adjusts the seat bottom angle.
- Seat bottom lever (6) adjusts the seat bottom forward or backward.
- Lever (7) adjusts the seat and control consoles forward or backward.
- Switch (8) adjusts the air suspension seat up or down.

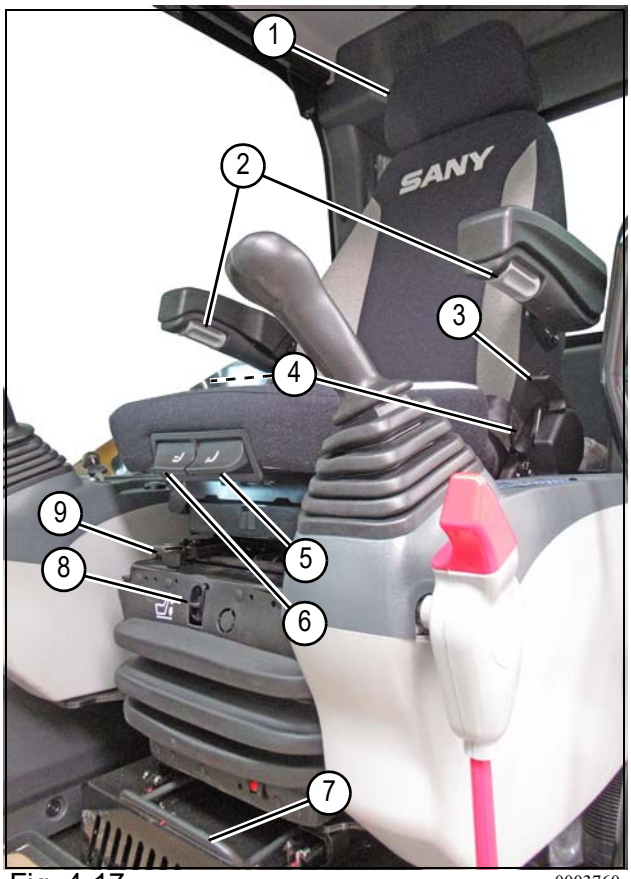


Fig. 4-17 0003760

- Lever (9) adjusts the upper seat mount forward or backward.
- Heat switch (10) turns the heated seat on and off.
- Lumbar adjustment knob (11) increases or decreases the lumbar support in the backrest.

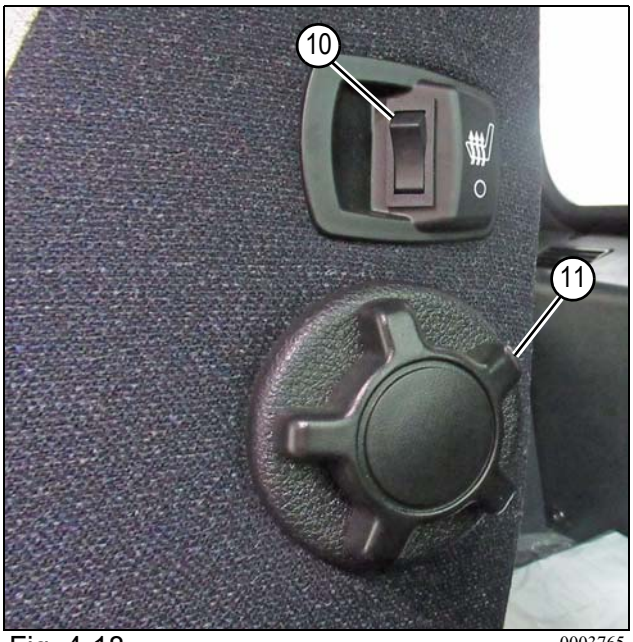


Fig. 4-18 0003765

# NEW MACHINE BREAK-IN

**NOTICE!**

**The machine has been throughly tested and adjusted before shipment. However, initial operation of the machine under severe conditions can adversely affect the performance of the machine or shorten the machine life. SANY recommends a break-in period of 100 service hours for a new machine. Properly break in a new machine is crucial for a long service life by allowing time for internal engine parts to break in.**

1. Stat the engine and run at low idle until it reaches proper operating temperature. Do not move the controls.
2. Avoid operating the machine under heavy loads or at high speeds during the break-in period. Operate as much as possible in the 1/2 to 3/4 throttle or load range. Do not operate this machine with a full load during the break-in period.
3. Avoid sudden starts, movements, or stops, except in an emergency.
4. Monitor the instruments frequently – especially the engine oil pressure and engine coolant temperature.
5. Avoid operating the engine at low idle for extended periods of time.
6. Manage engine power to allow acceleration to governed speed when conditions require more power. Do not over-rev the engine.
7. Always allow the engine to cool before shutting it down.
8. After shutting down the engine, check all fluid levels.

# PRESTART CHECKS AND ADJUSTMENTS

Complete the following checks and adjustments before starting the engine each day:

- Before operating the machine check the Maintenance Log to verify that all required maintenance checks have been performed before operating the machine.
- Check the machine for loose hardware, fluid leaks, or any other signs of damage. Make repairs as necessary.
- Check that the machine fluids are at operational levels.
- Inspect the engine compartment for combustible debris that may come in contact with hot engine components. Clear all debris from the engine and engine compartment.
- Check the undercarriage (track, sprockets, tension rollers, and guards) for damage, wear, loose fasteners, or roller oil leaks. Make repairs as necessary.
- Check the bucket or optional equipment for damage. Clean and check the mirrors and side mirror for damage. Repair as necessary. Adjust the mirrors so the area behind the machine is visible from the operator seat.
- Check the seat belt and buckle for damage or wear. Replace if necessary.
- Check the gauges and the monitor in the cab. Contact a SANY dealer to replace or repair any malfunctioning parts or components.

# Check the Pattern Change (SAE/BHL) Valve

**NOTICE!**

**Shutdown the engine before adjusting the pattern change (SAE/BHL) valve. Failure to follow this notice could damage the machine or cause it to operate improperly.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

   - In the SAE mode (position 1) (5), the arm is controlled by the left joystick and the boom by the right joystick.
   - In the BHL mode (position 2) (4), the arm is controlled by the right joystick and the boom is controlled by the left joystick.

2. The pattern change (SAE/BHL) valve (1) is behind the left front access door.


Fig. 4-19 0005246

3. Pull up on the spring-loaded pin (3) and rotate the bar (6) 90°. Release the pin into the hole (2) to lock the bar in place:

   **NOTE:** The pattern change (SAE/BHL) valve switches control of the boom and the arm from one joystick to the other.

   **NOTE:** Both patterns are printed on a card that is posted on the right window. Make sure the card matches the machine operation. If it does not, turn the card over to display the correct pattern.

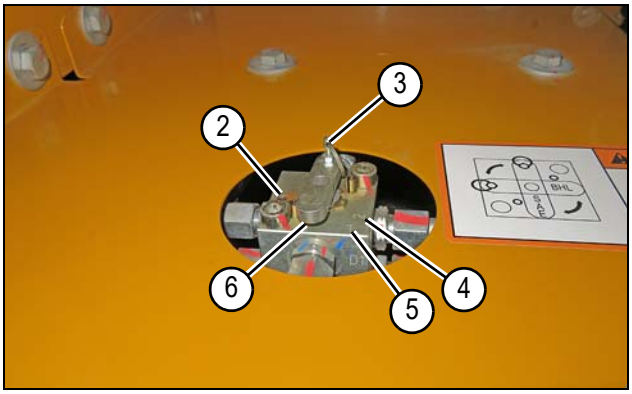



Fig. 4-20 0005248

# Interior

## Cab

**CAUTION!**

- **Never allow passengers to ride on or inside the machine.**
- **Never bring objects into the operator area that could restrict movement or vision.**
- **Appoint a signal person when driving or operating the machine in confined areas. Use standard hand signals before starting the machine.**

**Failure to follow these precautions could result in serious injury.**

Remove all debris from the cab to prevent interference with the operation of the machine.

Make sure the Operation and Maintenance Manual is in the cab.

## Daily Maintenance Record

Before operating the machine check the Maintenance Log to verify that all required maintenance checks have been performed before operating the machine.

**NOTE:** See “Maintenance Log” on page 1-3 for additional information.

## Windshield Latches

**CAUTION!**

**The windshield must be securely locked in the cab when opened or closed. If it is not secured, the windshield may open or close unexpectedly and result in injury or machine damage.**

Push forward on the handles (1) to make sure that the front windshield latches are fully engaged and locked. Make sure the window does not move while operating the machine.

**NOTE:** The right side is shown. The left side is similar.

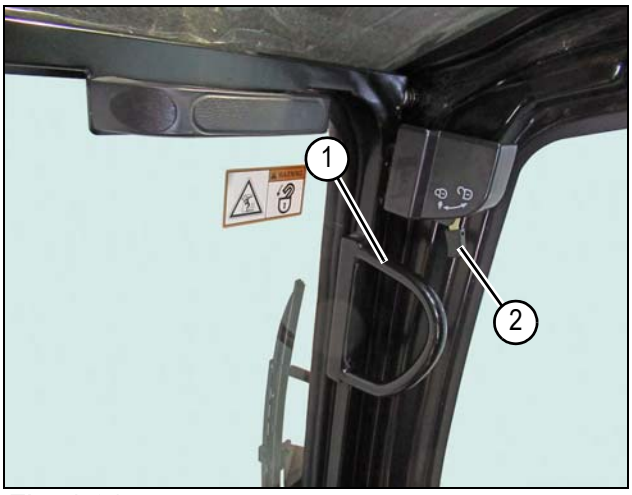



Fig. 4-21 0004487

## Seat Belt

**WARNING!**

- **Check the condition of the seat belt, buckle, and latch plate before using the machine. If the seat belt shows wear or damage, the seat belt must be replaced before using the machine.**
- **Always keep the seat belt fastened during machine operation. Never twist the seat belt when fastening it.**

**Contact a SANY dealer for more information. Failure to follow these warnings could result in death or serious injury.**

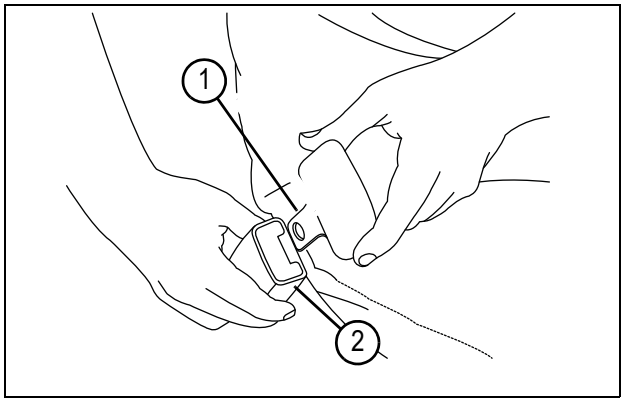


Fig. 4-22 0004353

1. Check the seat belt by fastening it tightly around your waist.
2. Make sure the latch plate (1) and buckle (2) connect securely.

**WARNING!**

**Keep 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 follow this warning could result in death or serious injury.**

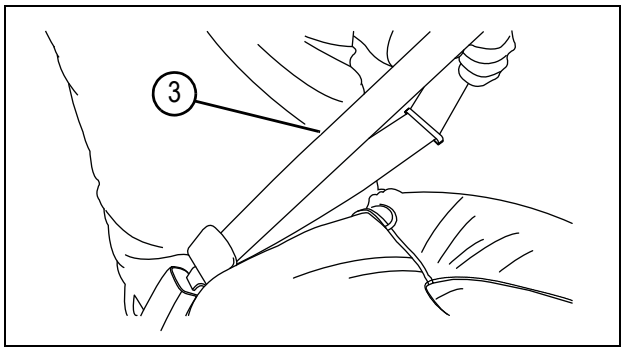


Fig. 4-23 0004354

3. Make sure the belt fits securely and that there is no slack (3) in the belt.

4. Press the red button (4) to release the latch plate from the buckle (5).

**WARNING!**

**Contact a SANY dealer if the seat belt fails any of these checks, or failures to fasten or unfasten. Failure to follow this warning could result in death or serious injury.**

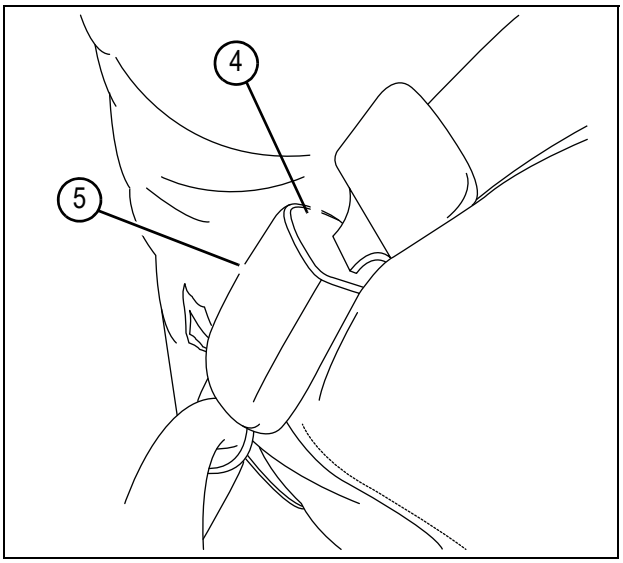



Fig. 4-24 0004355

## Mirrors

The machine has two flat mirrors (1) and one convex mirror (2) for viewing around the machine.

To position the mirrors, loosen the mounting fasteners (not shown). When positioned properly, tighten the mounting fasteners securely.


Fig. 4-25 0000452

## Backup Camera

1. Make sure that the backup camera (1) is free from debris.

2. From the home screen, press button F4 to activate the backup camera. Press button F4 again to turn off the camera.

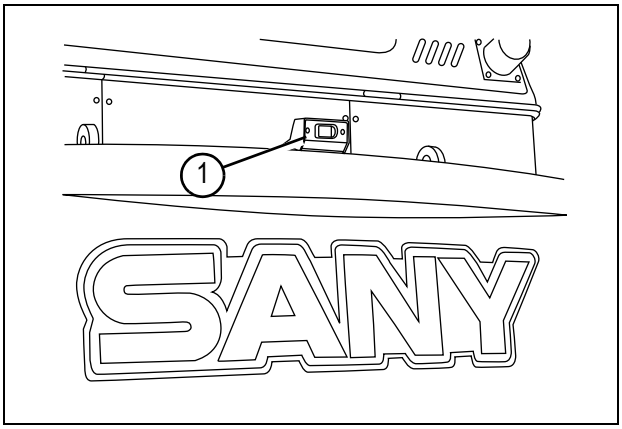



Fig. 4-26 0004357

## Operator Controls

With the key switch (3) OFF, check the joysticks (1), travel control levers (2), and travel control pedals (4) for smooth operation. The joysticks and travel controls should return to neutral freely and there should not be excessive play.

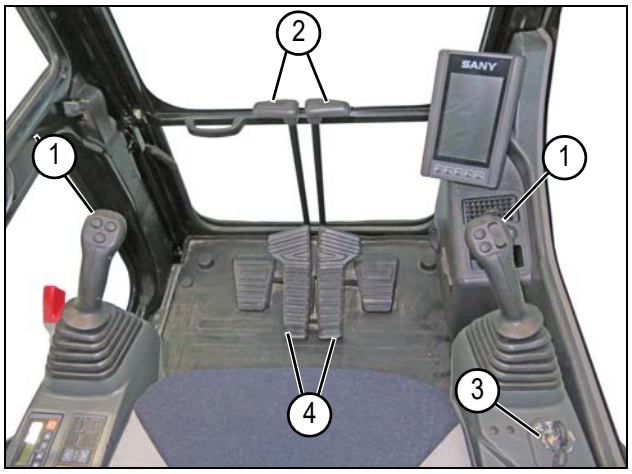



Fig. 4-27 0005255

## Lights and Warning Devices

Check the following for proper operation with the key switch in the ON position:

- The horn button (1) is on the left joystick.

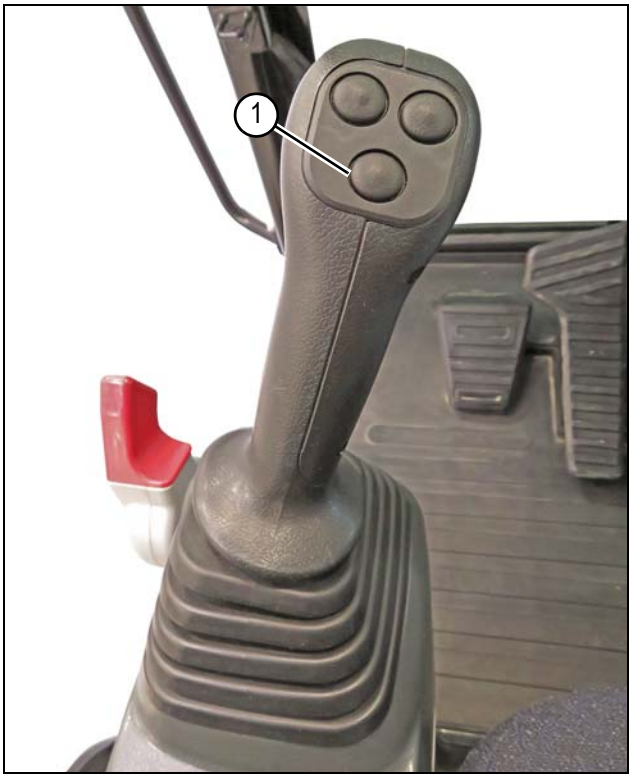



Fig. 4-28 0005230

- The work light switch (2) is on the right console.
- The beacon switch (3) is on the right console.

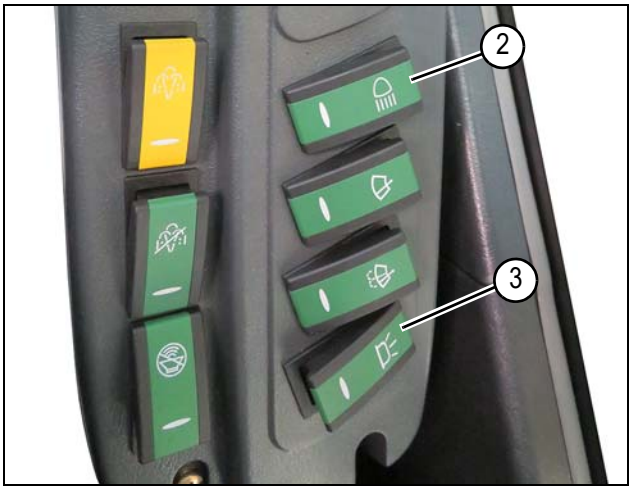



Fig. 4-29 0005313

## Fire Extinguisher

The fire extinguisher (1) is inside the cab, behind the seat.

Always keep a fire extinguisher on the machine. Read the instructions on the fire extinguisher carefully, and know how to use it in an emergency.

Inspect the condition of the fire extinguisher daily. If damaged, replace the extinguisher immediately.

Make sure the fire extinguisher is within the listed inspection period. Replace the fire extinguisher immediately if it has reached its expiration date.

The fire extinguisher must be at least a 2.5 lb. type ABC rated fire extinguisher (National Fire Protection Association [NFPA] 10 Standard for Portable Fire Extinguishers).


Fig. 4-30 0005232

## Escape Tool

If the cab door or windshield cannot be opened during an emergency, the escape tool (1) can be used to break a cab window, which can be used as an alternate exit.

To use the escape tool, grasp the handle and remove it from the holder. Firmly strike a cab window to break it.


Fig. 4-31 0005232

# INITIAL MONITOR SETTINGS

The monitor (1) is in the right front corner of the cab. Change or adjust the following screen settings as needed:

Fig. 4-32 0005229

## Language Selection

The Language Setting screen is accessed from the System Setting selection on the Main Menu screen. See “System Language Setup Screen” on page 3-48.

## System Clock Calibration

See “Date/Time Setting Screen” on page 3-44 to set the time and date.

## Data Unit Setting

The Data Unit Setting screen allows the operator to select which units of measure (metric or imperial) are displayed on the monitor. See “Data Unit Setting Screen” on page 3-46.

# STARTING THE ENGINE

**WARNING!**

- **Before starting the engine or leaving the operator seat, make sure the hydraulic lockout control lever is in the locked (closed) position. If the hydraulic system is not locked, unintentional machine operation may occur.**
- **Confirm that the surrounding area is clear of personnel and obstructions, and sound the horn before starting the engine.**
- **Always start the engine from the operator seat. Never start the engine by shorting the starter solenoid or starter relay.**
- **Never use ether starting fluid to start the engine. Ether is highly flammable and can cause a fire or an explosion.**
- **Exhaust gas contains carbon monoxide. Carbon monoxide is an invisible and odorless gas, and is toxic. Provide adequate ventilation when starting the engine in a confined space.**

**Failure to follow these warnings could result in death or serious injury.**

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

**WARNING!**

**The machine should not move when the hydraulic lockout control lever is in the locked (closed) position. If it does, contact a SANY dealer. Failure to correct this could result in death or serious injury.**

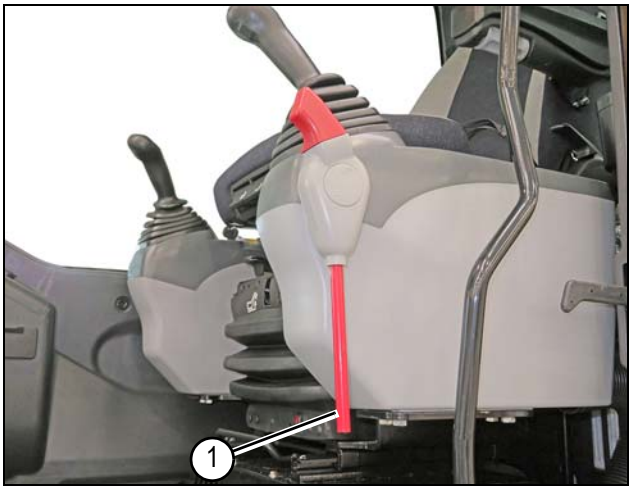


Fig. 4-33 0004363

Perform the following steps to start the engine:

1. Move the hydraulic lockout control lever (1) to the locked (closed) position.

2. Make sure that the emergency stop toggle switch (3) is set to its forward position with its red cover (3) down.

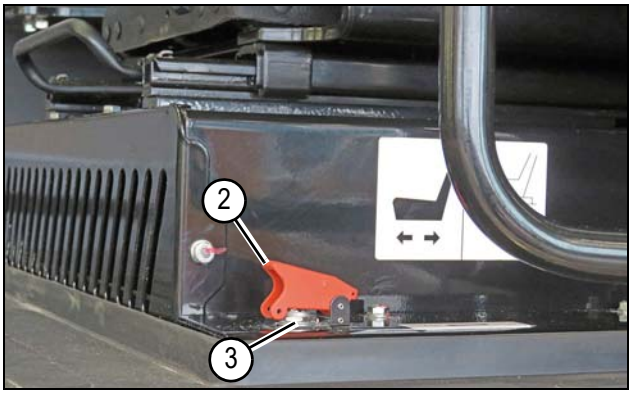



Fig. 4-34 0005256

3. Set the throttle control dial (4) to MIN (low idle).

4. Turn the key switch (5) to ON and check the monitor. If all readings are normal and no fault codes are present, the display will return to the default page within 2 seconds.

   **NOTE:** The monitor displays the home screen after the key switch is turned to the ON position.

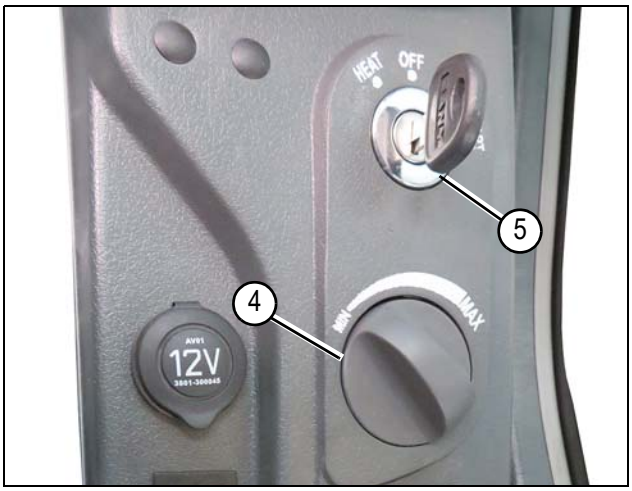



Fig. 4-35 0005312

The home screen displays the following information:

- Current date and time (1)
- Service hours (2)
- Notification icons (3)
- Error code indicator (if any) (4)
- Work tool selected (5)
- Engine coolant temperature gauge (6)
- Function buttons F1–F5 (7)
- Work mode icon (8)
- Engine speed (rpm) (9)
- Diesel Exhaust Fluid (DEF) level gauge (10)
- Fuel level gauge (11)
- Work mode (12)

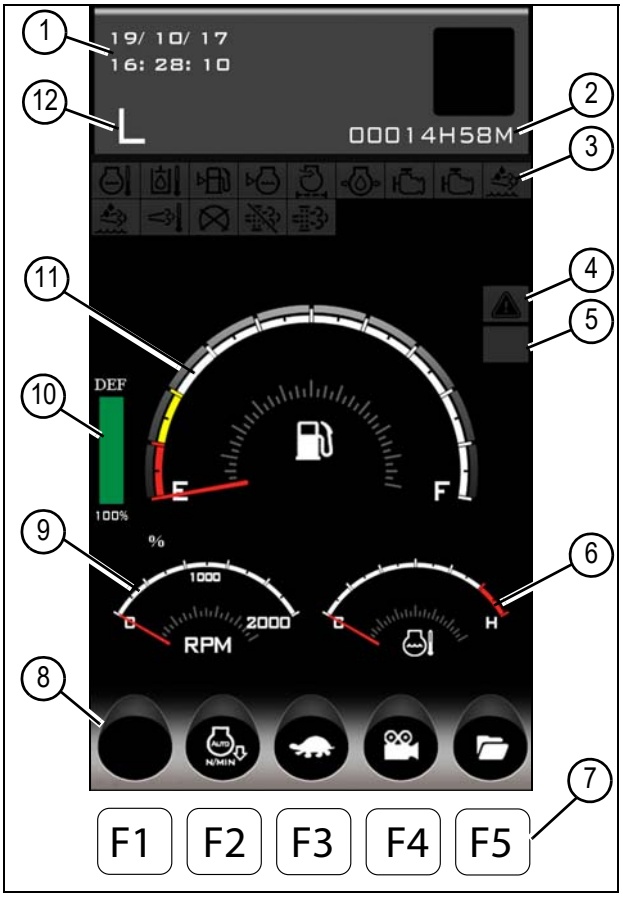



Fig. 4-36 0004595, 0004622

**NOTE:** The error code warning indicator (4) illuminates yellow if a failure is detected. Contact a SANY dealer to correct any error code issues.

5. Sound the horn to warn personnel that the machine is being started.

**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 2 minutes before attempting another start. If the engine fails to start after five attempts, contact a SANY dealer. Failure to follow this notice could damage the machine or cause it to operate improperly.**

6. Turn the key switch to START. When the engine starts, release the key. It will return to the ON position.

   **NOTE:** If the engine fails to start after five attempts, contact a SANY dealer.

7. Check for black exhaust smoke, loud noise, or excessive vibration. If found, shut down the engine immediately and contact a SANY dealer.

8. Check the engine instruments and monitor for any error codes after starting.

9. Shut down the engine if an error code is shown on the display screen and contact a SANY dealer.

## Idle the Engine

Idling the engine for long periods wastes fuel and 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. Allow the engine to idle until the engine coolant temperature reaches a normal operating temperature.

### Machine Warm-up

1. Start the engine.
2. Adjust the throttle to run the engine unloaded at low idle for about 5 minutes.

**NOTICE!**

**Do not over-rev the engine during the warm-up period. Operating the engine beyond its design levels could cause damage to the machine.**

3. Place the hydraulic lockout control lever in the unlocked (open) position.
4. Adjust the throttle to run the engine unloaded at 1400 rpm, then slowly operate the bucket for 5 minutes.
5. Adjust the throttle to run the engine at high idle, then operate the boom, arm, and bucket for 5–10 minutes.
6. Cycle each function of the machine several times.
7. Continue to warm up the machine until the engine coolant temperature reaches the normal operating range displayed on the monitor.
8. Press function button F1 (2) to select the desired work mode. The mode will be displayed in the icon (1) on the monitor.


Fig. 4-37 0004595, 0004622

## Engine Shutdown Procedure

**NOTICE!**

- **Stopping the engine before it cools can accelerate engine component wear. Never abruptly shut down the engine, except in an emergency**
- **Never stop the engine suddenly when it is overheated. Run the engine at low idle to allow the engine to cool down gradually before shutting it down.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

1. Park the machine on a firm, level surface.
2. Lower the bucket or optional equipment to the ground.
3. Adjust the throttle control dial to MIN (low idle) and allow the engine to idle for 5 minutes to cool down.
4. Turn the key switch to OFF.
5. With the engine off and the key in the ON position, raise the hydraulic control lever to the unlocked (open) position and operate all hydraulic controls to relieve the hydraulic system pressure.
6. Turn the key switch to the OFF position and remove the key. Move the hydraulic lockout control lever to the locked (closed) position..

**NOTICE!**

- **Never turn the battery disconnect switch to OFF while the engine is running. This can damage the electrical system or cause the machine to operate improperly.**
- **After machine shutdown, wait at least 2 minutes for the engine control module (ECM) to complete its shutdown before turning the battery disconnect switch to OFF.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

## Jump-Start the Engine

**CAUTION!**

- **When working with any live electrical power circuit, make sure to remove any metal objects (rings, watches, jewelry, etc.) that could come in contact with electrical circuits and cause a short-circuit.**

- **Wear personal protective equipment (PPE) when working with batteries. Burns or injury can occur. If battery acid makes contact with skin or eyes, flush the area immediately with fresh water and seek medical attention.**

**Failure to follow these precautions could result in serious 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 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, free of corrosion, suitable for the battery amperage, and securely attached.**

- **All machine controls must be set in their neutral position.**

- **Use caution when disconnecting jumper cables after running. Never allow the jumper cable clamps to touch each other.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

1. Make sure that the key switch of both machines is OFF.

**NOTICE!**

**Make sure that all jumper cables are securely clamped to their connections.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

2. Clamp one end of a jumper cable to the positive (+) red terminal (1) 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 negative (-) black terminal of the charged battery.

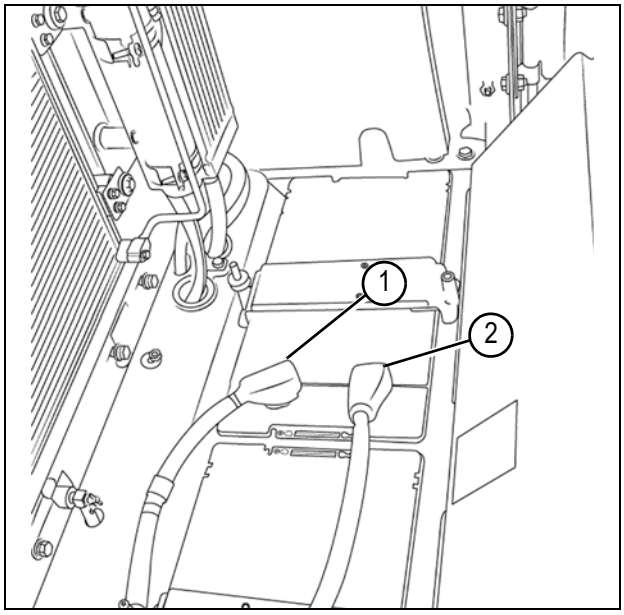


Fig. 4-38 0000055

5. Clamp the other end of the second jumper cable to the negative (-) black terminal (2) of the discharged battery or an unpainted area of the frame of the machine with the drained battery.

6. Start the engine with the charged battery and run it at medium rpm..

**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 2 minutes before attempting another start. If the engine fails to start after five attempts, contact a SANY dealer. Failure to follow this notice could damage the machine or cause it to operate improperly.**

7. Attempt to start the engine of the machine with the drained battery. Retry after 3 minutes if the engine will not start.

   **NOTE:** Contact a SANY dealer if the engine will not start after five attempts.

8. Perform steps 2 through 5 in reverse order to disconnect the jumper cables from the machine with the drained battery and from the machine with the charged battery.

# TRAVEL OPERATIONS

**CAUTION!**

- **Never allow passengers to ride on or inside the machine.**
- **Never bring objects into the operator area that could restrict movement or vision.**
- **Appoint a signal person when driving or operating the machine in confined areas. Use standard hand signals before starting the machine.**

**Failure to follow these precautions could result in injury or machine damage.**

**NOTICE!**

- **Standard travel direction: The idlers are in the front of the track assemblies, and the travel motors are at the rear of the track assemblies. If the travel motors are in the front of the machine, the travel control pedals will operate in reverse. Check the position of the travel motors before traveling.**
- **Stop the machine for 5 minutes after every 20 minutes of traveling. Prolonged traveling may strain the travel motors.**

## Before Travel

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

   **NOTE:** Check the direction of the track frame (directional arrow) before operating the travel control levers/pedals. The track frame is facing forward when the drive sprocket is to the rear of the operator. All travel controls are reversed when the machine is facing rearward (drive sprocket is forward of operator). See “Track Direction” on page 4-33.


Fig. 4-39 0005312

2. Move the hydraulic lockout control lever (2) to the unlocked (open) position.

3. Check the surroundings and sound the horn before moving the machine.

4. Raise work equipment a minimum of 16 in.–20 in. (40 cm–50 cm) above the ground.

5. Raise the boom to make sure there is good visibility to the operator's right.

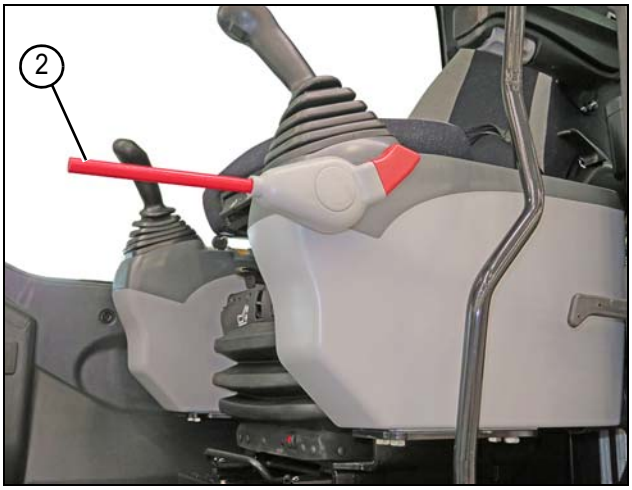



Fig. 4-40 0005235

## Track Direction

The direction arrow (1) on each of the track frames indicates the forward direction of the undercarriage. Check these arrows before using the travel control levers/pedals. When possible, face the cab in this direction. This 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 undercarriage in the normal position.

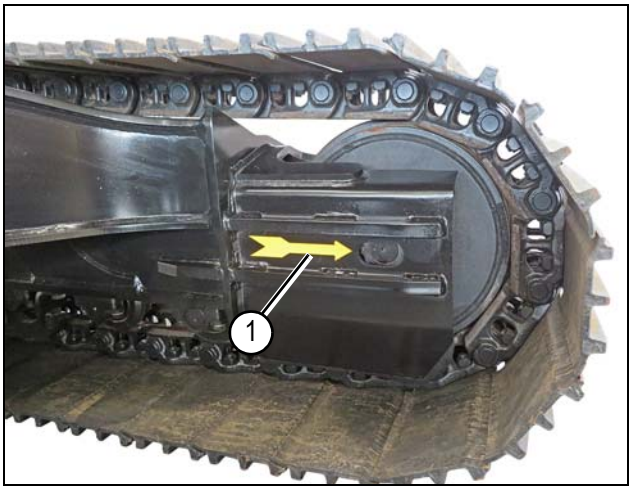



Fig. 4-41 0005213

## Travel with the Undercarriage Reversed

**CAUTION!**

**Traveling with the undercarriage reversed could pose a hazard resulting in injury. Failure to observe and follow this warning could result in death or injury.**

When the cab faces backward, the travel direction will be the reverse of the normal travel control functions. (The machine moves forward when you pull the control levers backward, and the machine moves backward when you push the control levers forward.)

SANY does not recommend traveling with the undercarriage reversed.

Always keep in mind that the travel control levers will be working in the opposite direction from normal travel.

## Forward Travel

Push both travel control levers equally or press the top of both foot pedals equally to move the machine forward.

## Backward Travel

Pull both travel control levers equally or press the bottom of both foot pedals equally to move the machine backwards.

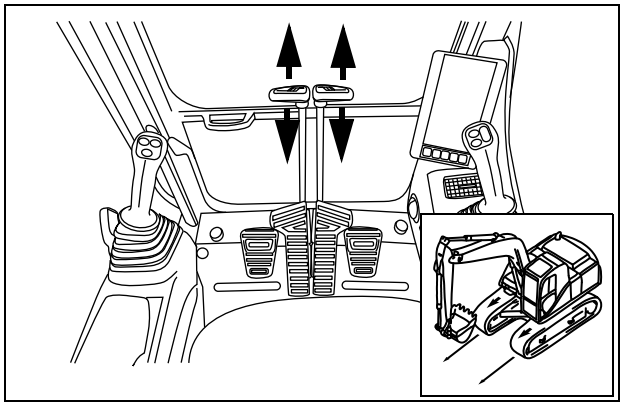


Fig. 4-42 0004007, 0004370

## Right Turn

Push the left travel control lever or press the top of the left foot pedal with the right travel control lever and foot pedal in the neutral position to turn the machine to the right.

The farther the control is moved, the faster the left track moves.

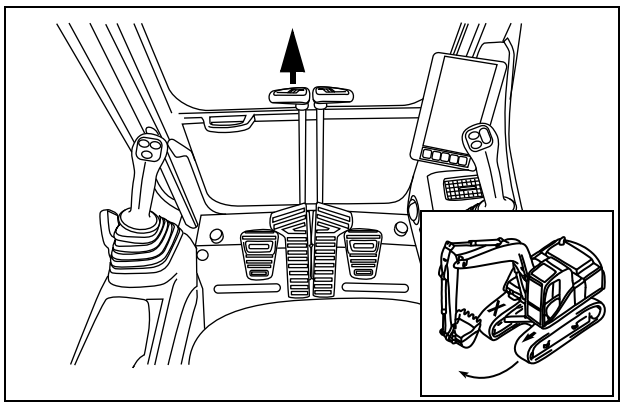


Fig. 4-43 0004007, 0004368

## Left Turn

Push the right travel control lever or press the top of the right foot pedal with the left travel control lever and foot pedal in the neutral position to turn the machine to the left.

The farther the control is moved, the faster the right track moves.

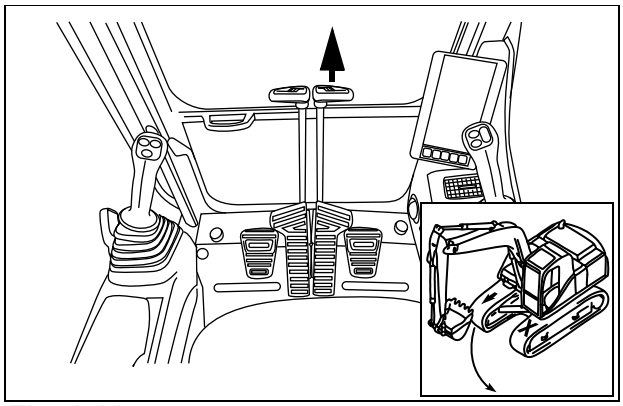


Fig. 4-44 0004007,0004369

## Spot Turning

### To the Left

Simultaneously push the right travel control lever or press the top of the right foot pedal and pull the left travel control lever or press the bottom of the left foot pedal to rotate the machine to the left.

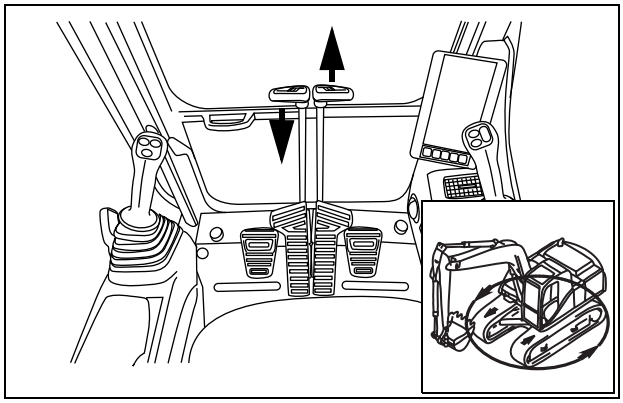


Fig. 4-45 0004007, 0004371

### To the Right

Simultaneously push the left travel control lever or press the top of the left foot pedal and pull the right travel control lever or press the bottom of the right foot pedal to rotate the machine to the left.

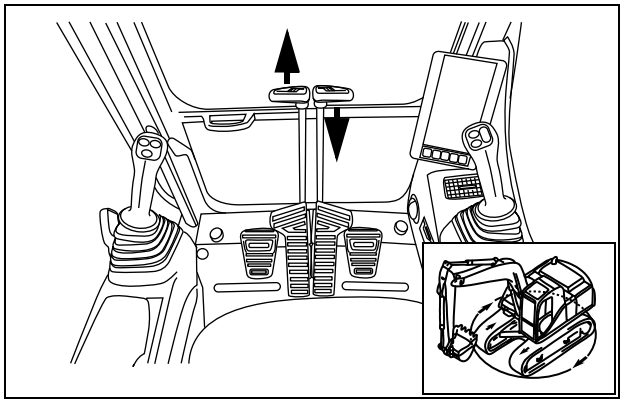


Fig. 4-46 0004007, 0004310

## Operating on Inclines

**WARNING!**

**Operating the machine on an incline may cause the machine to become unstable.**

**• Use caution when operating the machine on inclines, and use a lower engine rpm.**

**• Operate the machine slowly and monitor machine movement.**

**• Do not travel on an incline with the bucket loaded or with a lifted load.**

**• Do not swing a loaded bucket toward the downhill direction.**

**• Build a platform on an incline so the machine can be operated on a level surface.**

**Failure to follow these warnings could result in death or serious injury.**

Observe the following when operating a machine on a slope:

- Do not travel on a slope exceeding 15° side to side or 35° front and back.
- The hydraulic tank must be more than half full.
- Avoid holes, rocks, extremely soft surfaces, and other obstacles that might subject the machine to undue stresses and possible tipover.
- Keep the bucket pointed toward the traveling direction and 16 in.–20 in. (40 cm–50 cm) off the ground. Travel at low speed.
- Always set the throttle control dial to maintain a slow speed while traveling up or down a slope.
- Do not attempt to change direction on a slope, or the machine may slip and tip over. Only perform a direction change on an even and solid surface.
- Do not travel in reverse on a slope.

## Operating in Water

**NOTICE!**

**Operate the machine slowly when traveling through water. Check the depth of the water with the bucket. Do not operate the machine in a marine environment. Salt in seawater can damage the tracks.**

**When operating the machine out of water on a grade steeper than 15°, the rear of the upper structure may be submerged in water. The radiator fan may sustain damage that can damage the machine or cause the equipment to operate improperly.**

Observe the following when operating the machine in water:

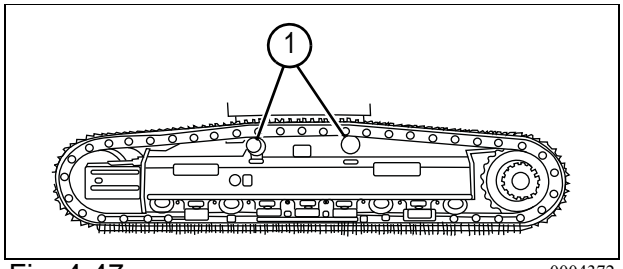


Fig. 4-47 0004372

- Do not drive the machine where the water level could reach the center of the carrier rollers (1).
- Grease parts that have been submerged until the old grease has been displaced from the bearing (especially from the bucket pin).
- Do not operate the machine in water unless the work site foundation is strong enough to properly support the machine.
- Continuously monitor the condition of the machine when operating in water. Move the machine to a different location if necessary.
- Make sure the swing bearing, swing drive gear, and swivel do not become submerged in water.

**NOTE:** If the swing bearing, swing drive gear, or swivel have been submerged in water, they must be cleaned. Lubricate the swing drive gear and swing bearing.

## Releasing the Machine from Mud.

**WARNING!**

**Use caution when placing cribbing under the track, since the machine is supported only by the boom and could drop without warning, causing injury or death.**

### One Track Stuck

**NOTE:** Use cribbing to provide a firm surface if necessary.

To release a machine that is stuck in mud, perform the following:

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 the back of the bucket touches the ground.

4. Lower the boom to raise the track.

   **NOTE:** Use cribbing to provide a firm surface if necessary.

5. Place cribbing under the track.
6. Raise the boom to lower the track onto the cribbing.
7. 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 the back of the bucket touches the ground.
4. Lower the boom to lift the front of the tracks.

   **NOTE:** Use cribbing to provide a firm surface if necessary.

5. Place cribbing under the tracks.
6. Raise the boom to lower the tracks onto the cribbing.
7. Cut the bucket into the ground in front of the machine.
8. Retract the arm as with normal excavating while driving the machine forward out of the mud.

## Towing the Machine

**WARNING!**

- **Do not exceed the wire rope(s) rated capacity.**
- **Never use a broken chain, worn wire rope(s), or a bent tow hook to tow the machine.**
- **Never jerk the wire rope(s).**

**Failure to follow these warnings could result in death or serious injury.**

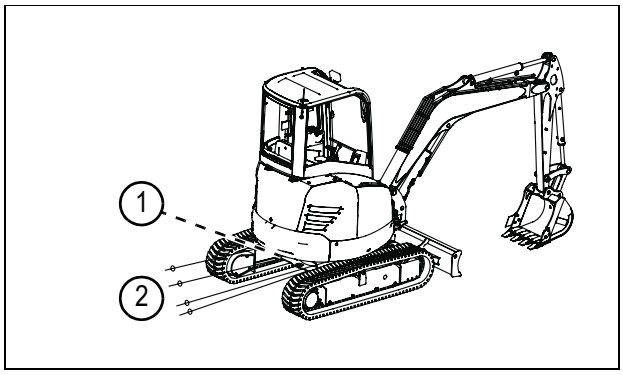



Fig. 4-48 0002911

If the machine is stuck in mud or soft terrain and is unable to get out under its own power, use wire rope(s) (2) attached to the frame towing point (1) to assist in its removal

## Towing Point for a Light Load

**WARNING!**

- **Make sure the wire ropes used for towing the machine are strong enough.**
- **A shackle must be used. Keep the wire ropes horizontal and parallel to the tracks.**
- **Drive the machine at low speed.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

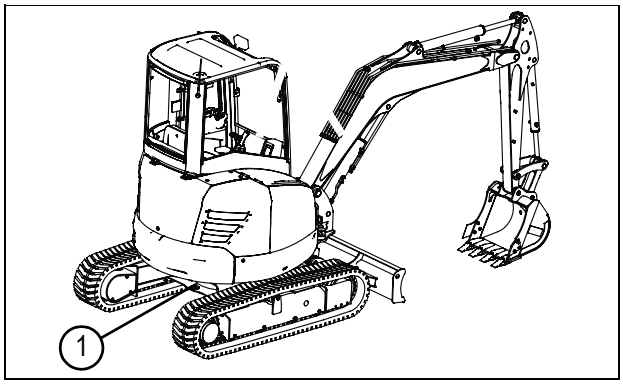



Fig. 4-49 0002913

The machine is equipped with a light-load towing point (1) on the frame that can be used to tow a light load.

# CONTROL WORK EQUIPMENT

**WARNING!**

- **Contact the site supervisor before any digging to make sure that all underground hazards have been located.**
- **Never allow any personnel within the work area of the machine while being operated.**
- **Avoid moving any control lever or pedal to abruptly change the direction of the machine.**
- **Avoid sudden stops when lowering the boom. Hydraulic shock could damage the hydraulic system.**

**Failure to follow these warnings could result in death or serious injury**

## SAE Control Pattern

See “SAE Mode” on page 3-10 for additional information.

### Arm Control–SAE Mode

To extend the arm, move the left joystick forward.

To retract the arm, move the left joystick rearward.

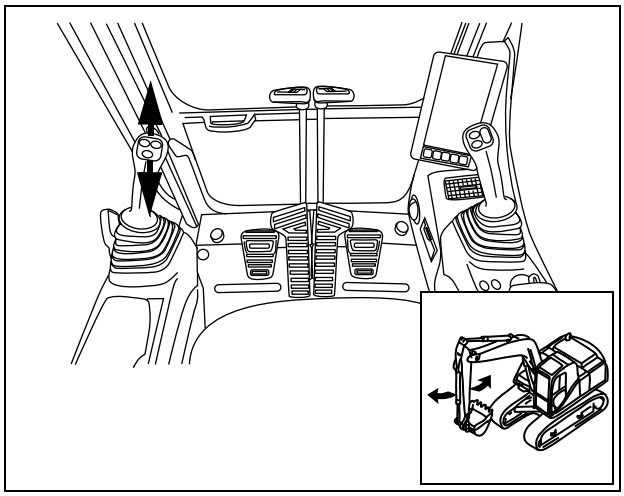


Fig. 4-50 0004007, 0004009

## Boom Control–SAE Mode

To lower the boom, move the right joystick forward.

To raise the boom, move the right joystick rearward.

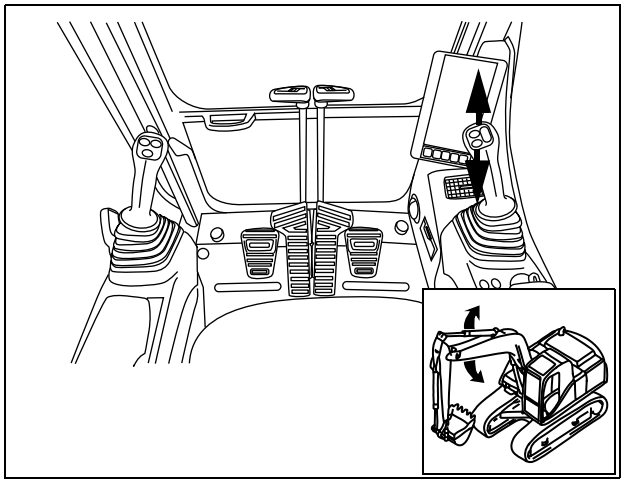


Fig. 4-51 0004007, 0004010

## Swing Control

**NOTE:** The swing function is the same for Society of Automotive Engineers (SAE) and Backhoe Loader (BHL) operating modes.

To swing the work equipment to the left, move the left joystick to the left.

To swing the work equipment to the right, move the left joystick to the right.

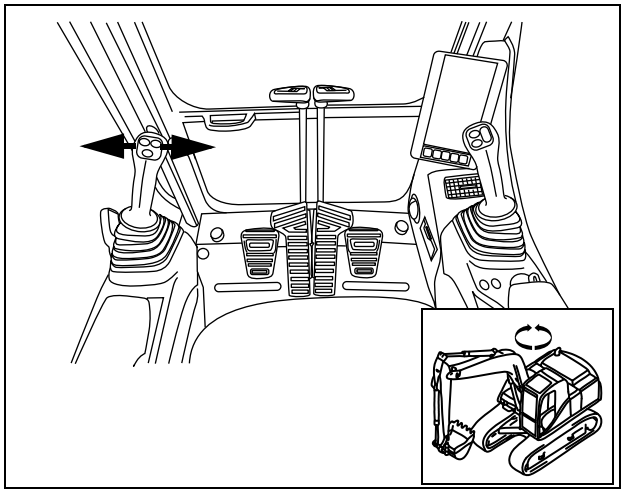


Fig. 4-52 0004007, 0004008

## Bucket Control

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

To curl the bucket, move the right joystick to the left.

To dump the bucket, move the right joystick to the right.

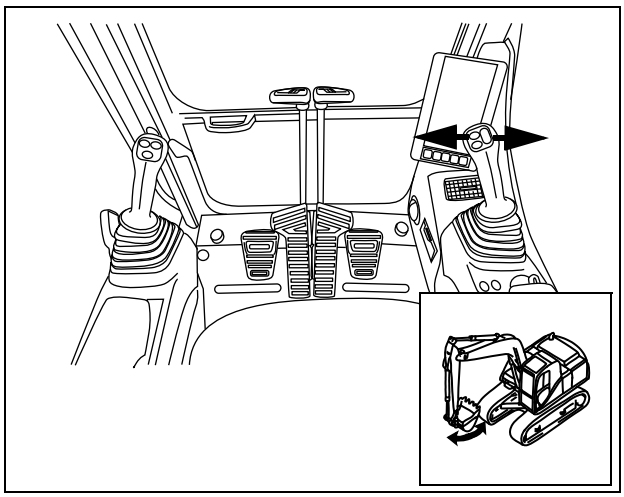


Fig. 4-53 0004007, 0004011

## BHL Control Pattern

See “BHL Mode” on page 3-11 for operation information.

### Arm Control–BHL Mode

To extend the arm, move the right joystick forward.

To retract the arm, move the right joystick to the rear.

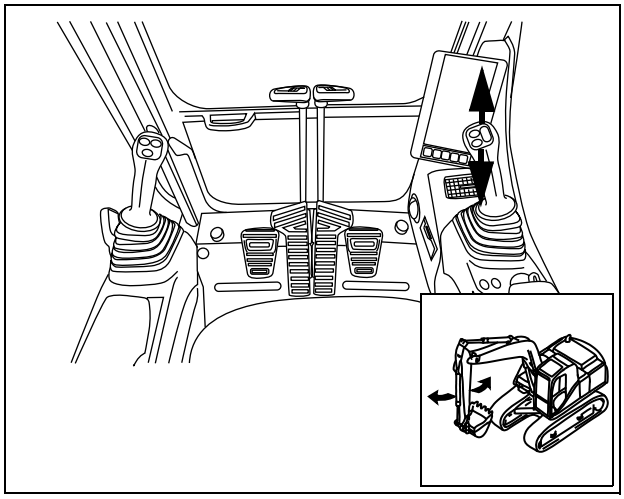


Fig. 4-54 0004007, 0004009

### Boom Control–BHL Mode

To lower the boom, move the left joystick forward.

To raise the boom, move the left joystick to the rear.

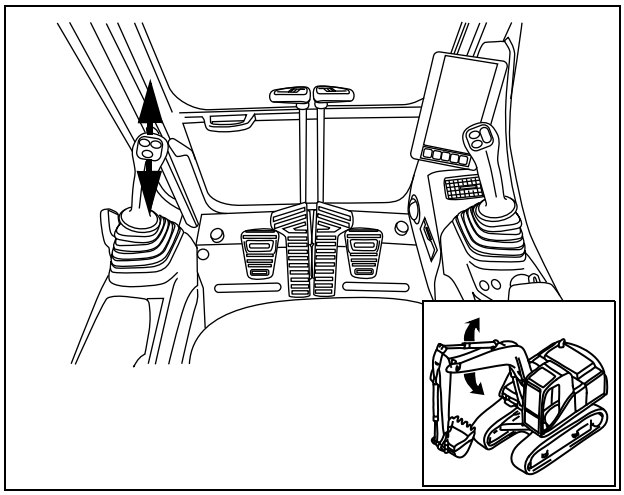


Fig. 4-55 0004007, 0004010

## Swing

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

To swing the work equipment to the left, move the left joystick to the left.

To swing the work equipment to the right, move the left joystick to the right.

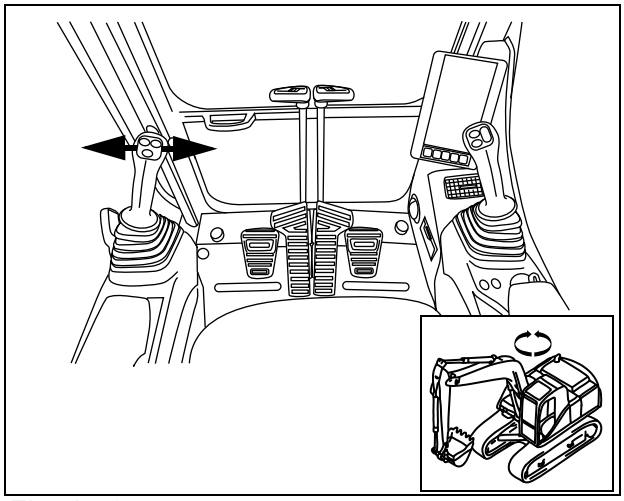


Fig. 4-56 0004007, 0004008

## Bucket

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

To curl the bucket, move the right joystick to the left.

To dump the bucket, move the right joystick to the right.

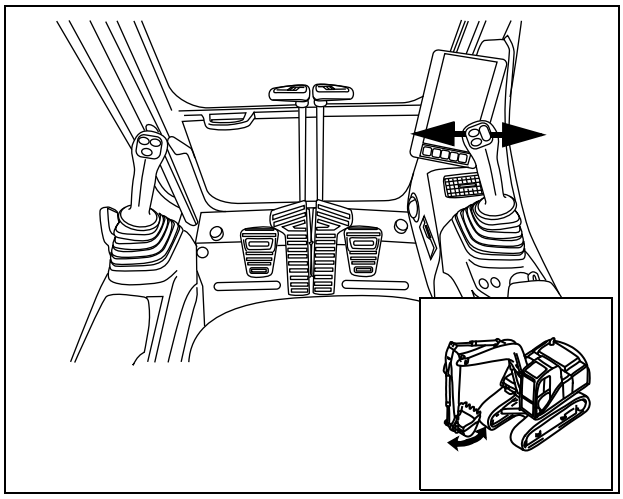


Fig. 4-57 0004007, 0004011

# RECOMMENDED APPLICATIONS

**CAUTION!**

- **Use caution when operating work equipment while the machine is traveling.**
- **When the engine auto-idle is on, moving any control lever will increase the engine rpm.**
- **When the machine is traveling, keep the bucket 8 in.–12 in. (20 cm–30 cm) above the ground.**
- **To avoid injury, never allow any personnel within 26 ft. (8 m) of the machine while it is moving.**

**Failure to follow these precautions could result in injury.**

## Backhoe Operation

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

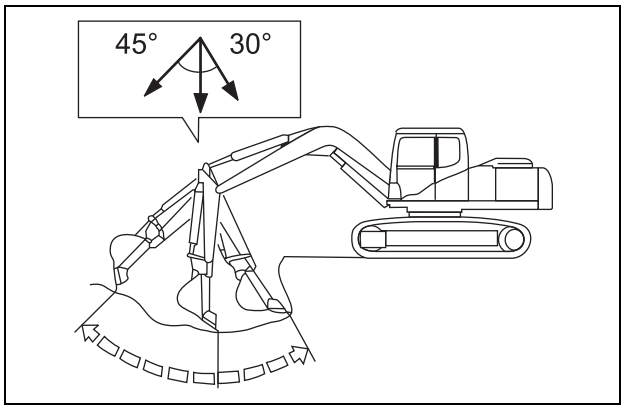



Fig. 4-58 0004373

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

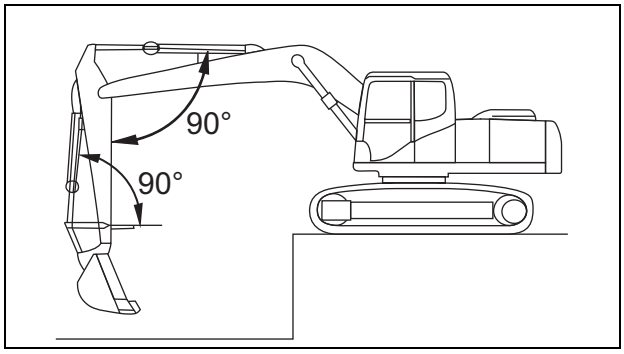



Fig. 4-59 0004374

## Trenching Operation

Trenching 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.

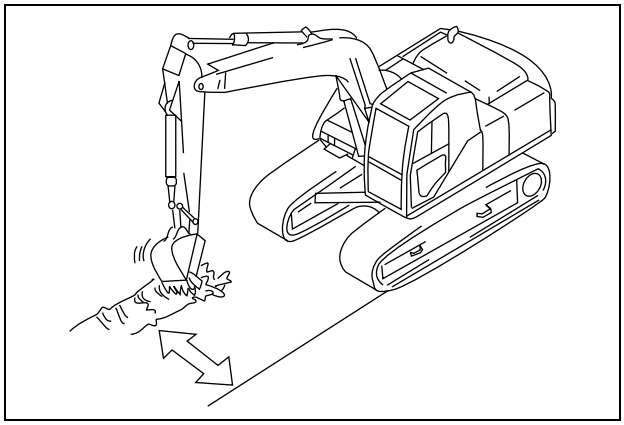


Fig. 4-60 0004375

## Loading Operation

Loading material from the rear of the truck is more convenient than from the side.

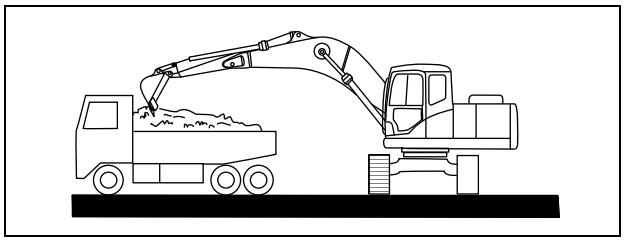


Fig. 4-61 0004376

# END OF WORKDAY CHECKS

1. Remove all built-up mud or debris on the undercarriage and machine exterior.
2. Remove all debris from inside the cab to avoid interference with machine operation.
3. Inspect the machine work equipment, machine exterior, and undercarriage for signs of fluid leaks or damage.

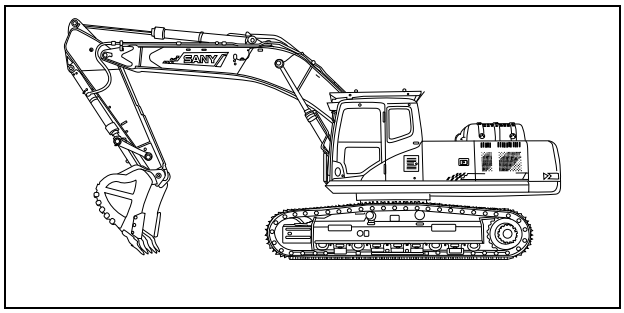


Fig. 4-62 0004071

4. In oceanic (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.

# MANUAL REGENERATION

**WARNING!**

- **The exhaust temperature during diesel particulate filter (DPF) manual regeneration can reach approximately 1100°F (600°C). Make sure there are no flammable materials around the exhaust system or machine. Do not touch any part of the exhaust system.**
- **Exhaust gas contains carbon monoxide. Carbon monoxide is an invisible and odorless gas, and is toxic. Operate the engine only in a well-ventilated area.**

**Failure to follow these warnings could result in death or serious injury.**

**NOTICE!**

**When performing diesel particulate filter (DPF) manual regeneration, start the engine and allow it to warm to an operating temperature of 104°F (40°C). Do not start the regeneration process before the engine is at operating temperature. Failure to follow this notice could damage the machine or cause it to operate improperly.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Make sure the machine has an adequate amount of DEF fluid (1) and enough fuel (2) as shown by the gauges on the monitor home screen.
3. Start the engine and park the machine in a safe location where the exhaust pipe will not face any combustible surface. See “Starting the Engine” on page 4-25.

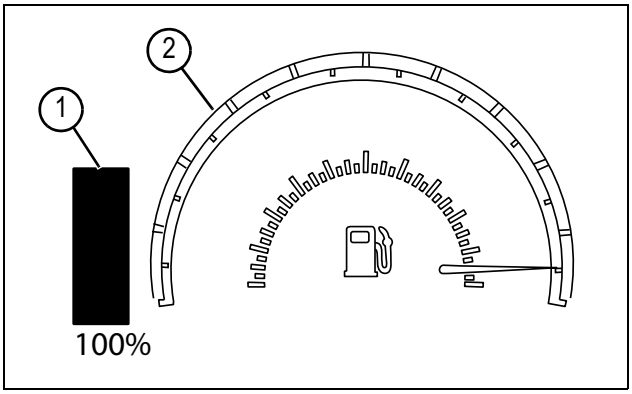


Fig. 4-63 0004797

4. Move the hydraulic lockout lever (3) into the locked (closed) position (4) and run the engine at low idle. See “Hydraulic Lockout Control Lever” on page 3-5.

   **NOTE:** Make sure the DPF regeneration icon is illuminated. The illuminated icon indicates that manual regeneration is permitted. See “Home Screen Function Icons and Buttons” on page 3-38.

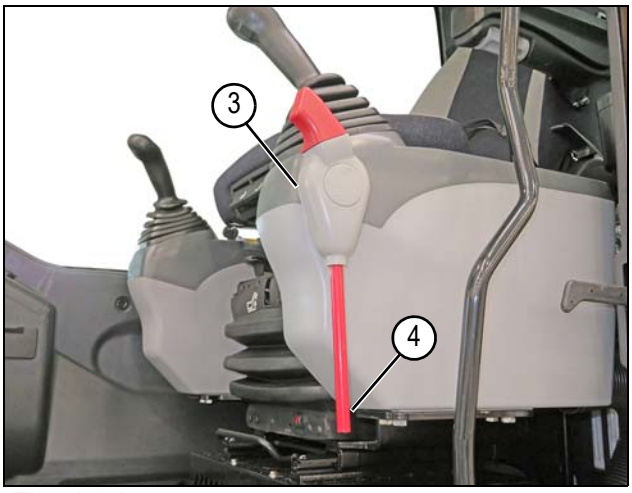


Fig. 4-64 0005234

5. With the engine running at low idle, press the stationary regeneration switch (5) on the right control console.

   **NOTE:** Do not move the hydraulic lockout control lever or throttle control dial during regeneration. Regeneration will stop if either the throttle dial or hydraulic lockout lever is moved, which will require the process to be started again.


Fig. 4-65 0005313

6. The engine rpm and turbocharger sounds may increase, the high exhaust system temperature (HEST) lamp (6) may illuminate, and the regeneration lamp will flash.

   **NOTE:** When the regeneration is complete, the engine will return to idle speed, and the HEST and regeneration lamps will turn off.

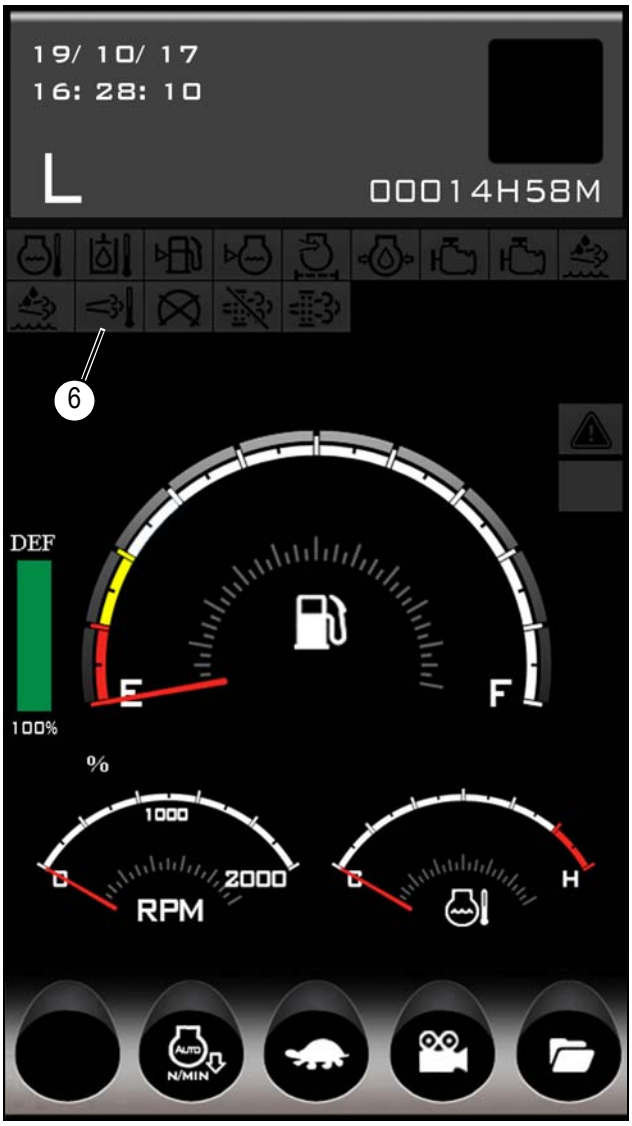



Fig. 4-66 0004595

# BUCKET

## Replace the Bucket Teeth

**WARNING!**

- **Unexpected machine movement can be dangerous when replacing the bucket teeth. Place the bucket on a stable work surface. Shut down the engine and lock out the control levers.**
- **Roll pins may eject with extreme force when removed. Do not allow anyone to stand in front of the pins during pin removal.**
- **Metal fragments from roll pins and tolls may break off during roll pin removal and installation. Wear safety goggles, gloves, and other personal protective equipment (PPE) to prevent serious injury.**

**Failure to follow these warnings could result in death or serious injury.**

**NOTE:** Bucket teeth must be replaced before the bucket tooth adapter (not shown) wears out.

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.
3. Select a stable work surface. Move the hydraulic controls to the neutral position. Keep the bottom of the bucket level on a wooden block (1).

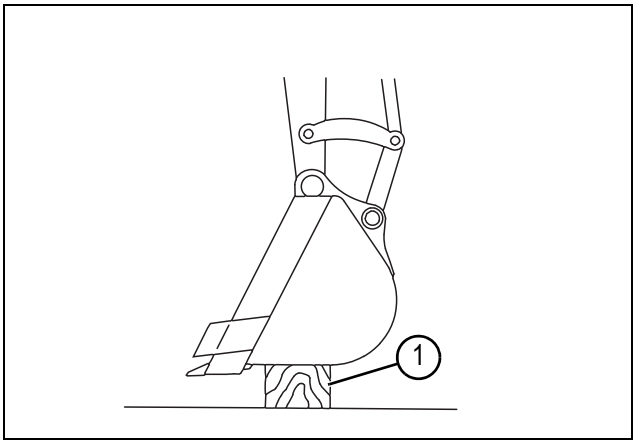



Fig. 4-67 0002350

4. Remove the roll pins (2) and worn bucket teeth (3).

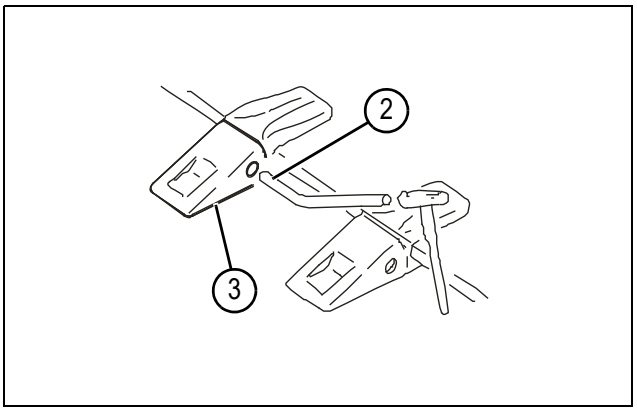



Fig. 4-68 0002351

5. Install new bucket teeth (4) and roll pins (5) in the reverse order of removal.

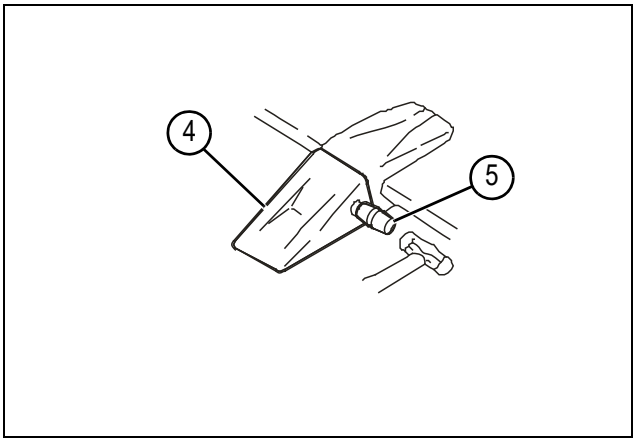



Fig. 4-69 0002352

## Replace the Bucket

**CAUTION!**

- **Keep fingers and other body parts away from pinch points to prevent crushing injuries while removing or installing the bucket. Never put your finger into the pin bore during alignment**
- **Secure bucket after removal and before servicing.**
- **Bucket pins may be ejected with force when removed forcefully. Do not allow anyone to stand in front of the pins during removal.**
- **Never stand or place your feet or other body part under the bucket when removing bucket pins.**

**Failure to follow these precautions could result in death or serious injury.**

### Remove the Bucket

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Lower the bucket to the ground and support the bucket to prevent it from rolling over when the bucket pin is removed.
3. Remove the bucket pin hardware and bucket pins (2) and (4) and remove the bucket (3) from the arm (1) and linkage (5).
4. Clean the pins and pin bores. Lubricate the pin bores with grease.

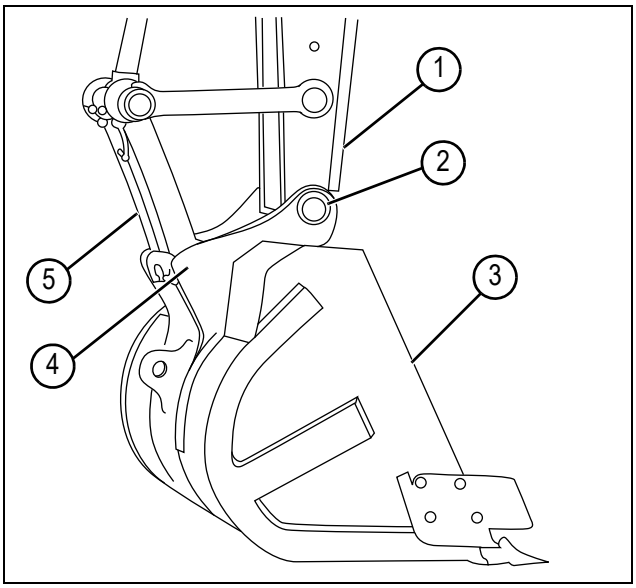



Fig. 4-70 0004799

## Install the Bucket

1. Align the arm with the new bucket. Make sure the bucket is secured and will not move.
2. Align the arm and bucket and install the bucket pin. Install the retaining fasteners into the pin.
3. Align the linkage to the bucket and install the bucket pin. Install the retaining fasteners into the pin.
4. Grease the bucket pins at grease fittings.
5. Start the engine and run it at low idle. Operate the bucket by slowly curling it in both directions to check for binding.

# COLD WEATHER OPERATION

The following recommendations are for operating SANY machines in below-freezing temperatures. See “Key Switch” on page 3-14 for details on using the key switch to preheat the engine for cold-weather starting.

## Battery in Cold Weather

**WARNING!**

**Before proceeding with any battery maintenance procedure, observe the following precautions:**

- **The top of the battery must be kept clean to prevent plugging of the battery vents. Regularly wash the top of the battery to prevent the battery vents from plugging.**
- **Battery gases are explosive. Never smoke around batteries or expose them to sparks or open flames. Work in a well-ventilated area.**
- **Wear personal protective equipment (PPE) when working with batteries.**
- **Battery acid can cause burns or injury. If battery acid makes contact with your skin or eyes, flush the area immediately with fresh water and seek medical attention.**

**Failure to follow this warning could result in death or serious injury.**

In cold climates, battery efficiency will decline. Electrolytes can freeze if the battery charge is low. Keep the battery charged near 100% and in a warm area if possible.

## Engine Lubricants, Fuel, and Engine Coolant in Cold Weather

When operating the machine in low temperatures, the engine may be difficult to start, the fuel line may freeze, and oil may become more viscous. The correct grade of oil for the prevailing temperature must be used in the engine crankcase. Diesel fuel must have a pour point of 10°F (6°C) lower than the lowest expected temperature.

- See “Engine Oil Viscosity/Temperature Data” on page 5-12
- See “Lubricating Grease/Temperature Data” on page 5-12
- See “Industrial Gear Oil/Temperature Data” on page 5-12
- See “Hydraulic Oil/Temperature Data” on page 5-13

## Track Cleaning in Cold Weather

When the temperature is below 32°F (0°C) and mud is built up on the tracks, swing the upper structure 90° and raise the machine so that one track is off the ground. Rotate the track forward and backward to remove the mud from the sprocket, track rollers, and idlers.

## After the Cold Weather Season

Replace the fuel and engine oil with fuel and oil of the specified viscosity. If permanent ethylene glycol engine coolant was not used, and ethanol engine coolant is used as an alternative, drain and flush the cooling system completely. Add new ethylene glycol engine coolant to the cooling system.

## Machine Storage in Cold Weather

Before storing the machine in cold weather:

- Clean the machine.
- Check the engine coolant and engine oil levels, and check for leaks. The machine is normally filled to withstand a maximum low temperature of -40°F (-40°C). Change the fuel, hydraulic oil, and gear oil with new fluids that meet the air temperature requirements as necessary.
- Check the hydraulic motors, hydraulic cylinders, pumps, circuits, and swivels for leaks. Check all cylinder rods for scratches and corrosion. Apply grease to exposed cylinder rods.
- Remove and charge the battery. When the battery is fully charged, store it indoors.
- Start and run the machine on a monthly basis.
- Clean the battery terminals as necessary. Apply a coat of dielectric grease to the terminals.

# PARK AND STORE THE MACHINE

## Overnight Storage

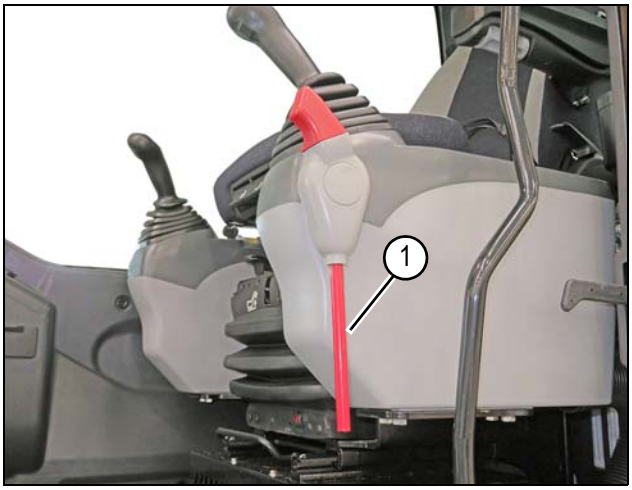



Fig. 4-71 0005234

1. Park the machine on a flat, level surface
2. Lower the work equipment to the ground.
3. Run the engine at low idle for about 5 minutes to allow the engine to cool down. Extend this cool-down time in hot weather.
4. Shut down the engine. With the engine not running and the hydraulic lockout control lever in the unlocked (open) position, turn the key switch to ON. Operate all joysticks and levers to relieve the hydraulic system pressure.
5. Turn the key switch to OFF.

   **NOTE:** Always remove the key when leaving the machine. Keep it with you to prevent unauthorized operation of the machine.

6. Remove the key from the key switch when the engine comes to a complete stop.
7. Move the hydraulic lockout control lever (1) to the locked (closed) position.
8. Close and lock the windows and exit the cab.
9. Fill the fuel tank.
10. Make sure the following items are secured and locked.
    - Cab door (2)
    - Engine cover (3)
    - Left rear access door (4)
    - Air conditioner fresh-air inlet door (5)

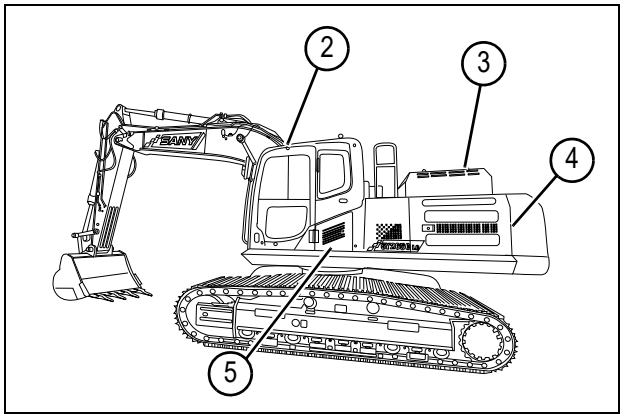



Fig. 4-72 0004378

- Right rear access door (6)
- Fuel tank cap (7)
- Diesel exhaust fluid (DEF) tank compartment (8)

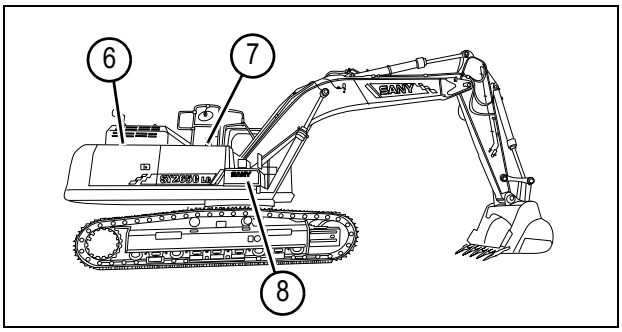



Fig. 4-73 0004379

## Short-Term Storage

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

Complete the “Overnight Storage” on page 4-53 and the following.

- Clean the machine and cover it to protect it from dust.
- Keep the machine dry.
- Keep the machine fully lubricated.

## Long-Term Storage

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

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

### Preparation

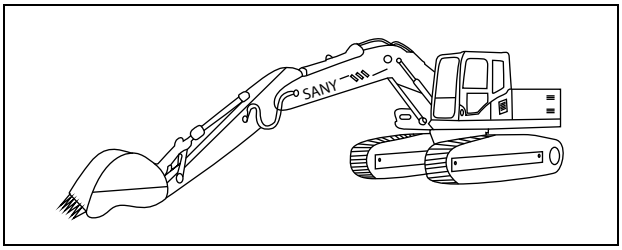



Fig. 4-74 0004380

1. Park the machine in a secure location and position the work equipment with the arm and bucket fully extended.
2. Run the engine at low idle for 5 minutes to cool it down. Extend this cool-down time in hot weather.
3. Shut down the engine and remove the key from the key switch.
4. With the engine not running and the hydraulic lockout control lever in the unlocked (open) position, turn the key switch to the ON position and operate all joysticks and levers to relieve the hydraulic system pressure.
5. Set the hydraulic lockout control lever to the locked (closed) position.
6. Close and lock the windows and exit the cab.
7. Fill the fuel tank.

8. Make sure that the following items are secured and locked:

    - Cab door (1)
    - Engine cover (2)
    - Left rear access door (3)
    - Air conditioner fresh-air inlet panel (4)

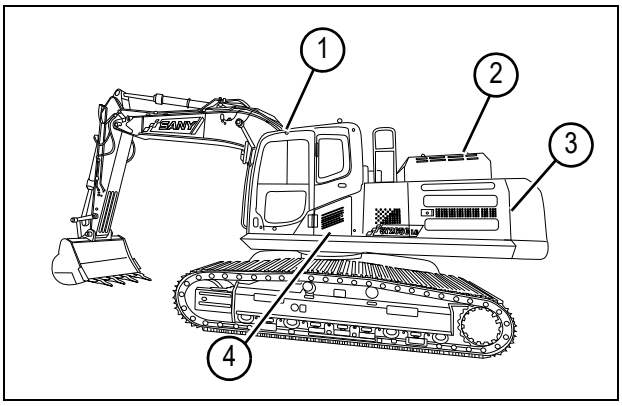



Fig. 4-75 0004378

    - Right rear door (5)
    - Fuel tank cap (6)
    - Diesel exhaust fluid (DEF) tank compartment (7)

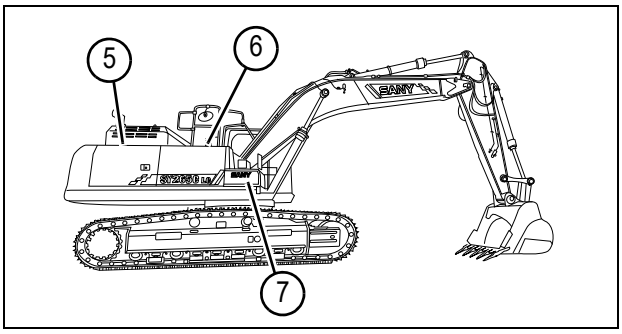



Fig. 4-76 0004379

9. Apply a thin layer of grease to any exposed cylinder rods.
10. Change the engine oil. See “Change the Engine Oil and Filter” on page 5-37.
11. Turn the battery disconnect switch to OFF or remove the batteries and store them in a separate location.

## Maintenance During Storage

**WARNING!**

**During indoor storage, if an anti-rusting operation is performed, open the windows and doors to provide proper ventilation and avoid gas poisoning. Failure to follow this warning could result in death or serious injury.**

Once a month, perform the following procedure.

1. Start the machine and drive the machine a short distance.
2. Cycle each cylinder a few times to coat cylinder rods and seals with hydraulic oil.
3. Coat the exposed parts of the cylinder rods with spray lubricant to prevent corrosion.
4. Turn on the air conditioning and allow it to run for 3–5 minutes to lubricate the compressor and related parts.
5. 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. Repair or replace as necessary.
3. Start the machine and test all operations.

# TRANSPORTATION INFORMATION

Applicable laws and regulations must be observed when transporting the machine.

- When transporting the machine on a trailer, confirm the length, width, height, and weight capacity of the trailer before loading.
- Investigate the road conditions in advance (for example, dimension restrictions, weight restrictions, and traffic regulations).
- The machine may need to be disassembled to meet the local dimension and/or weight limits.

**NOTE:** The machine's shipping weight and dimensions may vary, depending on its tracks and work equipment.

## Loading the Machine

**WARNING!**

**To prevent the machine from tipping over, select a firm and level location that is a safe distance from any road or structure:**

- **Make sure the trailer is 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. The machine may shift suddenly due to a change in its center of gravity.**
- **Use a signal person to alert the operator to any potential hazards.**

**Failure to follow these warnings could result in death or serious injury.**

1. Clean the undercarriage (1).
2. Position the machine so the centerline of the machine matches the centerline of the trailer.

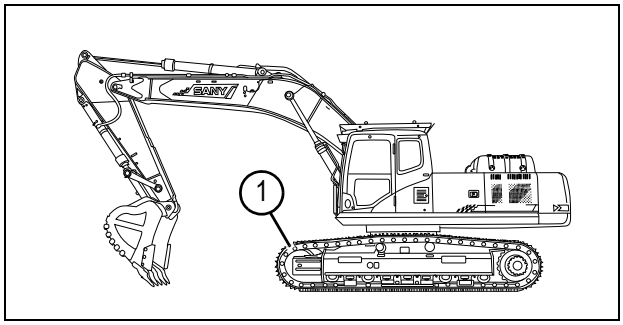



Fig. 4-77 0004071

3. Press function button F2 (2) on the monitor home screen to set the auto idle (3) to off.

4. Press function button F3 (5) on the monitor home screen to set the travel speed to low (turtle icon) (4).

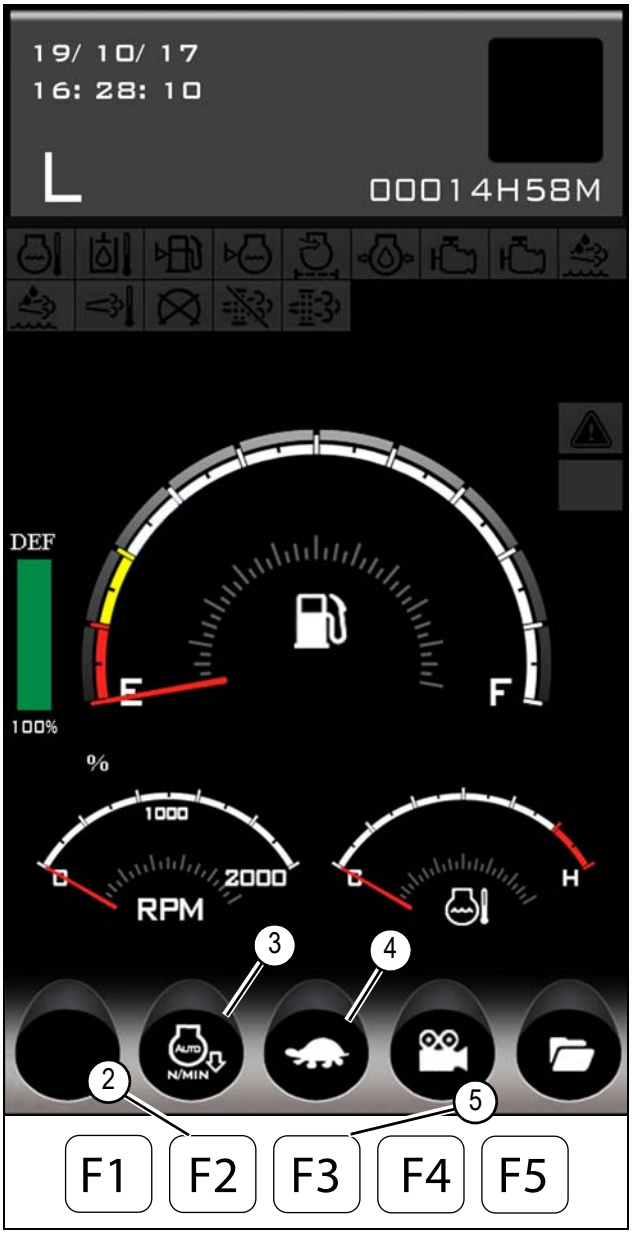



Fig. 4-78 0004595, 0004622

**NOTE:** If work equipment is attached to the machine, the equipment should be positioned in front of the machine during loading.

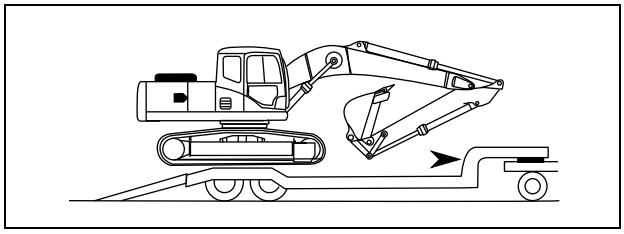


Fig. 4-79 0000098

**NOTE:** If no work equipment is attached, back the machine onto the trailer.

**NOTE:** The machine may lean forward when it passes over the trailer wheels.

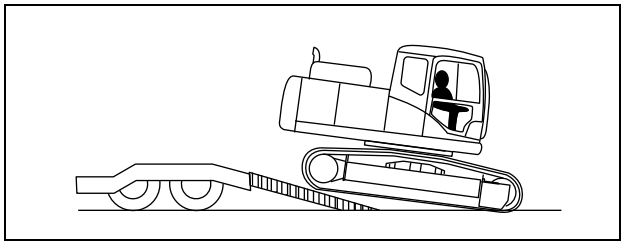


Fig. 4-80 0000099

5. Move the machine slowly until the tracks make full contact with the trailer.

6. Raise the work equipment slowly and high enough to avoid hitting the trailer or truck.

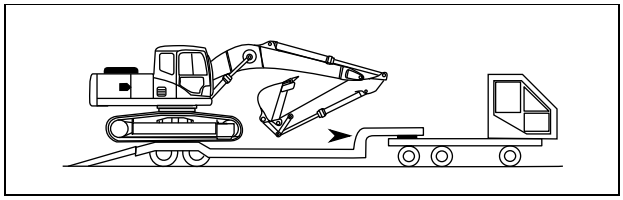


Fig. 4-81 0000100

7. Swing the machine so the work equipment faces the back of the trailer.

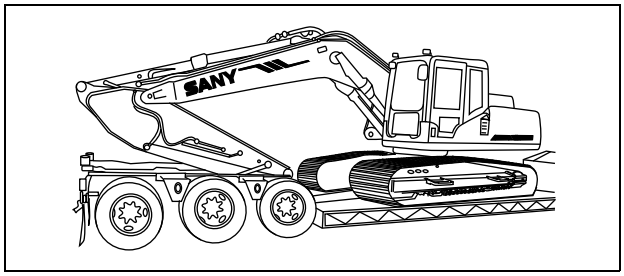



Fig. 4-82 00000101

8. Place a support block (6) on the trailer under the work equipment.

9. Fully extend the bucket cylinder and arm cylinder.

10. Lower the work equipment onto the support block.

11. Shut down the machine and remove the key from the key switch.

**NOTE:** Wait 2 minutes before turning the battery disconnect switch to OFF.

12. Close and lock the windows.

13. Exit the cab.

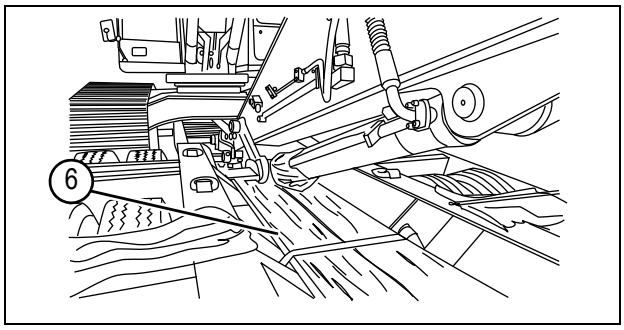



Fig. 4-83 00000102

14. Turn the two flat mirrors (7) and the convex mirror (8) inward so they are within the perimeter of the machine.

15. Turn the battery disconnect switch to the OFF position.

**NOTICE!**

**Never turn the battery disconnect switch to OFF while the engine is running. This can damage the electrical system or cause the machine to operate improperly.**

**After machine shutdown, wait at least 2 minutes for the Engine Control Module (ECM) to complete its shutdown before turning the battery disconnect switch to OFF.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

Fig. 4-84 0000452

16. Make sure that the following items are secured and locked.

    - Cab door (9)
    - Engine cover (10)
    - Left rear access door (11)
    - Air conditioner fresh-air inlet panel (12)
    - Right rear access door (13)
    - Exhaust opening (14)
    - Fuel tank cap (15)
    - Diesel exhaust fluid (DEF) tank compartment (16)

17. Cover the exhaust opening to prevent foreign material from entering it during transport.

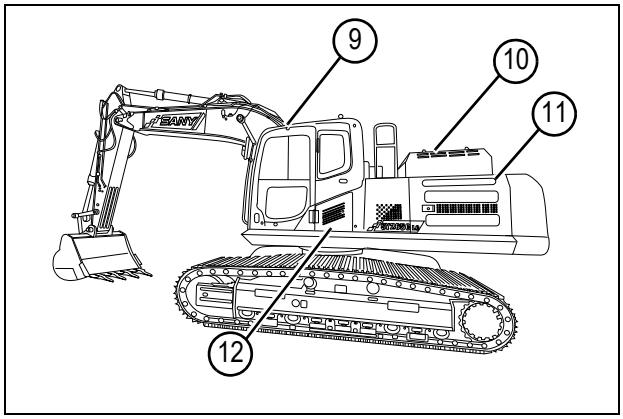


Fig. 4-85 0004378

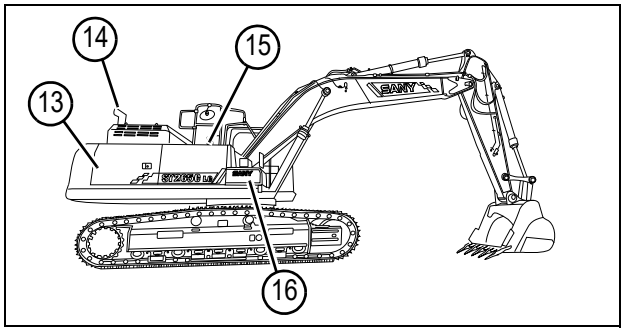


Fig. 4-86 0004379

18. Secure the machine to the trailer with suitable tie-downs (17) in accordance with all applicable laws and regulations.

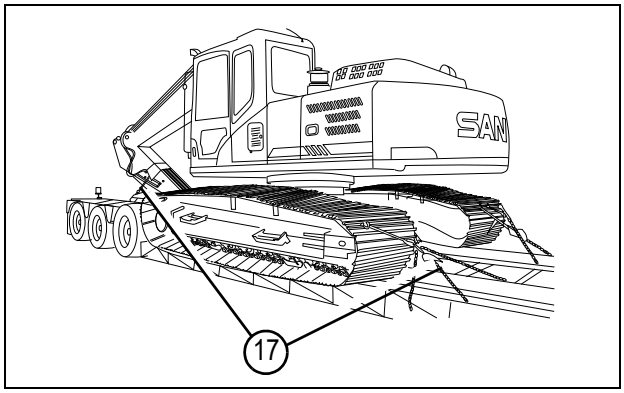



Fig. 4-87 0004385

## Unloading the Machine

**WARNING!**

**To prevent the machine from tipping over, select a firm and level location that is a safe distance from any road or structure.**

- **Make sure the trailer is properly chocked to prevent any movement.**
- **Use an access ramp with enough length, strength, and width to properly support machine. The ramp grade should not exceed 15°.**
- **Drive slowly at the junction of the ramp and the trailer. The machine may shift suddenly due to a change in its center of gravity.**
- **Use a signal person to alert the operator to any potential hazards**

**Failure to follow these warnings could result in death or serious injury.**

1. Chock the trailer wheels to prevent movement of the trailer during unloading.
2. Attach or construct ramps of suitable strength, width, and length to unload the machine.
3. Remove all tie-downs (1) and blocks that secure the machine to the trailer.
4. Turn the exterior rearview mirrors so the operator has a clear view to the front and rear of the machine.
5. Unlock and start the machine. Allow the machine to warm up to operating temperature.

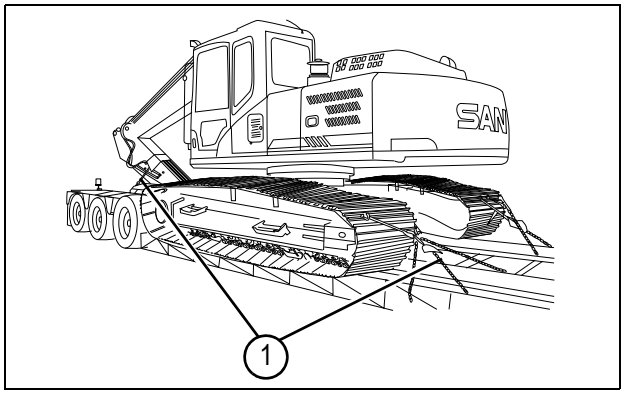



Fig. 4-88 0004385

6. Press function button F2 (2) on the home screen to set the auto idle (3) to off.

7. Press function button F3 (5) on the home screen to set the travel speed (turtle icon) (4) to low.

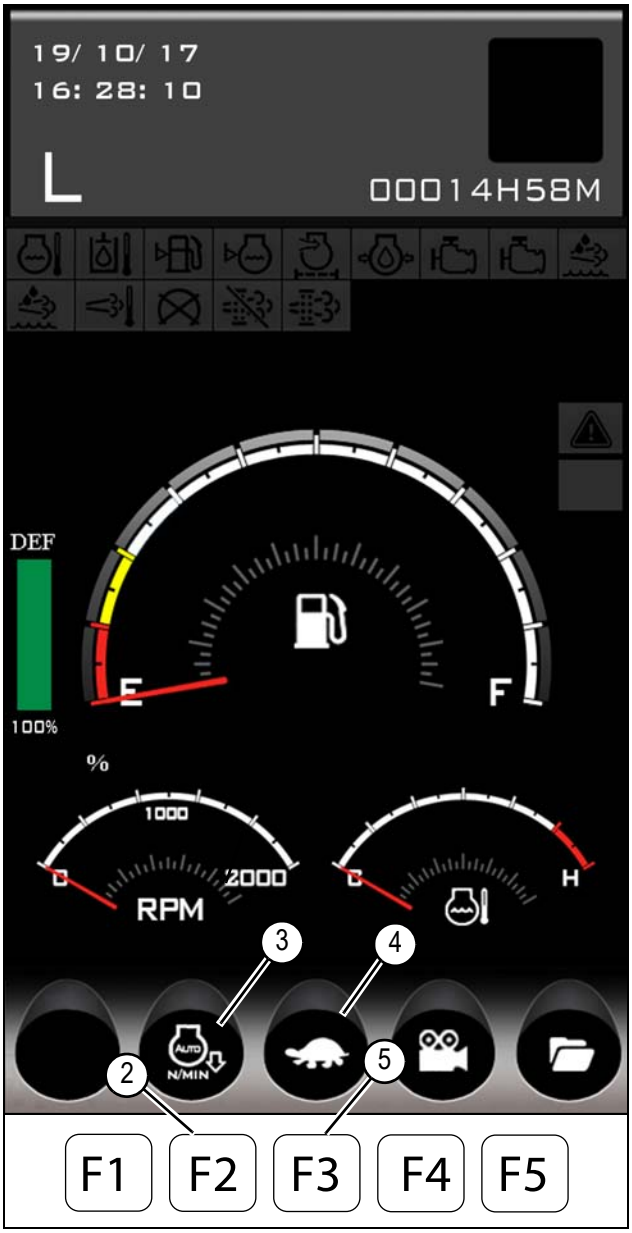



Fig. 4-89

0004595, 0004622

8. Set the hydraulic lockout control lever to the unlocked (open) position (6).

9. Raise the work equipment to clear the trailer.


Fig. 4-90 0005235

10. Lower the bucket and move slowly down the ramp while operating the boom and arm inward to provide support as the machine moves forward off the ramp.

11. Park the machine at the desired location.

12. Run the engine at low idle (approximately 1050 rpm) for 5 minutes.

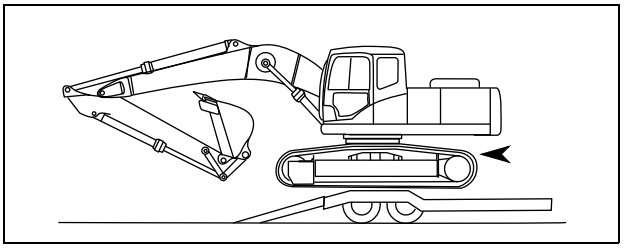


Fig. 4-91 0000106

**NOTICE!**

**Never turn the battery disconnect switch to OFF while the engine is running. This can damage the electrical system or cause the machine to operate improperly.**

**After machine shutdown, wait at least 2 minutes for the Engine Control Module (ECM) to complete its shutdown before turning the battery disconnect switch to OFF.**

**Failure to follow this notice could damage the machine or cause it to operate improperly.**

13. Shut down the engine, remove the key from the switch, and turn the battery disconnect switch to off.

## Lift the Machine

To lift the machine on or off a trailer, use the lift/tie-down points (2) identified on both sides of the machine, as well as the center of gravity point (1) on both sides of the machine.

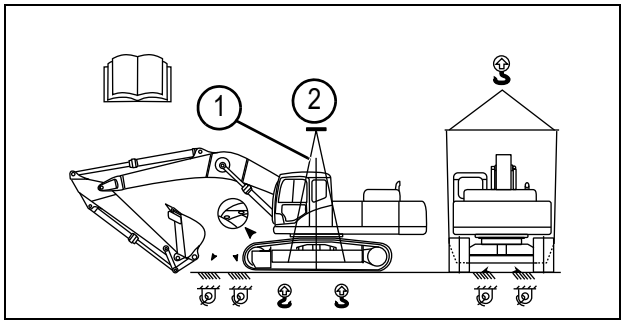



Fig. 4-92 0004381

SANY

# Maintenance

# MAINTENANCE INFORMATION

Do not perform any maintenance and/or repairs unless the procedures are covered in this manual. Always follow all safety precautions. Read and understand the Safety section of this manual before proceeding with any inspection or maintenance procedures. See “Maintenance Safety” on page 2-8.

## Checks Before Maintenance

Review the Maintenance Log and follow these points to make sure of your safety.

- 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 a 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

1. 1. Before starting the machine after maintenance or repairs, verify the following:
    - If necessary, have a coworker inspect your work for correct and proper completion.
    - Complete the Maintenance Log.
2. After starting the machine, verify the following:
    - Check for leaks in the system that had maintenance or repairs.
    - Verify there are no abnormal sounds coming from the engine or hydraulic system.
    - Check for any loose parts 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 fasteners to be sure none of these items were left on or inside the machine. Return the machine to its proper location.

## Hour Meter Reading

Record the hour meter reading daily. Confirm hour meter readings with the required maintenance intervals listed in this manual. When a maintenance service is due, an umbrella symbol will appear on the monitor display.

## Genuine SANY Replacement Parts

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

## SANY-Approved Lubricants

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

## Oil and Filter Inspection

**NOTICE!**

**Failure to inspect oils and filters for contamination may damage the machine or cause improper operation.**

Before changing the engine or hydraulic oil or filters, inspect them for contamination. If contamination is found, send a sample of the oil for testing to help determine the cause. Consult a SANY dealer before operating the machine.

## Collect an Engine Oil Sample

Collect and send an oil sample for testing according to the maintenance schedule. Obtain and follow the instructions within an oil analysis sample kit from a SANY dealer.

## Fuel Tank Strainer

The fuel tank strainer should always be installed when fueling the machine. The fuel tank strainer prevents larger dirt and other contaminates from entering the fuel system. The fuel tank strainer does not filter out very small or non solid impurities.

## Preventing Contamination

Clean all dirt, dust, and debris from the hydraulic tank filler cap or cover before opening. Make sure objects do not fall into the tank and contaminate fluids during servicing. If any object falls into any tank, remove it immediately. Failure to do so could result in component malfunction, damage to the machine, or improper machine operation.

## Securing Access Covers and Compartment Doors

When servicing the machine with any access cover or compartment door open, use the lock latch or bar to secure the cover or compartment door in the open position. Covers and doors that are not locked open can shut unexpectedly and cause injury.

## Cleaning the Machine

Never clean the machine with caustic chemicals or steam cleaners. Use mild soaps and a pressure washer to clean the machine. Always protect electrical parts when cleaning the machine. Never pressure-wash the inside of the cab. Use only nonflammable cleaning solvents.

## Weld, Drill, Cut, or Grind on the Machine

**NOTICE!**

**Disconnect the battery and all electrical control modules prior to welding. Failure to do this could damage the machine and personal property or cause the machine to operate improperly.**

**NOTICE!**

**Contact a SANY dealer before beginning any welding repairs. Any welding repairs on the machine must be performed by personnel who are qualified and certified to perform repairs that require welding. Owners are responsible for the structural integrity of any completed repair.**

**After turning off the key switch, wait 2 minutes before disconnecting the battery. Disconnect the negative battery cable from the negative (-) post of the battery prior to welding.**

**The welding ground cable must be connected within 3.3 ft. (1 m) of the welding area. The welding cable must be connected directly to the part being welded. Do not ground through bearings, hydraulic cylinder pins, or work equipment pins.**

**Failure to disconnect the negative battery cable could damage the machine or cause it operate improperly.**

## Daily Inspection and Maintenance

Do the following before operation with the engine off:

- Perform daily service as necessary.
- Inspect the machine for loose or missing components.
- Clean the cab.
- Check all controls for smooth operation and make sure they return to the neutral position.
- Make sure all safety decals are in place and are legible.
- Make sure safety equipment is in place and in operating condition.
- Check for fluid leaks.

Check the following during operation with the engine running:

- Monitor the control panel for normal machine operating parameters.
- Make sure the machine operates normally.

- Check for fluid leaks.

Check the following after operation with the engine off and cool:

- Check service points for wear or damage.
- Clean the cab.
- Check for fluid leaks.
- Check for loose or missing fasteners and components.

## Inspection and Maintenance for Severe Operating Conditions

If the machine will be operating under adverse conditions:

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

For heavy-load operation, add grease to the pins of the work equipment prior to each operation. Cycle the operation of all working parts several times before filling with additional grease.

### Mud, Rain, or Snow Conditions

Before operating the machine, inspect each connector for looseness.

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

### Near Ocean (Salt Air) Environments

Before operating the machine, inspect for any 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 electrical components to prevent corrosion.

### Dusty Environments

Clean the following components:

- Engine air filter–Clean the dust valve frequently. Immediately service the air filter and housing if an air filter restriction indicator is displayed. See “Check and Replace the Engine Air Filter System” on page 5-34.
- Radiator–Clean the radiator core frequently to prevent blockage.
- Fuel equipment–Drain water/sediment frequently. See “Drain the Primary Fuel Filter” on page 5-28.
- Fresh-air and recirculation filters–Clean the filters frequently.

### Cold Environments

In cold environments 32°F (0°C) or below, lubricate only with the oils and fuels shown in “Fluids and Lubricants” on page 5-10. Prior to starting the engine, make sure 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 experience and suggestions by lubricating oil suppliers, the lubricating intervals listed in the “Maintenance Schedule” on page 5-15 apply only to normal operating conditions. In harsh environments, including those with dusty and corrosive air, abnormal external temperature, extremely heavy overload, frequent operating times, longtime duty cycle, etc., lubricating intervals should be shortened. Always follow the “Maintenance Schedule” on page 5-15 until enough experience is obtained to establish a new schedule. If there are bearings or bushings that are overheating, loose parts, or rust during regular inspection, increase the frequency of lubrication.

## Check the Maintenance Log

The Maintenance Log lists regularly scheduled maintenance that should be performed by the operator or service personnel. All maintenance performed on the machine must be recorded in the Maintenance Log.

# FLUIDS AND LUBRICANTS

**NOTICE!**

**Never mix lubricants of different types or viscosities (weights), and never overfill the system that is being serviced. Failure to follow this notice could damage the machine or cause it to operate improperly.**

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

## Hydraulic Oil Description

Hydraulic oil is an important part of the hydraulic system. Hydraulic oil lubricates hydraulic system components, carries heat away from components, and contains anti corrosion additives and detergents.

Hydraulic system malfunctions are often caused by poor machine maintenance practices. Following the guidelines below will result in proper hydraulic system maintenance:

- Do not use any additives in the hydraulic oil.
- Replace hydraulic oil that has been subjected to overheating or damaged components.
- Change the hydraulic oil filter as recommended.
- Keep the hydraulic oil tank filled to the full level with hydraulic oil.
- Keep the hydraulic oil cooler free of dust and debris.
- Cap and plug all openings after removing components for service or repair.

## Lubrication and Grease

Always use clean extreme pressure (EP) grease when greasing the machine. Avoid using low-viscosity grease. SANY recommends EP2 or equivalent lubricants for heavy-duty plain and rolling element bearings operating under severe conditions, including shock loading in wet environments.

## Windshield Washer Fluid

Only use clean automotive windshield washer fluid. Do not mix concentrates into the washer fluid. In cold weather areas, use washer fluid with a low temperature rating.

## Diesel Exhaust Fluid (DEF)

SANY recommends using diesel exhaust fluid (DEF) that meets DIN 70700 or ISO 2224101.

## Fuel

**WARNING!**

- **Fuel or fuel vapors that come into contact with hot surfaces or electrical components can cause a fire.**
- **Never service the fuel system near an open flame or while smoking.**
- **Clean up spilled fuel immediately.**

**Failure to follow these warnings could result in death or serious injury.**

**NOTICE!**

**Never dilute fuels. Damage to the injection system can result, causing the machine to operate improperly.**

Observe the following when adding fuel:

- Use #2 diesel fuel or a mixture of #2 diesel and #1 diesel fuels in cold weather climates.
- Use only ultra-low sulfur fuel with a limit of S.15 ppm (S.15 PPM) for all normal operations.
- SANY does not recommend the use of any diesel fuel with a cetane level less than 40.
- Do not use gasoline, kerosene, or any unapproved fuels in the fuel system.
- If fuel waxing or bacterial growth occurs in the fuel system, contact a SANY dealer.
- Make sure there is no water or foreign material in the fuel. Take appropriate precautions to prevent fuel contamination during refueling.

## Engine Coolant

Engine coolant is an important fluid, protecting the engine against overheating and freezing.

- If using concentrated engine coolant, use distilled water to dilute per instructions on the engine coolant container. Natural water contains large amounts of minerals which can form scale in the engine and radiator. Mineral scale is not easily removed and can cause overheating.
- Precautions in this manual must be followed when working with engine coolants.
- Some engine coolants are flammable. Keep them away from open fire.
- If the engine is overheating, wait for the engine to cool before refilling engine coolant.

## Engine Oil Viscosity/Temperature Data

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

**NOTE:** Due to its comparatively better lubricating characteristics (including improved oil consumption, engine operation in frigid climates, and continued lubrication in high temperatures), SAE 15W-40 is recommended for most climates. In some circumstances, short-term use of low-viscosity engine oil in temperatures below 23°F (-5°C) is acceptable. However, long-term use can reduce engine life.

## Lubricating Grease/Temperature Data

| Grease Type | Temperature | |
|---|---|---|
| | 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 applying grease to the machine. Avoid using low-viscosity grease.

## Industrial Gear Oil/Temperature Data

| Oil Type | Temperature | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | -4°F (-20°C) | 14°F (-10°C) | 32°F (0°C) | 50°F (10°C) | 68°F (20°C) | 86°F (30°C) | 104°F (40°C) | 122°F (50°C) |
| Gear oil with EP additive API GL4 or GL5 | | | | | | | | |

**NOTE:** Any brand meeting AGMA standard 9005-D94, ISO 3448 grade 220 is acceptable.

## Hydraulic Oil/Temperature Data

| Oil Type | Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -22°F (-30°C) | -4°F (-20°C) | 14°F (-10°C) | 32°F (0°C) | 50°F (10°C) | 68°F (20°C) | 86°F (30°C) | 104°F (40°C) | 122°F (50°C) |
| 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 general 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.

Hydraulic oil is an important part of the hydraulic system. Hydraulic oil lubricates hydraulic system components, carries heat away from components, and contains anti corrosion additives and detergents. Hydraulic system malfunctions are often caused by poor machine maintenance practices. Following the guidelines below will result in proper hydraulic system maintenance:

- Do not use any additives in the hydraulic oil.
- Replace hydraulic oil that has been subjected to overheating or damaged components.
- Change the hydraulic filter as recommended.
- Keep the hydraulic oil tank filled.
- Cap and plug all openings after removing components for service or repair.

## Capacities

The capacities shown in the table are approximate. For exact capacities, use the inspection points, inspection plugs, dipsticks, and sight glasses.

### SY265C LC Capacities

| Capacities | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Engine** | **Fuel System** | **Engine Cooling System** | **Swing Drive** | **Final Drive** | **Hydraulic System (including tank)** | **Swing Bearing Gear Bath** | **Diesel Exhaust Fluid (DEF)** |
| 6.5 gal. (24.7 L) | 122.8 gal. (465.0 L) | 10.6 gal. (40.0 L) | 2.77 gal. (10.5 L) | 1.06 gal. (4.0 L) (each side) | 73.2 gal. (277.0 L) | 75.0 lb. (34.0 kg) | 10.0 gal. (38.0 L) |

### SY265C LR Capacities

| Capacities | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Engine** | **Fuel System** | **Engine Cooling System** | **Swing drive** | **Final Drive** | **Hydraulic System (including tank)** | **Swing Bearing Gear Bath** | **Diesel Exhaust fluid (DEF)** |
| 6.5 gal. (24.7 L) | 122.8 gal. (465.0 L) | 10.6 gal. (40.0 L) | 2.77.0 gal. (10.5 L) | 1.06 gal. (4.0 L) (each side) | 73.2 gal. (277.0 L) | 75.0 lb. (34.0 kg) | 10.0 gal. (38.0 L) |

## Other Approved Products

**NOTICE!**

**Commercially available lubricants and additives may cause harm. Use only the lubricants recommended in this manual. The use of other lubricants can damage the machine and could cause it to operate improperly.**

Approved products include:

- Any thread-locking compound having properties that offer high temperature performance and oil tolerance to prevent the loosening of fasteners.
- Any lithium grease-based spray lubricant.
- Mineral spirits, Type II odorless and/or Class 1 (high flash point).

# MAINTENANCE SCHEDULE

## Secure the Machine for Maintenance

**NOTICE!**

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

1. Park the machine on a flat, firm surface.
2. Obtain the Maintenance Log for this machine and complete it at the close of all maintenance procedures.
3. Read and understand all of the procedures to be performed.
4. Prepare the machine for checks and inspections. See “Maintenance Safety” on page 2-8.
5. Allow the machine to cool before performing maintenance.

## When Required

- Check air conditioner fresh-air and recirculation filters. (See page 5-50.)
- Perform a stationary regeneration. (See page 3-19.)
- Replace engine primary air filter. (See page 5-34.)
- Replace hydraulic system breather filter. (See page 5-69.)
- Check the radiator, oil cooler, charge-air cooler, and the air conditioner condenser fins. (See page 5-46.)
- Check the track tension. (See page 5-83.)
- Replace the bucket teeth. (See page 5-111.)
- Check the windshield washer fluid and windshield wiper. (See page 5-30.)

## Daily or Every 10 Hours

- Lubricate the work equipment. (See page 5-102.)
- Check the seat belt and buckle. (See page 4-14.)
- Check decals. (See page 5-109.)
- Check sheet metal. (See page 5-109.)
- Check idler wheels. (See page 5-82.)

- Drain the primary fuel filter/water separator. (See page 5-28.)
- Check the hydraulic pump mounting fasteners. (See page 5-80.)
- Check the hydraulic tank oil level. (See page 5-29.)
- Check the hydraulic line connections. (See page 5-76.)
- Check the pattern change (SAE/BHL) valve. (See page 3-12.)
- Check the engine coolant level. (See page 5-20.)
- Check the engine oil level. (See page 5-22.)
- Check and adjust the air conditioner compressor belt. (See page 5-47.)
- Check the engine accessory belt. (See page 5-40.)
- Check the crankcase breather tube. (See page 5-32.)
- Check the air intake and charge-air piping. (See page 5-36.)
- Check the aftertreatment exhaust piping. (See page 5-42.)
- Check the swing drive. (See page 5-90.)
- Check the escape tool. (See page 4-23.)
- Check the fire extinguisher. (See page 4-23.)
- Check the front window latches. (See page 4-18.)
- Adjust the mirrors. (See page 4-20.)
- Check the electrical system. (See page 5-60.)
- Check the fuel level. (See page 5-24.)
- Check the operator controls. (See page 3-4.)
- Check air conditioning operation. (See page 5-47.)

## After the First 50 Hours

- Initial change of the engine oil and the filter. (See page 5-37.)

## Weekly or Every 50 Hours

- Lubricate the work equipment. (See page 5-102.)
- Check the engine air filter system. (See page 5-34.)

- Check the batteries. (See page 5-62.)
- Check the hydraulic hoses and lines. (See page 5-76.)
- Check the final drive oil level. (See page 5-88.)
- Check the top roller fasteners. (See page 5-83).
- Check the track shoe fasteners. (See page 5-81).
- Check and adjust the track tension. (See page 5-83.)
- Check the final drive. (See page 5-87.)

## Monthly or Every 250 Hours

**NOTE:** Make sure all daily and 50-hour maintenance tasks have been completed before proceeding with the 250-hour maintenance tasks.

- Check the doors and locks. (See page 5-109.)
- Check the grab handles and steps. (See page 5-109.)
- Perform a structural inspection. (See page 5-110.)
- Initial replacement of the hydraulic pilot oil filter element. (See page 5-71.)
- Initial replacement of the hydraulic oil tank return filter. (See page 5-73.)
- Check the track assemblies. (See page 5-81.)
- Check and adjust track tension. (See page 5-83.)
- Check windshield washer fluid and windshield wiper. (See page 5-30.)
- Check the electrical system. (See page 5-52.)

## Every 3 Months or 500 Hours

**NOTE:** Make sure all daily, 50-hour, and 250-hour maintenance tasks have been completed before proceeding with the 500-hour maintenance tasks.

- Replace the primary and secondary fuel filter. (See page 5-57 and page 5-58.)
- Collect an engine oil sample. (See page 5-6.)
- Collect a hydraulic oil sample. (See page 5-29.)
- Collect a final drive oil sample. (See page 5-100.)
- Collect a swing drive oil sample. (See page 5-101.)

- Clean and check the upper structure and undercarriage. (See page 5-109.)
- Check the swing grease bath level. (See page 5-98.)
- Check the swing drive fasteners. (See page 5-97.)
- Lubricate the swing drive bearing. (See page 5-90.)
- Check the final drive. (See page 5-87.)
- Check the hydraulic pump. (See page 5-80.)
- Check the hydraulic hoses and lines. (See page 5-76.)
- Check the radiator, hydraulic oil cooler, and air conditioner condenser fins. (See page 5-46.)
- Check the air conditioner fresh-air and recirculation filters. (See page 5-50.)
- Replace the hydraulic system breather filter. (See page 5-69.)
- Change the engine oil and filter. (See page 5-37.)
- Replace the primary and secondary engine air filter. (See page 5-34.)
- Replace the swing drive oil. (See page 5-93.)
- Check the stationary regeneration. (See page 3-19.)

## Every 6 Months or 1000 Hours

**NOTE:** Make sure all daily, 50-hour, 250-hour, and 500-hour maintenance tasks have been completed before proceeding with the 1000-hour maintenance tasks.

- Check accumulator function. (See page 5-66.)
- Check the fuel tank strainer. (See page 5-59.)
- Replace the hydraulic pilot filter element. (See page 5-71.)
- Replace the hydraulic return filter. (See page 5-73.)
- Check the fuel lines. (See page 5-56.)
- Check the aftertreatment exhaust piping. (See page 5-42.)
- Replace the diesel exhaust fluid (DEF) tank filter. (See page 5-43.)

## Annually or Every 2000 Hours

**NOTE:** Make sure all daily, 50-hour, 250-hour, 500-hour, and 1000-hour maintenance tasks have been completed before proceeding with the 2000-hour maintenance tasks.

- Perform a structural inspection. (See page 5-110.)
- Replace the crankcase ventilation filter. (See page 5-32.)
- Check the swing bearing fasteners. (See page 5-97.)
- Check hydraulic hoses and lines. (See page 5-76.)
- Change the hydraulic oil. (See page 5-29.)
- Replace the diesel exhaust fluid (DEF) pump filter. (See page 5-32.)
- Replace the engine air filter. (See page 5-34.)
- Change the engine coolant. (See page 5-44.)
- Check the crankcase breather tube. (See page 5-32.)
- Change the final drive oil. (See page 5-89.)
- Replace the diesel exhaust fluid (DEF) pump filter. (See page 5-53.)

## Hydraulic Breaker Maintenance Interval

Hydraulic oil breaks down faster on machines equipped with a hydraulic breaker than on machines equipped with a bucket.

Change the hydraulic oil and filters every 400 hours on breaker-equipped machines.

**NOTICE!**

**A breaker operating at a rate over 50% for 250 hours must have the hydraulic oil filter replaced. Failure to do so could result in damage to the machine.**

See “Check the Hydraulic Oil Level” on page 5-29.

## After Maintenance is Completed

Record the completion of all of the maintenance tasks in the Maintenance Log. If authorized, remove all lockout/tagout warnings and machine-securing elements and fully activate the machine. Return the machine to operation.

# MAINTENANCE PROCEDURES

## Fluid Level Checks

### Check the Engine Coolant Level

**WARNING!**

- **Engine coolant is toxic. Avoid inhaling or ingesting engine coolant. If eyes or skin are contaminated by coolant, wash the affected area with plenty of water and seek medical treatment immediately.**

- **Do not remove the radiator cap while the engine is hot. Engine coolant is under pressure when the engine is hot. Avoid contact with hot engine coolant. Allow the engine to cool before removing the radiator cap.**

**Failure to follow these warnings could result in death or serious injury.**

**NOTICE!**

**Dispose of the engine coolant in accordance with all applicable environmental regulations. Failure to follow this notice could damage the environment.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Open the engine compartment door (1). See “Engine Compartment Door” on page 4-11.

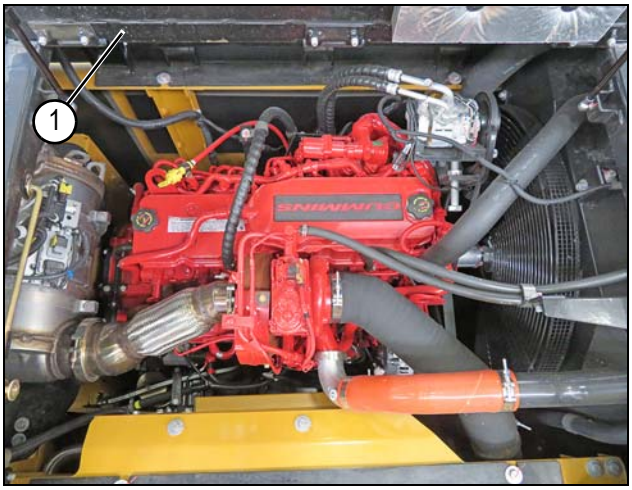



Fig. 5-1 0005314

3. Check the engine coolant level in the sight glass (2) on the side of the expansion tank. The acceptable engine coolant level is the middle of the sight glass.

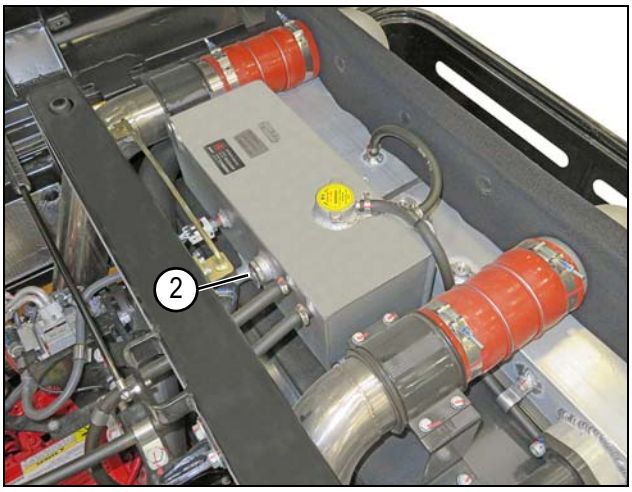



Fig. 5-2 0005184

## Fill the Engine Coolant

**WARNING!**

- **Engine coolant is toxic. Avoid inhaling or ingesting engine coolant. If eyes or skin are contaminated by coolant, wash the affected area with plenty of water and seek medical treatment immediately.**
- **Do not remove the radiator cap while the engine is hot. Engine coolant is under pressure when the engine is hot. Avoid contact with hot engine coolant. Allow the engine to cool before removing the radiator cap.**

**Failure to follow these warnings could result in death or serious injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the engine compartment door. See “Engine Compartment Door” on page 4-11.
3. Slowly loosen the expansion tank cap (1) to relieve any engine cooling system pressure.
4. Remove the expansion tank cap when engine cooling system pressure has been relieved.
5. For engine coolant capacity, see “Capacities” on page 5-14.

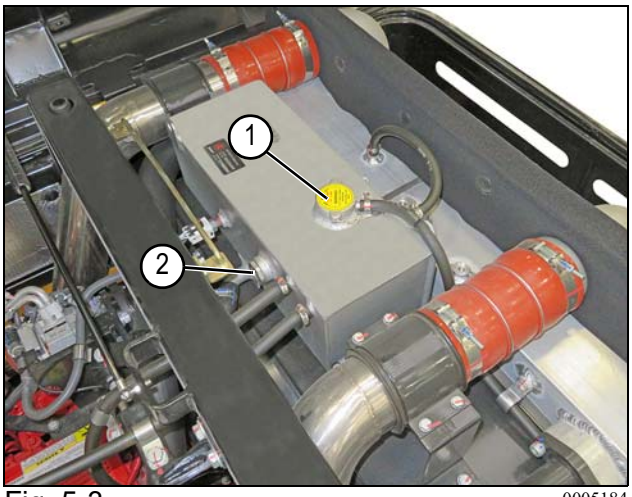



Fig. 5-3 0005184

6. Add new engine coolant through the expansion tank until the engine coolant level reaches the middle of the sight glass (2).
7. Install the expansion tank cap.
8. Start the engine and run it at low idle for several minutes to allow engine coolant to circulate.

9. Shut down the engine.

10. Check the engine coolant level. See “Check the Engine Coolant Level” on page 5-20.

11. Close the engine cover.

## Check the Engine Oil Level

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Open the engine compartment door (1). See “Engine Compartment Door” on page 4-11.

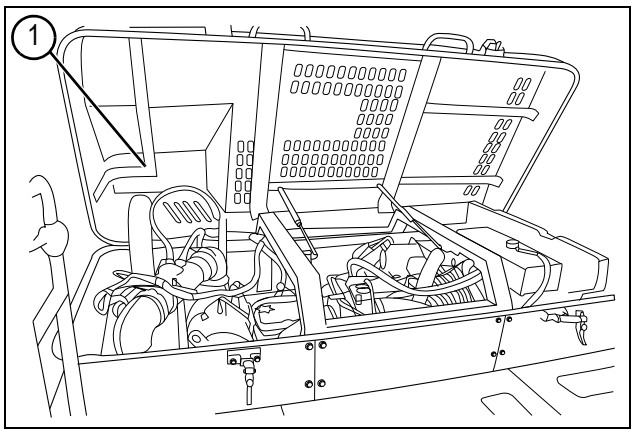



Fig. 5-4

3. Remove the engine oil dipstick (2) from the engine, wipe it with a clean cloth, then insert the dipstick into the holder.

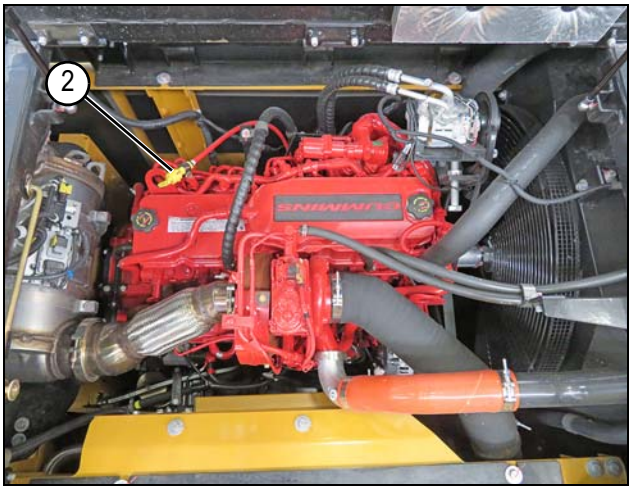



Fig. 5-5

0005314

4. Remove the dipstick and note the oil level.

   **NOTE:** The oil level should be within the etched area (3) of the dipstick.

5. Install the dipstick into the holder.

6. If the oil level is not within the etched area, remove the engine oil filler cap and add oil until the level is within the etched area.

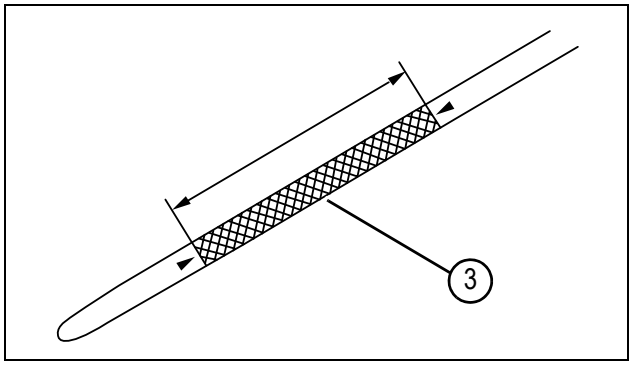



Fig. 5-6

## Add Engine Oil

**CAUTION!**

**Do not perform engine maintenance when the engine is hot. Hot engine oil or engine components may cause severe burns. Allow the engine to cool before performing engine maintenance. Failure to follow this caution could result in injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the engine compartment door (1). See “Engine Compartment Door” on page 4-11.

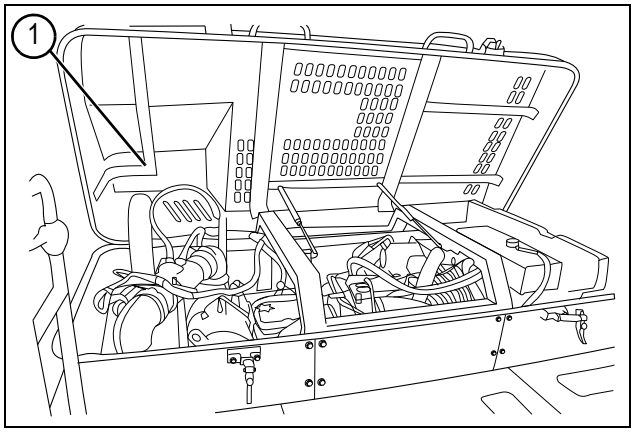



Fig. 5-7

3. Remove either of the engine oil filler caps (3) and add engine oil. See “Capacities” on page 5-14.

**NOTICE!**

**Do not overfill the engine with oil. Overfilling could result in machine damage and improper machine operation.**

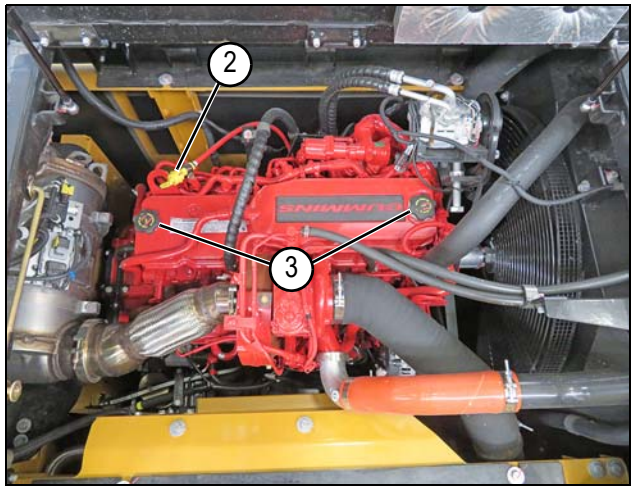



Fig. 5-8 0005314

4. Install the engine oil filler cap.
5. Remove the engine oil dipstick (2) from the engine, wipe it with a clean cloth, then insert the dipstick in its holder.
6. Remove the dipstick, note the oil level. Install the dipstick.

**NOTE:** The oil level should be within the etched area (4). If the oil is not within the etched area, remove the engine oil filler cap, then add oil until the level is within the etched area.

7. Start and run the engine at low idle for several minutes, shut off the engine, and check for oil leaks.

8. Check the oil level. Add oil as needed.

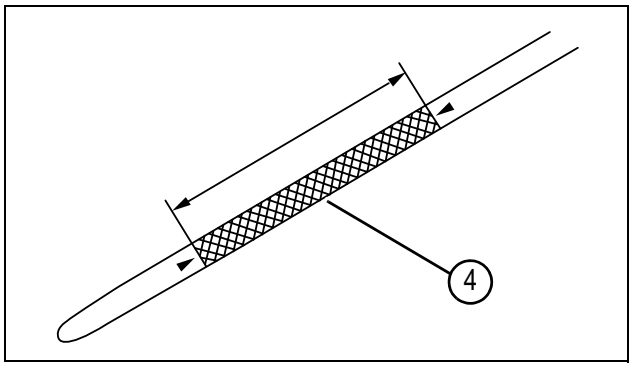



Fig. 5-9

## Check the Fuel Level

Turn the key switch to ON and check the fuel level displayed (1) on the system monitor.

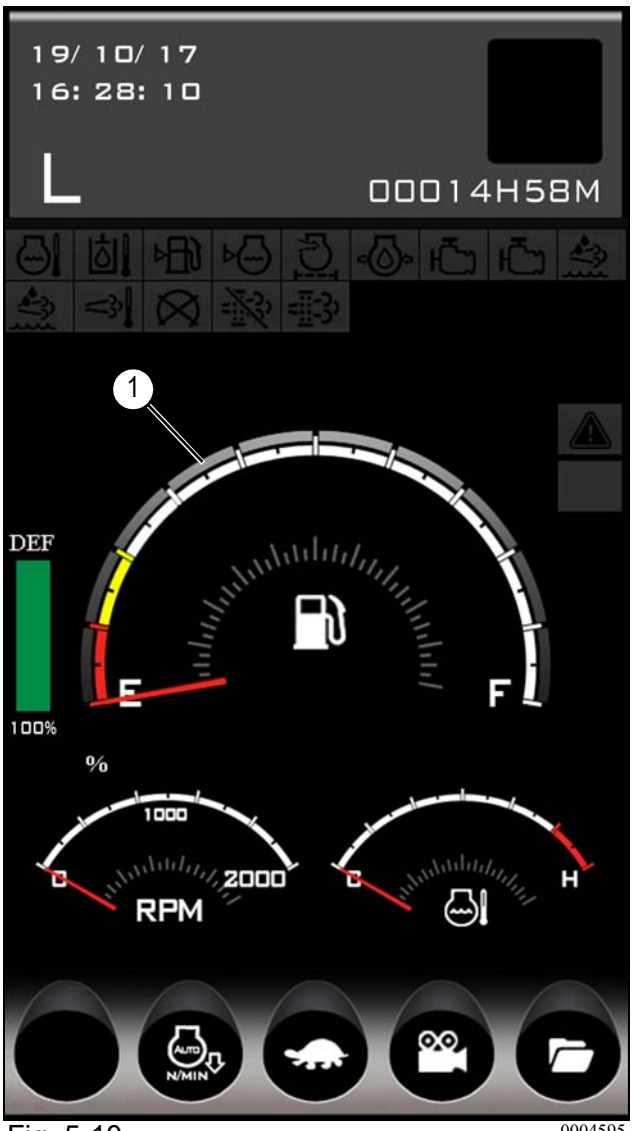



Fig. 5-10 0004595

## Fill the Fuel Tank

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Remove the fuel tank cap (1).
3. Add clean, fresh fuel as needed until the tank is full.
4. Install the fuel tank cap.

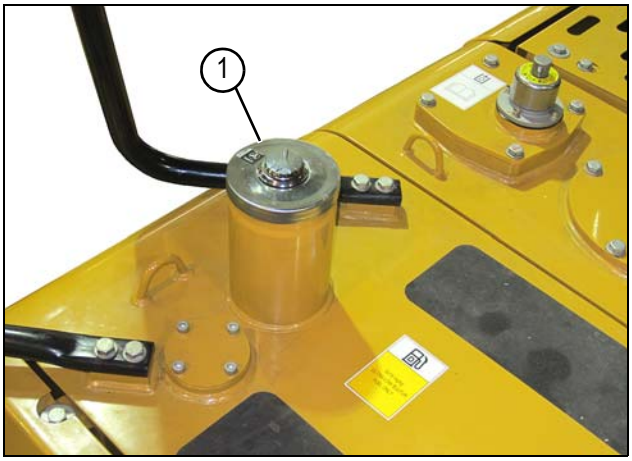



Fig. 5-11 0004153

## Check the Diesel Exhaust Fluid (DEF) Level

Check the DEF level (1) on the monitor home screen.

**NOTE:** The DEF tank should be at least 10% full.

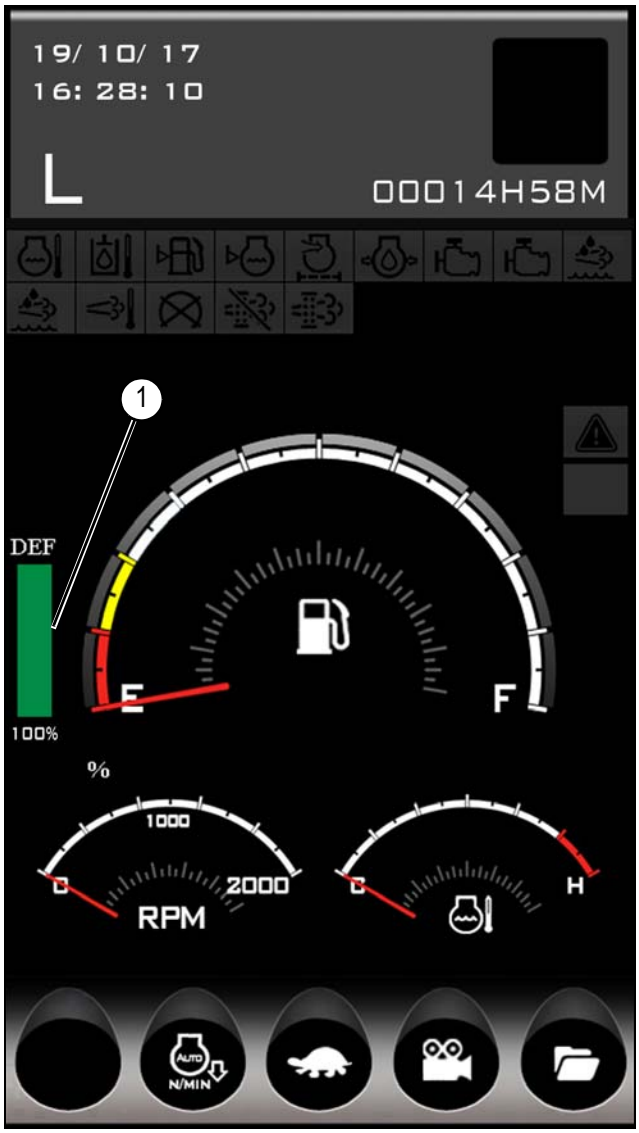



Fig. 5-12 0004595

## Fill the Diesel Exhaust Fluid (DEF) Tank

**CAUTION!**

**It is critical when working with the DEF system that all materials used are absolutely clean. Failure to follow this caution can cause equipment damage.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the DEF compartment door (1) on the right front side of the machine. See “Right Front Access Door” on page 4-8.


Fig. 5-13 0005188

3. Remove the DEF tank cap (2).
4. Add DEF through the filler neck as needed.
5. Install the DEF tank cap.
6. Close the DEF compartment door.

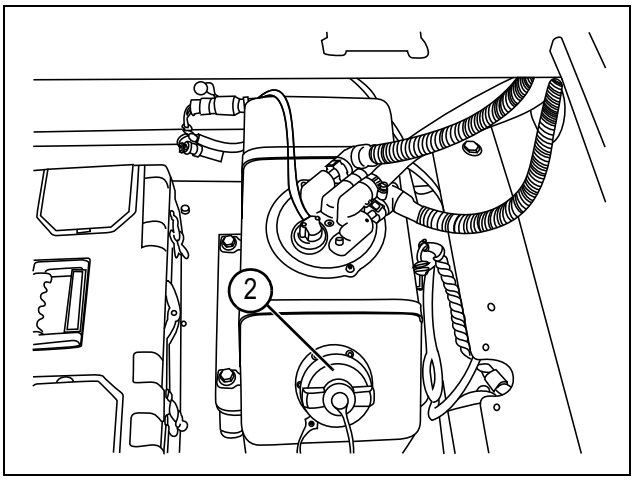



Fig. 5-14

## Drain the Primary Fuel Filter

**WARNING!**

**Never service the fuel system near an open flame or while smoking. Failure to follow this warning may result in death or serious injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. The primary fuel filter (1) is behind the right rear door. See “Right Rear Access Door” on page 4-9.

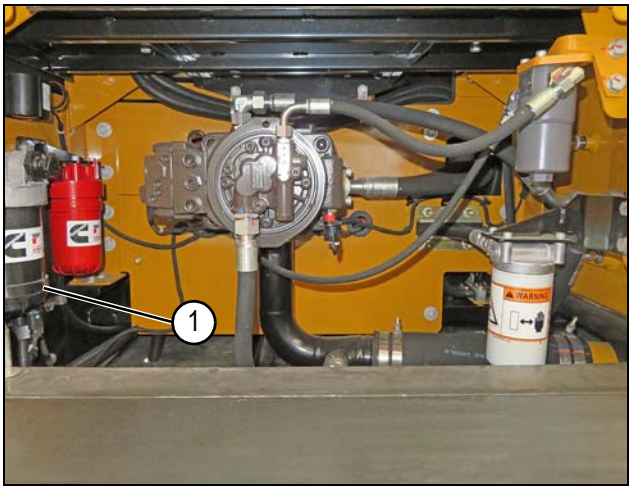



Fig. 5-15 0005321

3. Place an appropriately sized container under the primary fuel filter.

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

**NOTICE!**

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

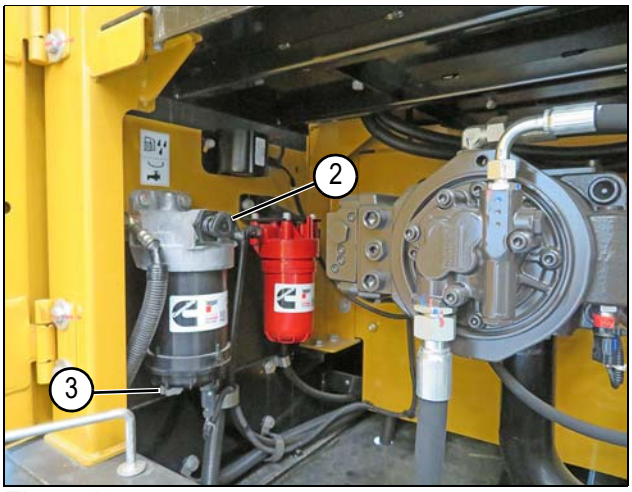



Fig. 5-16 0005319

5. Close the drain valve when the fuel is free of water and contamination.

**NOTE:** SANY recommends draining the fuel tank and replacing the filter if an excessive amount of water or contaminant is found while draining the fuel filter.

## Check the Hydraulic Oil Level

1. Park the machine on a flat, level surface and position the work equipment as shown on the hydraulic tank decal.

2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

3. Open the right rear door (1). See “Right Rear Access Door” on page 4-9.

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

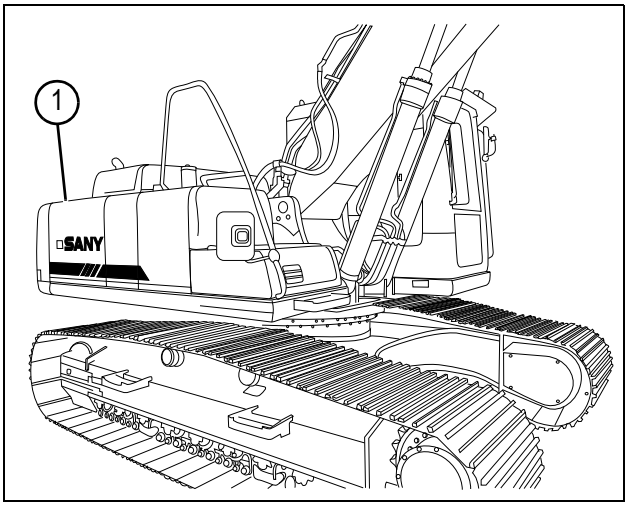



Fig. 5-17

5. Check the oil level using the sight glass (2) on the side of the hydraulic tank. Make sure the oil level is between the level marks in the sight glass.

6. Add hydraulic oil to the system as necessary. See “Add Hydraulic Oil” on page 5-68.

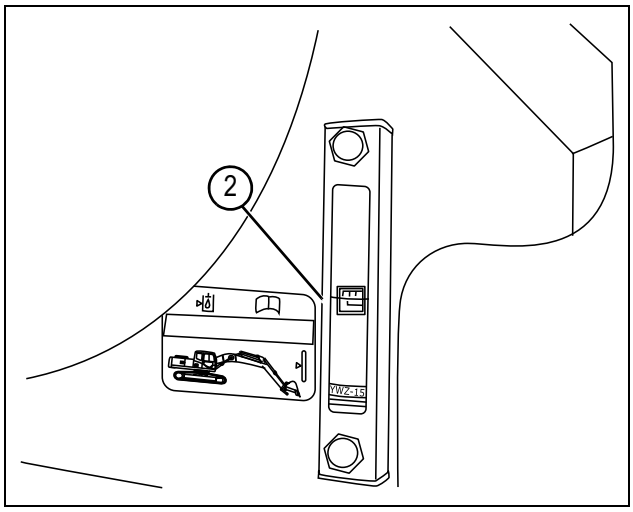



Fig. 5-18

## Check the Windshield Washer Fluid and Windshield Wiper

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Check the washer fluid level inside the windshield washer tank (2), located behind the left front door. See “Left Access Doors” on page 4-10.

   **NOTE:** Use windshield washer fluid appropriate for very cold or winter climates as required.

3. Remove cap (1) and add windshield washer fluid as necessary.

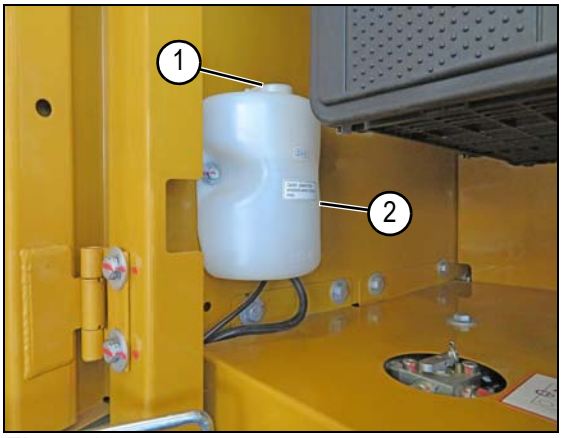


Fig. 5-19 0005322

4. Check the operation of the windshield washer nozzle (3) and wiper (4) to make sure there is no smearing across the windshield during operation. Replace the wiper blade with a new one if smearing occurs.

5. Adjust the spray nozzle (3) to make sure 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.**

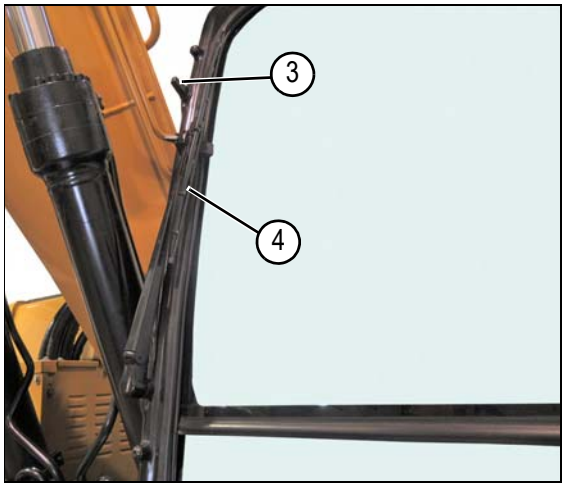


Fig. 5-20 0003692

6. Inspect the windshield wiper for excessive wear. Replace as necessary.

# Engine Inspection and Maintenance

## Engine Inspection

**NOTE:** Regular inspection of the engine and engine compartment helps to identify potential problems and prevent defects that may lead to service interruption and costly repair.

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the appropriate access covers or compartment doors. See “Doors, Escape Hatch, and Filler Caps” on page 4-6.
3. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.
4. Inspect the engine and engine compartment for the following:
   - Oil, fuel, and engine coolant leaks.
   - Loose fasteners and connections.
   - Worn or loose drive belts.
   - Damaged hoses and wiring harnesses.
   - Engine air filter.

## Check the Crankcase Breather Tube

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the engine compartment door. See “Engine Compartment Door” on page 4-11.
3. Visually inspect the crankcase breather tube (1) for the following conditions.
   - Cracks
   - Restriction
   - Material deterioration
   - General damage

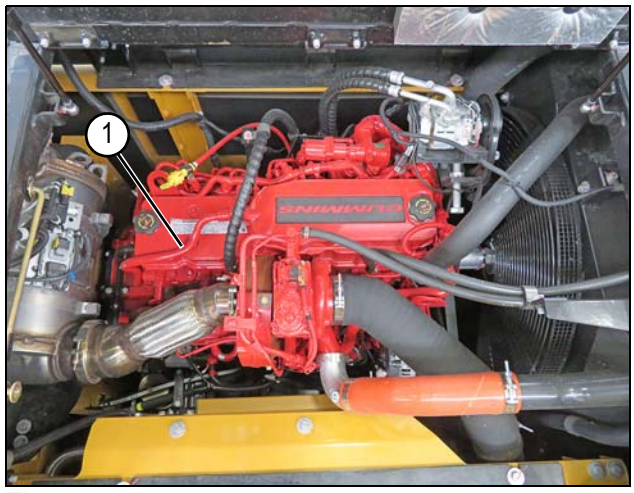


Fig. 5-21 0005314

**NOTE:** If any of the above conditions exist, replace the crankcase breather tube.

## Replace the Crankcase Breather

**NOTICE!**

- **Make sure the battery disconnect switch is OFF before removing the crankcase breather.**
- **Never turn the battery disconnect switch to OFF while the engine is running. This can damage the electrical system or cause the machine to operate improperly.**
- **After machine shutdown, wait at least 2 minutes for the engine control module (ECM) to complete its shutdown before turning the battery disconnect switch to OFF.**

**Failure to follow this notice could cause damage to the machine or cause it to operate improperly.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the engine compartment door. See “Engine Compartment Door” on page 4-11.
3. Clean the crankcase breather cover (1).

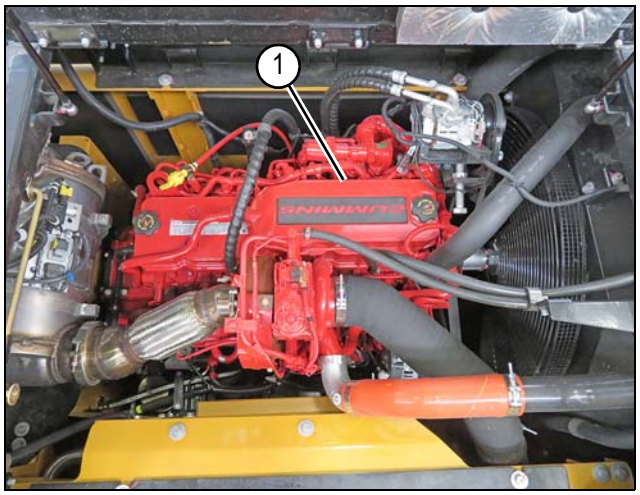



Fig. 5-22 0005314

4. Remove the breather cover fasteners (2).
5. Remove the crankcase breather cover (3).
6. Remove the breather (4) and tray (5).
7. Inspect the breather cover and tray for damage. Replace as necessary.
8. Check for internal obstructions or sludge buildup.
9. Clean the breather cover with hot, soapy water and a soft brush.
10. Rinse the cover with clean water and dry with compressed air.

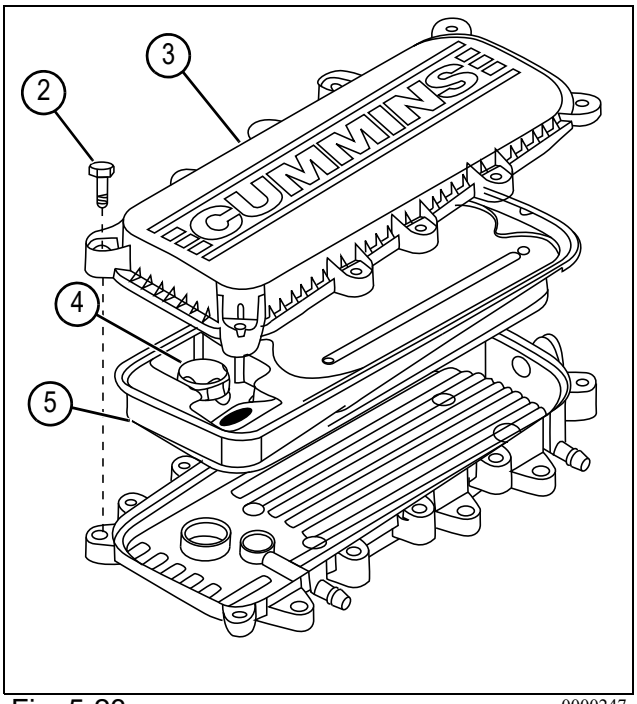


Fig. 5-23 0000247

**CAUTION!**

- **Do not allow compressed air to come into contact with skin.**
- **Always wear goggles, gloves, and other personal protective equipment (PPE).**

**Failure to follow these precautions could result in injury.**

**NOTE:** Do not use soapy water to clean or rinse the breather base (6).

11. Clean the breather base with a damp rag to prevent water from entering the crankcase.

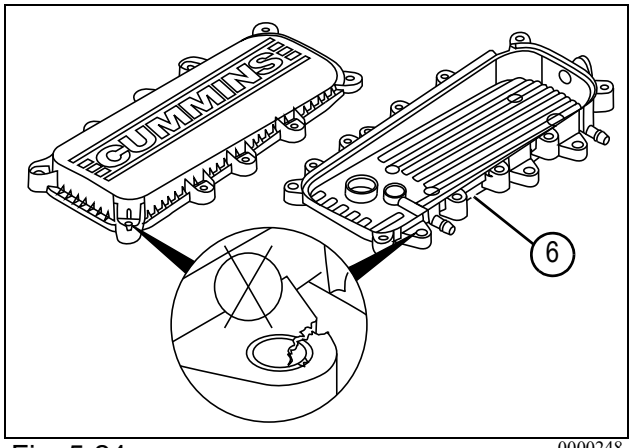


Fig. 5-24 0000248

12. Lubricate the breather O-ring seal (7) with clean lubricating oil.
13. Install the new breather onto the breather tray.
14. Install the tray into the base.
15. Install the breather cover.
16. Install the breather cover fasteners.

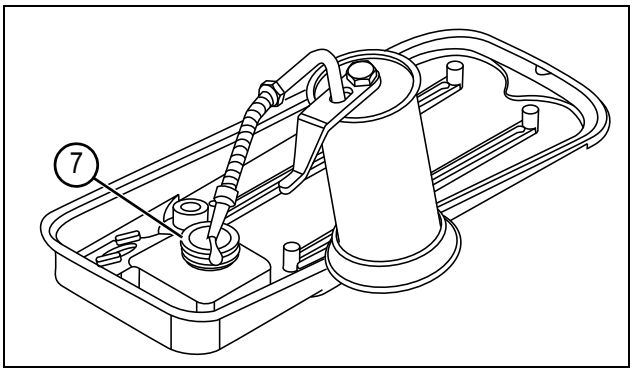



Fig. 5-25 0000249

17. Tighten the fasteners in the sequence shown (1–11) to 7 lb-ft (10 N•m).
18. Turn the battery disconnect switch to the ON position.
19. Close the engine cover.
20. Start the engine and run for 10 minutes at low idle.

    **NOTE:** Open the engine cover and check the cover for leaks.

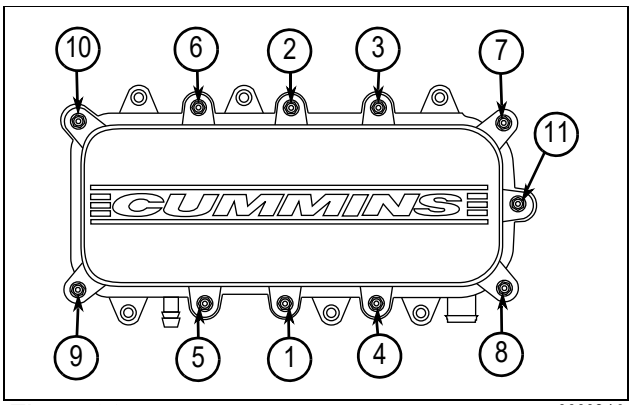



Fig. 5-26 0000246

## Replace the Crankcase Ventilation Filter

**NOTE:** Replace the crankcase ventilation filter every 4000 hours.

## Check and Replace the Engine Air Filter System

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. The air filter housing (1) is behind the left front door. See “Left Access Doors” on page 4-10.

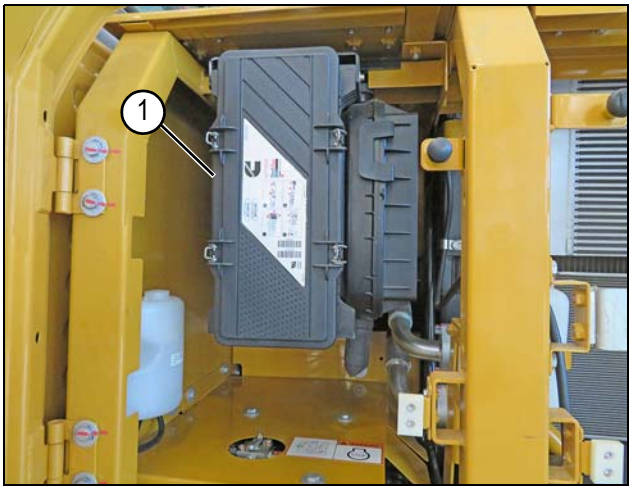



Fig. 5-27 0005317

3. Check the condition of the dust valve and replace if required.

   **NOTE:** If the dust valve is cracked, torn, remains open, or is missing, dust particles that are normally expelled can collect on the air filter and shorten the air filter service life.

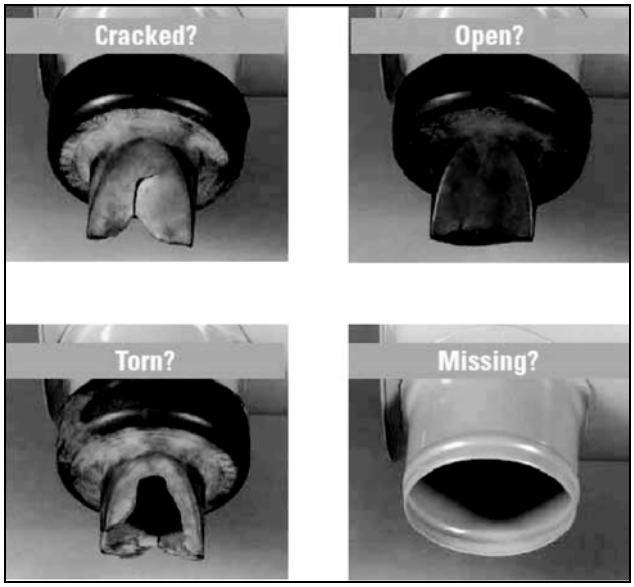



Fig. 5-28 0004113

4. Open the air filter housing and remove the primary air filter (2).

5. Clean the inside of the air filter housing with a clean cloth.

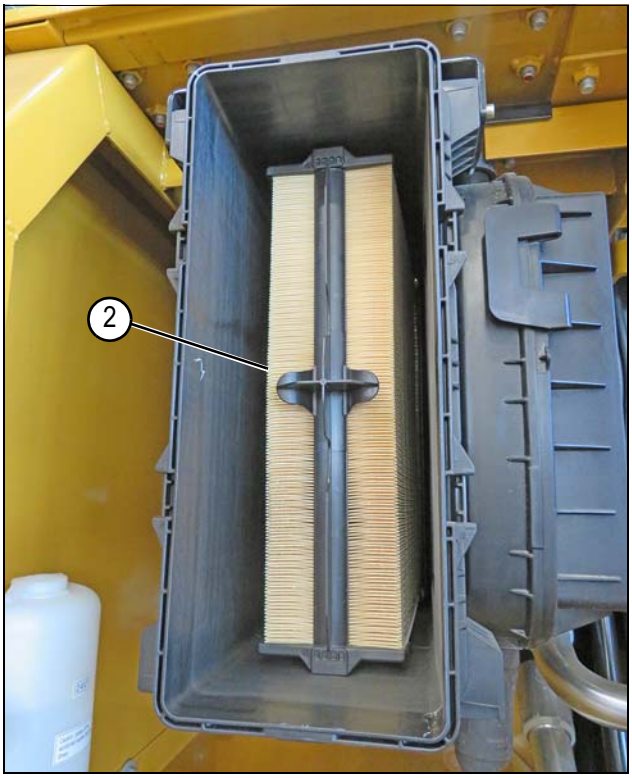



Fig. 5-29 0005323

6. Remove the secondary air filter (3).

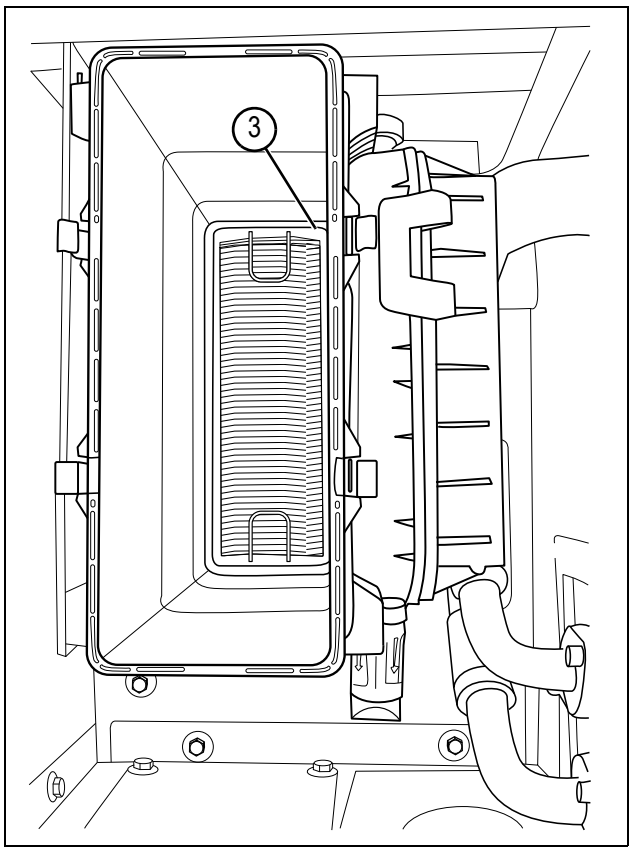


Fig. 5-30

**NOTICE!**

**Do not attempt to clean the air filter. Failure to replace a damaged, damp, or clogged air filter could cause the engine or machine to operate improperly.**

7. Inspect the secondary air filter and replace as necessary.
8. Inspect the primary air filter and replace as necessary.
9. Close the air filter housing.
10. Close and secure left access doors.

## Check the Air Intake and Charge-Air Pipes

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the appropriate access panels and doors. See “Doors, Escape Hatch, and Filler Caps” on page 4-6.
3. Inspect the intake piping daily for wear points, damage to piping, loose hose clamps, and punctures that can damage the engine.
4. Replace damaged pipes and tighten loose hose clamps as necessary to prevent the air system from leaking.

   **NOTE:** Tighten hose clamps (2) to 72 lb-in (0.5 N•m).

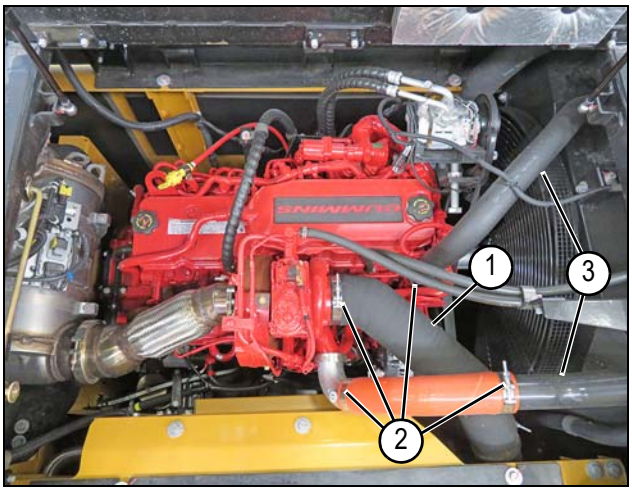


Fig. 5-31 0005314

5. Check for corrosion under the hose clamps and hoses of the intake system piping. Corrosion can allow corrosive products and dirt to enter the intake system. Disassemble and clean as required.
6. Inspect the charge-air piping (3) and hoses for leaks, holes, cracks, or loose connections.
7. Tighten the hose clamps as necessary.

## Change the Engine Oil and Filter

**WARNING!**

**Do not perform this procedure when the engine is hot. Wait for the engine to cool before proceeding. Failure to follow this warning could result in burns or other serious injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Open the engine compartment door (1). See “Engine Compartment Door” on page 4-11.

3. Loosen the engine oil filler cap (2).

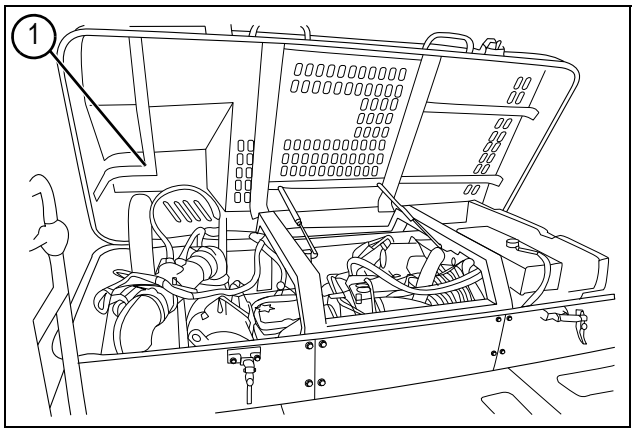



Fig. 5-32

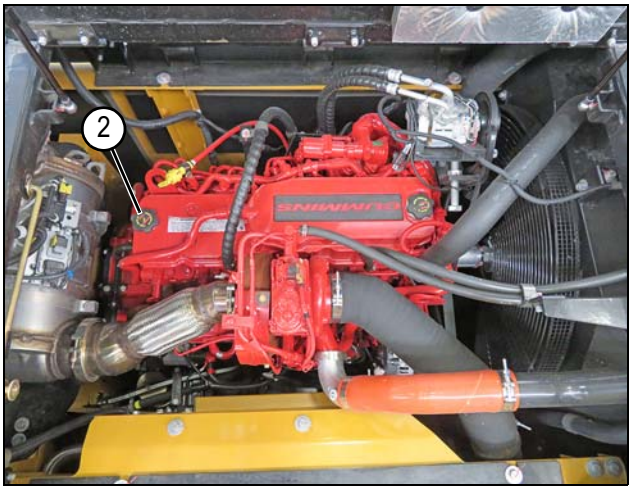



Fig. 5-33 0005314

4. Remove fasteners (3) and the engine compartment bottom cover (4).

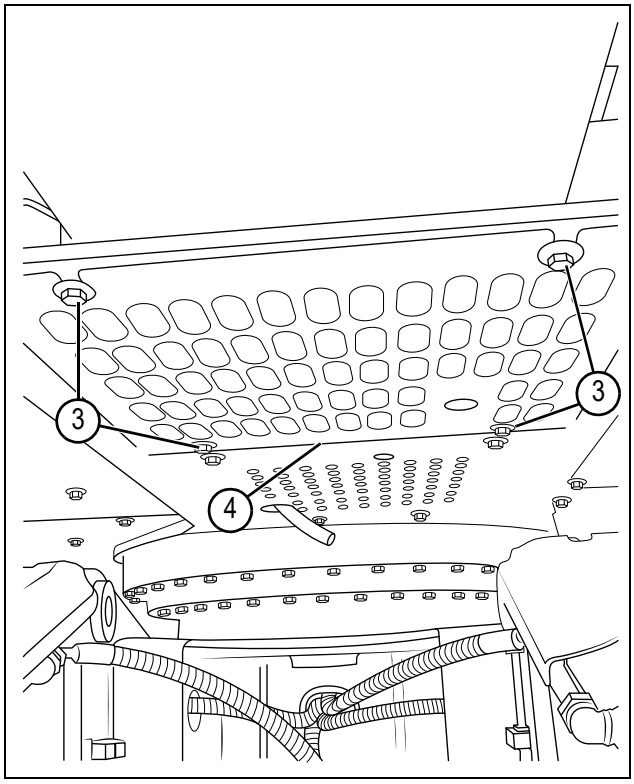



Fig. 5-34

5. Place an appropriately sized container under the engine oil drain valve (5). See “Capacities” on page 5-14 for more information.

6. Open the engine oil drain valve.

7. Allow the engine oil to completely drain into the container.

8. Close the engine oil drain valve.

9. Install the engine compartment bottom cover.

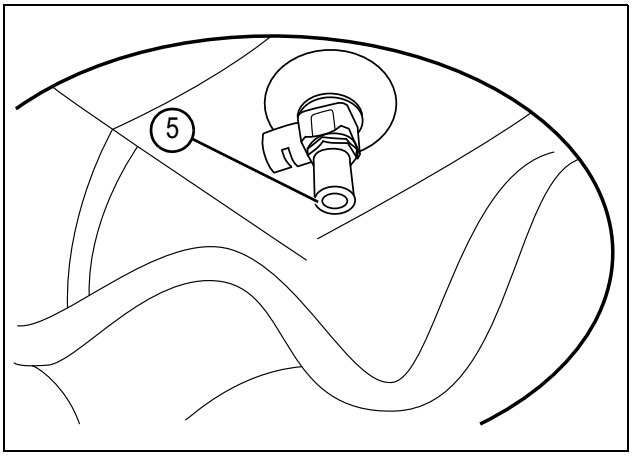



Fig. 5-35

**NOTICE!**

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

10. The engine oil filter (6) is behind the right rear door.

11. Place a catch container under the engine oil filter.

12. Remove the oil filter.

13. Inspect the drained oil and the filter for metal particles and foreign material.

14. Clean the engine oil filter mating surface.

15. Apply a thin film of clean engine oil to the new filter gasket.

16. Install the new engine oil filter until the filter gasket makes contact with the filter mating surface, then tighten the filter 3/4 turn more.

17. Remove either of the engine oil filler caps (7) and add engine oil. See “Capacities” on page 5-14.

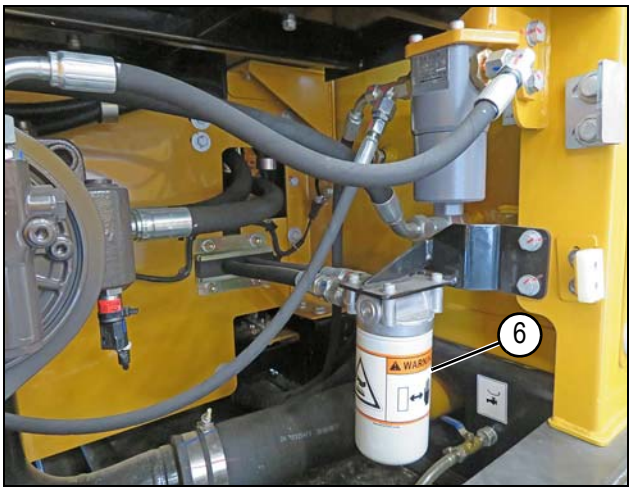



Fig. 5-36 0005320

**NOTICE!**

**Do not overfill the engine with oil. Overfilling could result in machine damage and improper machine operation.**

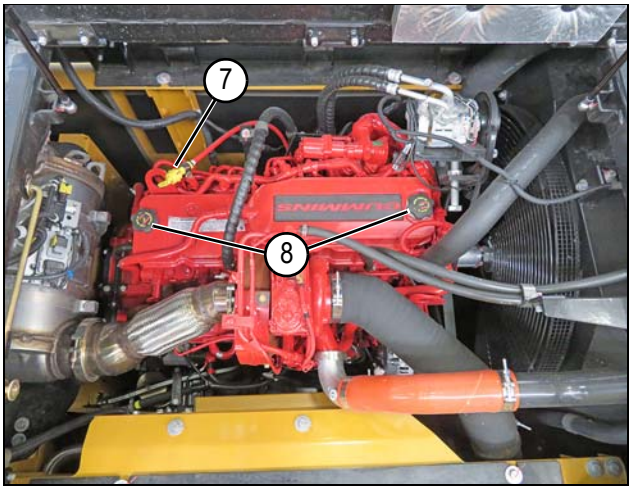



Fig. 5-37 0005314

18. Install the engine oil filler cap.

19. Remove the engine oil dipstick (8) from the engine, wipe it with a clean cloth, then insert the dipstick in its holder.

20. Remove the dipstick, note the oil level. Install the dipstick.

    **NOTE:** The oil level should be within the etched area (9). If the oil is not within the etched area, remove the engine oil filler cap, then add oil until the level is within the etched area.

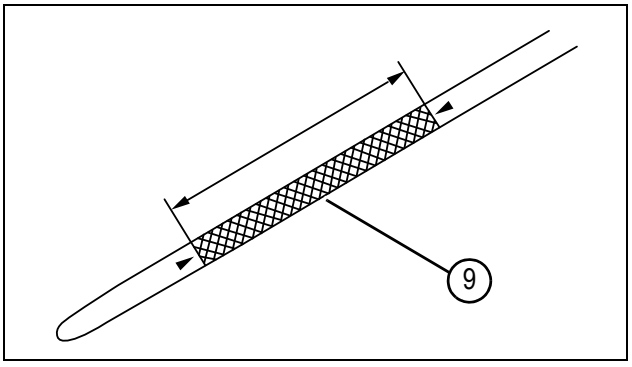



Fig. 5-38

21. Start and run the engine at low idle for several minutes, shut off the engine, and check for oil leaks.

22. Check the oil level. Add oil as needed.

## Inspect the Engine Serpentine Belt

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

**CAUTION!**

**Rotating parts inside the engine compartment can cause injury. Make sure the engine is off and that all components have stopped moving.**

2. Open the appropriate access covers or compartment doors. See “Doors, Panels, Covers, and Filler Cap” on page 4-5.

3. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.

4. Check the engine serpentine belt and pulleys for wear or damage.

5. Press on the engine serpentine belt (1) between the fan and component pulley.

   **NOTE:** The belt should deflect 0.20 in.–0.31 in. (5 mm–8 mm) (2).

   - If using a tension meter to check the belt tension of the engine serpentine belt, the tension should measure 143 lbf. (636 N).

6. Replace the belt if:

   - It has stretched past the point of being correctable.
   - Cuts or cracks are found in the belt.
   - The belt slips or squeals.

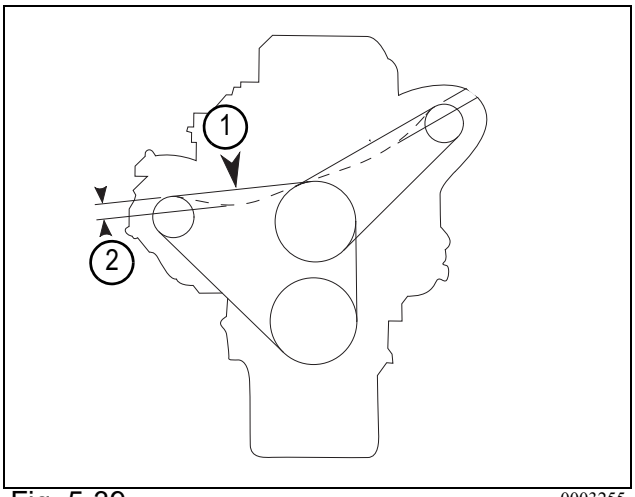


Fig. 5-39 0003255

## Check the Starter

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

**CAUTION!**

**Rotating parts inside the engine compartment can cause injury. Make sure the engine is off and that all components have stopped moving.**

2. Open the appropriate access covers or compartment doors. See “Doors, Escape Hatch, and Filler Caps” on page 4-6.

3. Turn the key switch to the START position and listen for abnormal noise and operation that may indicate a faulty starter:

- High-pitched screeching sounds.
- Grinding noise.
- Intermittent whirring sound (starter not engaging engine flywheel).
- Starter turns engine over slowly.
- Burning smell or smoke coming from the starter.

4. If the starter is malfunctioning, contact a SANY dealer for additional information.

## Check the Alternator

Contact a SANY dealer for inspection.

## Check the Aftertreatment Exhaust Piping

**WARNING!**

**Never operate a machine with a damaged or defective exhaust system, exhaust leaks, or restrictions. Failure to follow this warning could result in death or serious injury.**

**CAUTION!**

**Make sure that the engine is shut down and that the exhaust components have cooled down to a point where they can be touched without burning. Failure to follow this caution could result in injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the engine compartment cover (1). See “Engine Compartment Door” on page 4-11.

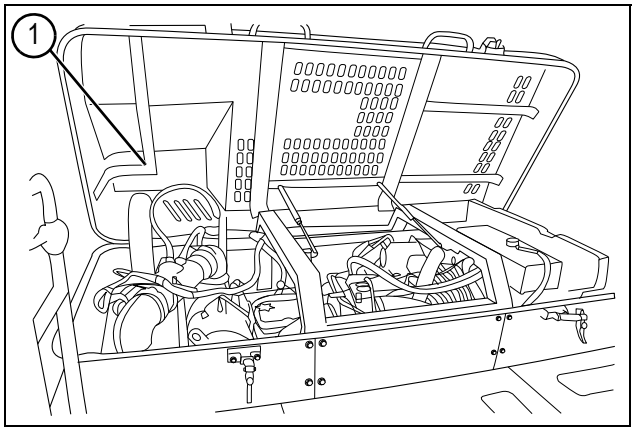



Fig. 5-40

3. Locate the exhaust system (2) under the engine compartment cover, next to the engine.
4. Inspect the exhaust system and its mount for leaks or signs of damage.
5. Check the connection to the expansion pipe (3) for leaks or signs of damage.
6. Make sure the exhaust pipe is clear and not restricted.

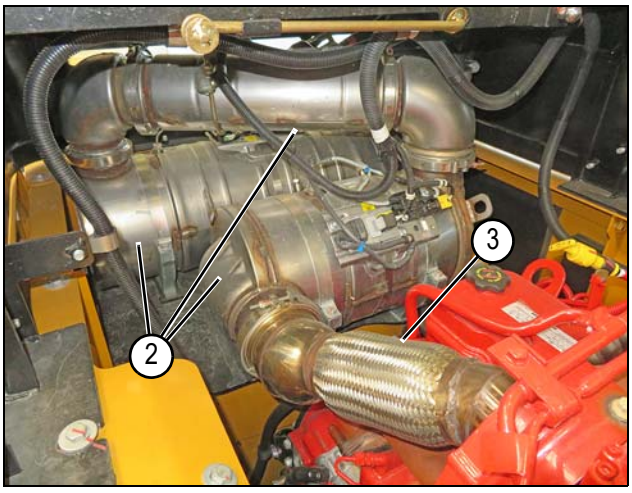



Fig. 5-41 0005324

## Check the Engine Exhaust Pipe Clamps

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Open the engine compartment cover (1). See “Engine Compartment Door” on page 4-11.

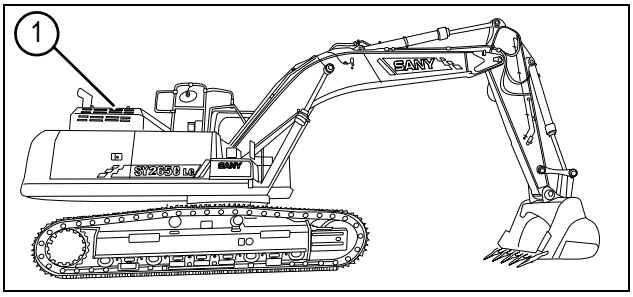



Fig. 5-42 0000240

**CAUTION!**

**Make sure that the engine is off and that the exhaust components have cooled down to a point where they can be touched without burning. Hot engine and exhaust components can cause burns and injury.**

3. Check the clamps (2) on the exhaust system for tightness.

4. Tighten as required. Replace damaged or missing clamps. Not all clamps are shown in this illustration.

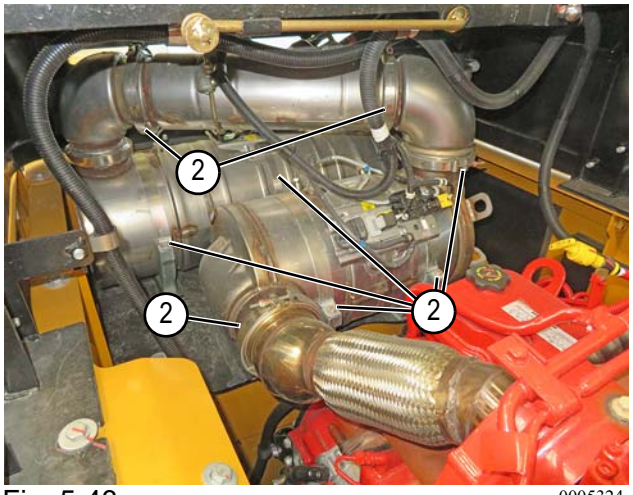



Fig. 5-43 0005324

# Engine Cooling System

## Change the Engine Coolant

**WARNING!**

- **Engine coolant is toxic. Avoid inhaling or ingesting engine coolant. If eyes or skin are contaminated by coolant, wash the affected area with plenty of water and seek medical treatment immediately.**
- **Do not remove the radiator cap while the engine is hot. Engine coolant is under pressure when the engine is hot. Avoid contact with hot engine coolant. Allow the engine to cool before removing the radiator cap.**

**Failure to follow these warnings could result in death or serious injury.**

1. Position the upper structure as shown to allow access to the radiator drain valve.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
3. Open the engine compartment door (1). See “Engine Compartment Door” on page 4-11.

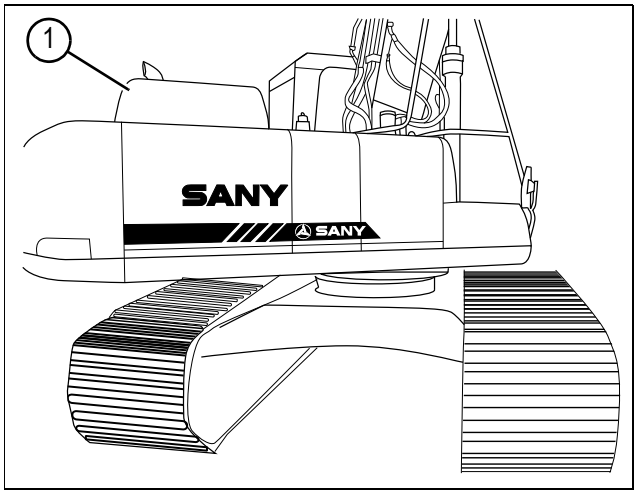


Fig. 5-44

4. Slowly loosen the expansion tank cap (2) to relieve any engine cooling system pressure.
5. Remove the expansion tank cap when engine cooling system pressure has been relieved.

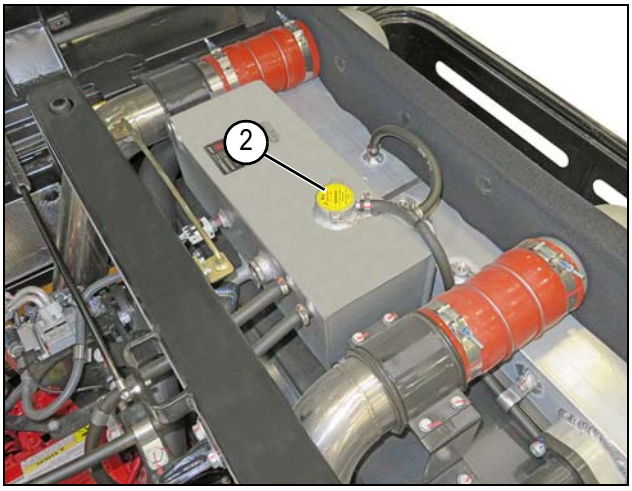


Fig. 5-45 0005184

6. Remove the bottom access panel (3).

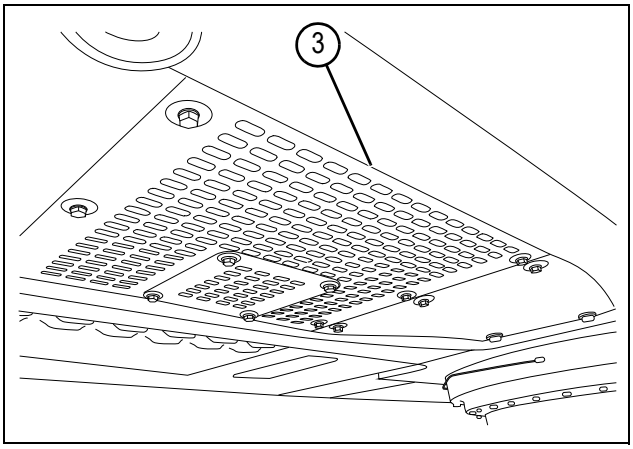



Fig. 5-46

7. Place an appropriately sized container under the radiator drain hose (4). For engine coolant capacity, see “Capacities” on page 5-14.

8. Open the radiator drain valve (5).

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

10. When the engine cooling system is empty, close the radiator drain valve.

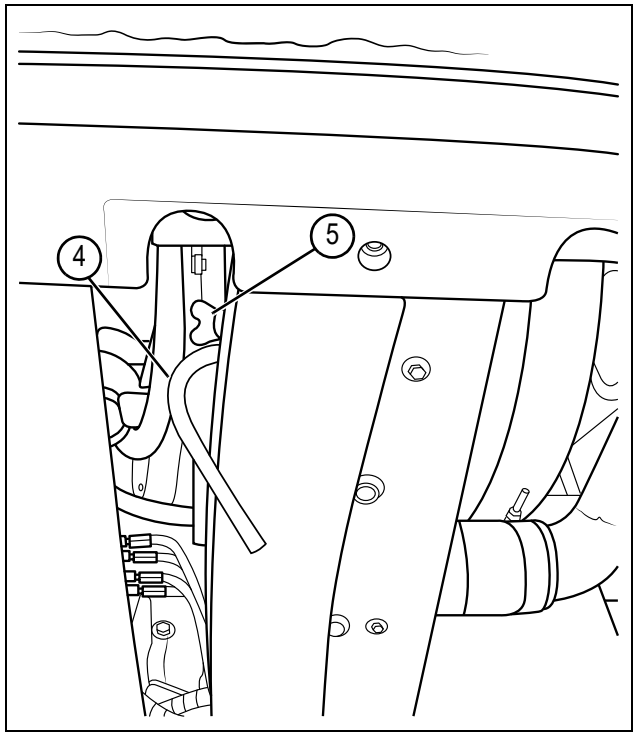



Fig. 5-47

**NOTICE!**

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

11. Add new engine coolant through the expansion tank until the engine coolant level reaches the bottom of the filler neck.

12. Install the expansion tank cap.

13. Start the engine and run it at low idle for several minutes to allow engine coolant to circulate.

14. Shut down the engine, then check the engine coolant level. See “Check the Engine Coolant Level” on page 5-20.

15. Install the bottom access cover.

16. Close the engine cover.

## Check the Radiator, Oil Cooler, Charge-Air Cooler, and Air Conditioner Condenser

**WARNING!**

**Do not allow compressed air, pressurized water, or steam to come into contact with skin. Always wear goggles, gloves, and other personal protective equipment (PPE). Failure to follow these warnings could result in death or serious injury.**

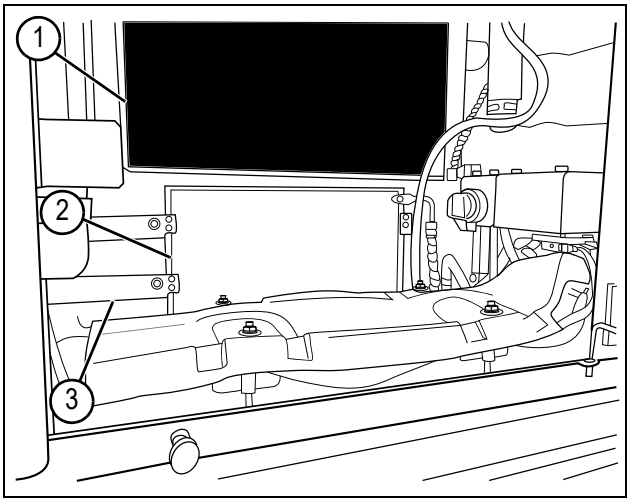


Fig. 5-48

1. Open the engine compartment access door. See “Engine Compartment Door” on page 4-11.
2. Open the left rear access door. See “Left Access Doors” on page 4-10.
3. Clean the engine coolant radiator (1), air conditioner condenser (2), and hydraulic oil cooler (3) using low-pressure compressed air.

**NOTICE!**

- **Compressed air, high-pressure water, or steam can damage the cooling fins if the nozzle is too close to the fins. To prevent cooling fin damage, keep the nozzle at a safe distance while cleaning.**
- **Damaged cooling fins may lead to leaks and overheating. In dusty environments, inspect the cooling fins daily regardless of the maintenance schedule.**

4. Clean out any debris that has accumulated during operations and cleaning.
5. Close and secure all doors.

## Inspect the Engine Coolant Pump

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the appropriate access covers or compartment doors. See “Doors, Escape Hatch, and Filler Caps” on page 4-6.
3. Turn the battery disconnect switch to OFF. See “Battery Disconnect Switch” on page 3-20.
4. Check the engine coolant pump for signs of leakage. This indicates a faulty seal on the pump shaft.
5. If the fan pulley has play, the bearings inside the engine coolant pump are worn. Contact a SANY dealer for replacement of an engine coolant pump.

# Heating and Air Conditioning System

## Check the Air Conditioning Operation

**CAUTION!**

**The air conditioning system is under pressure. Working on it could create a hazardous situation, which could result in injury. Contact a SANY dealer for repairs.**

With the engine running:

- Press the OFF button (1) and make sure no heat is present.
- Press the fan switch (2) to check start-up, airflow, and fan speed.
- Press the temperature control button (3) to adjust the heat temperature and check if the air temperature changes from warm to hot.
- Press the A/C button (4) and check if the air temperature changes from warm to cool.

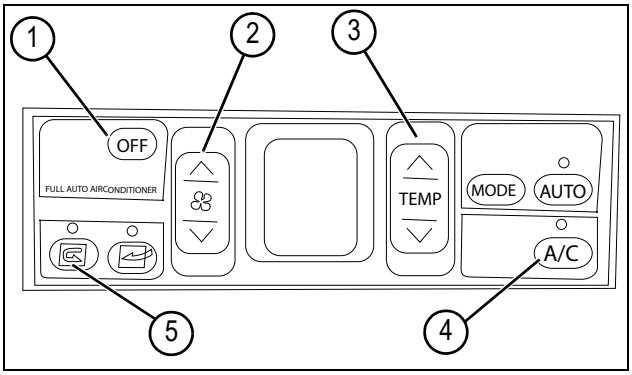


Fig. 5-49

6. Check the recirculated-fresh-air control switch (5) function.

## Check the Air Conditioner Compressor Belt

**CAUTION!**

**Make sure the engine is off and that all rotating parts inside the engine compartment have stopped moving. Failure to follow this caution could result in injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the engine compartment door. See “Engine Compartment Door” on page 4-11.
3. Remove fasteners (1) that secure the shroud around the air conditioner compressor and drive belt. Remove shroud from machine.
4. Check for damaged pulleys and worn V-groove or V- belt.
5. Make sure the V-belt does not rub against the bottom of the V-groove.
6. Examine the belt for signs of damage.

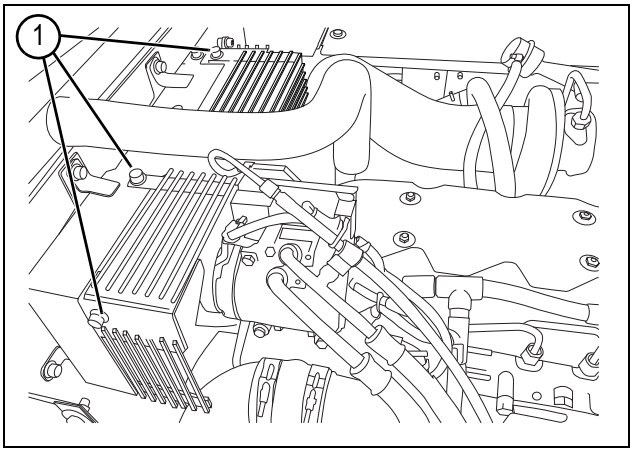


Fig. 5-50

7. Use a belt tension gauge to apply a force of 80 lbf to 120 lbf (356 N to 534 N) halfway between the air conditioner pulley and engine fan pulley.

8. The belt should deflect 0.20 in.–0.31 in. (5 mm–8 mm).

9. Adjust belt tension as necessary.

10. Install the shroud.

### Adjust the Air Conditioner Compressor Belt

**NOTE:** Do not repair the air conditioning system beyond the tasks described in this manual.

**CAUTION!**

**Make sure the engine is off and that all rotating parts inside the engine compartment have stopped moving. Failure to follow this caution could result in injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Open the engine compartment door. See “Engine Compartment Door” on page 4-11.

3. Remove fasteners (1) that secure the shroud around the air conditioner compressor and drive belt. Remove shroud from machine.

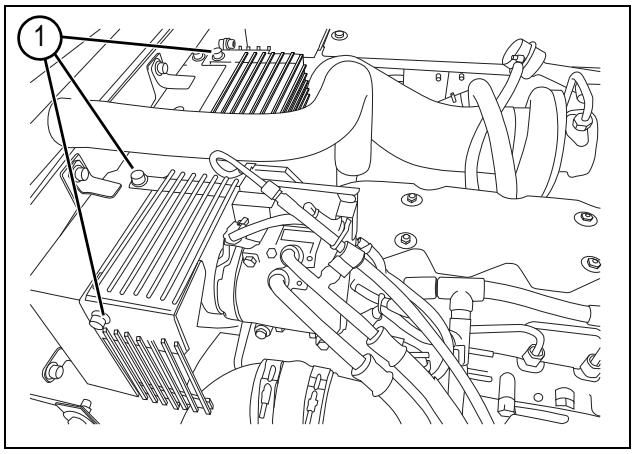



Fig. 5-51

4. Loosen the compressor bracket fasteners (2).

   **NOTE:** Not all bracket fasteners are shown.

5. Loosen the jam nut (3) on the tension adjustment bolt (4).

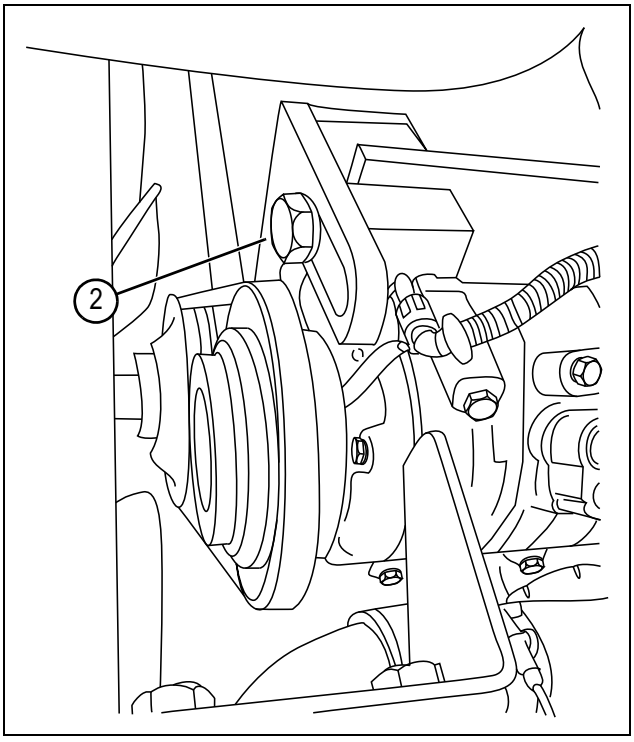



Fig. 5-52 0000239

6. Use a tensioning gauge to check the tension of the air conditioner compressor belt between two pulleys.

7. With a force of 80–120 lbf (356–534 N), the belt should deflect 0.20 in.–0.31 in. (5 mm–8 mm).

8. Turn the tension adjustment bolt to adjust the belt tension.

   **NOTE:** If the belt is out of the tension range, replace the belt and perform the belt tension check again.

9. Tighten the jam nut to lock the tension adjustment bolt in place.

10. Tighten the compressor bracket fasteners.

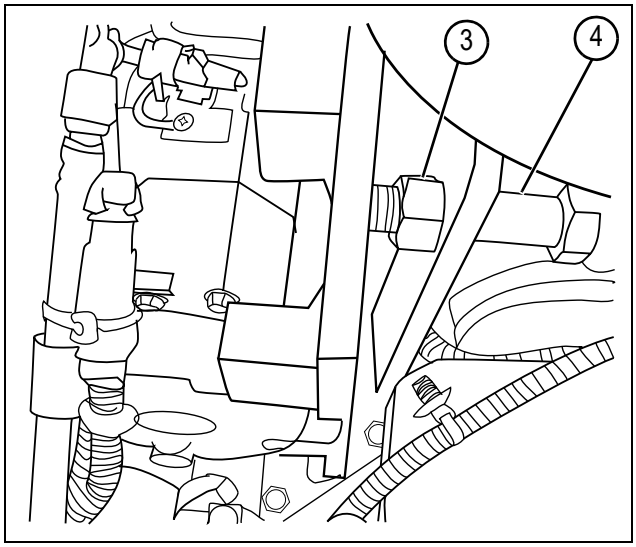



Fig. 5-53

**NOTE:** Replace the belt if:

- It has stretched and there is little margin left for adjustment.
- Cuts or cracks are found in the belt.
- The belt slips or squeals.

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

## Check the Air Conditioner Fresh-Air and Recirculated-Air Filters

### Fresh-Air Filter

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Unlock and open the fresh-air filter door (1). See “Fresh-Air Filter Access Door” on page 4-11.

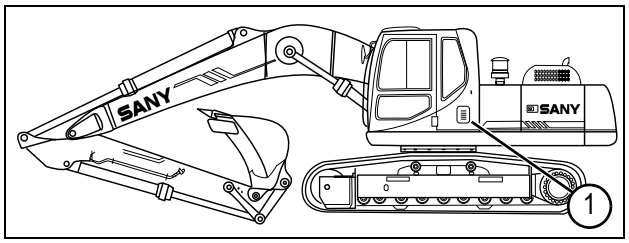



Fig. 5-54

3. Remove hardware (2) that secures the fresh-air filter (3).
4. Remove the fresh-air filter.
5. Clean the fresh-air filter using compressed air.

   **NOTE:** Replace the fresh-air filter after cleaning five times or it cannot be cleaned.

6. Install or replace the fresh-air filter.
7. Install the hardware.
8. Close and lock the fresh-air filter access door.

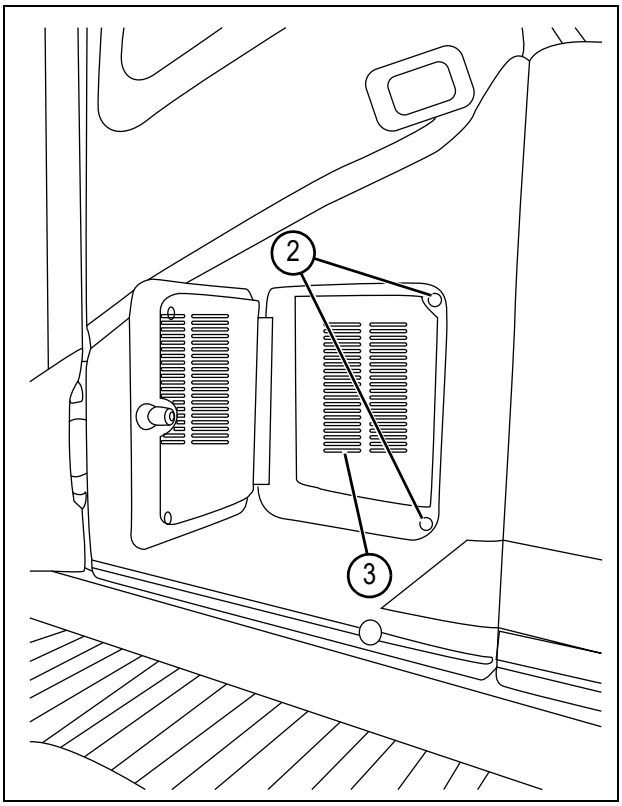



Fig. 5-55

### Recirculated-Air Filters

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Remove fasteners (1) that secure the recirculated-air filter cover (2).

   **NOTE:** The recirculated-air filter is behind the seat.

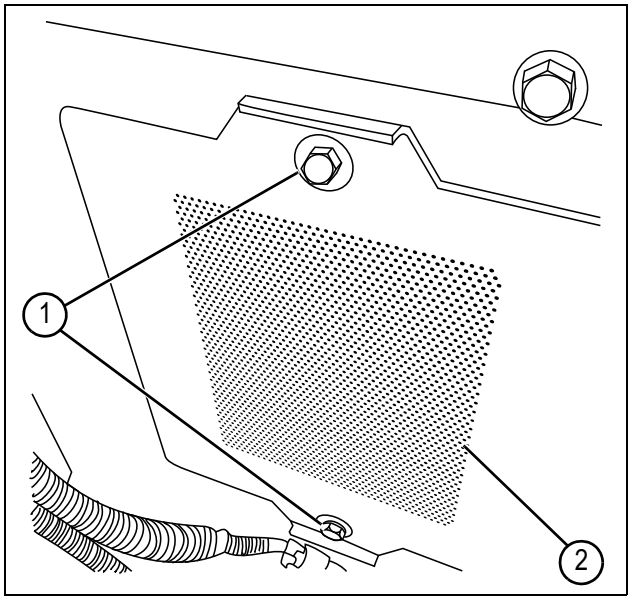



Fig. 5-56

3. Remove fasteners (3) that secure the recirculated-air filter (4).
4. Remove the recirculated-air filter.
5. Clean the recirculated-air filter using compressed air.

   **NOTE:** Replace the recirculated-air filter after five cleanings or if it cannot be cleaned.

6. Install or replace the recirculated-air filter and fasteners.
7. Install the recirculated-air filter cover and fasteners.

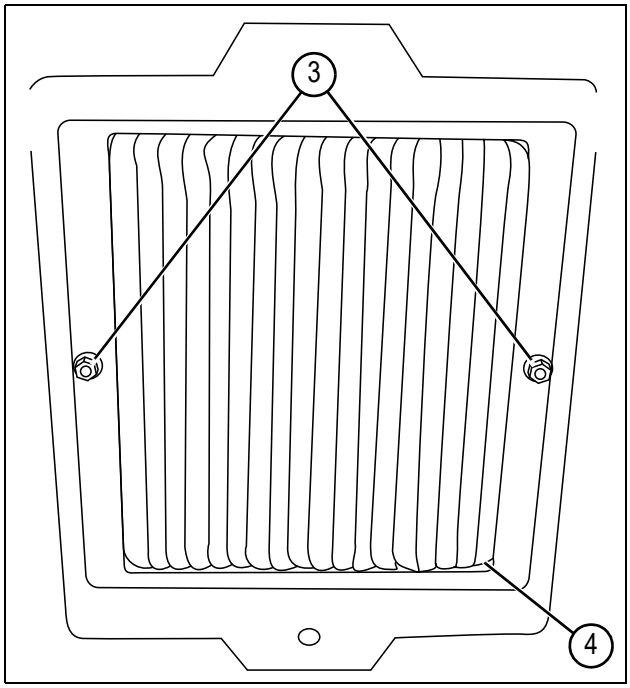



Fig. 5-57

# Exhaust System

## Check the Exhaust System

**CAUTION!**

**Make sure that the engine is off and that the exhaust components have cooled to a point where they can be touched without burning. Hot engine and exhaust components can cause burns and injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the engine compartment cover (1). See “Engine Compartment Door” on page 4-11.

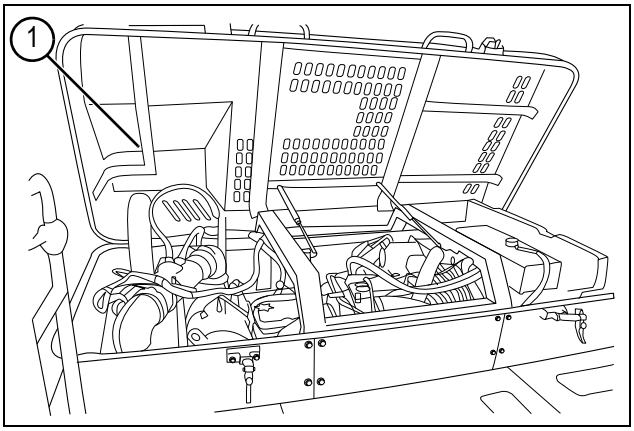



Fig. 5-58

3. Locate the exhaust components (2) and exhaust pipe (3) next to the engine.
4. Inspect the exhaust components and its mount for leaks or signs of damage.
5. Be sure the exhaust pipe is clear and not restricted.
6. Check the connection to the expansion pipe (4) for leaks or signs of damage.

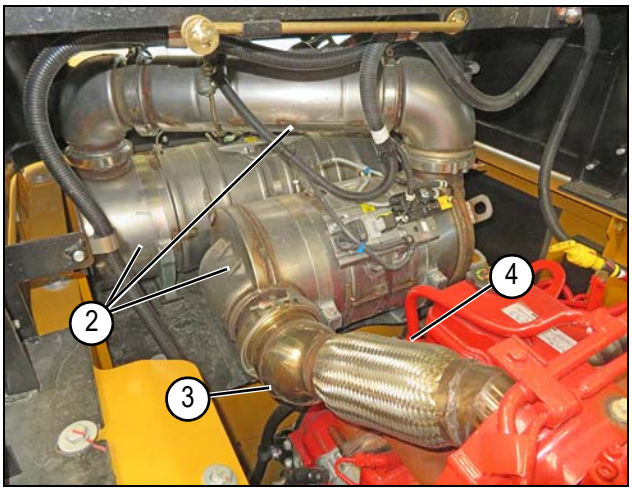



Fig. 5-59 0005324

**NOTICE!**

**Never operate a machine with a damaged or defective exhaust system, exhaust leaks, or restrictions. A damaged exhaust system could result in engine damage.**

## Replace the Diesel Exhaust Fluid (DEF) Pump Filter

**CAUTION!**

**It is critical when working with the DEF system that all materials used are absolutely clean. Dispose of the DEF pump filter in accordance with all applicable environmental regulations. Failure to follow this caution could damage the machine or environment.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the right rear access door.See “Right Rear Access Door” on page 4-9.
3. The DEF pump (1) is mounted on the right side center of the machine near the case drain filter.
4. Remove the DEF pump filter housing (2) from the bottom of the DEF pump.
5. Remove and replace the DEF pump filter element.
6. Replace the DEF pump filter housing O-ring.
7. Install the DEF pump filter housing to the bottom of the DEF pump.

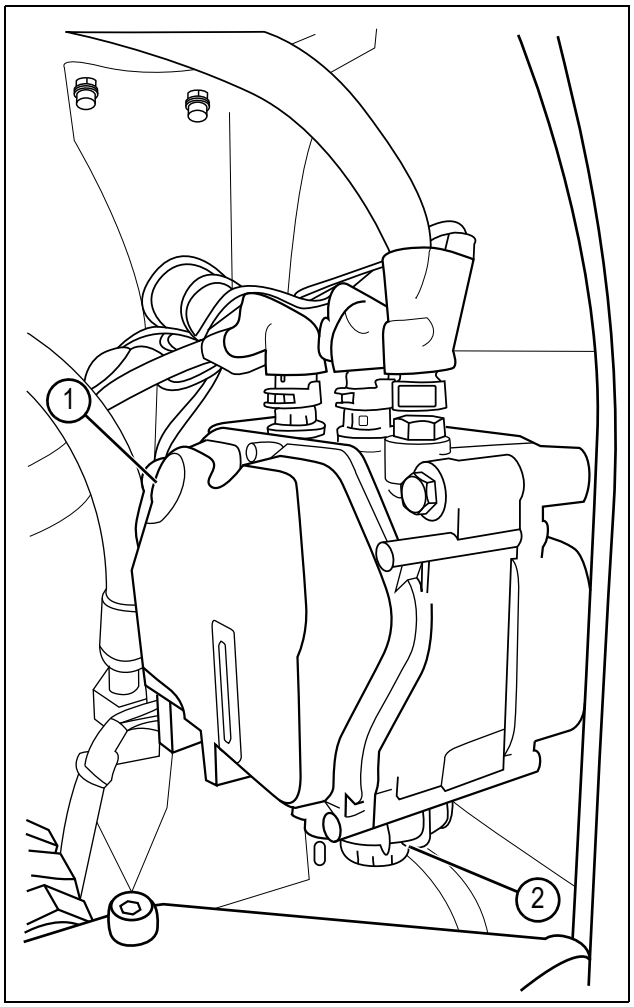



Fig. 5-60

## Replace the Diesel Exhaust Fluid (DEF) Tank Filter

**CAUTION!**

**It is critical when working with the DEF system that all materials used are absolutely clean. Failure to follow this caution can cause equipment damage.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Open the right front access door (1). See “Right Front Access Door” on page 4-8.

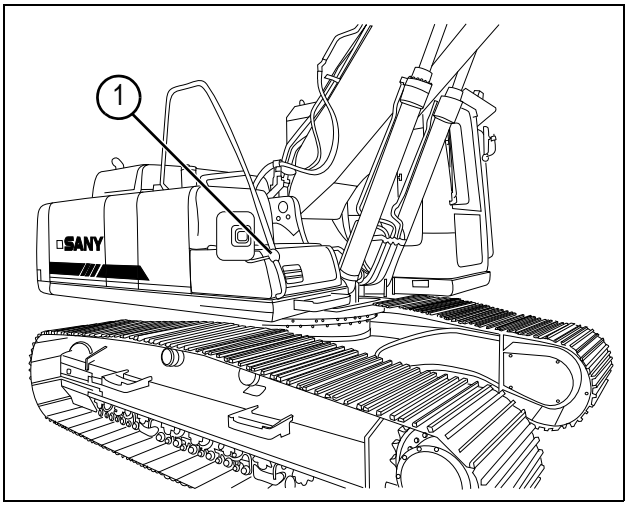



Fig. 5-61

3. Disconnect the DEF sending unit electrical connector (2).

   **NOTE:** For proper installation, label all hoses and note their positions before disconnecting.

4. Disconnect the two engine coolant hoses (3) from the DEF sending unit.

   **NOTE:** Place a suitable container under the coolant hoses as they are removed to catch any coolant. Clamp or plug the engine coolant hoses to prevent excess leakage.

5. Disconnect the two DEF lines (4) from the DEF sending unit.

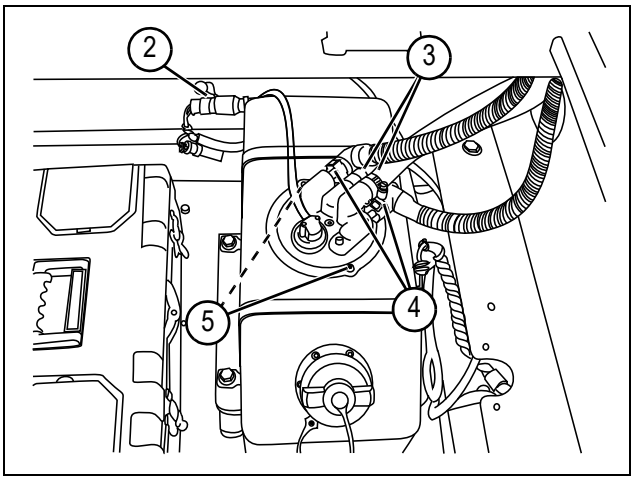



Fig. 5-62

   **NOTE:** Place a suitable container under the DEF lines as they are removed to catch any DEF fluid. Clamp or plug the DEF lines to prevent excess leakage.

6. Remove the DEF sending unit fasteners (5), then lift the DEF sending unit (6) from the tank.

7. Remove the old DEF tank filter (7).

8. Install the new DEF tank filter.

9. Install the DEF sending unit in the reverse order of removal.

10. Close and secure the right front access door.

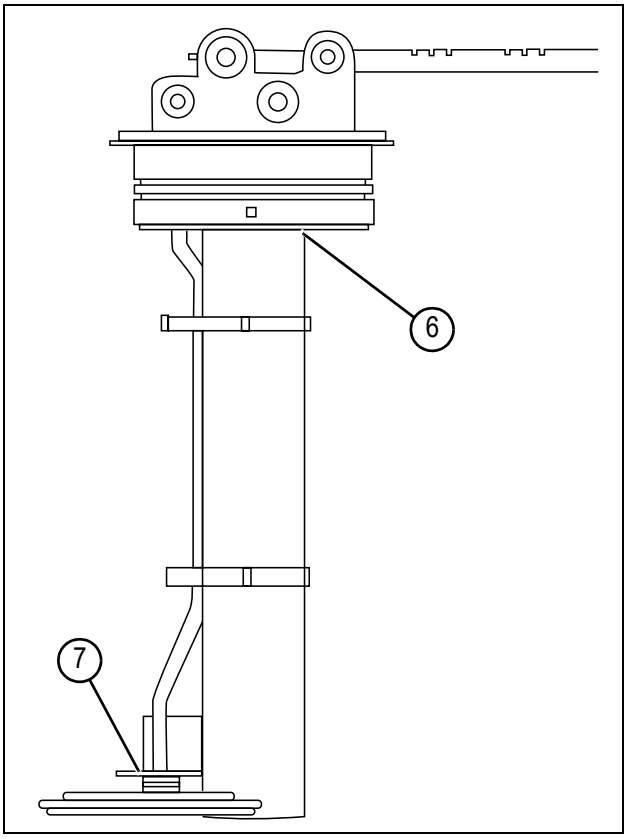



Fig. 5-63

# Fuel System

## Check the Fuel Lines

Inspect all fuel lines and hoses on the machine and the engine. Replace as necessary.

## Drain the Fuel Tank

1. Park the machine on a flat, level surface and position the upper structure to allow access to the right cover plate under the fuel tank.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
3. Open the right rear access door. See “Right Rear Access Door” on page 4-9.
4. Unlock and remove the fuel tank filler cap (1). See “Fuel Tank Filler Cap” on page 4-12.

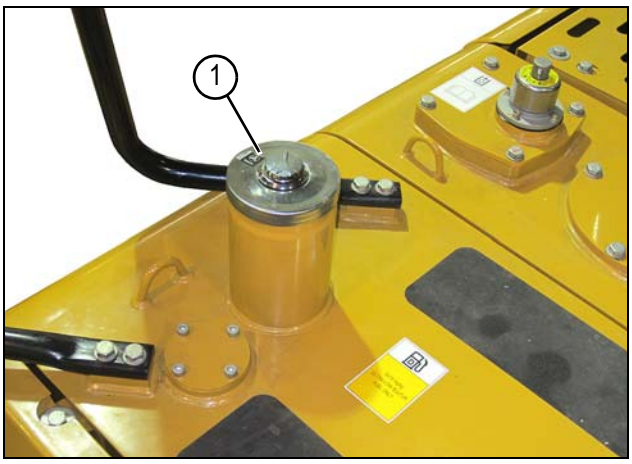



Fig. 5-64 0004153

5. Direct the drain tube (3) from the fuel tank down through the floor grating.
6. Place an appropriately sized container under the end of drain tube. See “Capacities” on page 5-14 for more information.
7. Open the drain valve (2).
8. Close the drain valve when the fuel flow stops.

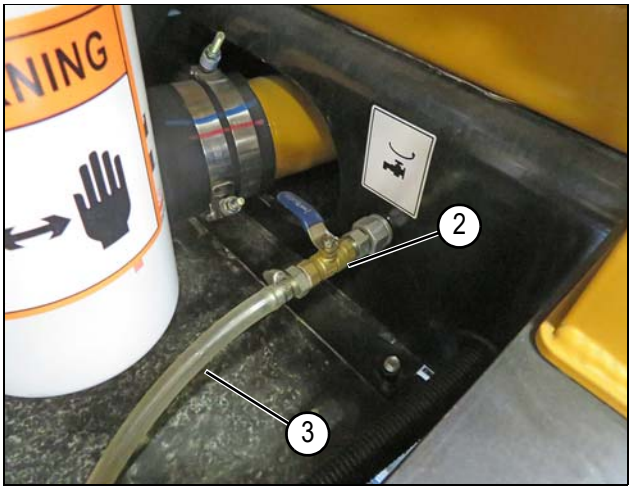



Fig. 5-65 0005327

**NOTICE!**

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

9. Add fuel to the system as necessary.
10. Install and lock the fuel tank filler cap.
11. Start the engine and allow it to run at low idle.
12. Check for leaks in the fuel system, repair as necessary.
13. Close and lock the right access door.

## Replace the Primary Fuel Filter

**WARNING!**

**Never service the fuel system near an open flame or while smoking. Failure to follow this warning may result in death or serious injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. The primary fuel filter (1) is behind the right rear door. See “Right Rear Access Door” on page 4-9.
3. Place an appropriately sized container under the primary fuel filter.
4. Slowly loosen the priming pump knob (2).
5. Open the drain valve (3) to allow all water and fuel to drain from the primary fuel filter.
6. Remove the primary fuel filter.

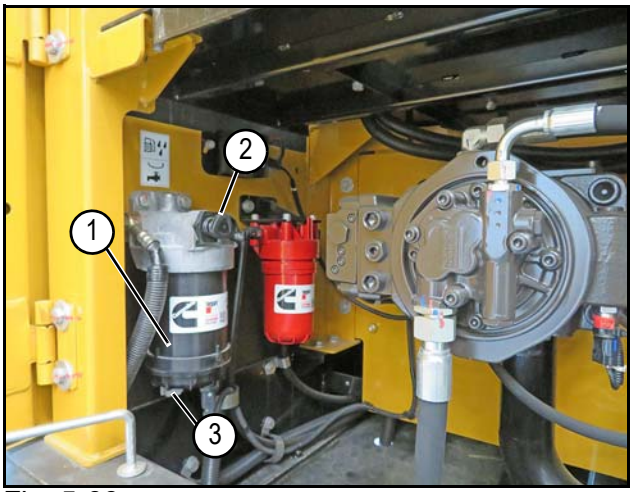


Fig. 5-66 0005319

**NOTICE!**

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

7. Fill the primary fuel filter with clean fuel.
8. Install a new primary fuel filter onto the primary fuel filter mount until the gasket contacts the primary fuel filter mount.
9. Tighten the primary fuel filter an additional 1/4 turn.
10. Start the engine and run at low idle and check for leaks in the fuel system.
11. Shut down the engine, close and secure the access door.

## Replace the Secondary Fuel Filter

**WARNING!**

**Never service the fuel system near an open flame or while smoking. Failure to follow this warning may result in death or serious injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open right rear access door. See “Right Rear Access Door” on page 4-9.
3. Place an appropriately sized container under the secondary fuel filter (2).
4. Remove the secondary fuel filter from the filter mount (1).
5. Clean the bottom of the filter mount.

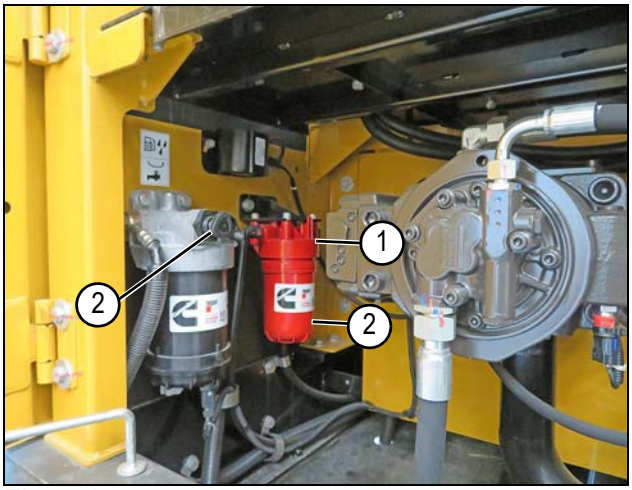


Fig. 5-67 0005319

**NOTICE!**

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

6. Install a new secondary filter onto the filter mount until the gasket contacts the filter mount.
7. Tighten the secondary filter an additional 1/4 turn.
8. Turn pump priming knob (3) counterclockwise to release priming knob.
9. Pump the priming knob until resistance is felt.
10. Push in pump priming knob and turn clockwise to lock the priming knob.
11. Start the engine and run at low idle.
12. Check for leaks in the fuel system.
13. Shut down the engine.

## Check the Fuel Tank Strainer

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Unlock and remove the fuel tank filler cap (1). See “Fuel Tank Filler Cap” on page 4-12.

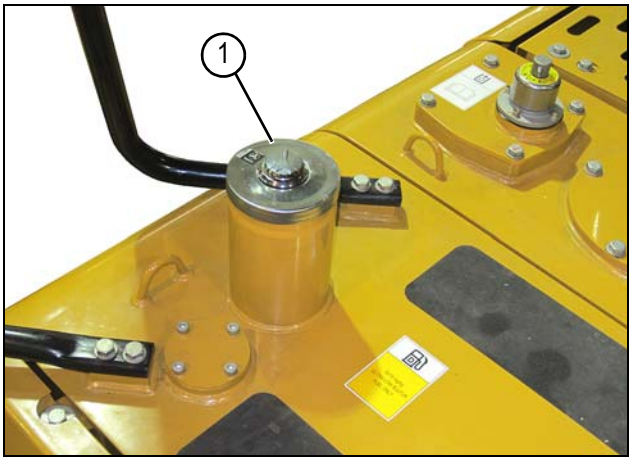



Fig. 5-68 0004153

3. Remove the fuel tank strainer element (2) from the fuel tank filler neck.
4. Clean and inspect the fuel tank strainer.
5. Install or replace the fuel tank strainer.
6. Install and lock the fuel tank filler cap.

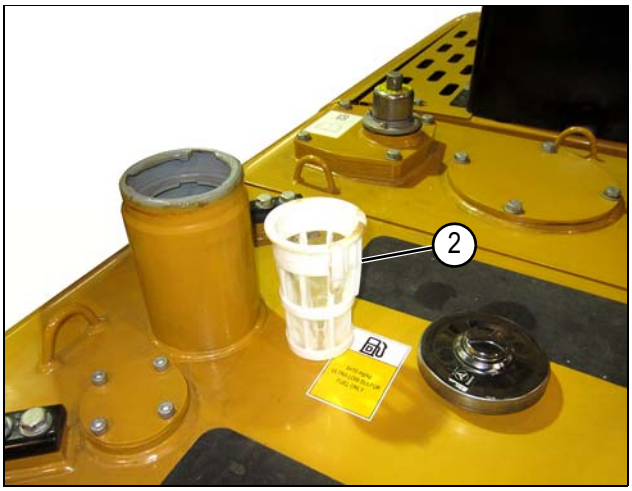



Fig. 5-69 000513

## Check the Backup Camera

1. Turn the key switch to the ON position.
2. Push button F4 on the monitor to activate the backup camera (1) and view activity behind the machine.
3. Make sure the backup camera is operating correctly and is free of all obstructions.

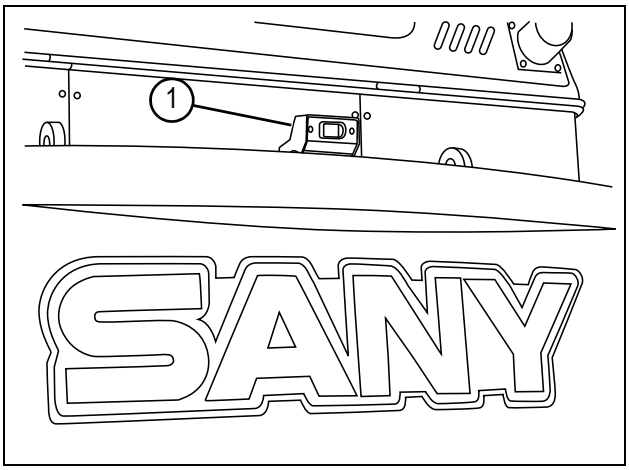



Fig. 5-70

## Disconnect the Electrical Power

**WARNING!**

**When working with any open electrical power source, make sure that your hands are free of any metal objects (rings, watches, jewelry, etc.) that could come in contact with electrical power points. Failure to avoid this hazardous situation could result in death or serious injury.**

1. Prepare the machine for checks and inspections. See “Maintenance Safety” on page 2-8.
2. The batteries are behind the left rear access door. See “Left Access Doors” on page 4-10.
3. Allow several minutes for any accumulated battery gases to clear before servicing the batteries.
4. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.
5. Remove the fasteners (2) and remove the battery cover (1).

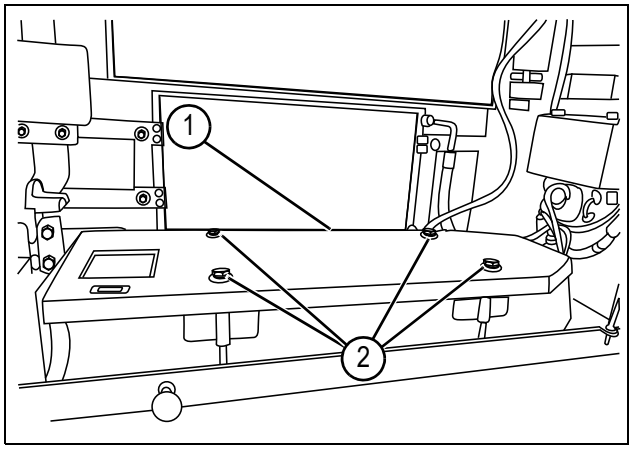



Fig. 5-71

6. Remove the black ground (–) cables (4) first, then disconnect the red positive (+) cables (3).

7. To reconnect power, connect the red cable first, followed by the black cable.

8. Install the battery cover with the fasteners.

9. Turn the battery disconnect switch to the ON position.

10. Close and secure the access door.

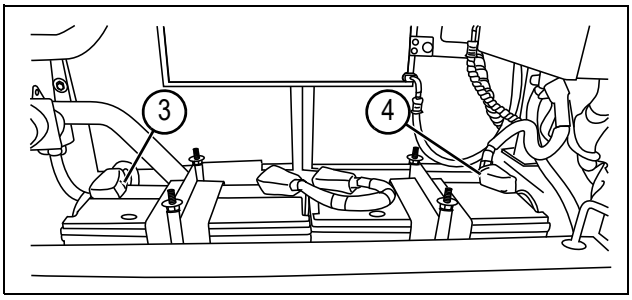


Fig. 5-72

## Check the Electrical System

The electrical system check should start with the fuse box. Inspect all electrical equipment. Replace all faulty items, including loose electrical connectors, worn or degraded wiring, cables, etc.

Locate and remove the cause of any electrical faults.

Use only genuine SANY parts and fuses.

Shut down the engine immediately if a fault occurs with the power supply.

Do not modify the electrical system, contact a SANY dealer to repair or replace any damaged wiring.

## Check the Batteries

**WARNING!**

**Before proceeding with any battery maintenance procedure, observe the following:**

- **The top of the battery must be kept clean to prevent plugging of the battery vents. Regularly wash the top of the battery to prevent the battery vents from plugging.**
- **Battery gases are explosive. Never smoke around batteries or expose them to sparks or open flames. Work in a well-ventilated area.**
- **Wear personal protective equipment (PPE) when working with batteries.**
- **Battery acid can cause burns or injury. If battery acid makes contact with skin or eyes, flush the area immediately with fresh water and seek medical attention.**

**Failure to follow these warnings could result in death or serious injury.**

1. Prepare the machine for checks and inspections. See “Maintenance Safety” on page 2-8.

**NOTICE!**

- **There are two 12-volt batteries connected in series to provide 24 volts to the electrical system.**
- **After machine shutdown, wait at least 2 minutes for the engine control module (ECM) to complete its shutdown before disconnecting the battery.**

**Failure to follow this notice can damage the machine or cause it to operate improperly.**

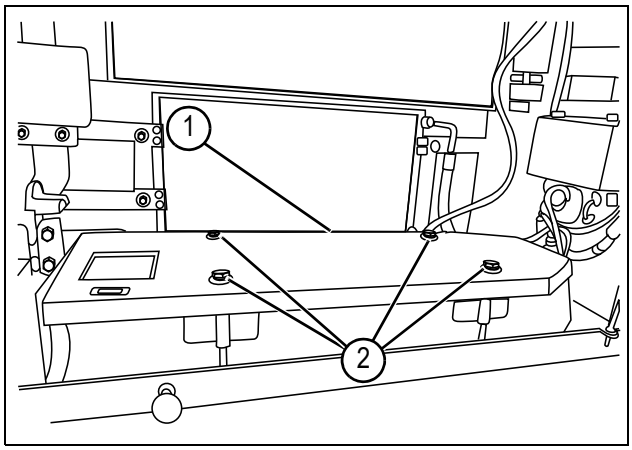


Fig. 5-73

2. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.
3. Disconnect the electrical power. See “Disconnect the Electrical Power” on page 5-60.
4. The batteries are under the cover (1) behind the left rear access door. See “Left Access Doors” on page 4-10.
5. Allow several minutes for any accumulated battery gases to clear before servicing the batteries.
6. Remove the fasteners (2) and remove the battery cover.

7. Check the top surfaces and all battery connections (3) for signs of corrosion or dirt buildup.

8. Use a clean rag to wipe any dirt from the batteries.

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

9. Remove any trash, tools, parts, or debris from the battery compartment.

10. Install the cover.

11. Close and secure left access doors.

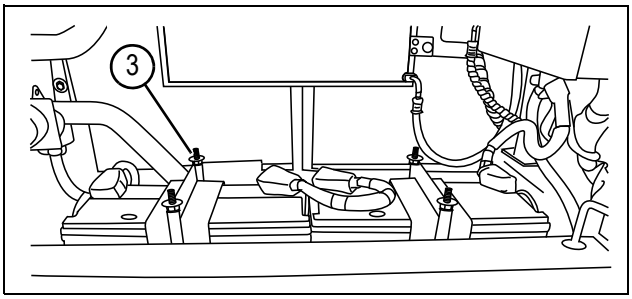


Fig. 5-74

## Replace the Batteries

**WARNING!**

**Before proceeding with any battery maintenance procedure, observe the following:**

- **The top of the battery must be kept clean to prevent plugging of the battery vents. Regularly wash the top of the battery to prevent the battery vents from plugging.**
- **Battery gases are explosive. Never smoke around batteries or expose them to sparks or open flames. Work in a well-ventilated area.**
- **Wear personal protective equipment (PPE) when working with batteries.**
- **Battery acid can cause burns or injury. If battery acid makes contact with skin or eyes, flush the area immediately with fresh water and seek medical attention.**

**Failure to follow these warnings could result in death or serious injury.**

1. Prepare the machine for checks and inspections. See “Maintenance Safety” on page 2-8.

2. The batteries are under the cover (1) behind the left rear access door. See “Left Access Doors” on page 4-10.

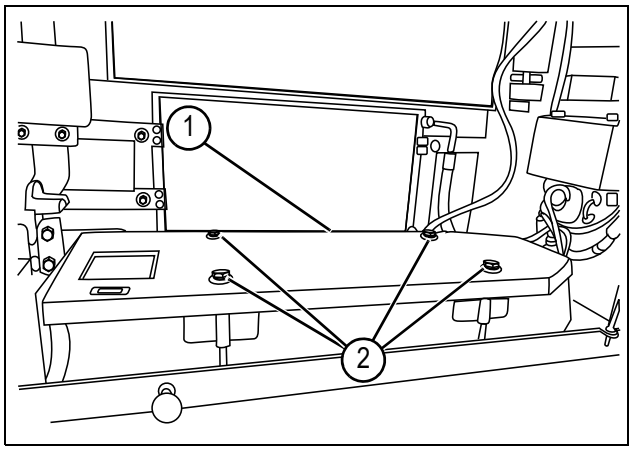


Fig. 5-75

**NOTICE!**

- **There are two 12-volt batteries connected in series to provide 24 volts to the electrical system.**
- **After machine shutdown, wait at least 2 minutes for the engine control module (ECM) to complete its shutdown before disconnecting the battery.**

**Failure to follow this notice can damage the machine or cause it to operate improperly.**

3. Allow several minutes for any accumulated battery gases to clear before servicing the batteries.
4. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.
5. Disconnect the electrical power. See “Disconnect the Electrical Power” on page 5-60.
6. Remove the fasteners (2) and remove the battery cover.
7. Disconnect the black ground (-) battery cables first, then disconnect the red positive (+) cables.
8. Remove the battery hold-down brackets (3).
9. Remove the batteries.
10. Install the new batteries.
11. Install the battery hold-down brackets over the batteries and secure them.
12. Connect the red positive (+) cables.
13. Connect the black ground (-) cables.

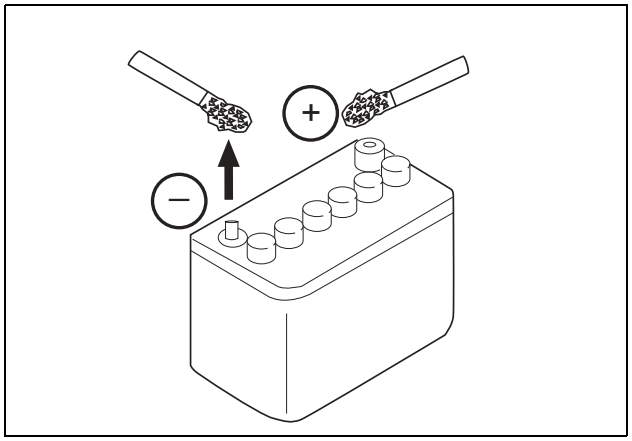


Fig. 5-76

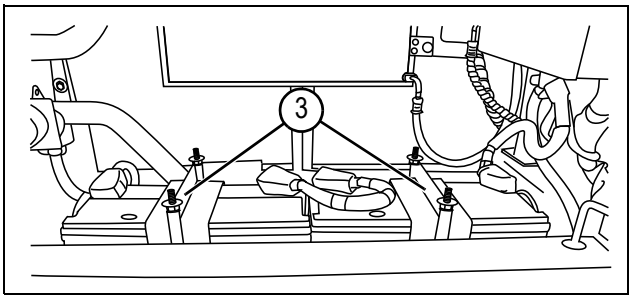


Fig. 5-77

**NOTE:** The two 12-volt batteries are connected in series. Make sure they are installed in the same manner.

**NOTICE!**

**Dispose of batteries in accordance with all applicable environmental regulations. Failure to follow this notice could result in damage to the environment.**

14. Install the battery cover and secure with the fasteners.

## Check the Fuses

**NOTICE!**

**If fuses fail frequently, the wiring harness must be inspected for broken or damaged wire insulation or a component placing a high electrical load on the system. Repair as necessary or contact a SANY dealer.**

Check all fuses for corrosion and proper function. The fuse box is behind the left rear access door. For locations and descriptions see “Fuses” on page 3-32.

If a fuse is corroded, or a white powdery substance can be seen on it, contact a SANY dealer for repair information regarding the electrical circuit in question.


Fig. 5-78 000513

# Hydraulic System

## Inspect the Accumulator

**WARNING!**

**Never open a hydraulic component under pressure. Escaping hydraulic oil is under high pressure and can penetrate the skin and cause serious injury or death. Do not use hands to check for leaks. Wear gloves, eye protection, and other personal protective equipment (PPE) and use a piece of cardboard or paper to search for suspected leaks.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the appropriate access covers or compartment doors. See “Doors, Escape Hatch, and Filler Caps” on page 4-6.
3. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.
4. The accumulator (1) is behind the left rear access door.
5. Inspect the accumulator and surrounding surfaces for signs of leaks and worn or damaged hoses.
6. If any damages is found, replace immediately.

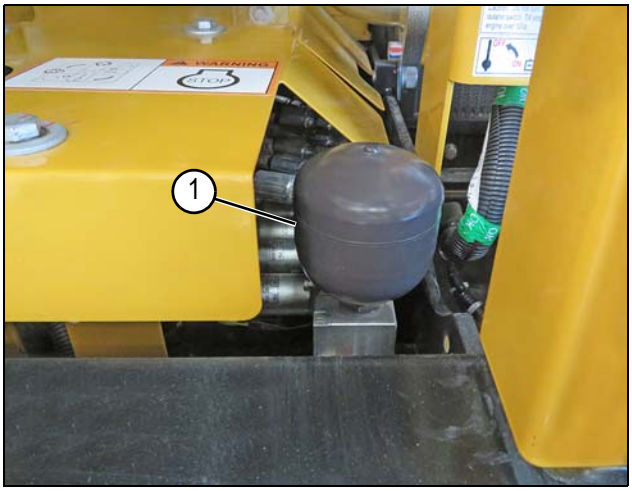



Fig. 5-79 0005318

## Check Accumulator Function

**NOTE:** Perform this procedure every 6 months (1000 hours) of service on machines with optional equipment attached. Perform this procedure annually (or every 2000 hours) on machines with a bucket attached.

1. Position the work equipment (1) 18 in.–24 in. (457 mm–610 mm) from the ground.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
3. Shut down the engine.
4. Turn the key switch to the ON position.

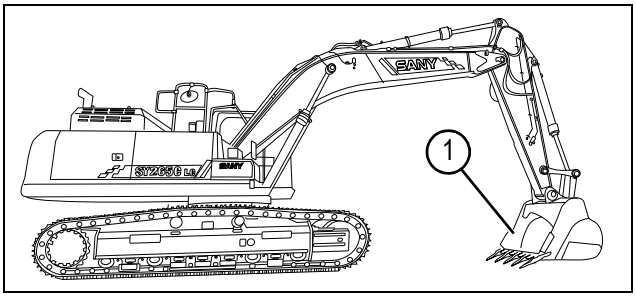



Fig. 5-80 0004379

5. Place the hydraulic lockout control lever (2) in the open (unlocked) position.

6. Move the right joystick down.

7. If the boom goes down to the ground, no action is needed.

8. If the boom does not go down to the ground, contact a SANY dealer.

9. Start the engine and run it at idle speed for about 1 minute to pressurize the accumulator.

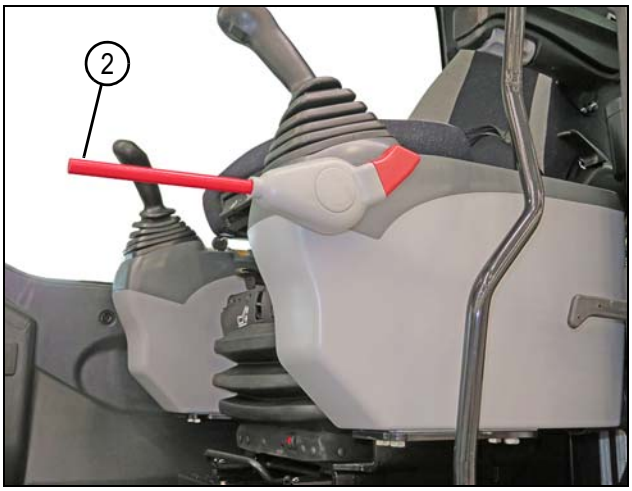



Fig. 5-81 0005235

## Relieve Hydraulic System Pressure

**NOTE:** Hydraulic system pressure must be relieved before disconnecting or servicing hydraulic system components.

1. Park the machine on a flat, level surface and position the work equipment on the ground.

2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

3. Turn the key switch to ON. Do not start the engine.

4. Place the hydraulic lockout lever in the open (unlocked) position.

5. Fully cycle each pedal, joystick, and travel control two to three times to release the system pressure remaining in the hydraulic lines.

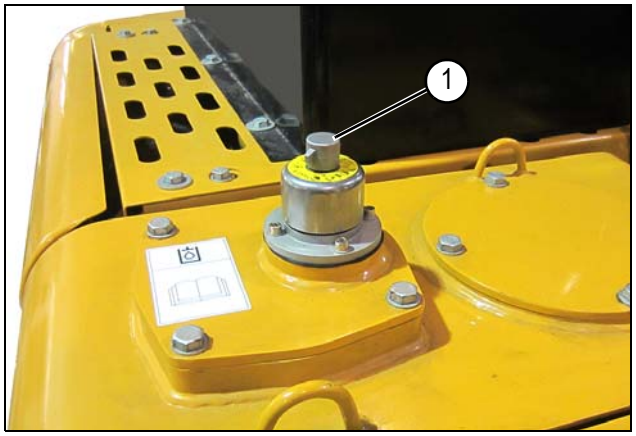



Fig. 5-82 00004158

6. Turn the key switch to OFF and place the hydraulic lockout lever in the closed (locked) position.

7. Clean the top of the hydraulic tank.

8. Remove the wing nut (1) from the breather valve.

9. Press the hydraulic tank vent button (2) to relieve pressure in the hydraulic tank.

10. Install the wing nut.

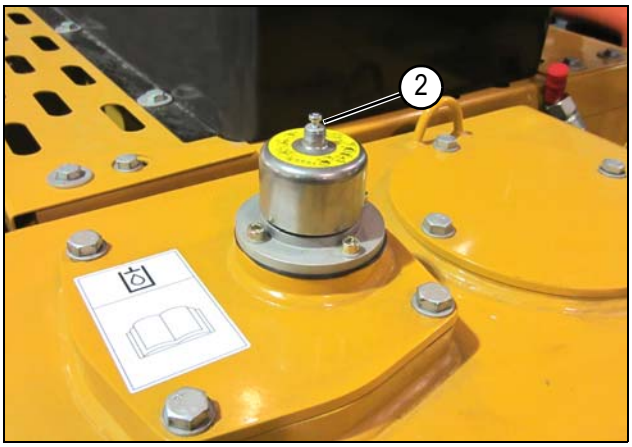



Fig. 5-83 00004159

## Add Hydraulic Oil

**WARNING!**

**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 injury.**

1. Park the machine on a flat, level surface and position the work equipment as shown on the hydraulic tank level decal.

2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

3. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.

4. Clean the top of the hydraulic tank.

5. Remove four fasteners (1) and the hydraulic suction strainer cover (2).

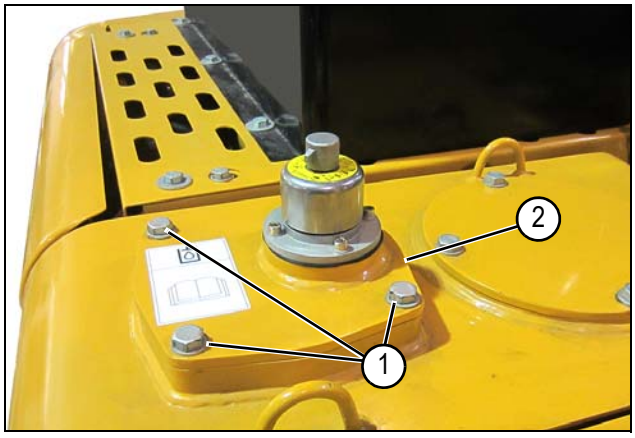



Fig. 5-84 00004158

**CAUTION!**

**Hydraulic oil may be hot and under pressure. Always use caution when opening the hydraulic system. Failure to follow this process could result in injury.**

6. Add hydraulic oil to the tank through the suction strainer opening.

7. Check the hydraulic oil level using the sight glass (3) on the side of the hydraulic tank. See “Check the Hydraulic Oil Level” on page 5-29.

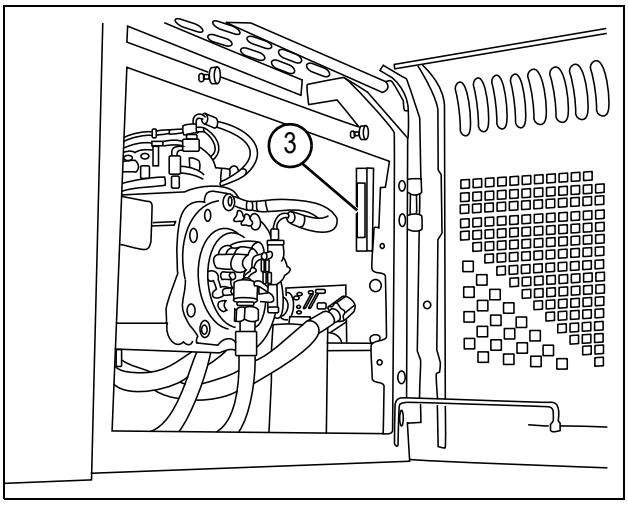



Fig. 5-85 0000257

**NOTICE!**

**Do not overfill the hydraulic tank. This could result in machine damage and improper machine operation.**

8. Install the suction strainer cover and secure using the fasteners.
9. Start the engine.
10. Run the engine for 10 minutes to circulate hydraulic oil through the hydraulic system.
11. Recheck the hydraulic oil level.
12. Check for leaks.

## Replace the Hydraulic System Breather Filter

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Clean the top of the hydraulic tank around the breather housing (2).
3. Remove the wing nut (1) from the breather valve.

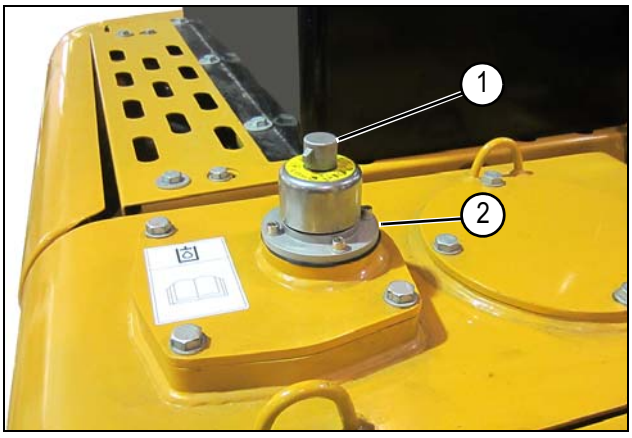



Fig. 5-86 00004158

4. Press the hydraulic tank vent button (3) to relieve pressure in the hydraulic tank.

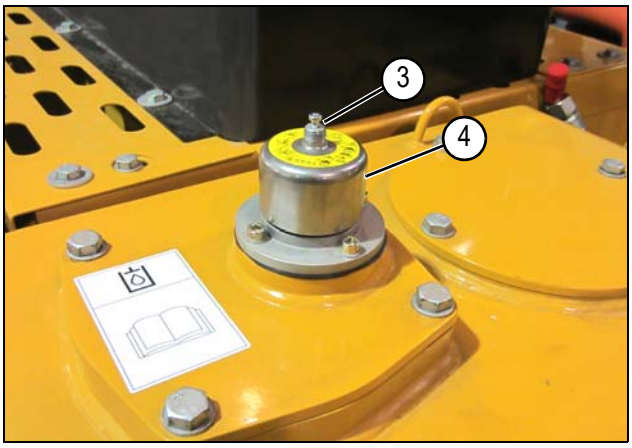



Fig. 5-87 00004159

5. Remove the breather filter element cover (4) from the breather valve and discard.
6. Install a new breather filter element (5).
7. Install the breather filter element cover.
8. Install the wing nut.

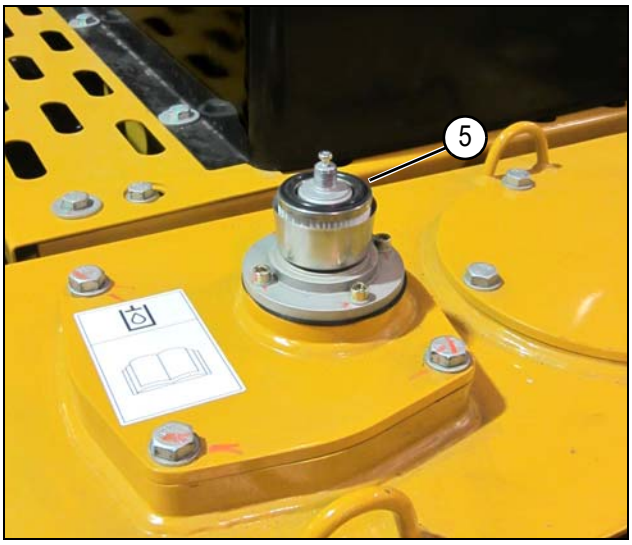



Fig. 5-88 00004157

## Replace the Hydraulic Pilot Filter Element

**WARNING!**

- **Allow the hydraulic system to cool before servicing. Hot oil may cause burns or other serious injury.**
- **The hydraulic tank may be under pressure, and hydraulic oil may be present at the filler cap. Relieve any pressure to prevent injury.**

**Failure to follow this warning could result in death or serious injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.
3. Open the right rear door and locate the hydraulic pilot filter housing (1) behind the hydraulic oil filter.
4. Place an appropriately sized container under the pilot filter housing to catch leaking hydraulic oil.

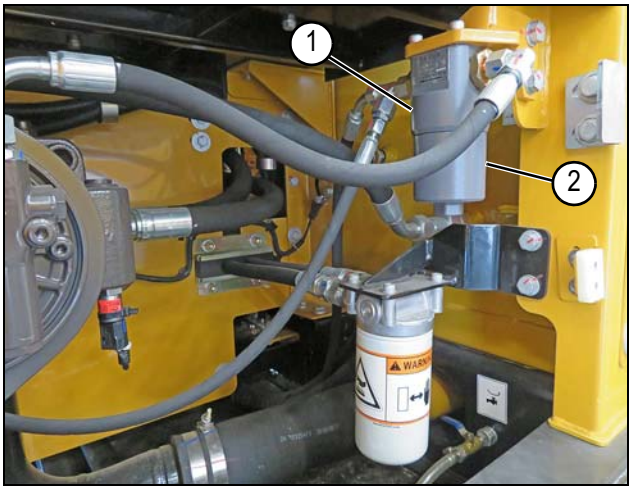


Fig. 5-89 0005320

**NOTICE!**

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

5. Remove the pilot filter bowl (2).

6. Remove the filter element (3) from the filter housing.
7. Clean the inside of the pilot filter bowl with clean fuel.
8. Install a new gasket and O-ring.
9. Install a new pilot filter element inside the pilot filter bowl.
10. Install the pilot filter bowl.
11. Check the oil level in the tank and add oil if needed. See “Add Hydraulic Oil” on page 5-68.
12. Start the machine and check for leaks.

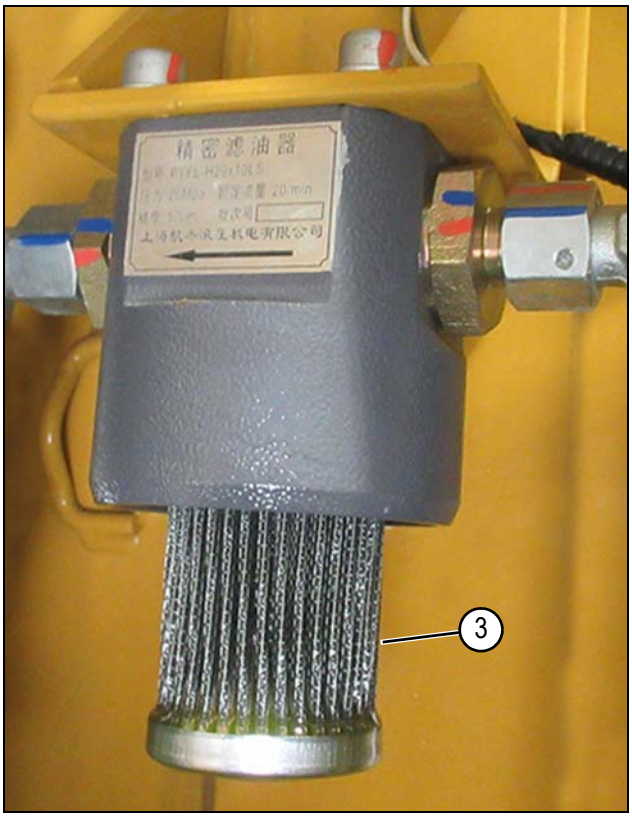



Fig. 5-90 0005270

## Replace the Hydraulic Tank Return Filter

**WARNING!**

- **Allow the hydraulic system to cool before servicing. Hot oil may cause burns or other serious injury.**
- **The hydraulic tank may be under pressure, and hydraulic oil may be present at the filler cap. Relieve any pressure to prevent injury.**

**Failure to follow this warning could result in death or serious injury.**

1. Park the machine on a flat, level surface and position the work equipment as shown on the hydraulic tank decal.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
3. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.
4. Remove the fasteners (1) and the hydraulic return filter cover (2).

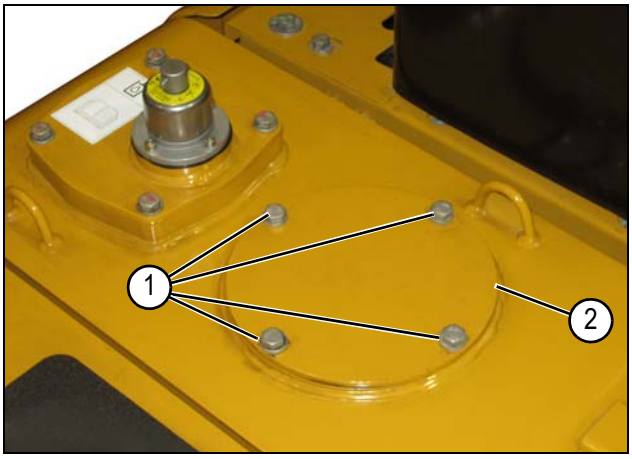



Fig. 5-91 0004166

5. Remove the spring (3) and withdraw the return filter (4).
6. Check the bottom of the return filter housing and remove any debris.
7. Insert a new return filter in the return filter housing.
8. Replace the O-ring (5).
9. Position the spring (3) on top of the return filter (4).
10. Install the hydraulic return filter cover and tighten the fasteners.

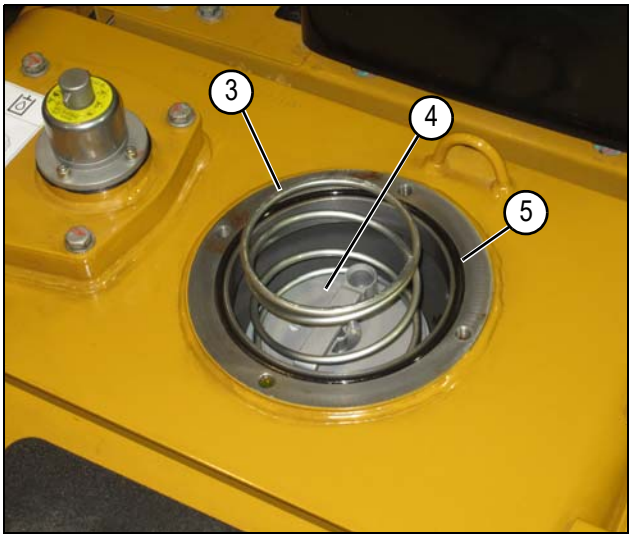



Fig. 5-92 0004161

11. Add hydraulic oil to the tank through the suction strainer opening until the hydraulic oil level displays full in the sight glass (6) on the hydraulic tank. See “Add Hydraulic Oil” on page 5-68.

12. Inspect and clean the suction strainer. Replace the suction strainer as needed.

13. Start the engine.

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

15. Check the level in the tank and add hydraulic oil if needed. See “Add Hydraulic Oil” on page 5-68.

16. Check for leaks.

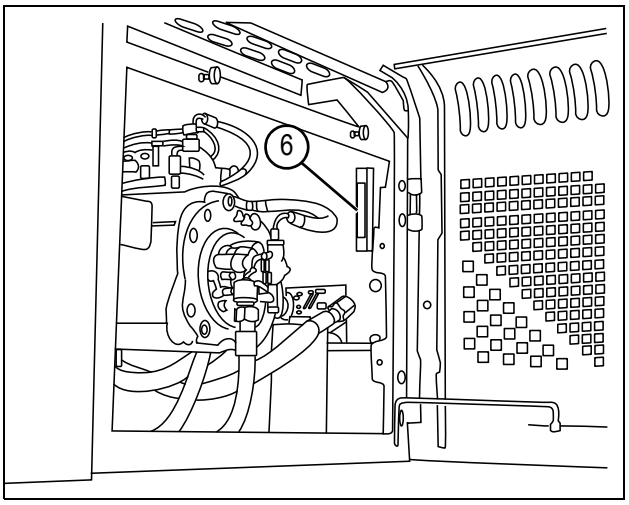


Fig. 5-93 0000257

## Clean and Replace the Hydraulic Oil Suction Strainer

**WARNING!**

- **Allow the hydraulic system to cool before servicing. Hot oil may cause burns or other serious injury.**
- **The hydraulic tank may be under pressure, and hydraulic oil may be present at the filler cap. Relieve any pressure to prevent injury.**

**Failure to follow this warning could result in death or serious injury.**

1. Park the machine on a flat, level surface and position the work equipment as shown on the hydraulic tank decal.

2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

3. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.

4. Remove four fasteners (1) and remove the hydraulic suction strainer cover (2).

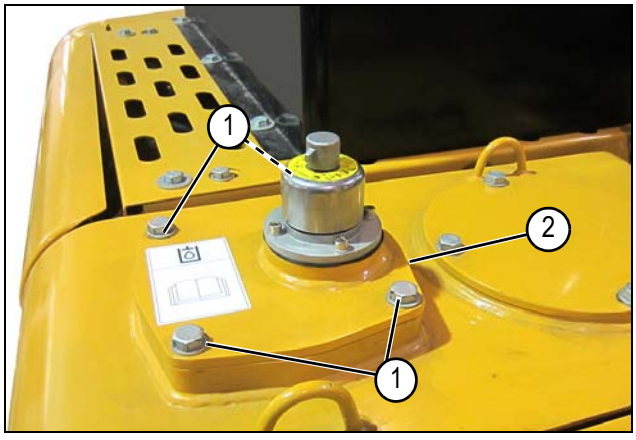


Fig. 5-94 0004158

5. Remove spring (3), rod (4), and strainer (5).
6. Clean the strainer of all debris.

   **NOTE:** Replace the strainer if damaged.
7. Replace the O-ring on the suction strainer cover.
8. Install the suction strainer with the rod and spring.

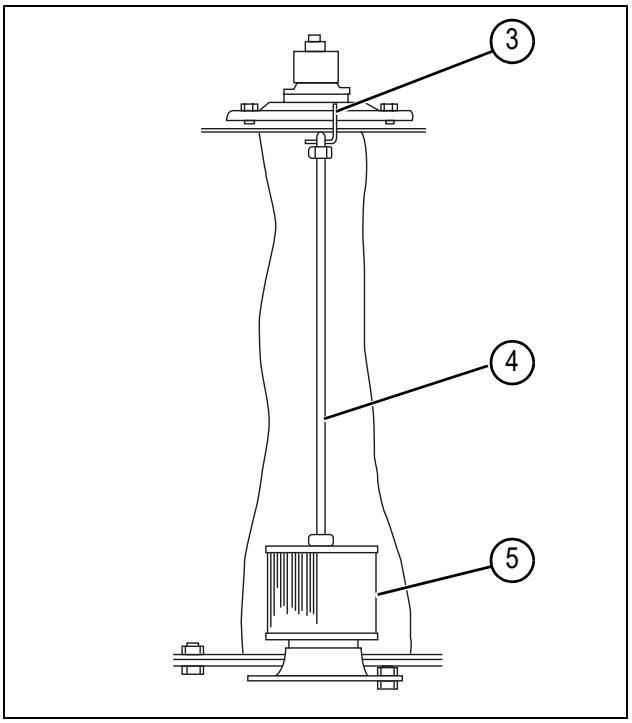


Fig. 5-95 0002408

9. Add hydraulic oil to the tank through the suction strainer opening until the hydraulic oil level displays full in the sight glass (6) on the hydraulic tank. See “Check the Hydraulic Oil Level” on page 5-29.
10. Install the suction strainer cover and fasteners.
11. Start the engine.
12. Run the engine for 10 minutes to circulate hydraulic oil in the hydraulic system.
13. Recheck the level in the tank and add hydraulic oil if needed.
14. Check for leaks.

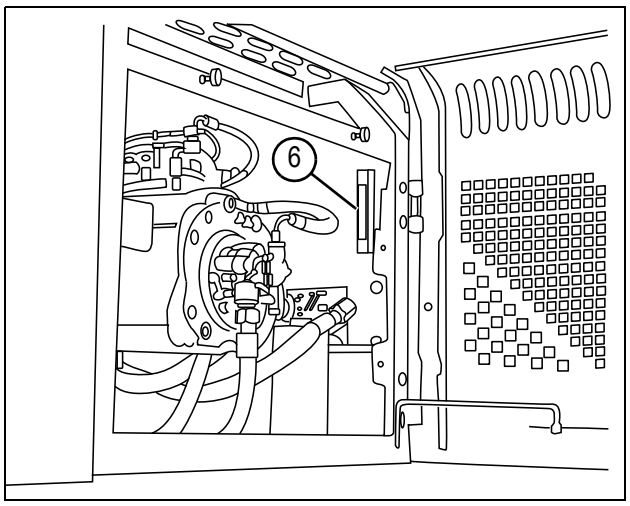


Fig. 5-96 0000257

## Check the Hydraulic Hoses and Lines

**WARNING!**

**Never open a hydraulic component under pressure. Escaping hydraulic oil is under high pressure and can penetrate the skin and cause serious injury or death. Do not use hands to check for leaks. Wear gloves, eye protection, and other personal protective equipment (PPE) and use a piece of cardboard or paper to search for suspected leaks.**

Check all hydraulic hoses and lines for leaks. Replace damaged or leaking hydraulic hoses and lines immediately.

Make sure there is sufficient distance between all lines and hoses and the high-temperature engine components (for example, the exhaust system).

Prepare the machine for service. See “Maintenance Safety” on page 2-8. Examine hydraulic hoses and lines for the following:

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

## Change the Hydraulic Oil

**WARNING!**

- **Allow the hydraulic system to cool before servicing. Hot oil may cause burns or other serious injury.**
- **The hydraulic tank may be under pressure, and hydraulic oil may be present at the filler cap. Relieve any pressure to prevent injury.**

**Failure to follow this warning could result in death or serious injury.**

1. Park the machine on a flat, level surface and position the work equipment as shown on the hydraulic tank decal.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
3. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.

4. Remove four fasteners (1) and remove the hydraulic suction strainer cover (2).

5. Place the suction strainer cover back over the opening. Do not secure at this time.

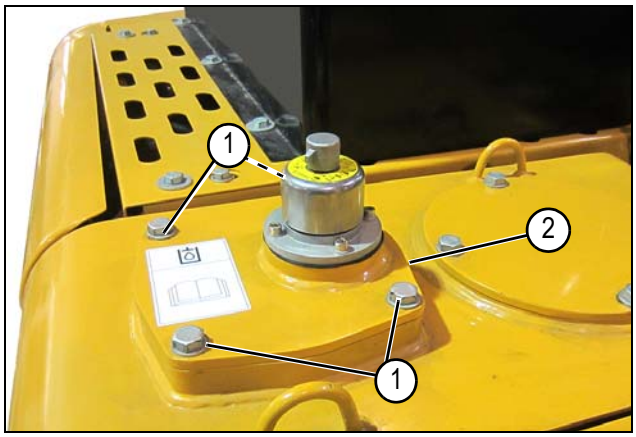



Fig. 5-97 0004158

6. Remove the bottom cover (3) to access the hydraulic tank drain plug.

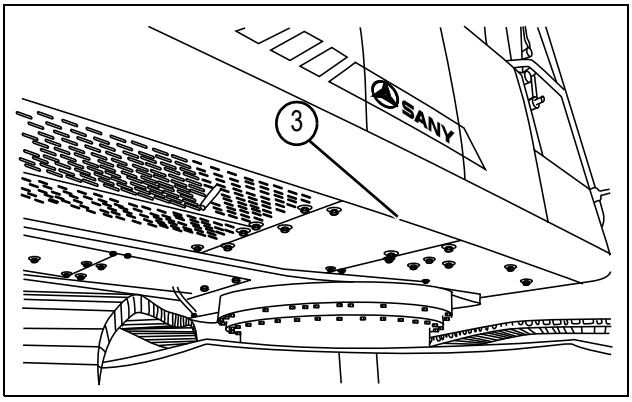



Fig. 5-98

7. Clean the area around the hydraulic tank drain plug (4).

8. Place an appropriately sized container under the drain plug. See “Capacities” on page 5-14.

9. Remove the hydraulic tank drain plug and allow the tank to drain.

**NOTICE!**

**Dispose of used hydraulic oil properly. Failure to do so could damage the environment.**

10. Replace the O-ring on the hydraulic tank drain plug.

11. Install the hydraulic tank drain plug.

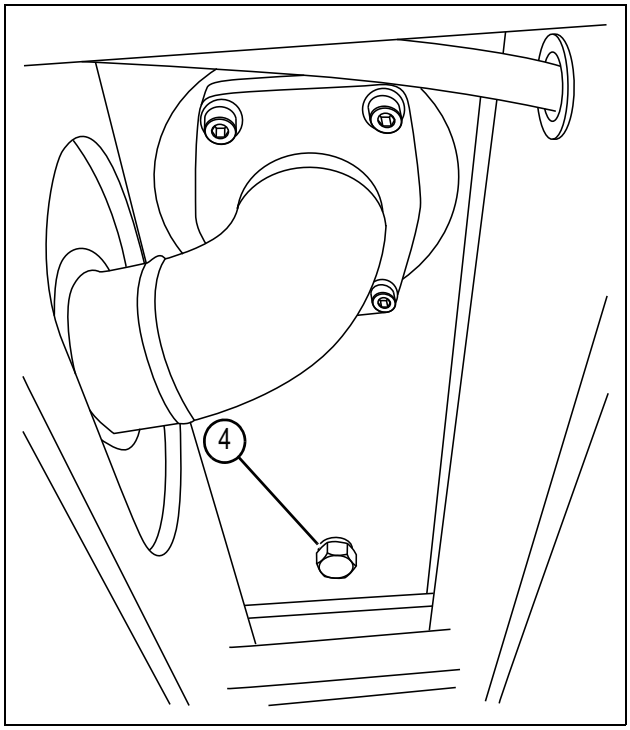



Fig. 5-99

12. Remove fasteners (5) and the hydraulic return filter cover (6).

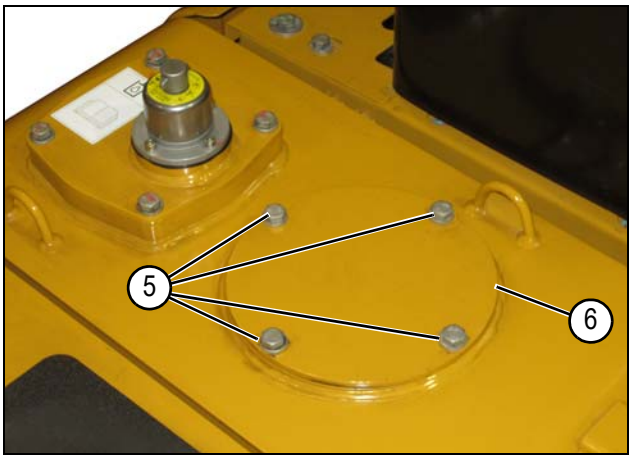



Fig. 5-100 0004166

13. Remove the spring (7) and withdraw the return filter (9).

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

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

16. Replace the O-ring (8).

17. Position the spring (9) on top of the return filter (7).

18. Install the hydraulic return filter cover and tighten the fasteners.

19. Remove the hydraulic suction strainer cover that was previously removed and placed over the suction strainer opening.

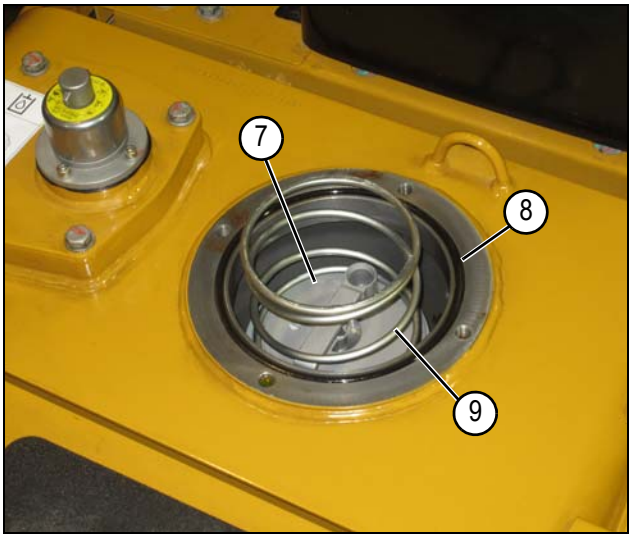



Fig. 5-101 0004161

20. Remove spring (10).
21. Pull up on rod (11) and remove suction strainer (12).
22. Clean the strainer of all debris.

    **NOTE:** Replace the strainer if damaged.

23. Replace the O-ring on the suction strainer cover.
24. Install the suction strainer with the rod and spring.
25. Replace the hydraulic system breather filter. See "Replace the Hydraulic System Breather Filter" on page 5-69.

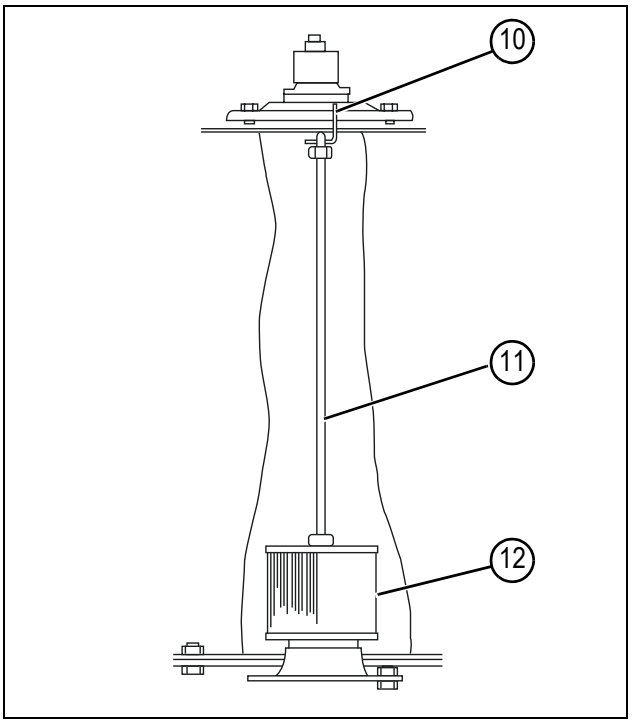


Fig. 5-102 0002408

26. Add hydraulic oil to the tank through the suction strainer opening until the hydraulic oil level displays full in the sight glass (13) on the hydraulic tank.
27. Install the suction strainer cover and fasteners.
28. Start the engine.
29. Run the engine for 10 minutes to circulate the hydraulic oil in the hydraulic system.
30. Check the level in the tank and add hydraulic oil if needed. See "Add Hydraulic Oil" on page 5-68.
31. Check for leaks.

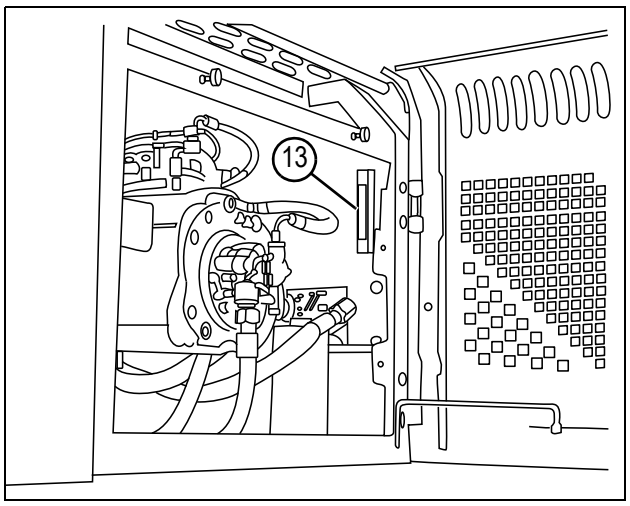


Fig. 5-103 0000257

## Check the Hydraulic Pump

**WARNING!**

- **Allow the hydraulic system to cool before servicing. Hot oil may cause burns or other serious injury.**
- **The hydraulic tank may be under pressure, and hydraulic oil may be present at the filler cap. Relieve any pressure to prevent injury.**

**Failure to follow this warning could result in death or serious injury.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the right rear access door. See “Right Rear Access Door” on page 4-9.
3. Start the engine.
4. Check the hydraulic pump (1) for leaks, function, and abnormal noise.
5. Shut down the engine.

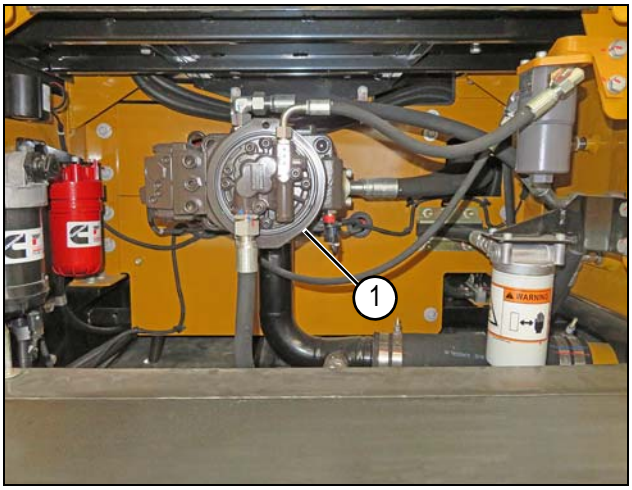



Fig. 5-104 0005321

## Check the Hydraulic Pump Mounting Fasteners

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the right rear access door. See “Right Rear Access Door” on page 4-9.
3. Inspect the hydraulic pump for loose, broken, or missing pump mounting fasteners (1).

   **NOTE:** Not all pump mounting fasteners (1) are shown here. Be sure to inspect all pump mounting fastener locations.
4. Tighten any loose fasteners to 36 lb-ft (49 N•m).

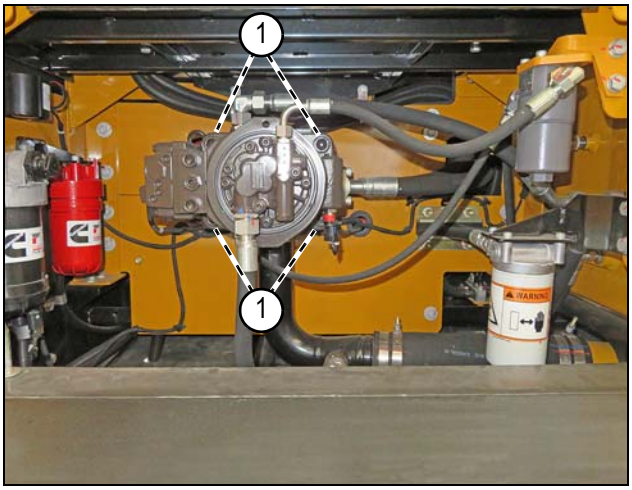



Fig. 5-105 0005321

# Track Frame

## Check the Track Assembly

**NOTE:** Use a pry bar to shift and/or lift the track shoes as needed to perform this procedure.

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Remove as much accumulated dirt as possible from the track assemblies.
3. Check track shoes (5) for damage, wear, unevenness, looseness, raised sections, binding, or any other abnormality.


Fig. 5-106 0005212

4. Replace track shoes as necessary.
5. Check the idler (2), track rollers (3), and top rollers (1) for wear and proper operation.
6. Check the track final drives (4) for wear and proper operation.

## Check the Track Shoe Fasteners

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Make sure that all fasteners are in place for each track shoe (1) and not broken, bent, damaged, or loose.
3. Replace any broken, bent, or damaged fasteners.
4. Tighten all loose fasteners.

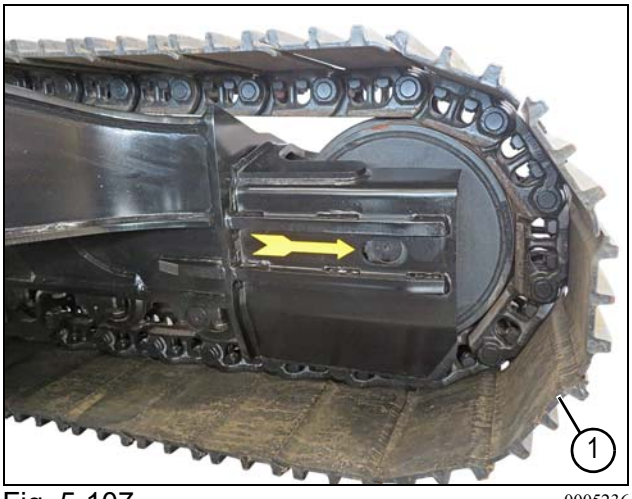



Fig. 5-107 0005236

**NOTE:** Tighten the fasteners in crisscross sequence, making sure the hardware and track shoe are in close contact with the link mating surfaces.

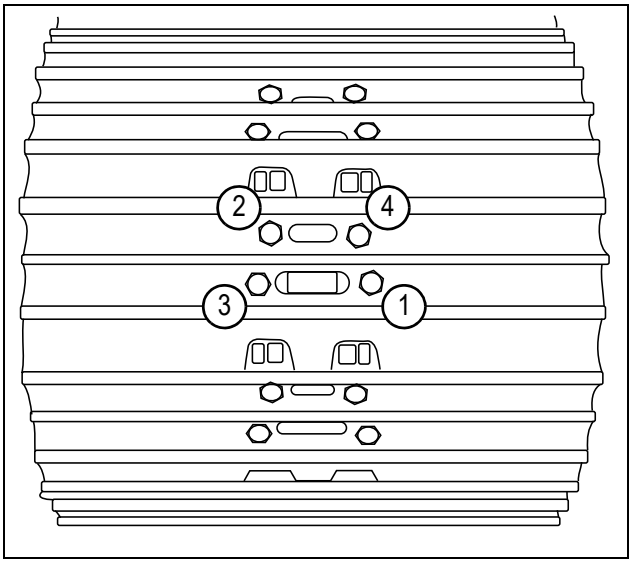



Fig. 5-108 0000225

## Check the Idler

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Inspect the idler (1). If the idler is cracked or distorted, contact a SANY dealer for replacement parts.

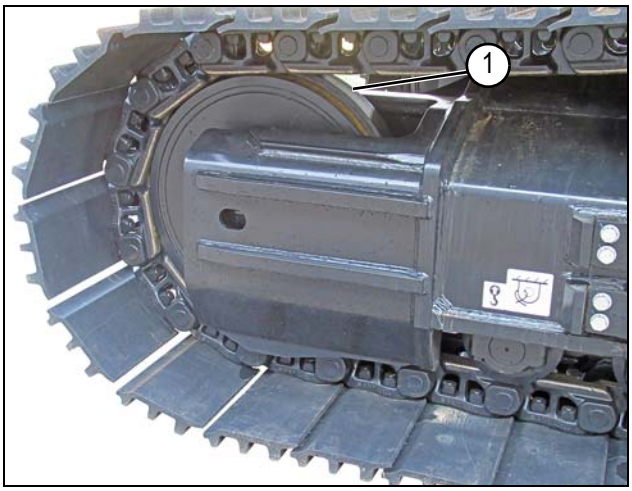



Fig. 5-109 0004728

## Check the Top Rollers

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Inspect each top roller (1). If a top roller is cracked, distorted, or leaking, contact a SANY dealer for replacement parts.

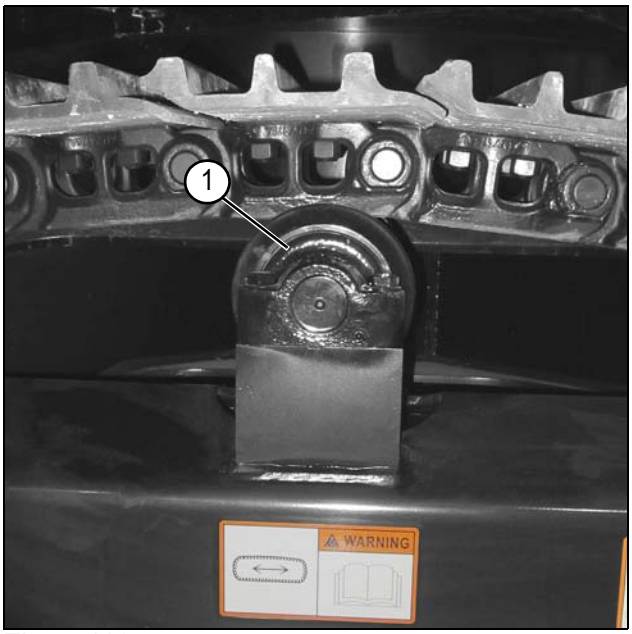



Fig. 5-110 0004188

## Check the Top Roller Fasteners

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Inspect the top roller mounting fasteners (1) that secure the top rollers to the track frame for rust, damage, or looseness.

3. Replace any damaged or defective fasteners and tighten any loose fasteners.

   **NOTE:** NOTE: Use thread-locking compound when tightening loose fasteners and installing new fasteners. Tighten the fasteners to a torque of 399 lb-ft–485 lb-ft (540 N•m–658 N•m).

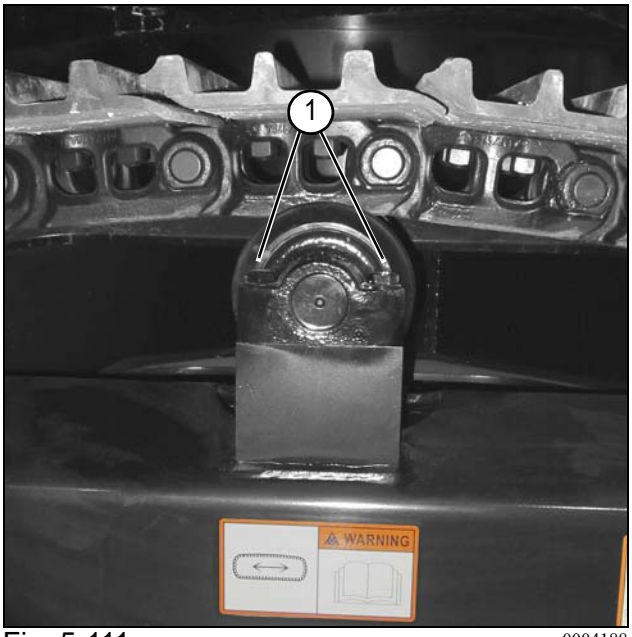



Fig. 5-111 0004188

## Check and Adjust Track Tension

### Check Track Tension

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Clean the track, rollers, and frame.

3. Drive the machine forward two machine-lengths on a flat, level, stable surface.

4. Park and prepare the machine for service.

5. Lay a straightedge from the forward top roller to the idler.

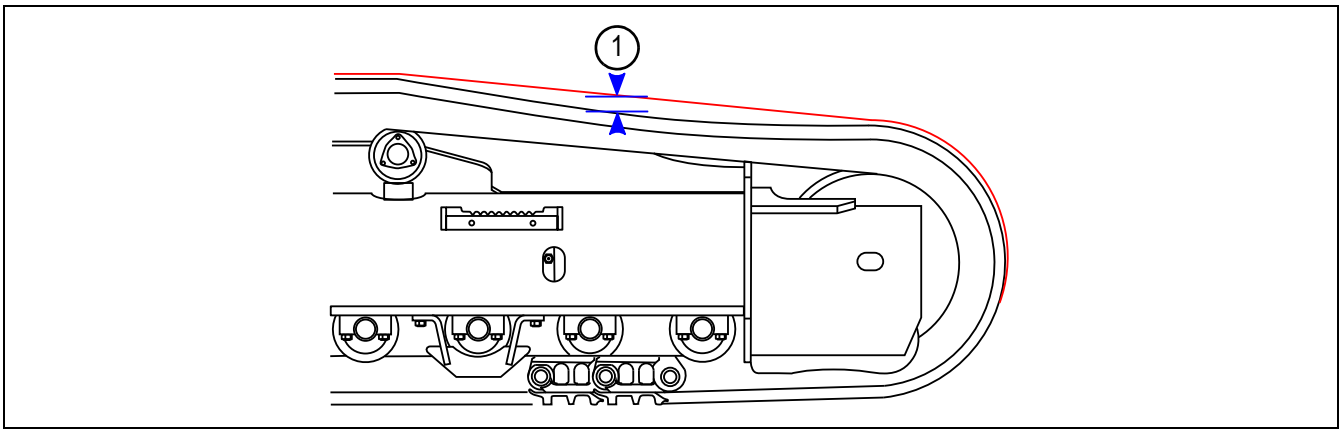



Fig. 5-112 0000226

6. Measure the gap at location (1) (to the top of the track shoe).

7. Lay a straightedge from the rear top roller to the final drive sprocket.

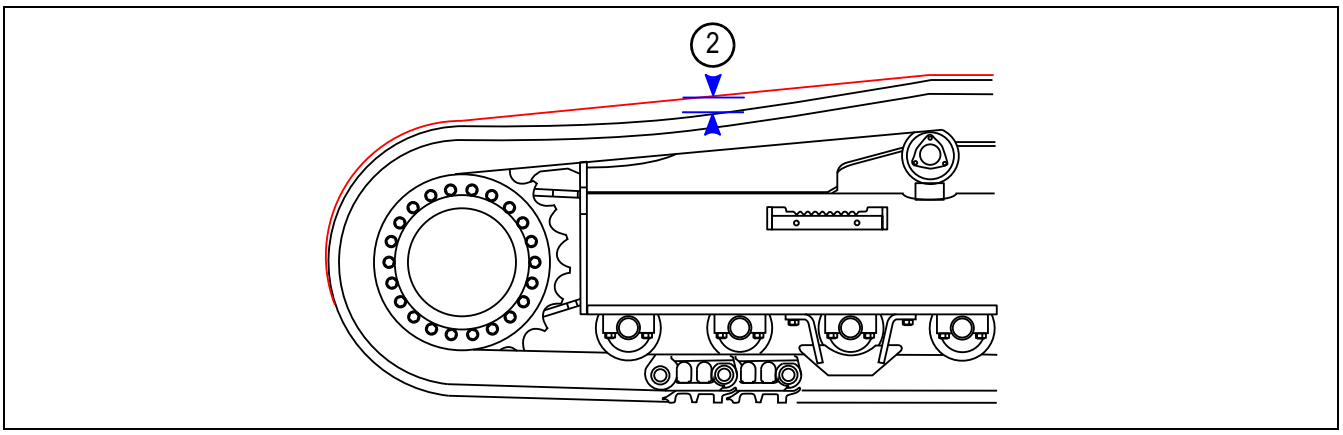



Fig. 5-113 0000227

8. Measure the gap at location (2) (to the top of the track shoe).

9. Add dimensions (1) and (2).

   **NOTE:** The total should be 3–4 in. (76.2–101.6 mm).

10. Adjust the track tension as needed.

### Increase Track Tension

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. To increase track tension, add grease through the grease fitting (1).

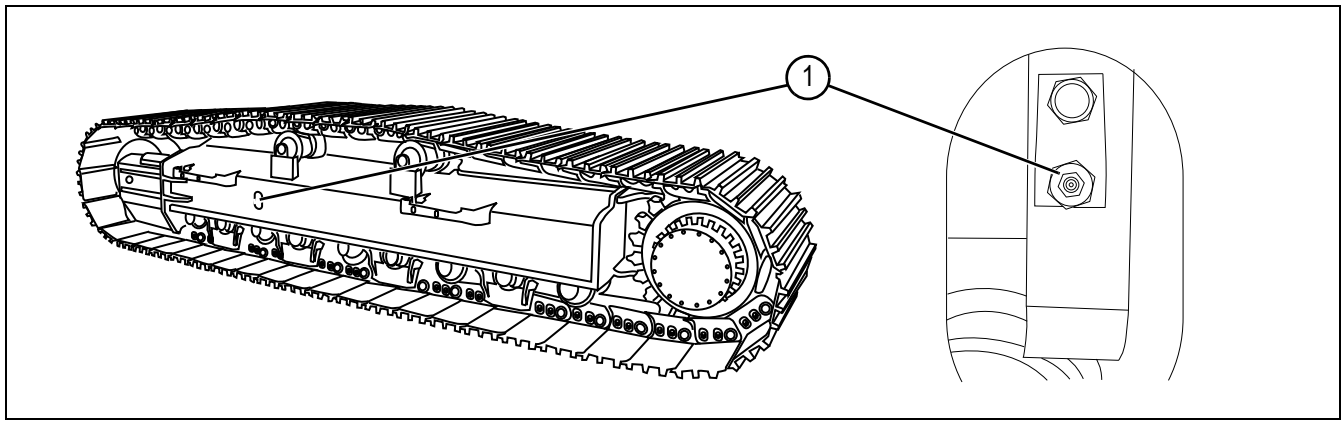



Fig. 5-114

0000224, 0000228

3. Slowly move the machine forward two machine-lengths.

4. Stop the machine and verify that the track tension now meets the requirement in “Check and Adjust Track Tension” on page 5-83.

5. Adjust the track tension as needed.

**Decrease Track Tension**

**WARNING!**

- **The track tension grease fitting is under extreme pressure. Grease can exit the grease valve at high pressure and cause serious injury.**
- **Wear safety goggles, gloves, and other personal protective equipment (PPE) to prevent serious injury.**
- **Do not stand directly in front of the track tension grease fitting valve when loosening the valve.**

**Failure to follow these warnings could result in death or serious injury.**

1. Make sure there is no gravel or mud between the sprocket and the track shoe before releasing track tension.
2. Do not loosen the grease fitting (1).
3. Position yourself off to the side, not in front of the grease valve (2).
4. Using the proper tools, slowly loosen the grease valve (2) counterclockwise in 90° increments (1/4 turn) to decrease track tension.

   **NOTE:** The grease will come out from behind the grease valve.
5. Move the machine back and forth for a short distance if the grease does not come out smoothly.
6. Check track tension. When it is correct, turn the grease valve (2) clockwise until it is tight.

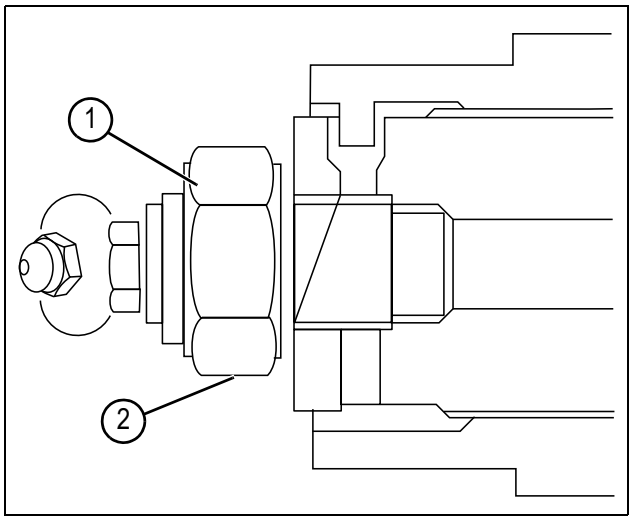


Fig. 5-115 0000229

7. Move the machine forward at low idle speed for a distance equivalent to the length of an unfolded track.
8. Stop the machine.
9. Check the track for proper tension. Adjust track tension as needed.

# Final Drive

## Check the Final Drive

**NOTE:** Perform this procedure after the first 50 hours or week of service, then every 500 hours or 3 months afterwards.

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.
3. Remove fasteners (2) and the final drive cover (1).

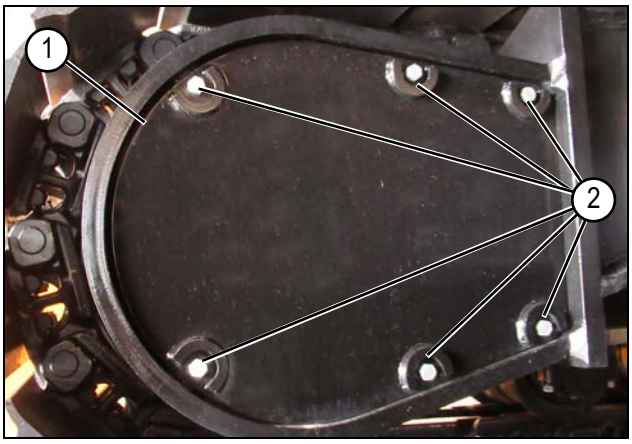


Fig. 5-116 0004744

4. Inspect the travel motor (3) to make sure all hoses are secured.
5. Check for leaks.
6. Make sure all fasteners (4), including the final drive motor mounting fasteners, are present and tight.
7. Replace any damaged or defective fasteners and tighten any loose fasteners.

   **NOTE:** Use anaerobic thread sealant when installing loose fasteners and installing new fasteners. Tighten fasteners securely.

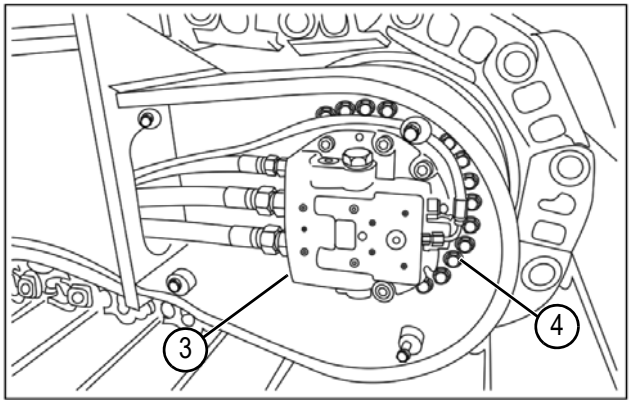


Fig. 5-117 0000157

8. Check the final drive oil level. See “Check the Final Drive Oil Level” on page 5-88.
9. Install the final drive cover.
10. Repeat steps for the final drive on the opposite side.

## Check the Final Drive Oil Level

**CAUTION!**

- **Allow the final drive to cool before servicing. Hot oil may cause burns or other serious injury.**
- **Wear safety goggles, gloves, and other personal protective equipment (PPE) to prevent serious injury.**
- **The final drive oil may be under pressure. Remove the plugs slowly to prevent injury.**

**Failure to follow these precautions could result in injury.**

1. Park the machine on a flat, level surface, positioning the oil drain plug (2) on the final drive cover at the bottom and the oil level mark parallel with the ground.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
3. Remove any dirt from around the oil level check plug (1).
4. Slowly loosen the oil level check plug to relieve pressure within the final drive.
5. Remove the oil level check plug and make sure that the oil level is within 0.4 in. (10 mm) of the bottom of the plug hole.

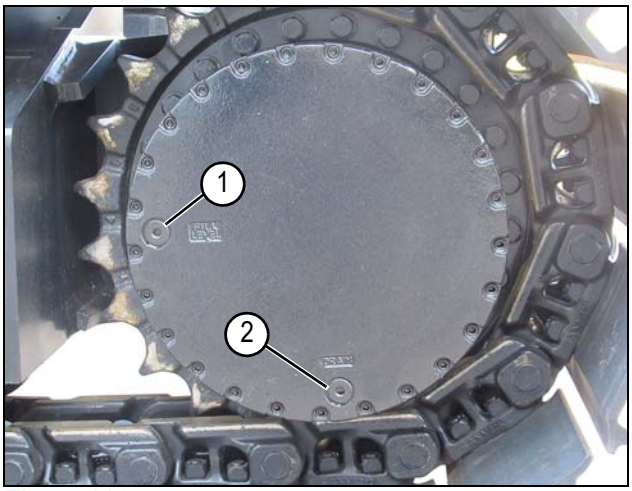


Fig. 5-118 0004729

6. Add oil through the oil level check plug hole as necessary until the level is within 0.4 in. (10 mm) of the bottom of the plug hole.
7. Replace the O-ring on the oil level check plug.
8. Install the oil level check plug.
9. Repeat steps 3 through 8 for the opposite final drive.

## Change the Final Drive Oil

**CAUTION!**

- **Allow the final drive to cool before servicing. Hot oil may cause burns or other serious injury.**
- **Wear safety goggles, gloves, and other personal protective equipment (PPE) to prevent serious injury.**
- **The final drive oil may be under pressure. Remove the plugs slowly to prevent injury.**

**Failure to follow these precautions could result in injury.**

1. Park the machine on a flat, level surface, positioning the oil drain plug (2) on the final drive cover parallel with the ground.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
3. Remove any dirt from around the oil level check plug (1) and the drain plug.
4. Place an appropriately sized container under the drain plug. See “Capacities” on page 5-14.
5. Slowly loosen the oil level check plug to relieve pressure within the final drive.
6. Remove the drain plug.
7. Allow the oil to drain completely.

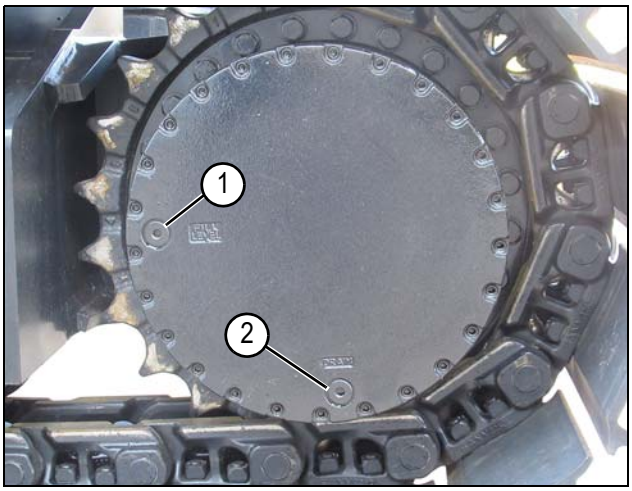


Fig. 5-119 0004729

**NOTICE!**

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

8. Replace the O-ring on the drain plug and install the drain plug.
9. Add oil through the check plug hole to a point 0.4 in. (10 mm) below the bottom of the plug hole.
10. Replace the O-ring on the check plug and install the check plug.
11. Repeat steps 3 through 11 for the opposite final drive.

# Swing Drive

## Lubricate the Swing Drive Bearing

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Grease the fittings (1) on the swing drive bearing until grease seeps out of the seal (2).
3. Check the seal condition.

   **NOTE:** If damaged, replace the seal immediately.
4. Start the engine.
5. Lift the arm off the ground.
6. Rotate the upper structure 90° and shut down the engine.

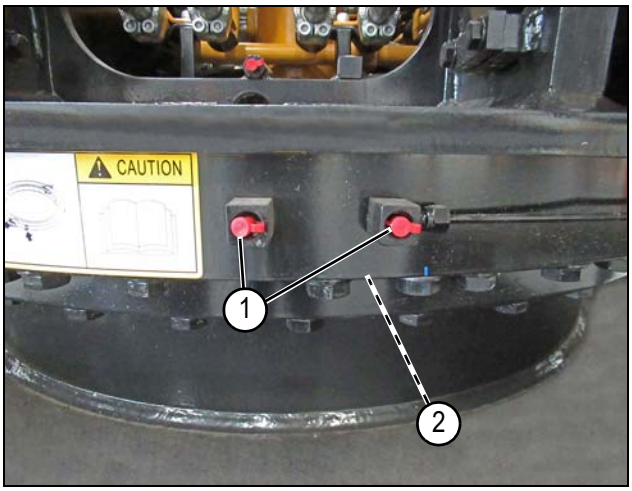


Fig. 5-120 0005214

7. Repeat steps 2 through 6 until a full 360° rotation has been made.

## Check the Swing Drive Oil Level

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Inspect the swing drive (1) for damage.

**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 do so could result in damage to the swing drive.**

3. Remove the dipstick (2) from the swing drive and note the oil level.

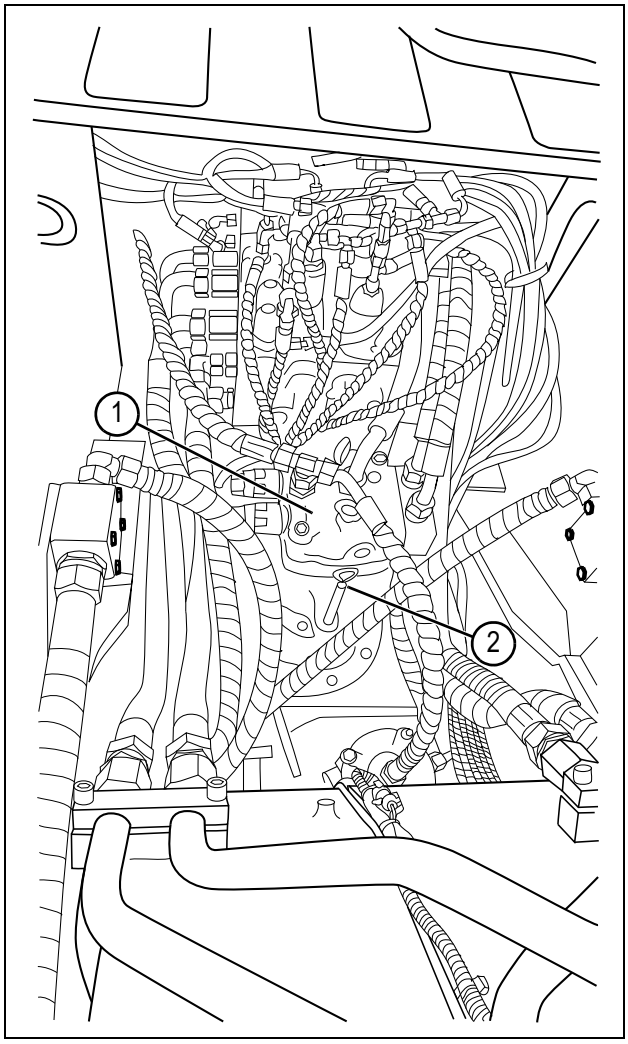



Fig. 5-121

**NOTE:** The oil level should be within the etched area (3).

4. Install the dipstick.

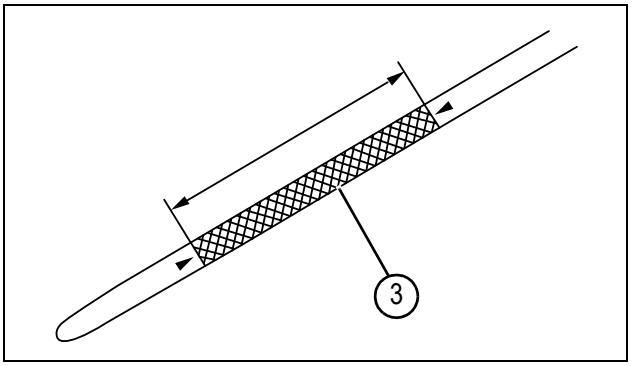



Fig. 5-122

5. Remove the swing drive oil filler cap (4) to add oil as needed.

**NOTICE!**

**Do not overfill. This could result in machine damage and improper machine operation.**

6. Recheck the swing drive oil level.

7. Install the swing drive oil filler cap.

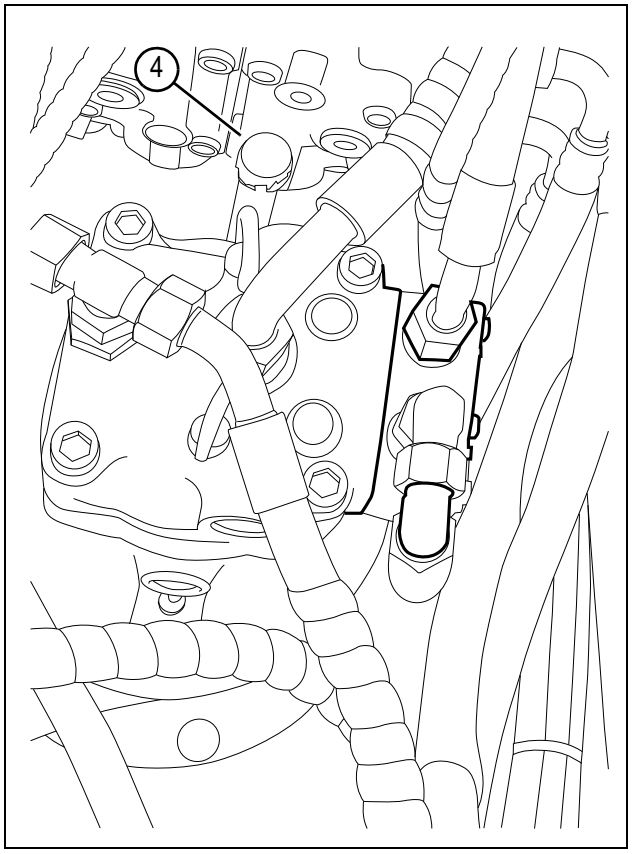



Fig. 5-123

## Change the Swing Drive Oil

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Start the engine.

3. Rotate the upper structure 90° in both directions five times to warm the oil. If the weather temperature is below 0° F (-18° C), rotate the upper structure 90° in both directions 10 times.

**CAUTION!**

**The engine and oil could be hot. Be sure to use personal protective equipment (PPE). Failure to follow this caution could result in injury.**

4. Shut down the engine.

5. Locate the swing drive (1).

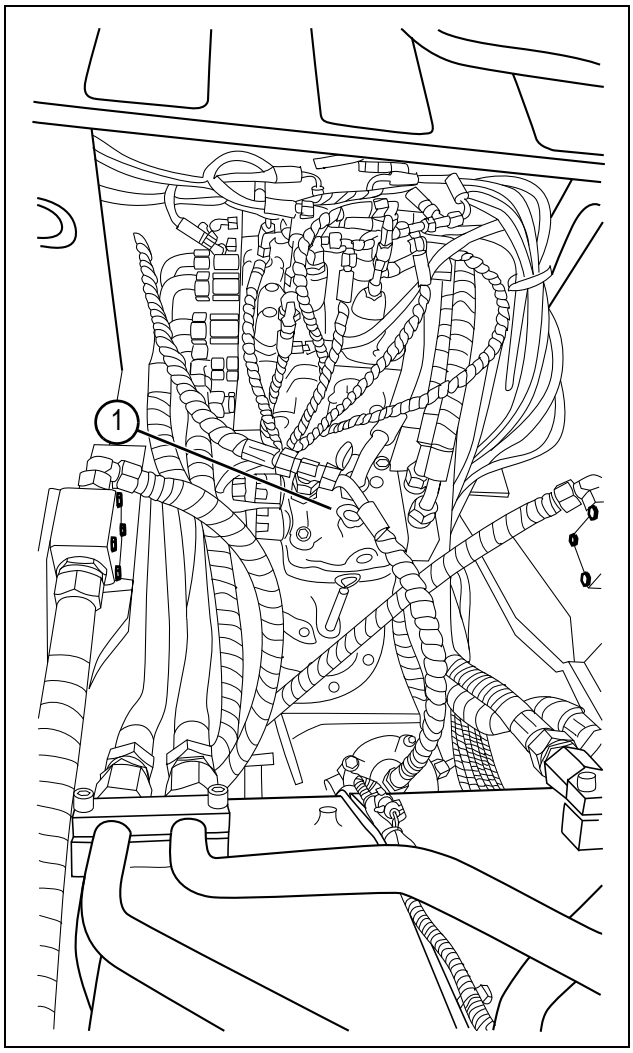



Fig. 5-124

6. Loosen the swing drive oil fill cap (2).

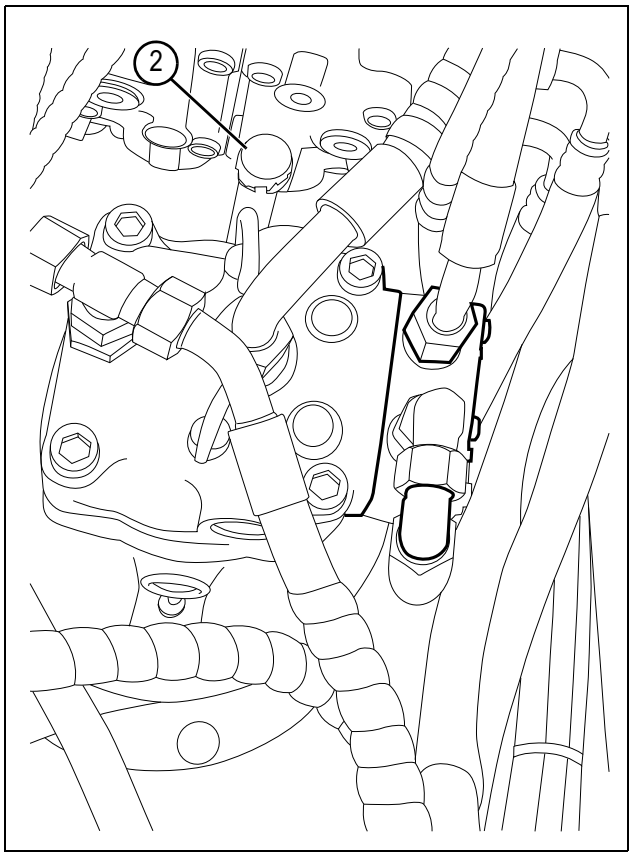



Fig. 5-125

7. Remove the bottom cover (3) for access to the swing drive drain hose.

8. Place an appropriately sized container under the oil drain hose. See “Capacities” on page 5-14.

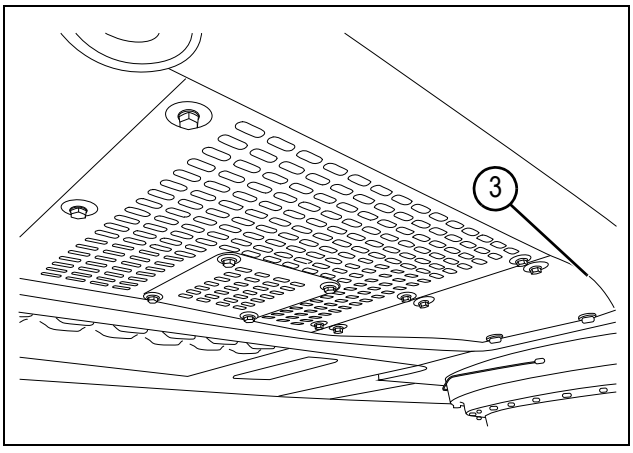



Fig. 5-126

9. Open the drain valve (4) and allow the oil to drain.

10. Close the drain valve.

**NOTICE!**

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

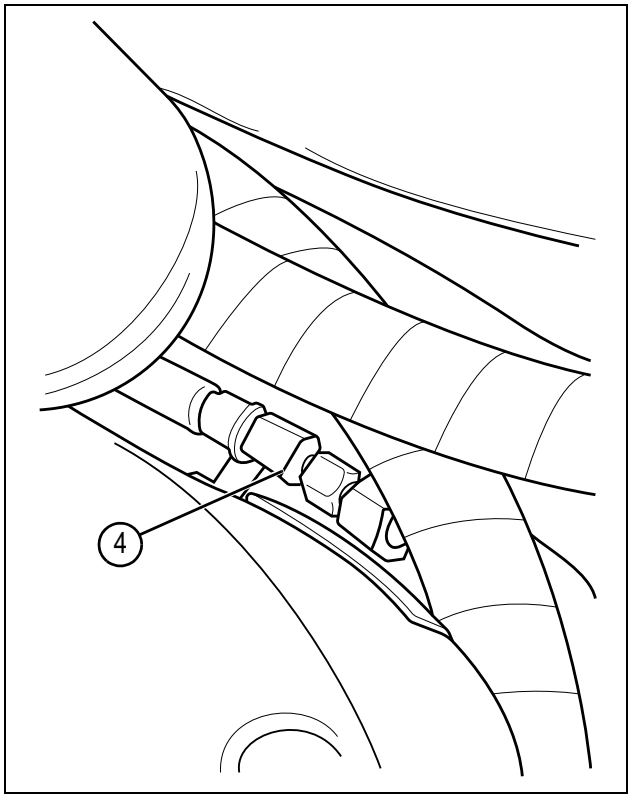



Fig. 5-127

11. Install the bottom cover (5).

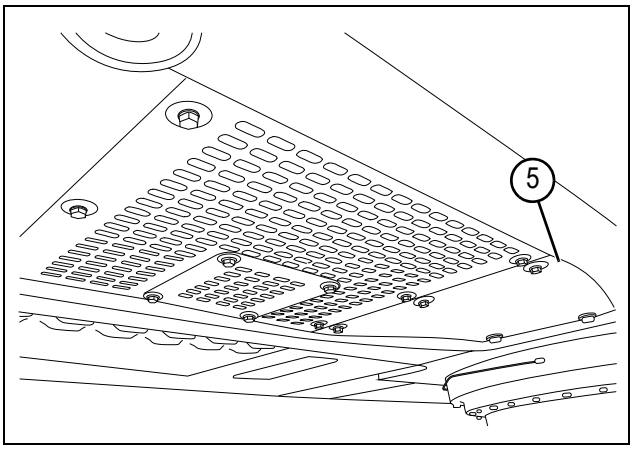



Fig. 5-128

12. Remove the swing drive oil filler cap (6).

13. Fill the swing drive with clean oil.

**NOTICE!**

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

14. Remove the swing drive oil dipstick (7) and note the oil level.

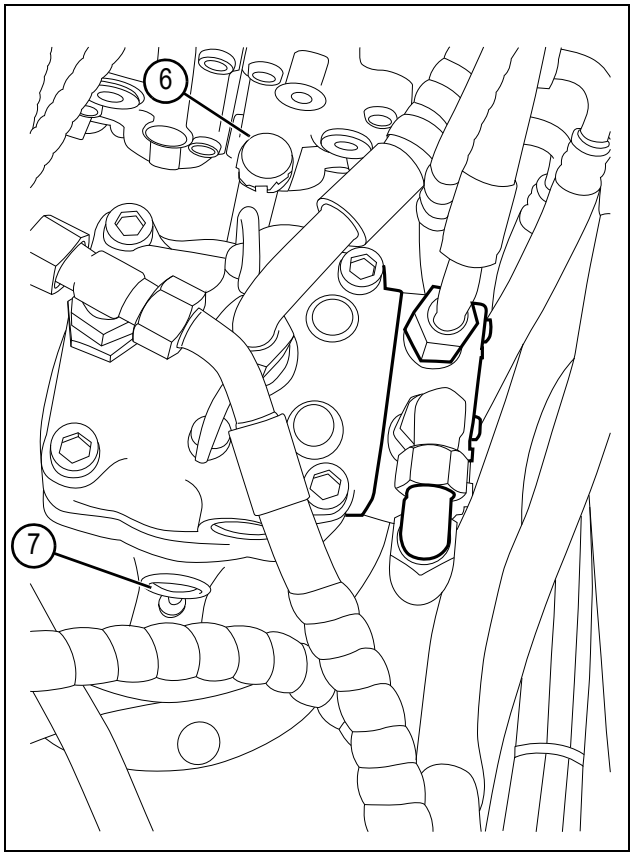



Fig. 5-129

**NOTE:** The oil level should be within the etched area (8). Add oil as necessary.

15. Install and tighten the swing drive oil filler cap.

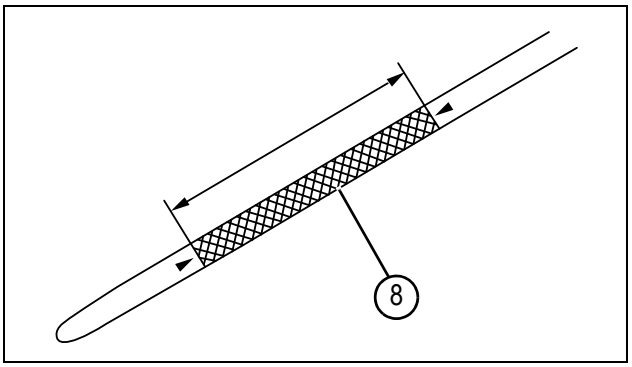



Fig. 5-130

## Check the Swing Drive Mounting Fasteners

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Check the swing drive for missing or broken mounting fasteners (1).
3. Tighten loose fasteners.

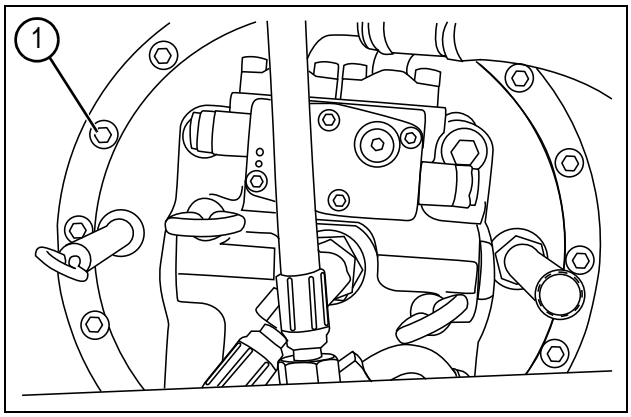


Fig. 5-131

**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 do so could result in damage to the swing drive.**

## Check the Swing Bearing Fasteners

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Inspect both rows of swing bearing mounting fasteners (1) for missing or damaged fasteners.
3. Start the engine and turn the cab 90° to the right.
4. Shut down the engine.
5. Repeat steps 1 through 3 until inspection of all of the fasteners is completed.

**NOTE:** Contact a SANY dealer if any fasteners are missing. Tighten fasteners to a torque of 879 lb-ft to 1073 lb-ft (1176 N•m to 1470 N•m).

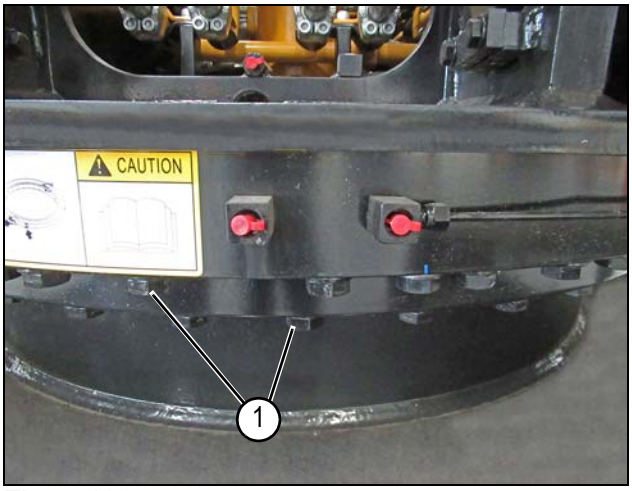


Fig. 5-132 0005214

## Check the Swing Grease Bath Level

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Remove the inspection/fill cover (2).
3. Insert a ruler into the grease through the inspection/ filler hole.
4. Check the grease level.

   **NOTE:** The minimum level is 0.75 in. (19 mm).
5. Check the grease color.

   **NOTE:** Milk-white grease indicates that the grease has been contaminated and must be replaced.
6. Add grease through the inspection/filler hole as needed.
7. Install the inspection/fill cover (2).

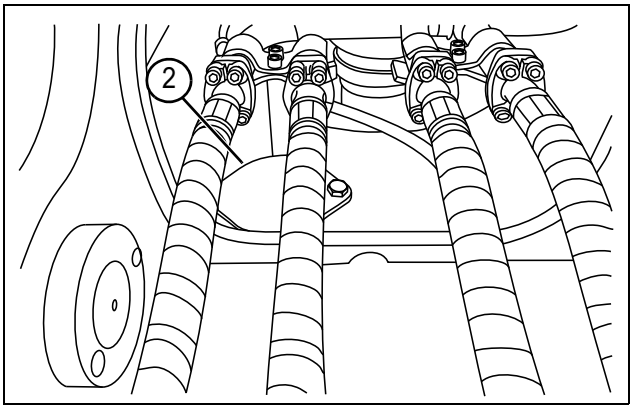


Fig. 5-133

## Collect Oil Samples

1. Obtain an oil analysis sample kit from a SANY dealer.
2. Operate the machine until the lubricant in the compartment being tested is up to normal operating temperature.

**NOTICE!**

**It is critical that all material used to collect the sample is absolutely clean. Failure to follow this notice can damage equipment and contaminate the sample.**

3. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
4. Obtain and send the oil sample for testing in accordance with the instructions included with the sample kit. Follow the instructions included with the sample kit to send the sample for testing.

### Collect an Engine Oil Sample

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Start the engine and operate the machine until all systems reach normal operating temperature.
3. Shut down the engine.
4. Open the engine compartment door. See “Engine Compartment Door” on page 4-11.
5. Clean the area around the engine oil dipstick (1).
6. Remove the dipstick.
7. Insert the oil sample tube into the dipstick tube.
8. Collect a sample of engine oil.
9. Remove the oil sample tube.
10. Install the dipstick.
11. Follow the instructions included with the sample kit to send the sample for testing.

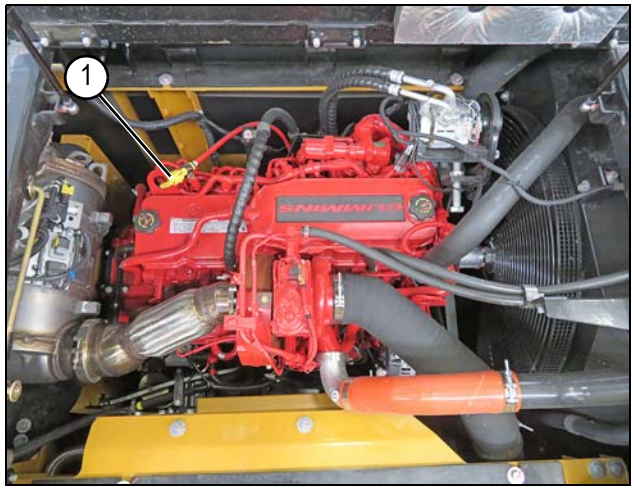


Fig. 5-134 0005314

## Collect a Hydraulic Oil Sample

1. Start the engine and operate the machine until all systems reach normal operating temperature.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
3. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.
4. Remove four fasteners (1) and remove the hydraulic oil suction strainer cover (2).
5. Insert the sample tube into the hydraulic oil tank.
6. Collect a sample of hydraulic oil.
7. Remove the sample tube.

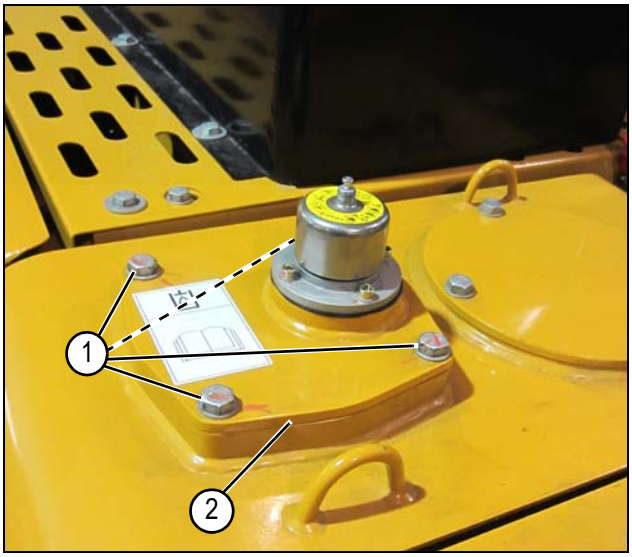


Fig. 5-135 0000487

8. Replace the hydraulic oil suction strainer cover (3).
9. Follow the instructions included with the sample kit to send the sample for testing.

## Collect a Final Drive Oil Sample

1. Start the engine and operate the machine until all systems reach normal operating temperature.
2. Park the machine on a flat, level surface, placing the oil drain plug (1) on the final drive cover at the bottom, and the oil level check plug (2) parallel with the ground.
3. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
4. Remove any dirt from the area around the oil level check plug.
5. Slowly loosen the oil level check plug to relieve any pressure within the final drive.
6. Remove the oil level check plug.
7. Insert the sample tube into the oil level check plug hole.
8. Collect a sample of oil from the final drive.
9. Remove the sample tube.

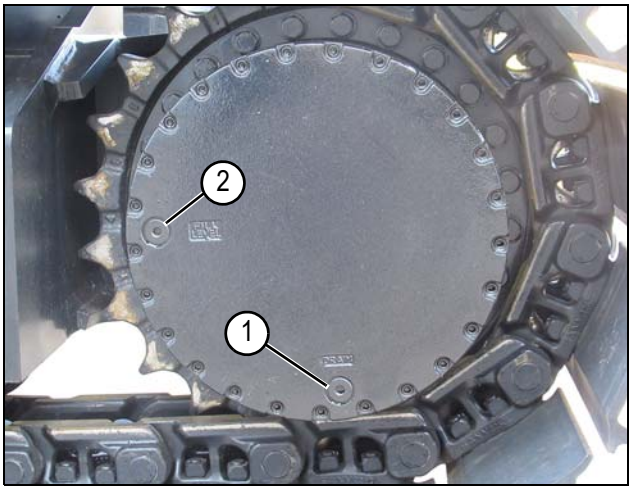


Fig. 5-136 0004729

10. Install the oil level check plug.

    **NOTE:** Repeat preceding steps for the other final drive as needed.

11. Follow the instructions included with the sample kit to send the sample for testing.

## Collect a Swing Drive Oil Sample

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Start the engine and operate the machine until all systems reach normal operating temperatures.
3. Shut down the engine.
4. Remove the dipstick (1) from the swing drive.
5. Insert the sample tube into the swing drive dipstick tube.
6. Collect a sample of swing drive oil.
7. Remove the sample tube.
8. Install the dipstick.
9. Follow the instructions included with the sample kit to send the sample for testing.

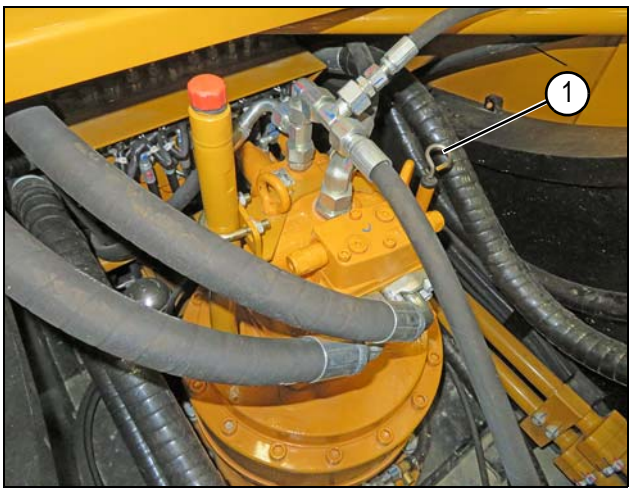



Fig. 5-137 00005215

# Lubrication

## Lubrication Points

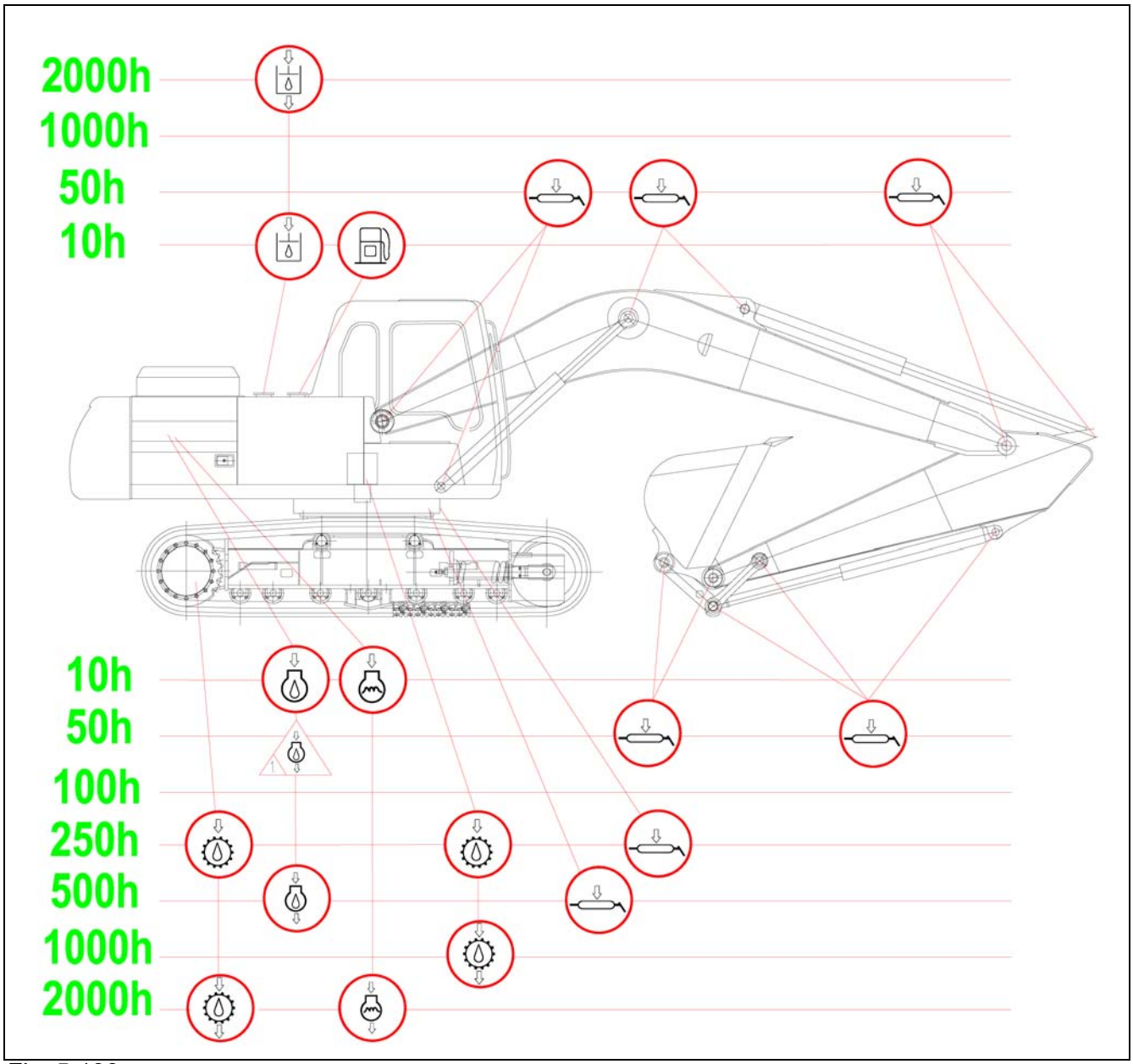



Fig. 5-138 0003799

**NOTE:** *A new machine must be greased every 8 hours within the initial 50 service hours.*

If the lubricated location produces abnormal noise, additional lubrication is required besides regular maintenance.

More frequent lubrication is required when the machine is operated with heavy optional equipment (e.g., a hydraulic breaker).

After operating in water, grease the machine to expel any water from the lubrication points.

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.
3. Using a grease gun, pump grease into the grease fittings.
4. Clean off all excess grease

## Boom Cylinder Base Ends

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Grease the two boom cylinder head end pin grease fittings (2).

   **NOTE:** Left side boom cylinder is shown, right side boom cylinder is similar.

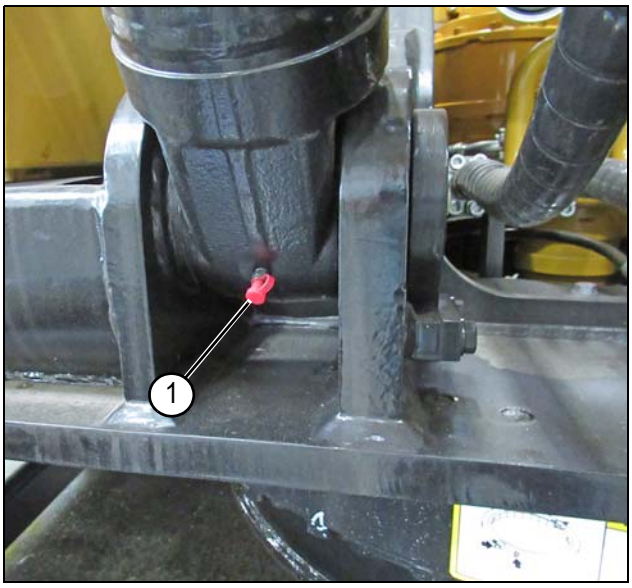



Fig. 5-139 0005218

## Swing Bearing Fittings

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Grease the swing bearing fittings (1) until the grease seeps out of the seal (2).
3. Start the engine.
4. Lift the arm off the ground.
5. Rotate the upper structure 90° and repeat step 2.
6. Rotate the upper structure until a full 360° rotation has been made.
7. Shut down the engine

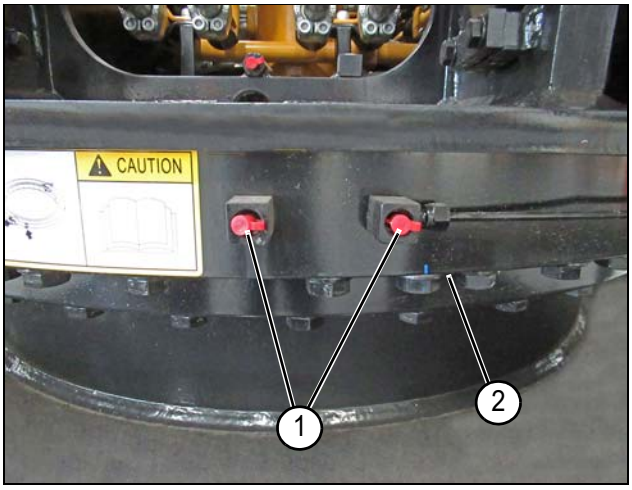



Fig. 5-140 0005214

## Swing Gear

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Grease the swing gear fitting (1).

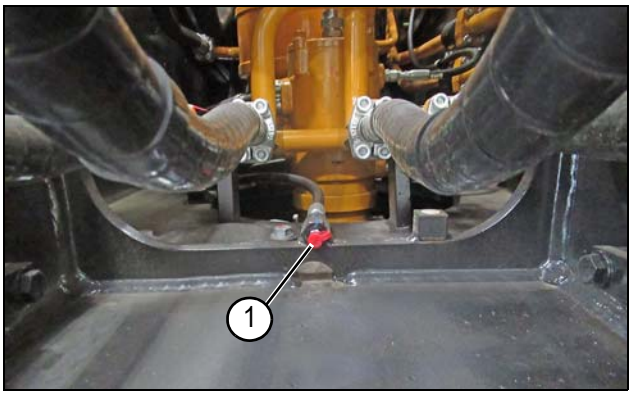



Fig. 5-141 0005217

## Boom Pins

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Grease the two boom pin grease fittings (1).

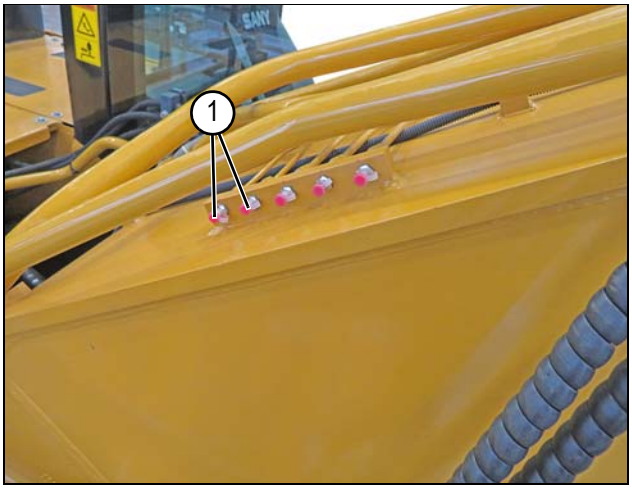



Fig. 5-142 0005216

## Boom Cylinder Rod End

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Grease the two boom cylinder rod end pin grease fittings (2).

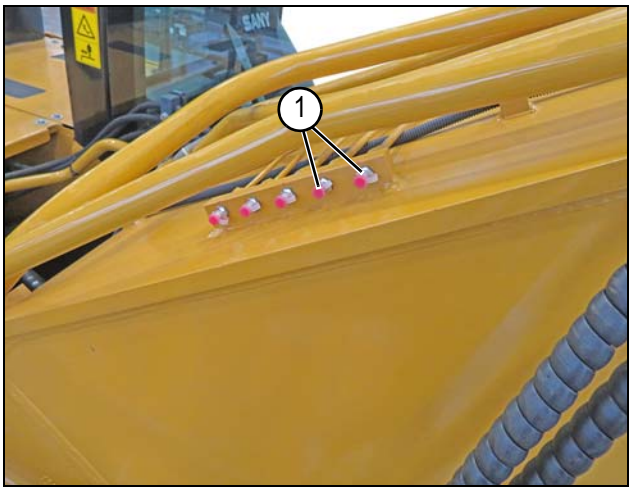



Fig. 5-143 0005216

## Arm Cylinder Head End

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Grease the arm cylinder head end pin grease fitting (1).

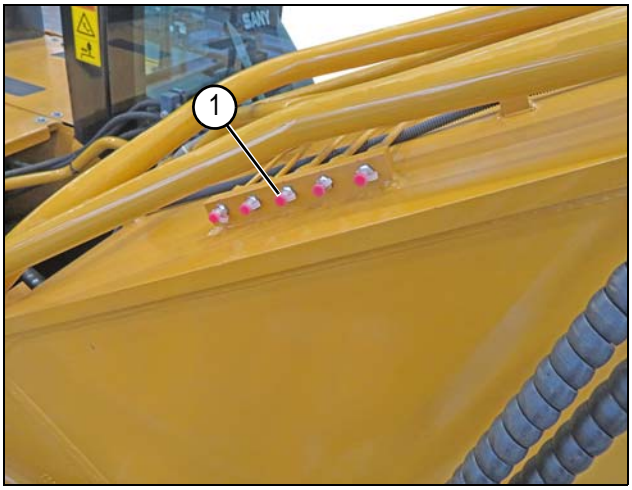



Fig. 5-144 0005216

## Arm Cylinder Rod End

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Grease the arm cylinder rod end grease fitting (1).


Fig. 5-145 0005353

## Arm-to-Boom Pin

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Grease the arm-to-boom pin grease fitting (1).


Fig. 5-146 0005353

## Bucket Cylinder Head End

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.

2. Grease the bucket cylinder head end grease fitting (1).


Fig. 5-147 0005353

## Bucket Linkages

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Grease the H-link grease fittings (1).
3. Grease the bucket linkage grease fitting (2).
4. Grease the H-link grease fitting (3).


Fig. 5-148 0005252

## Bucket

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Grease both bucket pin grease fittings (1).


Fig. 5-149 0005252

## Lubricate the Cab Door Hinges and Front Window Slide Rail

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Open the appropriate access or compartment doors. See “Doors, Escape Hatch, and Filler Caps” on page 4-6.
3. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.
4. Grease the two cab door hinges (1) until grease comes out of the hinge.
5. Wipe off excess grease.

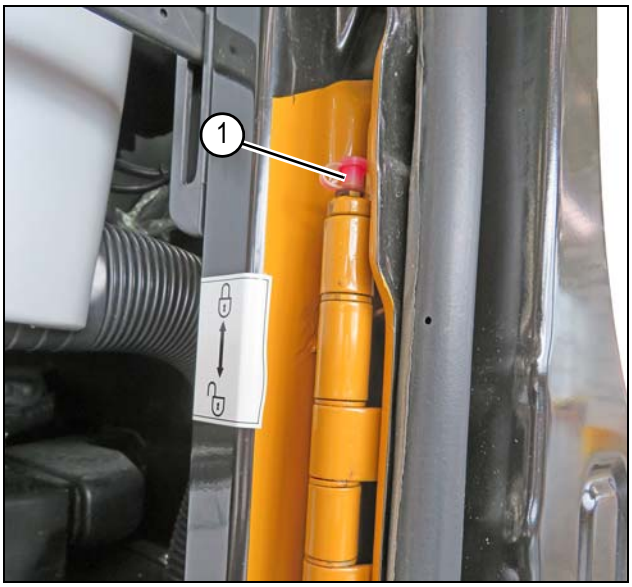



Fig. 5-150 0005219

6. Apply lubricating silicone to the windshield slide rails (2) on both sides of the cab door ceiling.

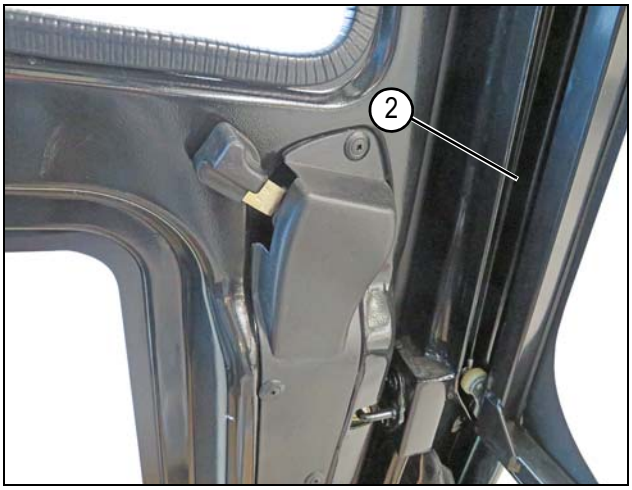



Fig. 5-151 0005220

# Cab

## Check the Grab Handles and Steps

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Check the mounting fasteners on grab handles (1).
3. Replace any missing or damaged mounting fasteners and tighten any loose fasteners.
4. Remove any tools, lubricants, or debris from the steps (2). Never allow loose items to remain on the machine.
5. Clean the grab handles and steps.

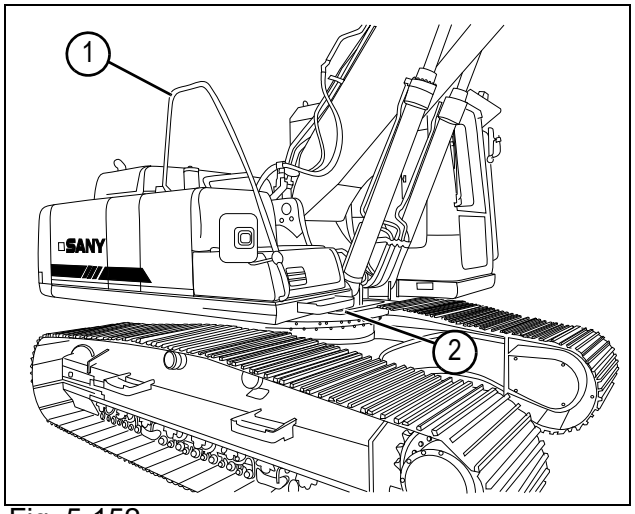


Fig. 5-152

## Check Doors and Locks

1. Check the cab door, all access doors, and locks to make sure they close and lock properly.
2. Repair or replace any damaged cab door, access doors, or locks.

## Check the Decals

All safety decals must be visible and complete. See “Machine Decals” on page 2-3 for additional information.

## Check the Sheet Metal

Check all sheet-metal covers and doors for damage, loose connections, or missing fasteners.

Repair or replace sheet metal as needed using SANY-approved parts.

## Clean and Check the Upper Structure and Undercarriage

The machine consists of two major component groups:

- The undercarriage with its various components and assemblies
- The upper structure with its various components and assemblies

Wash the exterior of the machine, then check the entire structure of the machine for signs of damage or excessive wear.

Notify a SANY dealer if any cracks or distortion are found.

## Perform a Structural Inspection

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Thoroughly wash the machine.
3. Inspect the machine structure for signs of damage or excessive wear.

## Inspect Windshield Wiper and Washer Nozzle

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Check the washer fluid level inside the windshield washer reservoir. See “Check the Windshield Washer Fluid and Windshield Wiper” on page 5-30.

**NOTICE!**

**Do not operate the wiper on a dry window. Doing so could result in machine damage and improper machine operation.**

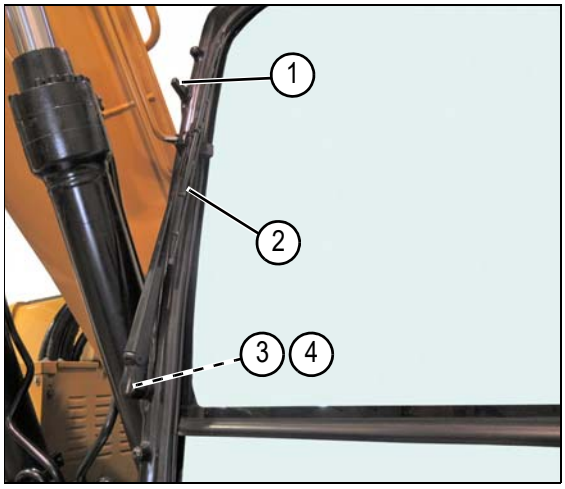


Fig. 5-153 0003692

3. Check the operation of the windshield washer nozzle (1) and wiper (2) to make sure there is no smearing across the windshield during operation. Replace the wiper blade if smearing occurs.
4. If necessary, adjust the spray nozzle to make sure the fluid spray is properly directed.
5. Lift the cover (3) and make sure the wiper arm nut (4) is tight. If the wiper arm nut is loose, tighten to 26 lb-ft to 33 lb-ft (35 N·m to 40 N·m).

# Bucket

## Replace the Bucket Teeth

**WARNING!**

- **Unexpected machine movement can be dangerous when replacing the bucket teeth. Place the bucket on a stable work surface. Shut down the engine and lock out the control levers.**
- **Roll pins may eject with extreme force when removed. Do not allow anyone to stand in front of the pins during pin removal.**
- **Metal fragments from roll pins and tools may break off during roll pin removal and installation. Wear safety goggles, gloves, and other personal protective equipment (PPE) to prevent serious injury.**

**Failure to follow these warnings could result in death or serious injury.**

**NOTE:** Bucket teeth must be replaced before the bucket tooth adapter wears out.

1. Prepare the machine for service. See “Maintenance Safety” on page 2-8.
2. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-20.
3. Select a stable work surface. Move the hydraulic controls to the neutral position. Keep the bottom of the bucket level on a wooden block (1).

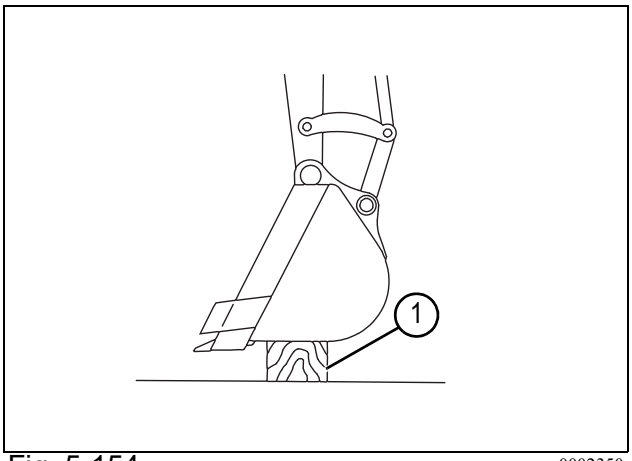



Fig. 5-154 0002350

4. Remove the roll pins (2) and worn bucket teeth (3).

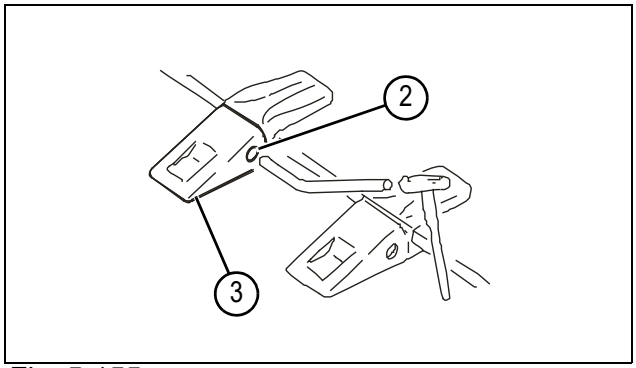



Fig. 5-155 0002351

5. Install new bucket teeth (4) and roll pins (5) in the reverse order of removal.

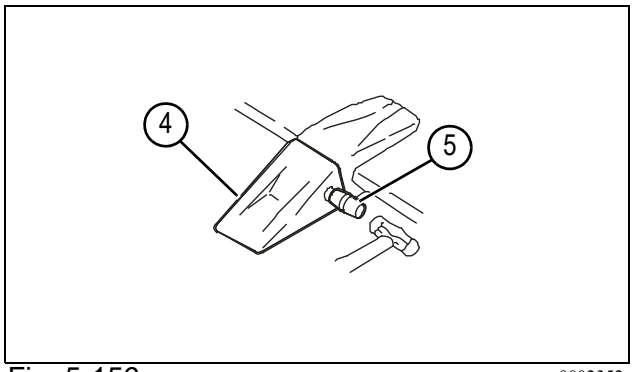



Fig. 5-156 0002352

SANY

# Specifications

# MACHINE DIMENSIONS

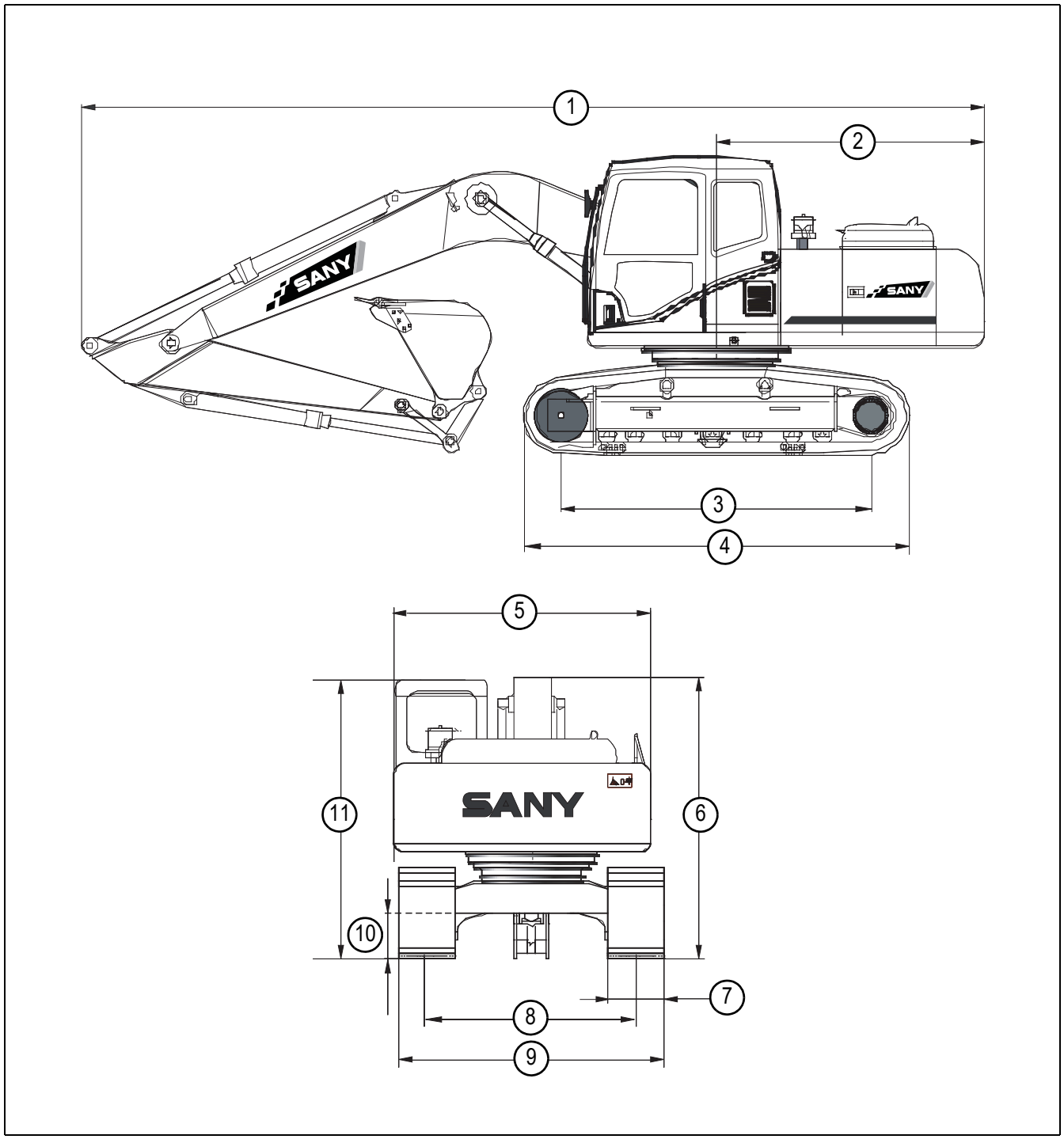



Fig. 6-1

0004013

## SY265C LC Machine Dimensions

| Item | SY265C LC Description | Dimensions |
|---|---|---|
| 1 | Transport length | 33 ft. 9 in. (10.29 m) |
| 2 | Tail swing radius | 10 ft. 2 in. (3.10 m) |
| 3 | Track length on ground | 12 ft. 7 in. (3.83 m) |
| 4 | Track length | 15 ft. 3 in. (4.64 m) |
| 5 | Upper structure width | 10 ft. 4 in. (3.15 m) |
| 6 | Transport height | 10 ft. 8 in. (3.26 m) |
| 7 | Track shoe width (standard) | 2 ft. 7 in. (0.78 m) |
| 8 | Track gauge | 8 ft. 6 in. (2.59 m) |
| 9 | Transport width | 11 ft. 1 in. (3.38 m) |
| 10 | Minimum ground clearance | 1 ft. 7 in. (0.48 m) |
| 11 | Cab height | 10 ft. 1 in. (3.08 m) |
| Boom length | | 19 ft. 4 in. (5.89 m) |
| Arm length | | 9 ft. 8 in. (2.95 m) |
| Operating weight | | 59,525 lb. (27,000 kg) |

## SY265C LR Machine Dimensions

| Item | SY265C LR Description | Dimensions |
|---|---|---|
| 1 | Transport length | 46 ft. 2 in. (14.07 m) |
| 2 | Tail swing radius | 10 ft. 3 in. (3.12 m) |
| 3 | Track length on ground | 12 ft. 7 in. (3.84 m) |
| 4 | Track length | 15 ft. 3 in. (4.65 m) |
| 5 | Upper structure width | 10 ft. 4 in. (3.15 m) |
| 6 | Transport height | 12 ft. (3.66 m) |
| 7 | Track shoe width (standard) | 2 ft. 7 in. (0.78 mm) |
| 8 | Track gauge | 8 ft. 6 in. (2.59 m) |
| 9 | Transport width | 11 ft. 1 in. (3.38 m) |
| 10 | Minimum ground clearance | 1 ft. 7 in. (0.48 mm) |
| 11 | Cab height | 10 ft. 1 in. (3.07 m) |
| Boom length | | 32 ft. 2 in. (9.80 m) |
| Arm length | | 24 ft. 7 in. (7.49 m) |
| Operating weight | | 69,446 lb. (31,500 kg) |

# OPERATING RANGES

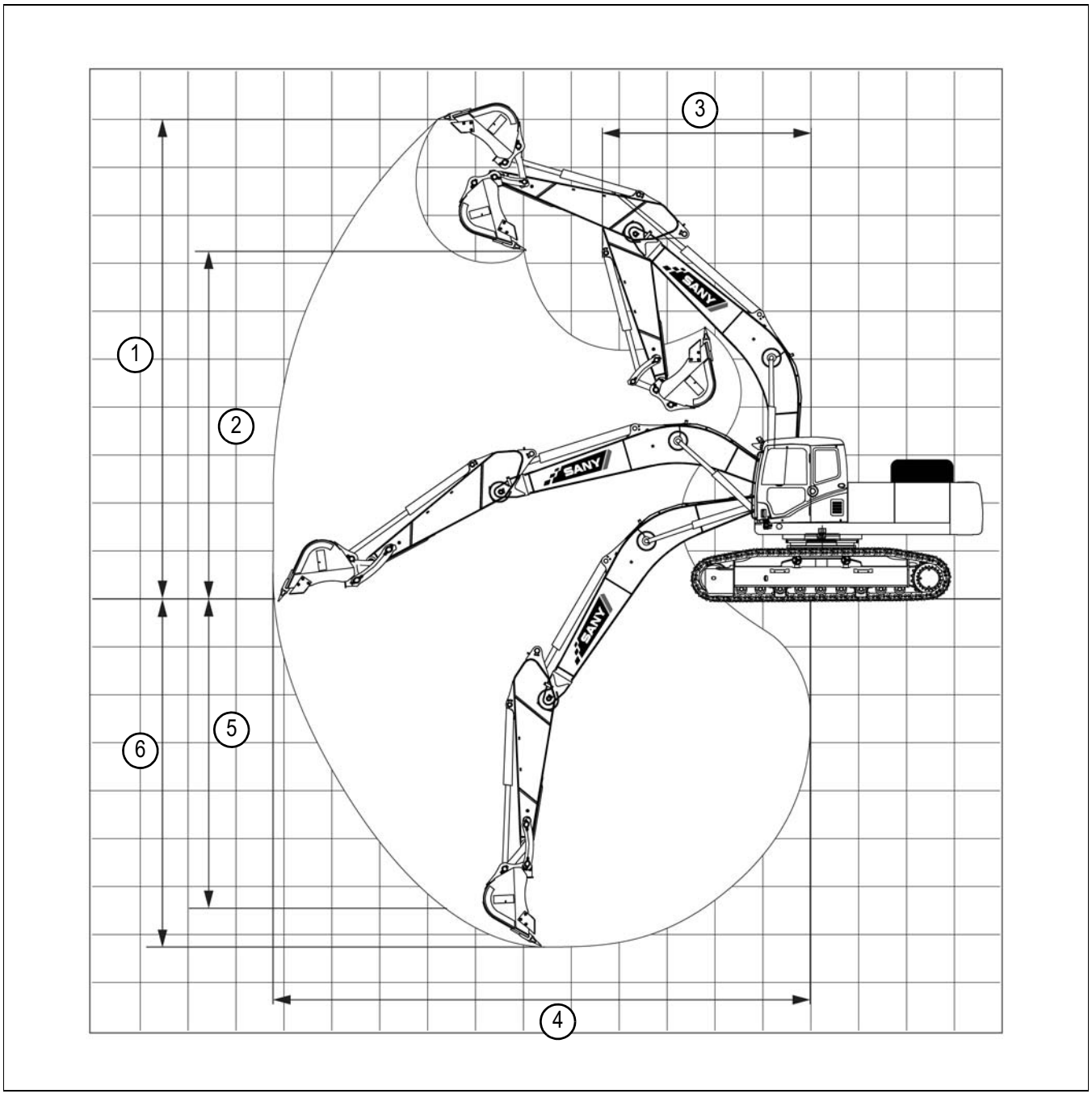



Fig. 6-2

0004956

## SY265C LC Operating Ranges and Digging Performance

| Item | Description | Dimensions |
|---|---|---|
| 1 | Maximum digging height | 31 ft. 11 in. (9.73 m) |
| 2 | Maximum dumping height | 22 ft. 0 in. (6.71 m) |
| 3 | Minimum swing radius | 12 ft. 6 in. (3.81 m) |
| 4 | Maximum digging reach | 33 ft. 7 in. (10.24 m) |
| 5 | Maximum vertical wall digging depth | 18 ft. 7 in. (5.66 m) |
| 6 | Maximum digging depth | 22 ft. 0 in. (6.71 m) |
| Bucket Breakout Force (ISO) | | 42,039 lbf (187.0 kN) |
| Stick (Arm) Digging Force (ISO) | | 29,225 lbf (130.0 kN) |

## SY265C LR Operating Ranges and Digging Performance

| Item | Description | Dimensions |
|---|---|---|
| 1 | Maximum digging height | 48 ft. 7 in. (14.81 m) |
| 2 | Maximum dumping height | 41 ft. 1 in. (12.52 m) |
| 3 | Minimum swing radius | 18 ft. 8 in. (5.69 m) |
| 4 | Maximum digging reach | 57 ft. 9 in. (17.60 m) |
| 5 | Maximum vertical wall digging depth | 41 ft. 10 in. (12.45 m) |
| 6 | Maximum digging depth | 43 ft. 8 in. (13.31 m) |
| Bucket Breakout Force (ISO) | | 19,334 lbf (86.0 kN) |
| Stick (Arm) Digging Force (ISO) | | 14,410 lbf (64.1 kN) |

# TECHNICAL SPECIFICATIONS

| Description | Specifications |
|---|---|
| Operating weight (with operator, standard bucket, and full fuel tank) | 59,525 lb. (27,000 kg) |
| Engine type | CUMMINS® QSB6.7T4F |
| Maximum engine power (gross) | SY265C LC = 194.4 hp/145.0 kW |
| | SY265C LR = 190.0 hp/142.0 kW |
| Engine displacement | 408.9 cu. in. (6.7 L) |
| Number of upper rollers | 2 |
| Number of lower rollers | 9 |
| Fuel tank capacity | 122.8 gal. (465.0 L) |
| Diesel exhaust fluid (DEF) capacity | 10.0 gal. (38.0 L) |
| Hydraulic tank capacity | 73.2 gal. (277.0 L) |
| Cooling system capacity | 10.6 gal. (40.0 L) |
| Engine oil capacity | 6.5 gal. (24.7 L) |
| Ground pressure | SY265C LC = 5.7 psi (39.3 kPa) |
| | SY265C LR = 6.7 psi (46.2 kPa) |
| Boom length | SY265C LC = 19 ft. 4 in. (5.89 m) |
| | SY265C LR = 32 ft. 2 in. (9.80 m) |
| Arm length | SY265C LC = 9 ft. 8 in. (2.94 m) |
| | SY265C LR = 24 ft. 7 in. (7.5 m) |
| Grade capability (maximum) | 35° |
| Main hydraulic pump | Axial piston with variable displacement |
| Main hydraulic pump operating flow (maximum) | 137.4 gpm (520.0 Lpm) |
| Main hydraulic pump operating pressure (maximum) | 4975 psi (34.30 MPa) |
| Main hydraulic pump power boost pressure (maximum) | 5410 psi (37.30 MPa) |
| Swing motor | Axial piston with swing brake |
| Swing speed (maximum) | 10.6 rpm |
| Swing pressure (maximum) | 3989 psi (27.50 MPa) |
| Travel motor | Axial piston with park brake |
| Travel speed | 2.2/3.4 mph (3.5/5.5 kph) |
| Travel pressure (maximum) | 4975 psi (34.3 MPa) |
| Travel effort | 51,032 lb-ft (227.0 kN) |

# LIFT CHART

## SY265C LC Lift Chart

| Load Radius | 10 ft. (3.0 m) | | 15 ft. (4.5 m) | | 20 ft. (6 m) | | 25 ft. (7.5 m) | | Lift capacity at max. radius | |
|---|---|---|---|---|---|---|---|---|---|---|
| Load Point Height (LPH) | End  | Side  | End  | Side  | End  | Side  | End  | Side  | End  | Side  |
| 25 ft. (7.5 m) | | | | | *13,186 (*5,981) | *13,186 (*5,981) | | | *13,228 (*6,000) | *13,228 (*6,000) |
| 9.8 ft. (6.0 m) | | | | | *13,411 (*6,083) | *13,411 (*6,083) | 12,732 (5,775) | 12,507 (5,673) | *12,500 (*5,670) | *12,434 (*5,640) |
| 15 ft. (4.5 m) | | | | | *13,761 (*6,242) | *13,761 (*6,242) | 12,870 (5,838) | 12,527 (5,682) | 12,489 (5,665) | 11,045 (5,010) |
| 10 ft. (3.0 m) | | | *20,853 (*9,459) | *20,853 (*9,459) | 17,319 (7,856) | 16,539 (7,502) | 6,724 (14,824) | 11,872 (5,385) | 13,494 (6,121) | 10,187 (4,621) |
| 5 ft. (1.5 m) | | | 25,822 (11,713) | 23,885 (10,834) | 19,555 (8,870) | 15,692 (7,118) | 7,037 (15,514) | 11,444 (5,191) | 13,115 (5,949) | 9,764 (4,429) |
| 0.0 ft. (0.0 m) | | | 28,195 (12,789) | 23,098 (10,477) | 21,034 (9,541) | 15,121 (6,859) | 15,194 (6,892) | 11,131 (5,049) | 13,479 (6,114) | 9,980 (4,527) |
| -5 ft. (-1.5 m) | *24,451 (*11,091) | *24,451 (*11,091) | 28,836 (13,080) | 22,855 (10,367) | 21,107 (9,574) | 15,165 (6,879) | 15,329 (6,953) | 11,261 (5,108) | 14,777 (6,703) | 10,983 (4,982) |
| -10 ft. (-3.0 m) | *39,032 (*17,705) | 39,032 (17,705) | 27,652 (12,543) | 23,054 (10,457) | 20,589 (9,339) | 15,265 (6,924) | | | 17,485 (7,931) | 12,934 (5,867) |
| -15 ft. (-4.5 m) | *33,644 (*15,261) | *33,644 (*15,261) | 23,735 (10,814) | 23,735 (10,766) | | | | | 19,010 (8,623) | 17,780 (8,065) |

## SY265C LR Lift Chart

| Load Radius | 5 ft. (1.5 m) | | 10 ft. (3.0 m) | | 15 ft. (4.5 m) | | 20 ft. (6 m) | | 25 ft. (7.5 m) | |
|---|---|---|---|---|---|---|---|---|---|---|
| Load Point Height (LPH) | End  | Side  | End  | Side  | End  | Side  | End  | Side  | End  | Side  |
| 39.3 ft. (12.0 m) | | | | | | | | | | |
| 34.4 ft. (10.5 m) | | | | | | | | | | |
| 29.5 ft. (9.0 m) | | | | | | | | | | |
| 25 ft. (7.5 m) | | | | | | | | | | |
| 9.8 ft. (6.0 m) | | | | | | | | | | |
| 15 ft. (4.5 m) | | | | | | | | | | |
| 10 ft. (3.0 m) | | | *12,811 (*5811) | *12,811 (*5811) | | | | | *8935 (*4053) | 5221 (2368) |
| 5 ft. (1.5 m) | | | *4795 (*2175) | *4795 (*2175) | 16378 (*7429) | 7846 (3559) | *13,349 (*6055) | 5595 (2538) | *10,375 (*4706) | 4059 (1841) |
| 0.0 ft. (0.0 m) | | | *5198 (*2358) | *5198 (*2358) | 11,360 (*5153) | 5496 (2493) | *15,227 (*6907) | 4085 (1853) | *11,649 (*5284) | 3073 (1394) |
| -5 ft. (-1.5 m) | *5020 (*2277) | *5020 (*2277) | *6711 (*3044) | *6711 (*3044) | 11,153 (*5059) | 4365 (1980) | *16,519 (*7493) | 3109 (1410) | *12,648 (*5737) | 2339 (1061) |
| -10 ft. (-3.0 m) | *6927 (*3142) | *6927 (*3142) | *8554 (*3880) | 8554 (3880 | 12,348 (*5601) | 3913 (*1775) | *17264 (*7831) | 2566 (1164) | *13,331 (*6047) | 1861 (844) |
| -15 ft. (-4.5 m) | *8885 (*4030) | *8885 (*4030) | *10,613 (*4814) | 8547 (3877) | 14,240 (*6459) | 3836 (1740) | *17540 (*7956) | 2332 (1058) | *13,693 (*6211) | 15,931 (7226) |
| -9.8 ft. (-6.0 m) | *10,957 (*4970) | *10,957 (*4970) | *12,901 (*5852) | 9169 (4159) | *16671 (*7562) | 4008 (1818) | *17,394 (*7890) | 2321 (1053) | *13,733 (*6229) | 1519 (689) |
| -25 ft. (-7.5 m) | *13,210 (*5992) | *13,210 (*5992) | *15492 (*7027) | 10,055 (4561) | *19,687 (*8930) | 4383 (1988) | *16821 (*7630) | 2489 (1129) | *13,419 (*6087) | 1592 (722) |
| -29.5 ft. (-9.0 m) | *15,715 (*7128) | *15,715 (*7128) | *18,503 (*8393) | 11,241 (5099) | *20,421 (*9263) | 4956 (2248) | *15745 (*7142) | 2826 (1282) | *12,679 (*5751) | 1814 (823) |
| -34.4 ft. (-10.5 m) | | | *22,141 (*10043) | 12,809 (5810) | *17,872 (*8107) | 5763 (2614) | *13993 (*6347) | 3353 (1521) | *11,336 (*5142) | 2207 (1001) |
| -39.3 ft. (-12.0 m) | | | | | *15,009 (*6808) | 2440 (1107) | *11,863 (*5381) | 1561 (708) | *8971 (*4069) | 2846 (1291) |

## *SY265C LR Lift Chart Continued*

| Load Radius | 29.5 ft. (9.0 m) | | 34.4 ft. (10.5 m) | | 39.3 ft. (12 m) | | 44.3 ft. (13.5 m) | | 49.2 ft. (15.0 m) | |
|---|---|---|---|---|---|---|---|---|---|---|
| Load Point Height (LPH) | End  | Side  | End  | Side  | End  | Side  | End  | Side  | End  | Side  |
| 39.3 ft. (12.0 m) | | | | | | | | | | |
| 34.4 ft. (10.5 m) | | | | | | | *3869 (*1755) | 2019 (916) | | |
| 29.5 ft. (9.0 m) | | | | | | | *4815 (*2184) | 2011 (912) | | |
| 25 ft. (7.5 m) | | | | | | | *4936 (*2239) | 1907 (865) | *3854 (*1748) | 1171 (531) |
| 9.8 ft. (6.0 m) | | | | | *5324 (*2415) | 2555 (1159) | *5152 (*2337) | 1735 (787) | *4709 (*2136) | 1080 (490) |
| 15 ft. (4.5 m) | | | *6142 (*2786) | 3175 (1440) | *5734 (*2601) | 2235 (1014) | *5437 (*2466) | 1519 (689) | *5236 (*2375) | 944 (428) |
| 10 ft. (3.0 m) | *7650 (*3470) | 3719 (1687) | *6797 (*3083) | 2665 (1209) | *6197 (*2811) | 1883 (854) | *5765 (*2615) | 1274 (578) | *5459 (*2476) | 783 (355) |
| 5 ft. (1.5 m) | *8613 (*3907) | 2967 (1346) | *7469 (*3388) | 2154 (977) | *6680 (*3030) | 1526 (692) | *6113 (*2773) | 1025 (465) | *5701 (*2586) | 615 (279) |
| 0.0 ft. (0.0 m) | *9506 (*4312) | 2297 (1042) | *8111 (*3679) | 1684 (764) | *7147 (*3242) | 1193 (541) | *6453 (*2927) | 791 (359) | *5939 (*2694) | 459 (208) |
| -5 ft. (-1.5 m) | *10,256 (*4652) | 1759 (798) | *8671 (*3933) | 1294 (587) | *7564 (*3431) | 911 (413) | *6757 (*3065) | 591 (268) | *6142 (*2786) | 324 (147) |
| -10 ft. (-3.0 m) | *10,814 (*4905) | 1378 (625) | *9107 (*4131) | 1001 (454) | *7893 (*3580) | 692 (314) | *6989 (*3170) | 439 (199) | *6277 (*2847) | 234 (106) |
| -15 ft. (-4.5 m) | *11,155 (*5060) | 1144 (519) | *9387 (*4258) | 811 (368) | *8100 (*3674) | 553 (251) | *7112 (*3226) | 348 (158) | *4985 (*2261) | 201 (91) |
| -9.8 ft. (-6.0 m) | *11,248 (*5102) | 1047 (475) | *9471 (*4296) | 730 (331) | *8135 (*3690) | 500 (227) | *7061 (*3203) | 337 (153) | | |
| -25 ft. (-7.5 m) | *11,050 (*5012) | 1082 (491) | *9299 (*4218) | 758 (344) | *7923 (*3594) | 547 (248) | | | | |
| -29.5 ft. (-9.0 m) | *10,470 (*4749) | 1250 (567) | *8757 (*3972) | 913 (414) | *7277 (*3301) | 732 (332) | | | | |
| -34.4 ft. (-10.5 m) | *9306 (*4221) | 1583 (718) | *7544 (*3422) | 1252 (568) | | | | | | |
| -39.3 ft. (-12.0 m) | | | | | | | | | | |

**This Page Intentionally Left Blank**

SANY

# Optional Equipment

# OPTIONAL EQUIPMENT SELECTION

Consult a SANY dealer before installing any optional equipment onto the 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 assumes no responsibility for accidents, loss, or failures caused by unapproved optional equipment.

# READ EQUIPMENT INSTRUCTIONS

Read and understand the optional equipment manual before installing and operating any optional equipment. Do not exceed the manufacturer's specifications for maximum flow and pressure of optional equipment.

If the optional equipment manual is missing or damaged, contact the manufacturer of the optional equipment to obtain a replacement.

# INSTALLATION AND REMOVAL PRECAUTIONS

**NOTICE!**

**The following precautions must be strictly observed when selecting, installing, and operating optional equipment. Failure to observe and follow this notice can damage the machine and cause it to operate improperly.**

- Follow the instructions in this manual and in the optional equipment manual.
- Remove and install equipment only on a firm, level surface.
- Use an appropriate lifting device when handling heavy objects.
- Never stand under a suspended load.
- Make sure the machine is well-balanced and supported whenever installing or removing equipment.

For additional information on removing and installing optional equipment, consult a SANY dealer.

# EQUIPMENT OPERATION PRECAUTIONS

**NOTICE!**

**The following precautions must be strictly observed when selecting, installing, and operating optional equipment. Failure to observe and follow this notice can damage the machine and cause it to operate improperly.**

- Prior to the operation, move the machine to a safe area and test its operation.
- Be aware of how the machine will move with an optional piece of equipment, since the machine's center of gravity and working range may change.
- Make sure the machine is well-balanced.
- Maintain a safe distance from all surrounding barriers during machine operation.
- To prevent the machine from tipping over, never swing, lower, or stop the machine suddenly.
- To prevent impact that may cause the machine to tip over, never raise or lower the boom suddenly.
- Install front guard on the machine as necessary per the nature of the optional equipment.

# OPTIONAL EQUIPMENT SYSTEM FUNCTIONS

## Equipment Controls

The equipment controls include two stop valves and a return flow selector valve. The two stop valves (1) are on the arm, and the return flow selector valve is near the boom base in the center of the machine.

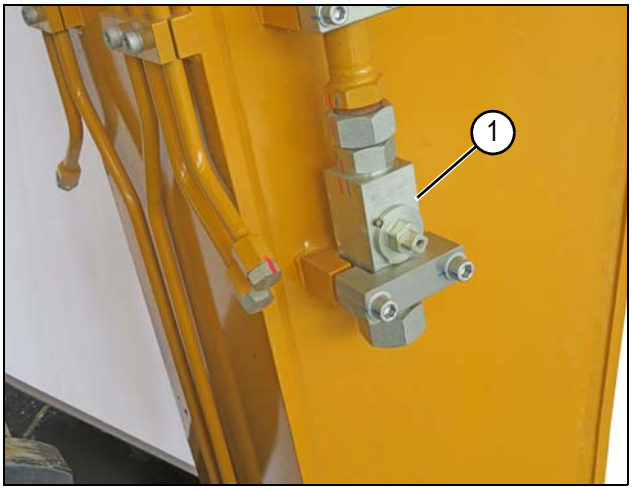



Fig. 7-1 0005330

### *Stop Valves*

Stop valves stop or allow the flow of hydraulic oil:

- In the ON position (1), the stop valve is rotated counterclockwise until it contacts the stop (3). The ON position is shown. This allows hydraulic oil to flow to the equipment.
- In the OFF position (2), the stop valve is rotated clockwise until it contacts the stop (3). This prevents hydraulic oil from flowing past the stop valve.

**NOTE:** *Turn the stop valve to the closed position when installing or removing optional equipment.*

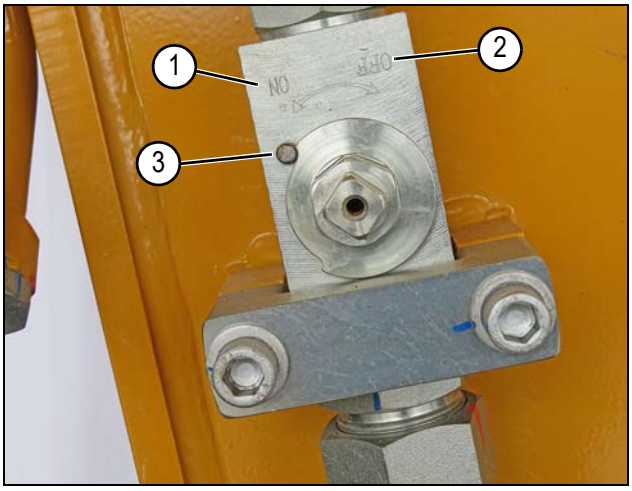



Fig. 7-2 0005331

### *Return Flow Selector Valve*

A variety of optional one-way and two-way flow equipment is available for use on this machine. A hydraulic breaker is an example of one-way flow equipment, and a shear is an example of two-way flow equipment.

The return flow selector valve (1) has a one-way (2) or two-way (3) position for operating optional equipment. It is on the side of the fuel tank.

**NOTE:** *Check the work tool operator manual for hydraulic flow rate information.*

| One-Way Hydraulic Attachment | Two-Way Hydraulic Attachment |
|---|---|
| Lever position shown for shear attachment use. | Lever position shown for breaker attachment use. |

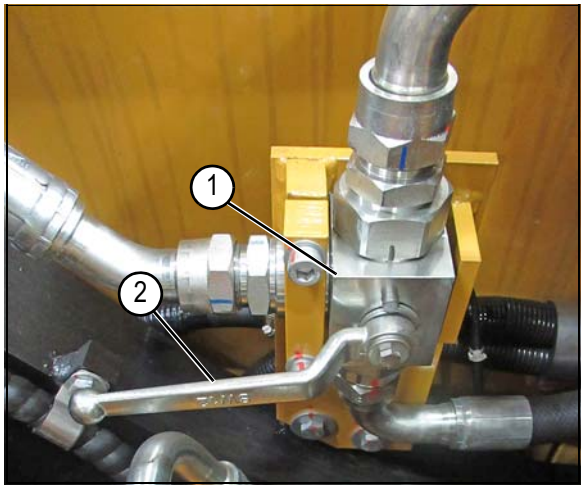



Fig. 7-3 0005328

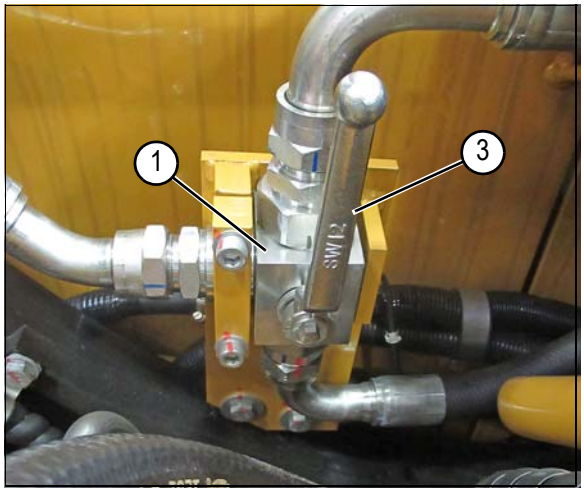



Fig. 7-4 0005329

### *Monitor Tool Selection*

Use the Tool Select screen to specify the work tool attached to the machine and, if needed, adjust the hydraulic oil flow for the tool. See “Tool Select Screen” on page 3-49.

# INSTALL OPTIONAL EQUIPMENT

**WARNING!**

- **Do not release equipment unless it is on the ground or on a solid, supportive surface. Block or support equipment to prevent rolling or tipping that could result in death or serious injury.**
- **Hydraulic systems operate under extremely high pressure. Escaping hydraulic oil under pressure is dangerous and could result in death or serious injury. Always relieve pressure before disconnecting hoses.**

**Failure to follow these warnings could result in death or serious injury.**

1. Prepare machine for service. See “Maintenance Safety” on page 2-8.
2. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.

**NOTICE!**

**Dispose of hydraulic oil according to all applicable environmental regulations. Failure to follow this notice could damage the environment.**

3. Place a suitably sized container under the hydraulic connections to catch any residual hydraulic oil.
4. Remove the caps and plugs from the hydraulic lines.
5. Connect the optional equipment to the machine according to the manufacturer’s instructions.
6. Connect the optional equipment hydraulic lines and operate the optional equipment according to the manufacturer’s instructions.
7. Adjust the return flow selector valve according to the optional equipment being installed. The return flow selector valve is located near the boom base in the center of the machine. See “Return Flow Selector Valve” on page 7-5.

   **NOTE:** *A variety of optional one-way and two-way flow equipment is available for use on this machine. A hydraulic breaker is an example of one-way flow equipment. A bucket thumb or shear are examples of two-way flow equipment.*

8. Check hydraulic oil level and add oil if necessary. See “Check the Hydraulic Oil Level” on page 5-29.
9. Select the correct operating mode from the monitor. See “Tool Select Screen” on page 3-49.

# REMOVE OPTIONAL EQUIPMENT

**WARNING!**

- **Do not release equipment unless it is on the ground or on a solid, supportive surface. Block or support equipment to prevent rolling or tipping that could result in death or serious injury.**
- **Hydraulic systems operate under high pressure. Escaping hydraulic oil under pressure is dangerous and could result in death or serious injury. Always relieve pressure before disconnecting hoses.**

**Failure to follow these warnings could result in death or serious injury.**

1. Prepare machine for service. See “Maintenance Safety” on page 2-8.
2. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-67.

**NOTICE!**

**Dispose of hydraulic oil according to all applicable environmental regulations. Failure to follow this notice could damage the environment.**

3. Place a suitably sized container under the hydraulic connection to catch any residual hydraulic oil.
4. Disconnect the optional equipment hydraulic lines according to the manufacturer’s instructions.
5. Install caps and plugs on the hydraulic lines.
6. Disconnect optional equipment from the machine according to the manufacturer’s instructions.
7. Adjust the return flow selector valve as necessary. See “Return Flow Selector Valve” on page 7-5.
8. Select the correct operating mode from the monitor. See “Tool Select Screen” on page 3-49.
9. Check the hydraulic oil level. See “Check the Hydraulic Oil Level” on page 5-29.

# OPTIONAL EQUIPMENT CONTROLS

**WARNING!**

**Do not operate the joystick control buttons when you are not operating the attachments. Accidental operation of an attachment could result in death or serious injury.**

The control switch and buttons on top of the left joystick (1) and right joystick (2) are used to control the optional equipment operation.

The control switch on the right joystick is used to control hydraulic flow in the lines.


Fig. 7-5 0005255

## Breaker Control

Press the upper part of the rocker switch (1) on the right joystick to send flow down the right side of the arm.

Press the lower part of the rocker switch (2) on the right joystick to send flow down the left side of the arm.

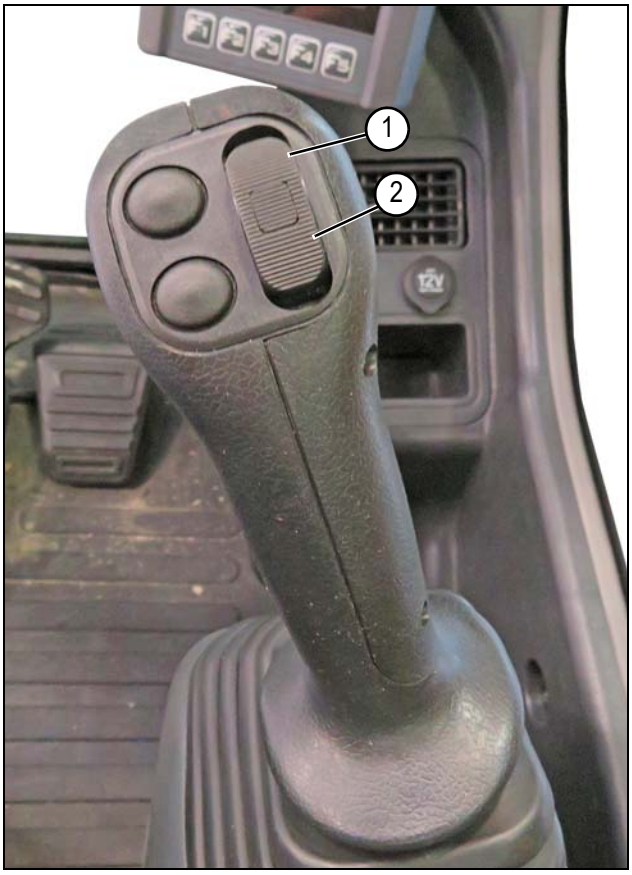



Fig. 7-6 0005259

## Shear Control

Press the upper part of the control switch (1) on the right joystick to open the shear. Press the lower part of the control switch (2) to close the shear.

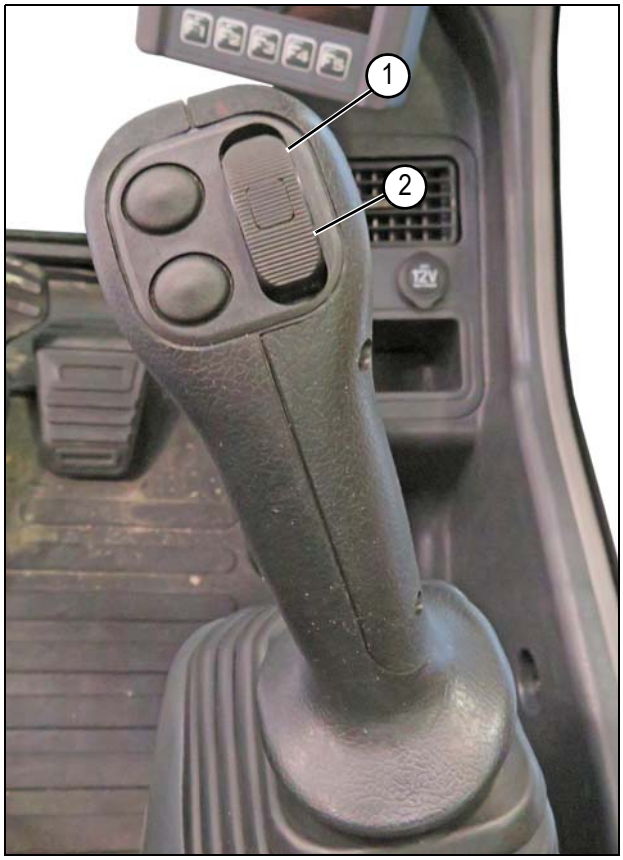



Fig. 7-7 0005259

Press the left button (3) on the left joystick to swing the shear to the left. Press the right button (4) on the left joystick to swing the shear to the right.


Fig. 7-8 0005230

**This Page Intentionally Left Blank**

Page Intentionally Blank

318 Cooper Circle

Peachtree City, Georgia 30269

Sales E-mail: sales@sanyamerica.com

E-mail: techpubs@sanyamerica.com

Service Hotline: 678-374-4122



SANY Part Number SSY005080427