Operation and Maintenance Manual

SY500H Excavator

service@sanyamerica.com

SANY Part Number SSY005084272

Page Intentionally Blank

SY500H Excavator

Operator and Maintenance Manual

WARNING

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

This manual is prepared by SANY Technical Publications,
while 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.

Contact a SANY dealer for additional information or assistance.

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

Page Intentionally Blank

Chapter 1

Introduction

About This Manual

This manual provides operation and maintenance information for the SY500H 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 the Operation and Maintenance Manual supplied with this 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 Operation and Maintenance Manual, Parts Manual, and Maintenance Log.

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

Optional Equipment

Provides general hydraulic installation and removal information for optional equipment.

Machine Applications

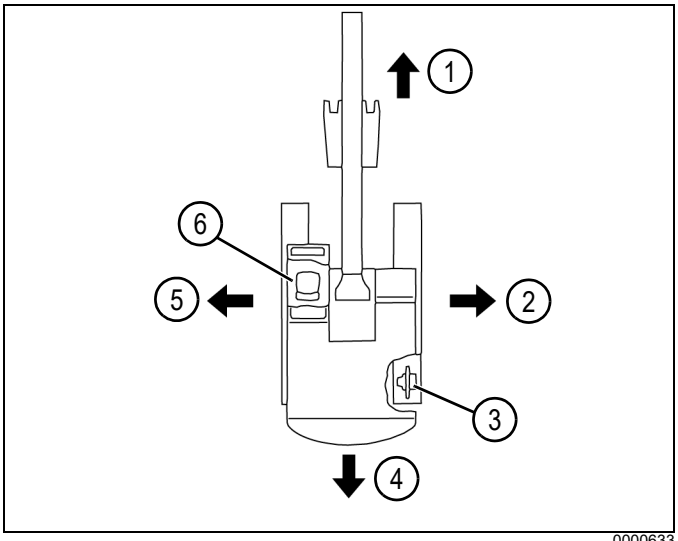
This excavator is a multipurpose construction machine used primarily for digging or loading earth and stones. It can also be used for lifting, demolishing, and trenching. It can perform the functions of a loader or a crane.

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).



0000633

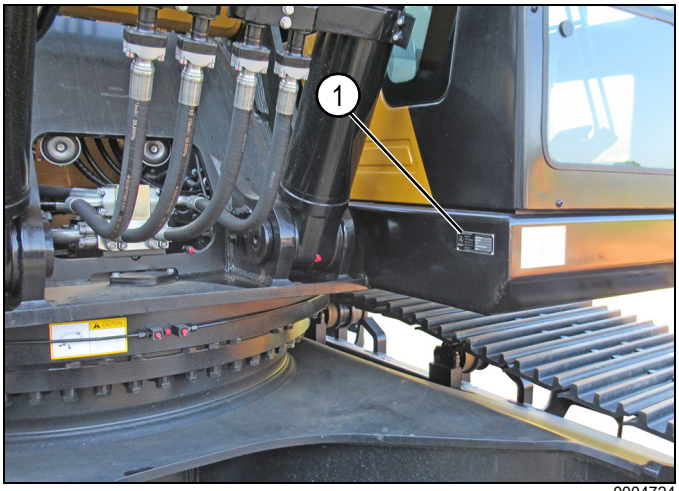
Figure 1-1

1	Front	4	Back
2	Right	5	Left
3	Drive Sprocket	6	Operator Seat

Serial Number Locations

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.

Product Identification Plate

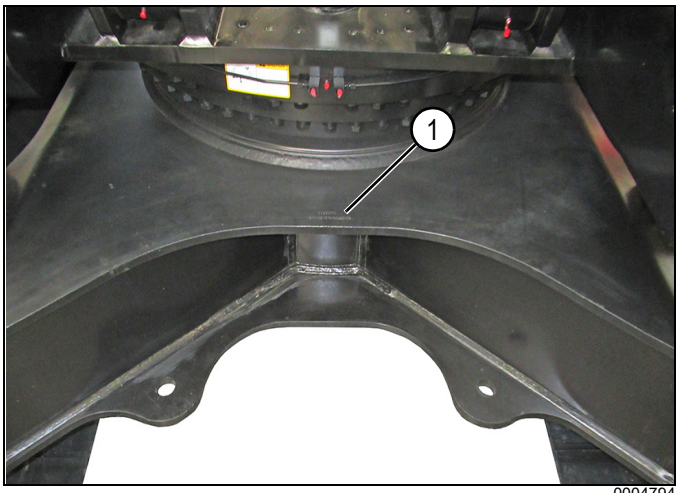


0004724

Figure 1-2

The product identification plate (1) with the machine's serial number is on the right side of the operator cab.

Frame Serial Number

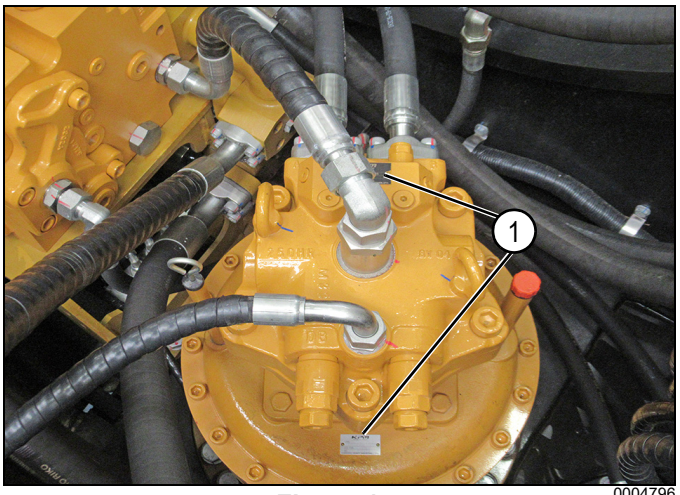


0004794

Figure 1-3

A frame serial number (1) is stamped on the front of the travel carriage frame.

Swing Motor Identification Plate

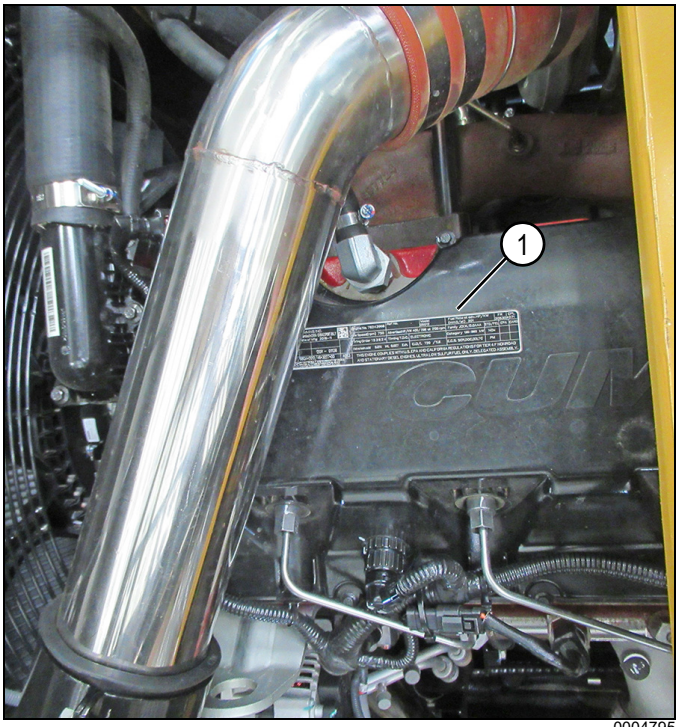


0004796

Figure 1-4

The identification plates (1) are on the top and bottom of the swing motor.

Engine Identification Plate

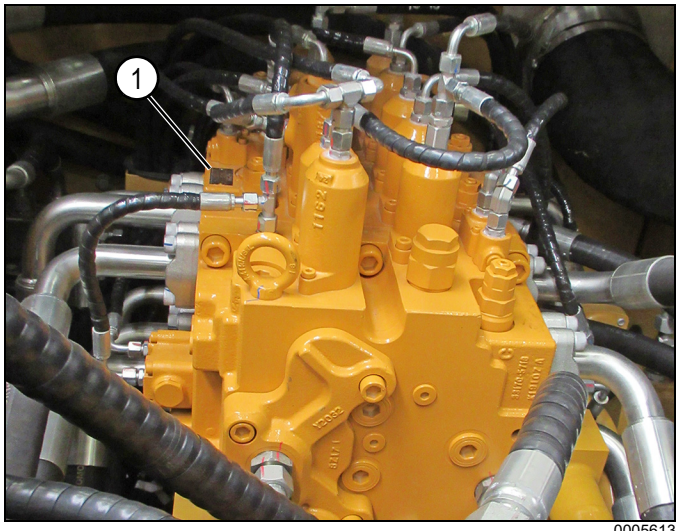


0004795

Figure 1-5

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

Main Control Valve Identification Plate

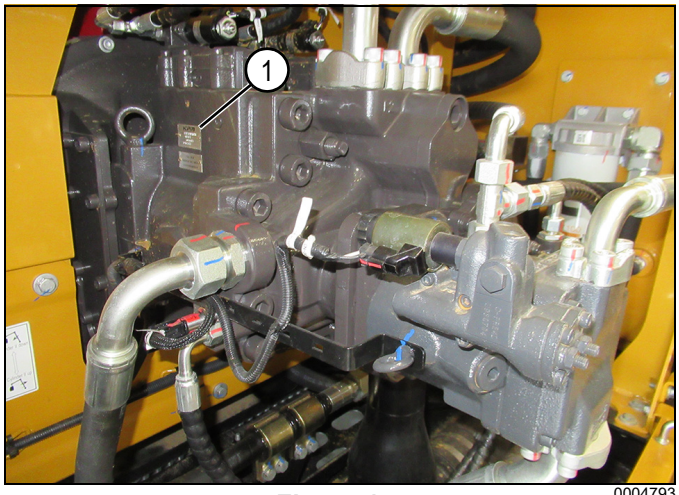


0005613

Figure 1-6

The identification plate (1) is on the top of the hydraulic main control valve.

Hydraulic Pump Identification Plate

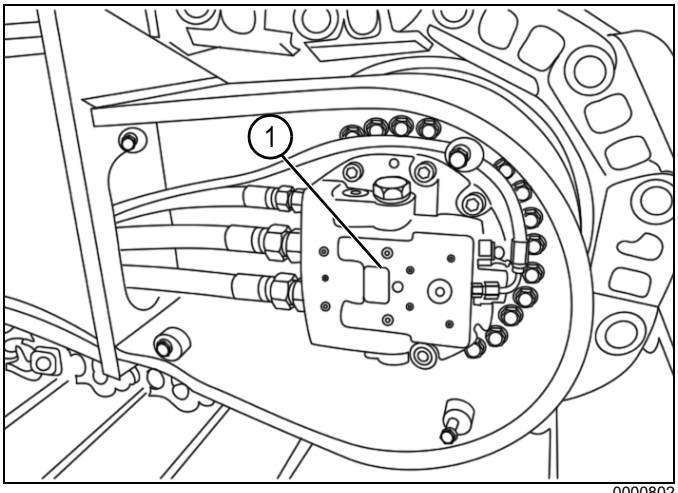


0004793

Figure 1-7

The identification plate (1) is on the side of the hydraulic pump.

Travel Motor Identification Plate



0000802

Figure 1-8

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

SANY Contact Information

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

Glossary of Acronyms

BHL – Backhoe Loader
DEF – Diesel Exhaust Fluid
DPF – Diesel Particulate Filter
ECM – Engine Control Module
HEST – High Exhaust System Temperatures
LCD – Liquid Crystal Display
MSDS – Material Safety Data Sheet
OEM – Original Equipment Manufacturer
PPE – Personal Protective Equipment
OSHA – Occupational Safety and Health Administration
PQR – Procedure Qualification Report
SAE – Society of Automotive Engineers
SDS – Safety Data Sheet
WPS – Weld Procedure Specification

Record of Serial Number and Dealer Information

Use this table to record the product information related to your machine.

Machine Serial Number	
Engine Serial Number	
Right Travel Motor Serial Number	
Left Travel Motor Serial Number	
Swing Drive Motor Serial Number	
Main Control Valve Serial Number	
Hydraulic Pump Serial Number	
Dealer Name: Address:	
Phone Numbers:	

Correction Request Form

If you find a problem with this manual, make a copy of this page, complete the form below, and send it to SANY.

Date of This Notification
Your Name
Company Name
Department
Street Address
City, State, and ZIP/Postal Code
Phone
E-mail
Machine Model and Serial Number
Description of Problem (wrong information, unclear or erroneous procedure, etc.)
Corrective Action Taken by You (if any)

Chapter 2

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, different 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.

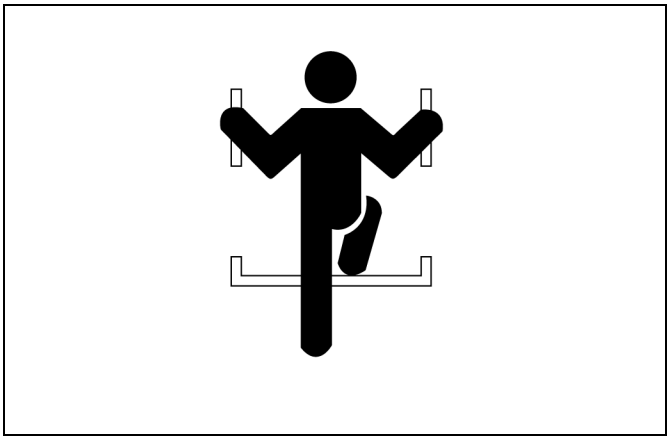
This symbol is used within a graphic to alert the user not to do something.

Operator Safety Information

It is impossible to compile a list of safety precautions that covers every situation. However, there are basic principles that 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



0000635

Figure 2-1

Mounting or dismounting the machine presents hazards. Observe the following:

- 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 cab by any means 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 riders 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 additional 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 a cab window for an emergency exit.*

As a precaution, 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 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 overcharging 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 windows and door during operation or travel.

Keep all guards in place on the machine.

Never remove the side window of the machine. If this 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.

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

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 to the area.

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.*

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 5-31.

The engine coolant and oil in the machine may be hot even after the engine is stopped. Wait for the engine coolant 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.

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

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

When removing hoses or lines, close all openings using caps and plugs. If any fuel or oil fluids leak, clean 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.

Clean 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.*

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 140°F (60°C) 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 period of time. The following 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 the skin or in the 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.

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 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 that 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 signal person 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. Always travel 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.

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.

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 Backover 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.

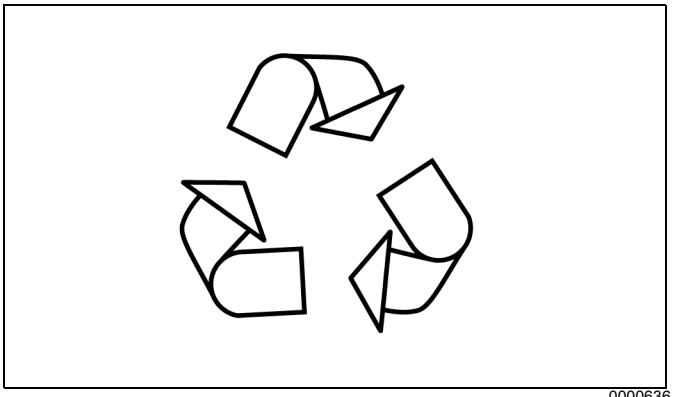
Use a signal person if the view is obstructed when backing up. Keep the signal person in view at all times.

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



0000636

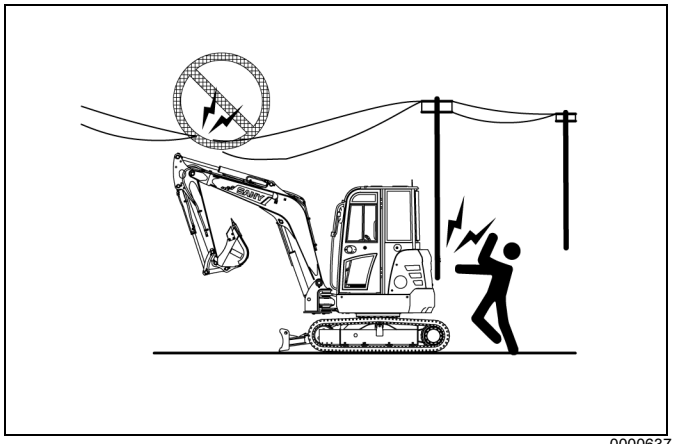
Figure 2-2

Oils 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.

Precautions in High-Voltage Areas



0000637

Figure 2-3

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.

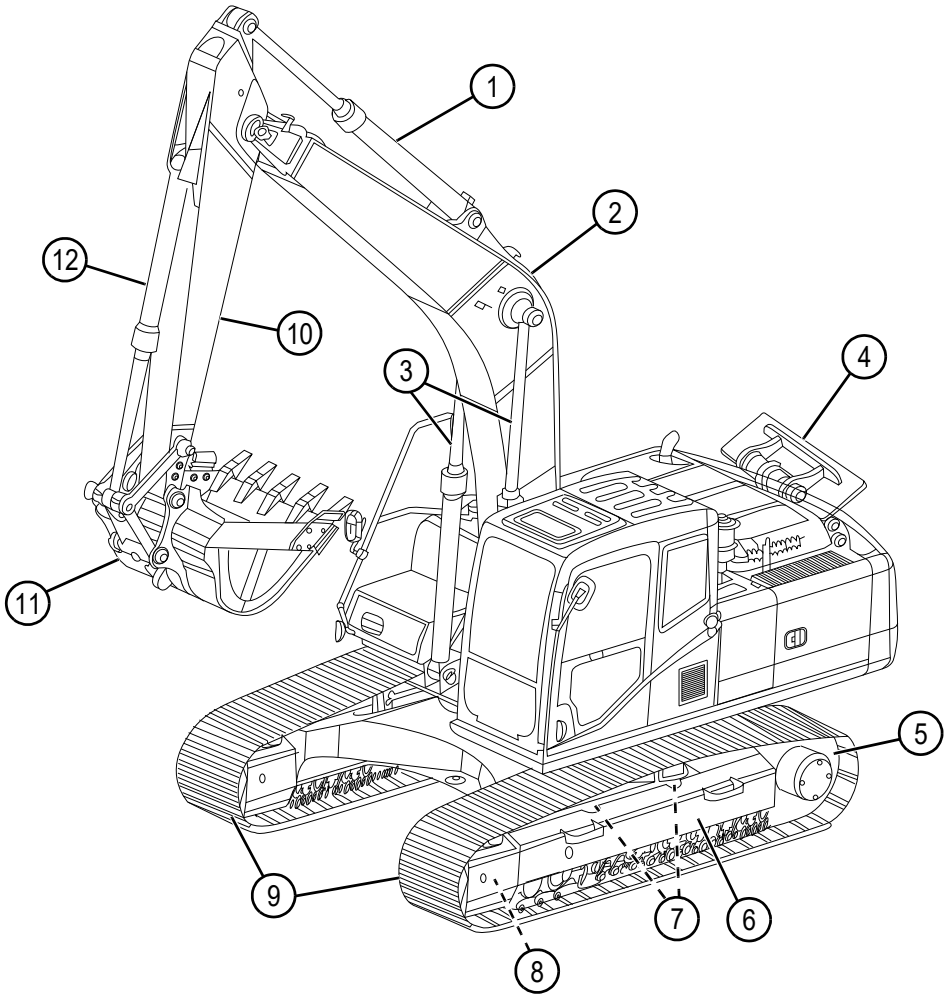
Be sure all underground utilities have been marked before excavating.

Page Intentionally Blank

Chapter 3

Machine Controls

Exterior Components



0000002

Figure 3-1

1 Arm cylinder
2 Boom
3 Boom cylinders
4 Counterweight removal system
5 Drive sprocket
6 Track frame
7 Carrier rollers
8 Idler
9 Tracks
10 Arm
11 Bucket
12 Bucket cylinder

Seat and Seat Belt

Figure 3-2

1	Headrest (page 3-5)	7	Seat belt latch plate (page 3-5)
2	Heat switch (page 3-5)	8	Seat cushion height adjustment lever (page 3-6)
3	Lumbar adjustment dial (page 3-5)	9	Seat and console adjustment lever (page 3-6)
4	Armrest angle adjustment control (page 3-5)	10	Weight adjusting switch (page 3-6)
5	Backrest angle adjustment lever (page 3-5)	11	Seat forward and backward adjustment lever (page 3-6)
6	Seat belt buckle (page 3-5)	12	Seat cushion adjustment lever (page 3-6)

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

Headrest

The headrest (1) can be raised or lowered.

Seat Heater

Press the heat switch (2) to turn the seat heater on and off.

Lumbar Adjustment

The lumbar dial adjustment (3) increases or decreases the lumbar support in the backrest.

Armrest Angle Adjustment

The seat has two armrests. The armrest angle can be adjusted by rotating the dials (4).

NOTE: *The armrest angle can be adjusted up to 90°.*

The armrest can be moved to a vertical position for operator comfort.

Backrest Angle Adjustment

NOTE: *When adjusting the angle of the backrest, make sure the backrest does not interfere with the cover plate of the air conditioner. Do not allow the control levers to touch the armrest.*

Lift the lever (5), move the backrest to the desired position, then release the lever.

Seat Belt

WARNING

- **Inspect the seat belt. Replace the seat belt immediately if the webbing is frayed or cut, if the buckle is damaged or malfunctions, or if the mounting hardware is loose. Replace according to the seat belt manufacturer's instructions.**
- **Always keep the seat belt fastened during machine operation. Never twist the seat belt when fastening.**

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

Buckle the Seat Belt

Hold the seat belt latch plate (7) and pull upward to lengthen the seat belt. Insert the seat belt latch plate into the seat belt buckle (6).

WARNING

Keep belt slack to no more than 1 in. (25 mm). Belt slack beyond this amount could significantly reduce operator protection in an accident. Failure to follow this warning could result in death or serious injury.

Unbuckle the Seat Belt

To unbuckle the seat belt, press the red button on the seat belt buckle (6).

Seat and Console Adjustment Lever

NOTE: *Both armrests and hydraulic lockout control move with the operator seat.*

Pull up on the seat and console adjustment lever (9), adjust the seat forward or backward to the desired position, then release the lever.

Weight Adjustment

For operator comfort, the air suspension seat can be adjusted by moving the switch (10) up to increase air pressure, or down to decrease air pressure.

Seat Forward and Backward Adjustment

NOTE: *The operator seat moves independently from the armrests and the hydraulic lockout controls.*

Move the seat forward and backward adjustment lever (11) to the side. Slide the seat to the desired position, and release the lever.

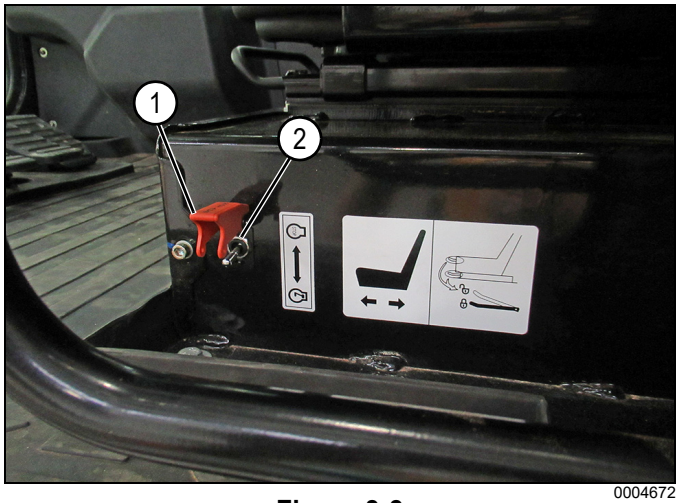
Seat Cushion Adjustments

NOTE: *The total adjustable depth is 2.3 in. (60 mm). The cushion can be adjusted in 1.2 in. (30 mm) increments.*

Pull the seat cushion depth adjustment lever (8), adjust the cushion angle and release the lever.

Pull the seat cushion adjustment lever (12), adjust the seat cushion forward or backward, and release the lever.

Emergency Stop Switch



0004672

Figure 3-3

The emergency stop switch is beneath the red cover (1) on the left lower side of the operator seat.

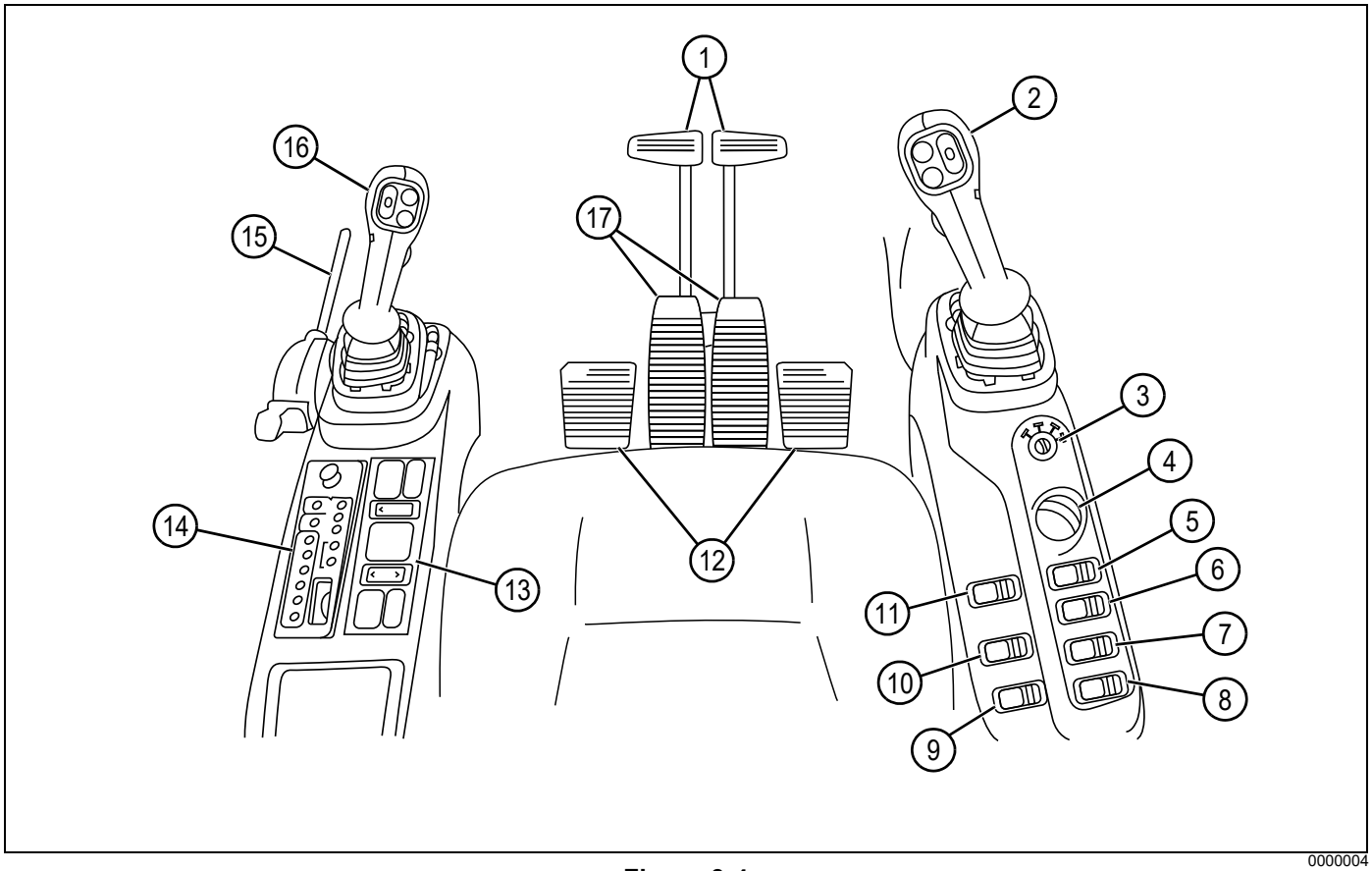
The emergency stop switch red cover is normally in the closed position.

In case of an emergency, raise the red cover and move the emergency stop switch (2) to the up position to shut down the engine.

The emergency stop switch stops the engine by opening the circuit ground to the engine control module (ECM).

NOTE: *Closing the red cover over the emergency stop switch forces the switch back to its original position for normal machine operation.*

Operator Controls



0000004

Figure 3-4

1 Travel control levers (page 3-21)
2 Right joystick (page 3-18)
3 Key switch (page 3-13)
4 Throttle control dial (page 3-13)
5 Work light switch (page 3-14)
6 Windshield wiper switch (page 3-15)
7 Windshield washer switch (page 3-15)
8 Headlight switch (page 3-15)
9 Travel alarm silence switch (page 3-14)
10 Regeneration disable switch (page 3-14)
11 Stationary regeneration switch (page 3-13)
12 Footrests
13 Climate control panel (page 3-10)
14 Radio control panel (page 3-11)
15 Hydraulic lockout control lever (page 3-8)
16 Left joystick (page 3-9)
17 Travel control pedals (page 3-21)

Left Control Console

0004673

Figure 3-5

This console is left of the operator seat and includes the following items:

- Hydraulic lockout control lever (1)
- Left joystick (2)
- Climate control panel (3)
- Radio control panel (4)

Hydraulic Lockout Control Lever

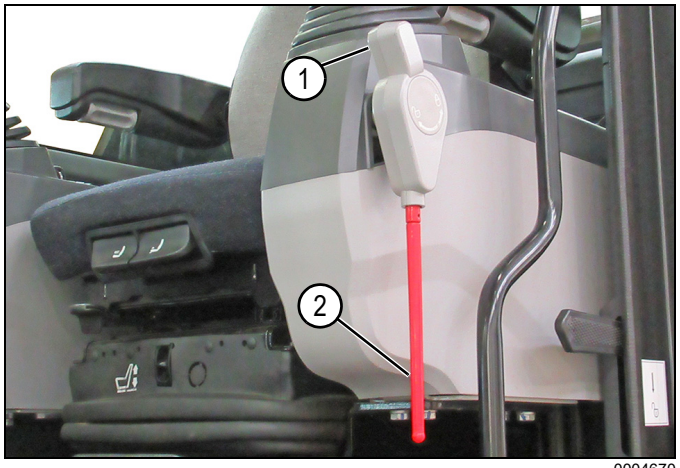
WARNING

Always move the hydraulic lockout control lever to the locked (closed) position before leaving the seat.

Avoid moving either joystick or travel control levers/pedals when you move the hydraulic lockout control lever to an unlocked (open) or locked (closed) position. Failure to follow these warnings could result in death or serious injury.

NOTICE!

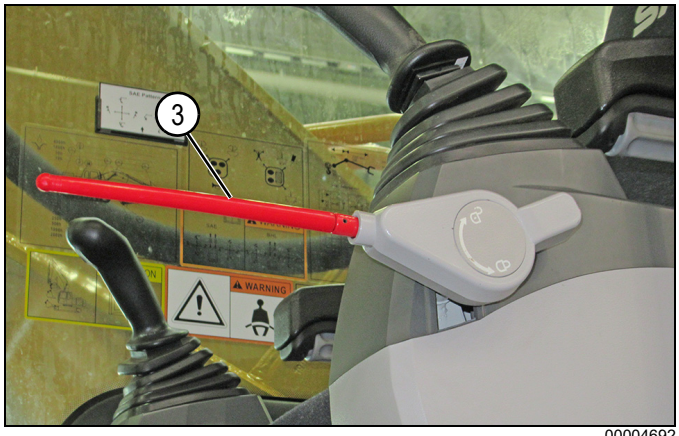
If any part of the machine moves when the hydraulic lockout control lever is in the locked (closed) position, shut down the engine immediately. Contact a SANY dealer for assistance.



0004670

Figure 3-6

The hydraulic lockout control lever (1) disables or enables the controls for work equipment, swing, travel, and attachments (if equipped). To prevent accidental movement move the hydraulic lockout control lever to the locked (closed) position (2) to disable all hydraulic controls.

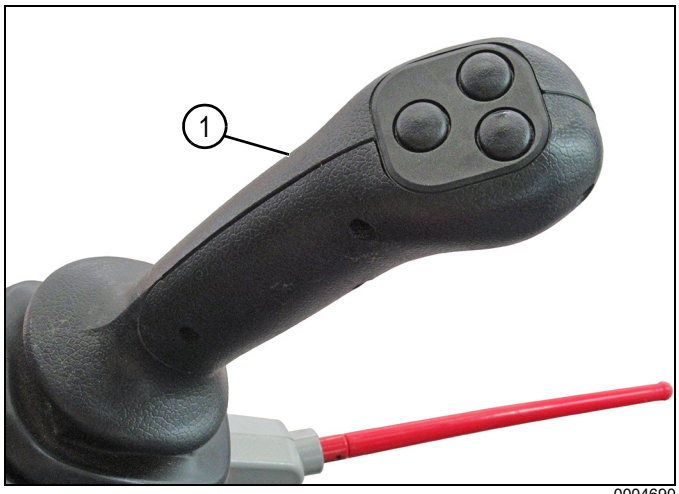


00004692

Figure 3-7

Move the hydraulic lockout control lever to the unlocked (open) position (3) to enable hydraulic controls.

Left Joystick



0004690

Figure 3-8

The left joystick (1) has three buttons. See “Left Joystick Buttons” on page 3-18.

Climate Control Panel

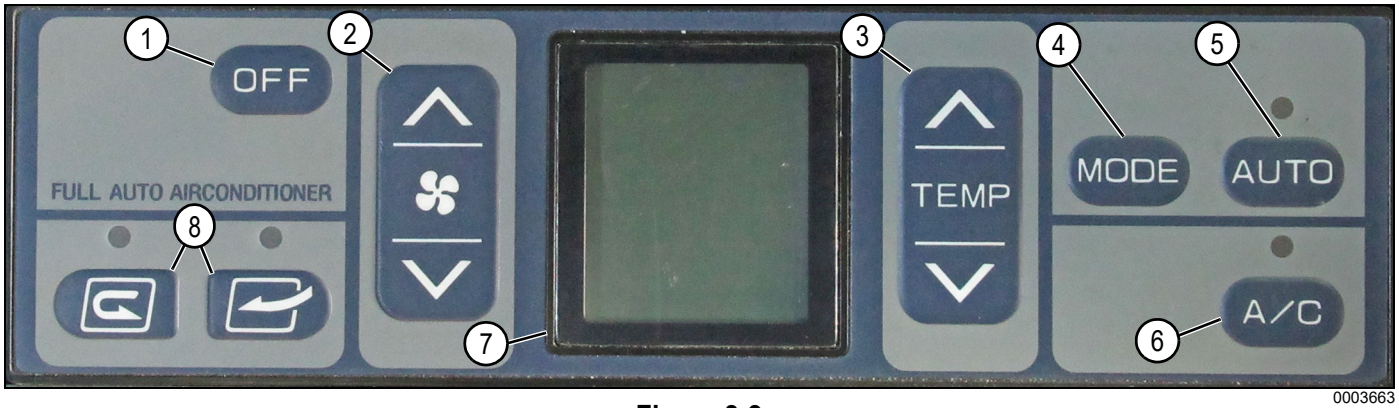


Figure 3-9

1. OFF button
2. Fan speed control switch
3. Temperature (TEMP) selection control switch
4. Vent MODE selection button
5. Automatic (AUTO) temperature control selection button
6. Air conditioning (A/C) power button
7. Liquid crystal display (LCD)
8. Fresh-air/recirculated-air selection buttons

Climate Control 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: *Check the fuses if there is a problem with the climate control panel operation. Check the sunlight sensor for blockage or damage if there is a problem with the climate control system. Contact a SANY dealer for further information.*

OFF Button

Press the power OFF button (1) to shut off the fan and all heating and cooling functions.

NOTE: *To turn on the heating and cooling functions, press the fan speed button or the AUTO button.*

Fan Speed Control Switch

Press the fan speed control switch (2) up or down arrow to set the fan to one of six speeds. In AUTO mode, the fan will remain on high speed until the selected temperature is reached.

Temperature Selection Control Switch

Press the temperature selection control switch (TEMP) up or down arrow (3) to control the inside cab temperature 63°F–90°F (18°C–32°C). Press and hold both the up and down arrows for about 5 seconds to toggle between Fahrenheit (°F) and Celsius (°C) temperature display.

Vent Mode Selection Button

Press the vent MODE selection button (4) to select which vent or vents are used for airflow inside the cab:

- Floor vent only
- Front and rear vents only
- All vents (front, rear, and floor)

Automatic Temperature Control Selection Button

Press the automatic temperature control selection button (AUTO) (5) to activate the automatic temperature control system. The climate control panel will automatically adjust fan speed, outlet vents, and air source to achieve and maintain the selected temperature. The desired temperature can be changed while in AUTO mode. Any other selection will deactivate the automatic temperature control.

NOTE: *A sunlight sensor adjusts the airflow of the climate control system when the cab is in direct sunlight.*

Air Conditioning Power Button

Press the air conditioning (A/C) power button (6) to switch the air conditioning system on and off.

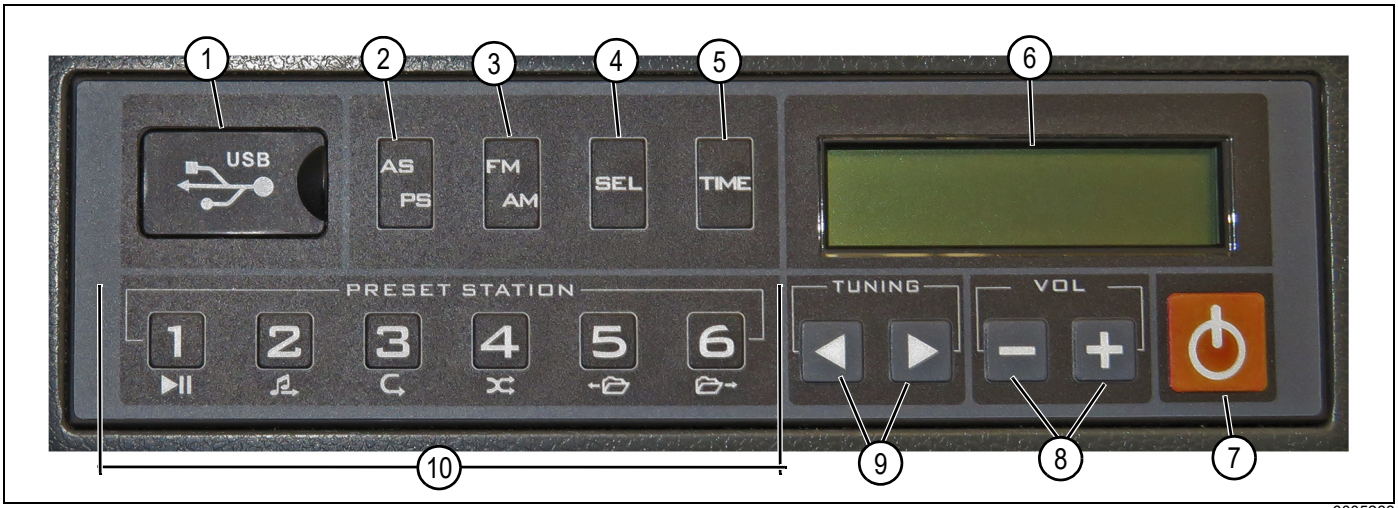
LCD Screen

The LCD screen (7) shows the preset temperature, fan speed, and vent selection during operation.

Fresh/Recirculated-Air Selection Buttons

Press the fresh-air button (8) to choose either fresh air from outside or recirculated air from inside the cab.

Radio Control Panel



0005263

Figure 3-10

1 Universal serial bus (USB) port
2 AS/PS selector button
3 FM/AM selector button
4 Audio selection (SEL) button
5 Time display/time set (TIME) button
6 Liquid crystal display (LCD)
7 Power button
8 Volume (VOL) control buttons
9 Tuning control buttons
10 Preset station buttons

Radio Operation

NOTICE!

The radio could easily be damaged if penetrated by water. When washing the machine, take care not to spray water on the radio. Wipe the radio with a dry cloth.

NOTE: *The battery disconnect switch and the key switch must be ON for the radio to operate.*

Universal Serial Bus (USB) Port

The USB port (1) allows the operator to interface computers or other electronic devices through the radio port.

Auto Scan/Preset Station (AS/PS) Button

Press and release the AS/PS button (2) to begin the auto scan feature. Each preset station will play for 10 seconds with the currently playing station frequency blinking on and off on the LCD screen (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 buttons (10).

FM/AM Selector Button

Press the FM/AM selector button (3) to toggle between AM1/AM2 and FM1/FM2 bands. Each band can have different preset stations selected.

Audio Selection (SEL) Button

Use the audio selection button (SEL) (4) to adjust the sound tones and speaker left/right balance. Each time the button is pressed, the display will cycle to adjustment options as follows:

- Press and hold the SEL button to access the bass adjustment.
- Press and release the SEL button again to access the treble adjustment.
- Press and release the SEL button again to adjust the cab speaker balance.

With the audio option selected, use the VOL (+) or the VOL (–) button (8) to adjust the audio level.

NOTE: *If the audio selection button is not pressed after 5 seconds, the display defaults to the current radio station frequency.*

Time Display/Time Set Button

Press and release the time display/time set (TIME) button (5) to display the set time for 5 seconds.

While the time is being displayed, press and hold the button to enter the time set screen. The hour numbers will flash. Press the tuning control arrows (9) to set the desired hour.

To set the minutes, press and release the button again and the minute numbers will flash. Press the tuning arrows to set the desired minutes.

Press and release the button to leave the time set screen and return to time display for 5 seconds. The time display will return to the radio display.

Liquid Crystal Display (LCD)

The liquid crystal display screen (6) displays the band (either AM or FM), currently tuned radio station frequency, present station number, and current time.

Power Button

Press and release the power button (7) to turn the radio on. The currently selected radio station frequency will appear on the display screen when the radio is turned on. Press and release the power button to mute the radio. Press and hold the power button to turn the radio off.

WARNING

For safety, maintain volume at a level that allows the operator to hear alert signals, such as horns or sirens. Failure to follow this warning could result in death or serious injury.

Volume Control Buttons

Press the volume (VOL) + (increase) or – (decrease) button (8) for volume.

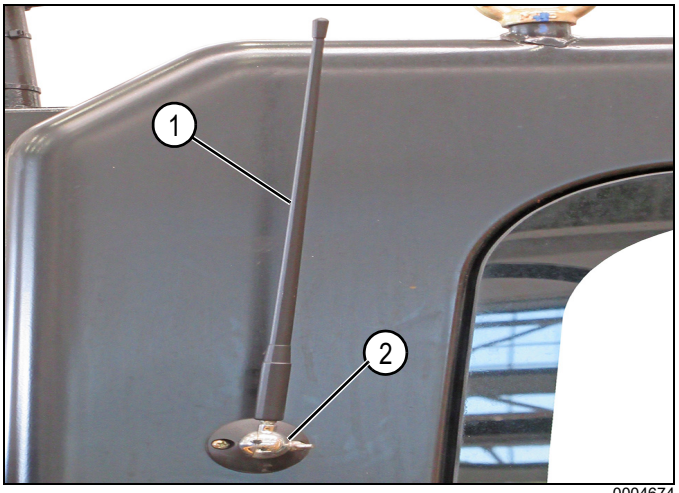
Tuning Buttons

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

Preset Station Buttons

Press and hold any of the six preset station buttons (10) to assign the current radio station to that button. When stations have been assigned to the buttons, press and release a preset station button to select.

Antenna



0004674

Figure 3-11

If the radio signal is weak or noisy, adjust the antenna (1) by loosening the wing nut (2) and moving the antenna to the appropriate position.

Right Control Console

Switches

0004676

Figure 3-12

The right control console includes the following controls:

- Right joystick (1)
- Key switch (2)
- Throttle control dial (3)
- Work light switch (4)
- Windshield wiper switch (5)
- Windshield washer switch (6)
- Headlights (7)
- Travel alarm silence switch (8)
- Regeneration disable switch (9)
- Stationary regeneration switch (10)

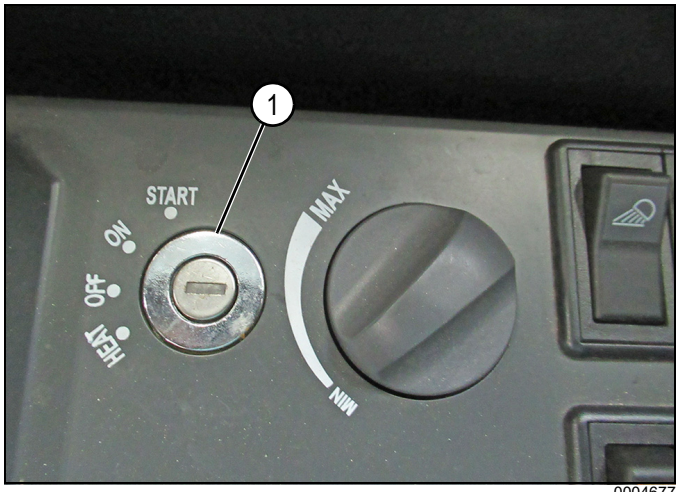
Right Joystick

0004682

Figure 3-13

The right joystick (1) has two buttons and a switch. See “Right Joystick Buttons/Switch” on page 3-18.

Key Switch



0004677

Figure 3-14

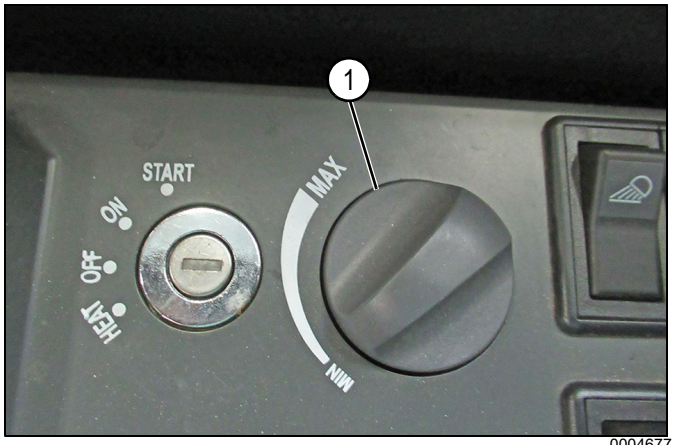
NOTICE!

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

The key switch (1) is used for the following functions:

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

Throttle Control Dial



0004677

Figure 3-15

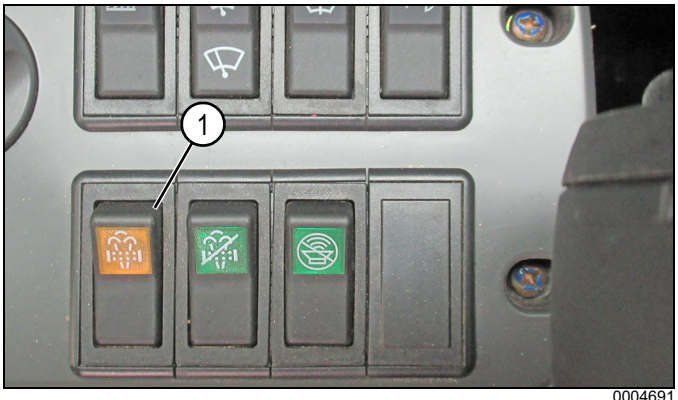
The throttle control dial (1) is used to adjust engine speed. Turn the dial clockwise to increase engine speed, and counterclockwise to decrease engine speed:

- Low idle (MIN): Turn it fully counterclockwise.
- High idle (MAX): Turn it fully clockwise.

Stationary Regeneration Switch

WARNING

If the red stop engine icon illuminates, shut down the engine as soon as it is safe to do so and immediately contact a SANY dealer for service support. Failure to do so could result in engine damage.



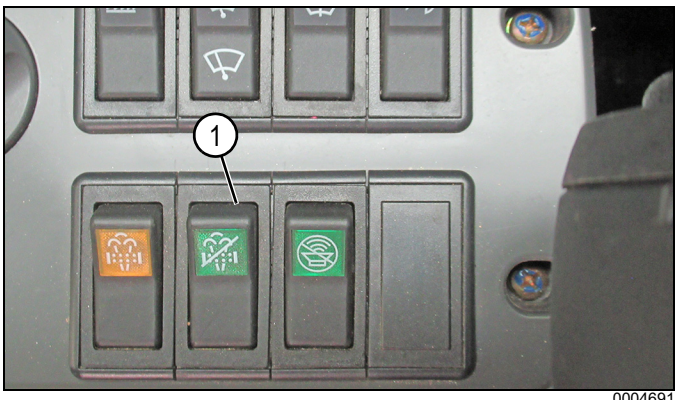
0004691

Figure 3-16

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

Stationary regeneration is required if the yellow diesel particulate filter icon on the monitor home screen is on or flashing, or if the yellow check engine icon on the monitor home screen is on, which indicates an increasing level of soot buildup in the exhaust system. Soot buildup occurs after continued operation with the regeneration disable switch set to the ON position.

Regeneration Disable Switch



0004691

Figure 3-17

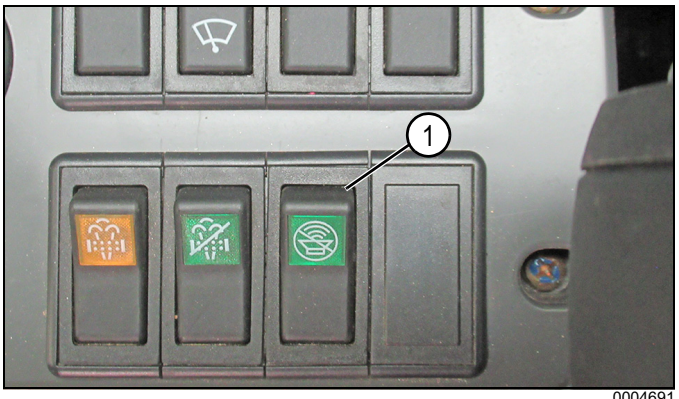
The regeneration disable switch (1) disables the automatic exhaust cleaning system. When this switch is in the ON position, an icon appears on the monitor screen.

Use the regeneration disable switch when high temperatures from automatic regeneration pose a risk due to the excavator's surroundings.

NOTICE!

Running the machine with automatic exhaust cleaning disable activated for an extended period of time will cause the soot level to increase and can damage the aftertreatment system.

Travel Alarm Silence Switch



0004691

Figure 3-18

The travel alarm silence switch (1) silences the travel alarm.

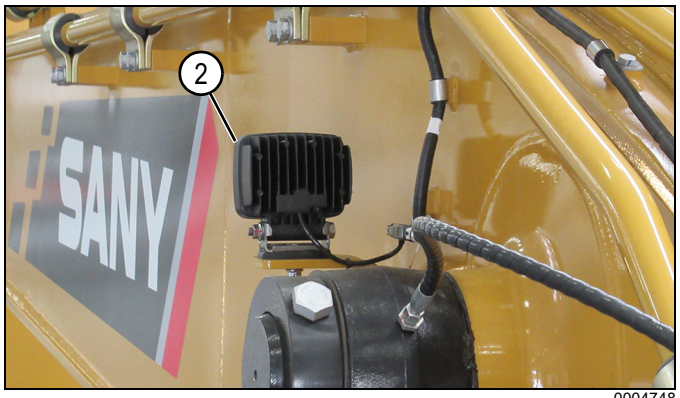
NOTE: *This switch does not cancel or reset any alarm.*

Work Light Switch

0004691

Figure 3-19

The work light switch (1) turns on three work lights.

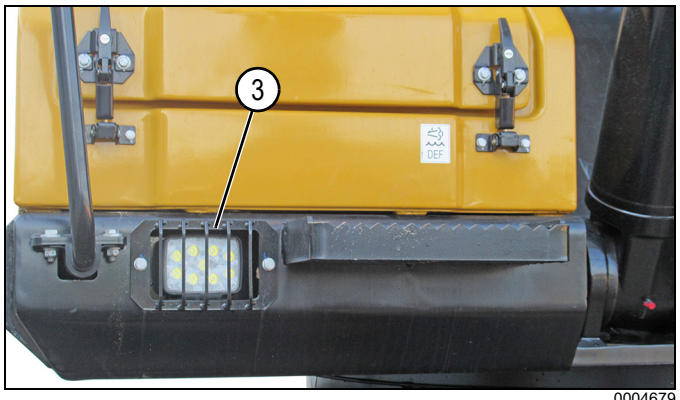


0004748

Figure 3-20

There are two work lights (2) located on the boom.

NOTE: *Left work light shown. Right work light is similar.*



0004679

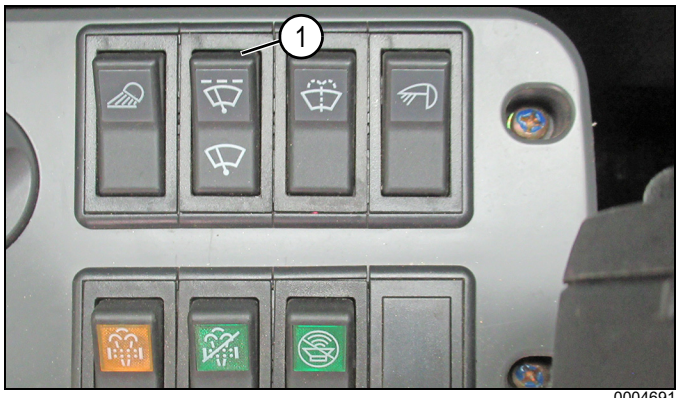
Figure 3-21

The third work light (3) is under the right front access door.

Windshield Wiper Switch

NOTICE!

Make sure the windshield of the cab is closed before activating the windshield wiper. Failure to follow this notice could damage the machine.



0004691

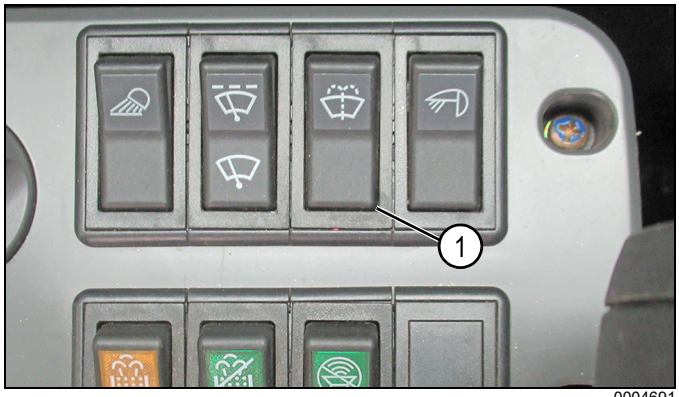
Figure 3-22

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

Windshield Washer Switch

NOTICE!

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

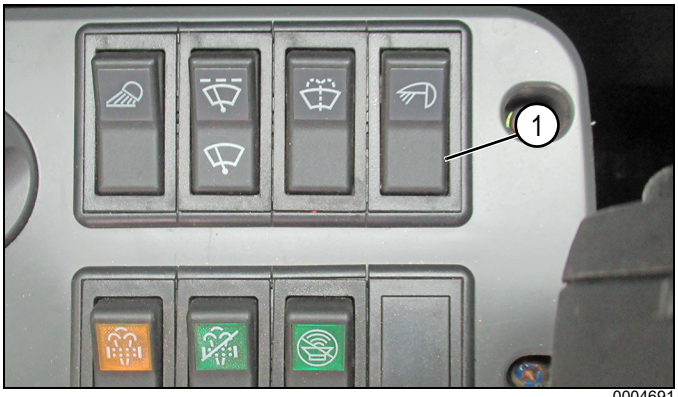


0004691

Figure 3-23

Press the windshield washer switch (1) to spray windshield washer fluid. Hold down the switch to continue spraying windshield washer fluid. Release the switch to stop spraying windshield washer fluid.

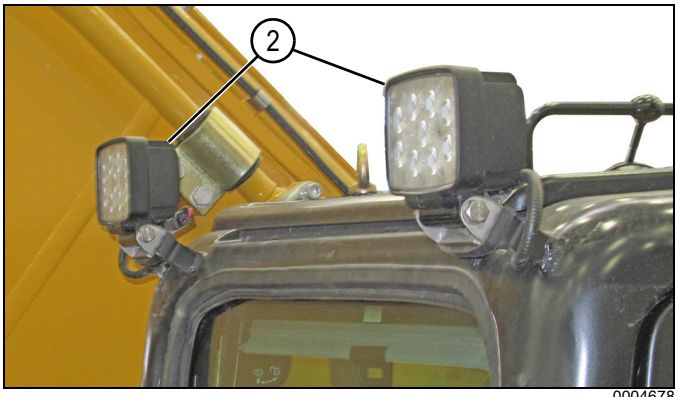
Headlight Switch



0004691

Figure 3-24

The headlight switch (1), mounted in the right control console, turns on the headlights.

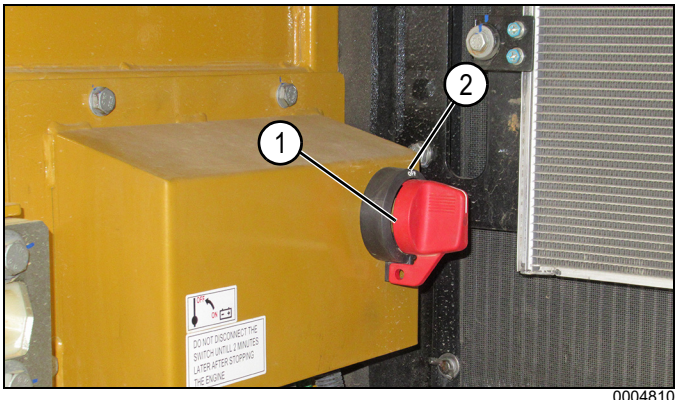


0004678

Figure 3-25

The headlights are on top of the cab.

Battery Disconnect Switch



0004810

Figure 3-26

The battery disconnect switch (1) is behind the left rear access door. See “Left Rear Access Door” on page 4-8. When the switch is moved to the OFF (2) position, electrical power is disconnected from all machine systems.

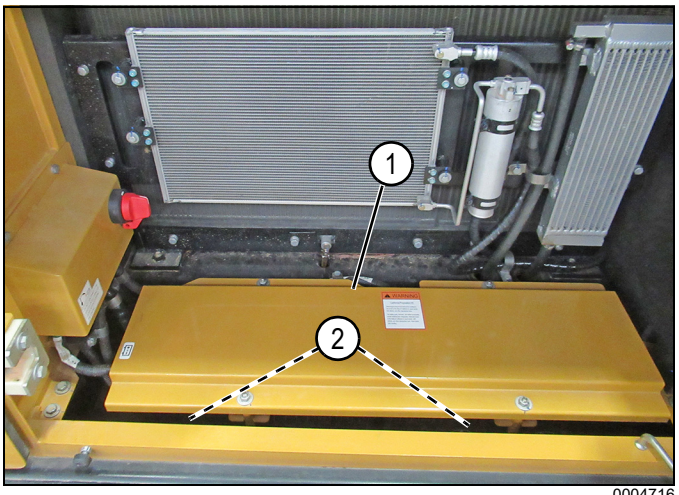
Turn the switch to the OFF position when securing the machine for the day, or as needed when performing service.

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.

Batteries



0004716

Figure 3-27

There are two 12V batteries (2) connected in series to provide 24V power to the machine's electrical system. The batteries are under a protective cover (1) behind the left rear access door. See "Left Rear Access Door" on page 4-8.

Monitor Console

0004717

Figure 3-28

The monitor (1) displays machine status information, warnings, and error messages. The operator can access various screens on the monitor, allowing machine settings to be changed. See “Monitor” on page 3-25.

12V Power Supply Socket

Use the 12V power supply socket (2) to power or charge 12V accessories.

The sunlight sensor (5) is located on the front of the monitor console. See “Sunlight Sensor” on page 3-17.

Cup/Ashtray

The cup/ashtray (3) is on the bottom of the console.

Airflow Vents

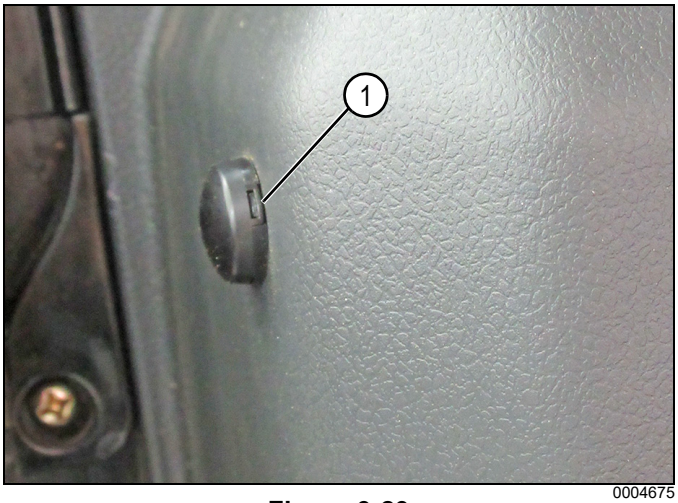
Airflow vents (4) on the monitor console can be opened, closed, and rotated.

Sunlight Sensor

NOTICE!

To make sure the automatic functions of the air conditioning function properly, the sunlight sensor must be clean. Never obstruct the sunlight sensor, or it could malfunction.

If the control panel or sunlight sensor gets wet, a failure may result. Always keep these components clean and dry. Failure to follow this notice could damage the machine or cause it to operate improperly.



0004675

Figure 3-29

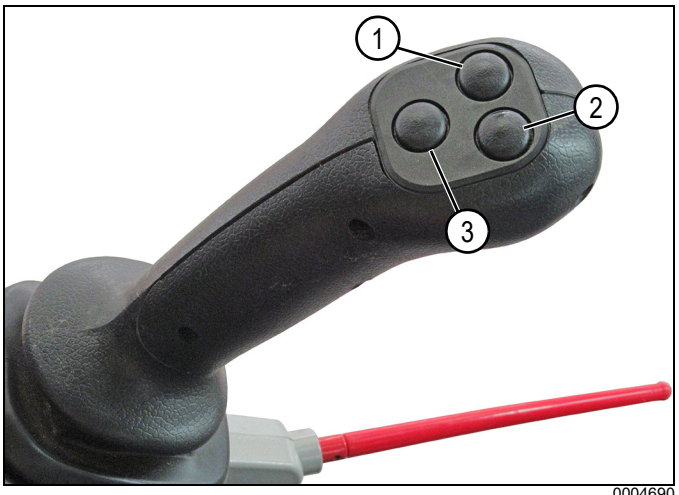
The sunlight sensor (1) adjusts the airflow to match the variation of temperature caused by direct sunlight. It is on the front of the monitor console.

Joystick Controls

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.

Left Joystick Buttons



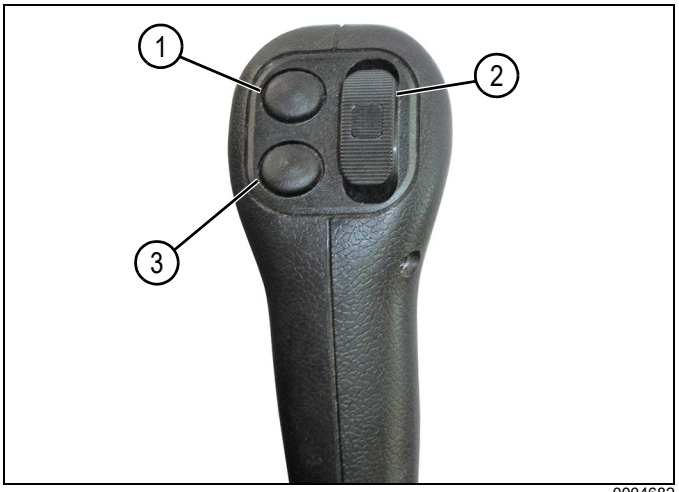
0004690

Figure 3-30

The left joystick has three buttons:

- Optional equipment hydraulic control button (1), clockwise rotation.
- Optional equipment hydraulic control button (2), counterclockwise rotation.
- Press the bottom button (3) to operate the horn.

Right Joystick Buttons/Switch



0004682

Figure 3-31

The right joystick has two buttons and a switch:

- The top left button (1) is for power boost, which temporarily provides extra hydraulic pressure.
- Optional equipment hydraulic control switch (2).
- The bottom left button (3) is not used.

SAE/BHL Joystick Operating Modes

Two operating modes are available for the joysticks:

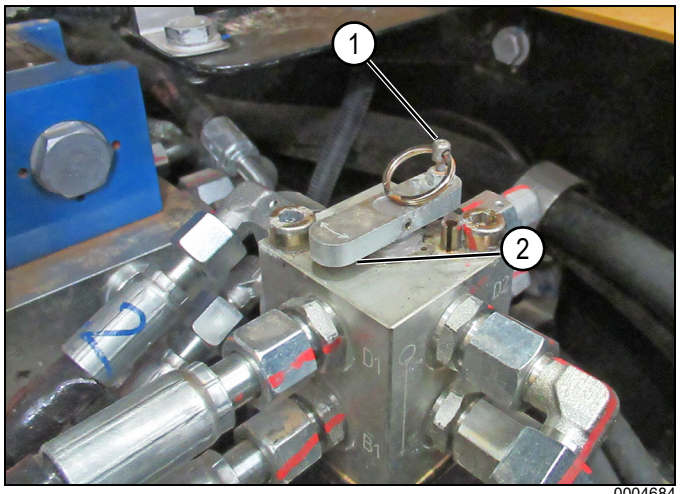
- Society of Automotive Engineers (SAE) mode. See “SAE Mode” on page 3-19.
- Backhoe Loader (BHL) mode. See “BHL Mode” on page 3-20.

Pattern Change (SAE/BHL) Valve

NOTICE!

Shut down 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.

The pattern change (SAE/BHL) valve is behind the left access door, below the engine air filters.



0004684

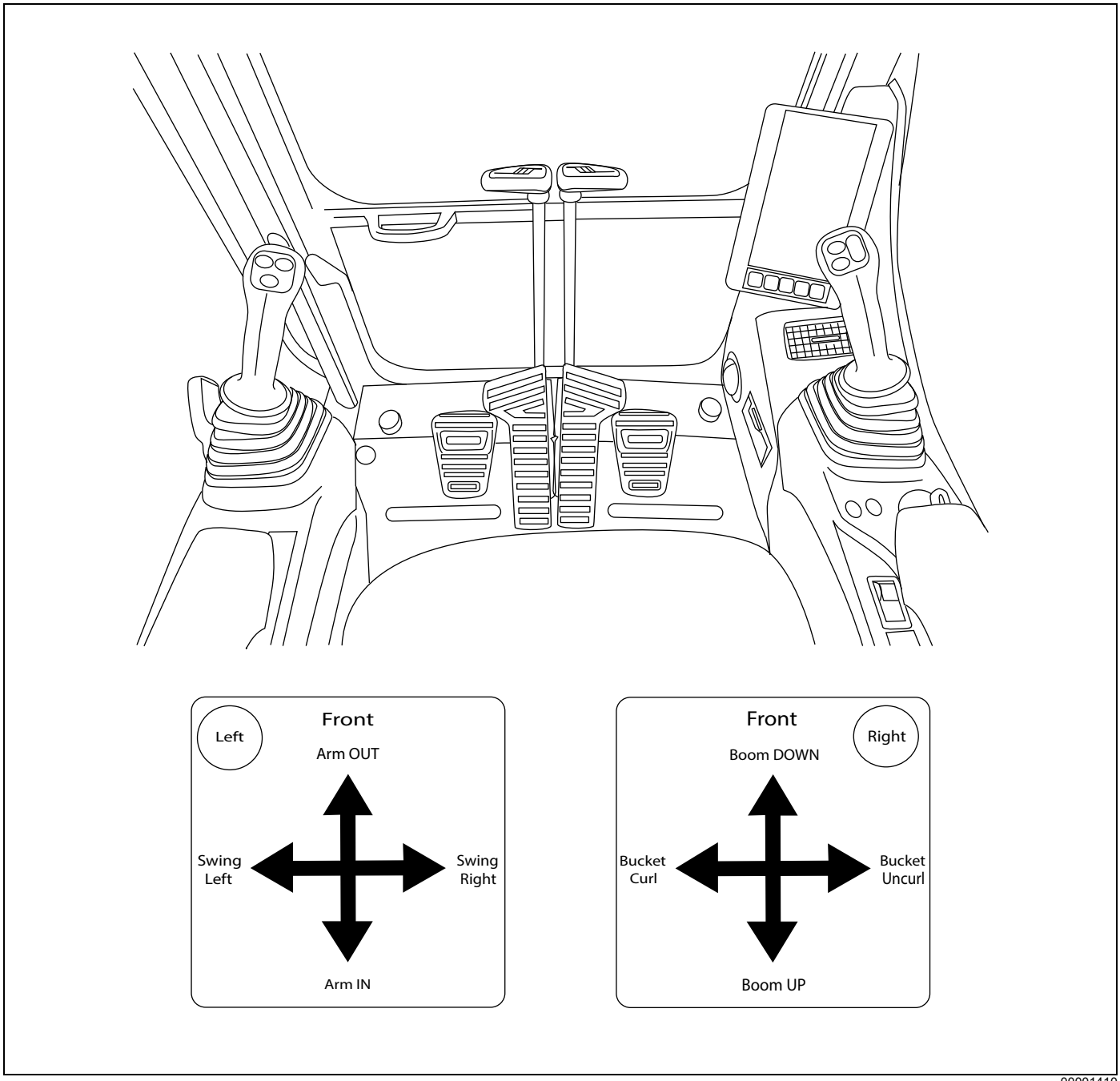
Figure 3-32

The pattern change (SAE/BHL) valve changes control of the boom and arm from one joystick to the other. The SAE mode position is shown above. To change to the BHL position, pull up on the pin (1) and rotate the bar (2) counterclockwise. Release the pin to lock the bar in place.

In SAE mode, the arm is controlled using the left joystick, and the boom is controlled using the right joystick.
NOTE: *See “SAE Mode” on page 3-19 for additional information.*

In BHL mode, the arm is controlled using the right joystick, and the boom is controlled using the left joystick.
NOTE: *See “BHL Mode” on page 3-20 for additional information.*

SAE Mode



00001410

Figure 3-33

BHL Mode

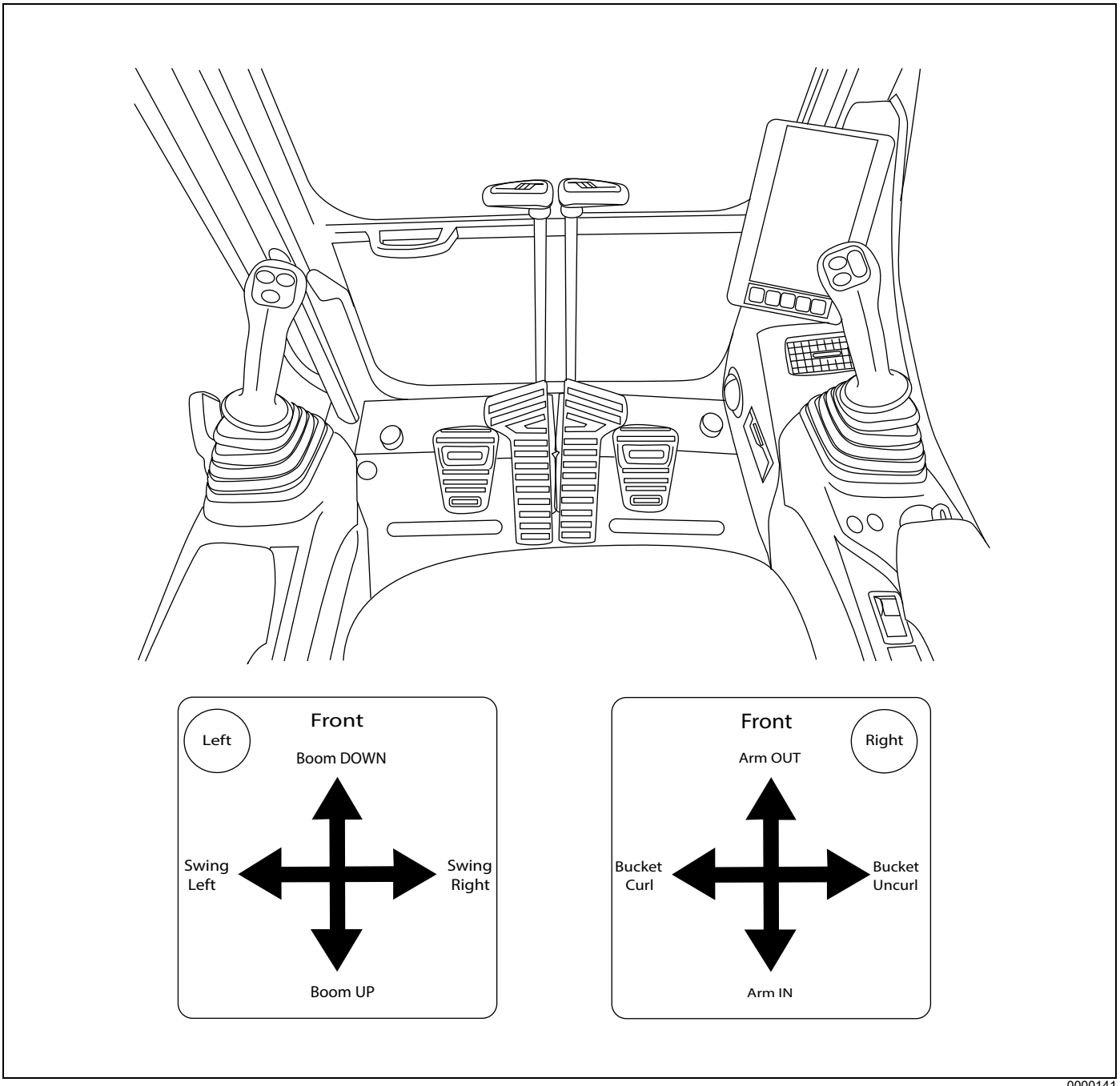
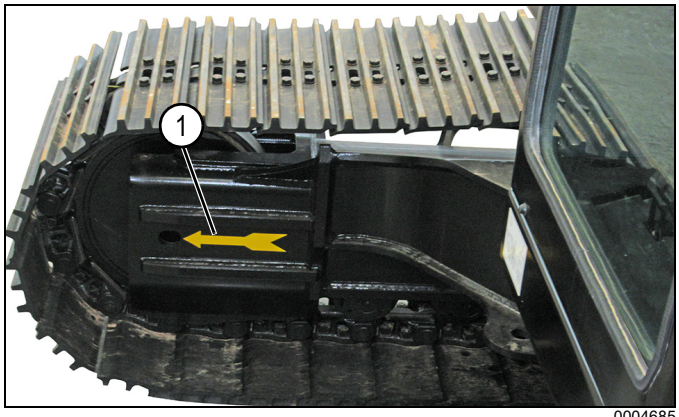


Figure 3-34

Travel Controls

WARNING

Take extra care when using the pedals to steer the machine. Never rest feet on the pedals unless driving or steering the machine. Failure to follow this warning could cause unexpected movement of the machine, which could result in death or serious injury.

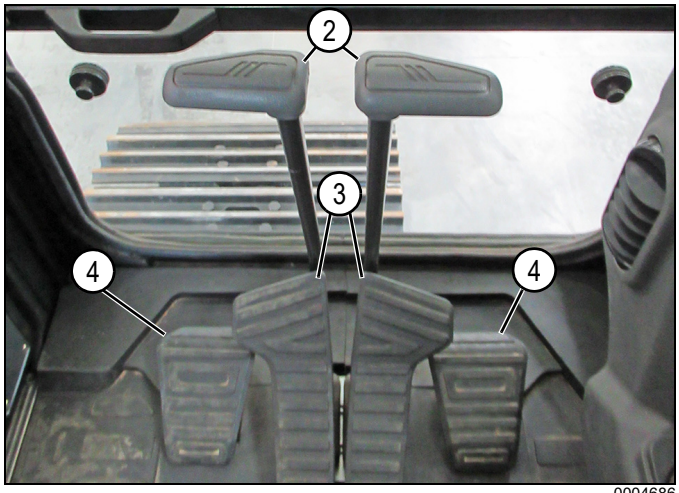


0004685

Figure 3-35

Always note the following before operating the travel controls:

- The directional arrow (1) on each of the track frames indicates the forward direction of the undercarriage. Check these arrows before using the travel control levers. When possible, face the cab in this direction.
- When the cab faces backward, the travel direction will be reversed. (The machine moves forward when the control levers are pulled, and backward when pushed.)



0004686

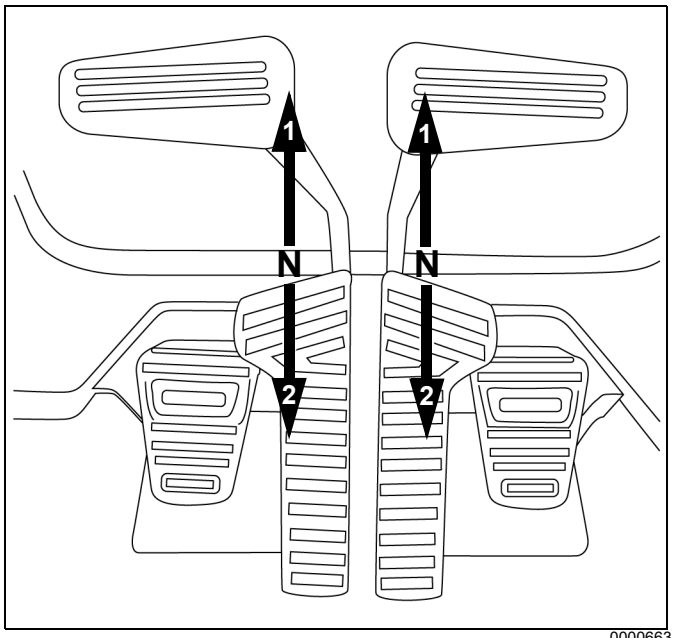
Figure 3-36

The travel controls include:

- Travel control levers (2)
- Travel control pedals (3)

NOTES:

- *The footrests (4) do not control any functions.*
- *When a travel control lever/pedal or a joystick is released, it returns to the neutral position and machine movement stops.*



0000663

Figure 3-37

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

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

Auto-idle

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

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

- If the joysticks and travel controls remain in their neutral positions for 5 seconds or longer, the engine reduces idle speed to the factory-set auto-idle speed (approximately 1300–1400 rpm).

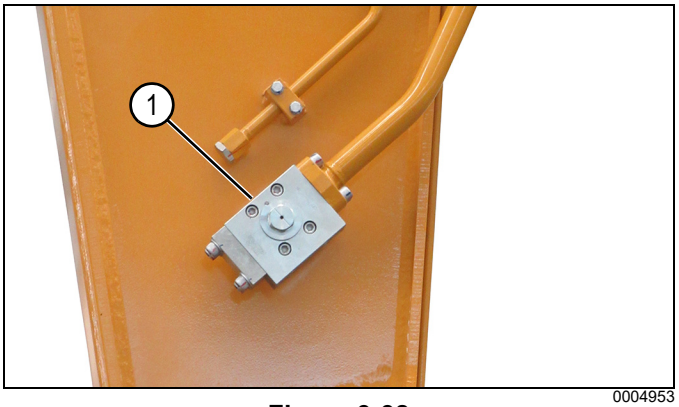
NOTE: *When the idle speed is set below the factory-set auto-idle speed, the auto-idle will not change the engine speed.*

- If either of the joysticks or travel controls are 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.

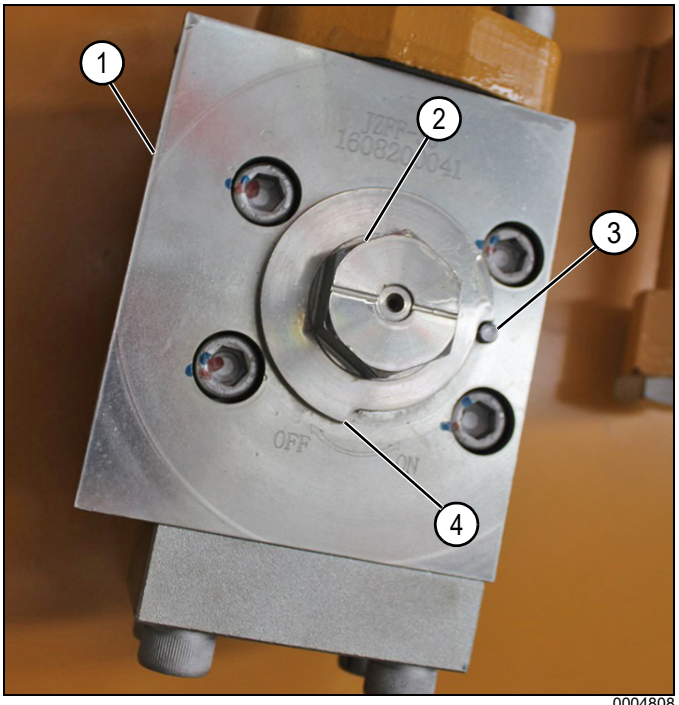
NOTE: *To enable or disable the auto-idle press function key F2. See “Home Screen Function Icons and Buttons” on page 3-27.*

Stop Valve



0004953

Figure 3-38



0004808

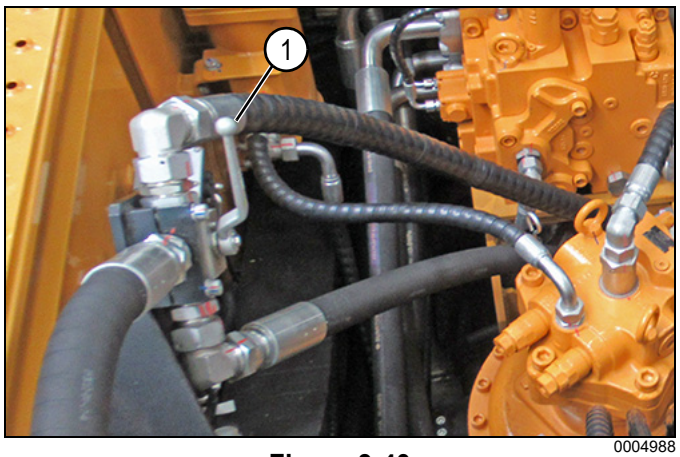
Figure 3-39

Two stop valves (1) are mounted on the arm to aid in the removal and installation of optional equipment by shutting off hydraulic flow when optional equipment is removed.

NOTE: *The right side of the arm stop valve is shown. The left is side is similar.*

NOTE: *The stop valve is shown in the closed position. To open the valve, turn the valve knob (2) counterclockwise until the stop (4) makes contact with the stop pin (3).*

Return Flow Selector Valve



0004988

Figure 3-40

The return flow selector valve (1) has a one-way or a two-way position for operating optional attachments. It is on the left side of the hydraulic oil tank.

The return flow selector valve is adjusted as follows:

- Move the lever toward the rear of the machine (position shown) for one-way flow position.
- Move the lever toward the front of the machine for two-way flow position.

A variety of optional one-way and two-way flow attachments are available for use on this machine. A breaker is an example of a one-way flow attachment, and a shear is an example of a two-way flow attachment.

Fuses and Relays

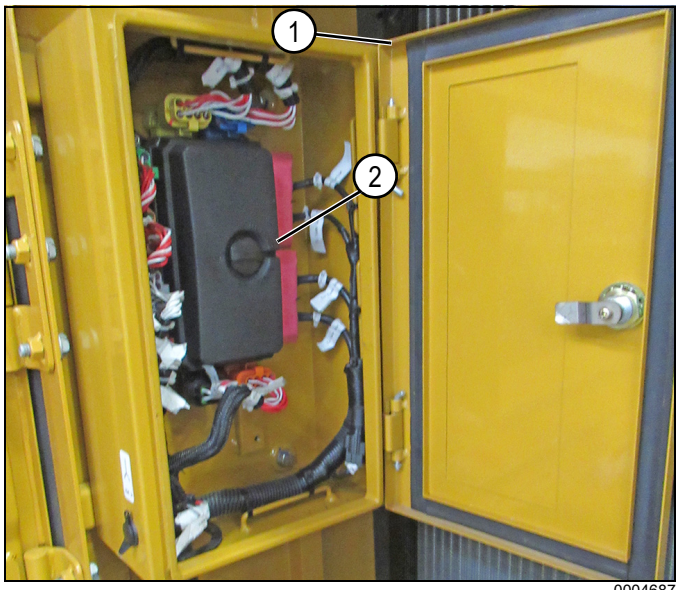
NOTICE!

A fuse should be replaced if it is corroded or becomes loose in the fuse panel.

Before replacing a fuse, make sure the battery disconnect switch is OFF and the batteries are disconnected.

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

Failure to follow these notices can damage the machine or cause it to operate improperly.

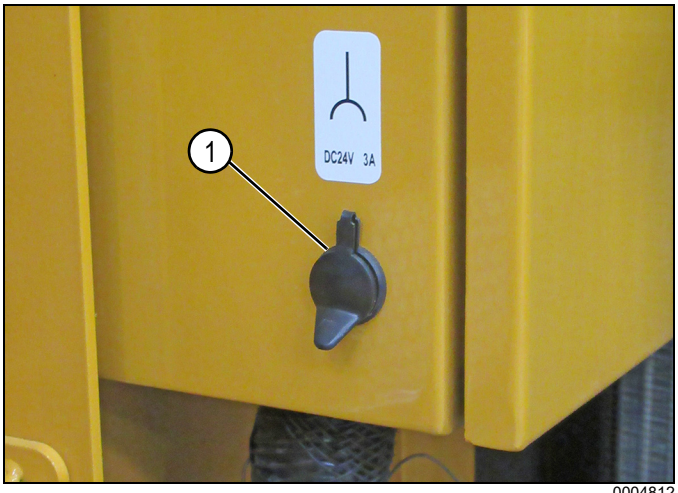


0004687

Figure 3-41

The fuse and relay panel is behind the left front access door, inside the electrical panel. Open the electrical panel door (1) and remove the fuse and relay panel cover (2) to access the fuses and relays.

Accessory Light Outlet (24V)



0004812

Figure 3-42

The accessory light outlet (1) is on the side of the electrical panel, behind the left front access door.

Fuse and Relay Locations

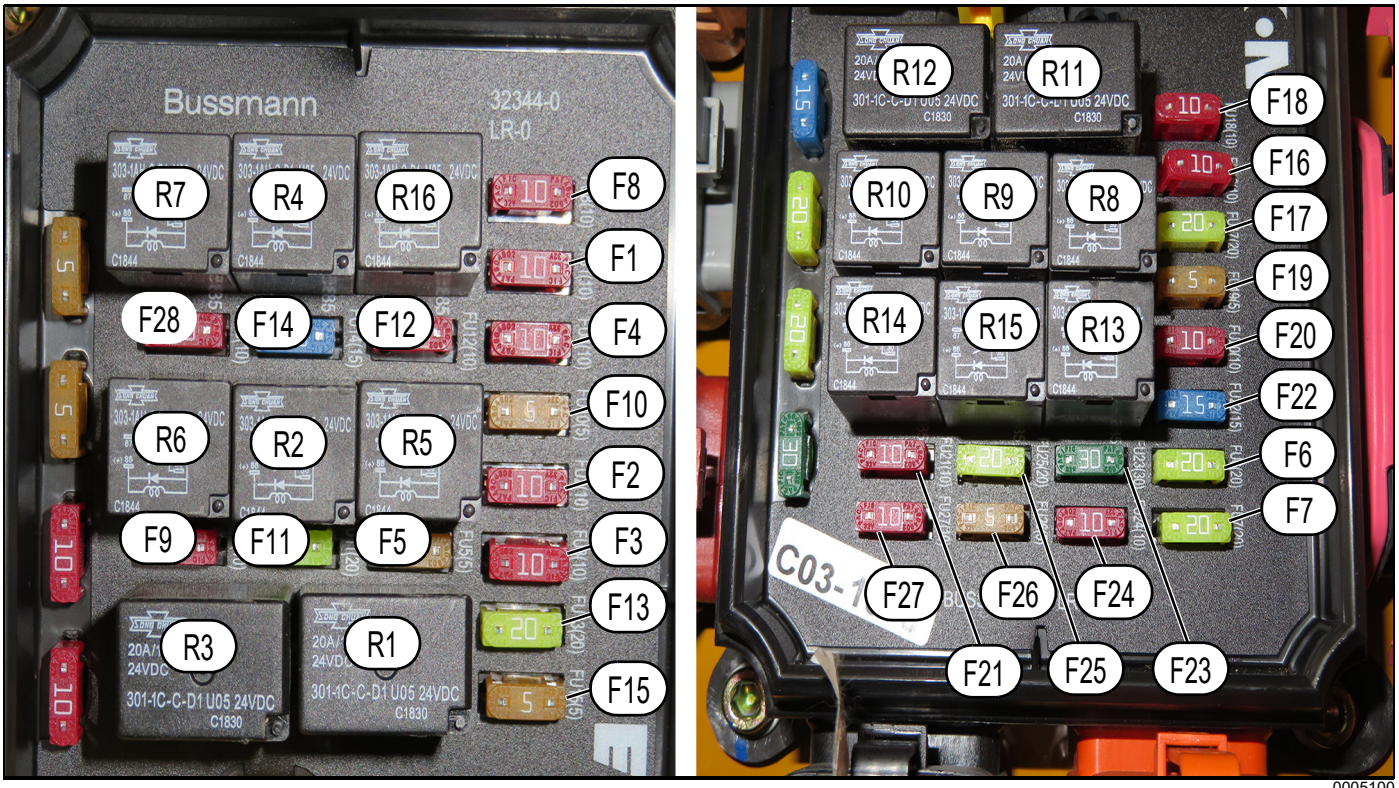
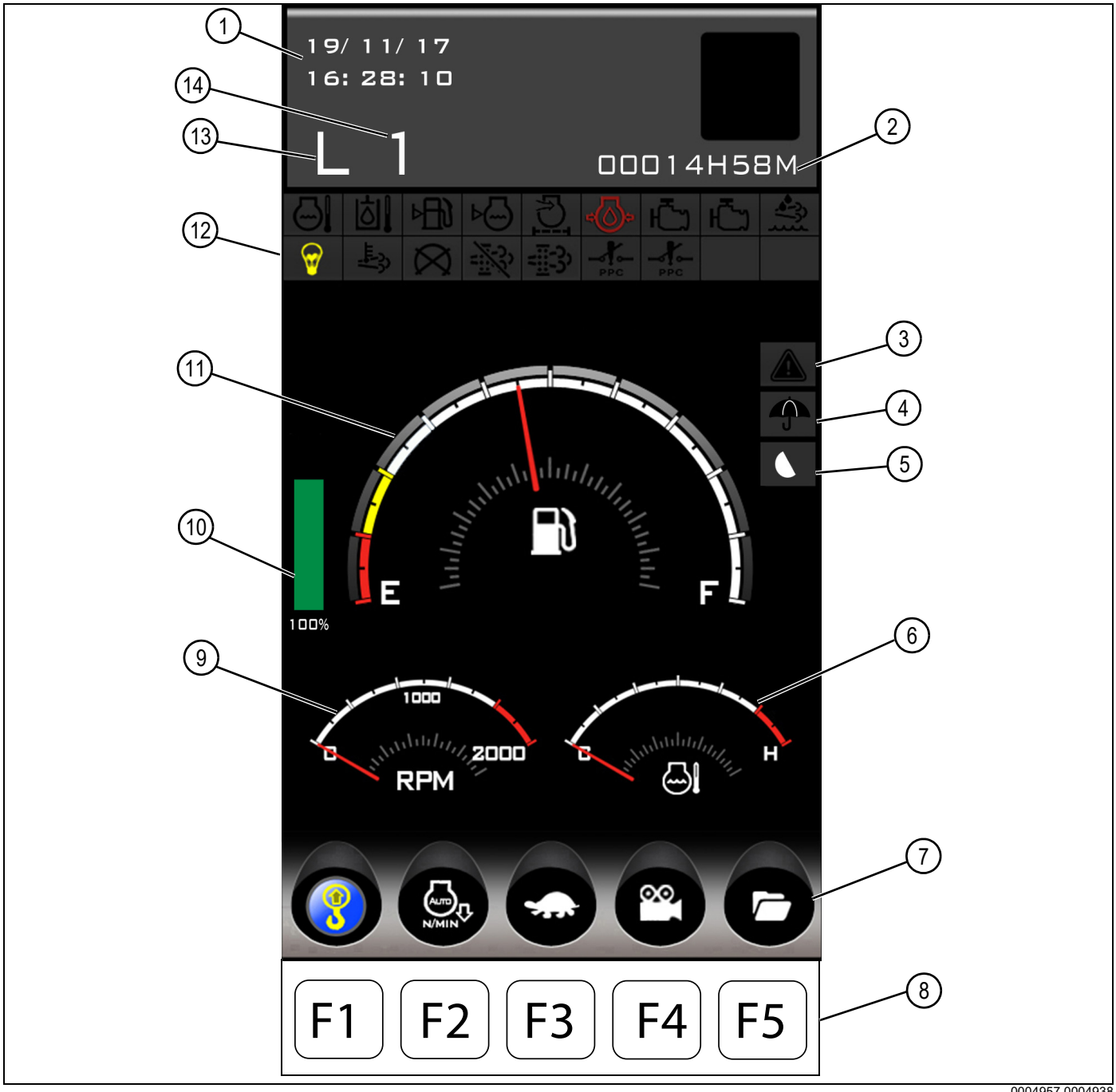


Figure 3-43

Fuses		Relays
F1 – Charging indicator fuse (10A)	F17 – Starter relay (20A)	R1 – Cap lamp relay (24V/20A)
F2 – Monitor (10A)	F18 – Emergency system (10A)	R2 – Travel alarm relay (24V/5A)
F3 – Radio (10A)	F19 – DEF relay coil (5A)	R3 – Work light relay (24V/20A)
F4 – 12V Power (10A)	F20 – DEF relay breaker (10A)	R4 – Pilot valve relay (24V/10A)
F5 – Wiper/washer (5A)	F21 – DEF pump motor (10A)	R5 – Power-off relay (24V/10A)
F6 – A/C (20A)	F22 – DEF heater relay (15A)	R6 – Overload alarm relay (24V/5A)
F7 – HCU power (20A)	F23 – ECU power fuse (30A)	R7 – Horn relay (24V/15A)
F8 – Fuel (10A)	F24 – Not used (10A)	R8 – Alarm lamp relay (24V/10A)
F9 – Power-off delay (10A)	F25 – Starter circuit (20A)	R9 – Starter relay (24V/20A)
F10 – Travel alarm (5A)	F26 – Cab (5A)	R10 – Starter cutoff relay (24V/20A)
F11 – Work light (20A)	F27 – Not used (10A)	R11 – Emergency system 1 relay (24V/10A)
F12 – Pilot valve (10A)	F28 – Not used (10A)	R12 – Emergency system 2 relay (24V/10A)
F13 – Cap lamp (20A)		R13 – DEF sensor relay (24V/10A)
F14 – Horn (15A)		R14 – DEF pump motor relay (24V/10A)
F15 – Overload alarm (5A)		R15 – DEF heater relay (24V/15A)
F16 – Alarm lamp (10A)		R16 – Fuel relay (24V/10A)

Monitor

Home Screen



0004957,0004938

Figure 3-44

1 Date and time
2 Hour meter
3 Fault icon
4 Periodic maintenance prompt
5 Installed equipment (bucket tool shown)
6 Engine coolant temperature gauge
7 Function icons
8 Function buttons
9 Engine speed gauge (tachometer)
10 Diesel exhaust fluid (DEF) level gauge
11 Fuel level gauge
12 System service icons
13 Work mode
14 Throttle control dial setting

When the key switch is in the ON position, the monitor displays the Home screen.

Home Screen Display Icons

Date and Time

This display shows the current date and time (1) numerically and follows the format selected in the System Setting screen.

Hour Meter

The hour meter (2) shows the total number of hours that the machine has been in service.

Fault Icon

The fault icon (3) triangle symbol will illuminate only if an error occurs. To see the specific error code, press function button F5 to access the Main Menu screen, function button F1 to navigate to the Error Codes icon, then function button F3 to confirm that selection.

Periodic Maintenance Prompt

The periodic maintenance prompt (4) umbrella symbol will illuminate only when the next set of scheduled maintenance procedures is required. To see the specific required maintenance, press function button F5 to access the Main Menu screen, function button F1 to navigate to the Maintenance Info icon, then function button F3 to confirm that selection.

Installed Equipment

The installed equipment (5) icon indicates which work tool (bucket, breaker, or shear) is attached as selected in the Tool Select screen.

Engine Coolant Temperature Gauge

The engine coolant temperature gauge (6) indicates the engine coolant temperature:

- Needle in white area = normal operating temperature range.
- Needle in red area = coolant operating temperature is too high (212ºF–248ºF [100°C–120°C]). Shut down the machine and perform engine coolant service.

Function Icons

The function icons (7) are used for selecting and programming machine functions. See “Home Screen Function Icons and Buttons” on page 3-27.

Function Buttons

The function buttons (8) are used for selecting and programming machine functions. See “Home Screen Function Icons and Buttons” on page 3-27.

Engine Speed Gauge (Tachometer)

The engine speed gauge (tachometer) (9) indicates the revolutions per minute (rpm) that the engine is producing, with 0 rpm (engine off) at the left and 2000 rpm at the right.

Diesel Exhaust Fluid (DEF) Level Gauge

The diesel exhaust fluid (DEF) level gauge (10) icon provides visual and numeric indications of the diesel exhaust fluid (DEF) level in the DEF tank. A solid bar displays 100% when the DEF tank is full. The bar lowers and the number decreases as the DEF level lowers.

Fuel Level Gauge

The fuel level gauge (11) indicates the level of diesel fuel in the fuel tank.

System Service Icons

The system service icons (12) illuminate as needed to signal that a specific system requires attention. Yellow indicates that service should be obtained as soon as possible, and red indicates that the machine should be shut down and serviced immediately.

Work Mode

Work mode (13) is a single-letter icon which is a visual indication on the Home screen of how much power is being delivered. There are four different work modes:

- Heavy duty (H) – indicated on the throttle control dial reading as 10-11.
- Standard duty (S) – indicated on the throttle control dial reading as 6-9.
- Light duty (L) – indicated on the throttle control dial reading as 1-5.

Throttle Control Dial Setting

The throttle control dial (14) is a numeric indicator of the current engine speed. The range is from 1 to 11.

System Service Icons

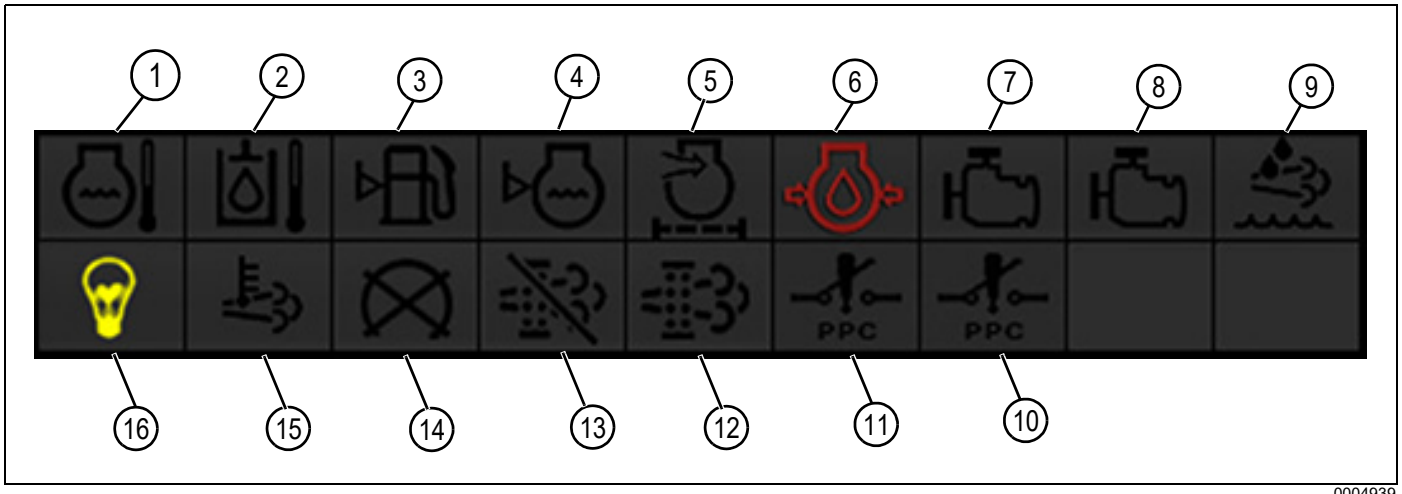


Figure 3-45

1 High engine coolant temperature
2 High hydraulic oil temperature
3 Low fuel level
4 Low engine coolant level
5 Blocked air filter
6 Low engine oil pressure
7 Stop engine
8 Check engine
9 Diesel exhaust fluid (DEF) alarm
10 Not used
11 Not used
12 Exhaust system regeneration
13 Exhaust system regeneration disable
14 Wait to start engine
15 High exhaust system temperature (HEST)
16 Battery charging

Home Screen Function Icons and Buttons

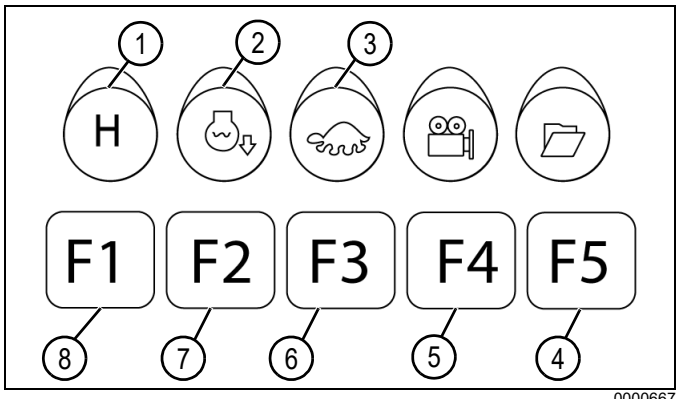


Figure 3-46

1. Press function button F1 (8) to cycle through the five work modes until the desired mode is displayed (1). See “Work Mode” on page 3-26.
2. Press function button F2 (7) to enable or disable auto-idle.

NOTE: *The icon (2) illuminates red when this function is disabled.*

3. Press function button F3 (6) to choose between slow travel speed mode (turtle shown) (3) or fast travel speed mode (rabbit).

NOTES:

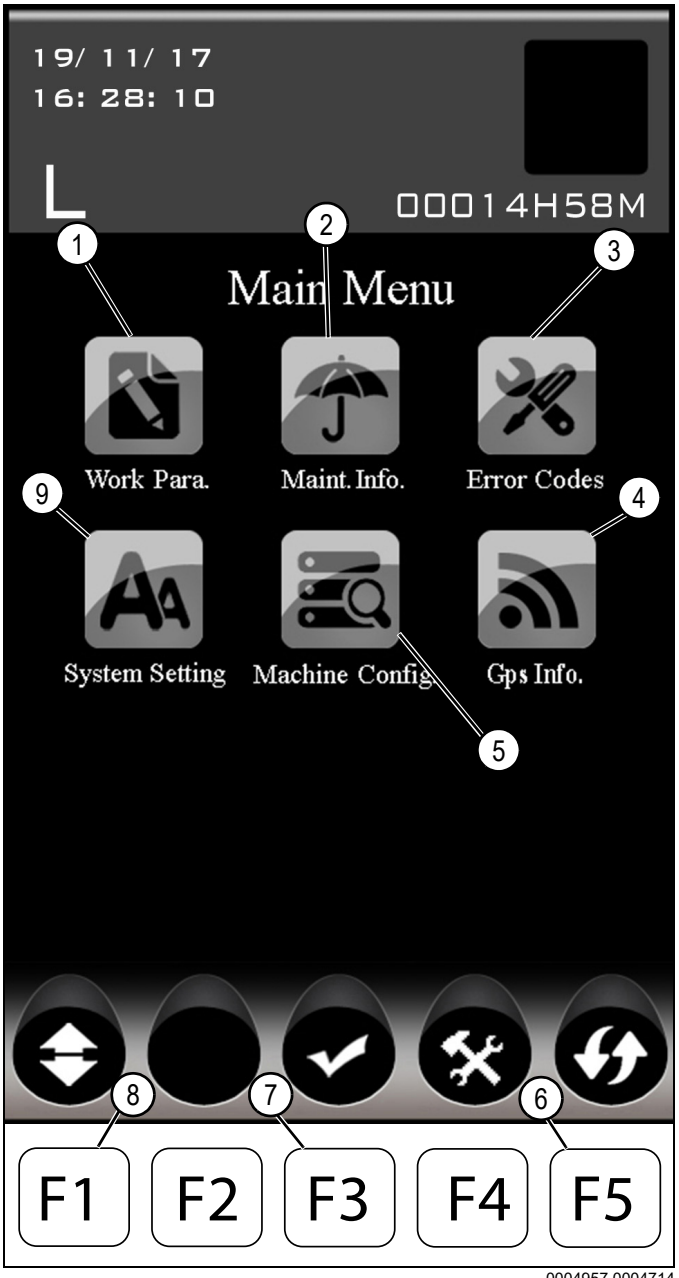
- Use the turtle mode when more power but less travel speed is required.
- Use the rabbit mode when more travel speed but less power is required.

4. Press function button F4 (5) to activate or deactivate the backup camera.

NOTE: *The icon illuminates red when the camera is deactivated.*

5. Press function button F5 (4) to proceed to the Main Menu screen.

Main Menu Screen



0004957,0004714

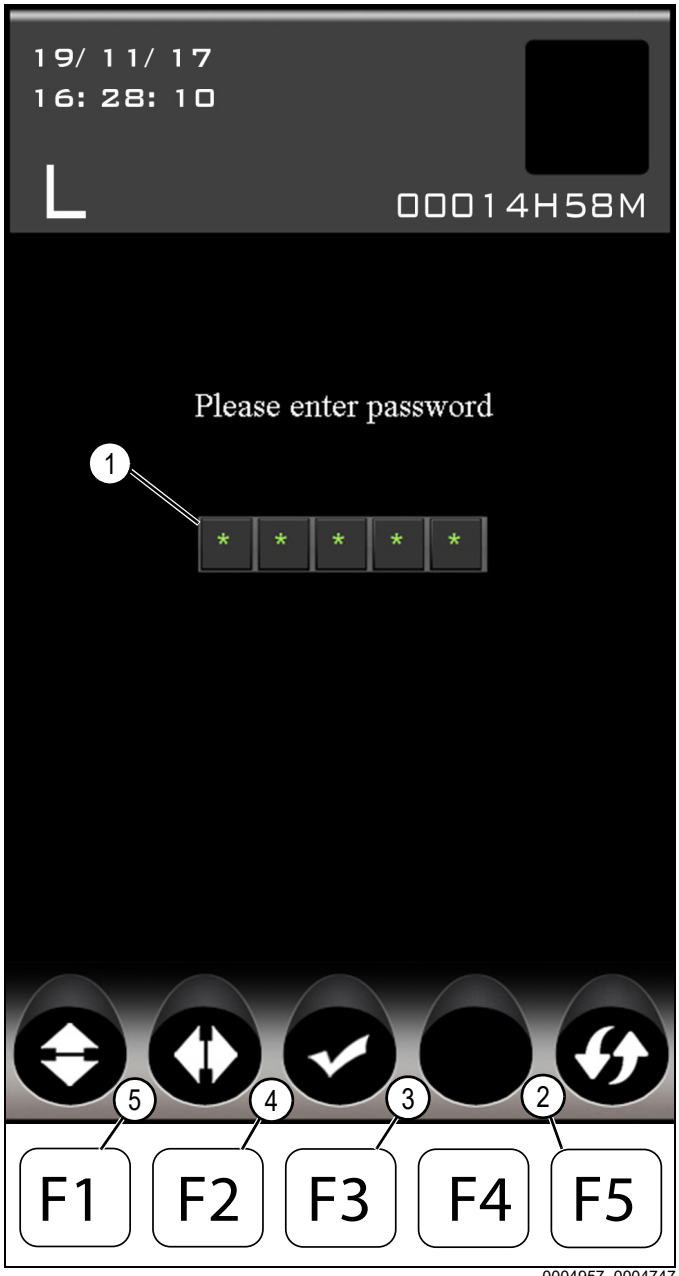
Figure 3-47

NOTE: *The Main Menu screen displays icons for the various options that can be accessed via the function icons and function buttons at the bottom of the screen. Each icon is highlighted when selected.*

1. Press function button F5 (6) on the Home screen to access this screen.
   - Work Parameters (1) (password required) – displays running parameters of the engine and hydraulic system. See “Password Screen” on page 3-29.
   - Maintenance Information (2) – viewable only when maintenance is required. See “Maintenance Information Screen” on page 3-29.
   - Error Codes (3) – displays specific codes if a fault condition occurs. See “Error Codes Screen” on page 3-31.
   - System Setting (9) – allows for language, units of measure, time, and date selection. See “System Setting Menu Screen” on page 3-32.
   - Machine Configuration (5) (for factory use only).
   - Global Positioning System (GPS) Information (4) – displays location, velocity, and time.
2. Press function button F1 (8) to navigate to the desired icon.
3. Press function button F3 (7) to confirm your selection and proceed to the next screen.
4. Press function button F5 (6) to return to the Home screen without selecting any icon.

NOTE: *Function button F4 is for use only by SANY technicians.*

Password Screen



0004957, 0004747

Figure 3-48

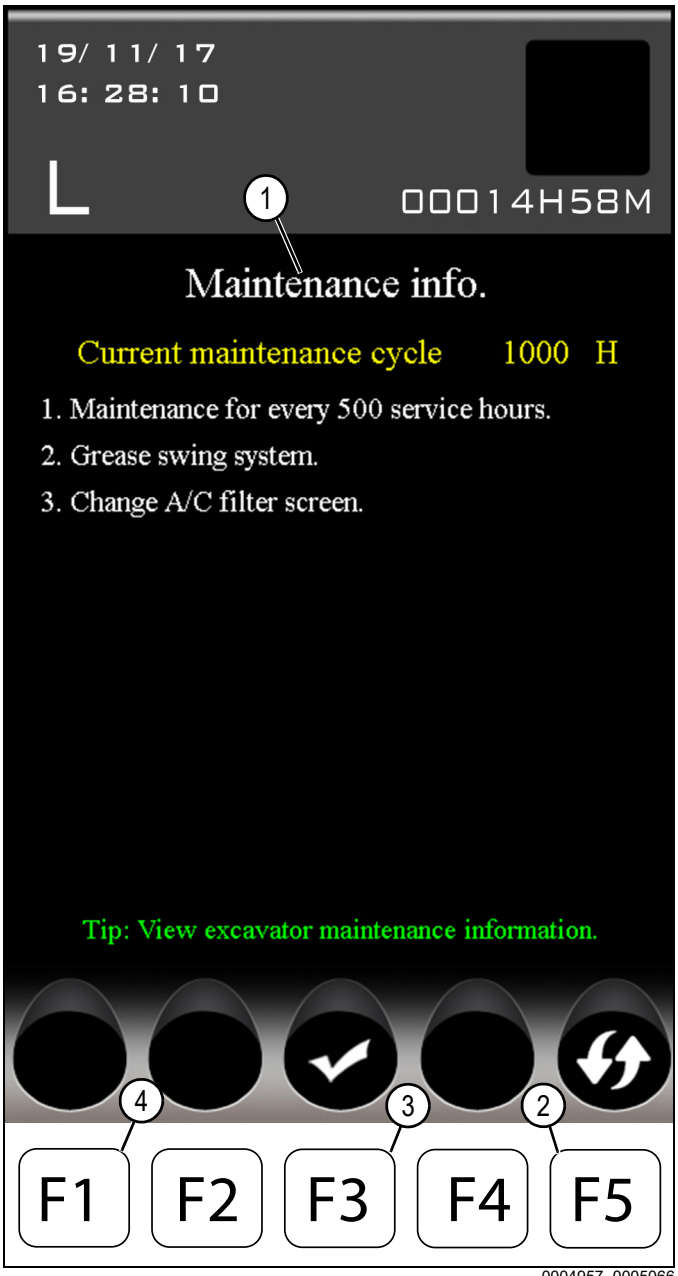
NOTE: *This screen appears whenever the Work Parameters icon is selected on the Main Menu screen.*

1. Enter the five-digit password (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.
2. Press function button F1 (5) to increase the digit.
3. Press function button F2 (4) to move between digits.
4. Press function button F3 (3) after entering the five-digit password.
5. Press function button F5 (2) to return to the Main Menu screen without entering a password.

Work Parameters Screens

These screens are for use by SANY technicians only and require a password.

Maintenance Information Screen



0004957, 0005066

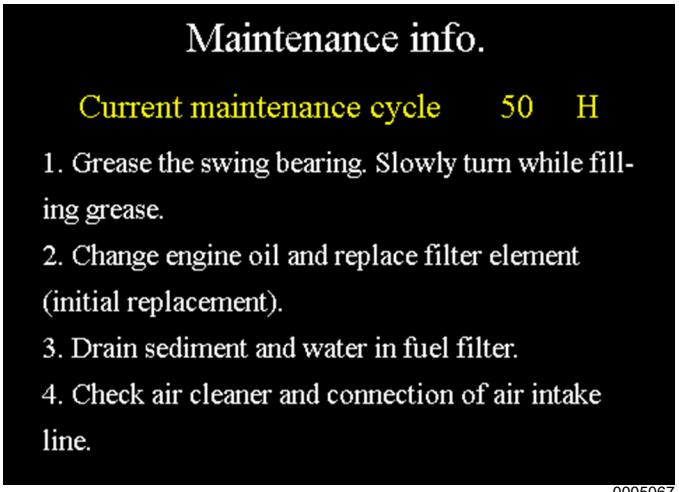
Figure 3-49

NOTE: *Use this screen to view procedures required for your machine when the Periodic Maintenance umbrella icon illuminates on the Home screen.*

1. Press function button F1 (4) once on the Main Menu screen to navigate to the Maintenance Info icon (1).

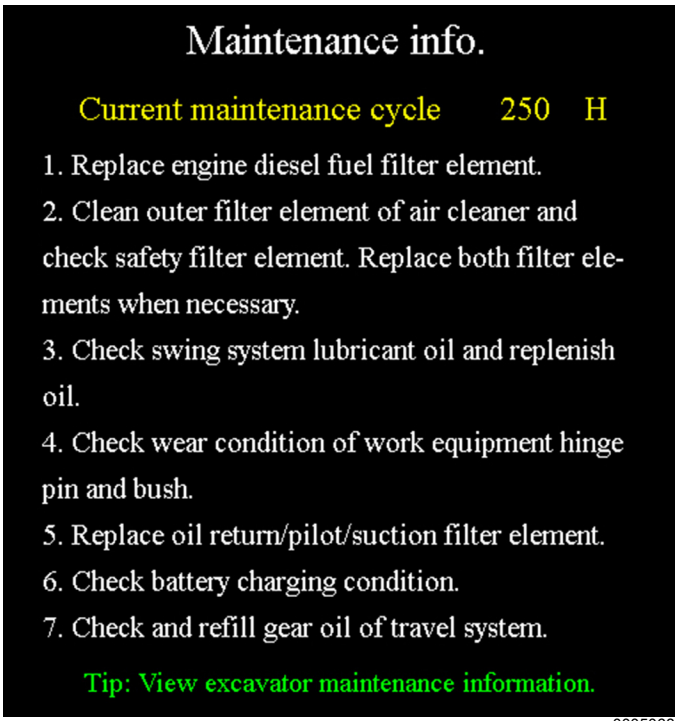
NOTE: *No password is required for this screen.*

2. Press function button F3 (3) to access the Maintenance Information screen.
3. There are a total of five Maintenance Information (info.) screens designed for each interval of recommended maintenance:



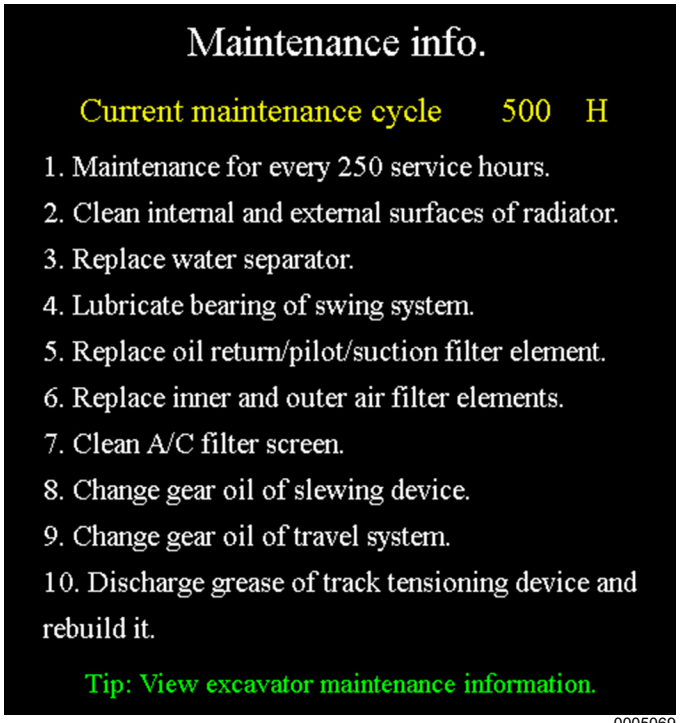
0005067

Figure 3-50: 50 Hours



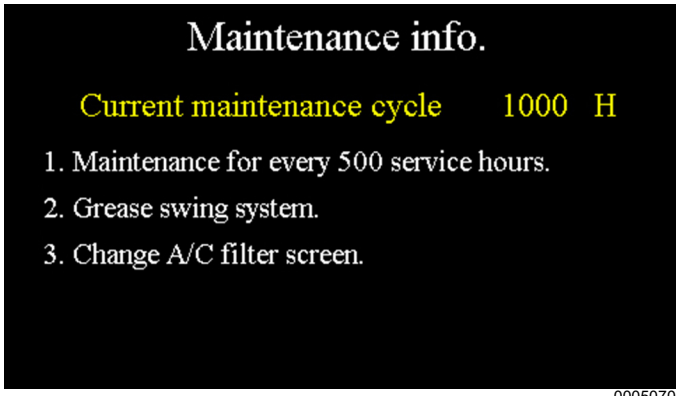
0005068

Figure 3-51: 250 Hours



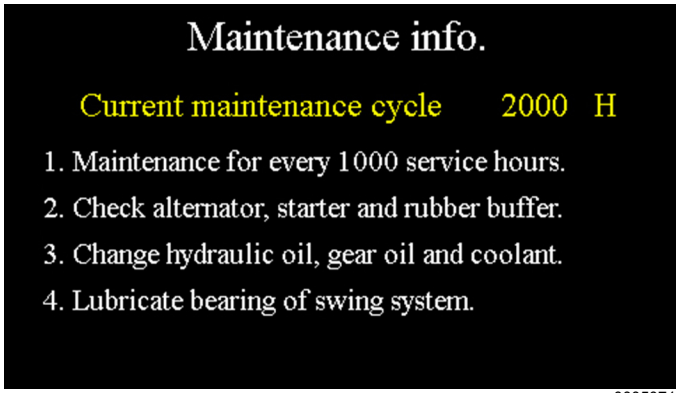
0005069

Figure 3-52: 500 Hours



0005070

Figure 3-53: 10000 Hours



0005071

Figure 3-54: 2000 Hours

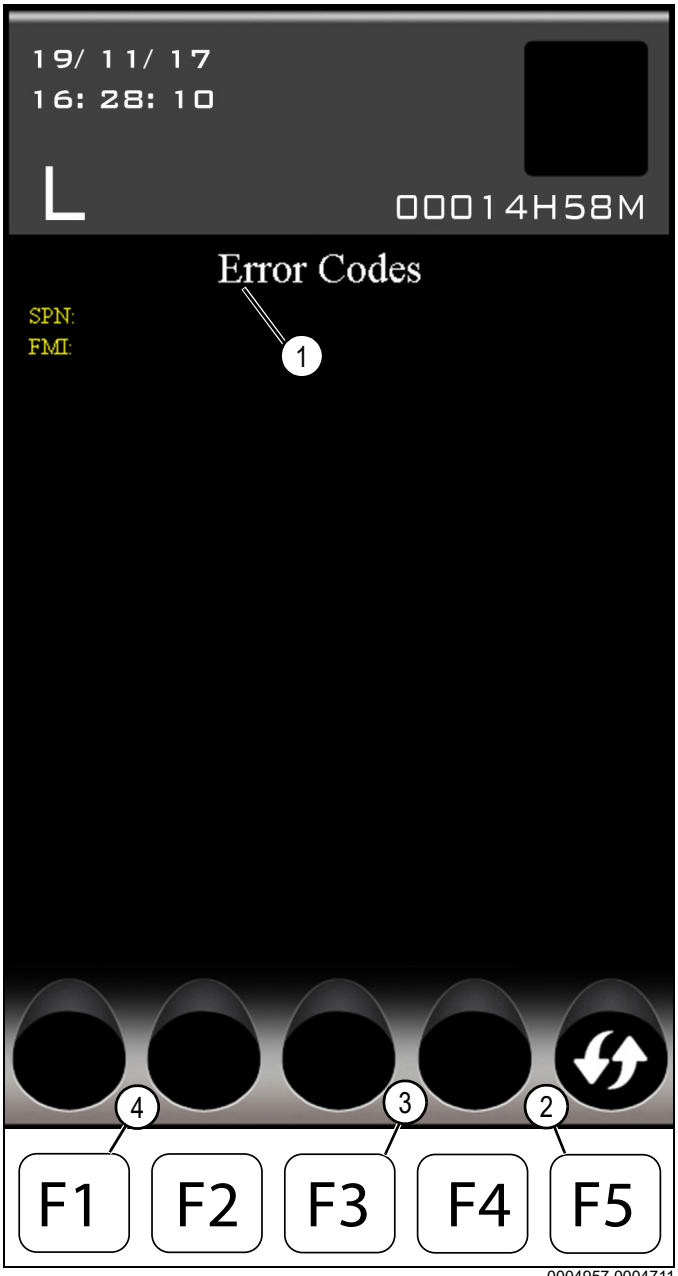
NOTES:

- *No maintenance screen will appear if the umbrella icon is off and if no periodic maintenance is required.*
- *The screen shown is information for a 1000-hour maintenance schedule.*

NOTE: *Consecutive screens will display if extensive periodic maintenance is required.*

4. Press function button F3 (3) on this screen, enter the password after completing the maintenance procedures, then turn the key switch to OFF and back to ON to confirm your selection and to clear the umbrella icon from the Home screen.
5. Press function button F5 (2) to return to the Main Menu screen without making any changes.

Error Codes Screen



0004957,0004711

Figure 3-55

NOTE: *Use this screen to view the specific error code(s) for your machine when the Machine Fault icon illuminates on the Home screen.*

1. Press function button F1 (4) twice on the Main Menu screen to navigate to the Error Codes icon (1).
2. Press function button F3 (3) to see the Error Codes screen showing specific error codes and description(s).

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

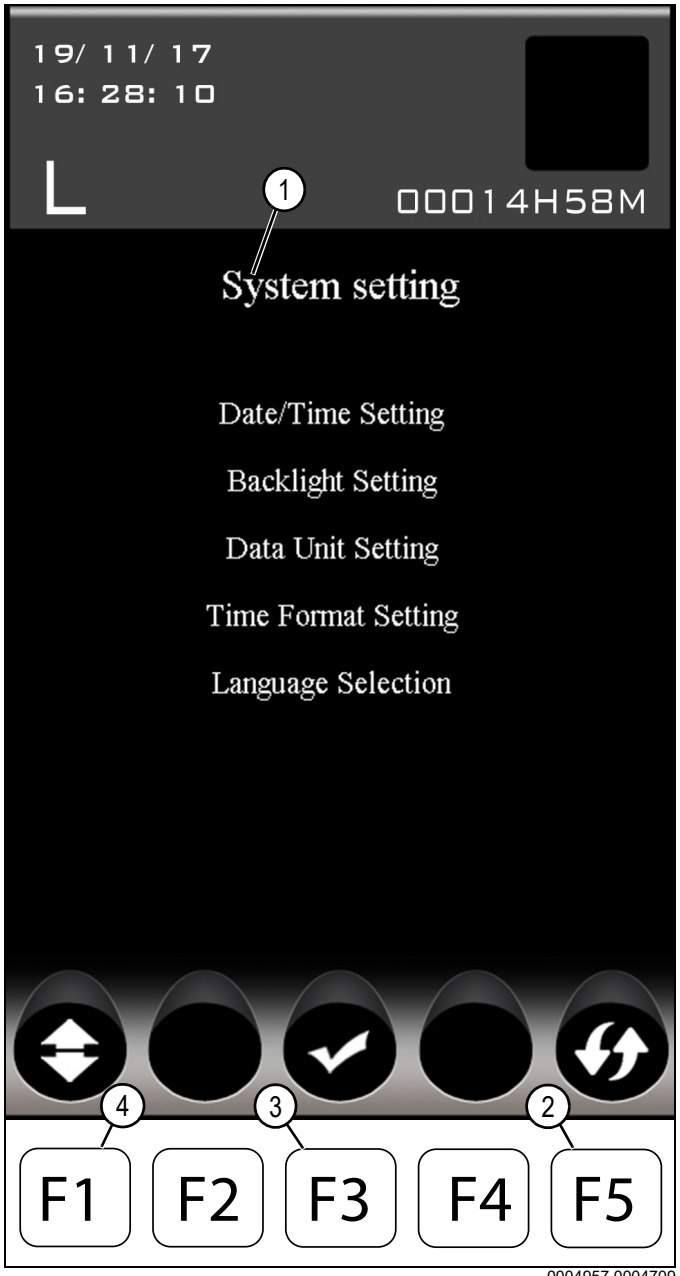
- *No error codes will display if the Machine Fault icon on the Home screen is off.*
- *The display shows an error code for a too-low fuel level.*

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

3. Press function button F5 (2) 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. In the example shown, the error code is removed when fuel is added to the tank.*

System Setting Menu Screen



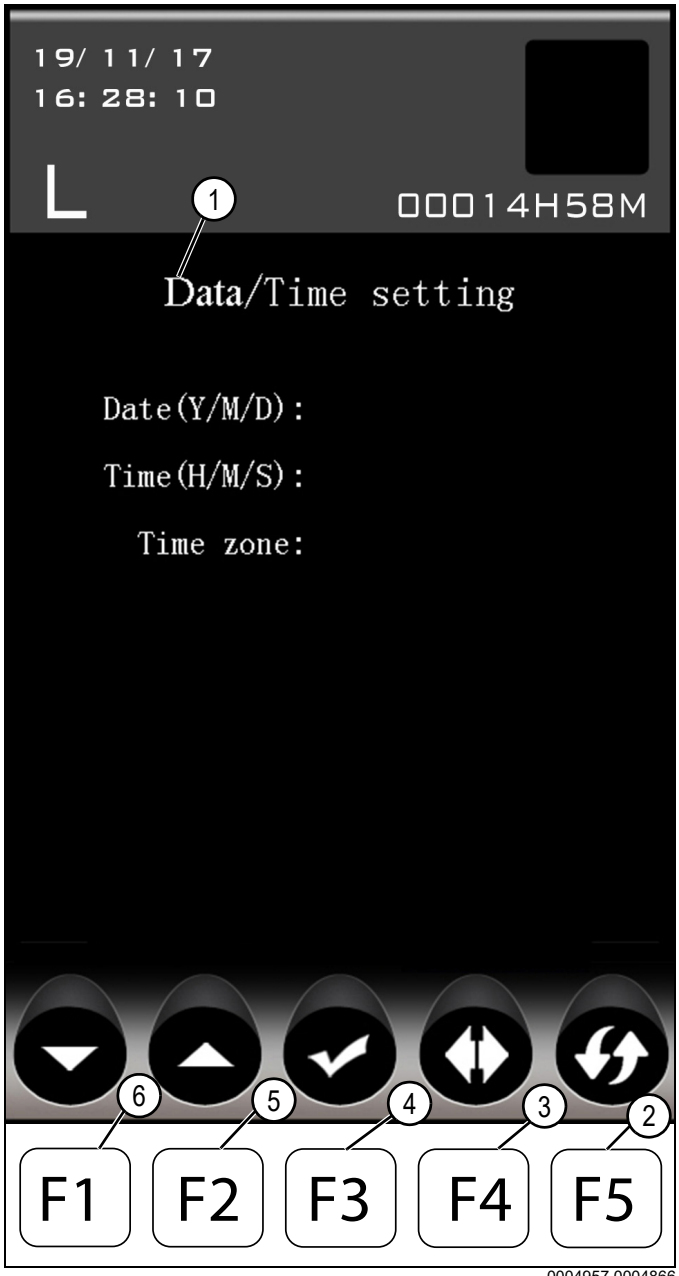
0004957,0004709

Figure 3-56

NOTE: *Use this screen to access other screens to set various parameters.*

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

Date/Time Setting Screen



0004957,0004866

Figure 3-57

1. Proceed to this option from the System Setting screen, then press function button F3 (3).
2. Press function button F1 (1) or F2 (2) to increase or decrease the value in the flashing year parameter.
3. Press function button F4 (4) to advance to the next flashing category (month).

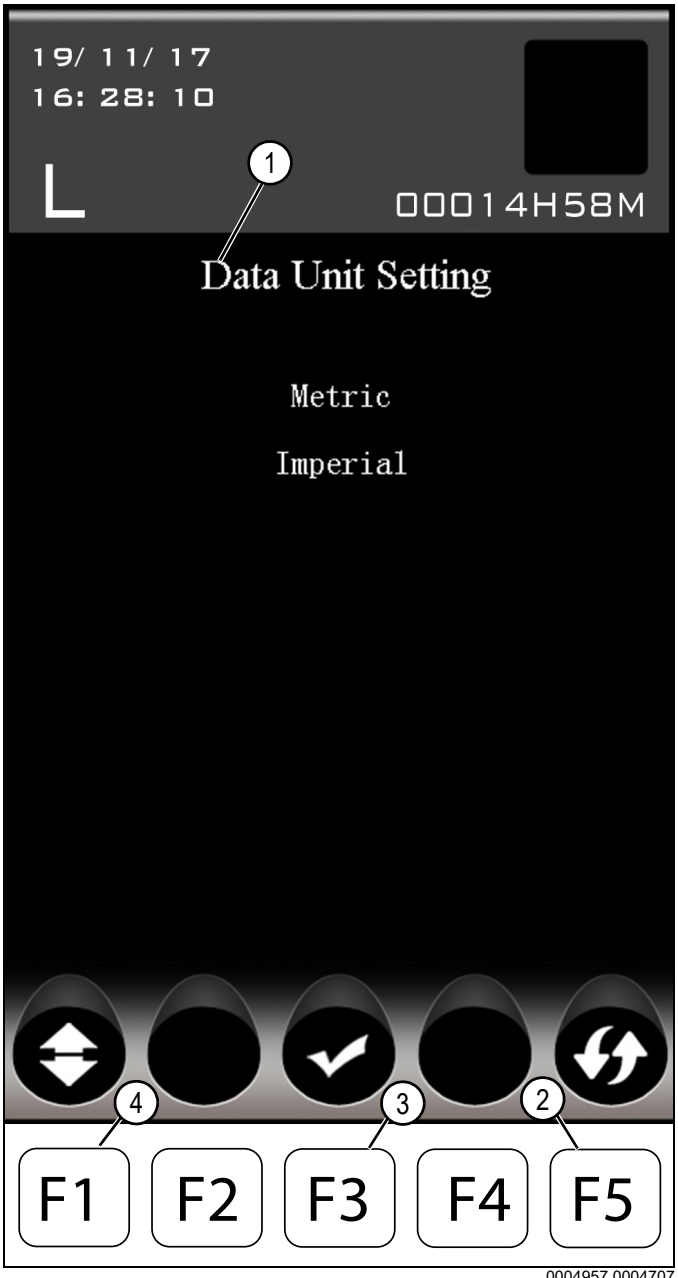
NOTE: *Repeat steps 2 and 3 to set and advance through the remaining categories.*

4. Press function button F3 (3), then turn the key switch to OFF and back to ON to confirm the selection.

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

5. Press function button F5 (5) to return to the System Setting screen without making any changes.

Data Unit Setting Screen



0004957,0004707

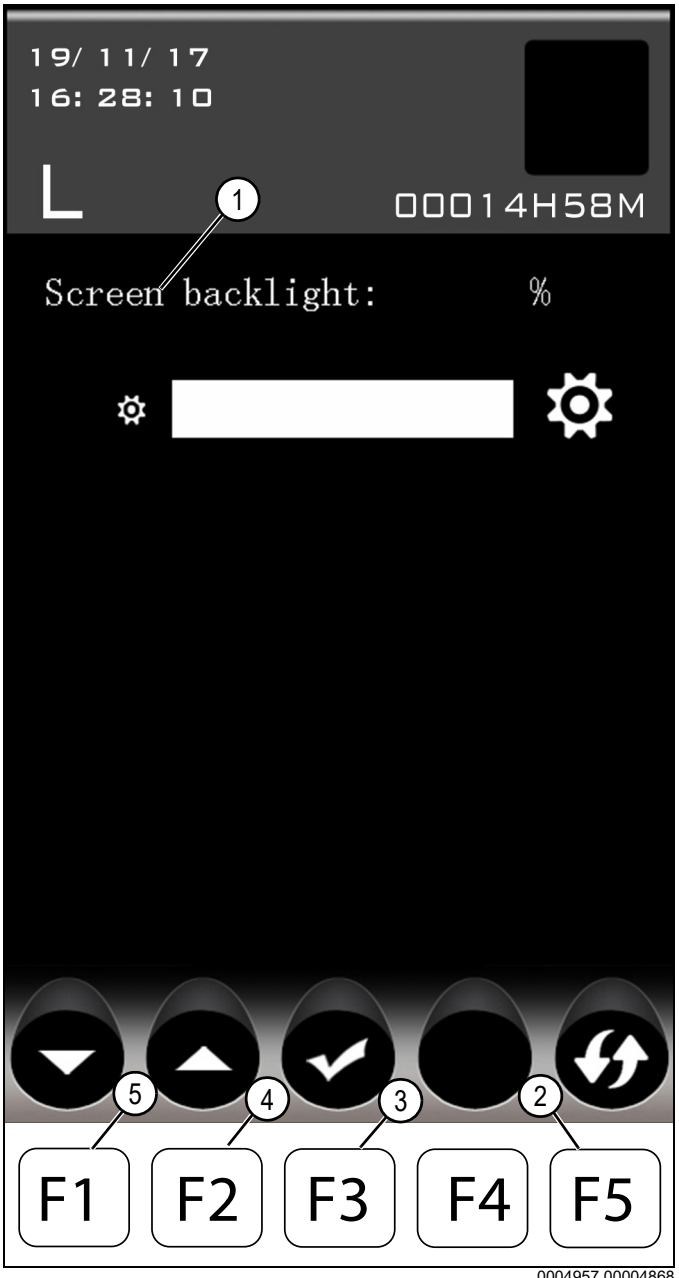
Figure 3-58

NOTE: *Use this screen to select which system of units of measure (metric or Imperial) will be displayed on the monitor. This screen defaults to highlight the metric option even with the Imperial format in effect.*

1. Proceed to the Data Unit Setting icon (1) on the System Setting screen.

2. Press function button F1 (4) to move between the two options.
3. Press function button F3 (3), then turn the key switch to OFF and back to ON to confirm the selection.
4. Press function button F5 (2) to return to the System Setting screen without making any changes.

Screen Backlight Setting



0004957,00004868

Figure 3-59

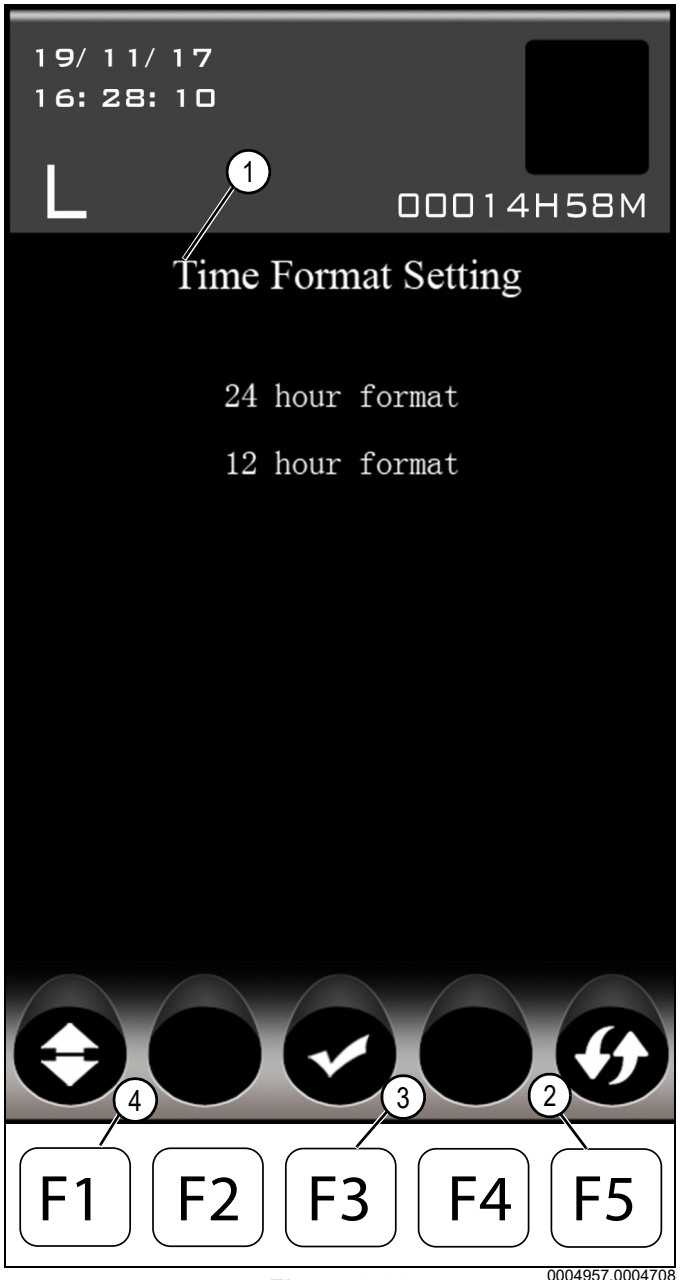
NOTE: *Use this screen to adjust the screen brightness for better readability of the monitor.*

1. Proceed to the Screen Backlight icon (1) on the System Setting screen, then press function button F3 (3).
2. Press function button F1 (5) to increase the screen brightness, or function button F2 (4) to decrease the screen brightness.

NOTES: *The number will change and the progress box will fill and empty to graphically indicate the screen brightness percentage (10% to 100%) as set by the function buttons F1 (5) and F2 (4).*

3. Press function button F3 (3), then turn the key switch to OFF and back to ON to confirm the selection.
4. Press function button F5 (2) to return to the System Setting screen without making any changes.

Time Format Setting Screen



0004957,0004708

Figure 3-60

NOTE: *Use this screen to specify how the current time of day will be displayed.*

1. Proceed to the Time Format icon (1) on the System Setting screen.
2. Press function button F1 (4) to move between the two options.
3. To confirm the selection, press the function button F3 (3), then turn the key switch to OFF and back to ON.
4. Press function button F5 (2) to return to the System Setting screen without making any changes.

NOTE: *This screen defaults to highlight the 24-hour time format option even with the 12-hour time format in effect.*

System Language Setup Screen

0004957,0004791

Figure 3-61

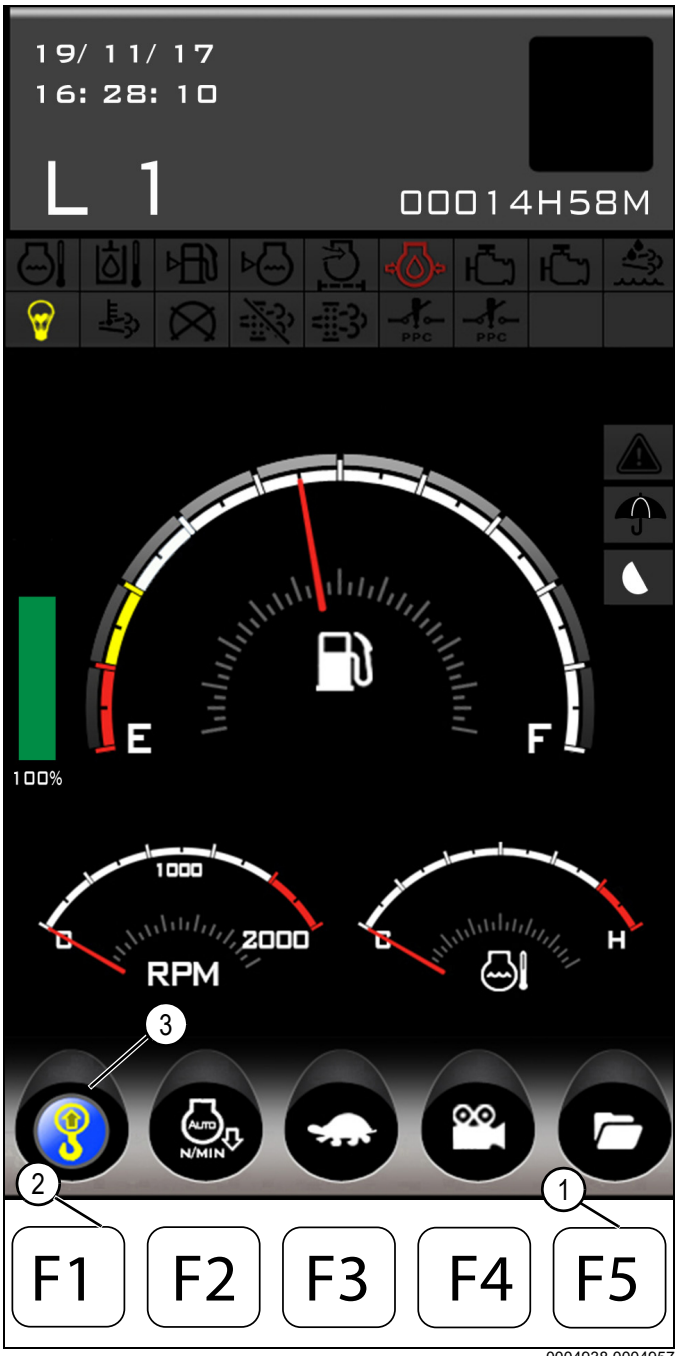
1. Proceed to the System Language Setup icon (1) on the System Setting screen.
2. Press function button F1 (5) or F2 (4) to move up or down through the list to select the desired option.
3. Press function button F3 (3), then turn the key switch to OFF and back to ON to confirm the selection.
4. Press function button F5 (2) to return to the System Setting screen without making any changes.

NOTE: *This screen defaults to highlight the Chinese language option regardless of the language option in effect.*

Machine Configuration Screen

NOTE: *This screen is for use by SANY technicians only and requires a password.*

Tool Select Screen



0004938.0004957

Figure 3-62

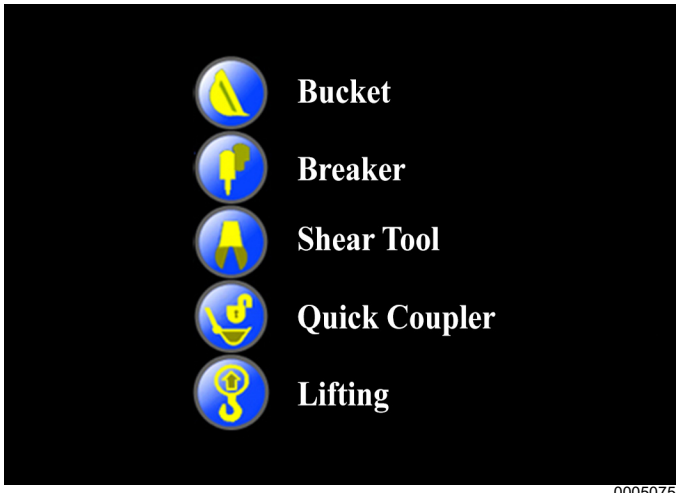
NOTE: *Use the Tools Select screen to specify which tool is attached to the machine (3) (lift shown) and to adjust the hydraulic oil flow for the tool if needed.*

1. Press function buttons F1 (2) to display the desired tool.

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

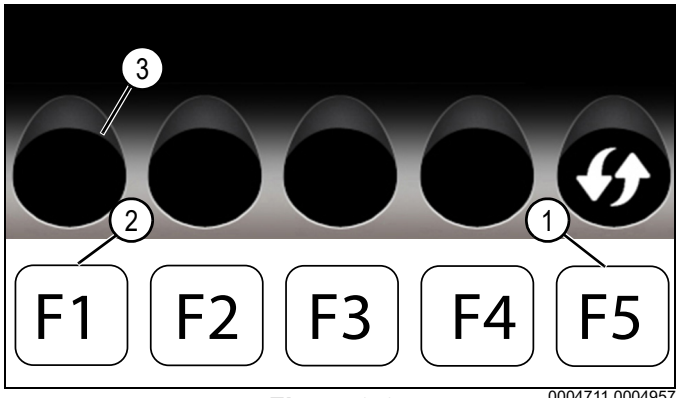
2. Press function button F5 (1) to return to the Main Menu screen without making any changes.

Tool Icons



0005075

Figure 3-63



0004711,0004957

Figure 3-64

1. Select one of five tool icons. See Figure 3-63.

NOTE: *The selected tool icon will illuminate on the Tool Select screen (3). See Figure 3-64.*

2. Press function button F1 (2) to confirm the selection and proceed to the next screen.
3. Press function button F5 (1) to return to the Main Menu screen without making any selection.

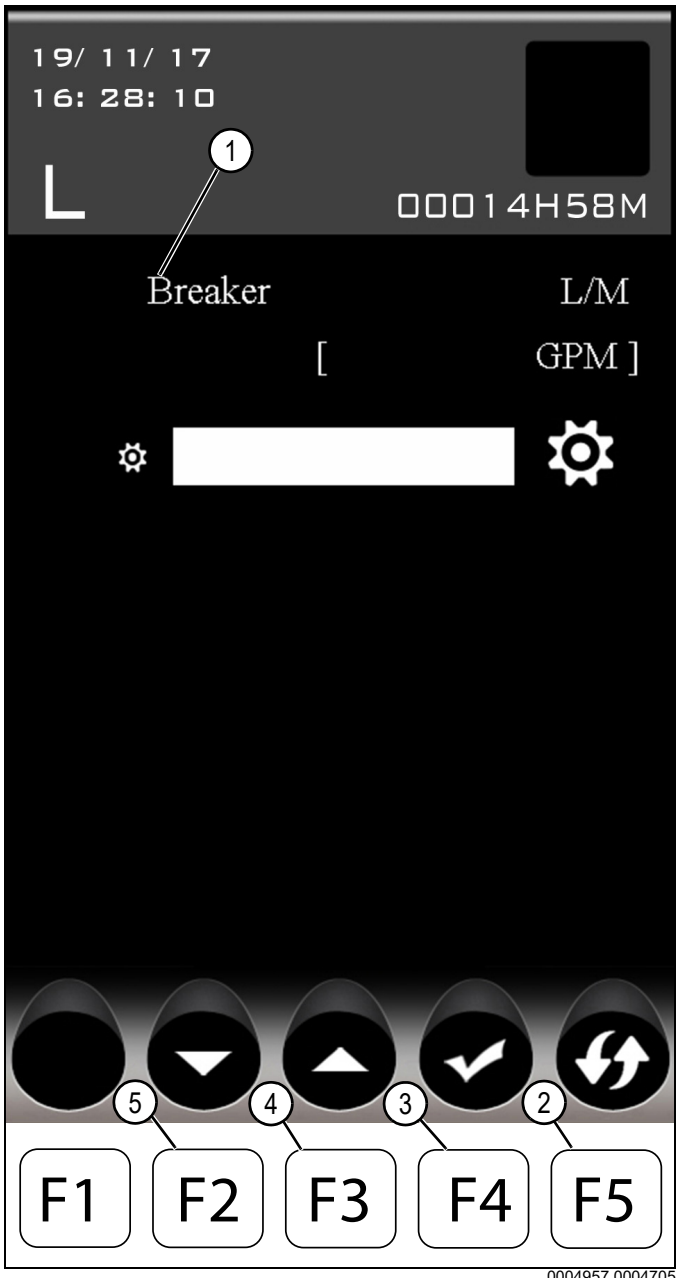
Bucket

1. Select the Bucket option. See Figure 3-63.

NOTE: *The selected tool icon will illuminate on the Tool Select screen (3). See Figure 3-64.*

2. Press function button F1 (2) to confirm the selection and proceed to the next screen.
3. Press function button F5 (1) to return to the Main Menu screen without making any selection.

Breaker



0004957,0004705

Figure 3-65

NOTE: *Use this screen (1) to enable the right joystick rocker switch for the breaker or other one-way flow work tool operation and to adjust the hydraulic oil flow for this tool.*

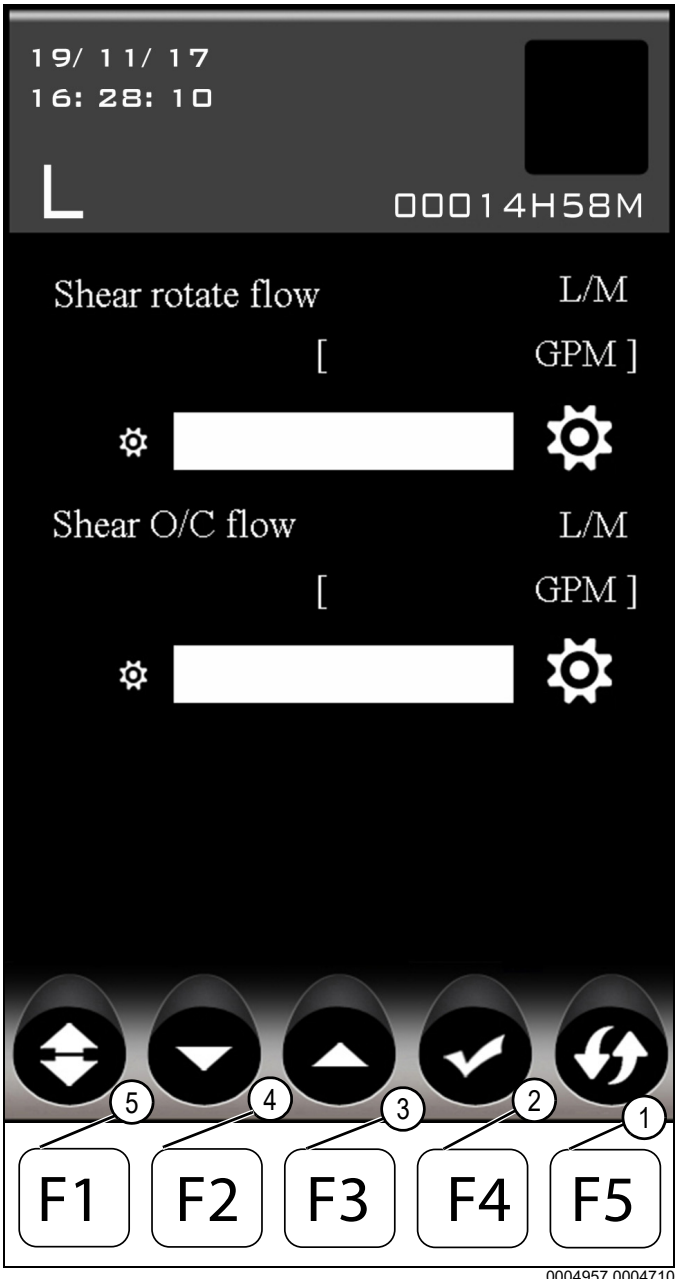
1. Select Breaker option. See “Tool Icons” on page 3-36.
2. Press function button F2 (5) or F3 (4) to increase or decrease the hydraulic oil flow rate as needed.

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

NOTE: *The numerical values for liters per minute (Lpm) and gallons per minute (gpm) will change, and the progress box will fill or empty to indicate the chosen hydraulic oil flow rate.*

3. Press function button F4 (3), then turn the key switch to OFF and back to ON to enable the rocker switch on the right joystick for one-way flow work tool operation. Confirm the hydraulic oil flow rate. The Breaker icon will be displayed on the Tool Select screen. See “Tool Select Screen” on page 3-36.
4. Press function button F5 (2) to return to the Tool Select screen without making any changes.

Shear Tool



0004957,0004710

Figure 3-66

1. Select Shear option. See “Tool Icons” on page 3-36.

NOTE: *Use this screen to enable the joystick switches for shear or other two-way flow tool operation and to adjust the hydraulic oil flow rate for this tool.*

2. Press function button F1 (5) or F2 (4) to change the hydraulic oil flow rate for rotation of this tool.

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

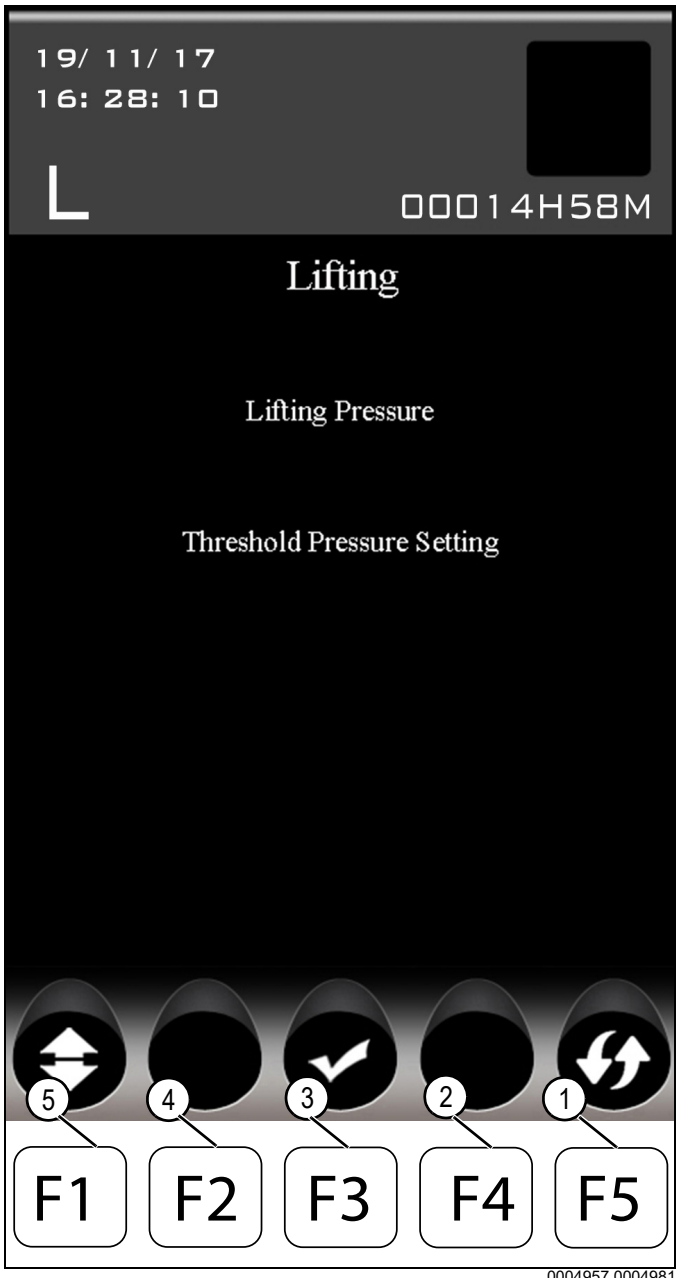
3. Press function button F4 (2) to move to the open/close hydraulic oil flow rate adjustment for this tool.
4. Press function button F1 (5) or F2 (4) to change the hydraulic oil flow rate for open/close action of this tool.

NOTES:

- *The available range is 0 gpm to 132 gpm (0 Lpm to 500 Lpm).*
- *The numerical values for gpm and Lpm will change, and the progress box will fill or empty to indicate the chosen hydraulic oil flow rate.*

5. Press function button F3 (3), then turn the key switch to OFF and back to ON to enable the joystick switches for two-way flow tool operation. Confirm the hydraulic oil flow rates. The Shear icon will appear on the Tool Select screen.
6. Press function button F5 (1) to return to the Tool Select screen without making any changes.

Lifting Tool



0004957,0004981

Figure 3-67

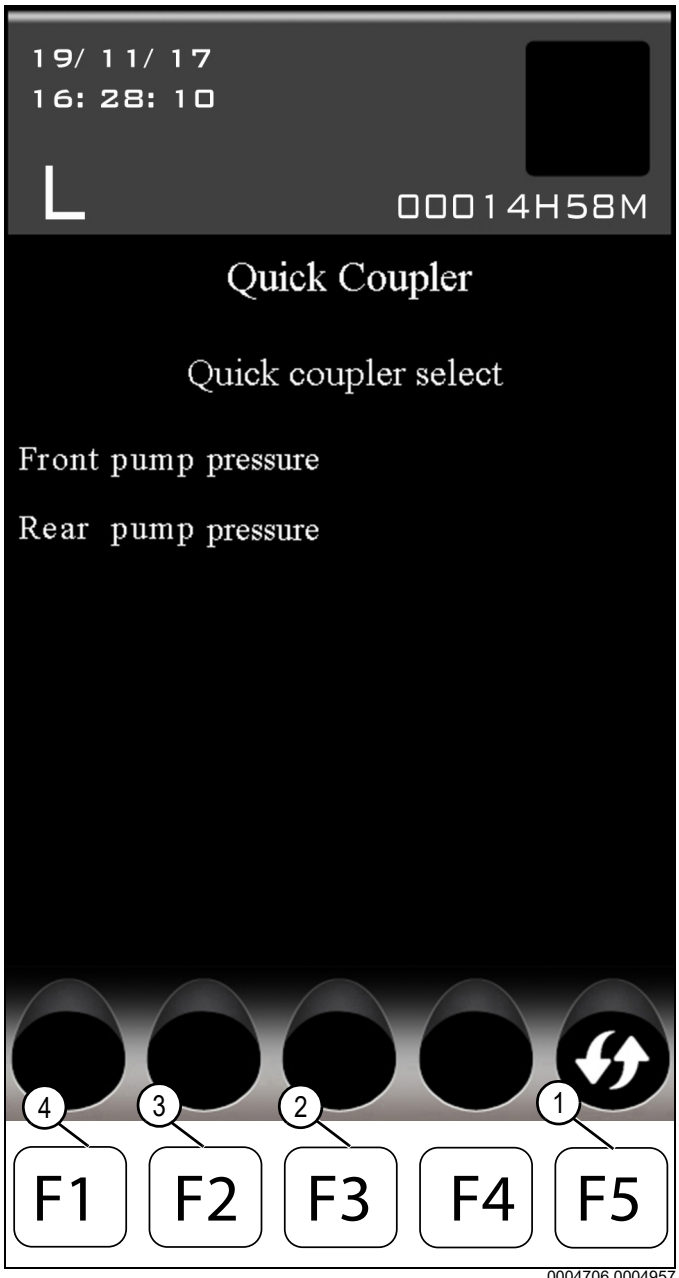
1. Select Lifting option. See “Tool Icons” on page 3-36.
2. Press function button F1 (5).
3. Adjust threshold pressure by using the function button F1 (5).
4. Press function button F3 (3) to confirm selection.

The available range is 0 gpm to 53 gpm (0 Lpm to 200 Lpm).

NOTE: *The numerical values for gpm and Lpm will change, and the progress box will fill or empty to graphically indicate the selected hydraulic oil flow rate.*

5. Press function button F4 (2), then turn the key switch to OFF and back to ON to confirm selection.
6. Press function button F5 (1) to return to the Tool Select screen without making any changes.

Quick Coupler Tool



0004706,0004957

Figure 3-68

1. Select Quick Coupler option. See “Tool Icons” on page 3-36.

NOTE: *Use this screen to display the hydraulic oil pressures for this device and to operate the quick coupler for work tool attachment and removal.*

2. Press function button F2 (3) to activate the quick coupler function.
3. Press function button F1 (4) to unlock the quick coupler to allow removal of the work tool.
4. Press function button F3 (2) to lock the quick coupler (secures the work tool in place).
5. Press function button F2 (2) to deactivate the quick coupler function.
6. Press function button F5 (1) to return to the Tools Select screen without making any changes.

Page Intentionally Blank

Chapter 4

Machine Operation

Work Area

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

WARNING

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

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

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

General Job Safety

See “Maintenance Safety” on page 2-4.

Operator Responsibilities

The machine operator must perform the following:

- Reject the work site if there are doubts regarding safety.
- Become familiar with the work area and surroundings before beginning work.
- Read and completely understand the instructions in this manual prior to operation.
- Know and obey the operating procedures, applicable laws, and regulations.
- Know and follow the requirements for safe operation.
- Know and use the required safety precautions and protective devices.
- Know basic information about the systems of the machine.
- Know and use the correct hand signals that will be used 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 control devices are set to the neutral position and that the engine is shut down.
- Give warning signals when necessary.

Seat Belt Usage

Always wear the seat belt when operating the machine. See “Seat and Seat Belt” on page 3-5.

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 that this Operation and Maintenance Manual remains in the cab and is available to the operator at all times.

Daily Maintenance Record Check

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

See “Maintenance Log” on page 1-2, and “Daily Maintenance and Inspection” on page 5-10.

Cleaning the Machine

0000453

Figure 4-1

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

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

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

NOTE: Left steps are shown, right steps are similar.

- Mirrors (2)

Cleaning the Cab Interior

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

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

Check that the escape tool and fire extinguisher are present. See “Check the Fire Extinguisher” on page 5-58 and “Check the Escape Tool” on page 5-58.

New Machine Break-in

This machine has been thoroughly tested and adjusted before shipment. However, initial operation of the machine under severe conditions can adversely affect its performance or shorten its life. SANY recommends a break-in period of 100 service hours for a new machine.

To properly break in a new machine is crucial for long service life by allowing time for internal engine parts to wear in properly. Make sure that the machine is in a normal working condition before proceeding with the break-in.

Contact a SANY dealer for details to properly break in the engine.

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

- Operate as much as possible in the 1/2 to 3/4 throttle or load range.
- Keep the engine speed at or near low idle until the engine reaches its normal operating temperature.
- Avoid long periods of operation with the engine at idle or at continuous maximum horsepower levels.
- Avoid sudden starts, movements, or stops.
- Manage engine power to allow acceleration to the governed speed when conditions require more power. Do not over-rev the engine.
- Monitor the instruments frequently, especially the engine oil and coolant temperatures. Shut down the machine at the first indication of an abnormal reading.
- Check all components frequently for proper operation, unusual noises, and excessive heating.
- Always allow the engine to cool down before shutting off the engine.
- Frequently check the fasteners for tightness.

When the engine break-in period has been completed, check the following:

- “Clean and Check the Upper Structure and Undercarriage” on page 5-60.
- “Check the Track Tension” on page 5-51.

Prestart Checks and Adjustments

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

- Check the Maintenance Log to verify that all required maintenance checks have been performed before operating the machine.
- Check the machine for loose fasteners, fluid leaks, and any other signs of damage or wear. 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, and fluid leaks. Make repairs as necessary.
- Check the bucket or optional equipment for damage. Clean and check the mirrors for damage. Repair if necessary.
- Check the gauges and the monitor in the cab. Contact a SANY dealer to replace or repair any malfunctioning parts or components.

Electrical Components Check

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. Contact a SANY dealer for more information. Failure to follow this notice could damage the machine or cause it to operate improperly.

- Check the fuse panel for blown fuses, fuses of incorrect amperage, open or short circuits, and loose connections. Replace blown fuses and fuses of incorrect amperage rating, and repair loose connections as necessary. See “Fuses and Relays” on page 3-23.
- Make sure the battery cables and wires are clean and in good condition when inspecting the battery, starting motor, and alternator. See “Check the Batteries” on page 5-43.
- Clean the area around the battery of combustible materials.

For additional information about troubleshooting faults in the electrical system, contact a SANY dealer.

Check the following electrical components:

- Monitor operation.
- Blown or loose fuses.
- Make sure the fuses have the proper amperage rating for each circuit.
- Make sure the battery terminal connectors are clean, secure, and free of dirt and debris.
- Inspect the electrical wires and cables for worn or damaged insulation.
- Make sure the vents on top of the batteries are free of any dirt or debris.
- Rear camera operation (if equipped).
- Proper windshield wiper and windshield washer operation.

Lights and Warning Devices

With the key switch ON, check the following for proper operation:

- Horn
- Headlight
- Work lights
- Radio
- Travel alarm and beacon light

Access Doors, Panels, and Covers

Cab Door

Opening the Cab Door

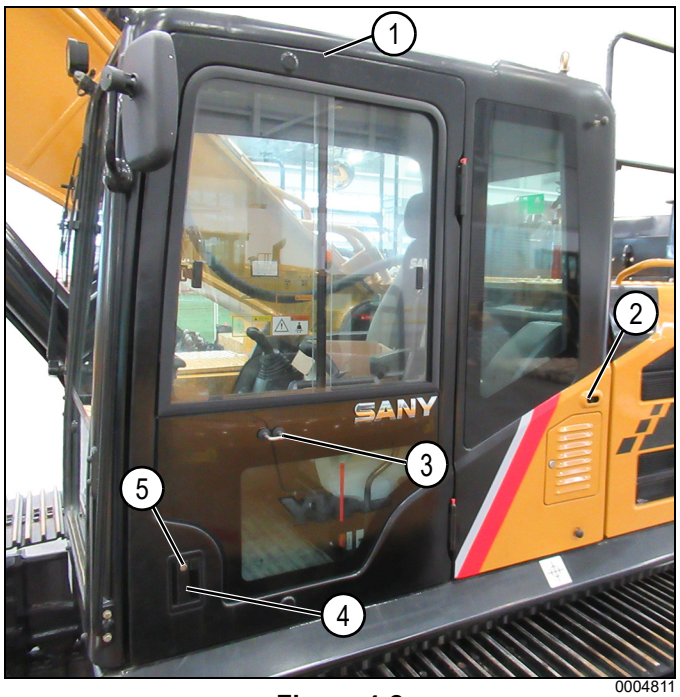
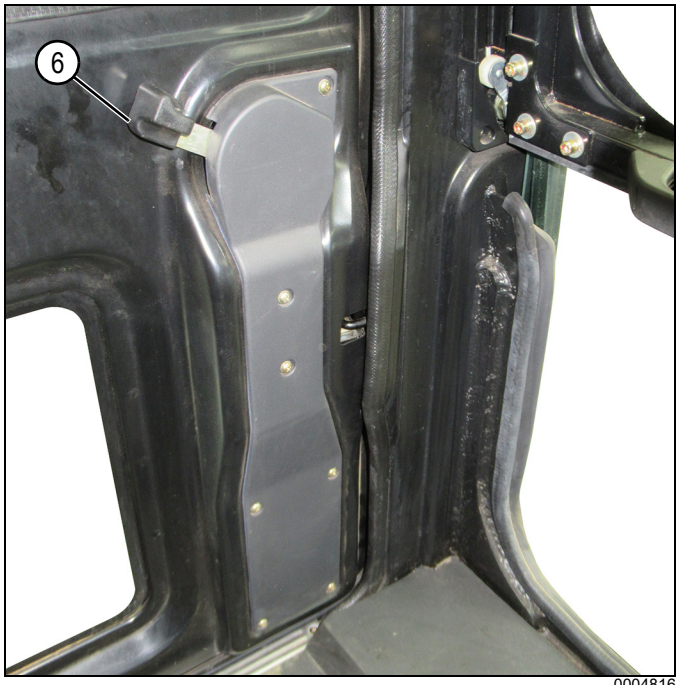


Figure 4-2

The cab door (1) can be locked from the outside when closed, using the cab door lock (5).

To open the cab door (1) from the outside, unlock and pull the handle (4). Swing the cab door open until the door catch (3) engages the cab door latch (2), securing it in the opened position.

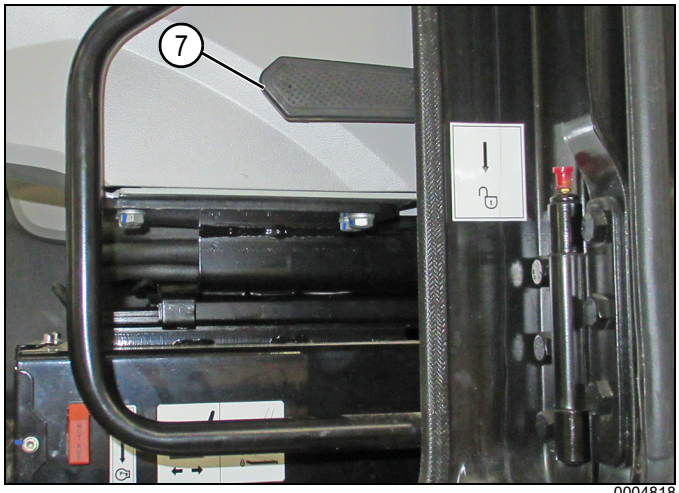


0004816

Figure 4-3

From inside the cab, press down on the cab door release lever (6) to open the cab door. Swing the cab door fully until the catch (3) engages the cab door latch (2).

Closing the Cab Door

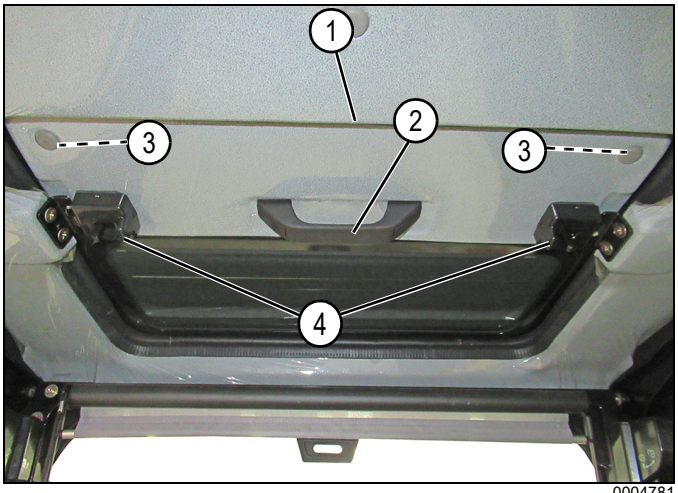


0004818

Figure 4-4

To release the door from the opened position, push down on the release lever (7) and close the door securely.

Emergency Escape Hatch



0004781

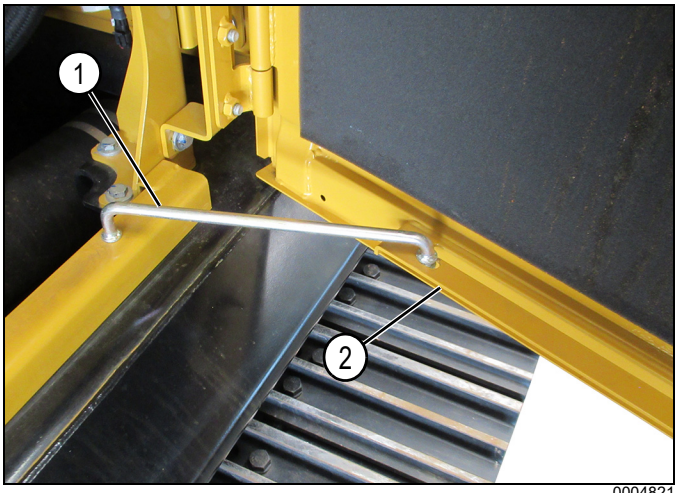
Figure 4-5

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 (4) and push up. The emergency escape hatch is supported in the open position by two pneumatic cylinders (3).

To close the emergency escape hatch, pull the handle (2) until right and left latches lock into place.

Access Door Support Rod



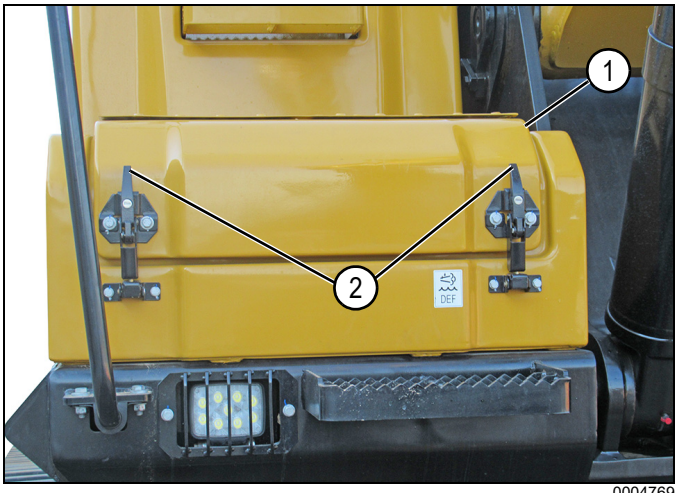
0004821

Figure 4-6

The access 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 the door in the open position.

NOTE: *Move the support rod out of the support bracket slot to close the access door.*

Right Front Access Door

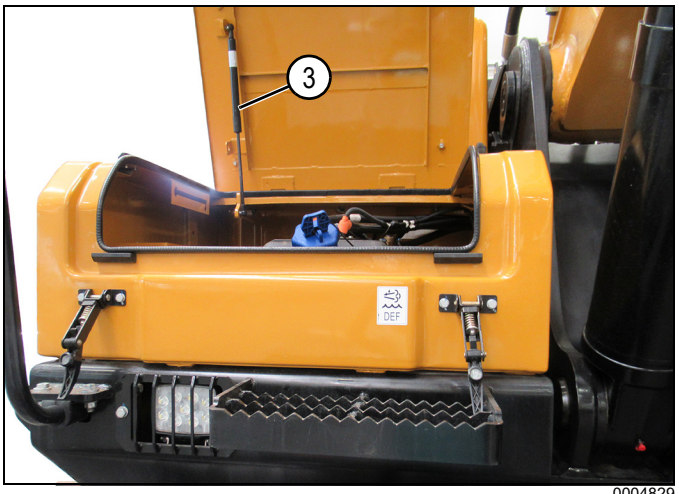


0004769

Figure 4-7

Opening the Right Front Access Door

To open the access door (1), unlock the door latches (2), pull the tops of the latch assembly arms away from the access door, and unhook the latches.



0004829

Figure 4-8

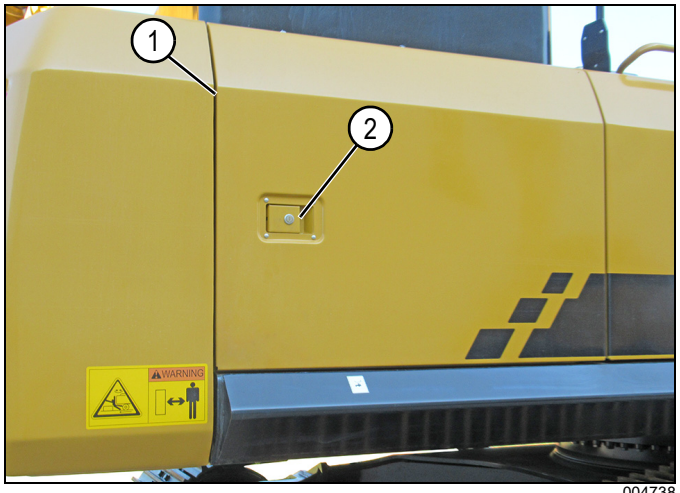
Lift the access door.

NOTE: *The access door has a pneumatic cylinder (3) assist to maintain the weight of the door and allow it to stay in the open position.*

Closing the Right Front Access Door

Pull the door down, hook the door latch onto the door, and secure by locking the door latch.

Right Rear Access Door



004738

Figure 4-9

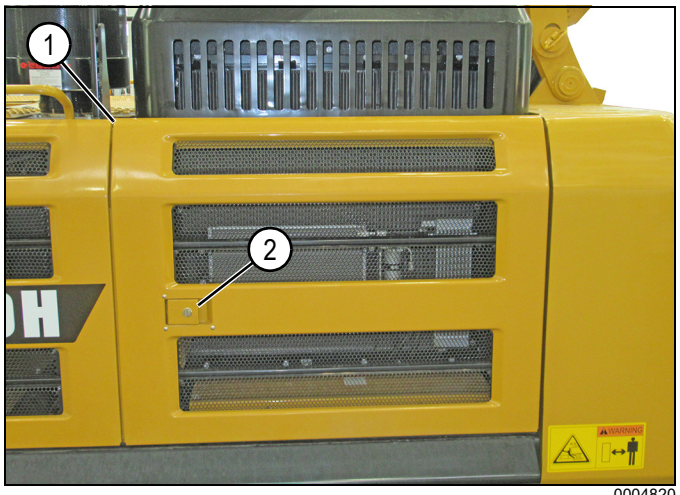
Opening the Right Rear Access Door

To open the right rear access door (1), unlock and pull the door latch (2). When fully open, place the access door support rod in the support bracket slot to prevent the door from closing unexpectedly. See “Access Door Support Rod” on page 4-7.

Closing the Right Rear Access Door

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

Left Rear Access Door



0004820

Figure 4-10

Opening the Left Rear Access Door

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. See “Access Door Support Rod” on page 4-7.

Closing the Left Rear Access Door

Move the support rod out of the slot in the support bracket to close the access door. See “Access Door Support Rod” on page 4-7. Close the access door until it is latched securely.

Left Front Access Door

0004958

Figure 4-11

Opening the Left Front Access Door

Open the left rear access door. See “Opening the Right Rear Access Door” on page 4-8. Open the left front access door (1) by pulling on the rear of door and swinging it toward the front of the machine. When fully open, place the access door support rod in the support bracket slot to prevent the door from closing unexpectedly. See “Access Door Support Rod” on page 4-7.

Closing the Left Front Access Door

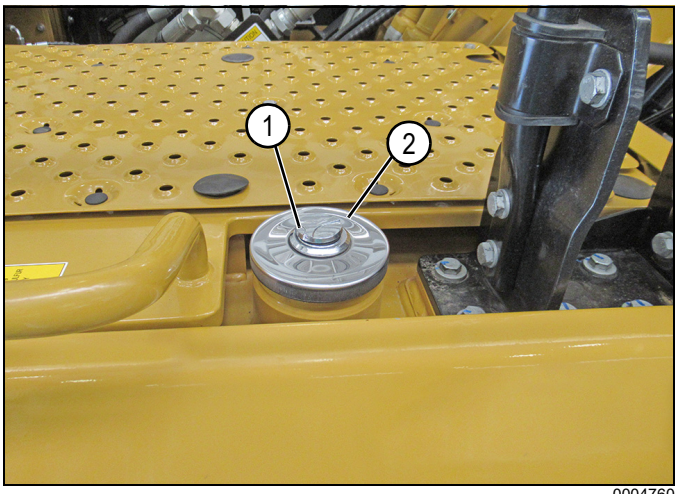
Move the support rod out of the slot in the support bracket to close the access door. See “Access Door Support Rod” on page 4-7. Close the access door. To secure the door, close the left rear access door. See “Closing the Left Rear Access Door” on page 4-9.

Fuel Filler Cap

NOTICE!

- **Make sure the O-ring on the 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 filler cap is fully seated before turning the key to lock or unlock 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.



0004760

Figure 4-12

Opening the Fuel Tank Filler Cap

Slide open the lock shield (1) on the filler cap (2).

Insert the key into the lock.

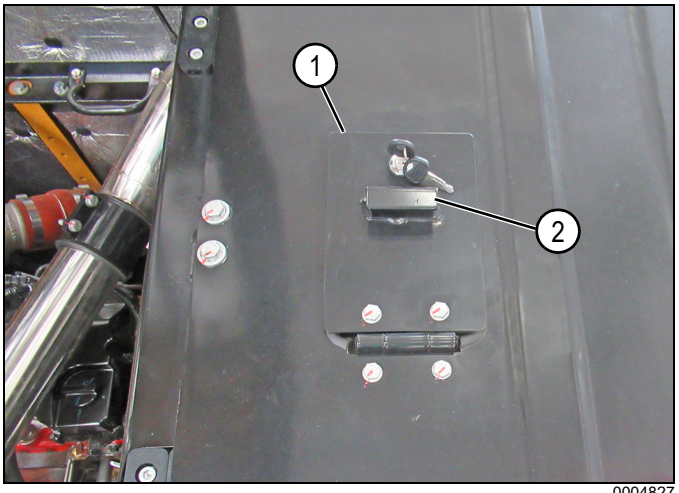
NOTE: *Insert the key fully into the lock. The key may break if it is turned before it is fully inserted.*

Turn the key and remove the filler cap.

Closing the Fuel Tank Filler Cap

Install the filler cap (2) onto the filler tube. Insert the key into the lock, turn and remove the key. Close the lock shield (1).

Expansion Tank Access Door



0004827

Figure 4-13

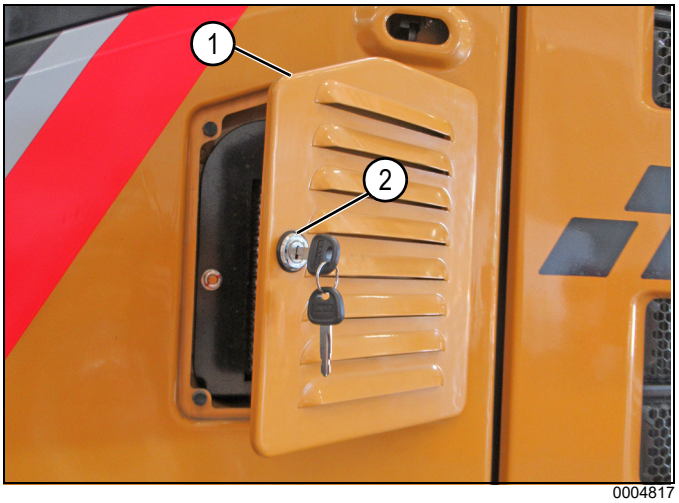
Opening the Expansion Tank Access Door

To open the expansion cap access door (1), unlock the door and lift the handle (2).

Closing the Expansion Tank Access Door

To close door, push the latch and panel down securely and lock.

Fresh-Air Access Door



0004817

Figure 4-14

Opening the Fresh-Air Access Door

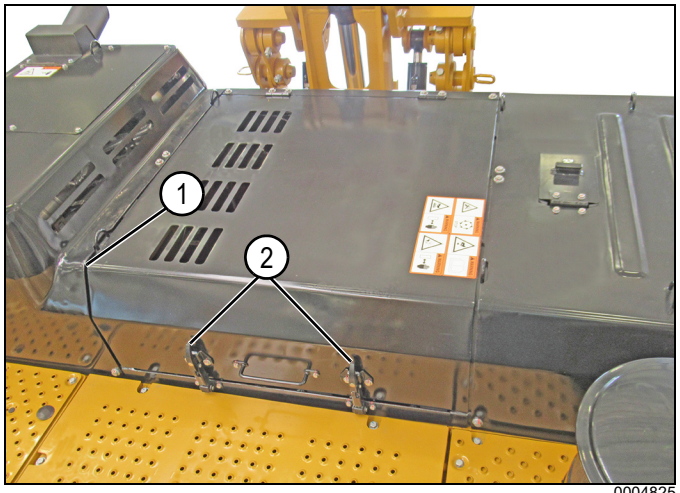
To open the fresh-air access door (1), insert the key into the lock (2) and turn the key clockwise.

Closing the Fresh-Air Access Door

With the key in the lock, push and hold the door in closed position and turn the key counterclockwise to secure.

Engine Access Door

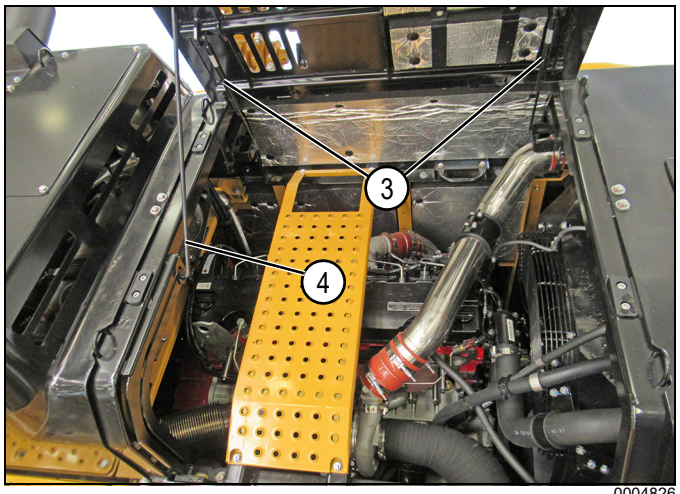
Opening the Engine Access Door



0004825

Figure 4-15

To open the engine access door (1), unlock the latches and pull the top of latch assembly arms (2) away from the access door, and unhook the latches.



0004826

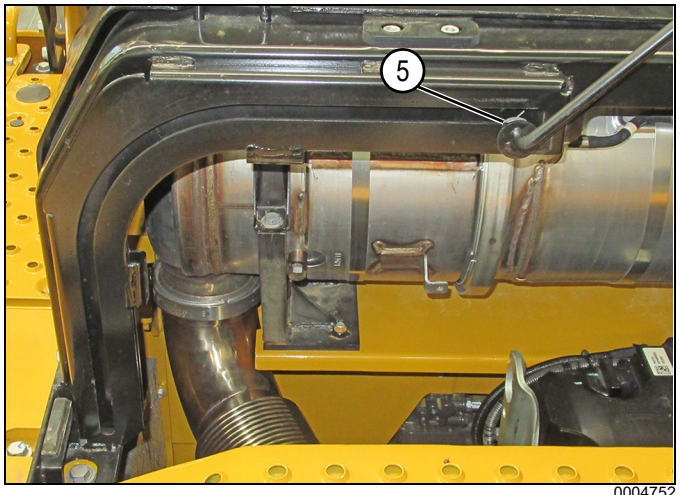
Figure 4-16

Lift the engine access door.

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

Secure the engine access door in the open position with the support rod (4) in the lock position.

Closing the Engine Access Door

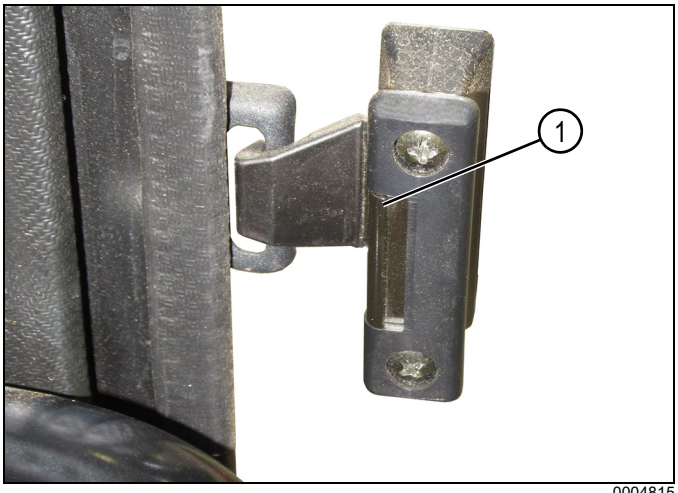


0004752

Figure 4-17

To close the engine access door, slightly push cover farther open, allowing the support rod out of the locked position (5). Close the latch and lock the engine access door.

Cab Door Windows



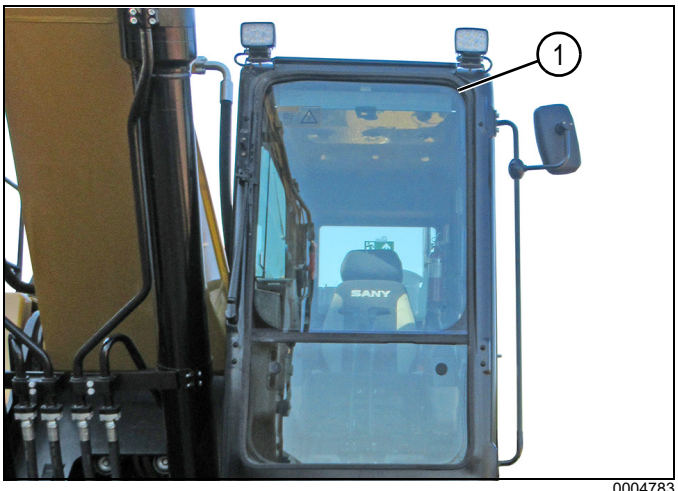
0004815

Figure 4-18

To open the cab door windows, press the window latch (1) and slide the rear or forward door window open.

NOTE: *Rear window latch shown. Front window latch is similar.*

Windshield



0004783

Figure 4-19

The windshield (1) can be opened and stored on the ceiling of the cab.

Opening the Windshield

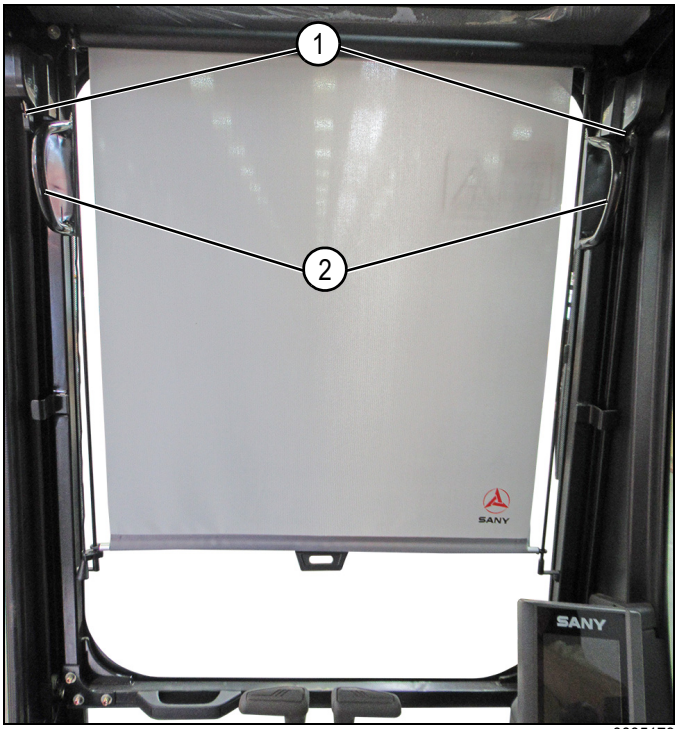
WARNING

Avoid sudden movement of the machine or work equipment. Always place the hydraulic lockout control lever in the locked (closed) position before opening or closing the windshield. Failure to follow this warning could result in death or serious injury.

1. Before opening the front windshield, park the machine on level ground, lower the work equipment to the ground, and stop the engine.
2. Place the hydraulic lockout control lever in the locked (closed) position. See “Hydraulic Lockout Control Lever” on page 3-8.

CAUTION

When open, the windshield must be latched securely to the ceiling of the cab. If it is not secured properly, the windshield may slide down unexpectedly and result in injury or machine damage.



0005179

Figure 4-20

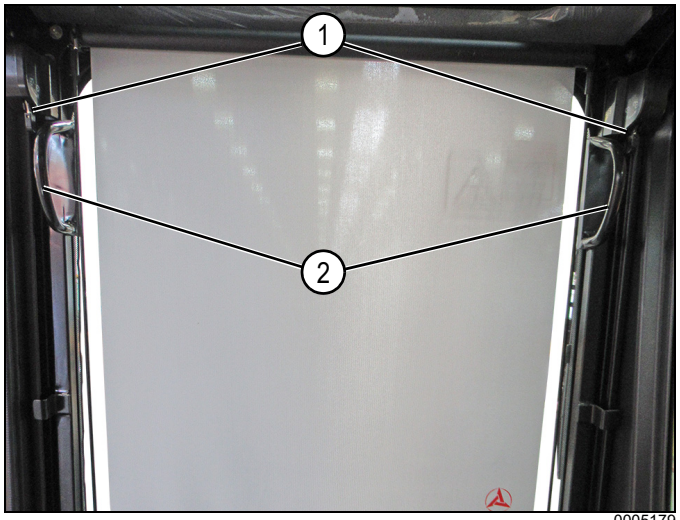
3. From the operator seat, pull both windshield latch releases (1) to unlock the windshield.
4. Using the handles (2), lift the windshield up and to the rear of the cab ceiling until it is latched in the open position.

Closing the Windshield

CAUTION

Close the windshield slowly to avoid pinching hands or fingers. Failure to follow this caution could result in injury or machine damage.

1. Before closing the windshield, park the machine on level ground, lower the work equipment to the ground, and stop the engine.
2. Move the hydraulic lockout control lever to the locked (closed) position. See “Hydraulic Lockout Control Lever” on page 3-8.



0005179

Figure 4-21

3. Pull both windshield latch releases (1) to unlock the windshield.
4. Hold the handles (2) and move the windshield forward and down while maintaining a firm hold on the handles.
5. When the windshield reaches the lowered position, firmly push the handles forward at the top of the windshield to engage the latches.

Lower the Front Windshield

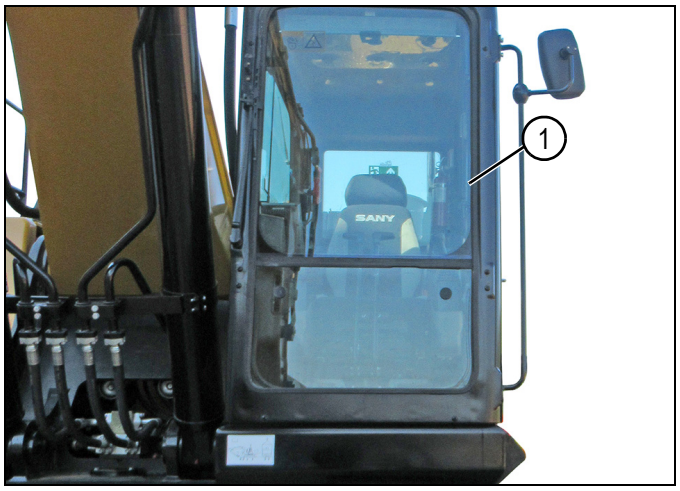
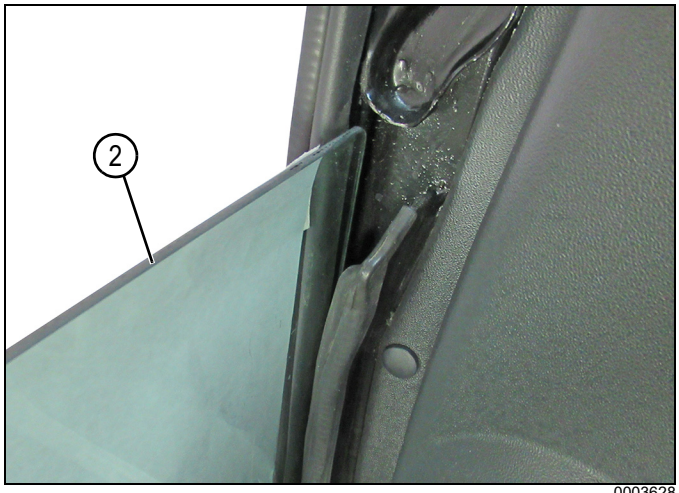


Figure 4-22

1. Raise the windshield (1) before removing the lower front windshield. See “Opening the Windshield” on page 4-11.

NOTE: *Make sure the bottom of the lower front windshield and the seal are clean. Accumulated dirt may make the windshield difficult to remove or install.*



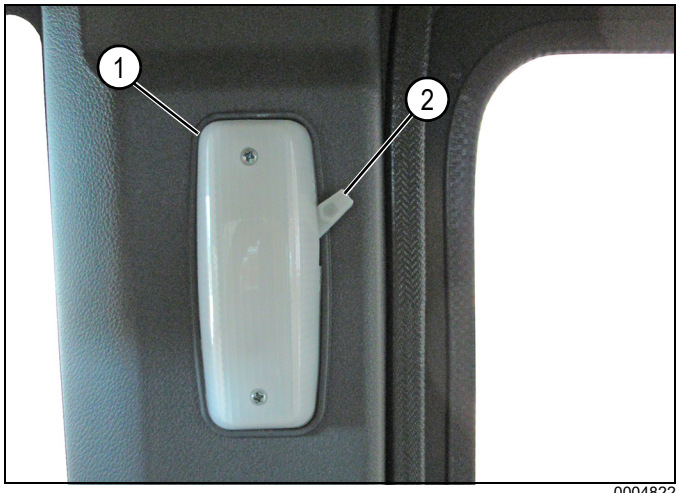
0003628

Figure 4-23

2. Firmly hold the top of the lower front windshield (2) and lift upward for removal.

NOTE: *The lower front windshield is curved and will only install as removed.*

Cab Light



0004822

Figure 4-24

The cab light (1) is turned on and off by moving the switch (2) up or down.

NOTE: *The battery disconnect switch and the key switch must be in the ON position for the cab light to operate.*

Mirrors

0000453

Figure 4-25

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

To position the mirrors, loosen the mounting fasteners. When positioned properly, tighten the mounting fasteners securely.

Backup Camera

0004742

Figure 4-26

1. Turn the key switch to the ON position.
2. Push function button F4 on the monitor to activate the backup camera and view activity behind the machine.

Monitor Settings

0004717

Figure 4-27

The monitor (1) is mounted in the front right side of the cab.

First-Time Setup

0004717

Figure 4-28

Access the Main Menu

1. Press function button F5 (11) to access Main Menu screen displays.
2. Press function button F1 (12) to move to and highlight the System Setting icon (13).
3. Press function button F3 (14) to activate System Setting.

Language Selection

See “System Language Setup Screen” on page 3-35.

System Clock Calibration

See “Time Format Setting Screen” on page 3-34.

Data Unit Setting

See “Data Unit Setting Screen” on page 3-33.

Engine Start Procedure

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.

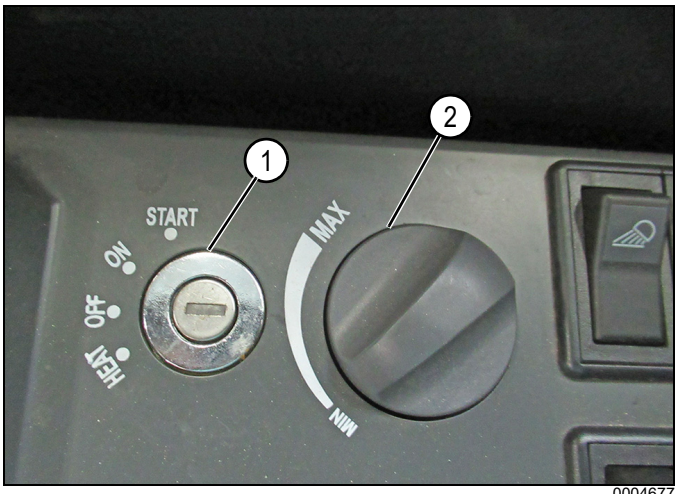
NOTES: *See “Cold Weather Operation” on page 4-17.*

1. Check the work area to be sure all personnel and equipment are clear of the machine. Before starting the machine, sound the horn to warn others.
2. Make sure all daily maintenance checks have been completed. See “Daily Maintenance and Inspection” on page 5-10.
3. Turn the battery disconnect switch to ON. See “Battery Disconnect Switch” on page 3-15.
4. When in the operator seat, buckle the seat belt. See“Seat and Seat Belt” on page 3-5.
5. Check that the emergency stop switch is in the run position. See “Emergency Stop Switch” on page 3-6.

WARNING

The engine should not start when the hydraulic lockout control lever is in the unlocked (open) position. If it does, contact a SANY dealer. Failure to follow this warning could result in death or serious injury.

6. Move the hydraulic lockout control lever to the locked (closed) position. If the hydraulic lockout control lever is in the unlocked (open) position, the engine will not start. See “Hydraulic Lockout Control Lever” on page 3-8.
7. Make sure the travel control levers/pedals and joysticks are in the neutral position, move freely, and return to the neutral position when released.



0004677

Figure 4-29

NOTICE!

Before starting the engine, make sure the throttle control dial is at MIN (low idle). Starting with the throttle control dial at MAX (high idle) will accelerate the engine and could damage it.

8. Set the throttle control dial (2) to MIN.
9. Turn the key switch (1) to the ON position and check the monitor. If all readings are normal and no fault codes are present, the display will return to the default screen within 2 seconds.
10. 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.

11. To start the engine, turn the key switch to START. When the engine starts, release the key. The key will return to ON.

Cold Weather Start

WARNING

- **Sound the horn before starting the engine and after confirming that the machine's surroundings are clear of personnel and obstructions.**
- **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 that could result in death or serious injury.**
- **Exhaust gas contains carbon monoxide. Carbon monoxide is an invisible and odorless gas. Carbon monoxide is toxic and could cause death or serious injury. Provide adequate ventilation when starting the engine in a confined space.**

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

1. Check the fluid levels before starting the engine. Drain water and sediment from the primary fuel filter/water separator once a week. See "Drain the Primary Fuel Filter" on page 5-30.
2. Turn the battery disconnect switch to ON. See "Battery Disconnect Switch" on page 3-15.
3. When in the operator seat, buckle the seat belt. See "Seat Belt Usage" on page 4-4.
4. Check that the emergency stop switch is in the run position. See "Emergency Stop Switch" on page 3-6.

WARNING

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

5. Move the hydraulic lockout control lever to the locked (closed) position. If it is in the unlocked (open) position, the engine will not start. See "Hydraulic Lockout Control Lever" on page 3-8.
6. Make sure the control levers and pedals are in the neutral position, move freely, and return to the neutral position when released.

NOTICE!

Before starting the engine, make sure the throttle control dial is at MIN (low idle). Starting with the throttle control dial at MAX (high idle) will accelerate the engine and could damage the engine.

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

7. Set the throttle control dial to MIN.
8. Turn the key switch 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.

Figure 4-30

NOTE: *The preheat cycle automatically begins if the engine coolant temperature is less than a preset value. When the preheat cycle begins, the preheat icon (1) is illuminated on the home screen. When the 'preheat cycle is complete, the preheat icon will turn off.*

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

NOTICE!

- **To prevent starter damage, do not operate the starter motor for more than 15 seconds. If the engine does not start. allow the starter motor to cool for at least 2 minutes. If the engine does not start the second time, turn the key switch to OFF and wait a minimum of 2 minutes before trying to start the engine again.**
- **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.

10. Turn the key switch to START. The starter motor will crank the engine. After the engine has started, release the key and the key switch will return to the ON position.

NOTE: *If the engine fails to start after preheating, wait at least 15 seconds before repeating the process.*

11. Allow the engine to idle until the hydraulic oil reaches 104°F (40°C) before using the machine. Once the hydraulic oil reaches 104°F (40°C), complete the warm-up operation. See See "Machine Warm-up" on page 4-17.
12. 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 mud from the sprocket, track rollers, and idlers.

Machine Warm-up

WARNING

- **In case of emergency, irregular engine operation, or other faults, turn the key switch to OFF or use the emergency stop switch to stop the engine.**
- **Do not operate the machine immediately after starting the engine. Insufficient warm-up of the machine and hydraulic oil may cause slow control response or abrupt movement during operation, resulting in serious accidents. Warm-up is especially necessary in cold areas.**

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

Do not operate the machine immediately after starting the engine. Allow the machine and hydraulic system to warm up. Complete the following warm-up procedures:

1. De-activate the auto-idle mode after starting the engine. See “Auto-idle” on page 3-21. Adjust the throttle so the engine runs unloaded at 1400 rpm for 5 minutes.
2. Adjust the throttle so the engine runs at 1500 rpm, then slowly operate the bucket for 5 minutes.
3. Adjust the throttle so the engine runs at a high rpm, then operate the boom, arm, and bucket for 5 to 10 minutes.

Repeat all procedures several times and stop the warm-up process. Check the monitor and indicators for normal operating readings after the warm-up process.

Idling the Engine

Allow the engine to idle until the engine temperature reaches 140°F (60°C) before beginning operation.

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.

Engine Shutdown Procedure

1. Park the machine on a flat, level surface away from people, traffic, and other machines.
2. Lower the work equipment to the ground.
3. Run the engine at low idle (approximately 1050 rpm) for 5 minutes.

NOTE: *Except for emergencies, never shut down the engine while it is running at high speed. Stopping the engine at high speed can damage the machine, personal property, and the environment, or cause the equipment to operate improperly.*

4. Turn the key switch to OFF and remove the key.
5. Turn the battery disconnect switch to OFF.

Cold Weather Operation

The following recommendations are for operating SANY machines in low temperatures (below 32°F [0°C]):

NOTE: *See “Key Switch” on page 3-13 for details on using the key switch to preheat the engine for cold-weather starting.*

NOTE: *See “Cold Weather Start” on page 4-16 for cold weather starting procedures.*

- The correct grade of oil for the ambient temperature must be used in the crankcase. Diesel fuel must have a pour point of 10°F (-12°C) less than the lowest expected temperature.
- This machine must have appropriate hydraulic oil, lubricants, and other auxiliary items required for operation in very low temperatures (below 32°F [0°C]). Individual machine functions should be operated to provide they are sufficiently warmed prior to performing work.
- Only competent operators who possess the skill, experience, and dexterity to provide smooth operation should operate the machine at full-rated capacities in temperatures between 0°F and -40°F (-18°C and -40°C). Shock-loading must be avoided.

Cold-weather operation requires additional precautions:

- Avoid touching metal surfaces with exposed skin in extreme cold conditions.
- Keep the machine clear of all ice and snow.
- Allow sufficient time for the hydraulic oil to warm up before operating.
- Park the machine in an area where it cannot freeze to the ground.

Manual Regeneration

WARNING

The engine exhaust will be very hot. Make sure the machine is not in a highly combustible area. Failure to follow this warning could cause a fire or explosion, resulting in death or serious injury.

A manual regeneration is required when the regeneration icon is flashing yellow. See “Home Screen Function Icons and Buttons” on page 3-27.

NOTICE!

If the flashing yellow regeneration icon is ignored for too long, the regeneration icon remains on, the engine icon turns red, and engine power is reduced. Park the machine and perform a manual regeneration. After regeneration, full engine power is restored.

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

1. Make sure the machine is in a safe location where the exhaust pipe outlet will not face any combustible surface.
2. Run the engine at low idle. Engine speed must be below 1400 rpm for regeneration to be initiated and maintained.
3. Move the hydraulic lockout control lever into the unlocked (open) position. See “Hydraulic Lockout Control Lever” on page 3-8.
4. Press the stationary regeneration switch on the right console. See“Stationary Regeneration Switch” on page 3-13.The engine speed and turbocharger sounds may increase, the High Exhaust System Temperature (HEST) lamp may illuminate, and the regeneration lamp will flash.

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

5. During regeneration, the regeneration icon displays a steady yellow. See “Function Icons” on page 3-26.
6. When the regeneration is complete, the engine will return to idle speed, and the HEST and regeneration lamps will turn off.

Jump-Start the Engine

WARNING

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

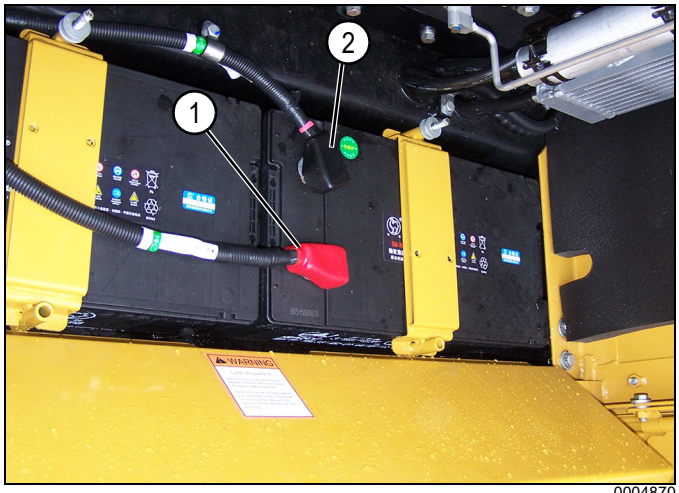
Failure to follow this warning could result in death or serious injury.

NOTICE!

- **The starting system voltage and the battery voltage in the boosting machine should be no more than 24VDC. Never use 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 the engine is 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 switches of both machines are at OFF.



0004870

Figure 4-31

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 (2) of the charged battery.
5. Clamp the other end of the second jumper cable to the negative (-) black terminal of the other battery or an unpainted area of the chassis of the machine with the drained battery.
6. Start the engine of the machine with the charged battery and run it at medium speed.

NOTICE!

Never crank the engine for more than 15 seconds. It could damage the machine or cause it to operate improperly. 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.

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 every 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.

Traveling Operations

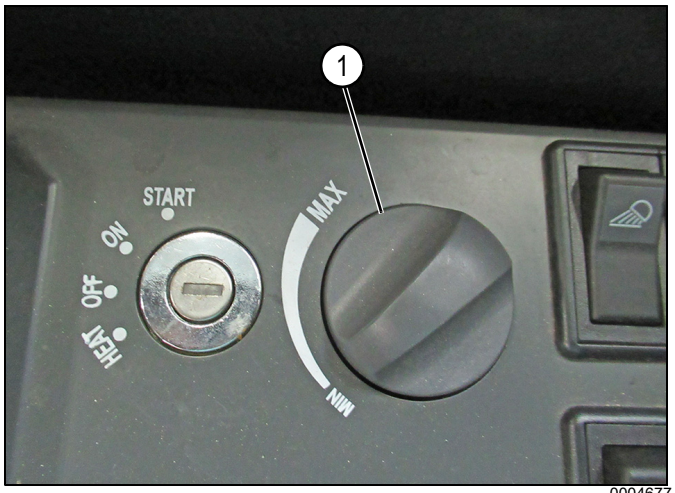
WARNING

Never allow any personnel to be in the work area while the machine is being operated.

- **Avoid moving any control lever or pedal to abruptly change the direction of the machine.**
- **Be aware of all crush points on the machine and make sure all personnel keep clear of these areas.**
- **Never allow passengers to ride on or inside the machine.**
- **Never bring objects into the cab that could restrict movement or vision.**
- **Appoint a signal person when operating the machine in a confined or restricted-view area.**
- **Make sure that all personnel involved understand all industry-standard hand signals that are to be used.**
- **The operator shall respond to operating signals from the 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 signal person must be used. If visibility becomes blocked for any reason, stop operation immediately.**

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

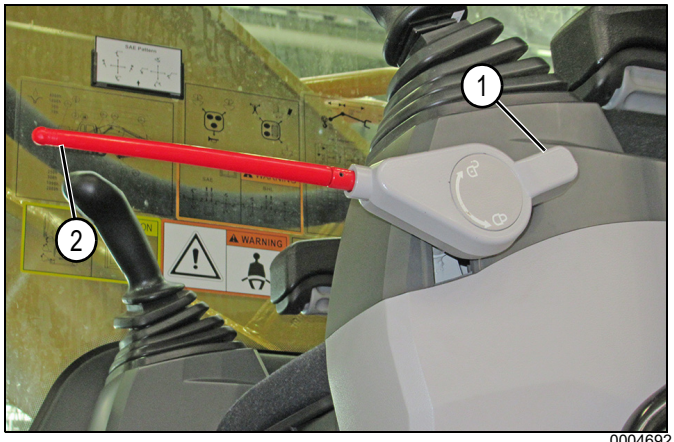
Before Traveling



0004677

Figure 4-32

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

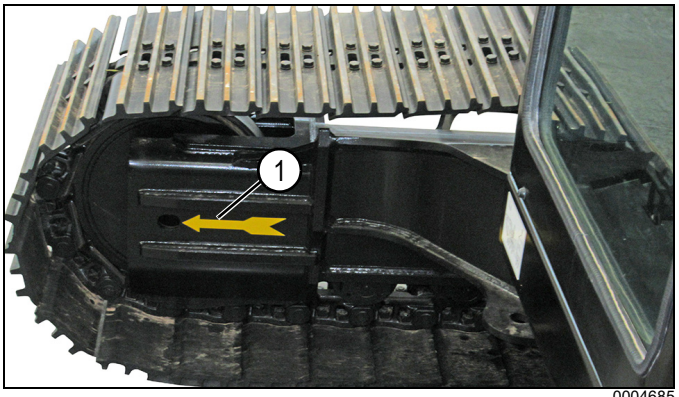


0004692

Figure 4-33

2. Move the hydraulic lockout control lever (1) to the unlocked (open) position (2).
3. Make sure there is good visibility to the right side of the machine.

Track Direction



0004685

Figure 4-34

The directional arrow (1) on the inside of each track frame indicates forward movement of the machine. Check these arrows before using the travel control levers/pedals. The track drive sprocket is at the rear of the track frame. If the track frame is facing backward, the travel direction will be opposite the maneuvering direction of the travel control lever/pedal.

This means the machine will move forward when you pull the control levers backward and backward when you push the control levers forward. Left and right control directions are also reversed when the track frame faces backward.

Traveling with the Undercarriage Reversed

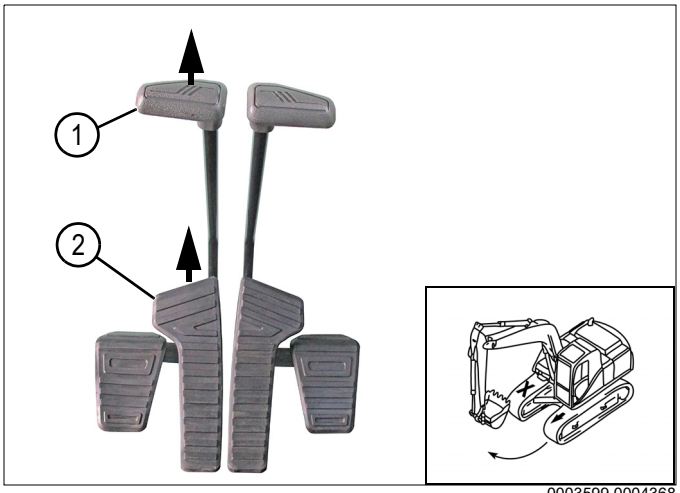
CAUTION

Traveling with the undercarriage reversed could pose a hazard resulting in injury.

When the cab faces the opposite direction of the arrows on the undercarriage, the machine moves forward when the control levers are pulled, and backward when they are pushed.

SANY does not recommend traveling with the undercarriage reversed.

Right Turn



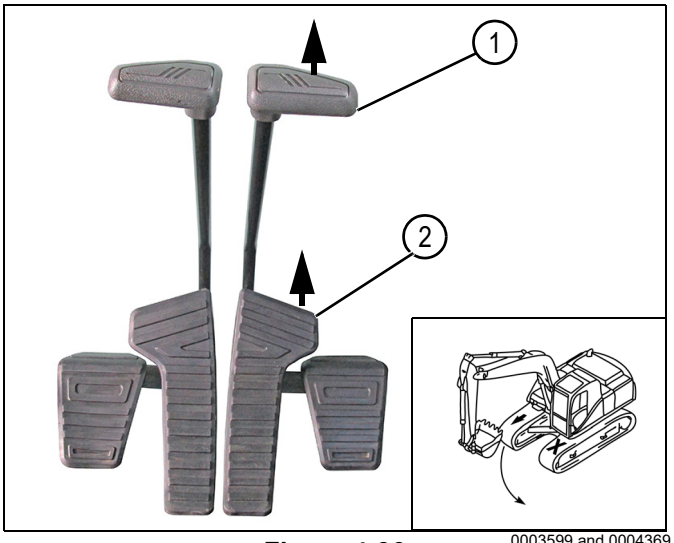
0003599,0004368

Figure 4-35

Push the left travel control lever (1) or press the top of the left foot pedal (2) 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 in either direction, the faster the left track moves.

Left Turn



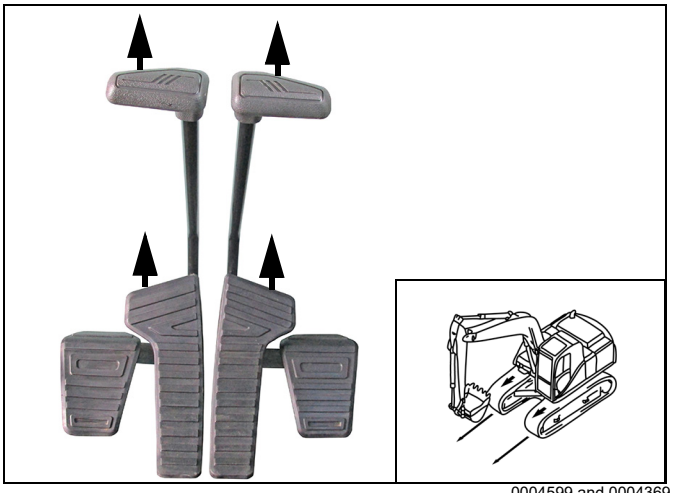
0003599 and 0004369

Figure 4-36

Push the right travel control lever (1) or press the top of the right foot pedal (2) 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 in either direction, the faster the right track moves.

Forward Travel



0004599 and 0004369

Figure 4-37

Move both travel control levers/pedals at the same time to cause both tracks to move forward. or backward,

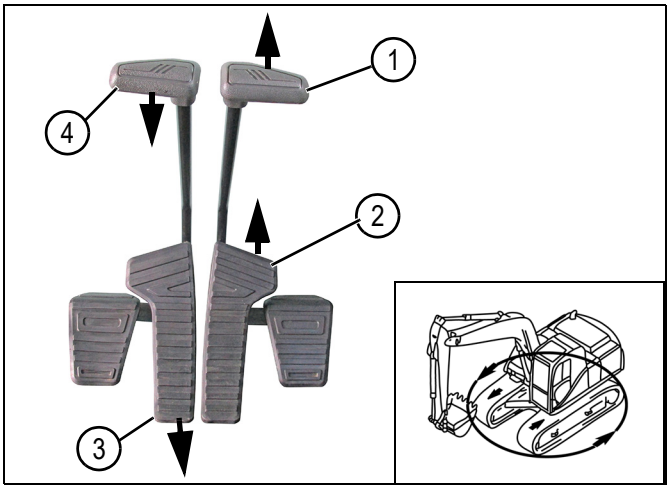
The farther the controls are moved in either direction, the faster each track moves.

Backward Travel

Move both travel control levers/pedals at the same time to cause both tracks to move backward.

Zero-Degree Rotation

Left

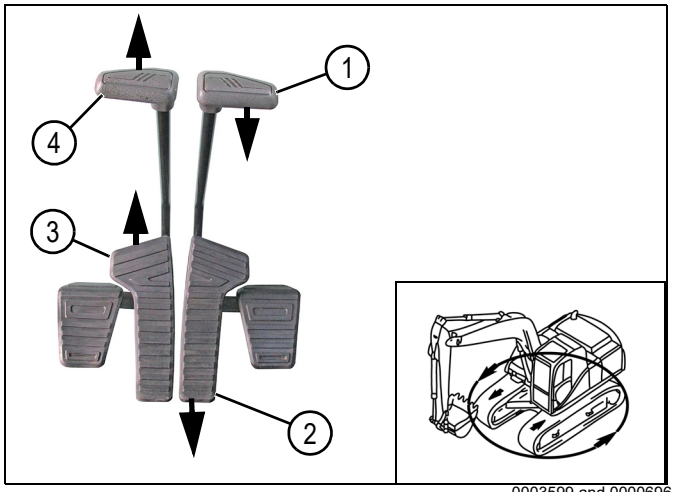


0003599 and 0000695

Figure 4-38

Simultaneously push the right travel control lever (1) or press the top of the right foot pedal (2) and pull the left travel control lever (4) or press the bottom of the left foot pedal (3) to rotate the machine to the left.

Right



0003599 and 0000696

Figure 4-39

Simultaneously push the left travel control lever (4) or press the top of the left foot pedal (3) and pull the right travel control lever (1) or press the bottom of the right foot pedal (2) to rotate the machine to the right.

Operating on Inclines

WARNING

- **Operating on an incline may cause the machine to become unstable.**
- **Use caution when operating the machine on inclines and use a lower engine speed.**
- **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 an incline:

- Do not travel on an incline exceeding 15° (26.8%) side to side, or 35° (70%) fore and aft.
- The hydraulic tank must be at the proper operating level.
- Avoid holes, rocks, extremely soft surfaces, and other obstacles that might subject the machine to undue stresses or possible tip-over.
- Position the bucket 16 in. to 20 in. (20 cm to 30 cm) above the ground while traveling.

- Always set the throttle control dial to maintain a slow speed while traveling up or down an incline.
- Do not turn the machine while on an incline.
- Do not travel in reverse on an incline.

Operating in Water

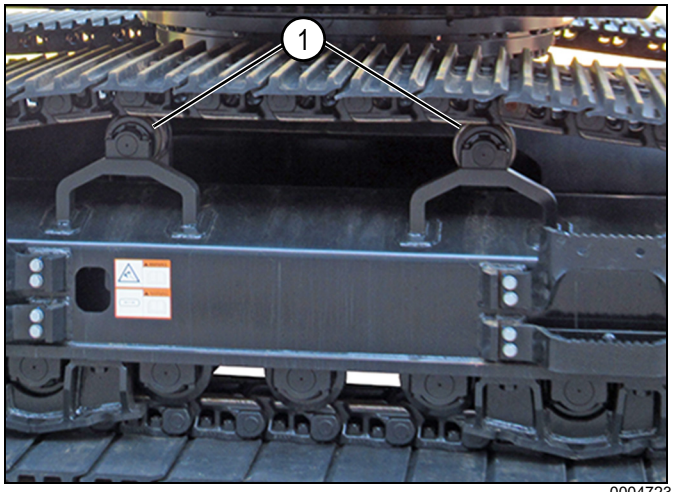


Figure 4-40

Observe the following when operating the machine in water:

- Do not drive the machine into water that could reach the center of the carrier rollers (1).
- Do not operate the machine in water unless the work site foundation is strong enough to properly support the machine.
- An escape tool is available for use in emergencies.

NOTICE!

If the swing bearing and swing gearbox have been submerged in water, to prevent damage to the machine, drain the swing gearbox oil to remove the mud and water. Refill the swing gearbox oil and lubricate the swing bearing.

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

Releasing the Machine from Mud

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

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

⚠ WARNING

Use caution when placing cribbing under a track, since the machine is supported only by the boom and could drop without warning. Failure to follow this warning could result in death or serious injury.

One Track Stuck

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

Work Equipment Controls

NOTES:

- *The joysticks will return to the neutral position when released, and the work equipment will hold its position.*
- *There are two operating modes available for the joystick controls, the Society of Automotive Engineers (SAE) mode and the backhoe loader (BHL) mode.*

SAE Control Pattern

See “SAE Mode” on page 3-19 for additional information.

Swing

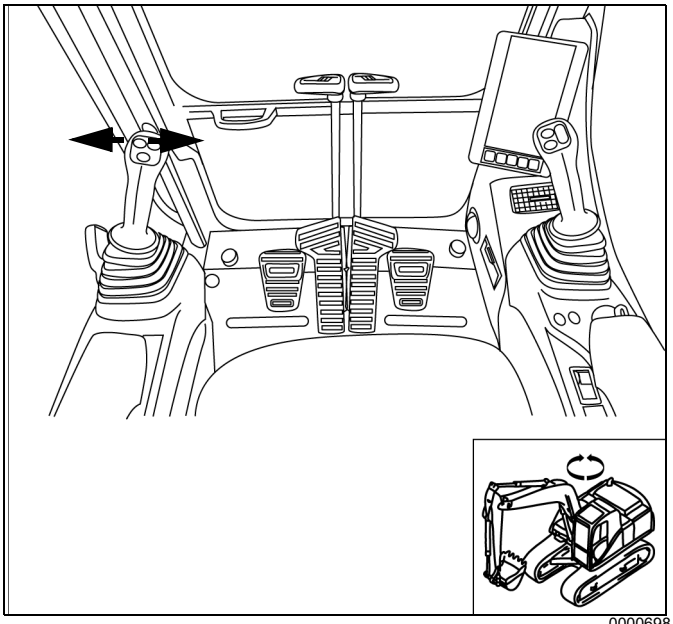


Figure 4-41

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.

Arm

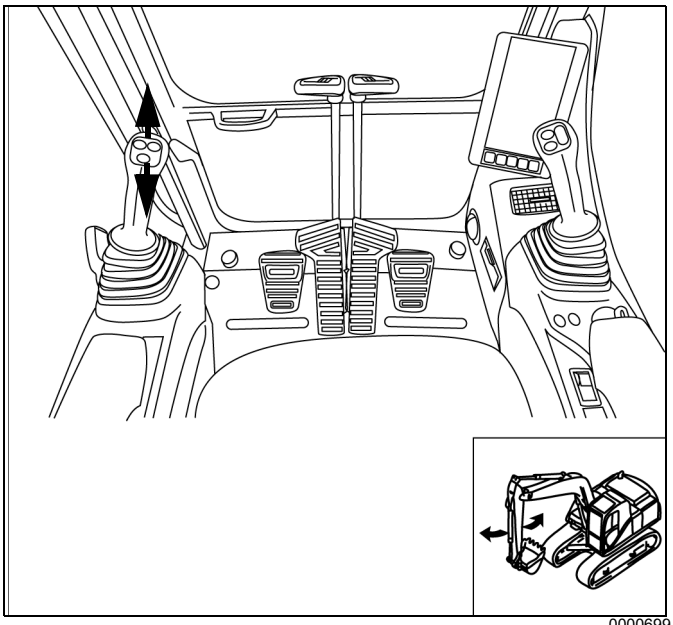


Figure 4-42

To extend the arm, move the left joystick forward.

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

Boom

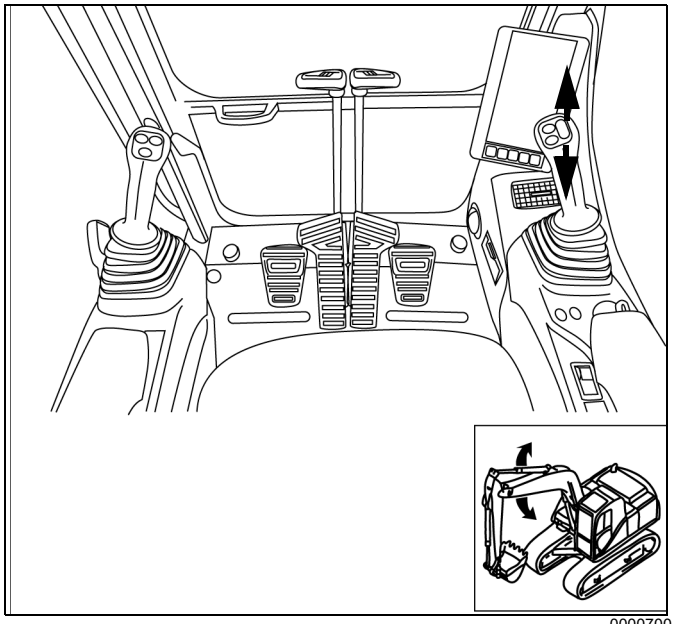


Figure 4-43

To lower the boom, move the right joystick forward.

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

Bucket

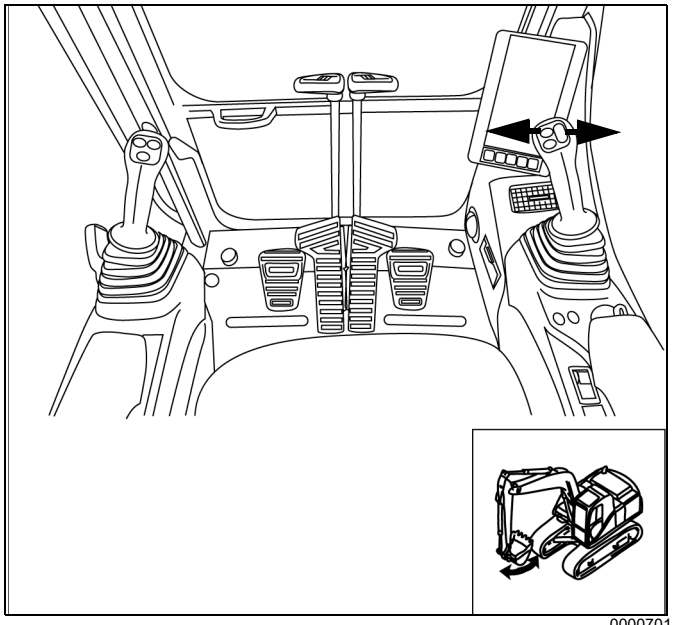


Figure 4-44

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.

BHL Control Pattern

See “BHL Mode” on page 3-20 for additional information.

Swing

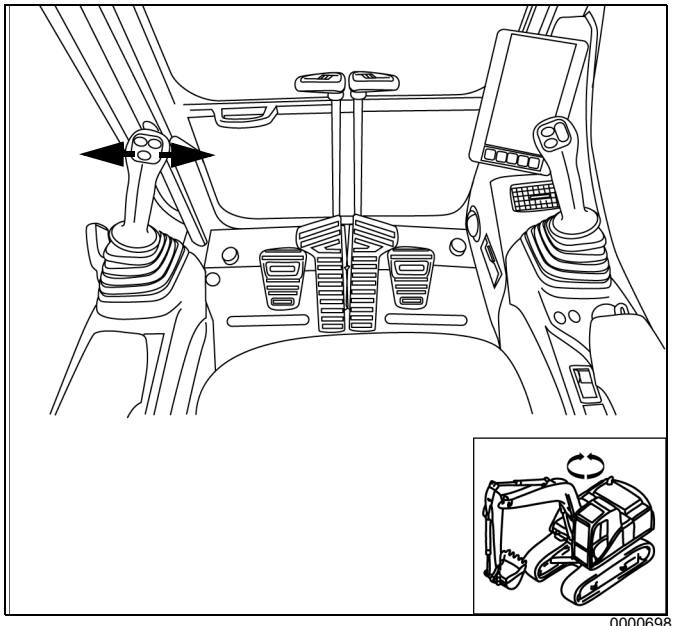


Figure 4-45

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.

Arm

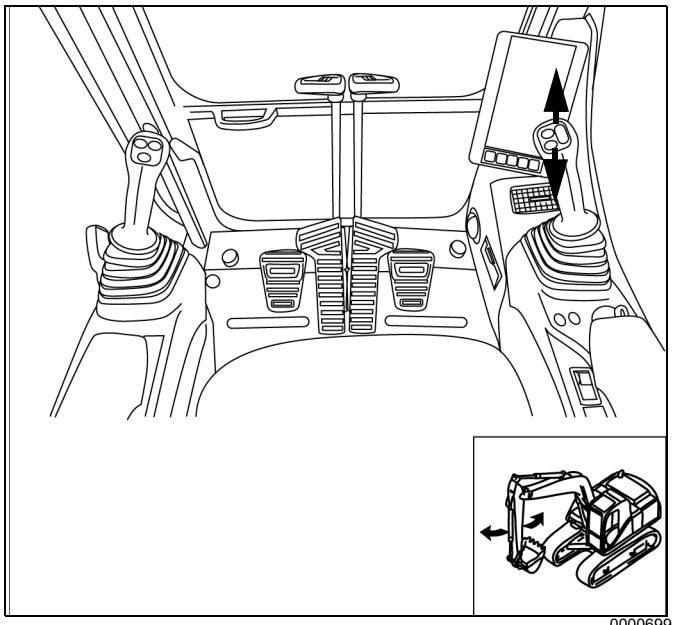


Figure 4-46

To extend the arm, move the right joystick forward.

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

Boom

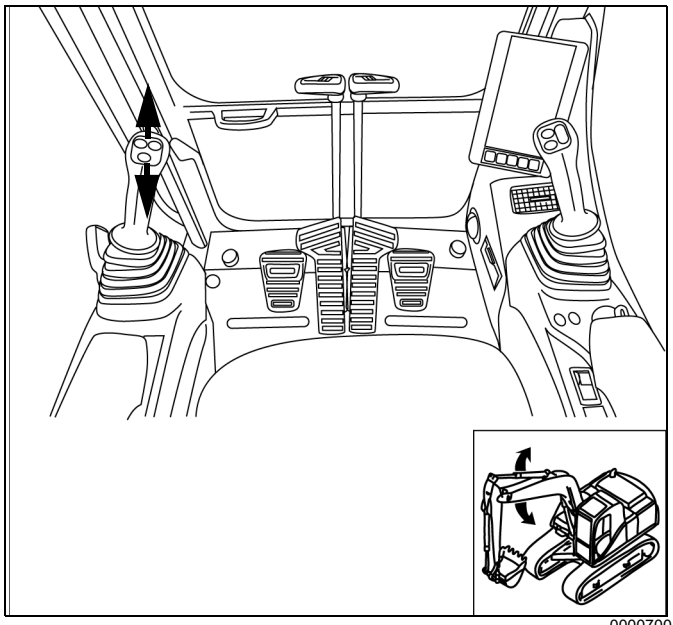


Figure 4-47

To lower the boom, move the left joystick forward.

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

Bucket

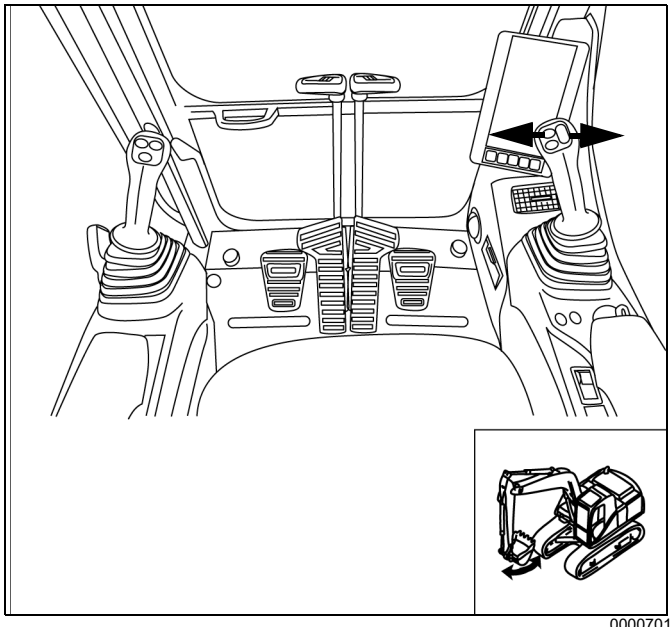


Figure 4-48

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.

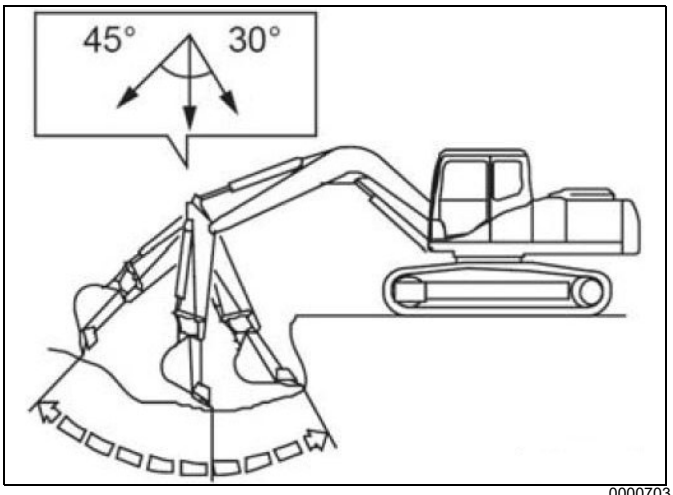
Recommended Applications

WARNING

- **Contact the site supervisor before any digging to make sure that all underground hazards have been located to avoid injury or death.**
- **To avoid injury, never allow any personnel within 26 ft. (8 m) of the machine while it is moving.**
- **Be aware of all crush points on the machine and make sure all personnel keep clear of these areas to prevent injury.**
- **To prevent injuries, avoid moving any travel control lever or pedal to abruptly change the direction of the machine, and avoid stopping the machine suddenly by releasing the lever or pedal while traveling at high speed.**

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

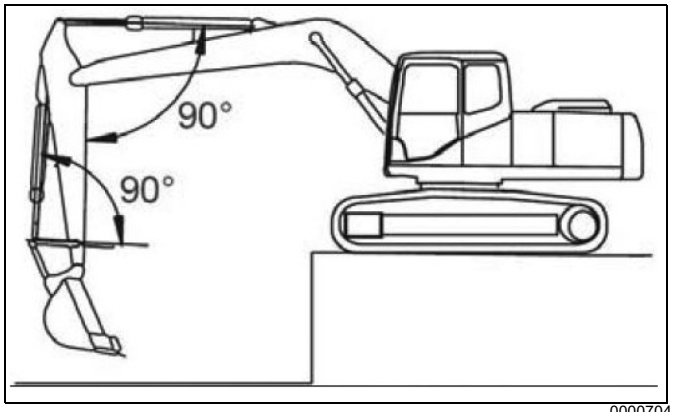
Backhoe Operation



0000703

Figure 4-49

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

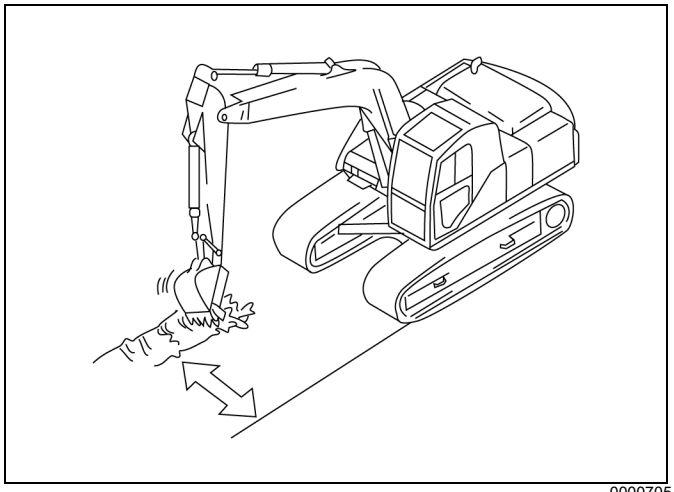


0000704

Figure 4-50

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

Digging a Trench

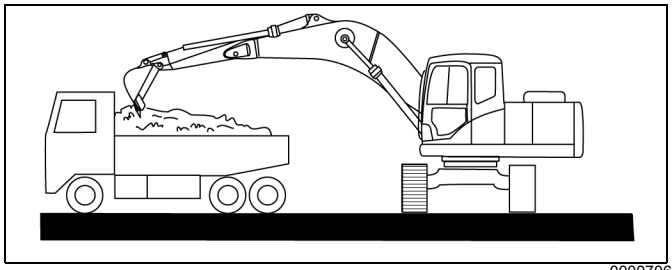


0000705

Figure 4-51

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

Loading Operations



0000706

Figure 4-52

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

End of Workday Checks

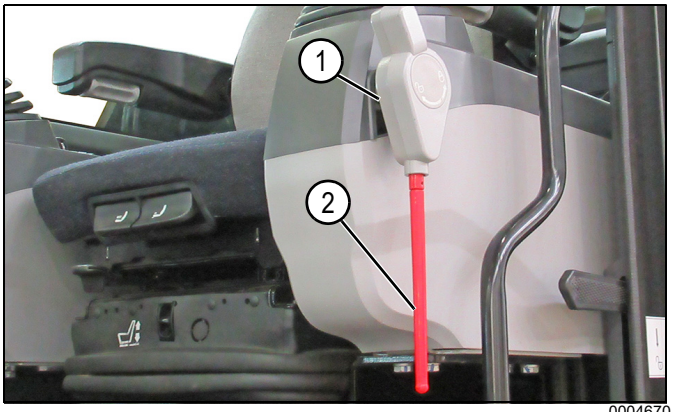
1. Collect any trash or debris from the cab and deposit it in a proper disposal container.
2. Remove all built-up mud or debris on the undercarriage and machine exterior.
3. Inspect the machine work equipment, machine exterior, and undercarriage for signs of fluid leaks or damage.
4. In oceanic (salt-air) environments, thoroughly wash away any salt residue. Apply grease where rust is found, and perform maintenance on the electrical components to prevent corrosion.

Parking and Storing the Machine

Overnight Storage

1. Park the machine on a flat, level, stable surface away from people, traffic, and other machines.
2. Lower the work equipment to the ground.
3. Run the engine at idle speed (1050 rpm) for 5 minutes to allow the engine to cool down. Extend this cool-down time in hot weather.
4. Turn the key switch to the OFF position.

NOTE: *Always remove the key and take it with you, even if you are leaving the machine for only a moment. Keep it with you to prevent unauthorized operation of the machine.*



0004670

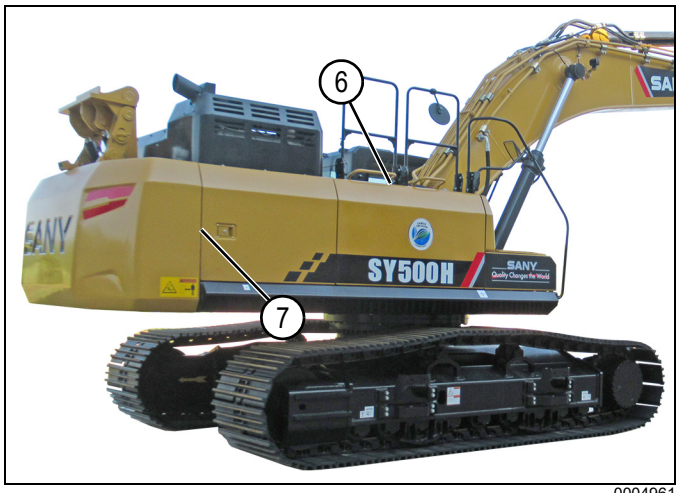
Figure 4-53

5. Move the hydraulic lockout control lever (1) to the locked (closed) position (2).
6. Close and lock the windows.
7. Exit the cab.
8. Turn the battery disconnect switch to the OFF position.
9. Fill the fuel tank.

0005040

Figure 4-54

10. Make sure that the following items are secured and locked:
    - Engine access door (1)
    - Left rear access door (2)
    - Air conditioner fresh-air inlet door (3)
    - Cab door (4)
    - DEF tank compartment (5)



0004961

Figure 4-55

- Fuel tank (6)
- Right rear access door (7)

Short-Term Storage

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

Complete the procedure for “Overnight Storage” on page 4-26.

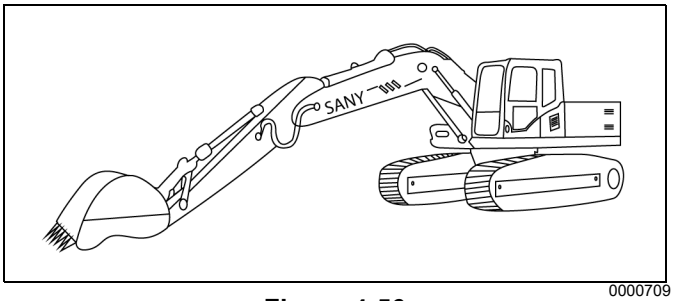
1. Clean the machine and cover it to protect it from dust.
2. Keep the machine dry.
3. Keep the machine fully lubricated.

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 or deterioration.

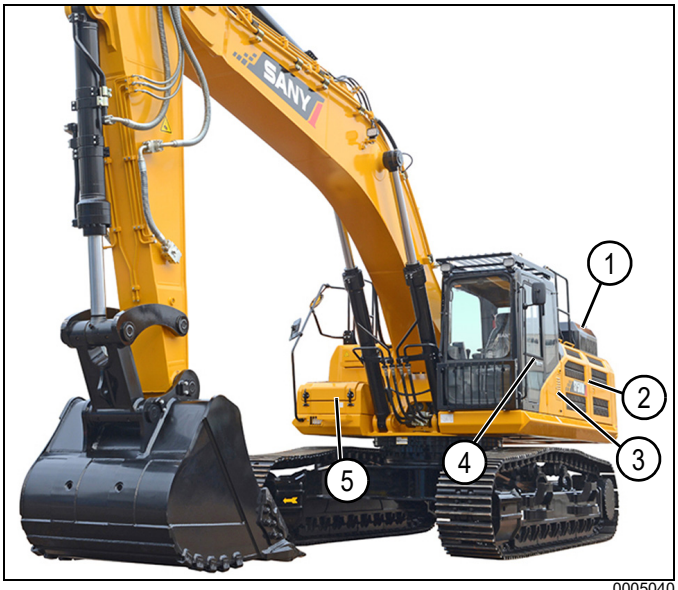
Preparation



0000709

Figure 4-56

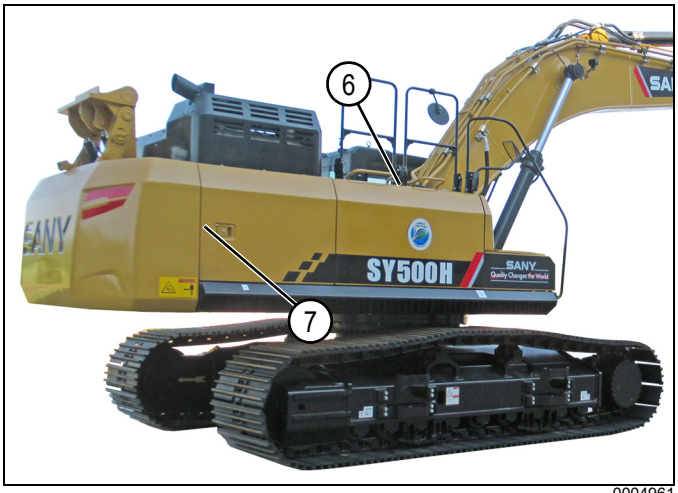
1. Park the machine in a secure location and position the work equipment with the arm and bucket fully extended with the bucket resting on the ground.
2. Run the engine at low idle speed for 5 minutes to avoid increasing internal temperatures and to allow for heat dissipation. Extend this cool-down time in hot weather.
3. Shut down the engine and remove the key from the key switch.
4. Move the hydraulic lockout control lever to the locked (closed) position. See “Hydraulic Lockout Control Lever” on page 3-8.
5. Close and lock the windows.
6. Exit the cab.
7. Fill the fuel tank.



0005040

Figure 4-57

8. Make sure that the following items are secured and locked:
   - Engine access door (1)
   - Left rear access door (2)
   - Air conditioner fresh-air inlet door (3)
   - Cab door (4)
   - DEF tank compartment (5)



0004961

Figure 4-58

   - Fuel tank (6)
   - Right rear access door (7)
9. Apply spray lubricant to any exposed cylinder rods.
10. Change the engine oil.
11. Turn the battery disconnect switch to OFF or remove the batteries and store them in a separate location.

NOTE: *If performing a battery disconnect, wait at least 1 minute before disconnecting the battery cables so the machine's electronic control module (ECM) can complete its updating procedure. Failure to follow this notice can damage the machine or cause it to operate improperly.*

Maintenance During Storage

WARNING

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

Once a month, perform the following procedures:

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

Return to Service

1. Check the fuel and engine oil for contamination. 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.*

WARNING

To prevent the machine from tipping over, observe the following precautions when loading or unloading:

- **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 the center of gravity.**
- **Use a signal person to observe and alert the operator of any potential hazards.**

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

Counterweight Removal

NOTE: *Removing the counterweight for transport is not required. However, it may be necessary to comply with weight limits.*

Figure 4-59

The SY500H excavator is equipped with a built-in counterweight removal system (1).

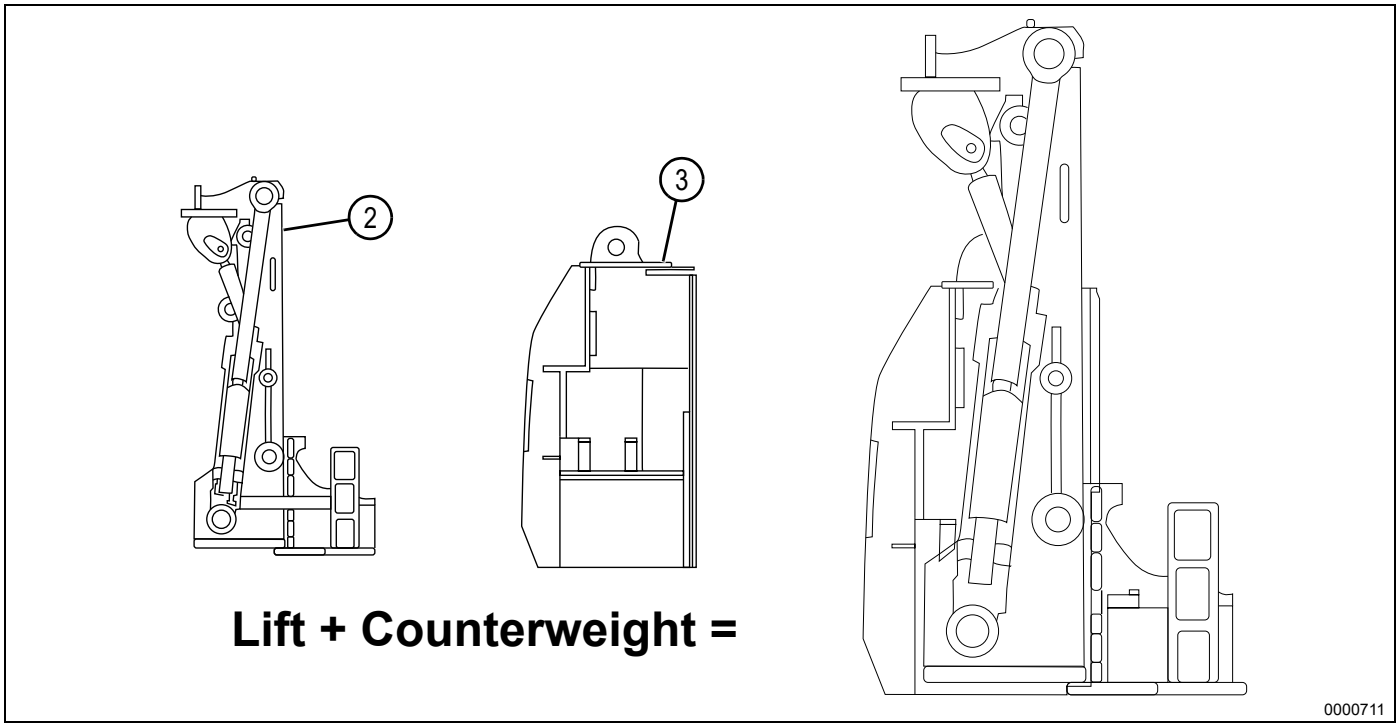
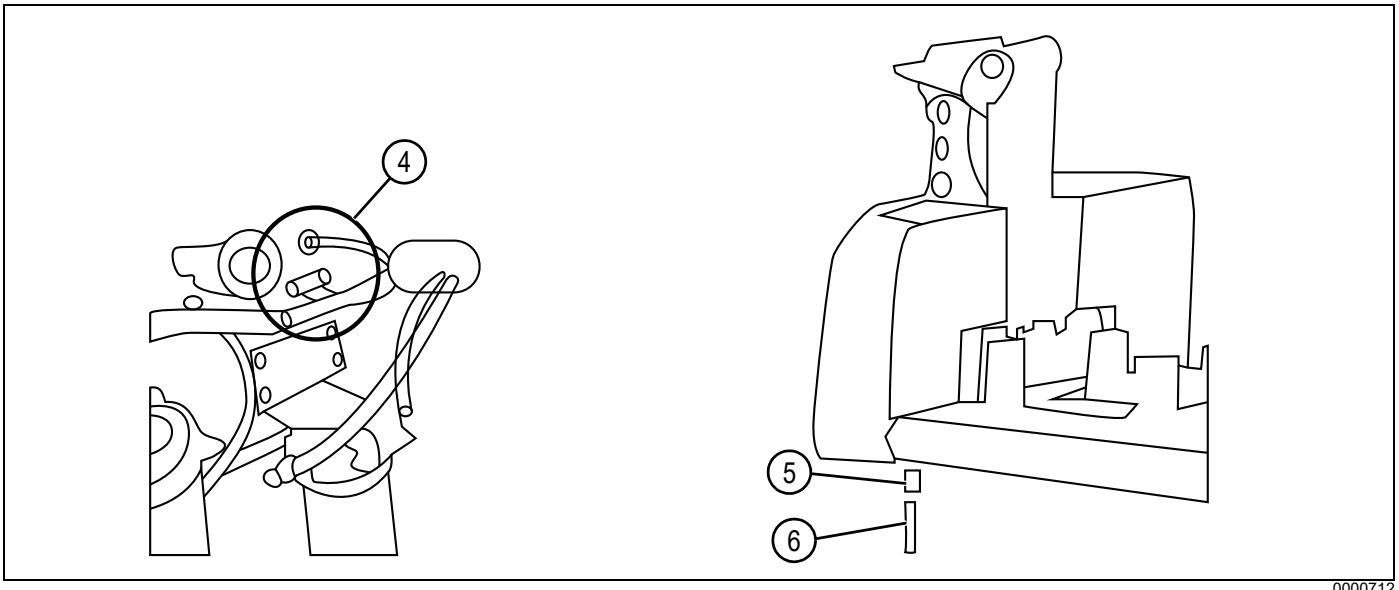


Figure 4-60

There are two parts to the SY500H counterweight assembly, the lift (2) and the counterweight (3).



0000712

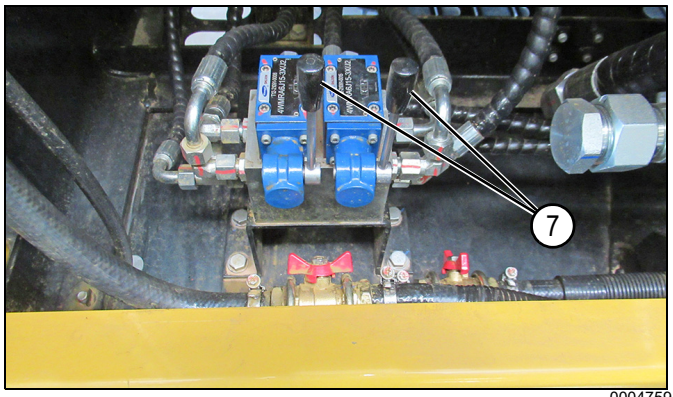
Figure 4-61

Perform the following steps to remove the counterweight:

1. Locate the backup camera wiring harness (4), behind the right rear access door. Identify and disconnect the wiring harness connector.

NOTE: *When removing the counterweight fasteners from the frame, note the location and type of shims used to level the counterweight. Replace the shims exactly the same way when reattaching the counterweight.*

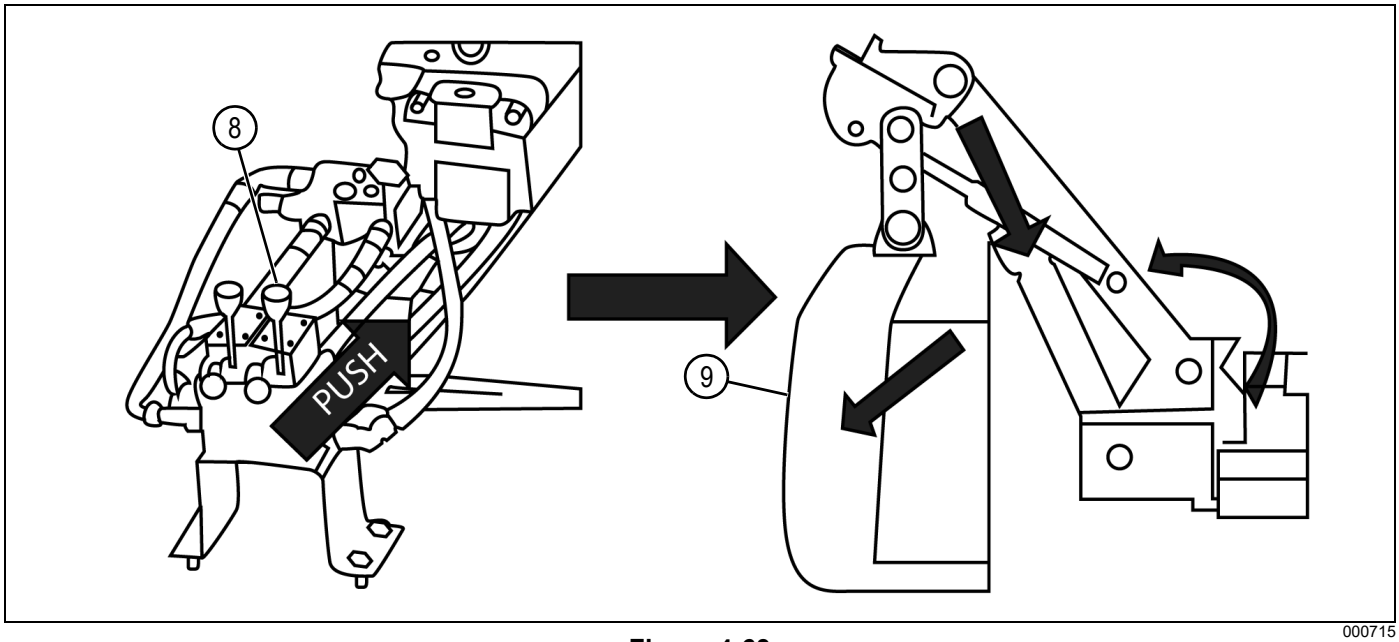
2. Remove the eight fasteners (6) and spacers (5) that secure the counterweight to the machine frame.
3. Start the machine and set the throttle to low idle.
4. Access the Tool Select screen. See “Tool Select Screen” on page 3-36.
5. Press function button F4.
6. Move the hydraulic lockout control lever to the unlocked (open) position. See “Hydraulic Lockout Control Lever” on page 3-8.



0004759

Figure 4-62

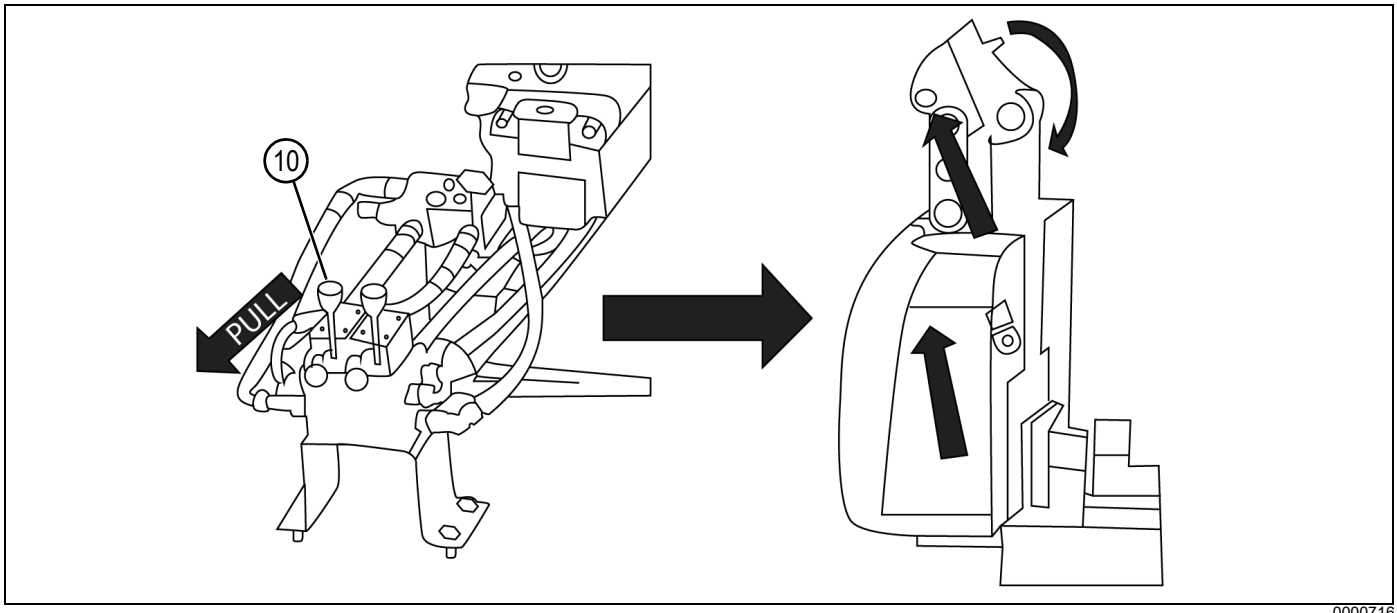
7. Access the control valves (7) in the right rear access door.



000715

Figure 4-63

8. Push the right handle (8) of the control valve to raise the counterweight (9) off the frame.



0000716

Figure 4-64

9. Pull the left handle (10) of the control valve and tilt the counterweight away from the machine.

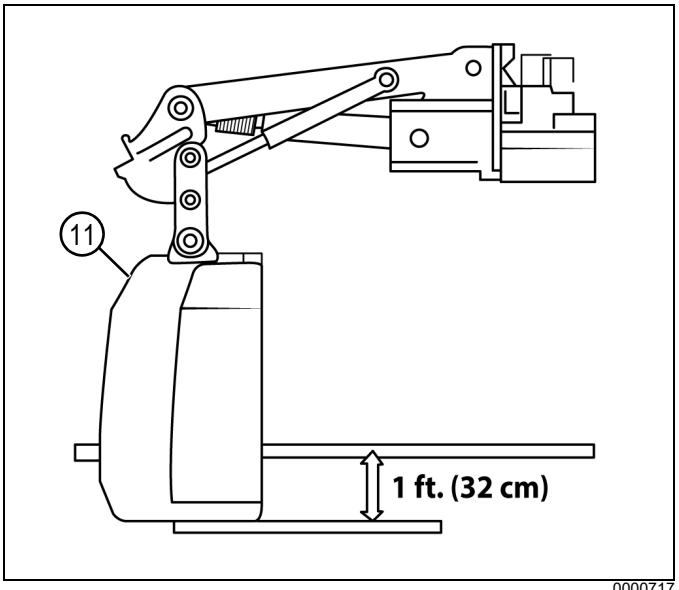


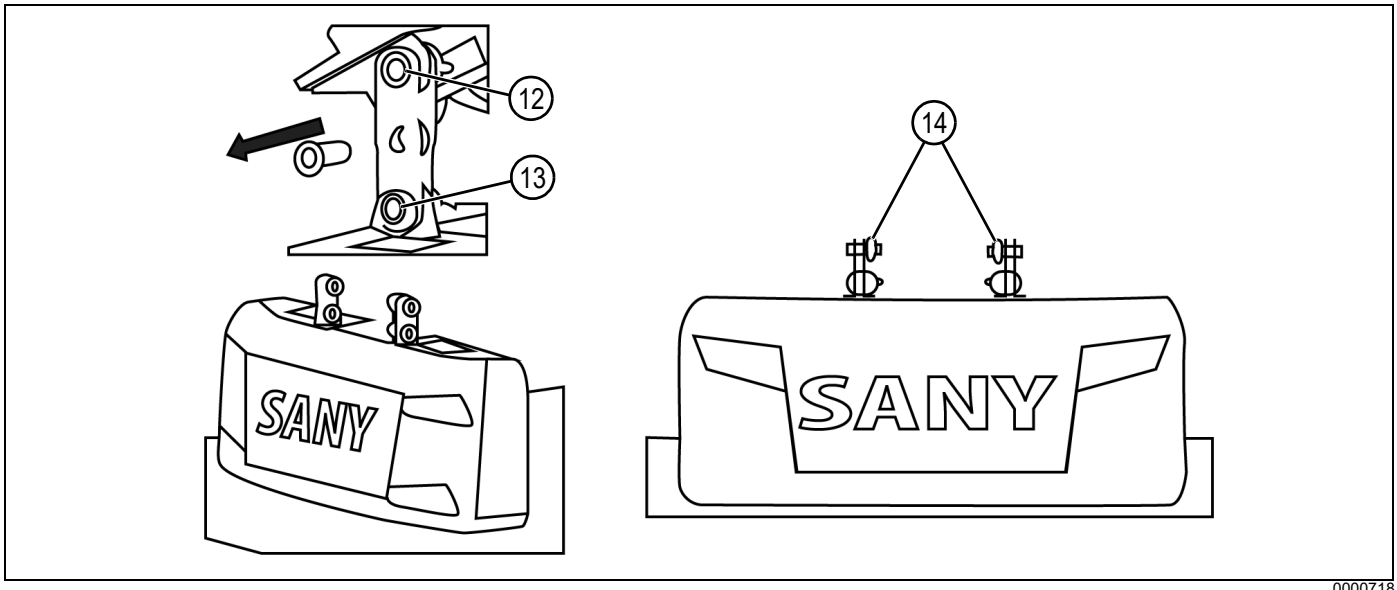
Figure 4-65

10. Lower the counterweight (11) to the ground.

WARNING

Do not move the counterweight onto a surface or area that cannot support its weight. The counterweight is heavy and could possibly break through surfaces that are not strong enough to support it, which could result in death or serious injury.

NOTE: *Make sure the ground is firm under the counterweight. Do not let the counterweight sink more than 1 ft. (32 cm) into the ground, or the machine may not be able to pick up the counterweight.*



0000718

Figure 4-66

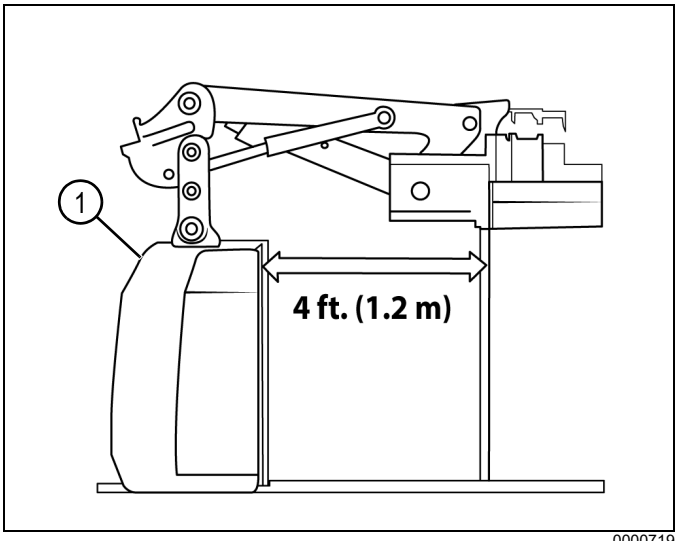
NOTE: *To aid in correct installation, record the location of the pins and shims before removing them.*

11. Remove the pin and linkages:
    - Upper linkage (12)
    - Lower linkage (13)
    - Lift points (14)
12. Raise the removal system back to its original position for transport.
13. Shut down the engine.

Counterweight Installation

NOTE: *Make sure that all shims are replaced in the same locations and are the same type/thickness as noted during removal.*

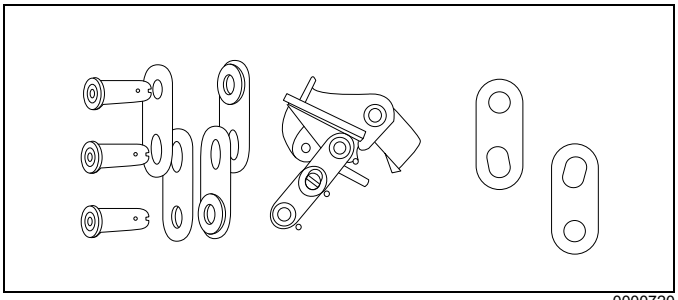
1. Install the counterweight in the reverse order of removal.
2. Tighten the mounting fasteners to 2249–2545 ft-lb (3050–3450 N•m).



0000719

Figure 4-67

3. With the counterweight (1) on the ground, the distance between the machine and the counterweight should not exceed 4 ft. (1.2 m).

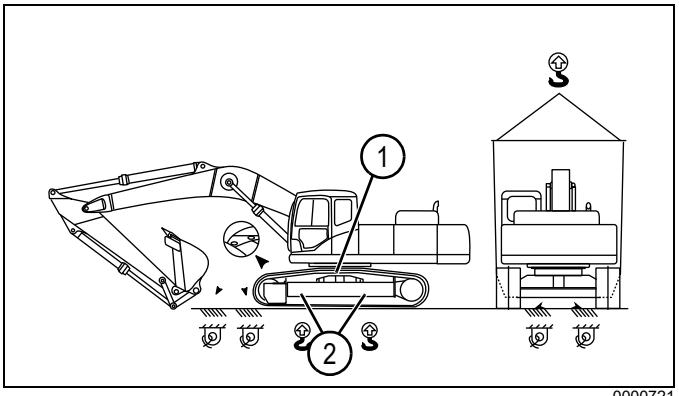


0000720

Figure 4-68

4. If reassembly is required for the linkage, follow the pattern shown.

Lifting the Machine



0000721

Figure 4-69

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

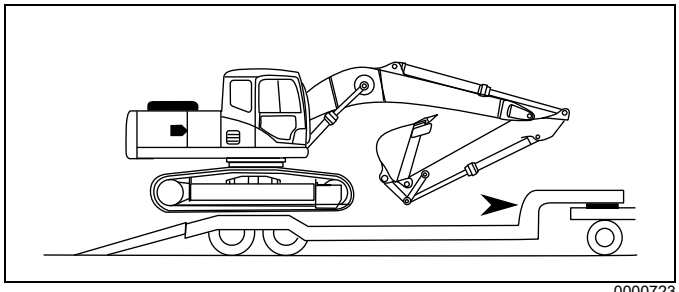
Loading the Machine

1. Clean the undercarriage.
2. Start the machine and allow it to reach operating temperature.
3. Position the machine so the centerline of the machine matches the centerline of the trailer.

0004938,0004957

Figure 4-70

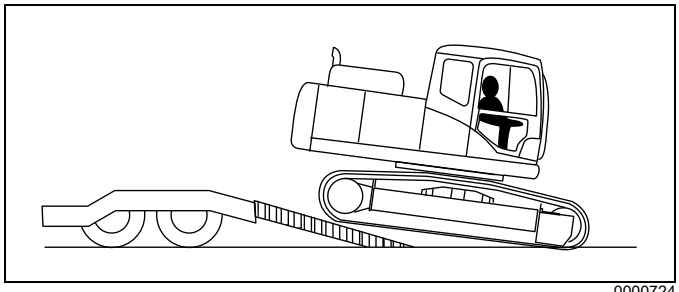
4. Press function button F2 (1) on the Main screen to set the auto-idle to OFF.
5. Press function button F3 (2) on the Main screen to set the travel speed to low.



0000723

Figure 4-71

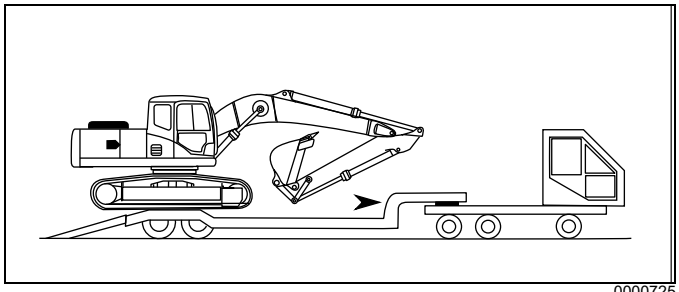
NOTE: *If work equipment is attached to the machine, the equipment should be positioned in front of the machine during loading.*



0000724

Figure 4-72

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

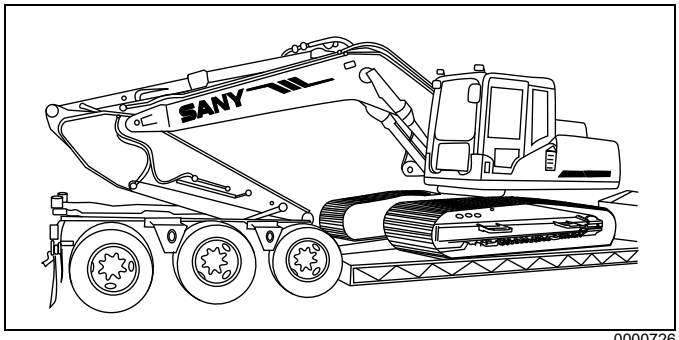


0000725

Figure 4-73

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

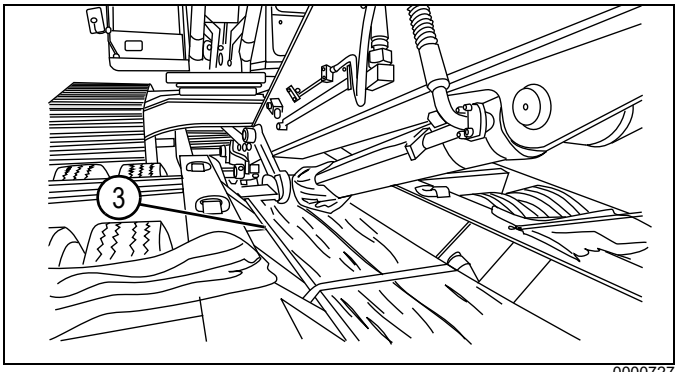
6. Move the machine slowly until the tracks have full contact with the trailer.
7. Raise the work equipment slowly and high enough to avoid hitting the trailer or truck.



0000726

Figure 4-74

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



0000727

Figure 4-75

9. Place a support block (3) on the trailer under the work equipment.
10. Fully extend the bucket cylinder arm and arm cylinder.
11. Lower the work equipment onto the support block.
12. Shut down the machine and remove the key from the key switch.
13. Close and lock the windows.
14. Exit the cab.

0000631

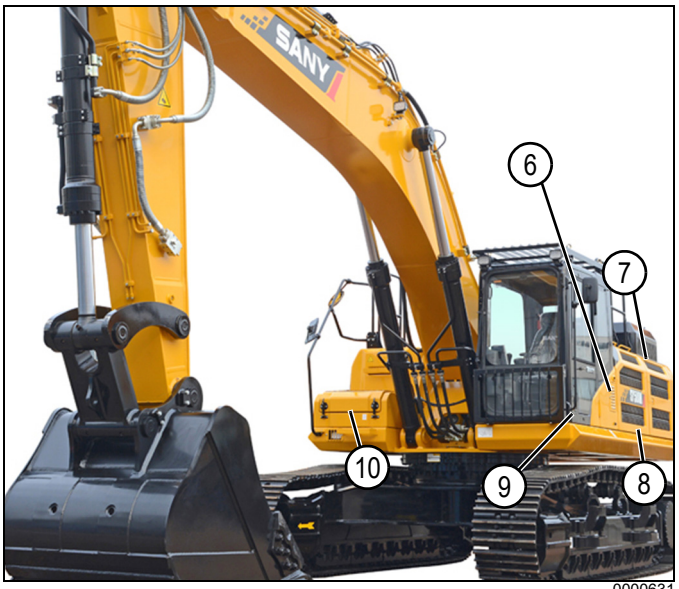
Figure 4-76

NOTE: *One outside mirror (4) is attached to the right side of the upper structure. The other mirror (5) is mounted to the cab.*

15. Turn both of the outside mirrors inward so they are within the perimeter of the machine.
16. Turn the battery disconnect switch to OFF.

NOTICE!

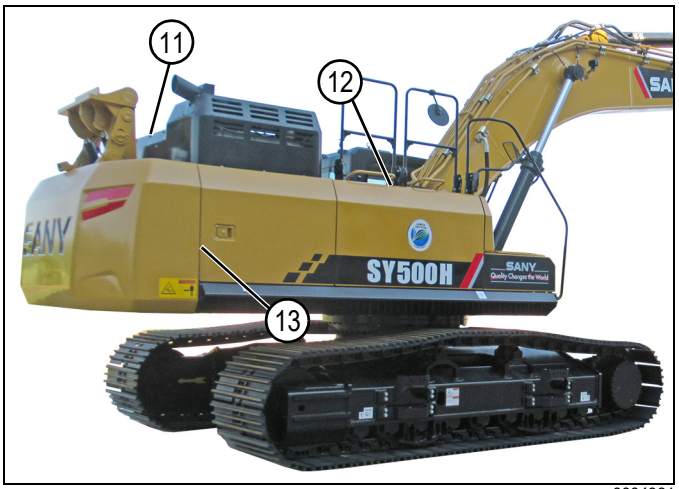
If disconnecting the battery, wait at least 1 minute before disconnecting the battery cables so the machine's ECM can complete its updating procedure. Failure to follow this notice can damage the machine or cause it to operate improperly.



0000631

Figure 4-77

17. Make sure the following items are secured and locked.
    - Air conditioner fresh-air inlet door (6)
    - Left rear access door (7)
    - Left front access door (8)
    - Cab access door (9)
    - DEF tank access door (10)

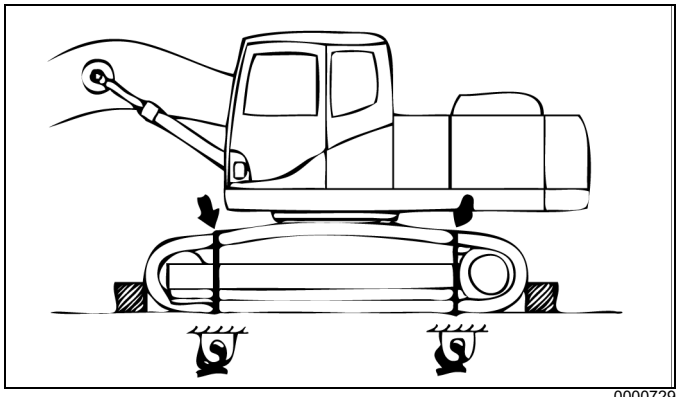


0004961

Figure 4-78

- Engine access door (11)
- Fuel tank (12)
- Right rear door (13)

18. Cover the exhaust opening (14) to prevent foreign material from entering during transport.



0000729

Figure 4-79

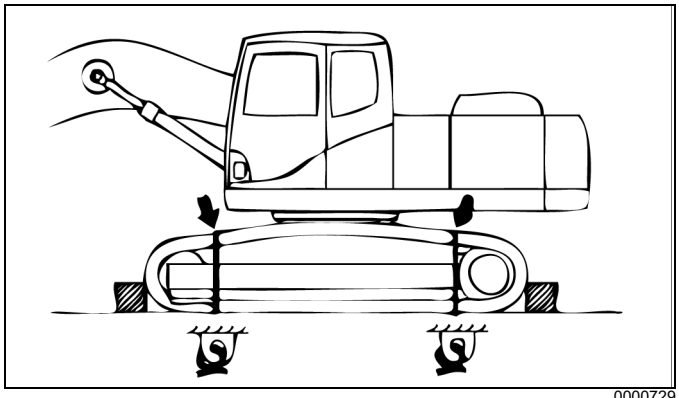
19. Secure the machine to the trailer with suitable tie-downs in accordance with all applicable laws and regulations.

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 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**

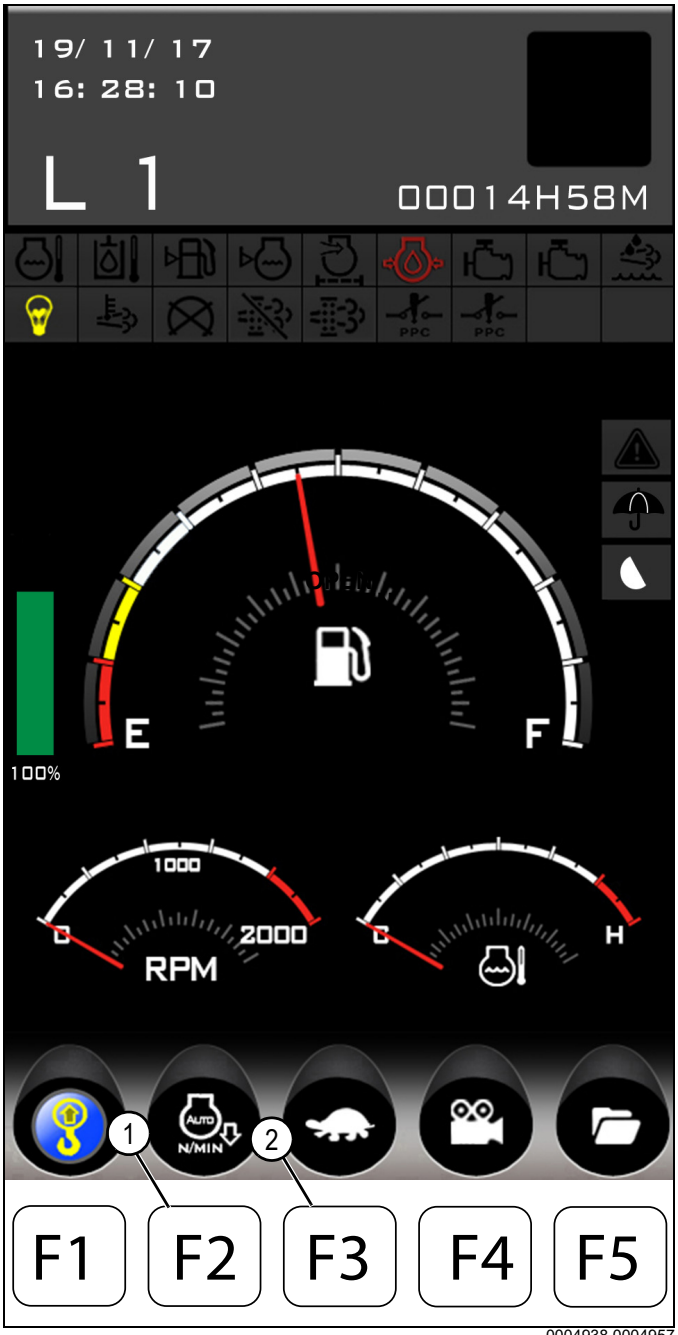
Failure to follow these warnings could result in death or serious injury.



0000729

Figure 4-80

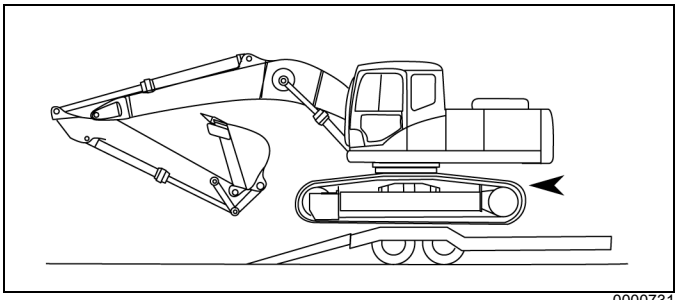
1. Chock the trailer wheels to prevent movement of the trailer during unloading.
2. Attach or construct ramps of suitable strength, width, and length to unload the machine.
3. Remove all tie-downs and blocks that secure the machine to the trailer.
4. Turn the exterior mirrors so the operator has a clear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



0004938,0004957

Figure 4-81

6. Press function button F2 (1) to set the auto-idle to OFF.
7. Press function button F3 (2) to set the travel speed to low.
8. Move the hydraulic lockout control lever to the unlocked (open) position. See “Hydraulic Lockout Control Lever” on page 3-8.
9. Raise the work equipment to clear the trailer.
10. Slowly drive the machine off the trailer.



0000731

Figure 4-82

11. 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.
12. Park the machine at the desired location.
13. Run the engine at low idle (approximately 1050 rpm) for 5 minutes.
14. Move the hydraulic lockout control lever to the locked (closed) position. See “Hydraulic Lockout Control Lever” on page 3-8.
15. Shut down the engine, remove the key from the key switch, and turn the battery disconnect switch to OFF.

NOTICE!

If disconnecting the battery, wait at least 1 minute before disconnecting the battery cables so the machine’s ECM can complete its updating procedure. Failure to follow this notice can damage the machine or cause it to operate improperly.

Chapter 5

Maintenance

Maintenance Information

Do not perform any maintenance and/or repairs unless the procedures are covered in this manual. Always follow all safety precautions

Checks Before Maintenance

Before proceeding with any inspection or maintenance procedures, read and understand the safety section of this manual, including the lockout/tagout procedure.

- Perform only maintenance that is covered in this manual's maintenance section for this machine.
- Avoid working on the machine while the engine is running unless required to do so in the procedure. If the engine must remain running during a procedure, always have a person in the cab who is visible at all times and can operate the machine correctly.
- 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

Always perform the following after completing any maintenance to the machine.

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

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

Hour Meter Reading

Record the hour meter reading on a daily basis. Compare meter readings with the required maintenance intervals listed in this manual.

Genuine SANY Replacement Parts

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

SANY-Approved Lubricants

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

Weld, Drill, Cut, or Grind on the Machine

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 1 minute before disconnecting the battery. Remove the negative battery cable from the negative (-) post of the battery.

The welding ground cable must be connected no more than 3.3 ft (1 m) from 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 battery chassis ground could damage the machine or personal property, or cause the machine to operate improperly.

Clean Parts of the Machine

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

NOTICE!

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

Securing Access Covers and Compartment Doors

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

Installation of Hydraulic Hoses

When disconnecting or connecting hydraulic hoses sealed by O-rings, clean the surfaces before installing new O-rings.

Never kink a hydraulic hose during removal or installation. Hydraulic hoses that have been kinked can be damaged internally and can have a considerably shorter service life.

Inspection and Maintenance in Adverse Environments

If the machine will be operating under adverse conditions:

- Check and clean all electrical components and connections. Clean electrical components and connections that show corrosion.
- Check and clean areas that are exposed to high levels of heat, such as the exhaust manifold and turbocharger, and keep them clear of combustible materials.

For heavy-load operation and deep excavation, grease the work equipment pins before operating. Cycle the boom, arm, and bucket several times before adding additional grease.

Mud, Rain, or Snow Conditions

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

Near Ocean (Salt Air) Environments

Before operating the machine, inspect for any sign of corrosion. Apply grease where corrosion is found.

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

Dusty Environment

Clean or replace the following components:

- Immediately service the air filter and air filter housing if the air filter alarm indicates service is required.
- Clean the fins and other cooling system parts on a regular basis to avoid overheating.
- Replace the fuel filter on a regular basis or as required.
- Clean the electrical components, including the starter motor and the alternator, to prevent dust buildup, and check terminals for corrosion and loose connections.
- When servicing the machine, park the machine in a dust-free location to prevent contamination of open components.

Rocky Ground Surface

The track should be set slightly looser than what is required for other environments. While track sag is normally 0.75 in.–1.75 in. (19 mm–45 mm), SANY recommends that you loosen the track tension to 1.75 in. (45 mm) for rocky ground surfaces only. Inspect the tracks for damage, such as cracks and loose or missing fasteners.

Cold Environments

In extremely cold environments, such as 32°F (0°C), lubricate only with the oils shown in “Engine Oil Viscosity/Temperature Data” on page 5-7. SANY recommends the use of fuels identified in “Fluids and Lubricants” on page 5-6 for extremely cold environments. Prior to starting the engine, make sure the battery is fully charged and that the battery and its cables have not cracked.

Other Weather Environments

NOTE: *If there are bearings or bushings that are overheating, loose, or corroded during regular inspection, perform repairs and increase the lubrication frequency.*

Based on past experience and suggestions by lubrication suppliers, the lubrication intervals listed in the following tables apply only to normal operating conditions. In harsh environments, including those with dusty or corrosive air, abnormal external temperature, extremely heavy overload, frequent operating times, or extended duty cycles, the lubrication intervals should be shortened.

Fluids and Lubricants

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

NOTICE!

Never mix fluids of different types or viscosities (weights), and never overfill the system you are servicing. This can cause machine damage or improper machine operation.

Location, Capacity, and Type

NOTE: *The following listed capacities are approximate only. For exact capacities, use the inspection points, inspection plugs, dipsticks, and sight glasses.*

NOTE: See “Collect Oil Samples” on page 5-6

Location	Approx. Capacity	Lubricant/Coolant
Engine	8.7 gal. (33 L)	See “Engine Oil Viscosity/Temperature Data” on page 5-7.
Fuel system	179.7 gal. (680 L)	Use #2 diesel fuel or a mixture of #2 diesel and #1 diesel fuels in cold weather conditions.
Engine cooling system	13.2 gal. (50 L)	Use SANY-approved coolant. Contact a SANY dealer for more information.
Swing gearbox	3.7 gal. (14 L)	See “Industrial Gear Oil/Temperature Data” on page 5-7.
Final drive	2.6 gal. (10 L) (each side)	
Hydraulic system (including tank)	126.8 gal. (480 L)	See “Hydraulic Oil/Ambient Temperature Data” on page 5-8.
Swing bearing gear bath		NGLI #2 molybdenum disulfide grease.
Diesel exhaust fluid (DEF)	14.7 gal. (56 L)	Any DEF meeting the standard of DIN 70700 or ISO 2224101.
Anaerobic sealant	NA	Contact a SANY dealer.
Spray lubricant	NA	Any lithium-based spray lubricant.

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.

⚠ WARNING

To ensure the validity of the oil sample, it is critical that all the materials used to collect the sample are absolutely clean.

Failure to adhere to this warning can cause equipment damage and contaminate the sample.

3. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
4. Obtain and send the oil sample for testing in accordance with the instructions included with the sample kit.

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: Use any engine oil meeting Cummins® Engine Standard Classification (CES) 20081. 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 a majority of climates. In some circumstances, short-term use of low-viscosity engine oil in cold 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 extreme pressure (EP) grease when greasing the machine. Avoid using low-viscosity greases. SANY recommends EP 2 or equivalent grease. See “Grease” on page 5-8.

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)
220 LS2 (85W-140)								

NOTE: Use any brand meeting AGMA standard 9005-D94, ISO 3448 grade 220. Short-term use of low-viscosity engine oil in cold temperatures (below 23°F [-5°C]) promotes engine life. Long-term use of low-viscosity engine oil can reduce engine life.

Hydraulic Oil/Ambient Temperature Data

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 anti-wear hydraulic oil									
ISO VG 32 low temperature anti-wear hydraulic oil									

NOTE: Select the proper hydraulic oil based on local operating climate and conditions:

- Use ISO VG 46 anti-wear hydraulic oil in generally temperate climates.
- Use ISO VG 32 low-temperature anti-wear hydraulic oil (pour point is -43.6°F [-42°C]) in generally arctic areas where ambient temperatures can reach -22°F (-30°C) during operation.

NOTICE!

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

- **Start the engine and run it at idle speed for 7 to 10 minutes. Increase the engine speed to 1200 rpm and perform only no-load traveling for a minimum of 30 minutes or until the hydraulic oil temperature is at least 68°F (20°C).**
- **Proceed with normal operation only after completing the warm-up as described above, or adjust the warm-up period according to the ambient temperature. During normal operation, take care to operate the controls slowly and observe the traveling system for any signs of trouble. Operation with oil temperature of 68°F (20°C) or below may damage the hydraulic system.**

Diesel Exhaust Fluid (DEF)

All diesel exhaust fluid (DEF) must meet ISO 22241-1.

Engine Coolant

Any engine coolant brand meeting Cummins® Engine Standard Classification (CES) 14603 may be used. Cummins recommends the use of Fleetguard® ES Compleat™ coolant.

Lubricants

NOTICE!

Use only lubricants recommended in this manual. Using other lubricants can damage the machine and could cause improper machine operation.

Contact a SANY dealer for assistance if the machine will be operated in subzero temperatures where the use of an auxiliary heating device is required.

Grease

Always use clean extreme pressure (EP) grease when greasing this machine. Avoid using low-viscosity greases. SANY recommends an EP 2 or equivalent grease designed for:

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

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. In cold weather climates, use a mixture of #2 diesel and #1 diesel fuels.

• Use only ultra-low sulfur fuel, with a limit of S<15 mg/kg 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.

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.

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 with the hydraulic oil.
- Replace hydraulic oil that has been subjected to overheating or damaged components.
- Change the hydraulic filter as recommended.
- Keep the tank filled to the full level of hydraulic oil.
- Keep the oil cooler free of dust and debris.
- Cap and plug all openings when removing components for service or repair.

NOTICE!

Failure to inspect hydraulic oil for contamination may damage the hydraulic system or cause the machine to operate improperly.

Maintenance Schedule

NOTICE!

Failure to perform the following procedures when and as directed can damage the machine and cause it to operate improperly.

NOTE: *The lubricating intervals listed in the following tables apply only to normal operating conditions. In harsh environments, including those with dusty or corrosive air, extreme temperatures, heavy loads, frequent operating times, or long duty cycles, lubricating intervals should be shortened.*

Daily Maintenance and Inspection

- Inspect the machine for loose or missing components.
- Clean the cab.
- Lubricate the work equipment. (See page 5-62.)
- Make sure all safety decals are in place and are legible.
- Make sure safety equipment is in place and in operating condition.
- Check all controls for smooth operation and make sure they return to the neutral position.
- Check if the engine fan belt is loose or damaged. (See page 5-17.)
- Check if the air conditioner compressor belt is loose or damaged. (See page 5-21.)
- Check for fluid leaks.
- Check the operation and maintenance manual. (See page 1-2.)
- Check the escape tool. (See page 5-58.)
- Check the fire extinguisher. (See page 5-58.)
- Check the engine oil level. (See page 5-14.)
- Check the engine coolant level. (See page 4-5.)
- Check the hydraulic oil level. (See page 5-33.)
- Drain water from the fuel/water separator. (See page 5-30.)

When Required

- Check the cooling package. (See page 5-20.)
- Check the track tension. (See page 5-51.)
- Check the windshield washer fluid. (See page 5-60.)
- Replace the bucket teeth. (See page 5-57.)
- Replace the bucket. (See page 5-56.)
- Check the air filter if a restriction warning is displayed. (See page 3-26.)

After the First 50 Hours

- Initial change of the engine oil and filter. (See page 5-15.)
- Lubricate the swing bearing. (See page 5-53.)
- Drain sediment and water in fuel filter. (See page 5-30.)
- Check air cleaner and connection of air intake line. (See page 5-12.)

Weekly or Every 50 Hours

- Lubricate the bucket linkage pins. (See page 5-62.)
- Check the batteries. (See page 5-43.)
- Check the hydraulic hoses, lines, and connectors. (See page 5-34.)
- Check the final drive oil level. (See page 5-47.)
- Check the final drive motor mounting fasteners. (See page 5-47.)
- Check and adjust the track tension. (See page 5-51.)

Every 100 Hours

NOTE: *Make sure all daily and 50-hour maintenance tasks have been completed before proceeding with the 100-hour maintenance tasks.*

- Lubricate the machine. (See page 5-62.)

Every 250 Hours

NOTE: *Make sure all daily, 50-hour, and 100-hour maintenance tasks have been completed before proceeding with the 250-hour maintenance tasks.*

- Change the engine oil and filter. (See page 5-15.)
- Replace the hydraulic oil filter after 250 hours with a breaker operating rate above 50%.
- Check the doors and hood. (See page 4-6.)
- Check the track tension. (See page 5-51.)
- Inspect and adjust air conditioner compressor belt tension. (See page 5-21.)

Every 3 Months or 500 Hours

NOTE: *Make sure all daily, 50-hour, 100-hour, and 250-hour maintenance tasks have been completed before proceeding with the 500-hour maintenance tasks.*

- Lubricate the swing bearing. (See page 5-53.)
- Check the swing grease bath level. (See page 5-55.)

- Inspect and clean the radiator, hydraulic oil cooler, and condenser fins. (See page 5-20.)
- Replace the secondary fuel filter. (See page 5-29.)
- Replace the fuel filter water separator element. (See page 5-29.)
- Replace the engine air filter. (See page 5-13.)
- Replace the hydraulic tank breather filter element. (See page 5-38.)
- Replace the cab fresh-air filter. (See page 5-22.)
- Collect an engine oil sample. (See page 5-14.)
- Collect a hydraulic oil sample. (See page 5-32.)
- Collect a final drive oil sample (both). (See page 5-47.)
- Replace the final drive oil. (See page 5-48.)

Every 6 Months or 1000 Hours

NOTE: *Make sure all daily, 50-hour, 100-hour, 250-hour, and 500-hour maintenance tasks have been completed before proceeding with the 1000-hour maintenance tasks.*

- Pressure-wash and clean the entire machine. Do a complete machine structural inspection.
- Check the fuel tank strainer. (See page 5-28.)
- Check the fuel lines for leaks or damage. Replace as necessary.
- Check the accumulator function. (See page 5-30.)
- Clean the hydraulic oil suction strainer. (See page 5-41)
- Replace the hydraulic tank return filter. (See page 5-40.)
- Replace the hydraulic oil pilot filter element. (See page 5-37.)
- Replace the hydraulic case drain filter element. (See page 5-32.

Annually or Every 2000 Hours

NOTE: *Make sure all daily, 50-hour, 100-hour, 250-hour, and 1000-hour maintenance tasks have been completed before proceeding with the 2000-hour maintenance tasks.*

- Check the alternator. (See page 5-17.)
- Check the starter. (See page 5-17.)
- Check the engine valve clearance. (Contact a SANY dealer for more information.)
- Replace the hydraulic oil. (See page 5-35.)
- Replace the engine coolant. (See page 5-18.)
- Replace the final drive oil. (See page 5-48.)

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!

The hydraulic oil filter must be replaced after 250 hours with a breaker operating rate above 50%.

See “Replace the Hydraulic Oil” on page 5-35.

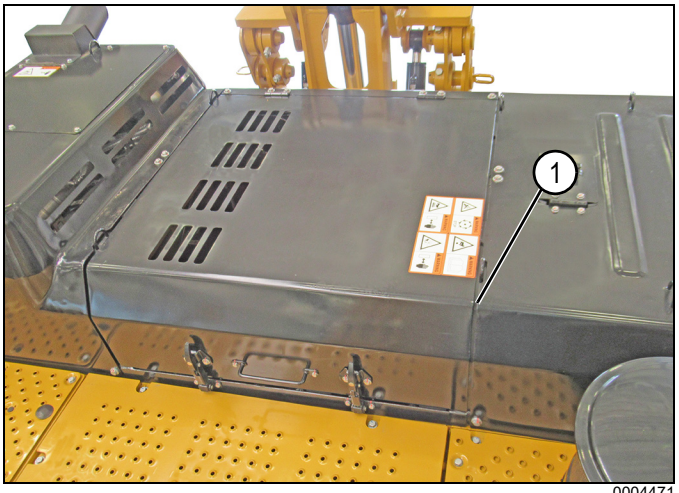
After Maintenance is Completed

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

Engine

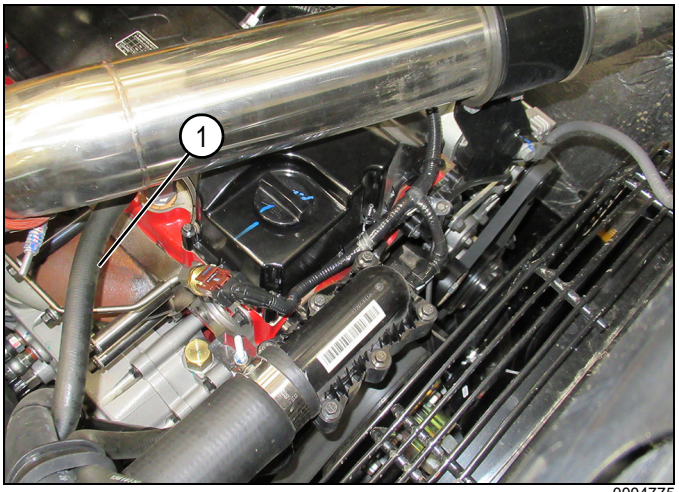
Check the Crankcase Breather Tube



0004471

Figure 5-1

1. Open the engine access door. See “Engine Access Door” on page 4-10.



0004775

Figure 5-2

2. Inspect the crankcase breather tube (1) for any damage. Replace the crankcase breather tube as necessary for:
   - Cracks
   - Restriction
   - Material deterioration
   - General damage

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

3. Close the engine access door. See “Closing the Engine Access Door” on page 4-11.

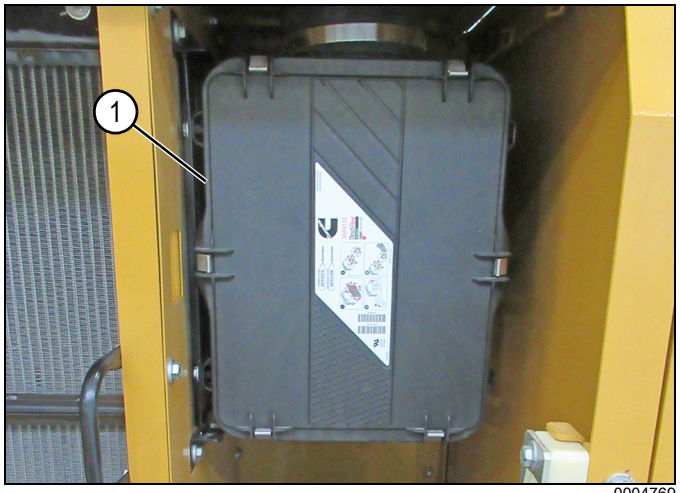
Check the Engine Air Precleaner

0004989

Figure 5-3

1. Check the engine air precleaner annually.
2. Remove the cover, inspect, and remove any debris.

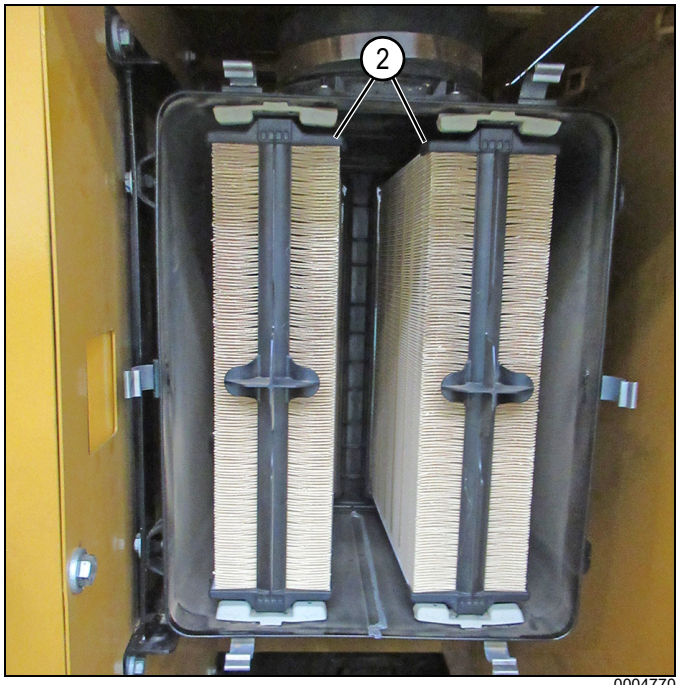
Check the Engine Air Filter System



0004769

Figure 5-4

1. Locate the engine air filter housing (1) behind the left front door. See “Opening the Left Front Access Door” on page 4-9.



0004770

Figure 5-5

2. Open the air filter housing and remove the air filters (2).
3. Inspect the air filters for damage or moisture and replace as necessary.

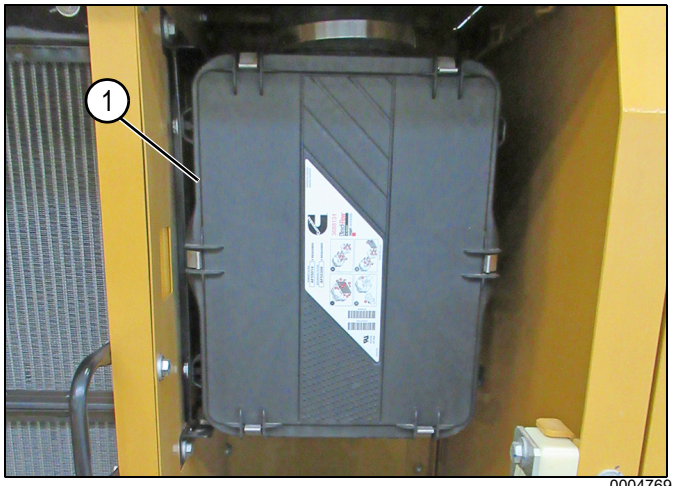
NOTE: *If any damage or moisture is present, change the air filters immediately.*

NOTICE!

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

4. Clean the inside of the air filter housing with a clean cloth.
5. Install the air filters.
6. Close the air filter housing.
7. Close the left front access door. See“Closing the Left Front Access Door” on page 4-9.

Replace the Engine Air Filter



0004769

Figure 5-6

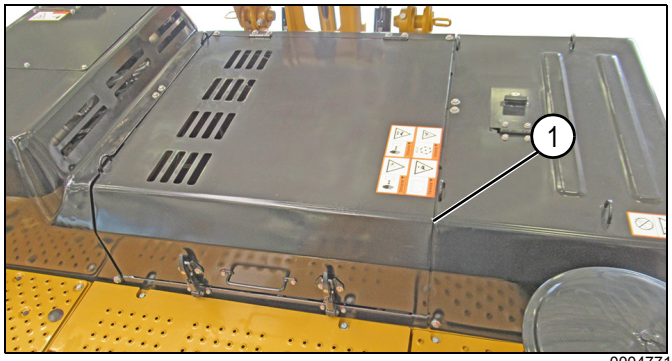
1. Locate the engine air filter housing (1) behind the left front door. See “Opening the Left Front Access Door” on page 4-9.

0004770

Figure 5-7

2. Open the air filter housing and remove the air filters (2).
3. Clean the inside of the air filter housing with a clean cloth if needed.
4. Install new air filters.
5. Close the air filter housing.
6. Close the left front access door. See “Closing the Left Front Access Door” on page 4-9.

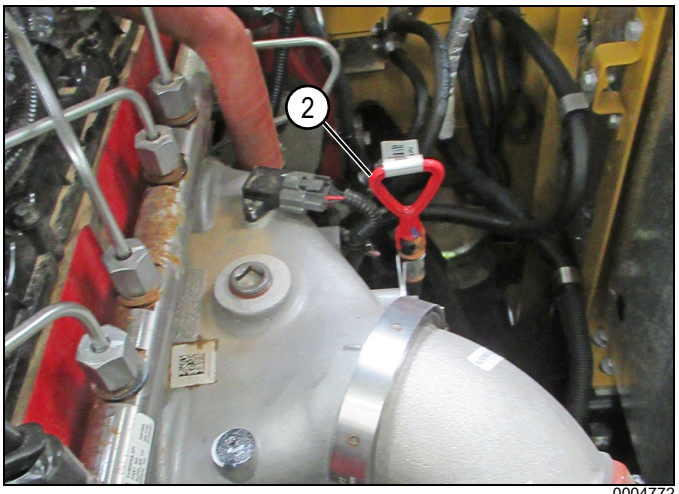
Check the Engine Oil Level



0004771

Figure 5-8

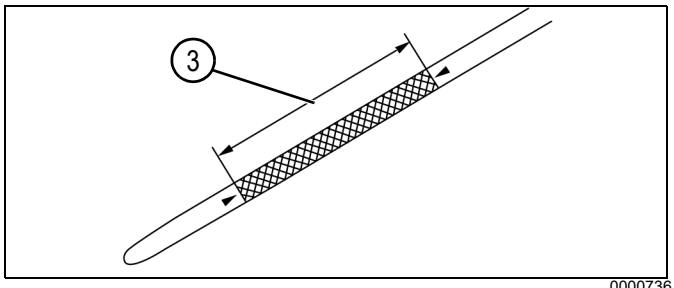
1. Open the engine access door (1). See “Engine Access Door” on page 4-10e.



0004772

Figure 5-9

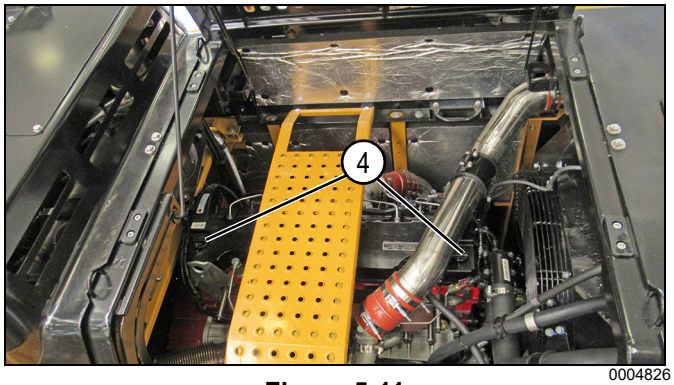
2. Locate the engine oil dipstick (2) in the engine compartment.
3. Remove the dipstick from the engine and wipe it with a clean cloth.
4. Insert the dipstick fully into the holder, wait a few seconds, and remove the dipstick.



0000736

Figure 5-10

5. Make sure the oil level is within the etched area (3) of the dipstick.
6. Insert the dipstick.



0004826

Figure 5-11

7. Add oil through either of the two oil filler openings (4), but only if the level is below the etched area on the dipstick.
8. Close and secure the engine access door. See “Closing the Engine Access Door” on page 4-11.

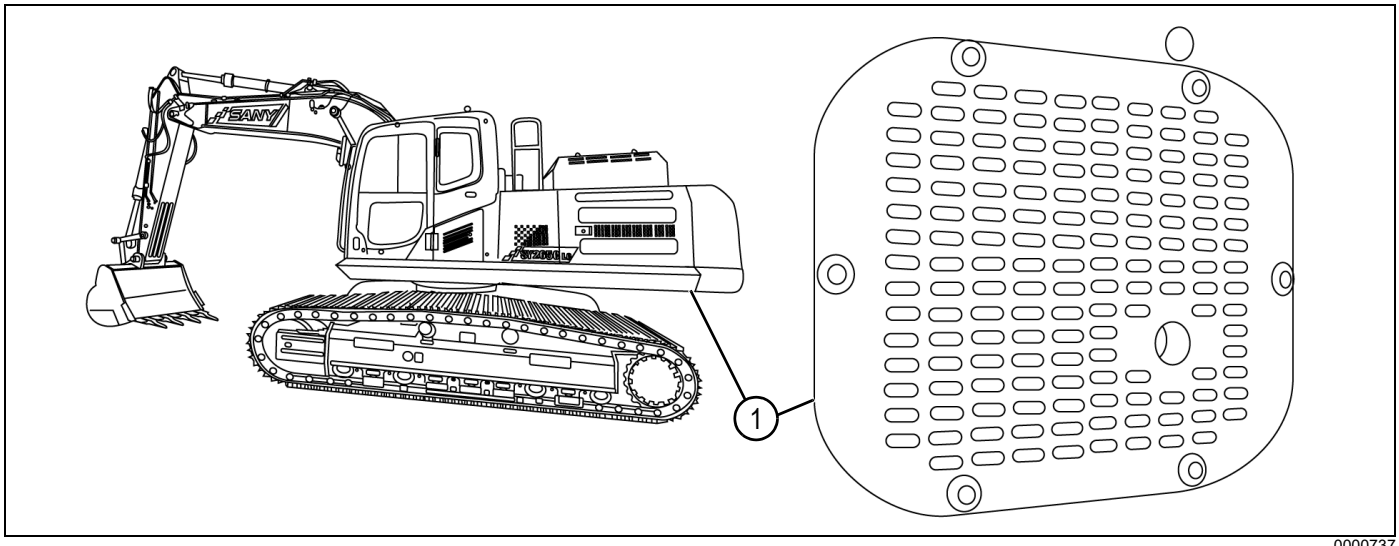
NOTICE!

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

Collect an Engine Oil Sample

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Start the engine and operate the machine for all systems to reach normal operating temperatures.
3. Shut down the engine and open the engine access door. See “Engine Access Door” on page 4-10.
4. Clean the area around the engine oil dipstick.
5. Remove the dipstick.
6. Insert the oil sample tube into the dipstick tube.
7. Collect a sample of engine oil.
8. Remove the oil sample tube.
9. Replace the dipstick.
10. Close and secure the engine access door.
11. Follow the instructions included with the sample kit to send the sample for testing.

Replace the Engine Oil and Filter



0000737

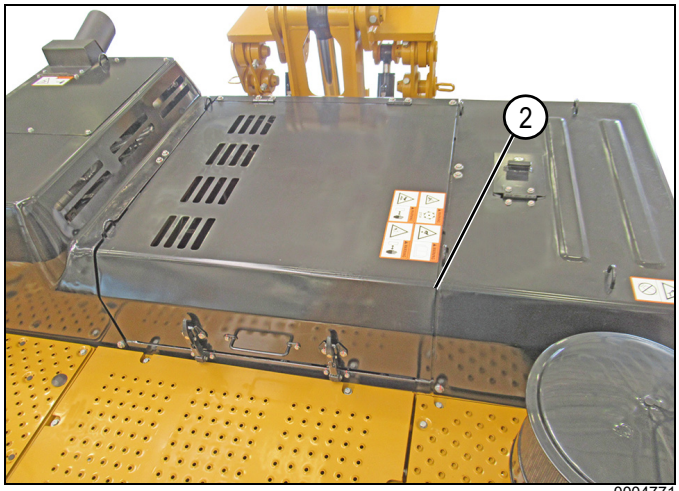
Figure 5-12

NOTE: *Inspect the drained oil and filter for signs of metal particles and foreign material. Collect a sample of engine oil for analysis.*

WARNING

Do not perform this task when the engine is hot. A hot engine and components may cause severe burns or other serious injury. Wait for the engine to cool before proceeding.

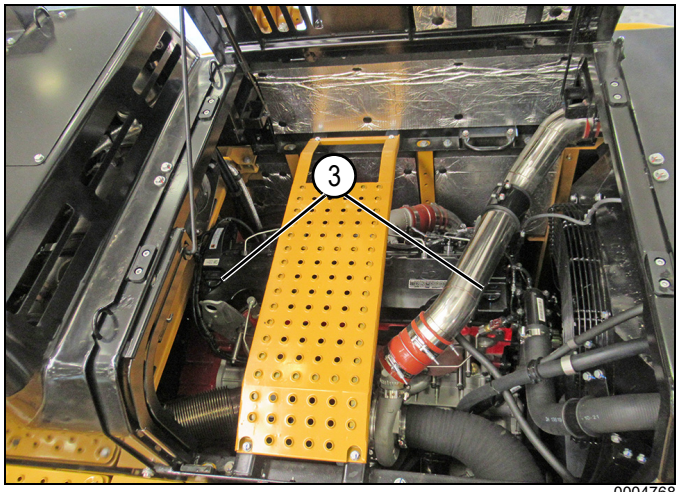
1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Remove the machine bottom cover (1) under the engine compartment.



0004771

Figure 5-13

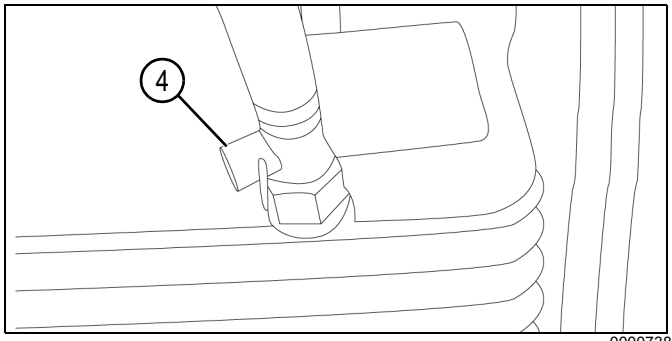
3. Open the engine access door (2). See “Engine Access Door” on page 4-10.



0004768

Figure 5-14

4. Loosen either of the two engine oil filler caps (3).



0000738

Figure 5-15

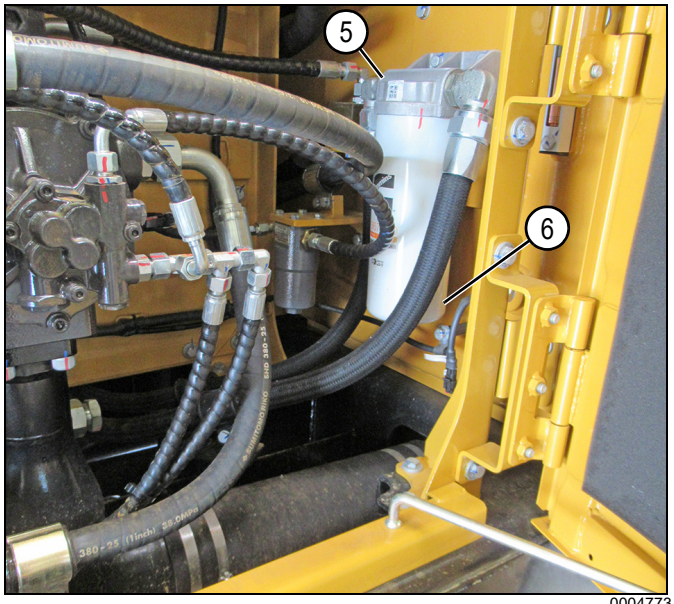
NOTE: *For engine oil capacity, see “Location, Capacity, and Type” on page 5-6.*

5. Place a suitable sized container under the engine oil drain valve (4).
6. Slowly open the drain valve to drain the oil.

7. Close the drain valve when the oil has completely drained from the engine.
8. Install the machine's bottom cover.

NOTICE!

Dispose of used oil in accordance with all applicable environmental regulations. Failure to do so could damage the environment.



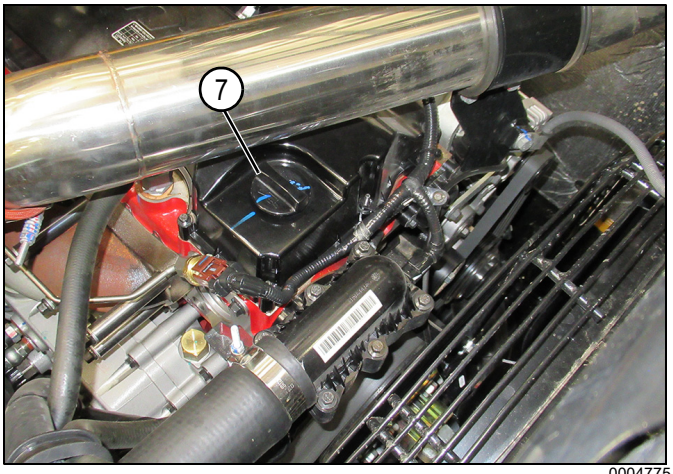
0004773

Figure 5-16

9. Locate the engine oil filter (6) behind the right rear door. See "Right Rear Access Door" on page 4-8.
10. Place a container under the engine oil filter.
11. Remove the oil filter using a suitable filter wrench.
12. Clean the engine oil filter mount (5).
13. Clean the oil filter mounting surface.
14. Coat the new filter seal ring with a thin layer of engine oil.
15. Fill the new filter with clean engine oil.
16. Thread the new filter into place on its mount until the filter gasket touches the filter mount, then tighten the filter by hand an additional 3/4 of a turn.
17. Remove the engine oil filler cap.

NOTE: *Do not overfill the engine with oil. Overfilling of oil could result in machine damage or improper machine operation.*

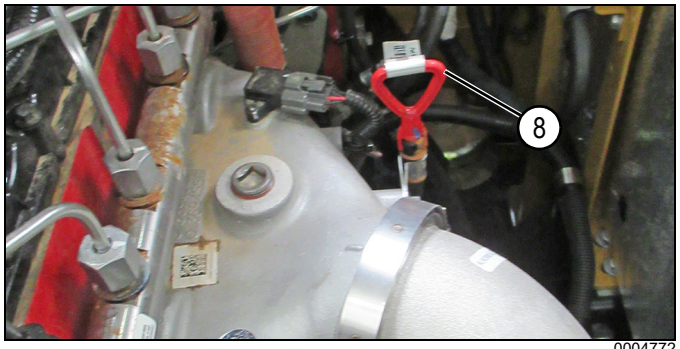
18. Add oil as needed. See "Location, Capacity, and Type" on page 5-6 for engine capacity.



0004775

Figure 5-17

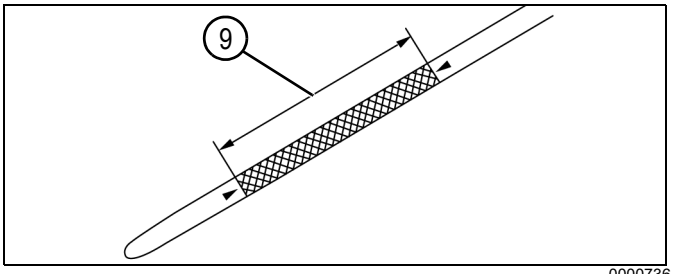
19. Install the engine oil filler cap (7).



0004772

Figure 5-18

20. Remove the dipstick (8) from the engine and note the oil level.



0000736

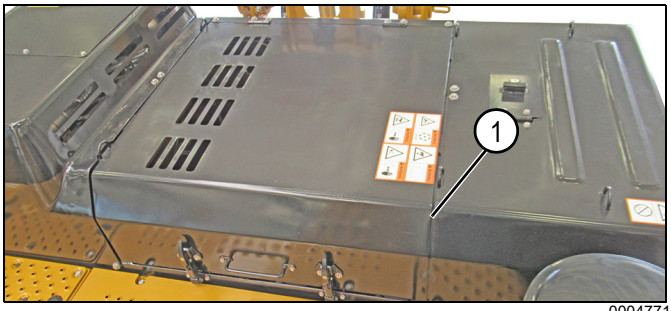
Figure 5-19

NOTE: *The oil level should be within the etched area (9) of the dipstick.*

21. If the oil is below the etched area, remove the engine oil filler cap, then add engine oil until the oil level is within the etched area.
22. Install the oil filler cap.
23. Start and run the engine at idle speed while checking for oil leaks.
24. Shut down the engine, wait several minutes, then remove the dipstick from the engine and note the oil level.
25. If necessary, remove the oil filler cap, add oil as needed, then install the filler cap.

26. Close right rear access door. See “Right Rear Access Door” on page 4-8.
27. Close engine access cover. See “Engine Access Door” on page 4-10.

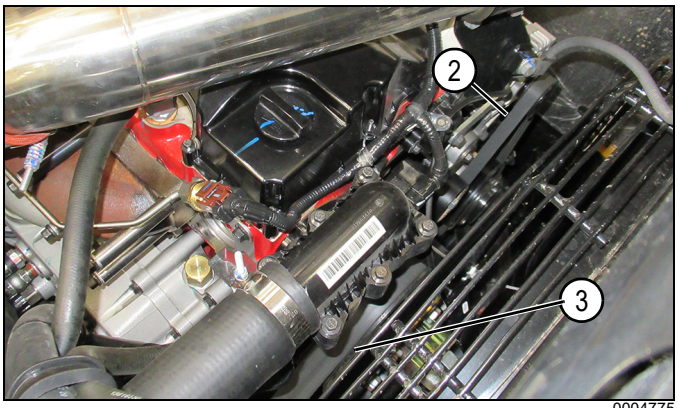
Check the Engine Belts



0004771

Figure 5-20

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Open the engine access door (1). See “Engine Access Door” on page 4-10.



0004775

Figure 5-21

3. Locate the engine serpentine belt (3) and alternator belt (2), and inspect for wear, cuts, cracks, or damage.
4. Replace as necessary.
5. Close the engine access door. See “Engine Access Door” on page 4-10.

Check the Alternator

Contact a SANY dealer for inspection.

Check the Starter

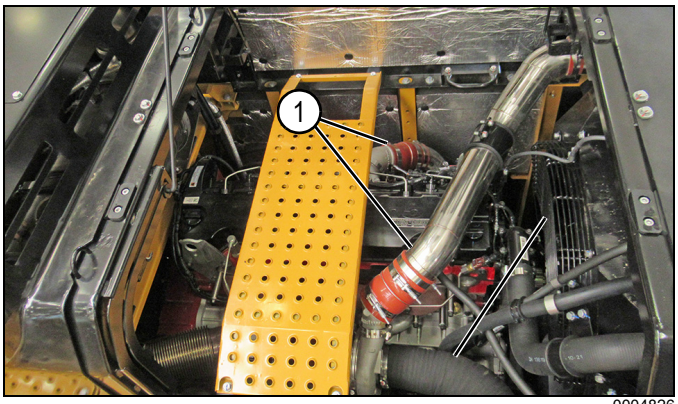
1. Prepare the machine for checks and inspections. See “Maintenance Safety” on page 2-4.
2. Open the appropriate access covers or compartment doors. See “Access Doors, Panels, and Covers” on page 4-6.
3. Turn the key switch to the START position and listen for abnormal noise and operation.

   Some symptoms 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.

If the starter is malfunctioning, contact a SANY dealer for additional information.

Check the Air Intake and the Charge Air Piping



0004826

Figure 5-1

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Open the engine access door. See “Engine Access Door” on page 4-10.
3. Inspect the intake piping (1) for wear points and damage to piping, loose clamps, and punctures that can damage the engine.
4. Replace damaged pipes and tighten loose clamps as necessary to prevent the air system from leaking.

NOTE: *Tighten all clamps to 6 lb-ft (8 N•m).*

5. Check for corrosion under the clamps and hoses of the intake system piping. Corrosion can allow corrosive products and dirt to enter the intake system. Disassemble and clean as necessary.
6. Inspect the charge air piping and hoses for any damage or loose connections.
7. Repair or replace hose clamps as necessary.
8. Close the engine access door. See “Engine Access Door” on page 4-10.

Cooling System

Replace the Engine Coolant

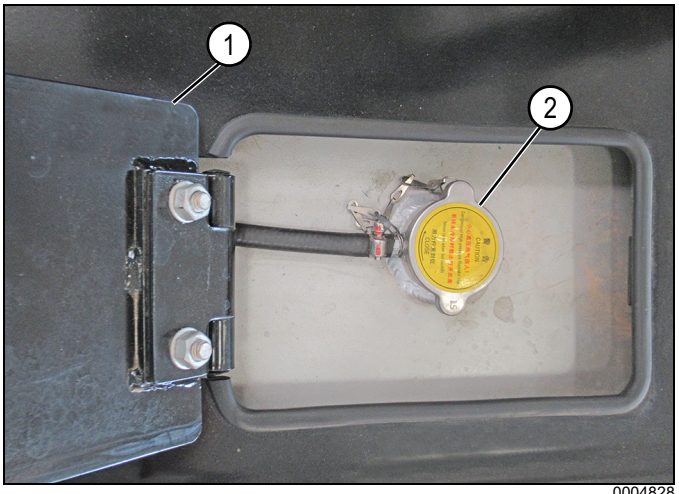
WARNING

Engine coolant is toxic and could result in death or serious injury. Avoid inhaling or ingesting engine coolant.

CAUTION

Do not remove the radiator cap while the engine is hot. Engine coolant is under pressure when hot and could spray out, which could result in burns or serious injury. Always wait for the engine to cool before removing the radiator cap.

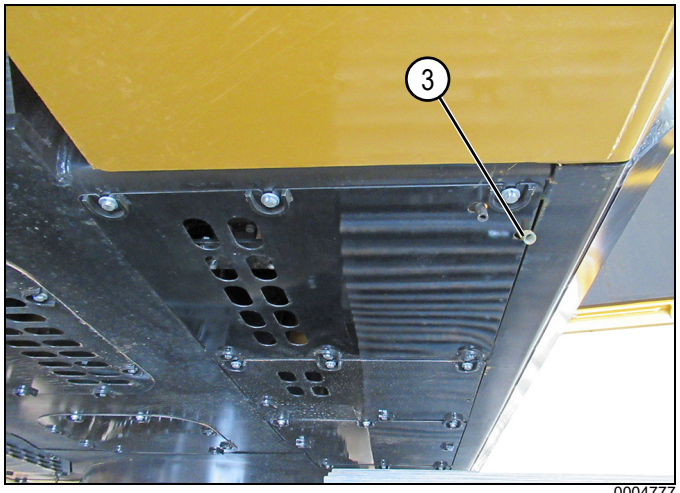
1. Swing the upper structure to allow easy access to the drain valve beneath the radiator.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
3. Open the engine access door. See “Engine Access Door” on page 4-10.



0004828

Figure 5-2

4. Open the expansion tank access door (1). See “Expansion Tank Access Door” on page 4-10.
5. Slowly open the filler cap (2) on top of the expansion tank to release the cooling system pressure.
6. Remove the cap when all pressure has been relieved.

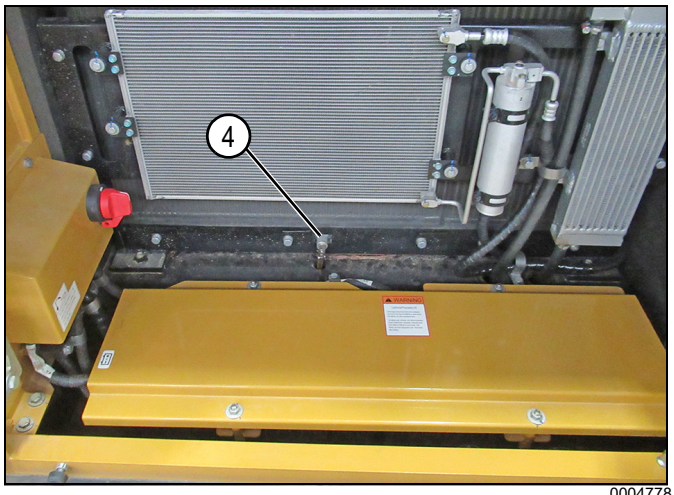


0004777

Figure 5-3

NOTE: *For engine cooling system capacity. See “Location, Capacity, and Type” on page 5-6.*

7. Place a suitable sized container under the radiator drain hose (3).



0004778

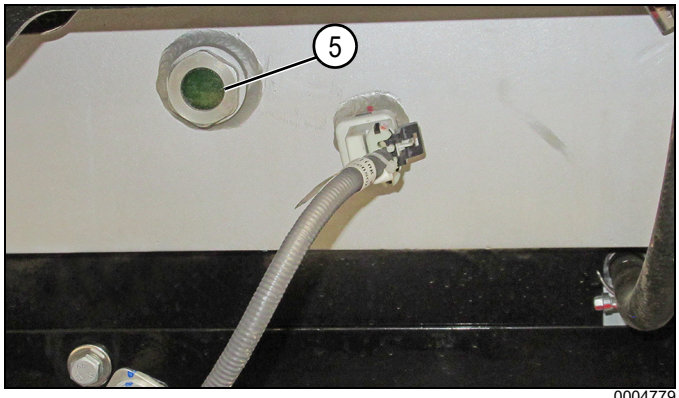
Figure 5-4

8. Open the left rear access door. See “Left Rear Access Door” on page 4-8.
9. Open the radiator drain valve (4).

NOTICE!

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

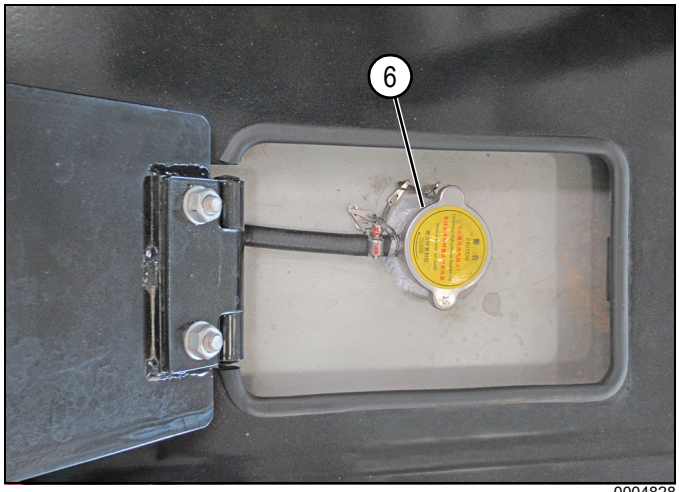
10. Allow the coolant to completely drain into the container, then close the drain valve.



0004779

Figure 5-5

11. Add new coolant directly into the expansion tank filler opening until the coolant is visible in the sight glass (5) on the side of the expansion tank.
12. Start and run the engine at idle speed for five minutes and turn on the cab heater to allow the coolant level to stabilize.
13. Turn the engine off.
14. Check the coolant level at the sight glass.
15. If necessary, add more coolant.



0004828

Figure 5-6

16. Install the expansion tank filler cap (6).
17. Close the expansion tank access door. See “Expansion Tank Access Door” on page 4-10.
18. Close the engine access door. See “Engine Access Door” on page 4-10.

Check the Engine Coolant Level

WARNING

Engine coolant is toxic and could result in death or serious injury. Avoid inhaling or ingesting engine coolant.

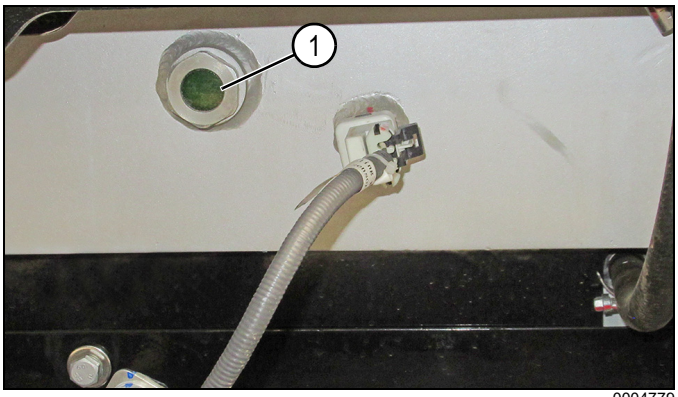
CAUTION

Do not remove the radiator cap while the engine is hot. Engine coolant is under pressure when hot and will spray out, which could result in burns or serious injury. Always wait for the engine to cool to outdoor ambient temperatures before removing the radiator cap.

NOTICE!

Dispose of the coolant in accordance with all applicable environmental regulations. Failure to do so could damage the environment.

1. Turn the engine off.
2. Open the engine access door. See “Engine Access Door” on page 4-10.
3. Open the expansion tank access door. See “Expansion Tank Access Door” on page 4-10.

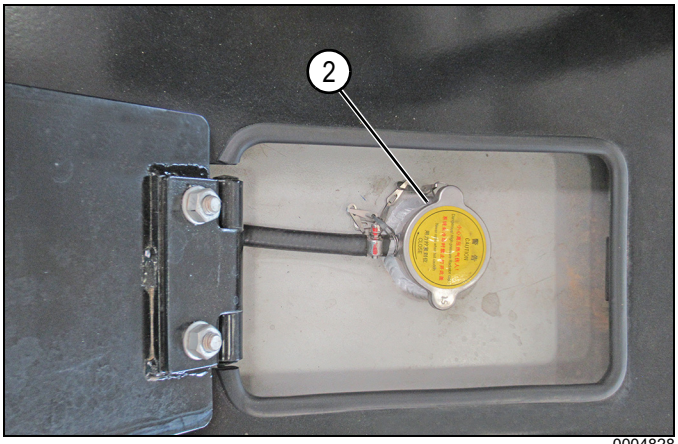


0004779

Figure 5-7

4. Check the sight glass (1) on the side of the coolant expansion tank to determine the coolant level.

NOTE: *If coolant is visible, the check is complete. Proceed to step 4 if the coolant is not visible in the sight glass.*



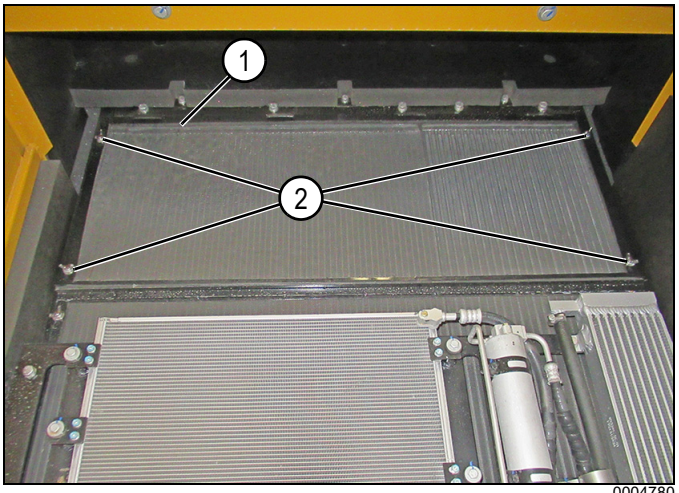
0004828

Figure 5-8

5. If coolant is required, slowly open the expansion tank filler cap (2) to release the cooling system pressure.
6. Remove the cap when all pressure has been relieved.
7. Add new coolant directly into the expansion tank filler opening until the coolant is visible in the sight glass on the side of the expansion tank.
8. Start and run the engine at idle speed for a minimum of 5 minutes and turn on the cab heater to allow the coolant level to stabilize.
9. Turn engine off.
10. Check the coolant level at the sight glass.
11. If necessary, add more coolant until the coolant is visible in the sight glass.
12. Install the expansion tank filler cap (3).
13. Close the engine access door. See “Engine Access Door” on page 4-10.
14. Close the expansion tank access door. See “Expansion Tank Access Door” on page 4-10.

Check the Radiator, Charge Air Cooler, and Air Conditioner Condenser Fins

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Open the engine access door. See “Engine Access Door” on page 4-10.
3. Open the left rear access door. See “Left Rear Access Door” on page 4-8.



0004780

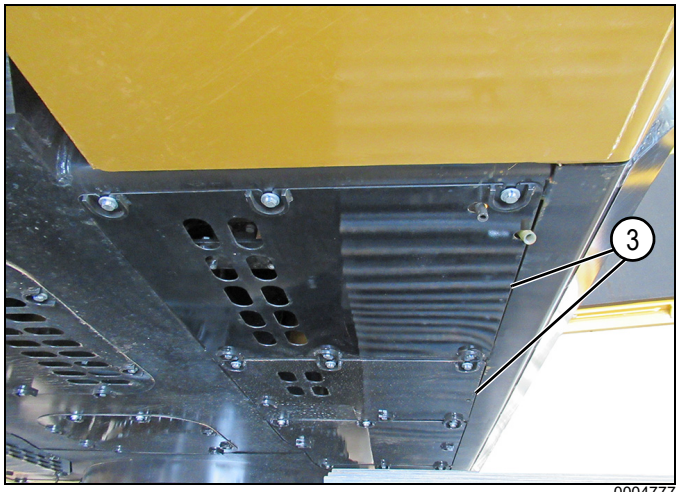
Figure 5-9

4. Remove the fasteners (2) that secure the protection screens (1) mounted in front of the radiator.
5. Remove the protection screens.
6. Clean the protection screens using compressed air.

NOTICE!

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

7. Clean the charge air cooler, radiator, and air conditioner condenser fins using compressed air.



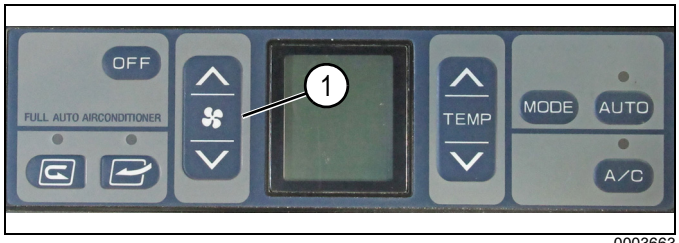
0004777

Figure 5-10

8. Remove the covers below the radiators (3).
9. Clean out any debris that has accumulated on the covers.
10. Install the covers below the radiators.
11. Reinstall the protection screens.
12. Close the engine access door. See “Engine Access Door” on page 4-10.
13. Close the left rear access door. See “Left Rear Access Door” on page 4-8.

Air Conditioning System

Check the Air Conditioner



0003663

Figure 5-11

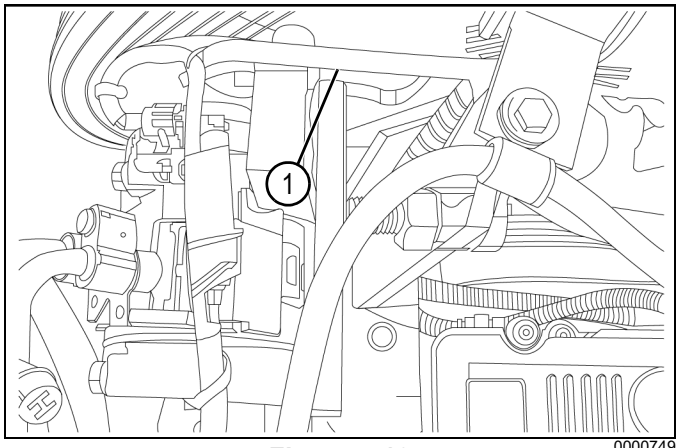
CAUTION

The air conditioning system is under pressure. Working on it could create a hazardous situation, which could result in injury.

With the engine running, press the air conditioner fan switch (1) inside the cab to check start-up, airflow, temperature, and fan speed control. See “Climate Control Panel” on page 3-10.

Check the Air Conditioner Compressor Belt

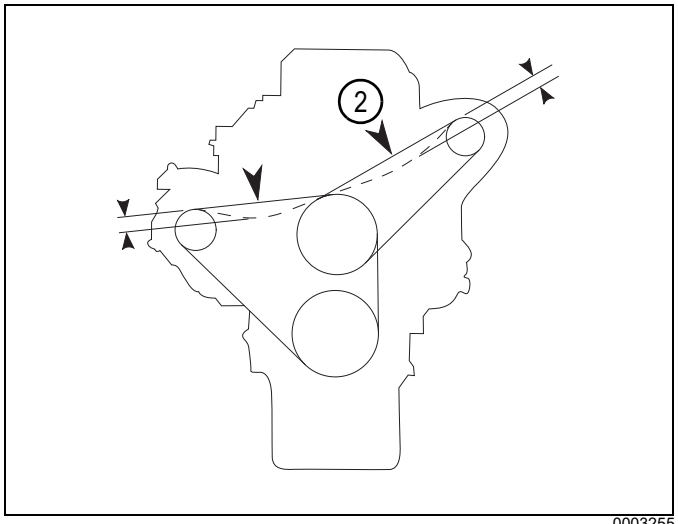
1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
1. Open the engine access door. See “Engine Access Door” on page 4-10.



0000749

Figure 5-12

2. Examine the air conditioner compressor belt (1) for signs of wear or damage.



0003255

Figure 5-13

3. Press on the belt (2) between the compressor pulley and the drive pulley. The belt should deflect 0.20 in.–0.31 in. (5 mm–8 mm).

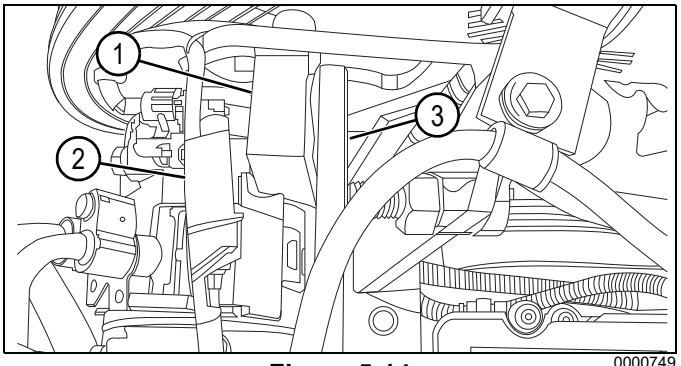
NOTE: *If using a tension meter to check the belt tension of the compressor, the tension should measure 143 lbf. (637 N).*

4. Adjust belt tension as necessary.
5. Close and secure the engine access door.

Adjust the Air Conditioner Compressor Belt

NOTE: *Do not perform any air conditioning system repairs that are not covered in this manual.*

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Open the engine access door. See “Engine Access Door” on page 4-10.



0000749

Figure 5-14

3. Loosen the upper compressor bracket (1) and lower compressor bracket (not shown).
4. Check for damaged pulleys, worn V-groove, and V-belt. Make sure the V-belt does not rub against the bottom of the V-groove.
5. Move the compressor (2) and its bracket (3) to adjust the belt tension.

NOTE: *The belt should deflect 0.20 in.–0.31 in. (5 mm–8 mm).*

NOTE: *If using a tension meter to check the belt tension of the compressor, the tension of a new belt should measure 143 lbf. (637 N). An old belt will measure 99 lbf. (441 N).*

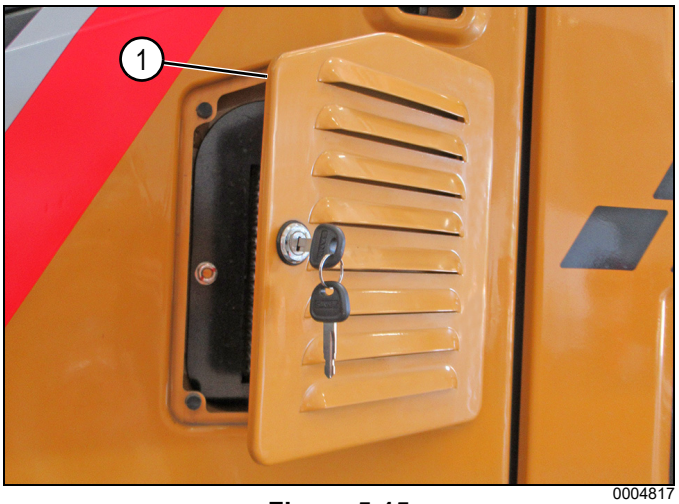
6. Tighten the two compressor bracket fasteners.

NOTE: *Replace the belt if it is worn, oily, stretched, or damaged with cuts and cracks.*

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

7. Close and secure the engine access door.

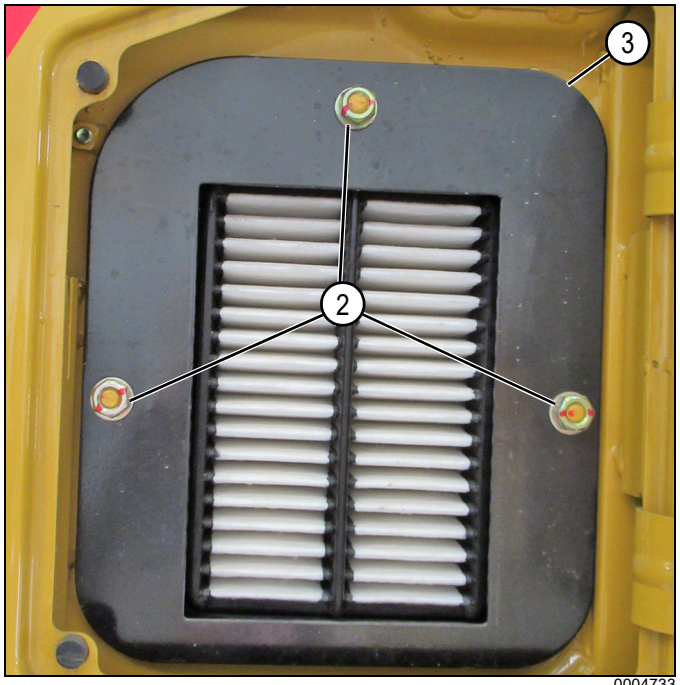
Replace the Fresh-Air Filter



0004817

Figure 5-15

1. Unlock and open the fresh-air filter door (1).



0004733

Figure 5-16

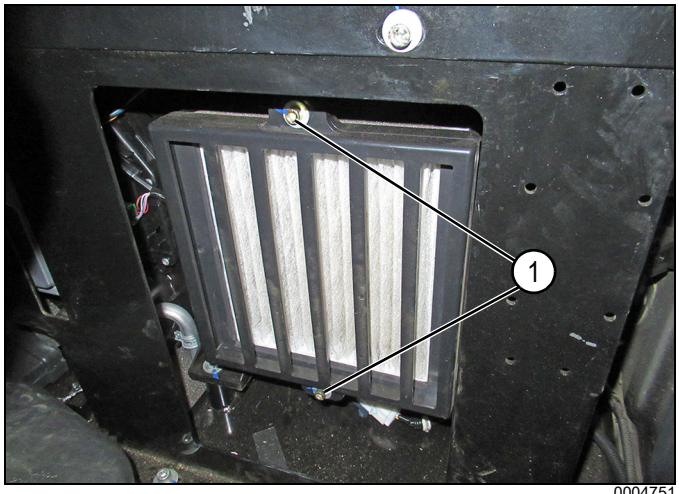
2. Remove the three fasteners (2) that secure the fresh-air filter (3) in place.
3. Remove the fresh-air filter.
4. Clean the fresh-air filter using compressed air.

NOTE: *The fresh-air filter can be cleaned up to five times. If the fresh-air filter cannot be cleaned, replace it.*

5. Install the fresh-air filter.
6. Install the three fasteners that secure the fresh-air filter in place.
7. Close and lock the fresh-air filter door.

Replace the Cab Recirculation Filter

NOTE: *The cab recirculation filter is inside the cab behind the seat.*



0004751

Figure 5-17

8. Remove the two fasteners (1) that secure the recirculation filter.
9. Remove the recirculation filter.
10. Clean the recirculation filter with compressed air.

NOTE: *The recirculation filter can be cleaned up to five times. If the recirculation filter cannot be cleaned, replace it with a new one.*

11. Install or replace the recirculation filter and fasteners.
12. Install the recirculation filter cover and fasteners.

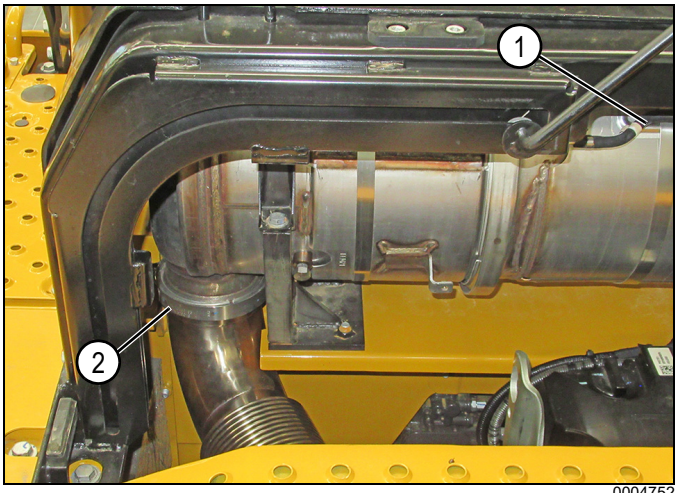
Exhaust System

Check the Aftertreatment Exhaust Piping

CAUTION

Make sure the engine is off an the exhaust components have cooled until they can be touched without burning. Hot engine and exhaust components can cause burns and injury.

1. Open the engine access door. See “Engine Access Door” on page 4-10.



0004752

Figure 5-18

2. Locate the exhaust system (1) next to the engine.
3. Inspect the exhaust system and its mount for leaks or signs of damage.
4. Check the connection to the expansion pipe (2) for leaks or signs of damage.
5. Make sure the exhaust pipe is clear and not restricted.

WARNING

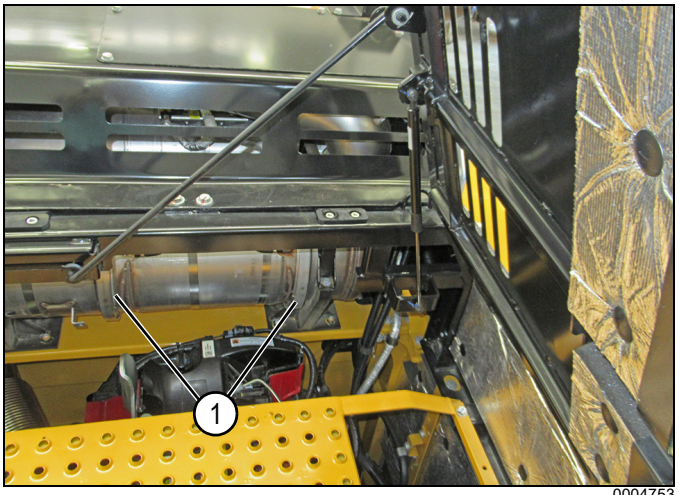
Never operate a machine with a defective exhaust system. A damaged exhaust system could result in death or serious injury.

Check the Engine Exhaust Pipe Clamps

1. Open the engine access door. See “Engine Access Door” on page 4-10.

CAUTION

Make sure the engine is off and the exhaust components have cooled until they can be touched without burning. Hot engine and exhaust components can cause burns and injury.



0004753

Figure 5-19

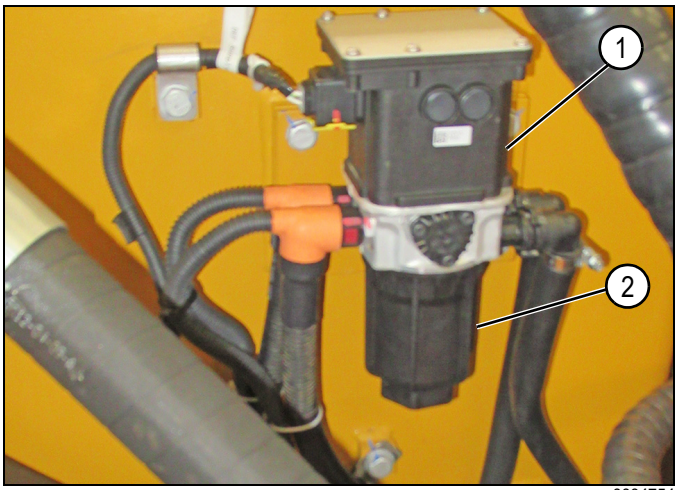
2. Check the clamps (1) on the exhaust system and make sure they are tight.

NOTE: *Tighten as required. Replace damaged, worn, or missing clamps. Not all clamps are shown in this illustration.*

Replace the Diesel Exhaust Fluid (DEF) Pump Filter

Perform this procedure every 4500 hours of operation or 3 years, whichever comes first.

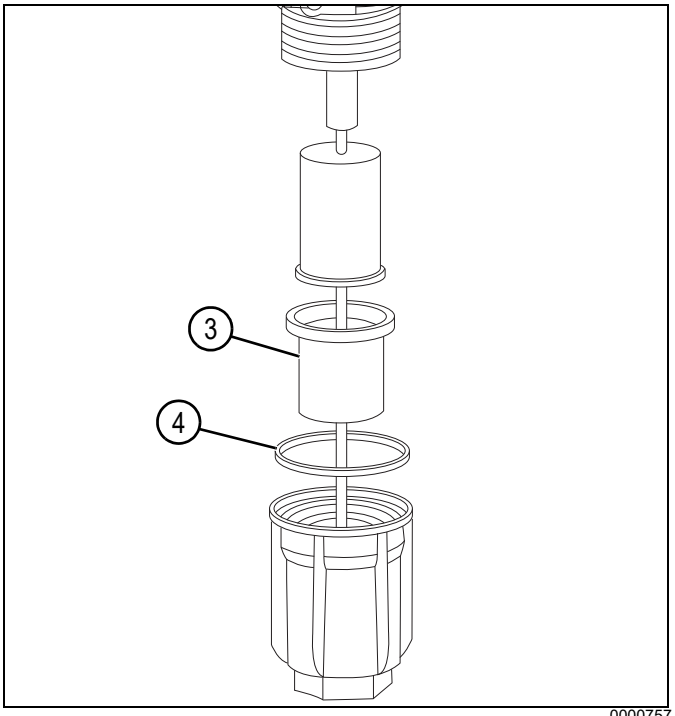
1. Open the right front access door. See “Right Front Access Door” on page 4-8.



0004754

Figure 5-20

2. Locate the DEF pump (1).
3. Remove the DEF pump filter housing (2) from the bottom of the pump.

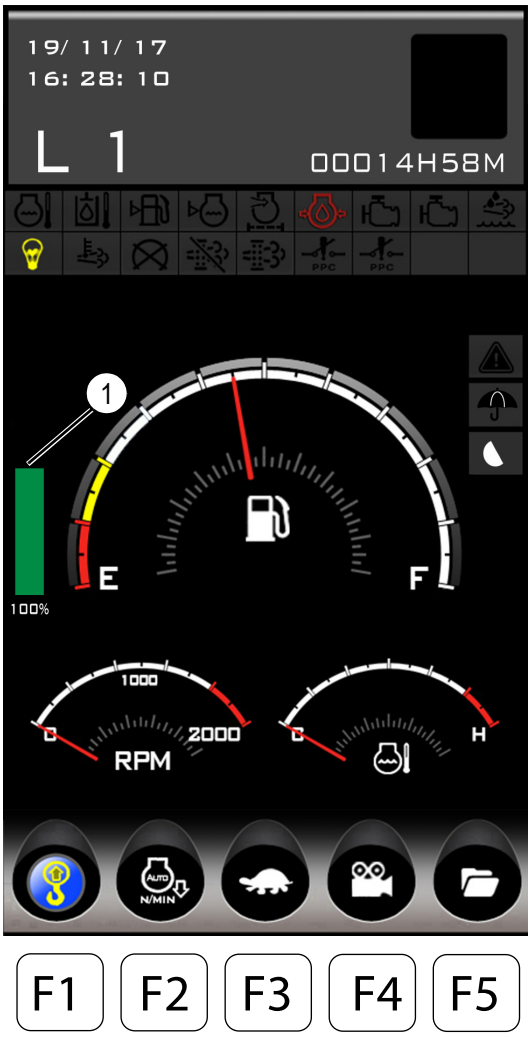


0000757

Figure 5-21

4. Remove the old filter element (3) and replace it with a new one.
5. Install a new DEF pump filter housing O-ring (4).
6. Install the DEF pump filter housing.

Check the Diesel Exhaust Fluid (DEF)



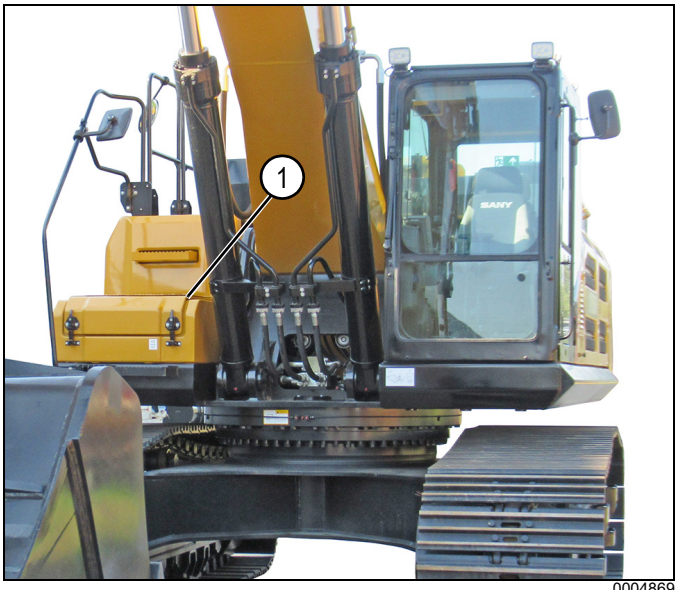
0004957,0004938

Figure 5-22

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

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

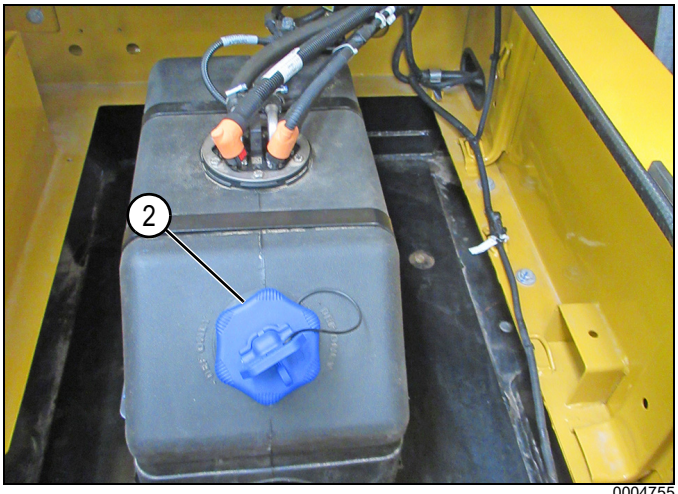
Fill the Diesel Exhaust Fluid (DEF) Tank



0004869

Figure 5-23

1. Open the DEF tank compartment door (1) on the right front side of the machine. See “Right Front Access Door” on page 4-8.



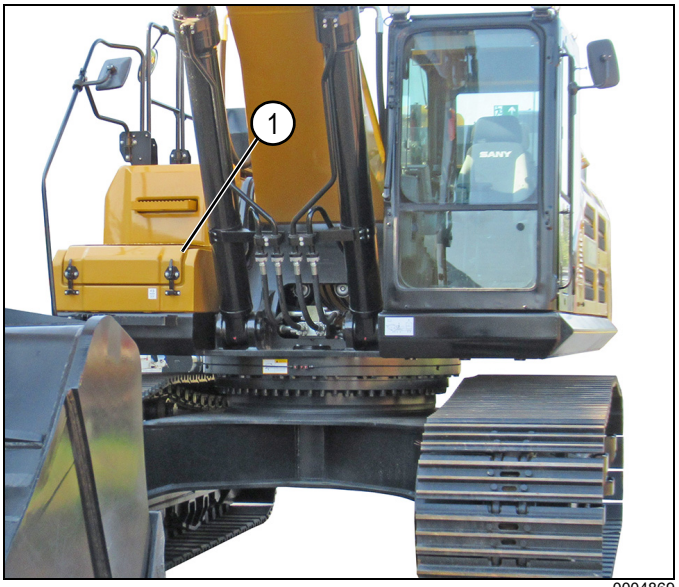
0004755

Figure 5-24

2. Remove the DEF tank cap (2), then add DEF through the filler neck as needed.

3. Install the DEF tank cap and close the right front access door.

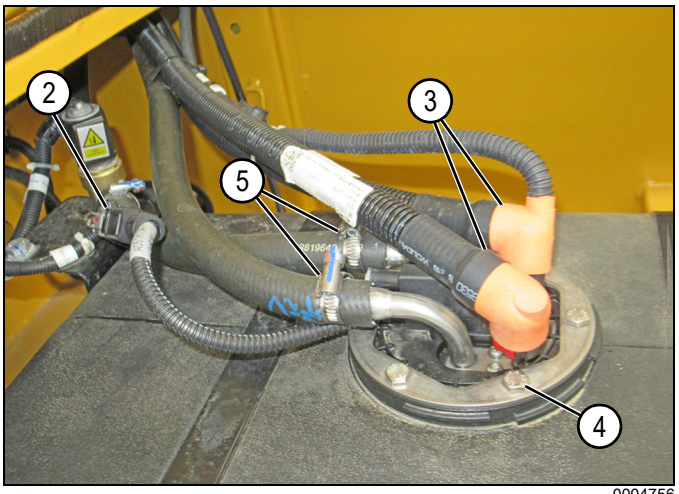
Replace the Diesel Exhaust Fluid (DEF) Tank Filter



0004869

Figure 5-25

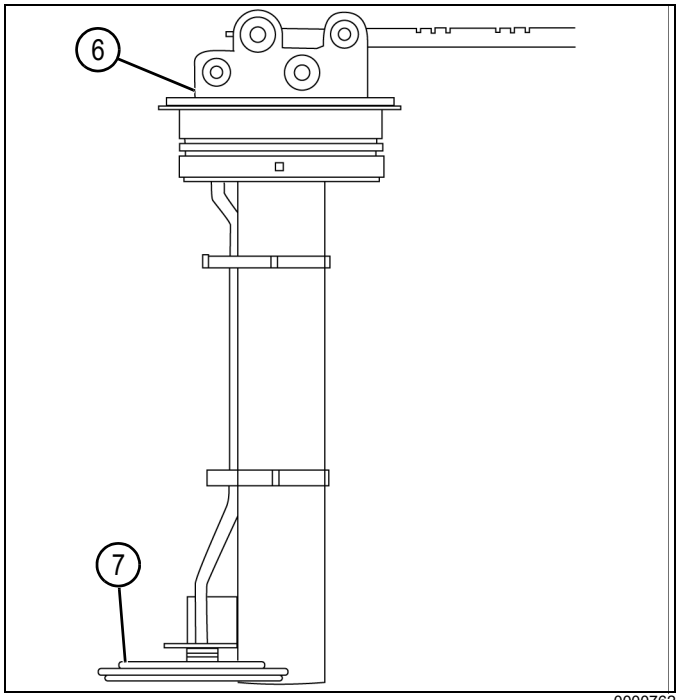
1. Open the DEF tank compartment door (1) on the right front side of the machine. See “Right Front Access Door” on page 4-8.



0004756

Figure 5-26

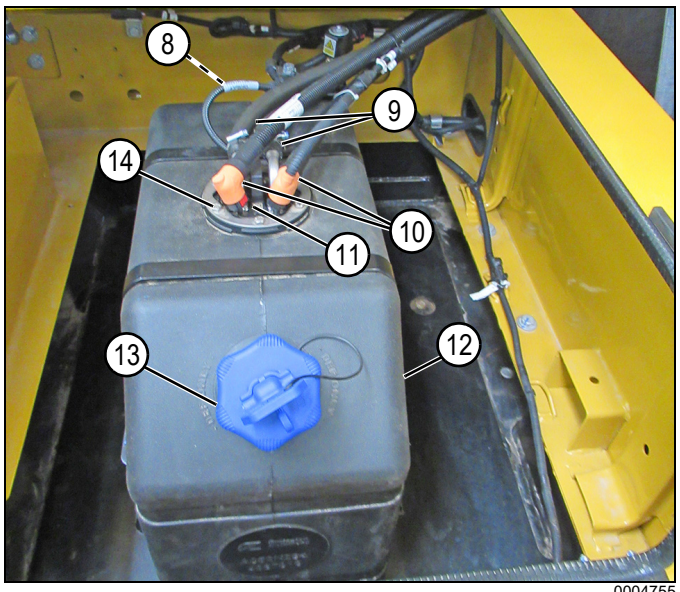
2. Disconnect the DEF sending unit wiring harness connector (2).
3. Disconnect the two DEF lines from the DEF sending unit (3) and mark the line locations.
4. Disconnect the two DEF coolant hoses (5) from the DEF sending unit and mark the hose locations.
5. Remove the DEF sending unit fasteners (4), then lift the DEF sending unit from the tank.



0000762

Figure 5-27

6. Remove and replace the DEF suction filter (7).
7. Install the DEF sending unit (6) into the tank.

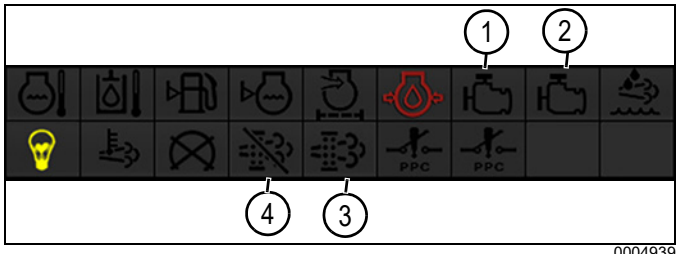


0004755

Figure 5-28

8. Install the fasteners (14) to secure the DEF sending unit (11) to the tank (12).
9. Connect the two DEF lines (10) and two DEF coolant hoses (9).
10. Connect the DEF sending unit wiring harness connector (8).
11. Remove the DEF tank cap (13), then add DEF through the filler neck as needed.
12. Install the DEF tank cap, then close the DEF compartment door.

Stationary Regeneration



0004939

Figure 5-29

NOTE: *Perform this procedure to activate the stationary exhaust cleaning system when the yellow diesel particulate filter (DEF) icon (3) on the monitor Home screen is either on or flashing, or if the yellow check engine icon (1) on the monitor Home screen is on, each of which indicates increasing levels of soot buildup in the exhaust system. This occurs after continued operation with the regeneration inhibit switch set to the ON position and with its icon displayed (4).*

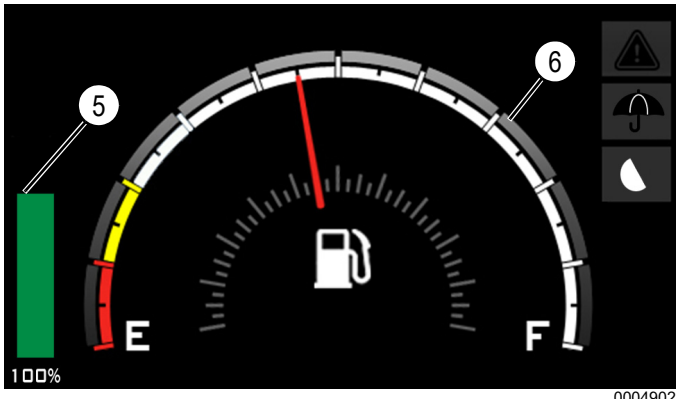
NOTICE!

If the red stop engine icon (2) illuminates, shut down the engine as soon as it is safe to do so and immediately contact a SANY dealer to arrange for service support. Failure to do so could result in engine damage.

1. Make sure the machine is in a safe location where the exhaust pipe outlet will not face any combustible materials.

⚠ CAUTION

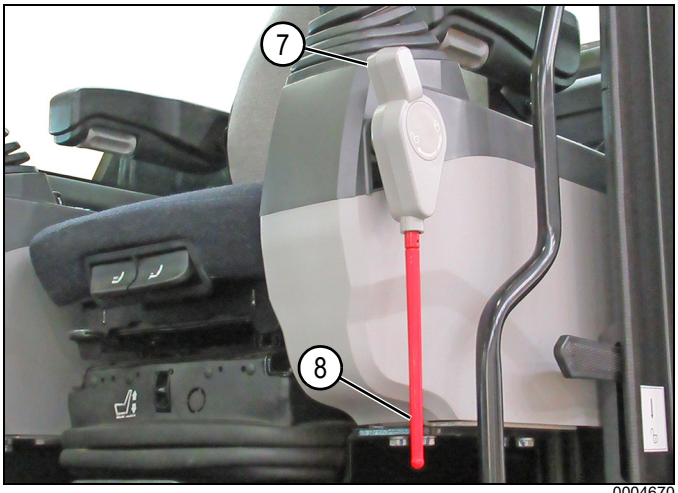
The engine exhaust will be very hot. Make sure that the machine is not in a combustible area. Otherwise, it could cause a fire or explosion, resulting in injury.



0004902

Figure 5-30

2. Make sure that both the DEF (5) and fuel tank (6) are full as shown by their indicators on the monitor Home screen.



0004670

Figure 5-31

3. Place the hydraulic lockout lever (7) in the locked (closed) position (8).

0004691

Figure 5-32

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

4. With the engine running at idle, press the regeneration switch (9) on the right control console.

0004939

Figure 5-33

During the regeneration process:

- The high exhaust system temperature (HEST) icon (10) will appear on the monitor Home screen.
- The diesel particulate filter (DPF) icon will be on, and the yellow check engine icon may be on.
- The engine speed may increase.
- The turbocharger sound may change.

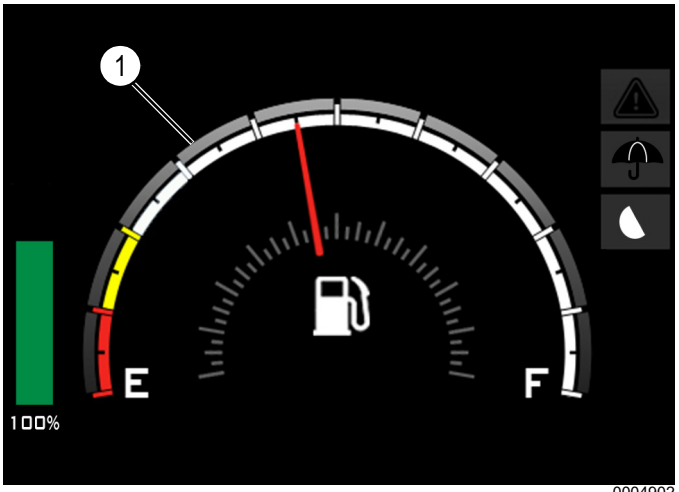
When the regeneration process is complete:

- The HEST icon, the DPF icon, and the yellow check engine icon all turn off.
- The engine returns to idle speed.
- The turbocharger sound returns to normal.

5. Allow the engine to idle for 10-15 minutes to cool to normal operating temperatures before resuming work.

Fuel System

Check the Fuel Level



0004902

Figure 5-34

With the key switch at ON, check the fuel level display (1) on the monitor Home screen.

Check the Fuel Lines

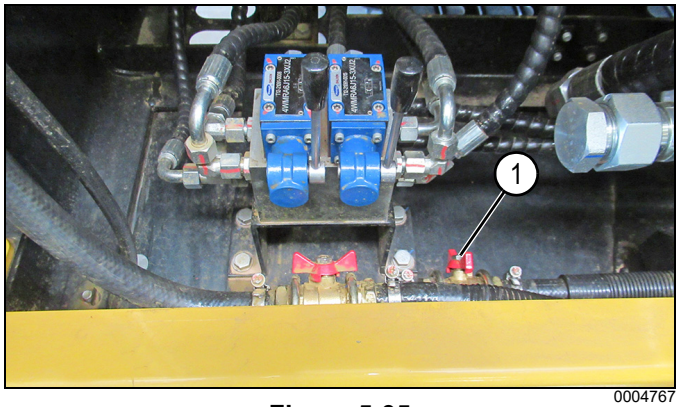
Inspect all steel, plastic, and rubber fuel lines, including those on the engine.

CAUTION

Failure to perform this procedure as directed could result in a fire during operation, which could result in death or serious injury.

Drain the Fuel Tank

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Open the right rear access door. See “Right Rear Access Door” on page 4-8.



0004767

Figure 5-35

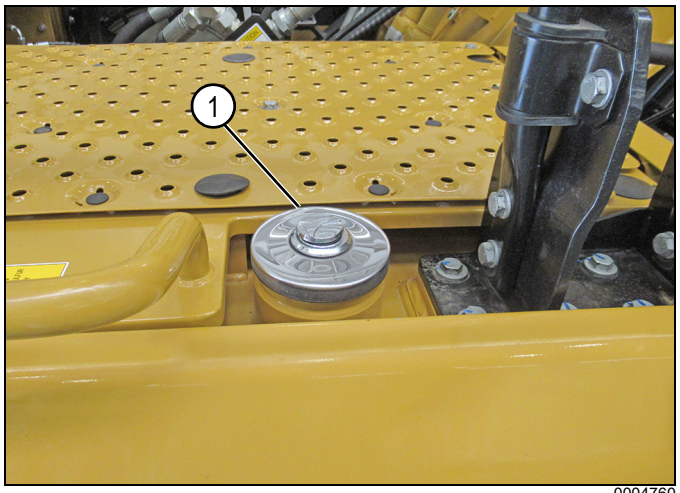
3. Locate the drain valve (1) for the fuel tank behind the right rear door.
4. Place an appropriately sized container under the drain hose.
5. Open the drain valve.
6. Close the drain valve when the fuel flow is free of water and contaminants.

NOTICE!

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

7. Add clean fuel to the fuel tank as necessary.
8. Start the engine and allow it to run at idle.
9. Check for leaks in the fuel system.
10. Repair any leaks.
11. Close and secure the right rear access door.

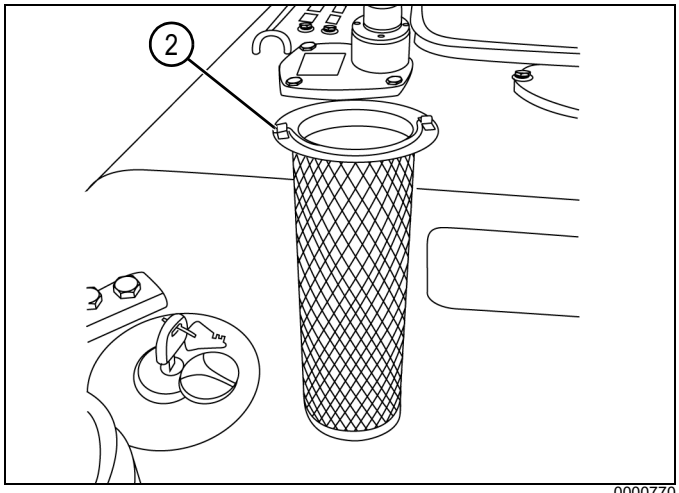
Check the Fuel Tank Strainer



0004760

Figure 5-36

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



0000770

Figure 5-37

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

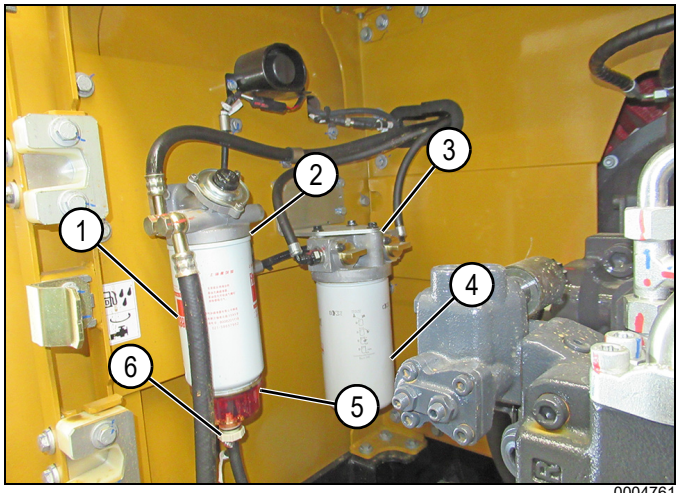
NOTE: *Replace a damaged or missing fuel strainer with a new one.*

4. Install the new (or cleaned) fuel tank strainer.
5. Install and lock the fuel tank filler cap.

Replace the Primary and Secondary Fuel Filter

WARNING

Never smoke or maintain the fuel system near an open flame. This could result in death or serious injury.



0004761

Figure 5-38

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Open the right rear access door. See “Right Rear Access Door” on page 4-8.
3. Locate the primary filter (1) behind the right rear engine compartment door.
4. Place an appropriately sized container under the fuel filter drain.
5. Open the drain valve (6) to allow all water and fuel to drain from the filter.
6. Remove the plastic housing (5) mounted to the bottom of the filter.
7. Examine the O-ring in the top of the plastic housing and replace if damaged.
8. Remove the primary fuel filter.

NOTICE!

Dispose of contaminated fuel or water in accordance with all applicable environmental regulations. Failure to do so could damage the environment.

9. Install the new filter on the primary filter housing (2).

NOTE: *Follow the manufacturer’s instructions on the fuel filter body when installing the filter.*

10. Install the plastic housing to the bottom of the fuel filter cartridge.
11. Remove the secondary fuel filter (4) from the fuel secondary filter housing (3).
12. Install a new filter.

NOTE: *Do not fill the secondary fuel filter with diesel fuel before replacing it.*

13. Once the filters are installed, close and secure the right rear access door.

CAUTION

Do not attempt to run the engine with the engine compartment door open.

14. Start the engine and allow it to run at idle speed for 10 minutes.

NOTICE!

The engine may not start quickly. Engage the starter for 15 seconds, wait for 15 seconds, and then attempt to restart for 15 seconds. Repeat this process up to 10 times. If the engine still fails to start, contact a SANY dealer.

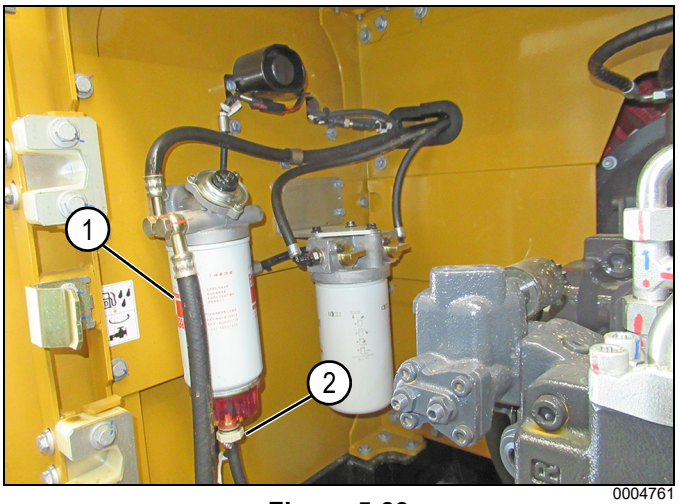
15. Check for leaks around both the primary and secondary fuel filters.
16. Repair fuel leaks if found.

Drain the Primary Fuel Filter

WARNING

Never maintain the fuel system near an open flame or while smoking. This could cause a fire and result in death or serious injury.

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.



0004761

Figure 5-39

2. Locate the filter (1) behind the right rear access door. See “Right Rear Access Door” on page 4-8.
3. Place an appropriately sized container beneath the fuel filter drain.
4. Open the drain valve (2) to allow all water and/or contaminated fuel to drain from the filter.

NOTICE!

Dispose of contaminated fuel or water in accordance with all applicable environmental regulations. Failure to do so could damage the environment.

5. Close the drain valve when the flow from the primary fuel filter is free of water or contamination.

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

6. Check for fuel leaks.
7. Repair fuel leaks if found.
8. Close and secure the right rear access door.

Hydraulic System

Check the Accumulator Function

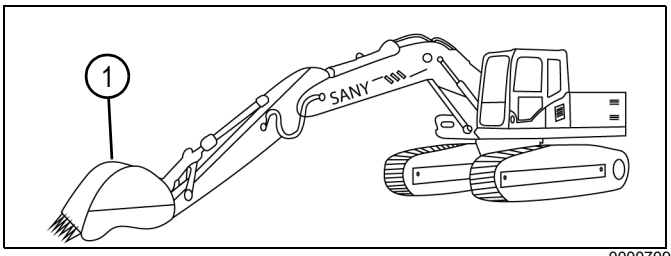
WARNING

- **The accumulator contains pressurized nitrogen. Improper handling is extremely dangerous.**
- **Do not drill holes in the accumulator or place it close to fire or a high-heat source.**
- **Do not weld any part on the accumulator.**
- **Air in the accumulator must be released upon disposal.**
- **See “Accumulator” on page 2-5 for special precautions that need to be taken when working with or around the accumulator. Contact a SANY dealer for additional information.**

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

The accumulator allows the operator to lower hydraulic equipment within 15 minutes of an engine shutdown with the key switch in the ON position.

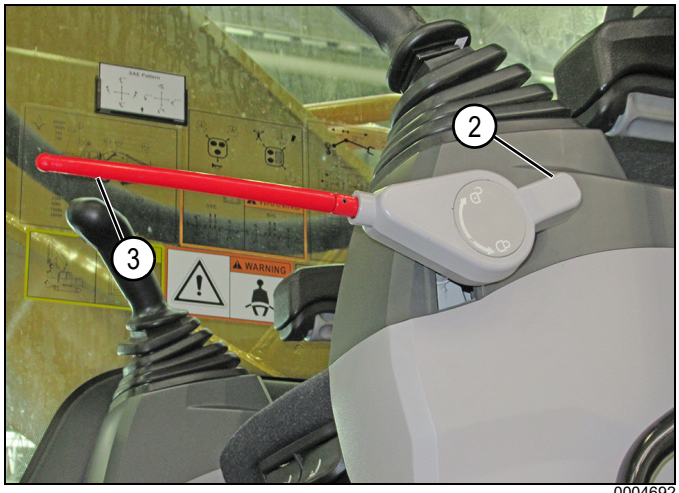
1. Prepare the machine for checks and inspections. See “Maintenance Safety” on page 2-4.



0000709

Figure 5-40

2. Position the work equipment (1) 18 in.–24 in. (457 mm–610 mm) from the ground.
3. Shut down the engine.
4. Turn the key switch to the ON position.



0004692

Figure 5-41

5. Set the hydraulic lockout control lever (2) to the unlocked (open) position (3).
6. Use the joystick control to lower the boom.
7. The boom should lower.

NOTE: *If there is no movement, contact a SANY dealer.*

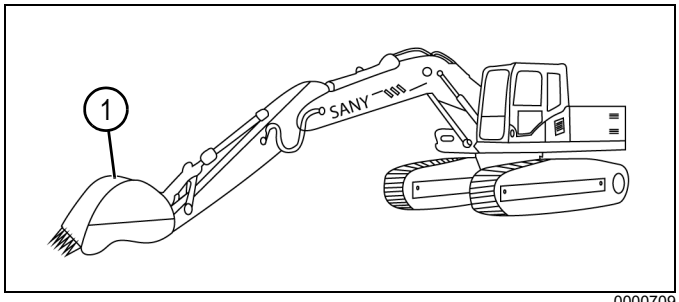
8. Start the engine and run at low idle for 5 minutes to repressurize the accumulator.

Relieve Hydraulic System Pressure

CAUTION

- **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 pressure to prevent injury.**

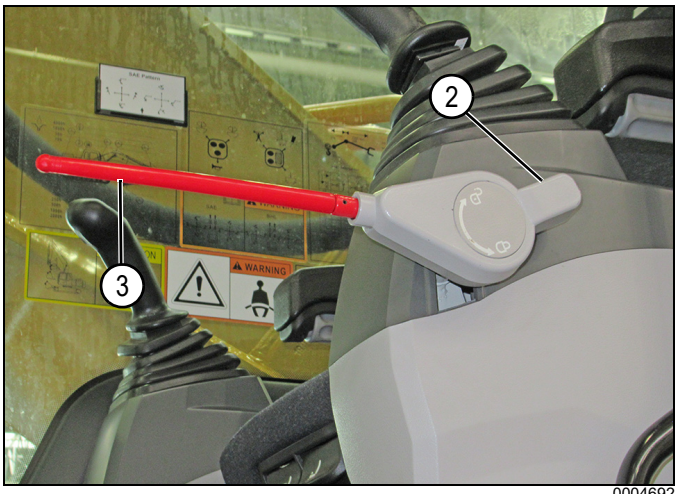
Failure to follow these warnings could result in death or serious injury.



0000709

Figure 5-42

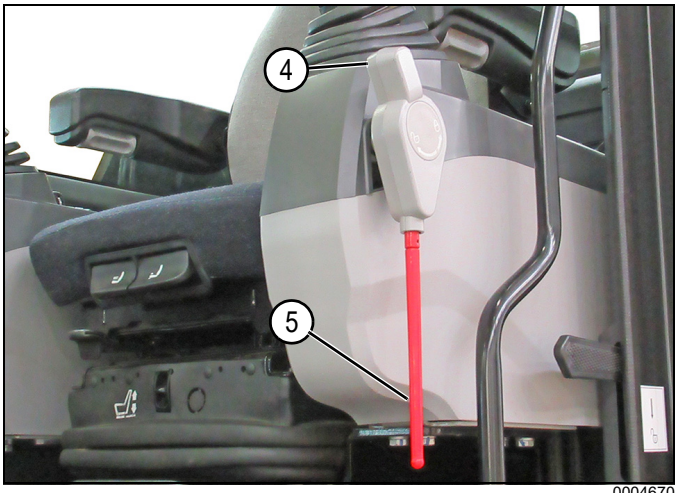
1. Park the machine in a secure location and position the work equipment with the arm and bucket fully extended (1).
2. Shut down the engine.
3. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
4. Turn the key switch to ON.



0004692

Figure 5-43

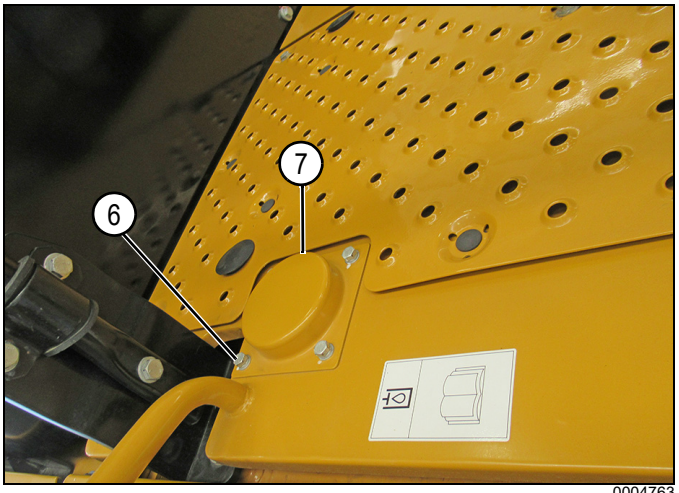
5. Set the hydraulic lockout control lever (2) to the unlocked (open) position (3).
6. Fully cycle each joystick, and travel control lever/pedals two to three times within 15 seconds to release hydraulic pressure remaining in the hydraulic system.



0004670

Figure 5-44

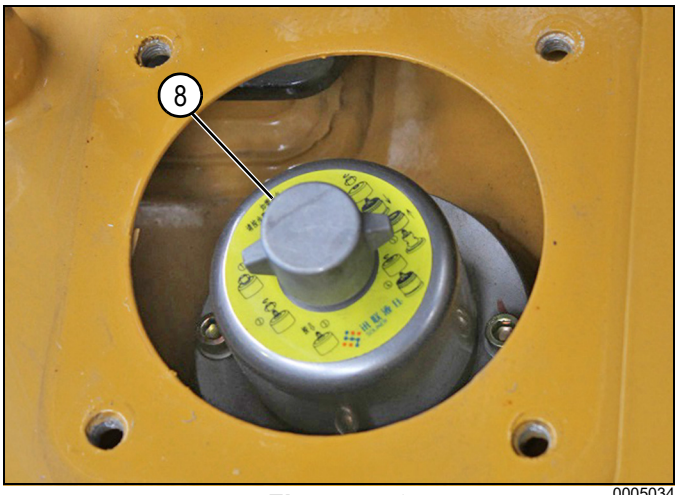
7. Turn the key switch to OFF.
8. Move the hydraulic lockout control lever (4) to the locked (closed) position (5).



0004763

Figure 5-45

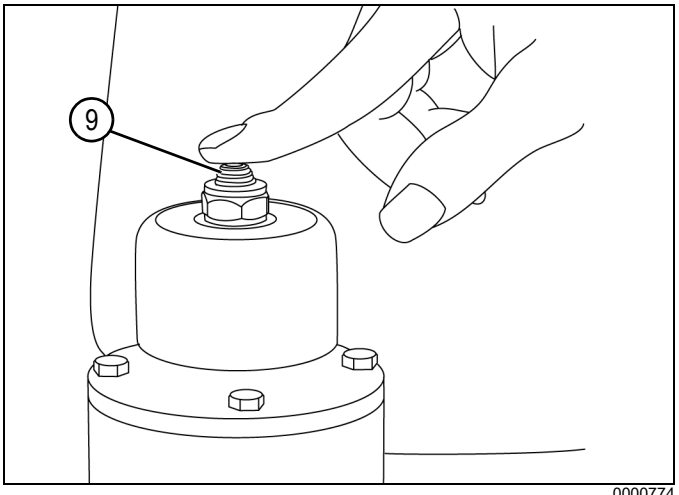
9. Remove four fasteners (6) that hold the breather valve cover to the tank and remove the cover (7).



0005034

Figure 5-46

10. Remove the vent cap (8) from the breather valve.



0000774

Figure 5-47

11. Press the vent button (9) to relieve pressure in the hydraulic tank.
12. Install the vent cap.
13. Install the breather cover and fasteners.

Collect a Hydraulic Oil Sample

1. Start the engine and operate the machine for all systems to reach normal operating temperatures.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
3. Clean the top of the hydraulic tank.
4. See “Relieve Hydraulic System Pressure” on page 5-31.
5. Remove the hydraulic suction strainer cover. See “Add Hydraulic Oil” on page 5-34.
6. Insert the oil sample tube into the hydraulic oil tank.
7. Collect a sample of hydraulic oil.
8. Remove the oil sample tube.
9. Replace the hydraulic suction strainer cover.
10. Follow the instructions included with the sample kit to send the sample for testing.

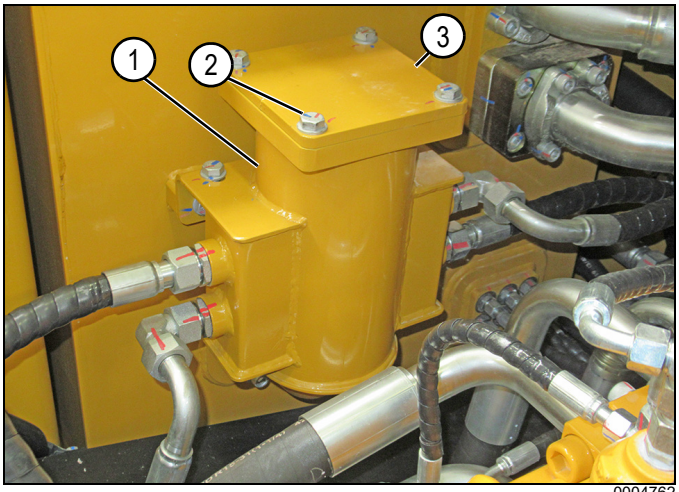
Replace the Case Drain Filter

CAUTION

Hydraulic oil may be hot and under pressure, which could result in injury. Always wait for the machine to cool down before attempting to open the hydraulic oil system.

NOTE: *The case drain filter must be replaced whenever the hydraulic oil is changed.*

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-31.
3. Open the right rear access door. See “Right Rear Access Door” on page 4-8.



0004762

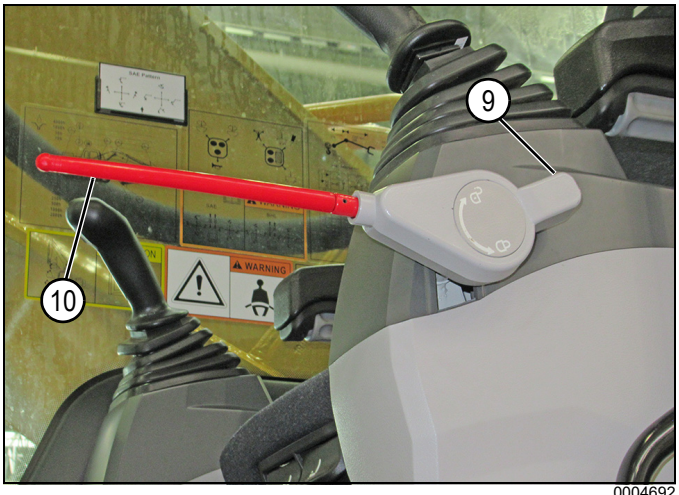
Figure 5-48

4. Place a suitable container under the case drain filter (1).

NOTICE!

Make sure the hydraulic tank is empty before removing the cover. See “Replace Hydraulic Oil” on page 5-35.

5. Remove four fasteners (2) that secure the cover to the housing.
6. Remove the case drain filter cover (3).
7. Remove the case drain filter.
8. Install a new case drain filter and a new O-ring.
9. Install the case drain filter cover.
10. Add hydraulic oil. See “Add Hydraulic Oil” on page 5-34.
11. Start and run the engine at low idle (1050 rpm) for 10 minutes to bleed any air from the hydraulic system.



0004692

Figure 5-49

12. Set the hydraulic lockout control lever (9) to the unlocked (open) position (10).

WARNING

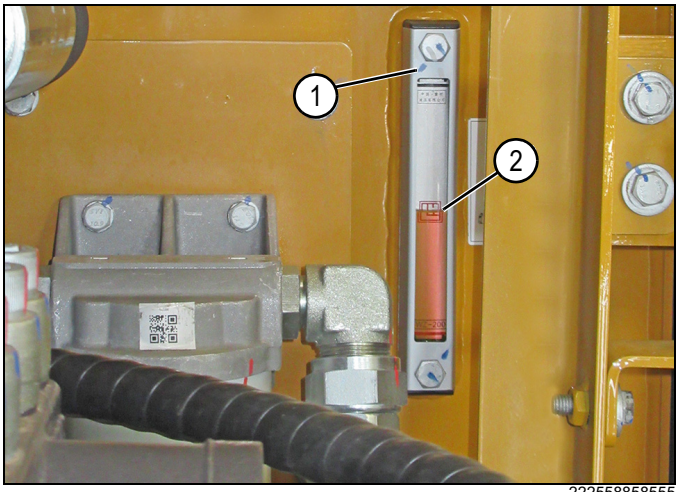
Never open a hydraulic component under pressure. Escaping hydraulic oil is under high pressure and can penetrate skin and cause serious injury or death. Do not use hands to check for leaks. Wear gloves, eye protection, and other personal protective equipment (PPE), and use a piece of cardboard or paper to search for suspected leaks.

13. Check for leaks and repair as necessary.
14. Close and secure the right rear access door.
15. Shut down the engine.

Check the Hydraulic Oil Level

NOTE: *Park the machine on a level surface.*

1. Prepare the machine for maintenance. See “Maintenance Safety” on page 2-4.
2. Open the right rear access door. See “Right Rear Access Door” on page 4-8.



222558858555

Figure 5-50

3. Check the hydraulic oil level in the hydraulic oil tank through the sight glass (1). The hydraulic oil level should be within the hydraulic oil level decal (2) of the sight glass.
4. If the level is below the L mark, add hydraulic oil. See “Add Hydraulic Oil” on page 5-34.

Check the Hydraulic Hoses

Check all hoses for leaks and replace damaged or leaking hoses immediately. Any hydraulic pump lines, hoses, and connectors connected to the engine compartment must be replaced if they are damaged.

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

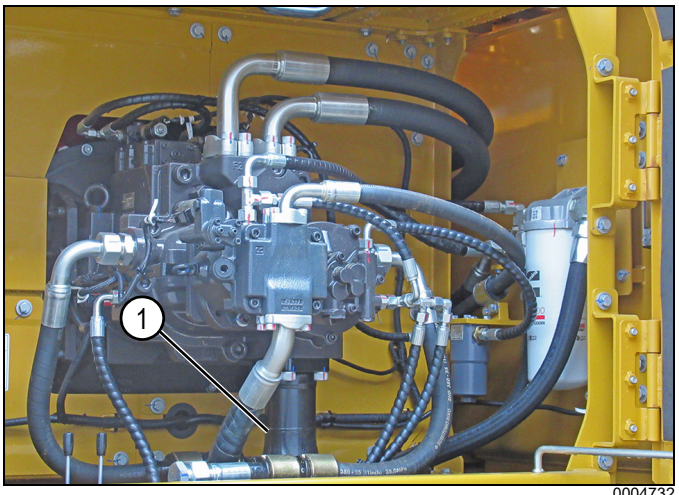
Examine hoses for the following:

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

Also check for oil leaks from the engine block and buildup of debris.

Check the Hydraulic Hose/Line Connections

1. Open the right rear access door. See “Right Rear Access Door” on page 4-8.



0004732

Figure 5-51

2. Examine the hydraulic lines and hoses (1) between the hydraulic tank and the hydraulic pump for cracks, damage, and abnormal wear.

NOTE: *Replace a hose if it is cracked, damaged, or worn.*

3. Check fittings at both ends of all lines and flexible hoses.
4. Inspect all fasteners. Tighten any loose fasteners.

NOTE: *Replace any damaged fasteners.*

Add Hydraulic Oil

CAUTION

Hydraulic oil may be hot and under pressure, which could result in injury. Always wait for the machine to cool before attempting to open the hydraulic system.

1. Position the machine as indicated on the hydraulic tank decal.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
3. Run the engine at idle speed for about 5 minutes to vent air from the hydraulic system.

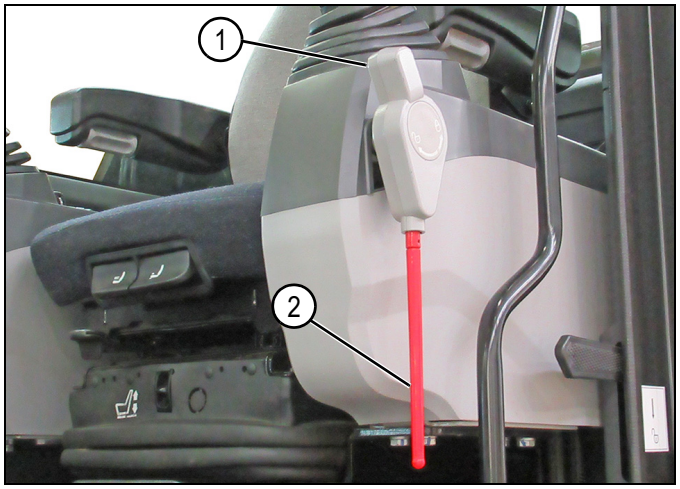
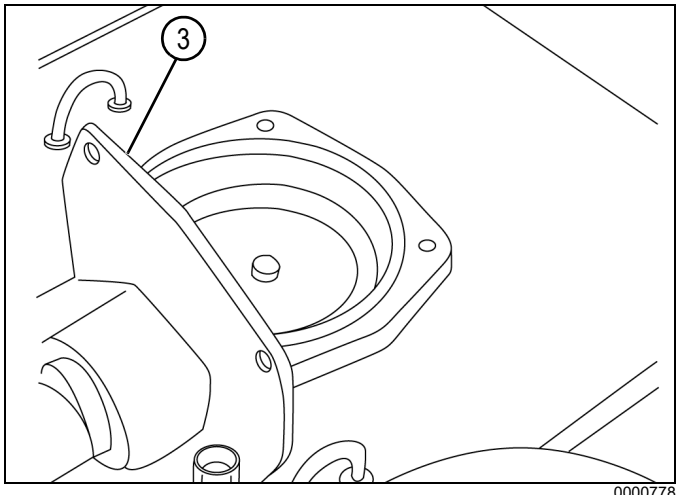


Figure 5-52

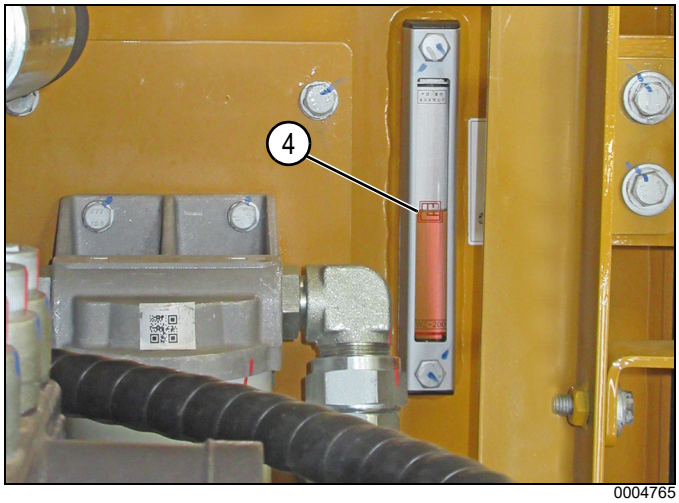
4. Move the hydraulic lockout control lever (1) to the locked (closed) position (2), then shut down the engine.
5. Clean the top of the hydraulic tank of any dust and debris.
6. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-31.



0000778

Figure 5-53

7. Remove the suction strainer cover (3).



0004765

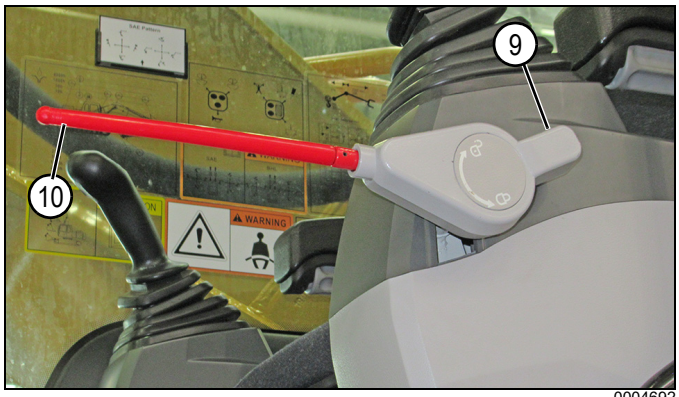
Figure 5-54

8. Add hydraulic oil through the suction strainer until the oil level is midway in the sight glass (4).

NOTICE!

Do not overfill the hydraulic tank. This could result in machine damage and improper machine operation.

9. Reinstall the suction strainer cover.
10. To purge air from the system, start the engine and run at low idle for 10 minutes.
11. Check the hydraulic oil level and add hydraulic oil as needed. See “Check the Hydraulic Oil Level” on page 5-33.



0004692

Figure 5-55

12. Set the hydraulic lockout control lever (9) to the unlocked (open) position (10).
13. Close and secure the right rear access door.
14. Run the engine at idle speed for 10 minutes to vent air from the hydraulic system.
15. Shut down the engine.
16. Recheck the hydraulic oil level at the sight glass.
17. If necessary, remove the suction strainer cover and repeat steps 9 through 15.
18. Reinstall the cover over the breather valve when the hydraulic oil level is correct.
19. Check for leaks.
20. Tighten connections if leaks are found.

Replace 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 filter cover. Relieve any pressure to prevent injury.**

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

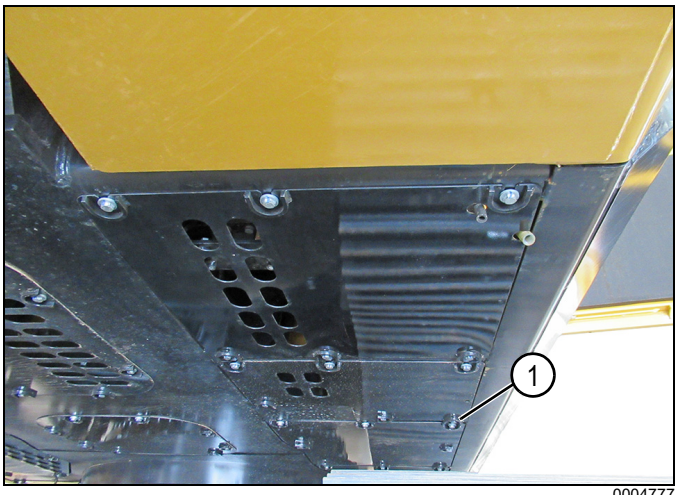
NOTICE!

- **If the hydraulic oil is contaminated (discolored or containing debris), change the oil immediately. Find and correct the cause of the contamination before changing the hydraulic oil.**
- **Dispose of the hydraulic oil and filters in accordance with all applicable environmental regulations.**

Failure to do so could damage the environment.

NOTE: *Perform this procedure every 2000 hours of service.*

NOTE: *Collect a hydraulic oil sample. See “Collect a Hydraulic Oil Sample” on page 5-32.*

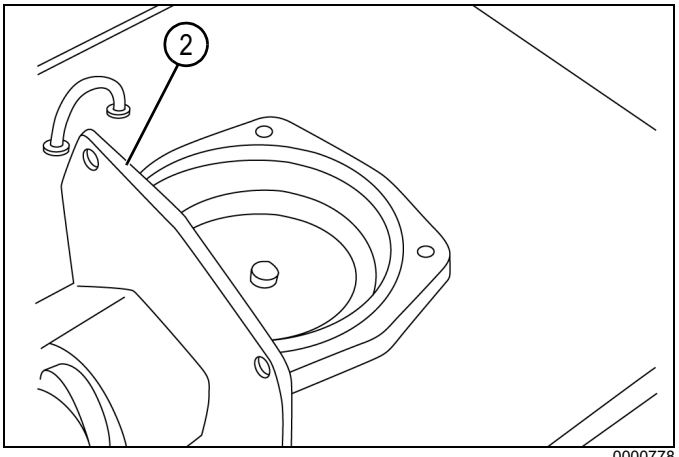


0004777

Figure 5-56

1. Swing the upper structure to position the hydraulic tank bottom cover (1) between the tracks.
2. Position the work equipment as shown on the hydraulic tank decal.

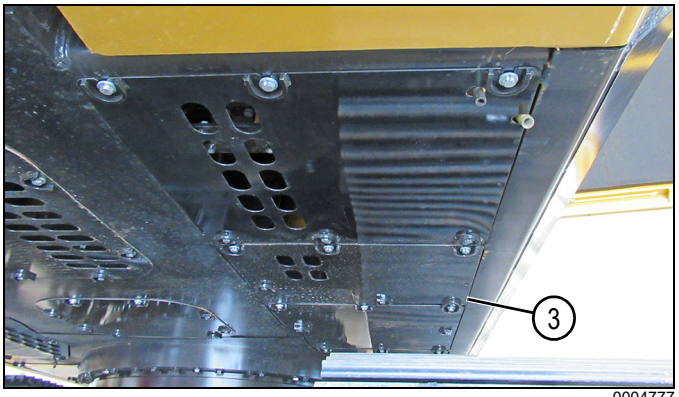
3. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
4. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-31.



0000778

Figure 5-57

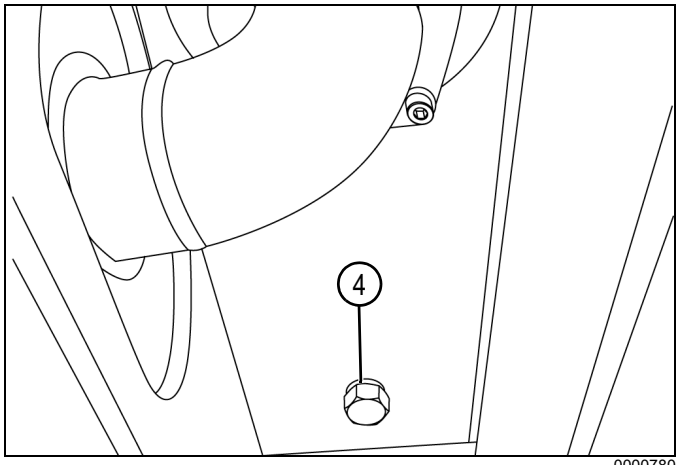
5. Remove the section strainer cover (2).
6. Obtain a hydraulic oil sample. *See “Collect Oil Samples” on page 5-59.*
7. Place the suction strainer cover back over the opening, but do not secure it in place.



0004777

Figure 5-58

8. Remove the bottom cover (3).



0000780

Figure 5-59

9. Place a suitable container with a minimum capacity of 127 gal. (480 L) under the hydraulic tank drain plug (4) to collect the drained hydraulic oil.
10. Clean the area around the hydraulic tank drain plug of dust and debris.
11. Remove the drain plug and allow the hydraulic tank to drain completely.

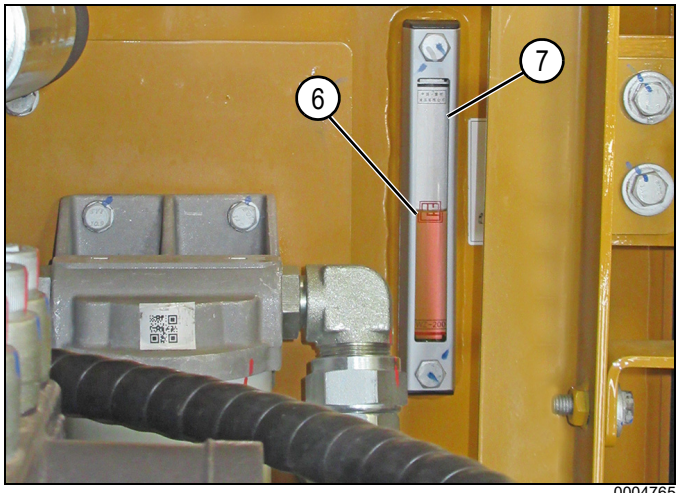
NOTICE!

Dispose of drained hydraulic oil in accordance with all applicable environmental regulations. Failure to do so could damage the environment.

0000781

Figure 5-60

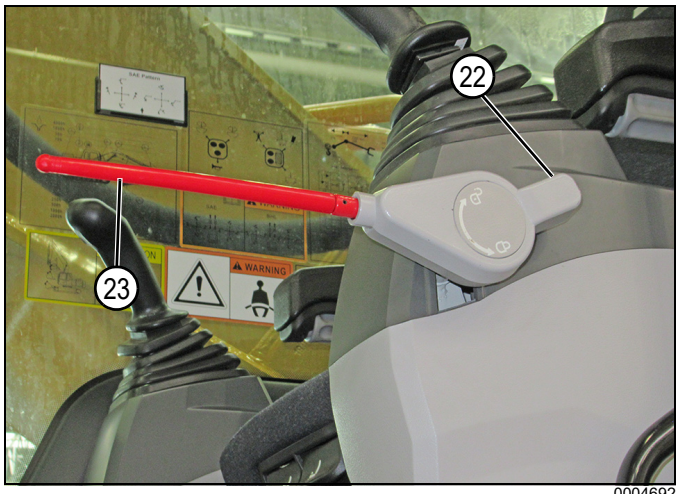
12. Install a new O-ring (5) on the drain plug.
13. Install and securely tighten the hydraulic tank drain plug.



0004765

Figure 5-61

14. Add hydraulic oil through the suction strainer opening until the hydraulic oil level is midway (6) in the sight glass (7). See “Add Hydraulic Oil” on page 5-34.
15. Install the suction strainer cover.
16. Start the engine.



0004692

Figure 5-62

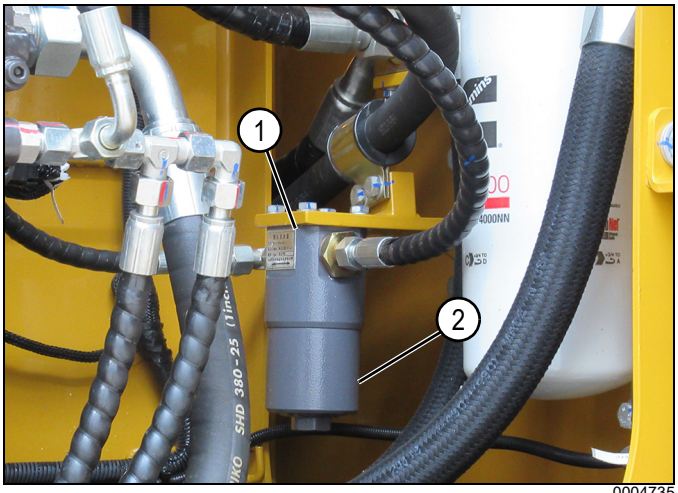
17. Set the hydraulic lockout control lever (22) to the unlocked (open) position (23).
18. Run the engine at idle for 10 minutes to bleed air from the hydraulic system.
19. Shut down the engine.
20. Check the hydraulic oil level at the sight glass.

Replace the Hydraulic Pilot Filter Element

NOTE: *Perform this procedure after the first 250 service hours, then every 1000 service hours or at least once each year, whichever occurs first.*

NOTE: *Make sure the machine is on firm, level ground before proceeding.*

1. Position the work equipment as shown on the hydraulic tank decal.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
3. Relive hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-31.



0004735

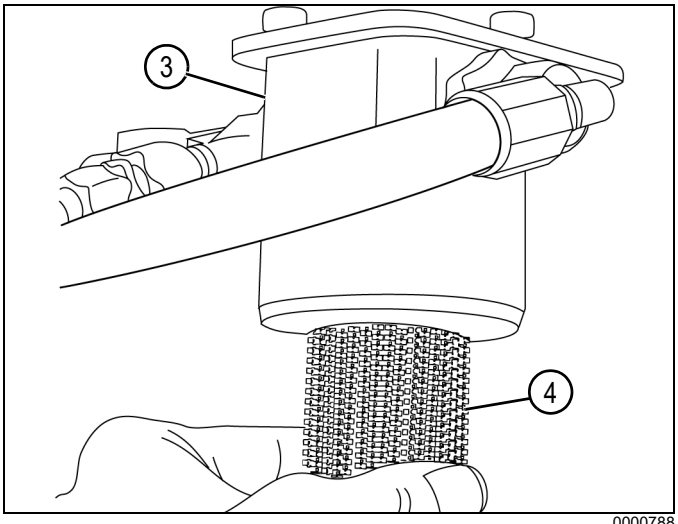
Figure 5-63

4. Open the right rear access door. See “Right Rear Access Door” on page 4-8.
5. Locate the hydraulic pilot filter housing (1) behind the right rear access door.
6. Place an appropriately sized container beneath the hydraulic pilot filter bowl to catch any hydraulic oil that may drain.

NOTICE!

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

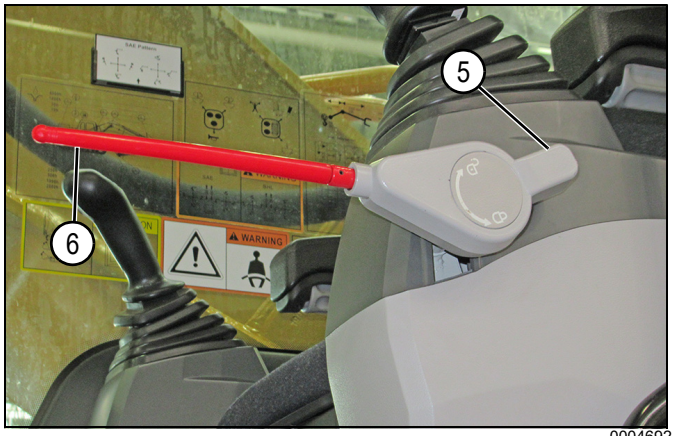
7. Remove the hydraulic pilot filter bowl from the filter housing (2).



0000788

Figure 5-64

8. Remove the filter element (4) from the housing (3).
9. Install a new gasket and O-ring in the hydraulic pilot filter bowl.
10. Clean the inside of the filter housing.
11. Install a new filter element inside the housing.
12. Clean out and install the hydraulic pilot filter bowl onto the hydraulic pilot filter housing.
13. Add hydraulic oil. See “Add Hydraulic Oil” on page 5-34.
14. Start the engine.



0004692

Figure 5-65

15. Set the hydraulic lockout control lever (5) to the unlocked (open) position (6).
16. Run the engine at idle speed for 10 minutes to bleed air from the hydraulic system.
17. Check for leaks and repair as necessary.
18. Shut down the engine.
19. Recheck the hydraulic oil level at the sight glass.
20. Add hydraulic oil, if necessary.
21. Close and secure the right rear access door.

Check the Hydraulic Pump

WARNING

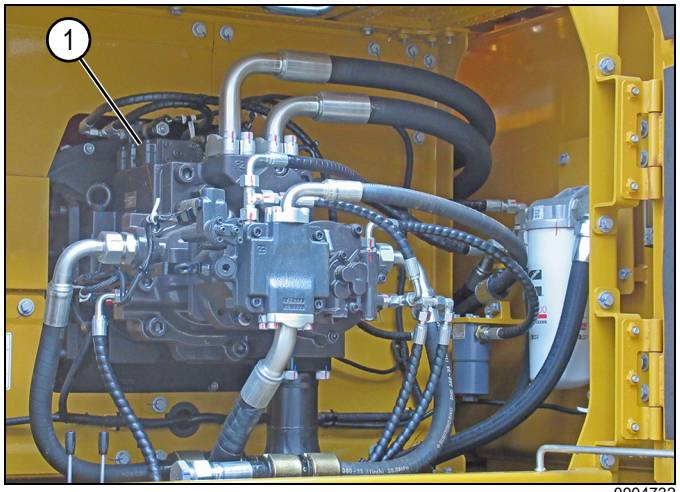
Never open a hydraulic component under pressure. Escaping hydraulic oil is under high pressure and can penetrate skin and cause serious injury or death. Do not use hands to check for leaks. Wear gloves, eye protection, and other personal protective equipment (PPE), and use a piece of cardboard or paper to search for suspected leaks.

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

CAUTION

Hydraulic oil may be hot and under high pressure, which could result in injury. Always wait for the machine to cool and relieve hydraulic pressure before attempting to open the hydraulic system.

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Open the right rear access door. See “Right Rear Access Door” on page 4-8.



0004732

Figure 5-66

3. Locate the hydraulic pump (1) behind the right rear access door. See “Right Rear Access Door” on page 4-8.
4. Start the engine.
5. Inspect for oil leaks and abnormal hydraulic pump noise. Check for proper hydraulic pump operation.
6. Shut down the engine.
7. Make repairs or adjustments as needed.
8. Close and secure the right rear access door. See “Opening the Right Rear Access Door” on page 4-8.

Replace the Hydraulic System Breather Filter

NOTE: *Depending on the work environment and the degree of contamination, the breather filter may need to be replaced more frequently than every 1000 hours.*

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.

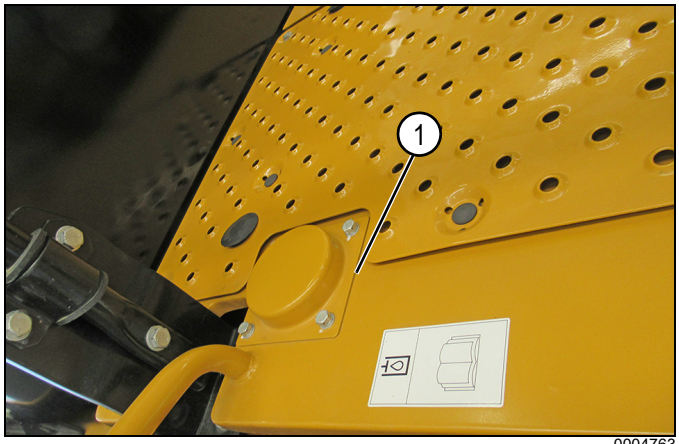


Figure 5-67

2. Remove the cover (1) over the breather valve.

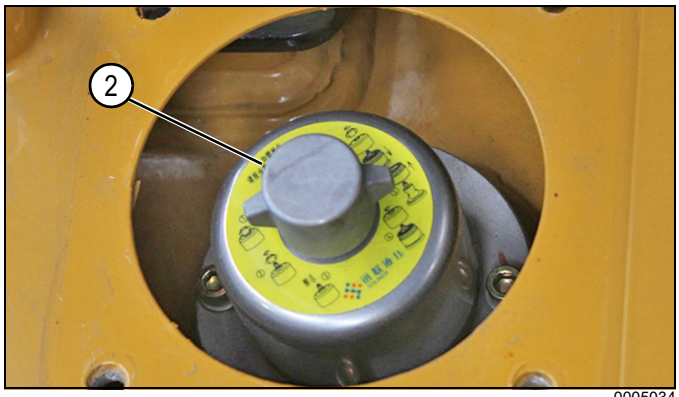


Figure 5-68

3. Remove the wing nut (2) and spacer from the breather valve.

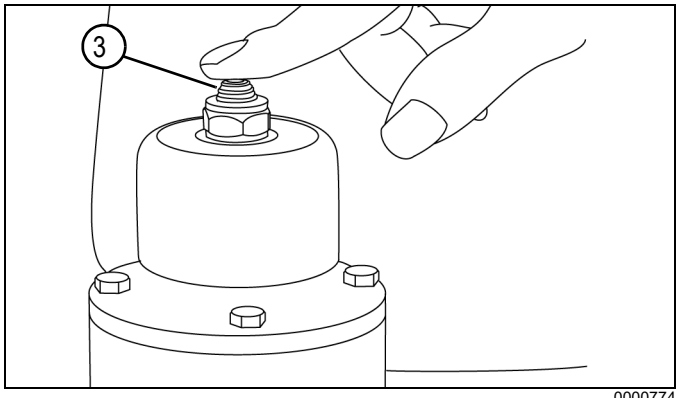


Figure 5-69

4. To relieve pressure in the hydraulic system, press the hydraulic tank vent button (3).

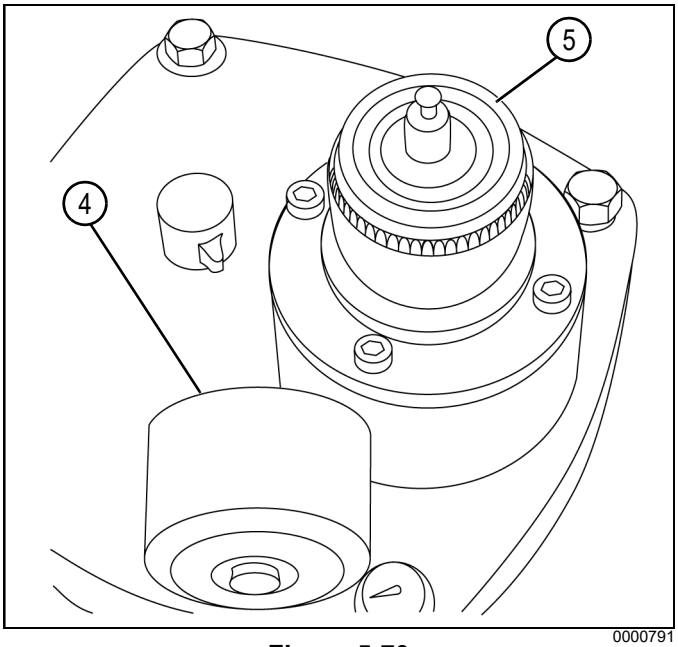


Figure 5-70

5. Unscrew and remove the filter element cover (4) from the filter (5).
6. Pull the filter up and remove it from the valve body.

NOTICE!

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

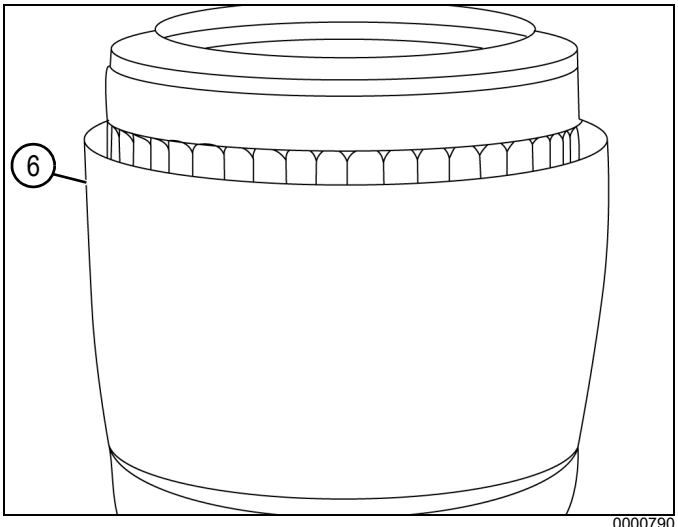
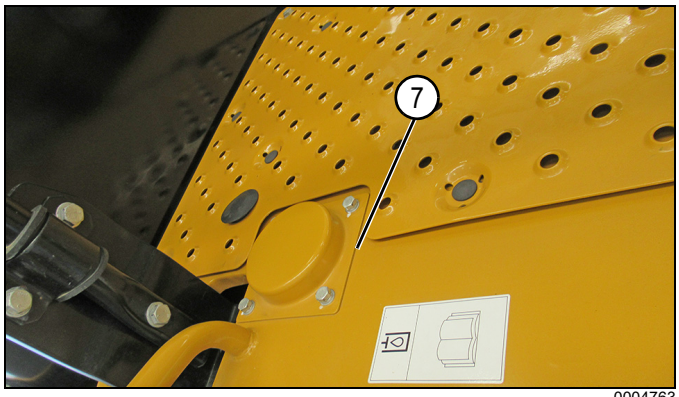


Figure 5-71

7. Install the new breather filter.
8. Install the breather filter cover (6).
9. Install the spacer and wing nut.



0004763

Figure 5-72

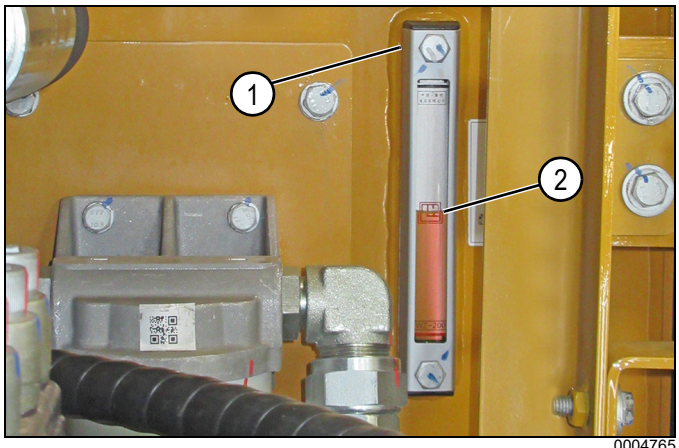
10. Install the cover (7) over the breather valve.

Check the Hydraulic Tank

CAUTION

- **Hydraulic oil may be hot and under high pressure, which could result in death or serious injury.**
- **Always wait for the machine to cool and relieve hydraulic pressure before attempting to open the hydraulic system.**

1. Position the machine work equipment as shown on the decal on the hydraulic tank.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-4.



0004765

Figure 5-73

3. Open the right rear access door to access the hydraulic oil tank sight glass (1). Make sure the oil level is at the midway mark (2) on the sight glass decal.
4. Check the hydraulic tank for leaks, exterior rust, and damage.
5. Add hydraulic oil to the system as necessary. See “Add Hydraulic Oil” on page 5-34.
6. Check and tighten all hydraulic fittings as necessary.
7. Close and secure the right rear access door.

Replace the Hydraulic Tank Return Filter

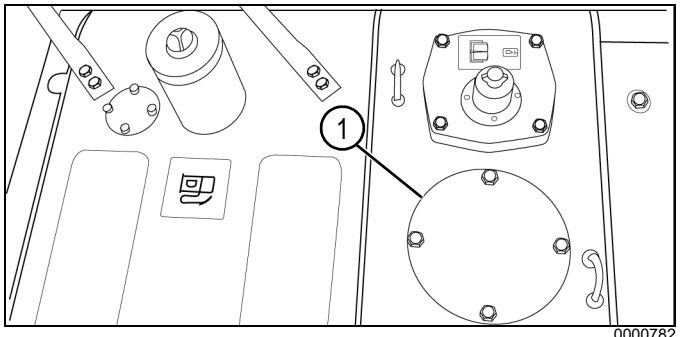
WARNING

- **Allow the hydraulic system to cool before servicing. Hot hydraulic 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 pressure to prevent injury.**

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

NOTE: *Perform this procedure after every 1000 service hours or at least once each year, whichever occurs first.*

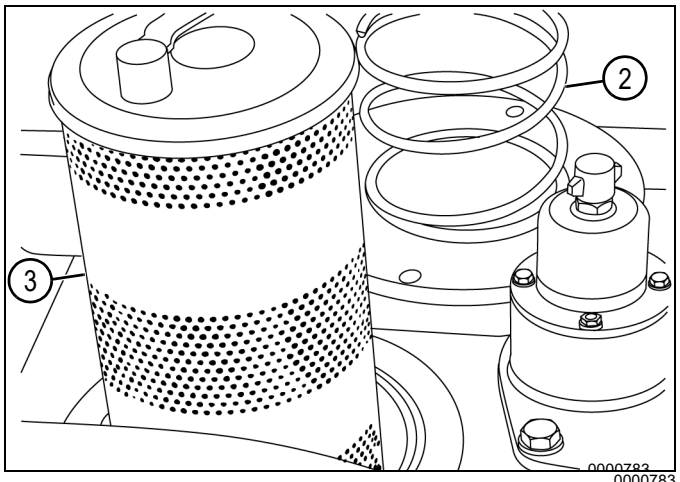
1. Position the work equipment as shown on the hydraulic tank decal.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
3. Relive hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-31.



0000782

Figure 5-74

4. Remove the hydraulic oil return filter cover (1).



0000783

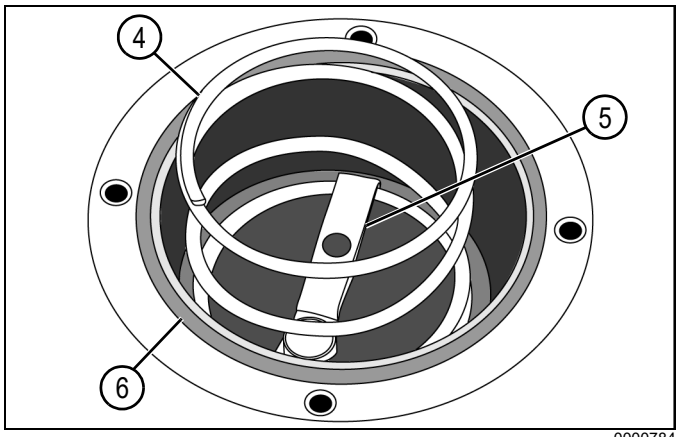
Figure 5-75

5. Remove the spring (2), and then remove the hydraulic oil return filter (3).

6. Check the bottom of the hydraulic oil return filter housing and remove any debris.
7. Collect a hydraulic oil sample.

NOTE: *See “Collect Oil Samples” on page 5-59.*

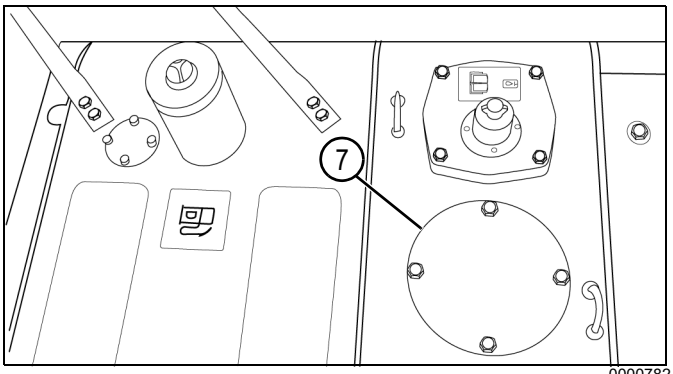
8. Install a new hydraulic oil return filter in the return hydraulic oil return filter housing.



0000784

Figure 5-76

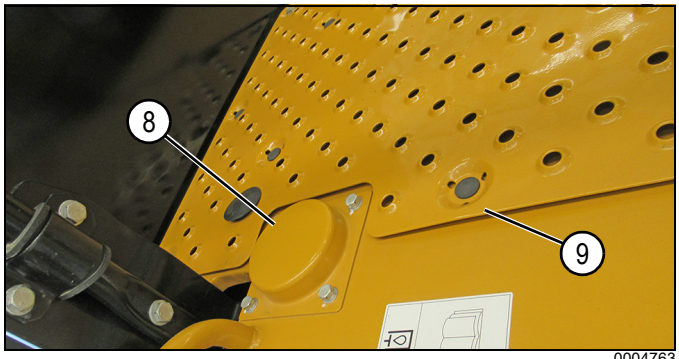
9. Position the spring (4) on top of the hydraulic oil return filter (5).
10. Install a new O-ring (6).



0000782

Figure 5-77

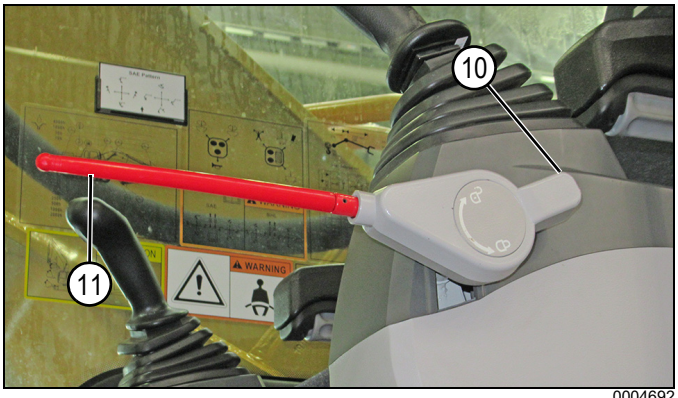
11. Install the hydraulic return filter cover (7).



0004763

Figure 5-78

12. Install the cover (8) over the breather valve.
13. Install the decking (9) on top of the hydraulic tank.
14. Start and run the engine at idle speed for 10 minutes to bleed any air from the hydraulic system.



0004692

Figure 5-79

15. Move the hydraulic lockout control lever (10) to the unlocked (open) position (11).
16. Check for leaks. If any are located, repair as needed.
17. Check the hydraulic fluid level. See “Add Hydraulic Oil” on page 5-34.

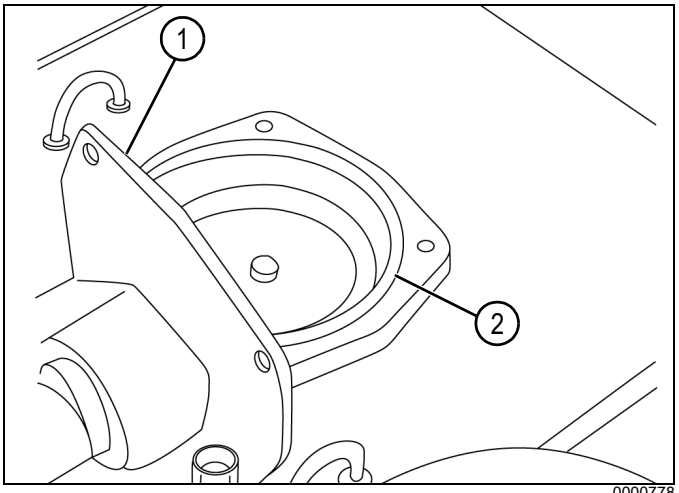
Clean the Hydraulic Suction Strainer

CAUTION

- **Allow the hydraulic system to cool before servicing. Hot hydraulic 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 pressure to prevent injury.**

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

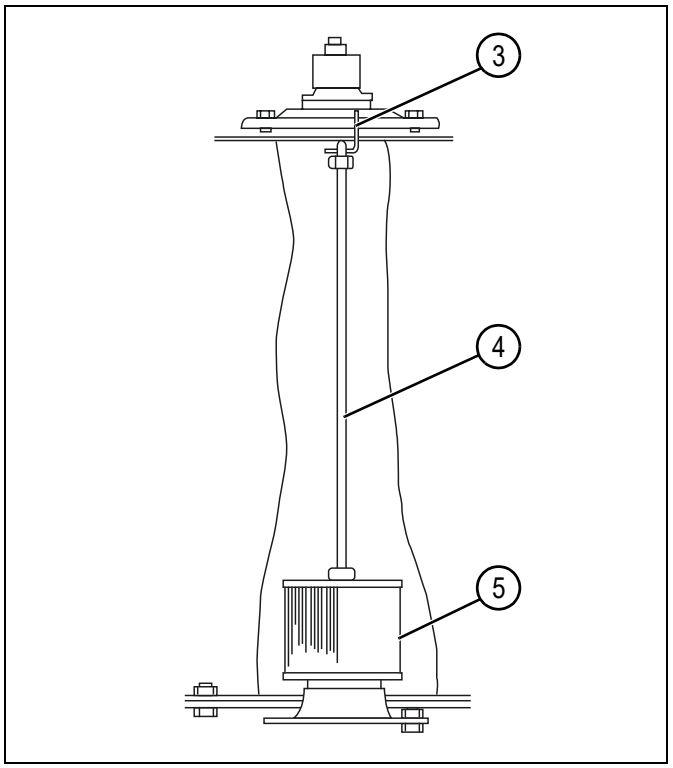
1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Clean the top of the hydraulic tank of any dust and debris.
3. Relieve hydraulic system pressure. See “Relieve Hydraulic System Pressure” on page 5-31.



0000778

Figure 5-80

4. Remove the suction strainer cover (1) and O-ring (2).

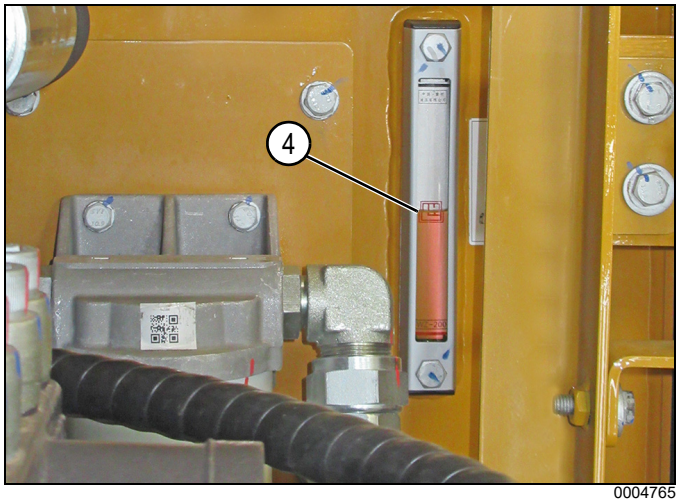


0002408

Figure 5-81

5. Remove spring (3), rod (4), and suction strainer (5).
6. Clean the suction strainer of all debris.

   NOTE: Replace the strainer if there is visible damage.
7. Replace the O-ring (2).
8. Install suction strainer (5) with rod (4) and spring (3).



0004765

Figure 5-82

9. Add hydraulic oil through the suction strainer until the oil level is midway in the sight glass (4).

NOTICE!

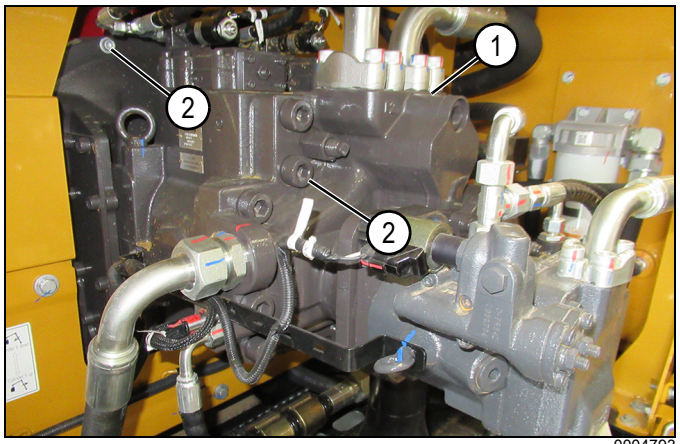
Do not overfill the hydraulic tank. This could result in machine damage and improper machine operation.

10. Reinstall the suction strainer cover.
11. To purge air from the system, start the engine and run at low idle for 10 minutes.

    Check the hydraulic oil level and add hydraulic oil as needed. See “Check the Hydraulic Oil Level” on page 5-33

Check the Pump Mounting Fasteners

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Open the right rear access door. See “Right Rear Access Door” on page 4-8.



0004793

Figure 5-83

3. Locate the hydraulic pump assembly (1).

NOTE: *Not all pump mounting fasteners are shown here. Make sure to inspect all pump mounting locations.*

4. Inspect the hydraulic pump for loose, broken, or missing pump mounting fasteners (2).
5. Tighten any loose fasteners.

NOTICE!

Do not overtighten the mounting fasteners. This could result in machine damage and improper machine operation.

Electrical System

Check the Batteries

⚠ CAUTION

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

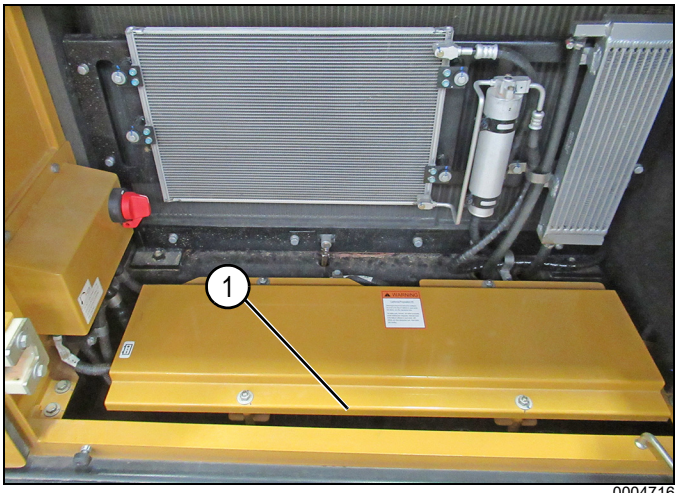
- **Battery gases are explosive, which could cause injury. Never smoke around batteries or expose them to sparks or open flames. Wear personal protective equipment (PPE) when working with batteries. Work in a well-ventilated area.**
- **Burns or injury can occur if battery acid makes contact with skin or eyes. Flush the area immediately with fresh water and seek medical attention.**

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

1. Open the left rear access door. See “Left Rear Access Door” on page 4-8.
2. Wait several minutes to allow any accumulated battery gases to clear before servicing the batteries.
3. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-15.

NOTICE!

If performing a battery disconnect, wait for at least 1 full minute before disconnecting the battery cables so the machine’s engine control module (ECM) can complete its updating procedure. Failure to follow this notice can damage the machine or cause improper machine operation.



0004716

Figure 5-84

4. Remove the battery cover (1).

0004870

Figure 5-85

5. Remove the plastic terminal covers and clean all the battery connections (2). Use a clean rag to wipe any dirt from the batteries.

NOTE: *If corrosion is found on the terminals, disconnect and clean the terminals and cable ends with corrosion cleaner.*

6. Clean the battery compartment as necessary.
7. Reinstall the battery cover.
8. Set the battery disconnect switch to the ON position.
9. Close and secure the left rear access door.

Replace the Battery

⚠ CAUTION

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

- **Battery gases are explosive, which could cause injury. Never smoke around batteries or expose them to sparks or open flames. Wear personal protective equipment (PPE) when working with batteries. Work in a well-ventilated area.**
- **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.**

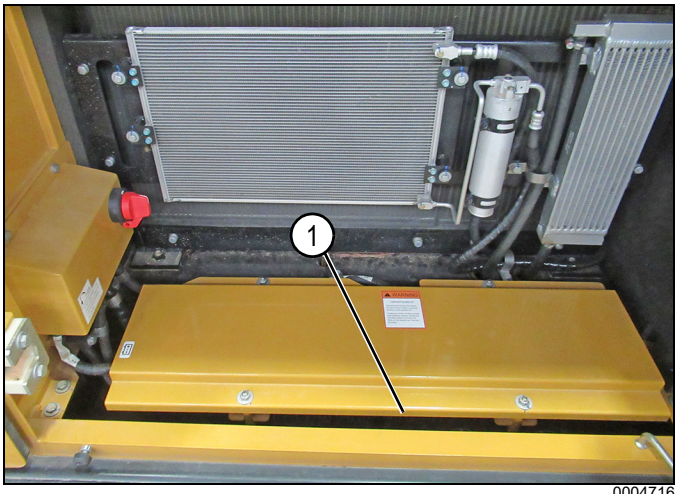
Failure to follow these cautions could result in death or serious injury.

1. Open the left rear access door. See “Left Rear Access Door” on page 4-8.
2. Wait several minutes to allow any accumulated battery gases to clear before servicing the batteries.
3. Prepare the machine for service. See “Maintenance Safety” on page 2-4.

NOTICE!

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

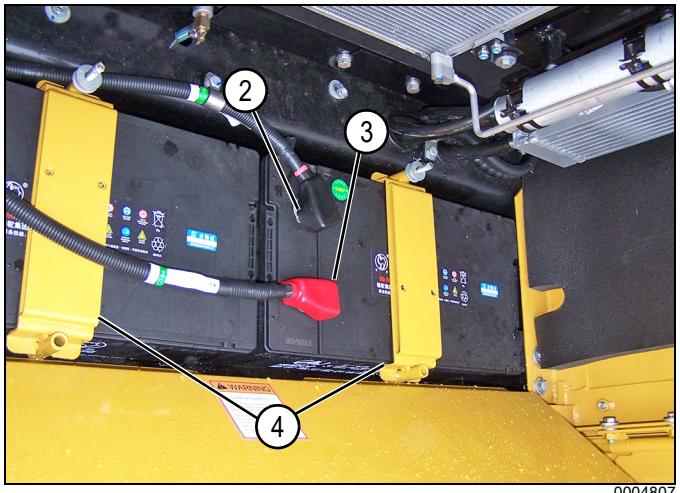
4. Turn the battery disconnect switch to the OFF position. See “Battery Disconnect Switch” on page 3-15.



0004716

Figure 5-86

5. Remove the battery cover (1).



0004807

Figure 5-87

NOTE: *Battery terminals are protected by plastic covers, lift covers to gain access to the terminals, do not remove covers.*

6. Disconnect the black ground (-) battery cables first (2), then disconnect the red positive (+) battery cables (3).

NOTE: *Two battery cables are shown, the other cables are similar.*

7. Remove the battery retaining frames.
8. Remove the battery (or batteries).

NOTICE!

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

9. Install a new battery (or batteries).
10. Connect the red positive (+) cables first, then connect the black ground (-) cables.

NOTE: *The two 12-volt batteries are attached in series. Make sure they are installed in the same manner as removed.*

NOTE: *Tighten the battery cable clamps to 7 lb-ft (10 N•m).*

11. Reinstall the battery retaining frame over the batteries and secure in place.
12. Install plastic terminal covers.
13. Install the battery cover.
14. Turn the battery disconnect switch to the ON position.
15. Close and secure the left rear access door.

Check the Fuses

Check all fuses for corrosion and proper function. See “Fuses and Relays” on page 3-23, and “Fuses and Relays” on page 3-23.

Check the Electrical System

The electrical system should be inspected, starting with the fuse box. The fuse box is behind the left front door.

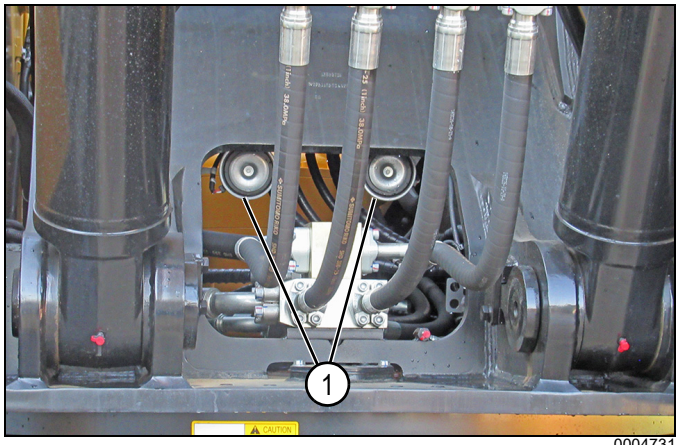
- If a fuse is corroded, contact a SANY dealer for repair information regarding the electrical circuit in question.
- Inspect all electrical equipment. If necessary, remove and replace faulty items, including loose connectors, worn or degraded wiring, etc.
- Identify and repair any electrical faults.
- Use only genuine SANY parts and fuses.
- Shut down the engine immediately if a fault with the power supply occurs.

Check the Operating Functions

1. Turn the key switch to ON (do not start the engine) to provide power to the machine and verify that all functions in the cab work correctly.

NOTE: *Make sure any damaged or inoperable components are repaired or replaced before returning the machine to service.*

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



0004731

Figure 5-88

- Horns (1)

0000453

Figure 5-89

- Boom work lights (2), one on either side
- Headlights (3)
- Work light (4)

0004962

Figure 5-90

- Windshield wiper (6) and washer (5)

0004742

Figure 5-91

- Backup camera (7)

Check the Backup Camera

0004742

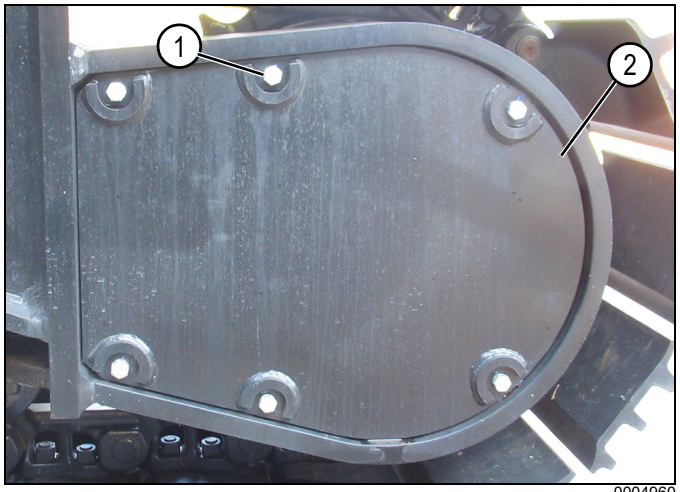
Figure 5-92

1. Make sure the backup camera (1) is operating correctly and is free of any obstructions.
2. Push function key F4 on the monitor to activate the backup camera and view activity behind the machine. Push function key F4 again to turn the camera off.

Final Drive

Check the Final Drive

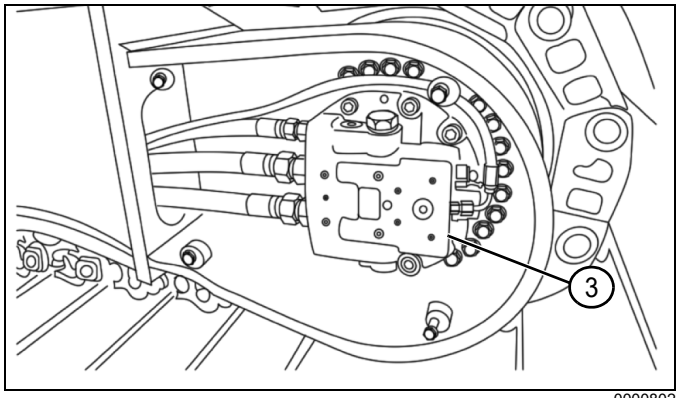
1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.



0004960

Figure 5-93

2. Remove six fasteners (1) and remove final drive motor cover (2).



0000802

Figure 5-94

3. Inspect the final drive motor (3) and make sure all hoses are connected tightly.
4. Make sure all fasteners are present and tight.

NOTE: *Replace any damaged or defective fasteners and tighten any loose fasteners. Use thread lock compound when reinstalling loose fasteners or installing new fasteners.*

5. Check for leaks.
6. If no issues are found, install the final drive motor cover.

NOTE: *Use thread lock compound when retightening loose fasteners and installing new fasteners.*

Collect a Final Drive Oil Sample

1. Start the engine and operate the machine for all systems to reach normal operating temperatures.
2. Park the machine on a flat, level surface, placing the oil drain plug on the final drive cover at the bottom, and the oil level mark parallel with the ground.
3. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
4. Remove any dirt from the area around the check plug. See “Check and Add Final Drive Oil” on page 5-47.
5. Slowly loosen the check/fill plug to relieve pressure within the final drive.
6. Remove the check/fill plug.
7. Insert the oil sample tube into the check plug hole.
8. Collect a sample of oil from the final drive.
9. Remove the oil sample tube.
10. Make sure the oil level is within operating range.
11. Install the check plug.

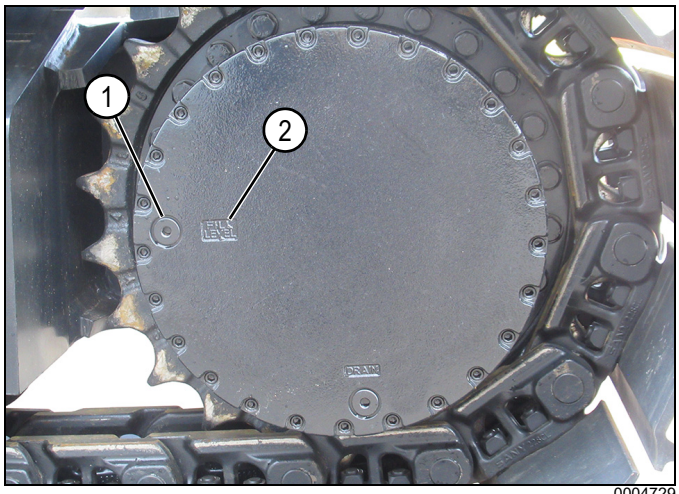
NOTE: Follow the instructions included with the sample kit to send the sample for testing.

Check and Add 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 death or serious injury.



0004729

Figure 5-95

1. Position the machine on a firm, level surface. Make sure the oil level line (2) is parallel with the ground and the arrow is pointed up.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
3. Turn the battery disconnect switch to OFF. See “Battery Disconnect Switch” on page 3-15.
4. Remove dirt and debris from around the filler plug and drain plug.
5. Remove the fill plug (1) slowly to relieve system pressure.
6. Make sure the oil level is within 0.4 in. (10 mm) of the bottom of the fill plug hole.

NOTE: *For the oil capacity of the final drive, see “Location, Capacity, and Type” on page 5-6.*

NOTICE!

- **Never mix fluids of different types or viscosities (weights), and never overfill the system you are servicing.**
- **Overfilling the final drive case may damage the case seals. This could result in machine damage and improper machine operation.**

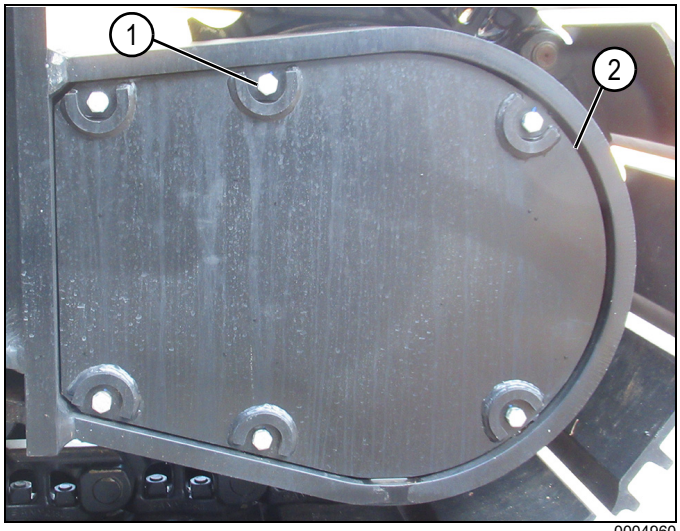
7. If the oil level is low, add oil through the fill plug hole until the level is within 0.4 in. (10 mm) of the bottom of the fill plug hole.
8. Replace the O-ring on the fill plug.
9. Install and tighten the plug.
10. Check for external leaks.

NOTICE!

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

Check the Final Drive Motor Mounting Fasteners

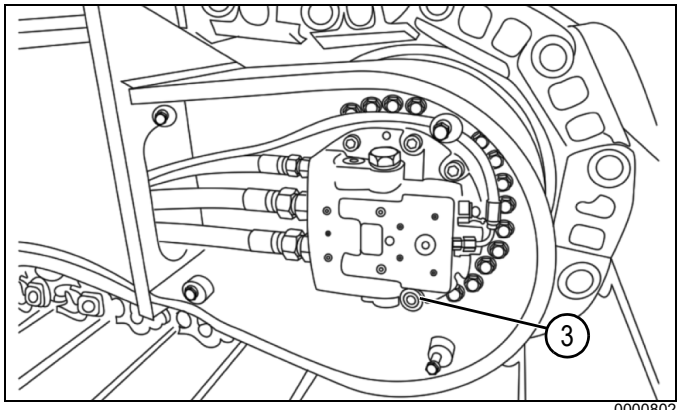
1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.



0004960

Figure 5-96

2. Remove six fasteners (1) and remove and remove final drive motor cover (2).



0000802

Figure 5-97

3. Inspect all of the final drive motor mounting fasteners (3) for rust, damage, or looseness.
4. Replace any damaged or defective fasteners and tighten any loose fasteners.

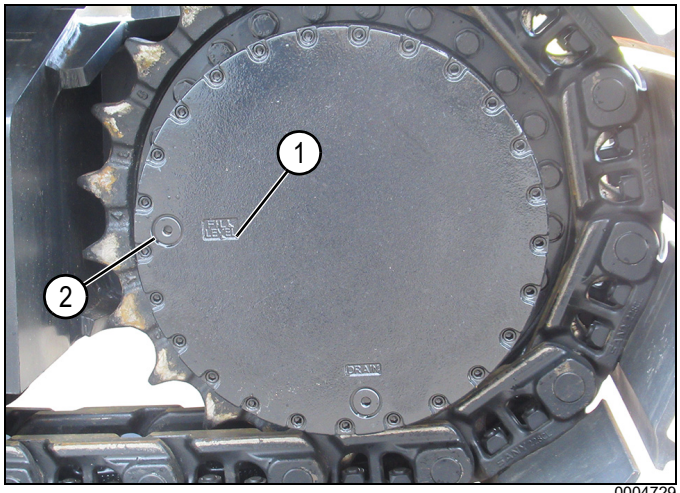
NOTE: *Use thread lock compound when retightening loose fasteners and installing new fasteners.*

Replace the Final Drive Oil

CAUTION

- **Allow the hydraulic system to cool before servicing. Hot hydraulic oil may cause burns or other serious injury.**
- **Residual pressure in the final drive can cause oil to squirt out or the plug to fly out with extreme force, which could result in injury. Slowly loosen the plug to gradually release the pressure.**

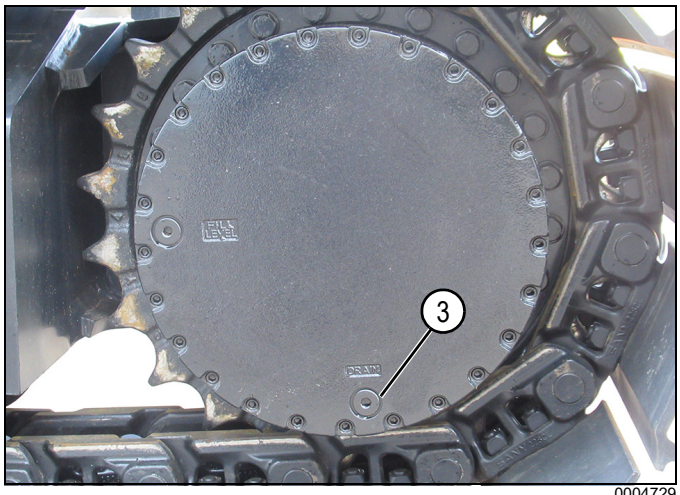
Failure to follow these precautions could result in death or serious injury.



0004729

Figure 5-98

1. Position the machine on a firm, level surface, making sure the oil level line (1) is parallel with the ground.
2. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
3. Remove any dirt and debris from around the plugs.
4. Remove the fill plug (2) slowly to relieve system pressure.



0004729

Figure 5-99

5. Place an appropriately sized container under the drain plug (3).
6. Remove the drain plug (3) slowly, taking care not to stand in front of the drain plug.
7. Allow the oil to drain completely.

NOTICE!

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

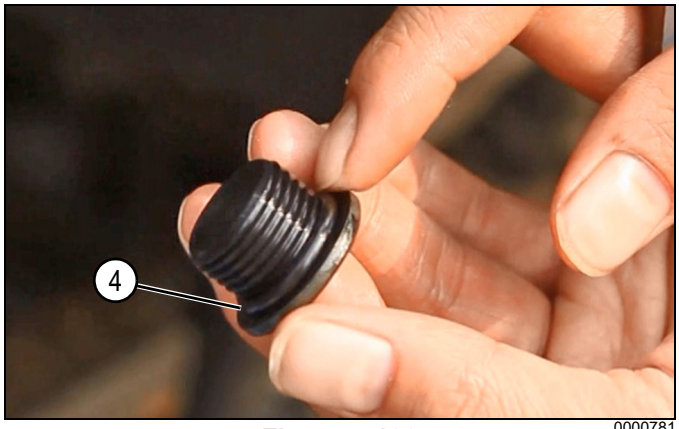


Figure 5-100

8. Replace the O-ring (4) on each plug before installing them.
9. Install and tighten the drain plug.
10. Remove the fill plug.

NOTICE!

Never mix fluids of different types or viscosities (weights), and never overfill the system you are servicing. This can damage the machine or cause it to operate improperly.

Overfilling the final drive case may damage the case seals, resulting in machine damage and improper machine operation.

11. Add new oil through the filler hole (2) until the oil level is within 0.4 in. (10 mm) of the bottom of the check plug hole.
12. Check for external leaks.

NOTICE!

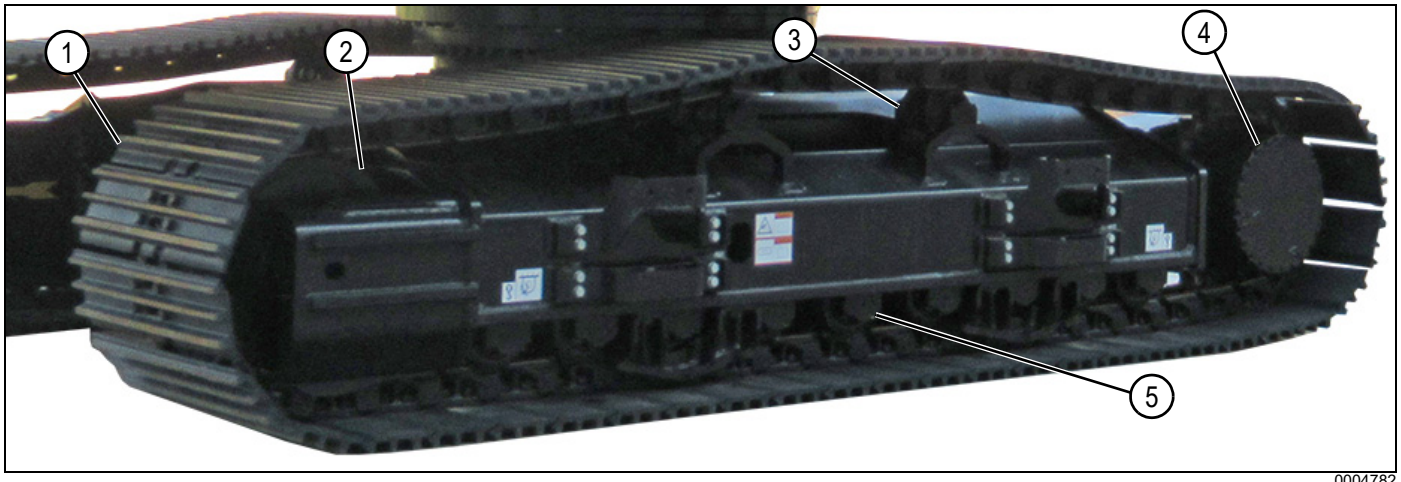
If oil leaks are found during the inspection, stop the inspection and locate and repair the cause of the oil leaks.

Failure to do so could result in machine damage and improper machine operation.

13. Repeat this procedure for the other final drive.

Track Assemblies.

Check the Track Assemblies



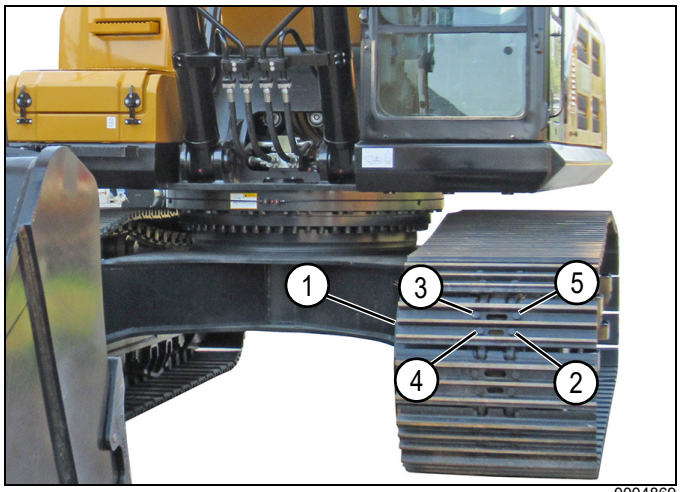
0004782

Figure 5-101

NOTE: *Use an appropriate lifting device to shift or lift the track shoes as needed to perform this procedure.*

1. Check the track shoes (1) for damage, wear, loose fasteners, or any other defects.
2. Replace defective track shoes as necessary.
3. Check the idler (2), track rollers (5), and top rollers (3) for irregular wear and defects.
4. Check the track final drives (4) for excessive wear, defects, and oil leaks.
5. Remove as much accumulated dirt as possible from the track assemblies. Excessive debris requires more energy to operate the tracks and causes the moving parts to wear rapidly.

Check the Track Fasteners



0004869

Figure 5-102

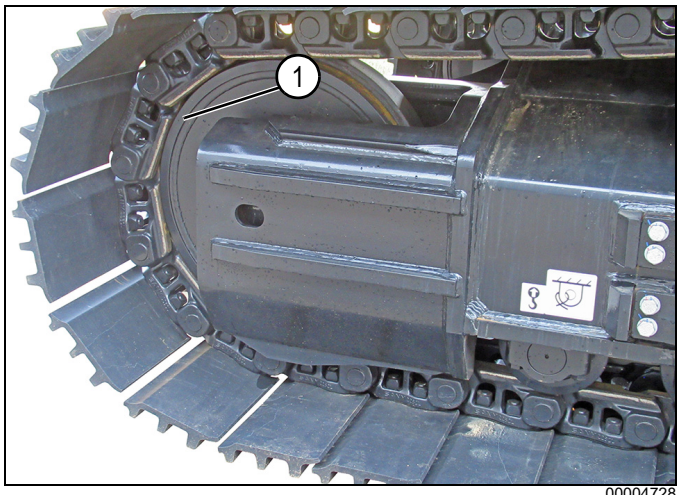
NOTE: *Replace any damaged or defective fasteners.*

1. Make sure all track fasteners are installed for each track shoe (1) and are not broken, bent, loose, or damaged.

NOTE: *Tighten the fasteners in a crisscross sequence shown, starting at the number 2 position and making sure the fasteners and track shoes are in contact with the links mating surfaces.*

2. Tighten any loose fasteners.

Check the Idler



00004728

Figure 5-103

Check the idler (1) for cracks and distortion. Replace as necessary.

3. Inspect the mounting fasteners (1) that secure the support rollers to the side frame for rust, damage, or loose parts.

Check the Track Tension

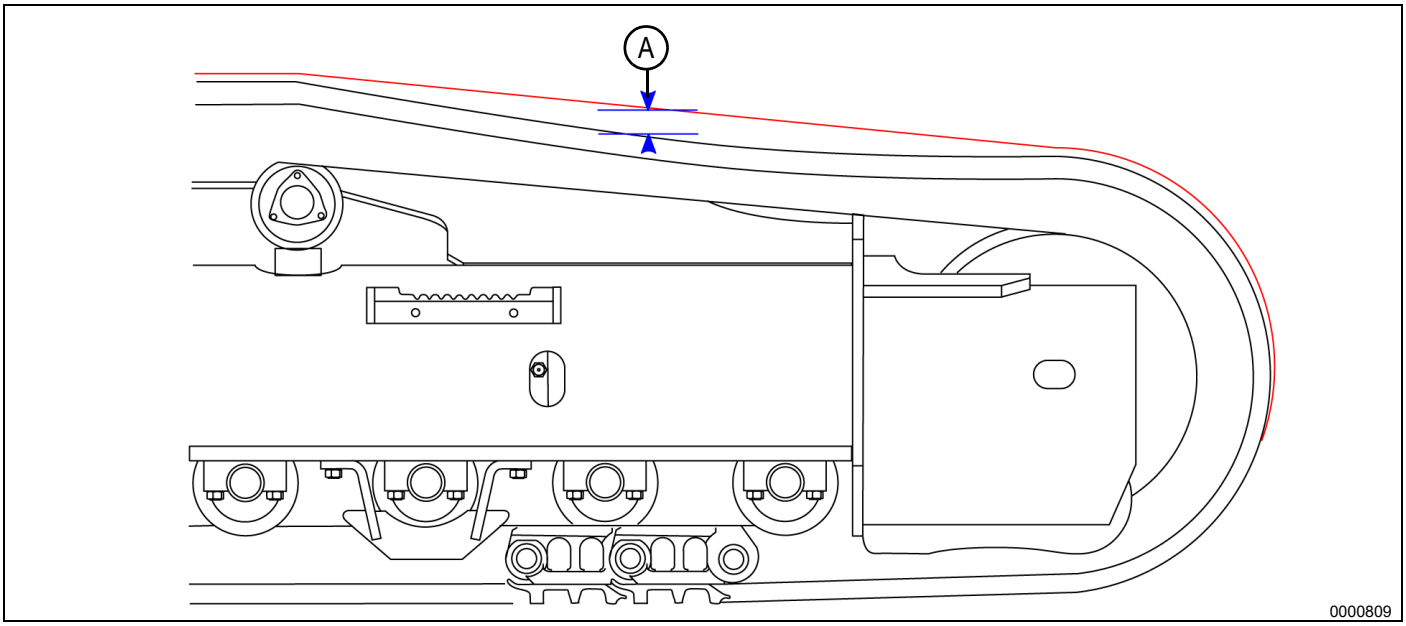


Figure 5-104

1. Clean the track, rollers, and frame of accumulated debris.
2. Move the machine forward two machine lengths on a firm and level surface.
3. Place a taut string or straightedge between the centers of the forward top roller and the idler as shown.
4. Measure the gap at location A from the top of the track to the string or straightedge.

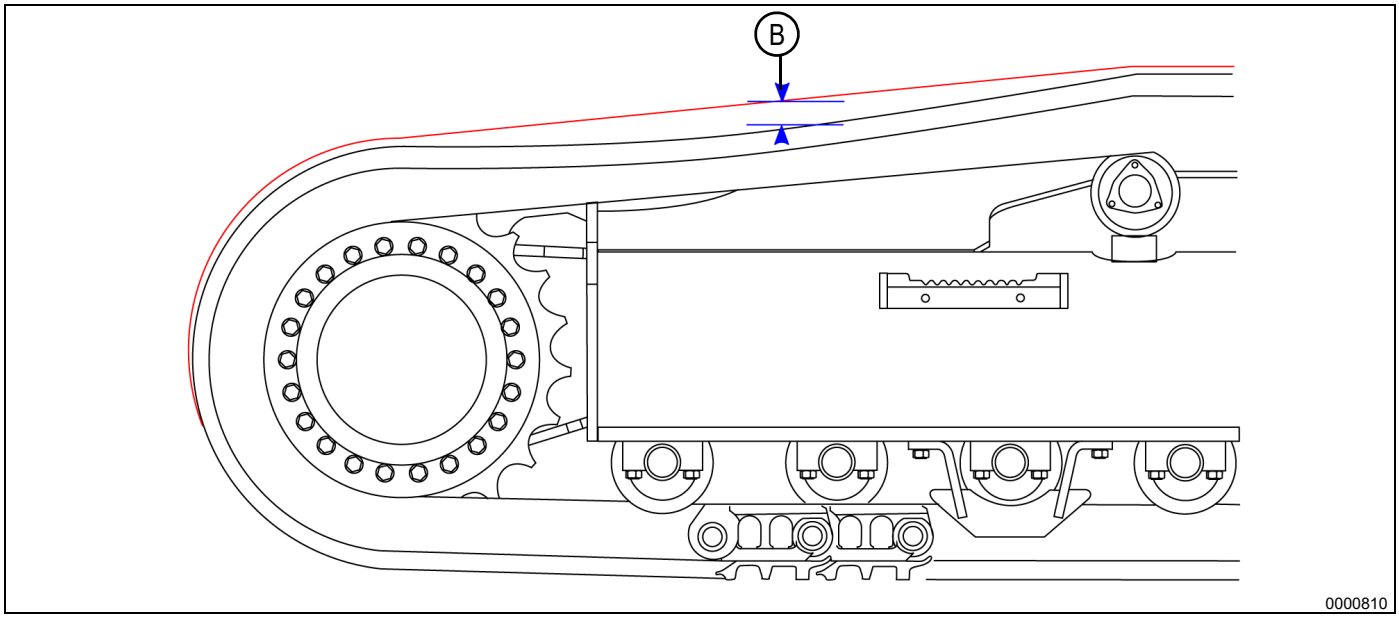


Figure 5-105

5. Hold a taut string or straightedge between the centers of the rear top roller and the sprocket as shown.
6. Measure the gap at location B from the top of the grouser to the string or straightedge.
7. Add dimensions A and B.

NOTE: *The specified range must be within 3 in.–4 in. (76.2 mm–101.6 mm).*

8. Adjust the track tension as needed to obtain this dimension.

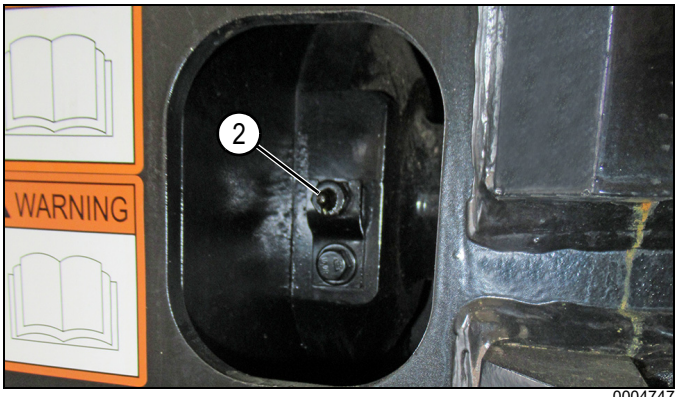
Increase the Track Tension

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.

0004782

Figure 5-106

2. Clean all debris from the grease fitting access port (1).



0004747

Figure 5-107

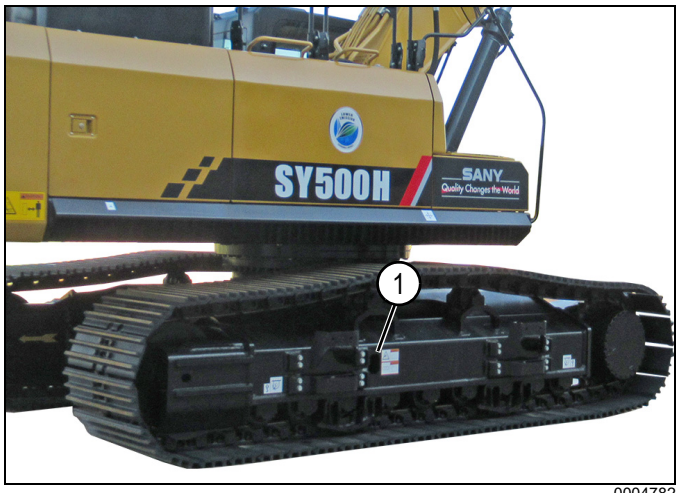
3. Using a grease gun, grease the fitting (2) to move the idler out and tighten the track.
4. Slowly move the machine forward two machine lengths.
5. Stop the machine.
6. Recheck the track tension. See “Check the Track Tension” on page 5-51.
7. Repeat step 1 if the track tension is not within the specified range.

Decrease the Track Tension

WARNING

Do not loosen the grease fitting! The grease fitting is under extreme pressure and can exit the grease valve quickly and forcefully, which could result in death or serious injury. Do not stand directly in front of the grease valve when loosening the valve. Wear suitable personal protective equipment (PPE) in the form of protective clothing, gloves, safety glasses, and head protection to protect against the sudden release of pressurized grease.

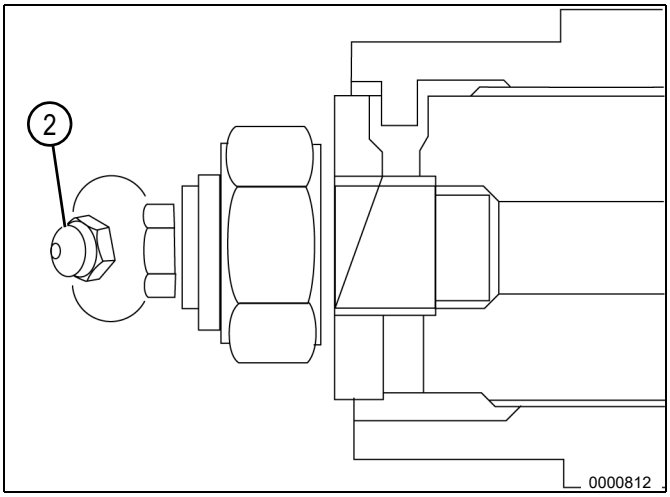
1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.



0004782

Figure 5-108

2. Make sure there is no gravel or mud between the sprocket and the track shoe before decreasing track tension.



0000812

Figure 5-109

NOTE: *Never stand in front of the grease valve (2) when opening the grease valve. The grease fitting is under extreme pressure and can exit the grease valve quickly and forcefully.*

3. Using the proper tools, slowly loosen the grease valve counterclockwise in 90° (1/4 turn) increments to decrease track tension.

NOTES: *The grease will come out from behind the grease valve.*

4. Move the machine back and forth for a short distance if the grease does not come out smoothly.
5. Check track tension. See “Check the Track Tension” on page 5-51.
6. When correct tension is obtained, turn the grease valve clockwise until tight.
7. Move the machine forward at low idle speed for one complete track revolution.
8. Park the machine.
9. Check track tension again. Readjust if it is still out of the acceptable range.

Swing Drive

Lubricate the Swing Bearing

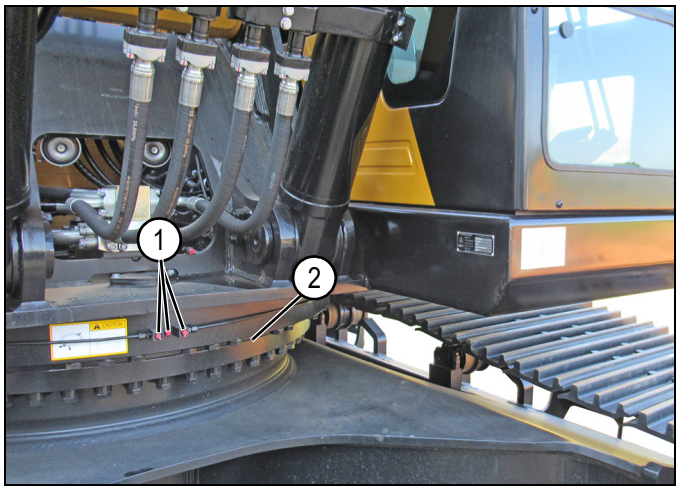


Figure 5-110

1. Lubricate the fittings (1) on the swing bearing with grease until grease seeps out of the seal (2).
2. Check the condition of the seal.

NOTE: *If the seal is leaking, replace it immediately.*

3. Start the engine.
4. Lift the arm off the ground.
5. Rotate the upper structure 90° and repeat steps 1 and 2.
6. Rotate the upper structure until a full 360° rotation has been made.
7. Shut down the engine.

Check the Swing Bearing Fasteners

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.

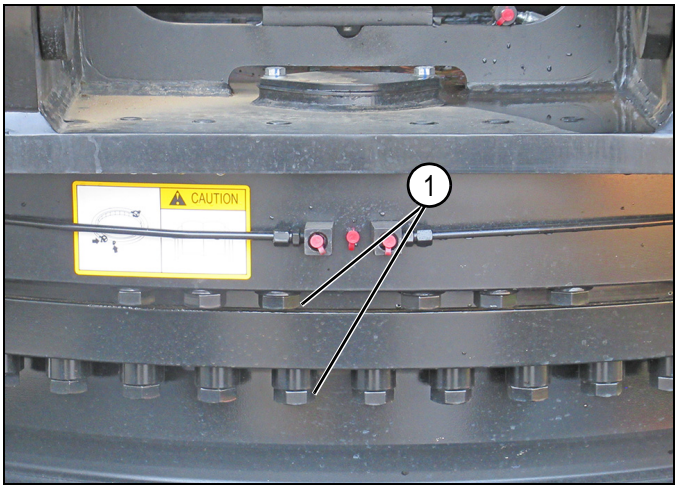


Figure 5-111

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 4 until you have inspected all of the fasteners.

NOTE: *Contact a SANY dealer for missing or damaged fasteners.*

Check the Swing Drive

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.

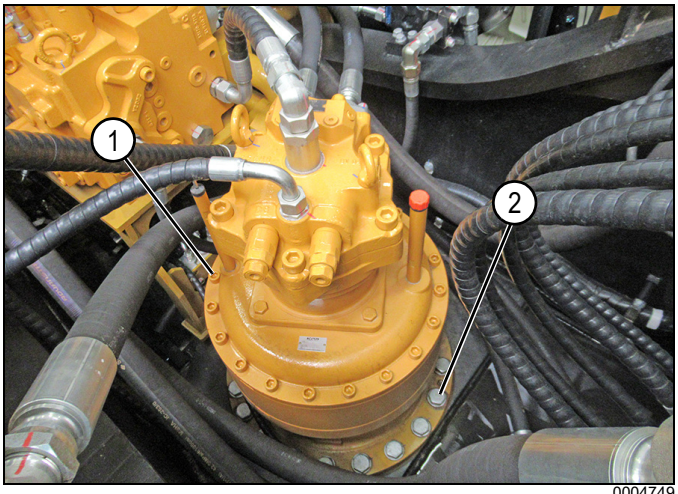
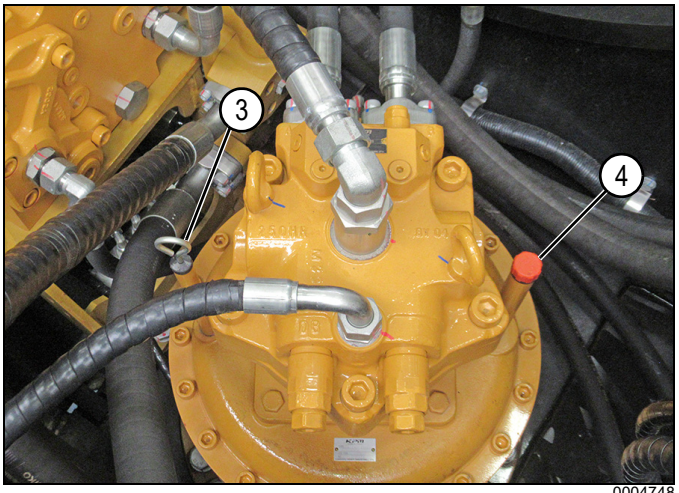


Figure 5-112

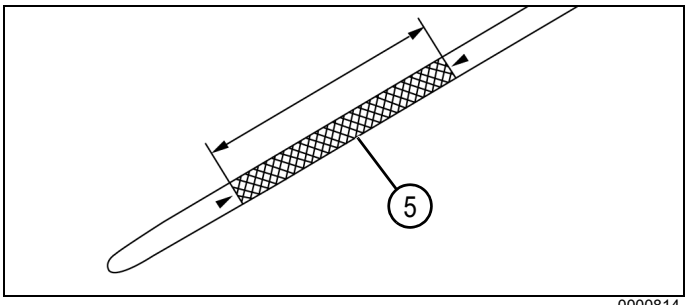
2. Locate and inspect the swing drive (1). Check for loose or missing fasteners (2) and for damage.



0004748

Figure 5-113

3. Check the swing drive oil level by removing the dipstick (3) from the swing gearbox.
4. Wipe the dipstick with a clean rag.



0000814

Figure 5-114

5. Insert the dipstick into the swing gearbox and remove it to check the oil level. The oil level must be within the etched area (5).

NOTICE!

Do not overfill the oil level in the swing gearbox. This could result in machine damage and improper machine operation.

6. If the oil level is low, clean dirt and debris from the oil filler cap (4) and remove the oil filler cap. Add clean oil as needed and install the cap.

Collect a Swing Drive Oil Sample

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Start the engine and operate the machine for all systems to reach normal operating temperatures.
3. Shut down the machine.
4. Remove the dipstick from the swing drive. See “Replace the Swing Drive Oil” on page 5-54.
5. Insert the oil sample tube into the dipstick tube.
6. Collect a sample of swing drive oil.
7. Remove the oil sample tube.
8. Replace the dipstick.
9. Follow the instructions included with the sample kit to send the sample for testing.

Replace the Swing Drive Oil

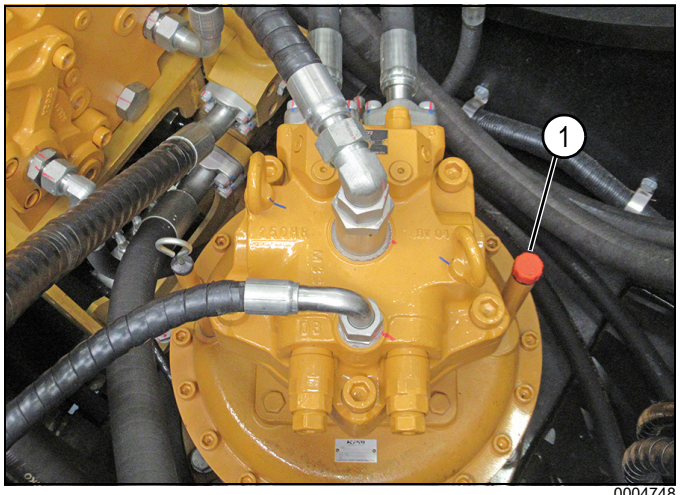
1. Start the engine.
2. Rotate the upper structure 90° in both directions five times to warm the oil. If cold weather conditions exist (0°F [-18°C] or lower), rotate the upper structure 90° in both directions 10 times.

⚠ CAUTION

Because the engine and oil are hot, which could result in injury, wear protective clothing (PPE) for this procedure.

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

3. Prepare the machine for service. See “Maintenance Safety” on page 2-4.



0004748

Figure 5-115

4. Loosen the swing drive oil fill cap (1).

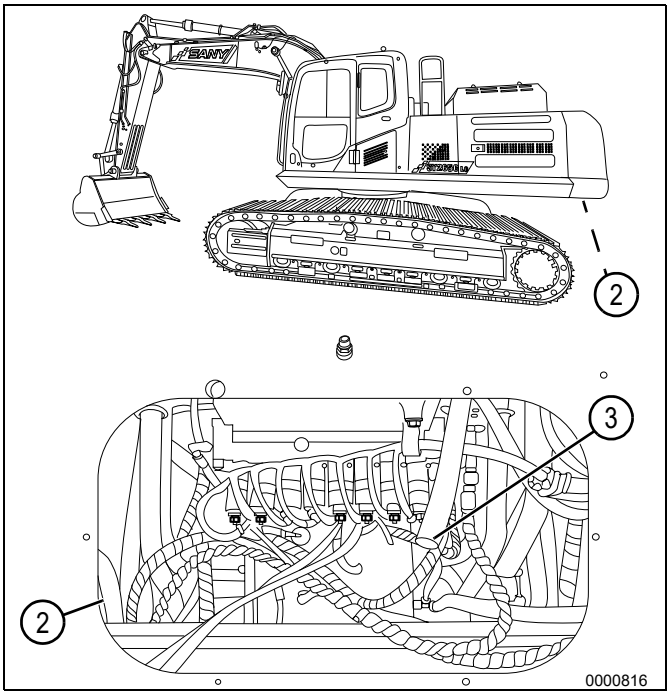


Figure 5-116

5. Remove the machine bottom cover (2) to access the drain hose (3).
6. Place a suitable container below the oil drain hose to collect the drain oil.

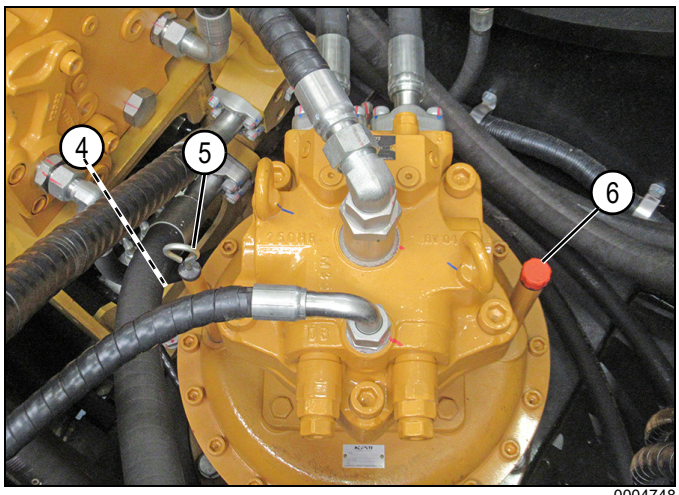


Figure 5-117

7. Open the drain valve (4) to drain the oil into the container.
8. After oil stops draining from the swing drive, close the drain valve.

NOTICE!

Dispose of the drain oil in accordance with all applicable environmental regulations. Failure to do so could result in damage to the environment.

9. Install the machine bottom cover.
10. Remove the swing drive oil fill cap (6).
11. Fill the swing drive with clean oil.

NOTICE!

Do not overfill the swing gearbox with oil. This could result in damage to the swing drive.

12. Check the swing gearbox oil level using the swing drive dipstick (5).

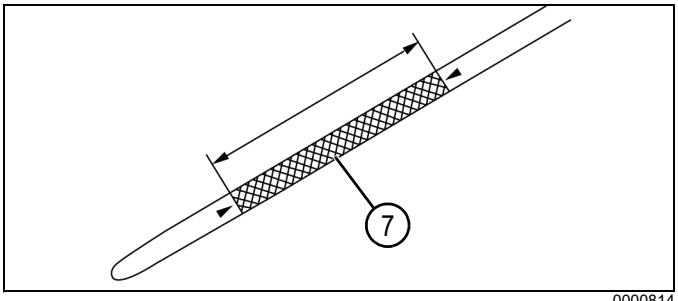


Figure 5-118

NOTE: *The oil level must be within the etched area (7). Add clean oil as necessary.*

13. Install and tighten the oil fill cap.

NOTICE!

If oil leaks are found during the oil level inspection, stop the inspection. Locate and repair the cause of the oil leak. Otherwise, this could damage the swing gearbox.

Check the Swing Grease Bath Level

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.

Figure 5-119

2. Locate the swing grease bath checkpoint (1).

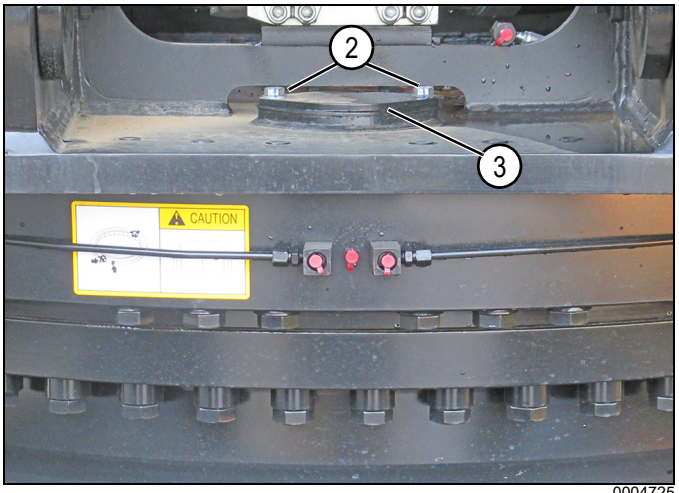


Figure 5-120

3. Remove two fasteners (2) and remove the inspection/fill hole cover (3).
4. Check the grease color.

NOTE: *Grease with a milk-white color indicates that the grease is contaminated and must be replaced.*

5. Check the grease level by inserting a ruler into the grease through the inspection/filler hole.

NOTE: *The minimum grease level is 19 mm (0.75 in.).*

6. Add grease through the inspection/filler hole as needed.
7. Install the cover.

Bucket

Replace the Bucket

CAUTION

Driving a pin with a hammer can cause metal pieces to fly off, leading to severe injuries. Wear goggles, a hard hat, protective gloves, and other personal protective equipment (PPE) during these operations.

Make sure the surrounding area is clear of all personnel when removing any of the pins. The pins could fly out and cause personal injury.

Do not stand behind the bucket when removing pins. Keep hands and feet clear of the underside of the bucket during removal to avoid injury.

To avoid injury, do not use hands or fingers to aid in bore alignment.

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.

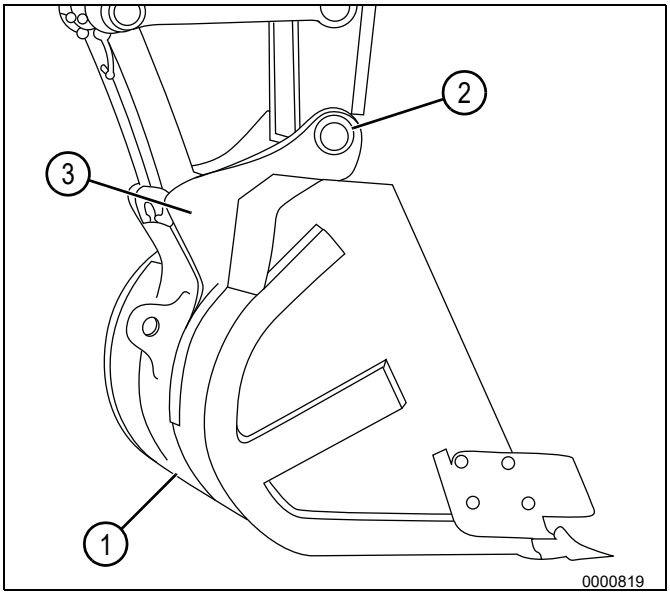


Figure 5-121

2. Lower the bucket (1) to where it just touches the ground and block the bucket to prevent movement.

NOTE: *If an excessive downward force is applied, resistance on the pin could increase, causing difficulty during removal.*

3. Remove the fasteners from the plate retaining the arm pin (2) and link pin (3).
4. Remove the arm pin and link pin, and remove the bucket.

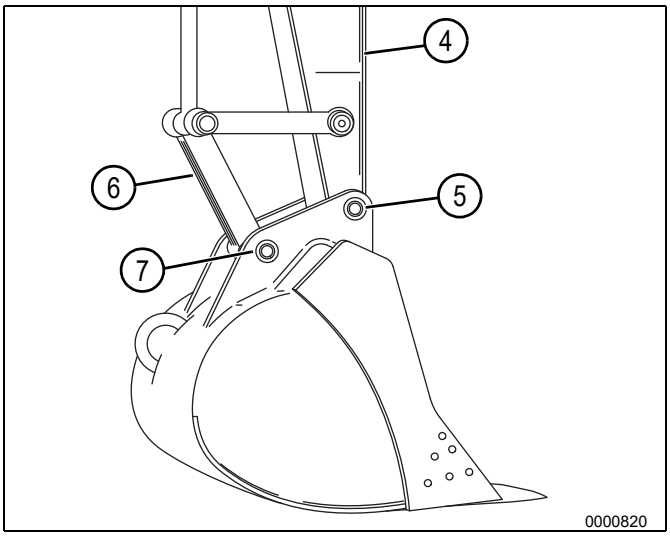


Figure 5-122

NOTE: *Make sure to apply grease to the arm and link pins before installing them.*

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

5. Align the arm (4) with the bore (5) and insert the pin through the bore.
6. Align the link (6) with the bore (7) and insert the pin through the bore.
7. Install the fasteners onto the plate retaining the pins.
8. Pump grease until it escapes from around the pins.

NOTICE!

Replace any broken seals when replacing a bucket. Using broken seals could allow sand or dust to penetrate through to the pins, causing abnormal wear. Failure to follow this notice can damage the machine or cause it to operate improperly.

Replace the Bucket Teeth

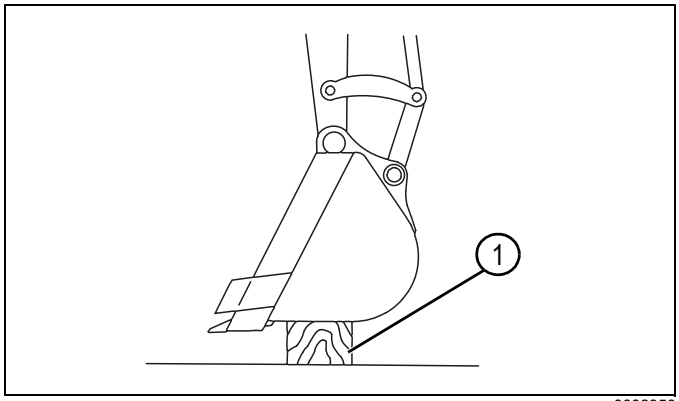
WARNING

- **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.*

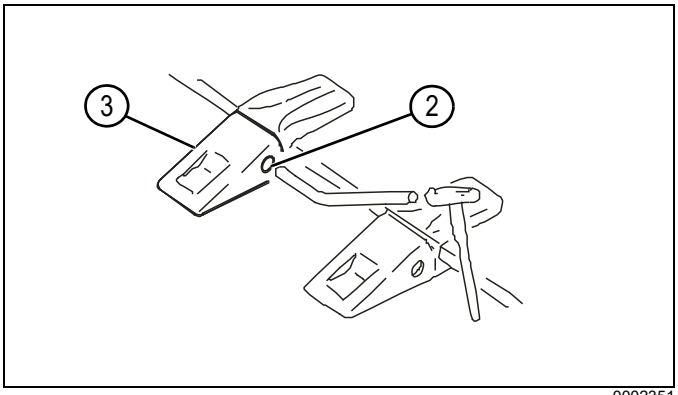
1. Prepare the machine for checks and inspections. See page 2-4.
2. Turn the battery disconnect switch to OFF. See “Battery Disconnect Switch” on page 3-15.



0002350

Figure 5-1

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).

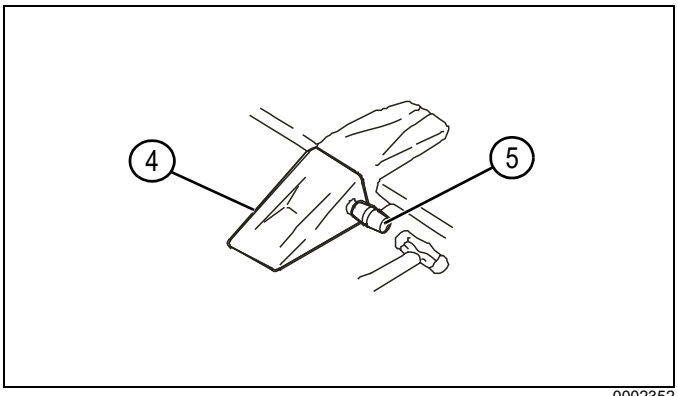


0002351

Figure 5-2

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

NOTE: *New bucket teeth and roll pins must be installed in the reverse order of removal.*



0002352

Figure 5-3

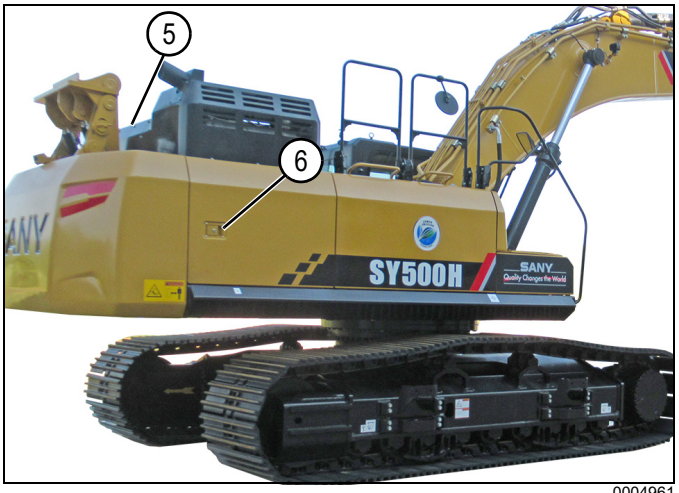
5. Install new bucket teeth (4) and roll pins (5) in the reverse order of removal.

Miscellaneous Procedures

Check the Cab Door, Doors, and Locks

0000453

Figure 5-1



0004961

Figure 5-2

1. Inspect the cab door (1), left front and rear access doors (2), air conditioner fresh-air filter access door (3), left front access door (4), engine access door (5), right rear access door (6), and locks. Make sure that they close and lock properly.

NOTE: *This is important for the security of the machine.*

2. Repair or replace any damaged components immediately.

NOTICE!

Failure to secure the machine could result in damage to the machine.

Check the Cooling Fan

1. Inspect the cooling fan for any damage and replace as necessary.
2. Make sure the cooling fan is securely mounted.
3. Tighten the fasteners if necessary.

Check the Decals

All safety decals should be visible and complete.

NOTE: *See “Operator Safety Information” on page 2-2.*

Check the Escape Tool

0004669

Figure 5-3

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

Make sure the escape tool (1) is installed on the machine.

Check the Fire Extinguisher

0004669

Figure 5-4

NOTICE!

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. Class ABC rated fire extinguisher (National Fire Protection Association [NFPA] 10 Standard for Portable Fire Extinguishers).

Always inspect the machine for a fire extinguisher.

Check the Front Window Locks

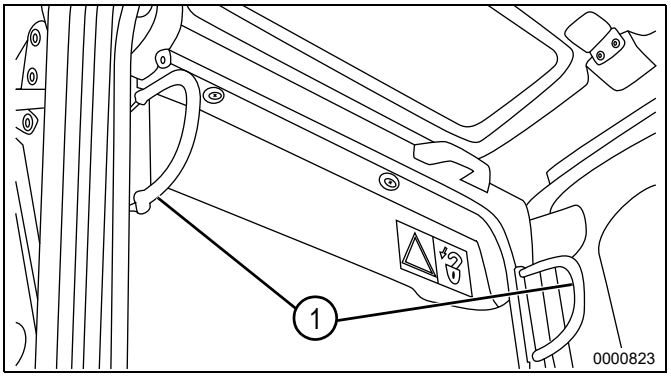


Figure 5-5

WARNING

Failure to lock the front window in place could cause it to open without warning, which could result in death or serious injury.

Push up on the handles (1) to make sure the front window locks are fully engaged. Make sure the window does not move while operating the machine.

Check the Grab Handles and Steps

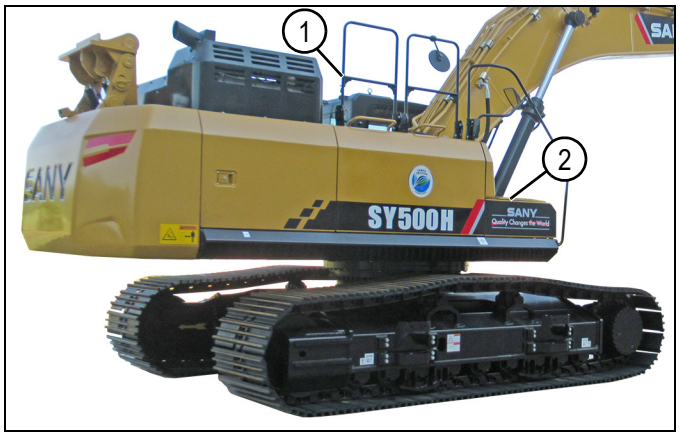


Figure 5-6

1. Check the mounting fasteners on the grab handles (1).
2. Replace any missing or damaged mounting fasteners and tighten any loose fasteners.
3. Remove any tools, lubricants, or debris from the steps (2). Never allow loose items to remain on the machine.

Collect Oil Samples

1. Acquire an oil analysis sample kit from a SANY dealer.
2. Collect the following oil samples:
   - Engine oil. See “Collect an Engine Oil Sample” on page 5-14.
   - Hydraulic oil. See “Collect a Hydraulic Oil Sample” on page 5-32.
   - Swing drive oil. See “Collect a Swing Drive Oil Sample” on page 5-54.
   - Final drive oil. See “Collect a Final Drive Oil Sample” on page 5-47.
3. Send the samples for analysis in accordance with the instructions packaged with the sample kit.

Check the Operation and Maintenance Manual

NOTE: *Replace the Operation and Maintenance Manual immediately if it is damaged or missing.*

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

Check the Seat Belt

NOTE: *Seat belt assemblies are maintenance-free. However, they should be inspected every 500 hours to make sure they are not damaged and are in proper operating condition, especially if they have been subjected to severe stress.*

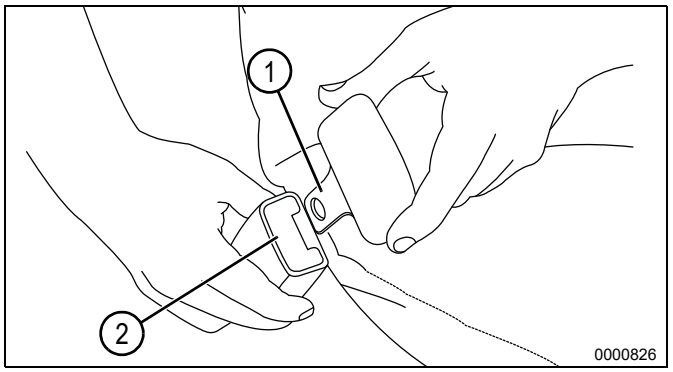


Figure 5-7

Check the seat belt by fastening it securely around your waist.

1. Make sure the latch plate (1) and the buckle (2) connect securely.
2. Make sure the seat belt fits securely with no slack.

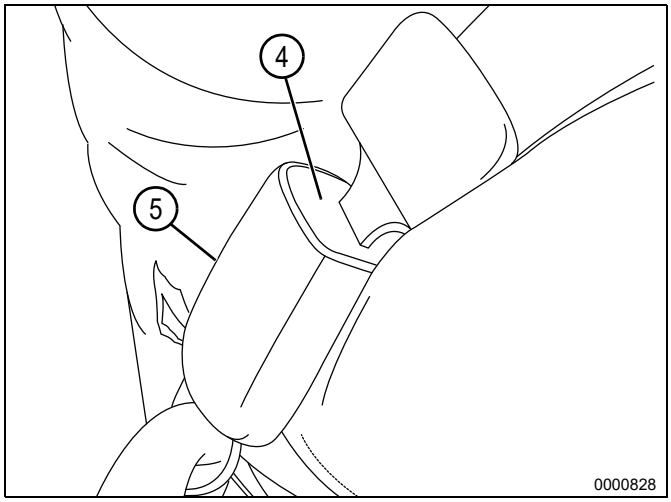


Figure 5-8

WARNING

Keep any belt slack to no more than 1 in. (25 mm). Belt slack beyond this amount could significantly reduce protection in an accident, which could result in death or serious injury.

3. Make sure the belt releases when the red button (4) is pressed at the end of the buckle (5).

WARNING

Contact a SANY dealer if the seat belt fails any of these checks or fails to fasten or unfasten, which could result in death or serious injury.

Check the Sheet Metal

NOTE: *Repair or replace sheet metal parts as needed using SANY-approved parts.*

Check all the sheet metal panels and covers for loss, damage, loose connections, or missing fasteners.

Structural Inspection

1. Thoroughly wash the machine.
2. Inspect the entire structure of the machine for signs of damage or excessive wear.

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

1. Thoroughly clean the machine.
2. Check all structural components for cracks or distortion.

Check the Windshield Washer Fluid

1. Check the washer fluid level inside the windshield washer tank, behind the left front access door.

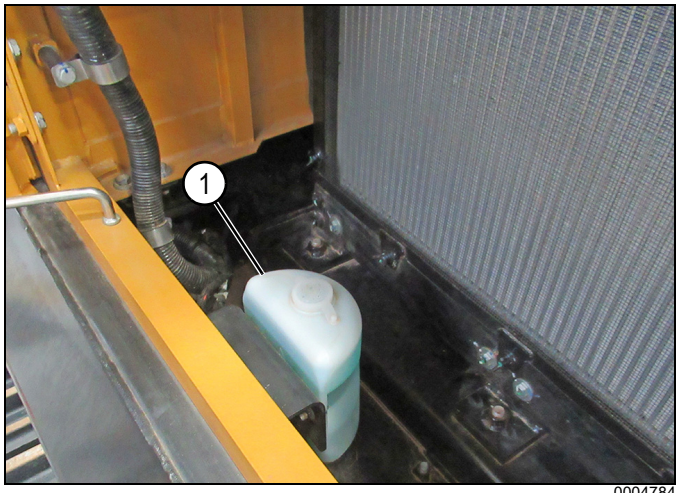
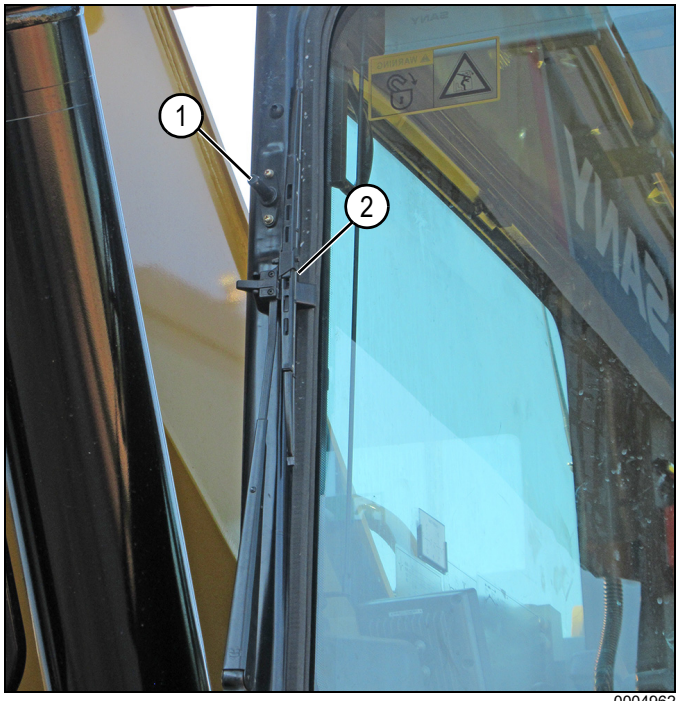


Figure 5-9

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

2. Remove the cap (1) and add windshield washer fluid if fluid is required.

Windshield Wiper



0004962

Figure 5-10

NOTICE!

Do not operate the wiper on a dry window. Failure to observe and follow this notice could result in machine damage or improper machine operation.

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 with a new one if smearing does occur.
4. If necessary, adjust the spray nozzle to make sure the fluid spray is properly directed.

Lubricate the Work Equipment

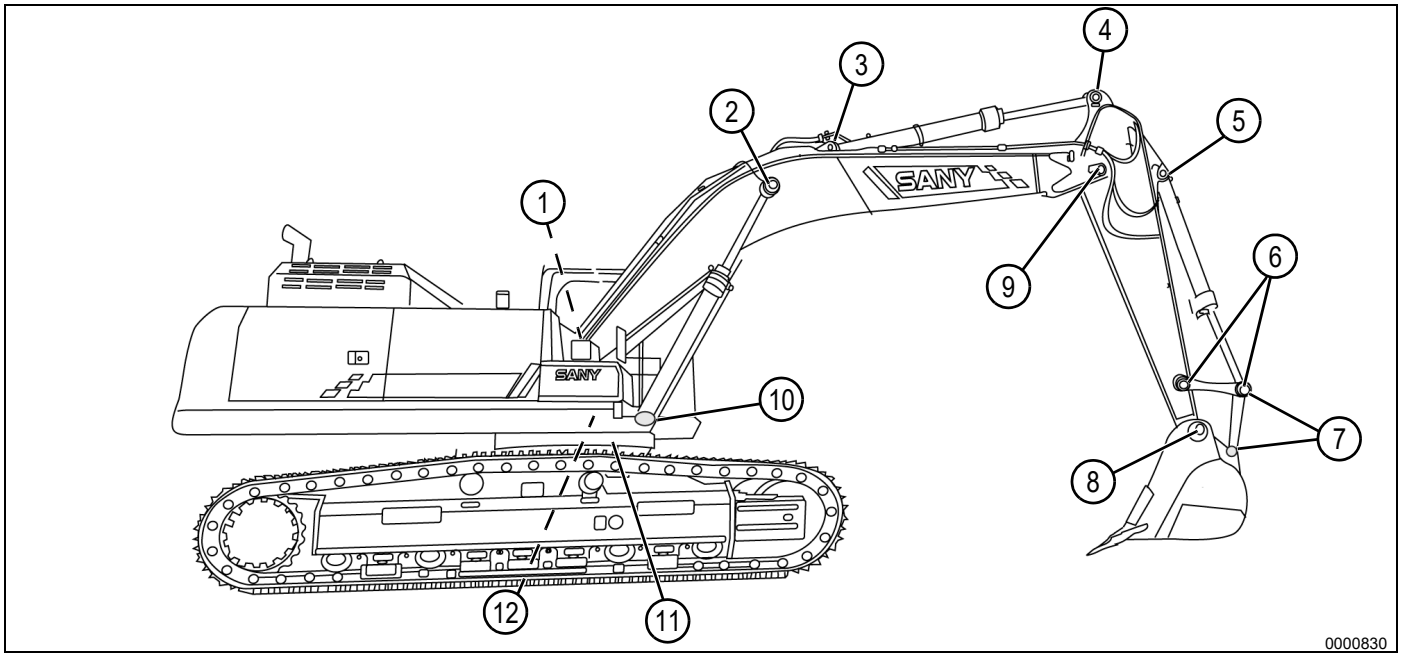


Figure 5-11

1 Boom pin
2 Boom cylinder rod end
3 Arm cylinder head end
4 Arm cylinder rod end
5 Bucket cylinder head end
6 Bucket linkage
7 H-link
8 Bucket pin
9 Arm pin
10 Boom cylinder head end
11 Swing bearing
12 Swing drive

Pump grease through the work equipment greasing points as indicated in the following illustration and as shown in the decal next to the cab door.

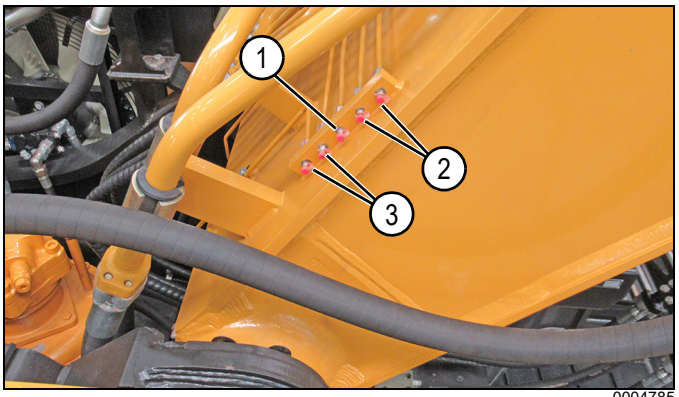


Figure 5-12

NOTE: *These fittings are mounted on the top of the boom near the base, with lines leading to the bearings.*

1. Grease the arm cylinder head end pin fitting (1).
2. Grease the two boom foot pin fittings (2).
3. Grease the two boom cylinder rod end pin fittings (3).

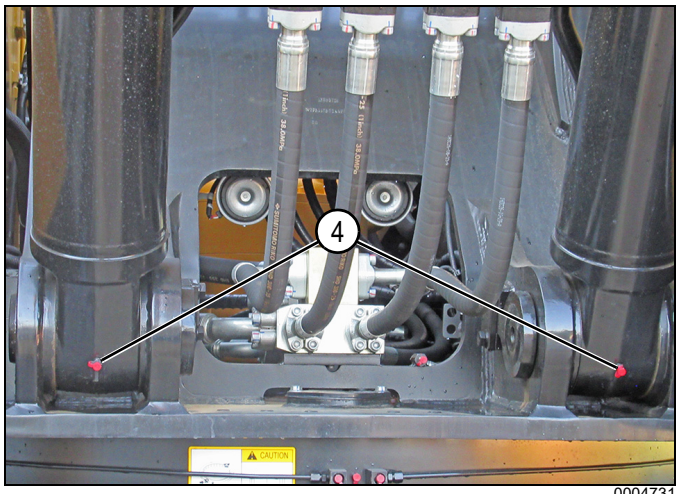


Figure 5-13

4. Grease the two boom cylinder head end pin fittings (4).

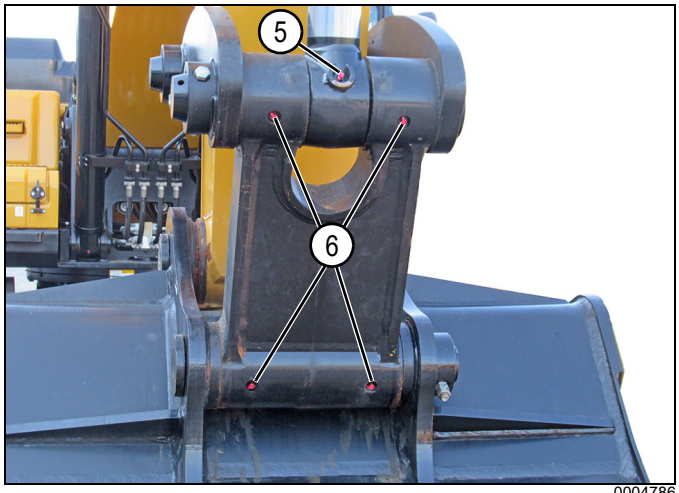


Figure 5-14

5. Grease the bucket cylinder rod end fitting (5).
6. Grease the H-link fittings (6).

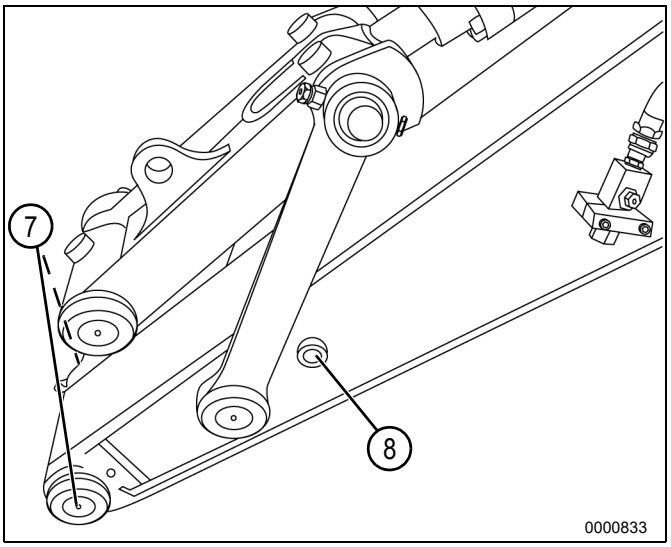


Figure 5-15

7. Grease the two bucket pin fittings (7) (one on each side).
8. Grease the bucket linkage fitting (8).

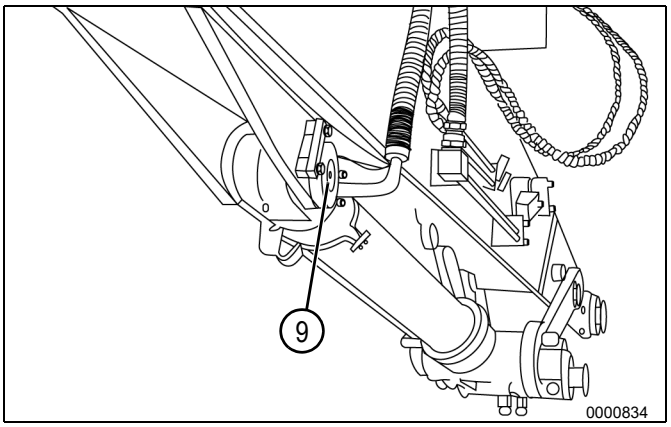


Figure 5-16

9. Grease the bucket cylinder head end pin fitting (9).

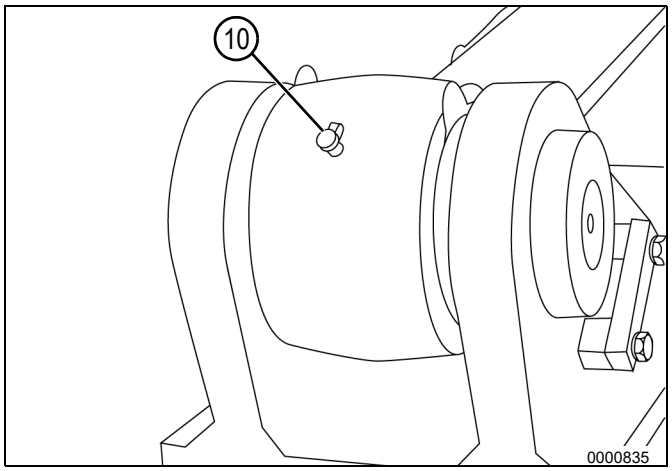


Figure 5-17

10. Grease the arm cylinder rod end fitting (10).

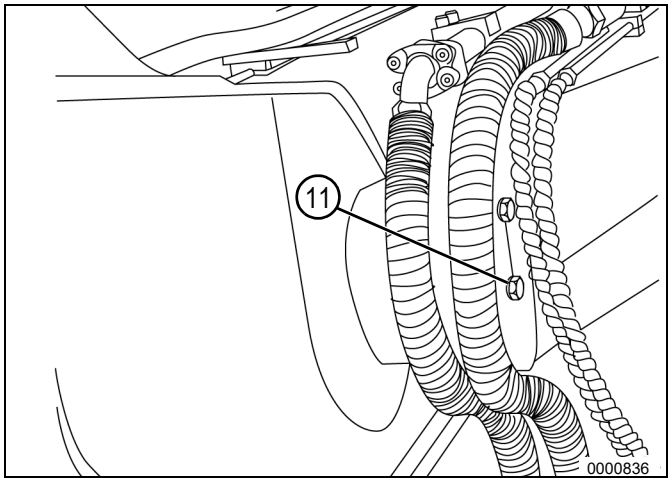


Figure 5-18

11. Grease the two arm pin fittings (11) (one on each side).

Machine Storage

Store the machine in a secure area free of public access. If your storage area is near the ocean or other saltwater environment, it is important to be aware of salt damage. Contact a SANY dealer for additional storage procedures if this is the case.

Short-Term Storage (Less Than 30 Days)

See “Short-Term Storage” on page 4-27.

Long-Term Storage (Longer Than 30 Days)

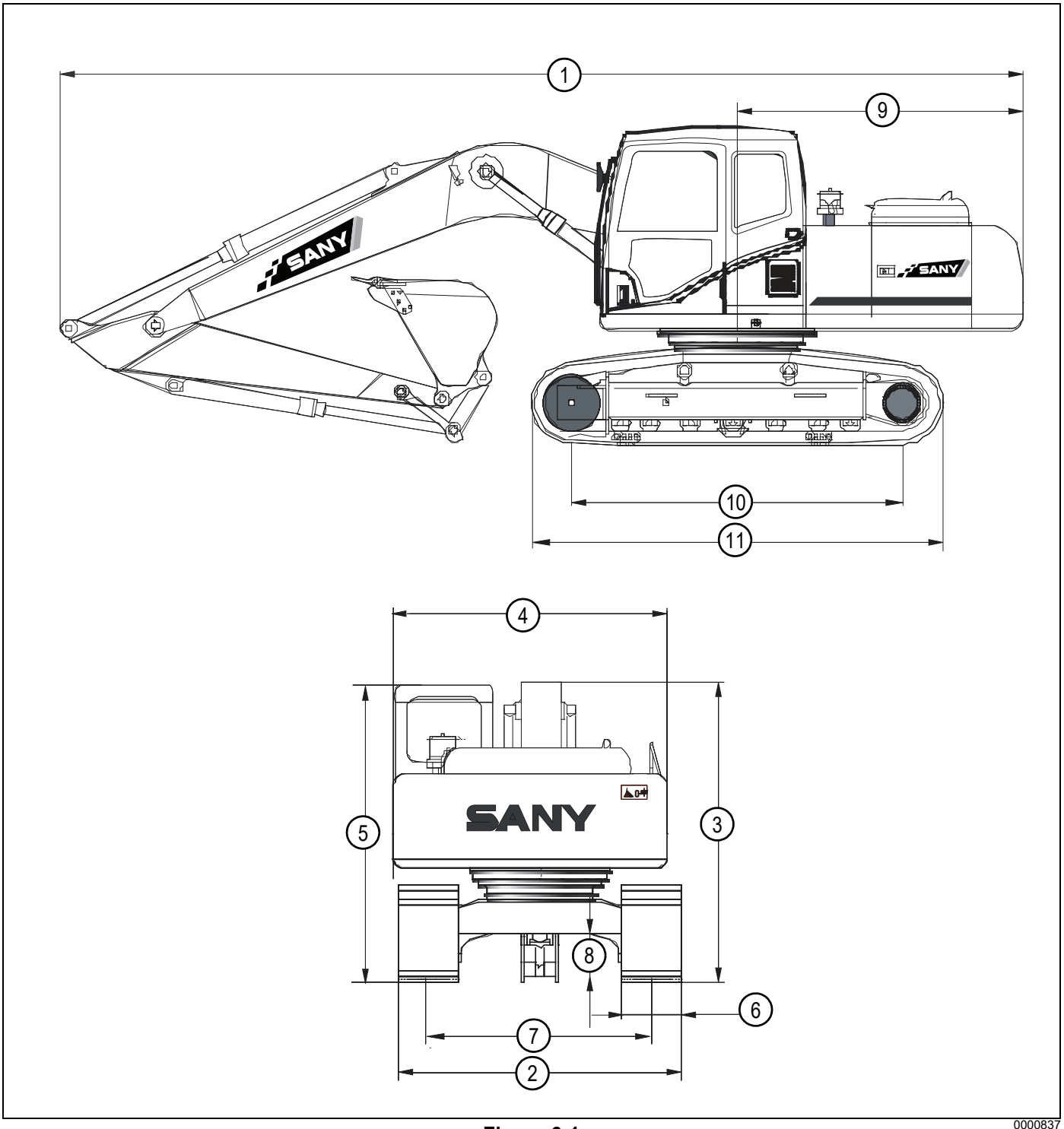
See “Long-Term Storage” on page 4-27.

Page Intentionally Blank

Chapter 6

Specifications

Machine Dimensions

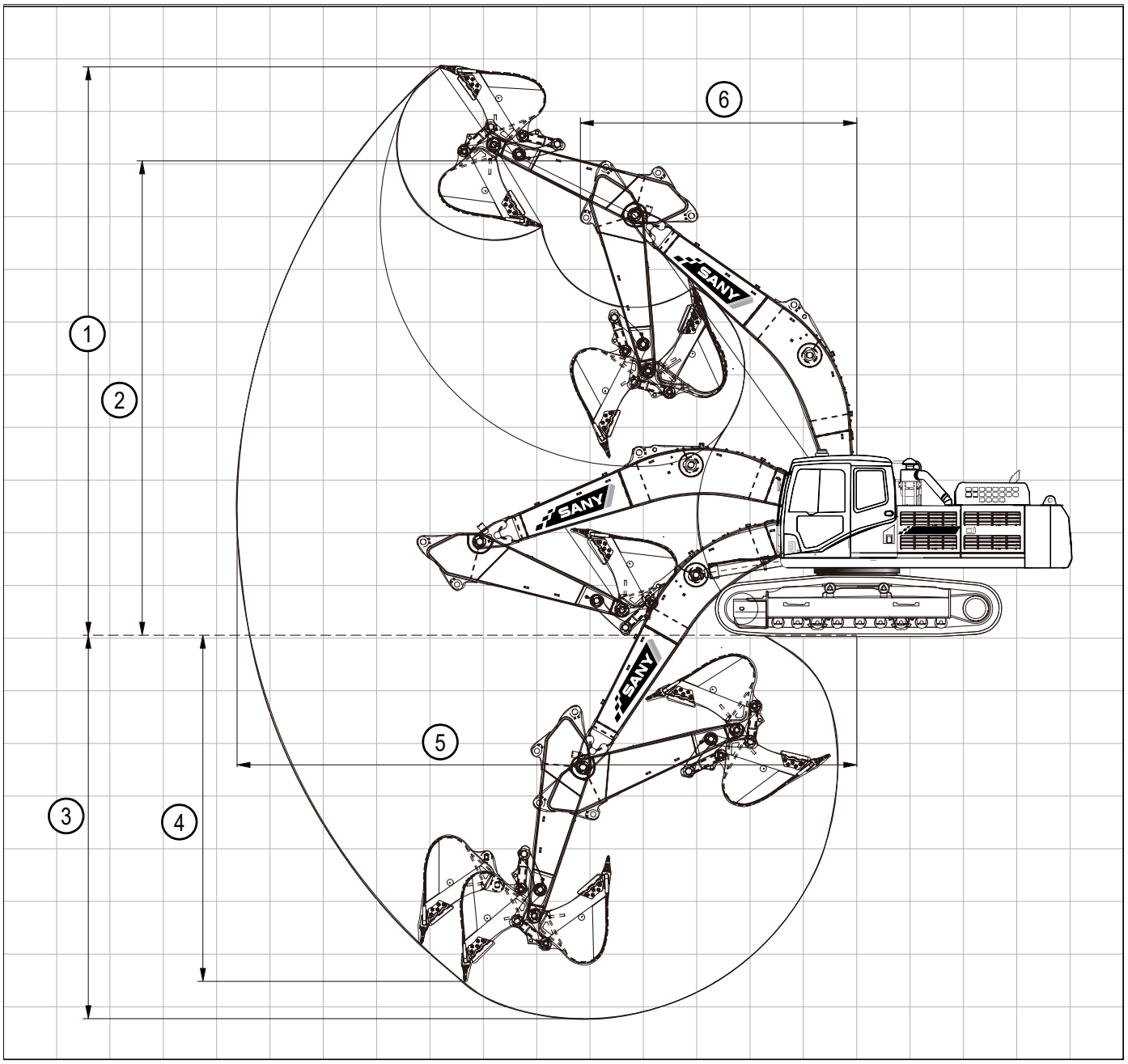


0000837

Figure 6-1

Item	Dimensions
Operating weight	120,152 lb. (54,500 kg)
1) Transport length	39 ft. 11 in. (12.16 m)
2) Transport width	11 ft. 11 in. (3.64 m)
3) Transport height	12 ft. 4 in. (3.76 m)
4) Upper width	10 ft. 10 in. (3.29 m)
5) Cab height	11 ft. 3 in. (3.42 m)
6) Track shoe width (standard)	2 ft. 11 in. (0.9 m)
7) Track gauge	9 ft. (2.74 m)
8) Minimum ground clearance	1 ft. 10 in. (0.56 m)
9) Tail swing radius	12 ft. 8 in. (3.85 m)
10) Track length on ground	14 ft. 6 in. (4.41 m)
11) Track length	17 ft. 11 in. (5.45 m)
Boom length	22 ft. 11 in. (6.99 m)
Arm length	12 ft. 9 in. (3.88 m)

Operating Ranges



0004012

Figure 6-2

Item	Dimensions
1) Maximum digging height	36 ft. 5 in. (11.11 m)
2) Maximum dumping height	25 ft. 9 in. (7.84 m)
3) Maximum digging depth	27 ft. 1 in. (8.25 m)
4) Maximum vertical wall digging depth	22 ft. 1 in. (6.72 m)
5) Maximum digging reach	41 ft. 1 in. (12.54 m)
6) Maximum swing radius	17 ft. 2 in. (5.24 m)

Technical Specifications

Description	Specifications
Operating weight	120,152 lb. (54,500 kg)
Ground pressure	8.6 psi (59.0 kPa)
Engine	Cummins QSG12
Displacement	720.1 cu in. (11.80 L)
Rated power (kW/rpm)	400 hp (298 kW)
Hydraulics	Positive flow control with pilot control
Main hydraulic pump	Axial piston–variable displacement
Operating flow (maximum)	190.2 gpm (720.0 Lpm)
Operating pressure (maximum)	4975 psi (34.3 MPa)
Power boost pressure (maximum)	5410 psi (37.3 MPa)
Travel motor	Axial piston with park brake
Travel pressure (maximum)	4975 psi (34.3 MPa)
Travel speed (high/low)	High speed 3.2 mph (5.2 kph) Low speed 2.1 mph (3.4 kph)
Travel effort (maximum)	48,109 lb-ft (214.0 kN)
Grade capability (maximum)	35°
Swing motor	Axial piston with swing brake
Swing pressure (maximum)	3989 psi (27.5 MPa)
Swing speed (maximum)	8 rpm
Undercarriage (standard)	Steel track
Track shoe width (standard)	2 ft. 7 in. (800.0 mm)
Track rollers (per side)	9
Carrier rollers (per side)	2
Bucket breakout force (ISO)	61,822 lb-ft (275.0 kN)
Arm digging force (ISO)	46,535 lb-ft (207.0 kN)
Fuel tank capacity	179.6 gal. (680.0 L)
DEF tank capacity	15.0 gal. (56.6 L)
Hydraulic tank capacity	126.8 gal. (480.0 L)
Engine oil capacity	8.7 gal. (33.0 L)
Cooling system capacity	13.2 gal. (50.0 L)

Lift Chart

Load Radius	9.8 ft. (3.0 m)		14.8 ft. (4.5 m)		19.7 ft. (6 m)		24.6 ft. (7.5 m)	
Load Point Height (LPH)	End 	Side 	End	Side 	End	Side 	End	Side 
24.6 ft. (7.5 m)								
19.7 ft. (6.0 m)								
14.8 ft. (4.5 m)					*29,008 (*13,158)	*29,008 (*13,158)	*25,164 (*11,414)	*25,164 (*11,414)
9.8 ft. (3.0 m)			*47,576 (*21,580)	*47,576 (*21,580)	*34,465 (*15,633)	*34,465 (*15,633)	*28,228 (*12,804)	*28,228 (*12,804)
4.9 ft. (1.5 m)			*48,579 (*21,580)	*48,579 (*22,035)	*39,244 (*17,801)	32,256 (14,631)	*31,127 (*14,119)	23,869 (10,827)
0.0 ft. (0.0 m)			*49,362 (*22,390)	*49,362 (*22,390)	*42,366 (*19,217)	31,109 (14,111)	*33,296 (*15,103)	23,104 (10,480)
-4.9 ft. (-1.5 m)	*33,268 (*15,090)	*33,268 (*15,090)	*58,930 (*26,730)	46,421 (21,056)	*43,557 (*19,757)	30,618 (13,888)	*34,326 (*15,570)	22,710 (10,301)
-9.8 ft. (-3.0 m)	*50,658 (*22,978)	*50,658 (*22,978)	*56,531 (*25,642)	46,782 (21,220)	*42,726 (*19,380)	*30,657 (*13,906)	*33,797 (*15,330)	22,710 (10,301)
-14.8 ft. (-4.5 m)	*70,636 (*32,040)	*70,636 (*32,040)	*51,271 (*23,256)	*51,271 (*23,256)	*39,339 (*17,844)	*31,202 (*14,153)	*30,680 (*13,916)	23,197 (10,522)
-19.7 ft. (-6.0 m)			*41,321 (*18,743)	*41,321 (*18,743)	*31,112 (*14,114)	*31,112 (*14,112)		

Lift Chart (Continued)

Load Radius	29.5 ft. (9.0 m)		34.4 ft. (10.5 m)		Lift capacity at max. radius	
Load Point Height (LPH)	End 	Side 	End 	Side 	End 	Side 
24.6 ft. (7.5 m)	*21,261 (*9,644)	*21,261 (*9,644)			*18,473 (*8,379)	*18,473 (*8,379)
19.7 ft. (6.0 m)	*21,691 (*9,839)	*21,691 (*9,839)			*19,057 (*8,644)	*19,057 (*8,644)
14.8 ft. (4.5 m)	*23,027 (*10,445)	*23,027 (*10,445)			*18,889 (*8,568)	15,684 (7,114)
9.8 ft. (3.0 m)	*24,766 (*11,234)	19,226 (8,721)	*22,842 (*10,361)	15,285 (6,933)	*18,931 (*8,587)	14,894 (6,756)
4.9 ft. (1.5 m)	*26,495 (*12,018)	18,609 (8,441)	*23,647 (*10,726)	14,991 (6,800)	*19,579 (*8,881)	14,643 (6,642)
0.0 ft. (0.0 m)	*27,818 (*12,618)	18,148 (8,232)			*21,914 (*9,940)	14,950 (6,781)
-4.9 ft. (-1.5 m)	*28,307 (*12,840)	17,932 (8,134)			*21,914 (*9,940)	14,950 (6,781)
-9.8 ft. (-3.0 m)	*27,172 (*12,325)	18,071 (8,197)			*26,037 (*11,810)	17,518 (7,946)
-14.8 ft. (-4.5 m)	*27,179 (*12,328)	16,905 (7,668)			*26,881 (*12,193)	20,926 (9,492)
-19.7 ft. (-6.0 m)					*26,912 (*12,207)	*26,912 (*12,207)

Page Intentionally Blank

Chapter 7

Optional Equipment

Optional Equipment Selection

Consult a SANY dealer before installing any optional equipment to 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 any 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.

Removal and Installation 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 or 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 objects weighing more than 55 lb. (25 kg).
- Never stand under a suspended load.
- Make sure the machine is well-balanced and supported whenever installing or removing optional equipment.

For additional information about removal and installation of optional equipment, consult a SANY dealer.

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 or 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 optional equipment installed, 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 operations.
- 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 guards on the machine as necessary per the nature of the optional equipment.

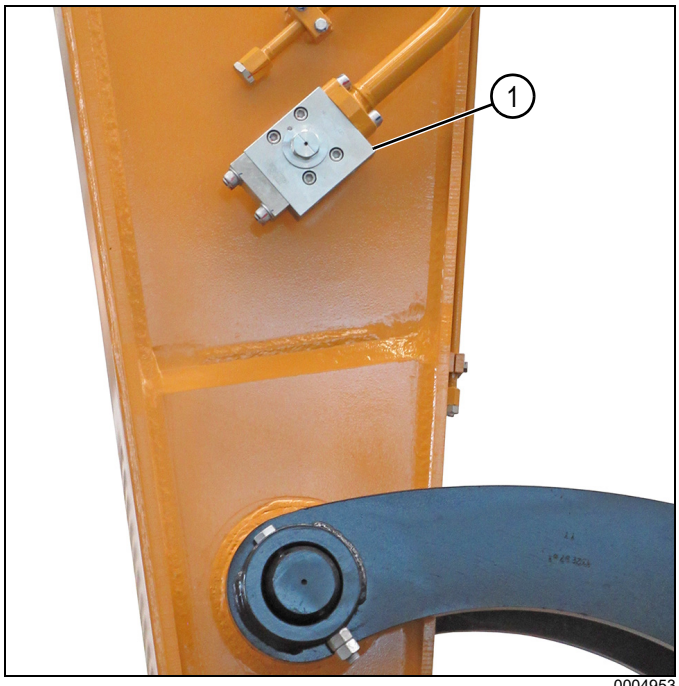
Equipment Control Valves

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 equipment control valves are two stop valves and a return flow selector valve. The two stop valves are mounted on the machine arm, and the return flow selector valve is near the base of the boom, in the center of the machine.

NOTE: *Consult a SANY dealer for hydraulic flow and pressure adjustment needed for the attached equipment.*

Stop Valves

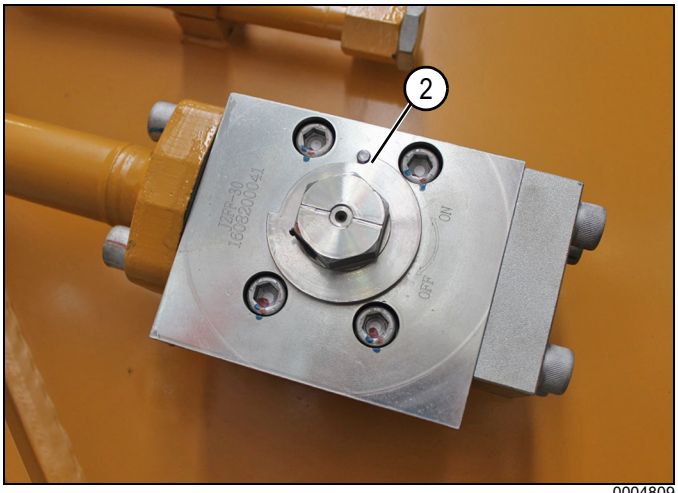


0004953

Figure 7-1

The stop valves (1) control the flow of the hydraulic oil to optional equipment when mounted to the arm.

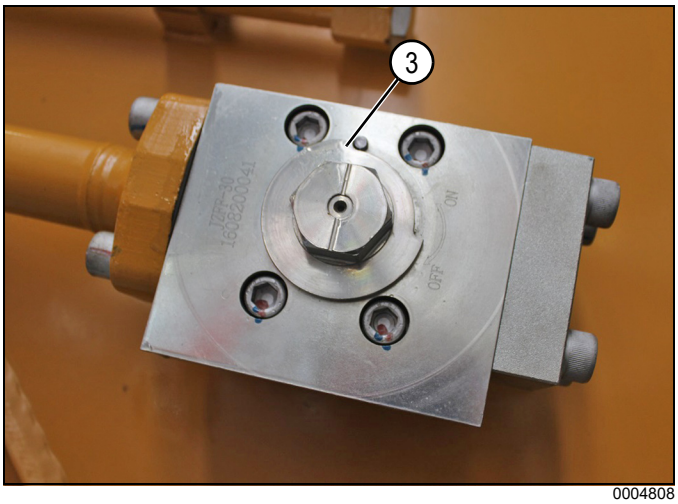
NOTE: *A stop valve is mounted on each side of the arm. The right side is shown.*



0004809

Figure 7-2

- In the open position (2), the line in the stop valve is in line with the oil flow. This allows the hydraulic oil to flow to the equipment.



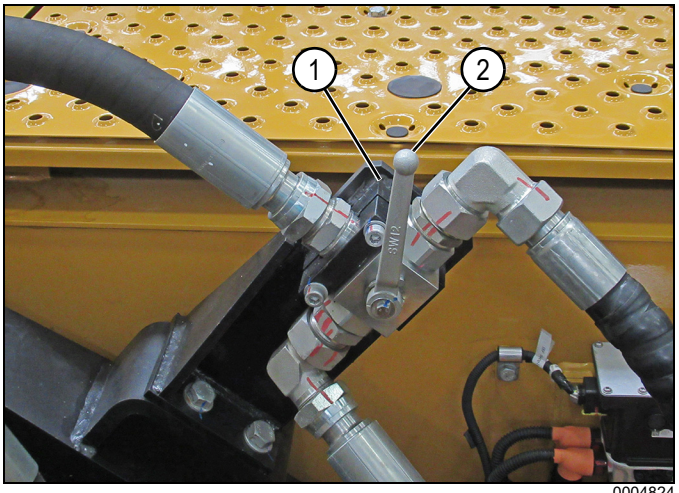
0004808

Figure 7-3

NOTE: *Turn the stop valve to the closed position when installing or removing optional equipment.*

- In the closed position (3), the line on the stop valve is perpendicular to the oil flow. This prevents hydraulic oil from flowing past the stop valve.

Return Flow Selector Valve



0004824

Figure 7-4

The return flow selector valve (1) has a one-way or a two-way position for operating optional attachments. It is on the left side of the hydraulic oil tank.

The return flow selector valve is adjusted as follows:

- Moving the select lever (2) toward the rear of the machine (position shown) engages the one-way flow position.
- Moving the select lever (2) toward the front of the machine engages the two-way flow position.

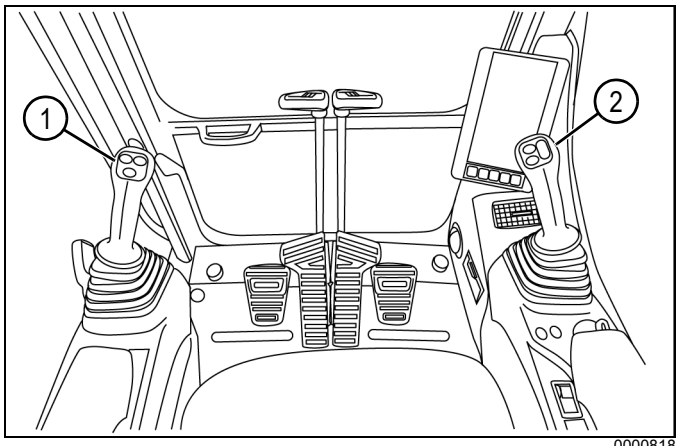
A variety of optional one-way and two-way flow attachments is available for use on this machine. A breaker is an example of a one-way flow attachment, and a shear is an example of a two-way flow attachment.

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.

Right and Left Joystick



0000818

Figure 7-5

The control switch and buttons on top of the left (1) and right (2) joysticks are used to control the optional equipment. See “Work Equipment Controls” on page 4-22.

Monitor

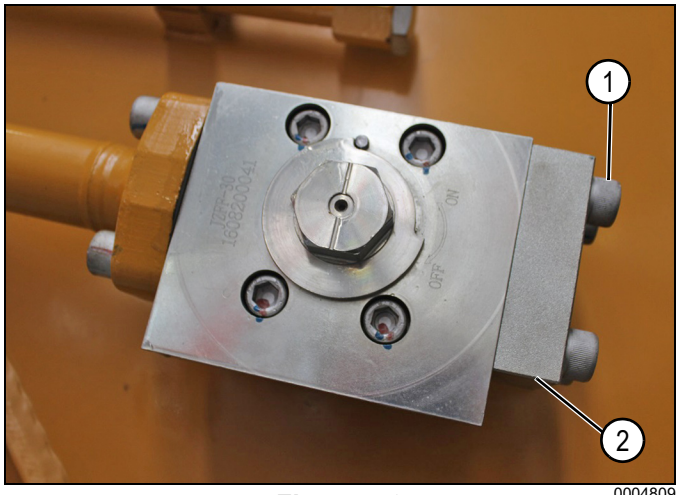
The monitor is used to select optional equipment and adjust hydraulic pressures of some of the equipment. See “Tool Select Screen” on page 3-36.

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.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Relieve system pressure. See “Relieve Hydraulic System Pressure” on page 5-31.



0004809

Figure 7-6

NOTICE!

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

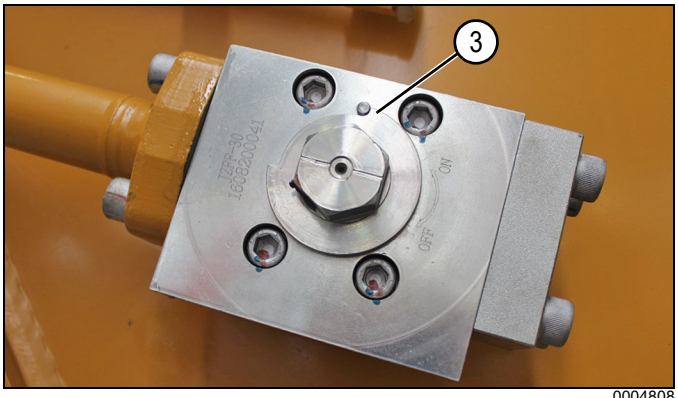
3. Place a suitably sized container under the stop valve to catch any hydraulic oil.

NOTE: *Replace the O-rings.*

4. Remove four fasteners (1) and plate (2) from the end of the stop valve to allow any residual hydraulic oil to drain into the container.

NOTE: *Right side shown. Repeat for the left side.*

5. Connect the optional equipment to the machine in accordance with the manufacturer’s instructions.
6. Connect the optional equipment’s hydraulic lines in accordance with the manufacturer’s instructions.



0004808

Figure 7-7

7. Turn the stop valves to the open position (3).
8. Turn the selector valve to the proper position.
9. Set the monitor to the correct work mode. See “Tool Select Screen” on page 3-36.
10. Set the flow rates and pressures as required.
11. Check the hydraulic oil level and add hydraulic oil if necessary. See “Check the Hydraulic Oil Level” on page 5-33.

NOTE: *Consult a SANY dealer for hydraulic flow and pressure adjustment needed for the attached equipment.*

Remove Optional Equipment

WARNING

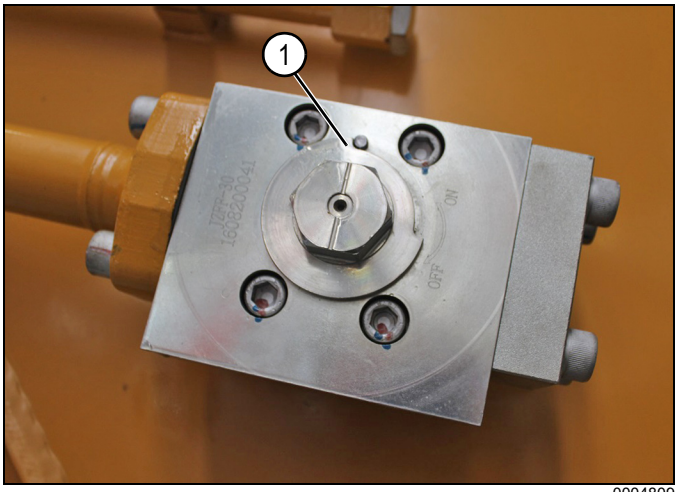
- **Do not release equipment unless it is on the ground or on a solid, supportive surface. Block or support equipment to prevent rolling or tipping that could result in death or serious injury.**
- **Hydraulic systems operate under extremely high pressure. Escaping hydraulic oil under pressure is dangerous and could result in death or serious injury. Always relieve pressure before disconnecting hoses.**

1. Prepare the machine for service. See “Maintenance Safety” on page 2-4.
2. Relieve system pressure. See “Relieve Hydraulic System Pressure” on page 5-31.

NOTICE!

Dispose of hydraulic oil in accordance with local environmental regulations. Failure to do so 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 in accordance with the manufacturer’s instructions.



0004809

Figure 7-8

5. Turn both stop valves to the closed position (1).

NOTICE!

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

6. Place a suitably sized container under the stop valves to catch any hydraulic oil when hoses are disconnected.
7. Disconnect the hoses from the stop valves.

NOTE: *Replace the O-rings.*

8. Install the four fasteners and plate onto the end of the stop valve.
9. Remove the optional equipment in accordance with the manufacturer’s instructions.
10. Check the hydraulic oil level in the hydraulic tank and add hydraulic oil as necessary. See “Check the Hydraulic Oil Level” on page 5-33.

A

B

C

D

E

F

G

H

I

J

K

L

M

O

P

R

S

T

V

W

Numerics

Page Intentionally Blank

Page Intentionally Blank

318 Cooper Circle
Peachtree City, Georgia 30269
www.sanyamerica.com/find-a-dealer
Sales E-mail: sales@sanyamerica.com
Service E-mail: service@sanyamerica.com
Service Hotline: 470 552 SANY (7269)

SANY Part Number SSY005084272