EN

Operation & Maintenance Manual

Compact Excavator

E88 S/N: B4NL11001 & Above

CE
UK
CA

7433617enGB (A)
December 2021

Printed in Belgium
Original Instructions

OPERATOR SAFETY WARNINGS

• Never operate without instructions. Read machine signs (decals), Operation & Maintenance Manual, and Operator's Handbook.
• Operator must have instructions before operating the machine. Untrained operators can cause injury or death.

SAFETY EQUIPMENT

The Bobcat® excavator must be equipped with safety items necessary for each job. Ask your Bobcat dealer for information on the availability and safe use of attachments and accessories.

- **SEAT BELT: Check belt fasteners and check for damaged webbing or buckle.**
- **OPERATOR CAB / CANOPY: Check condition and mounting hardware.**
- **OPERATOR'S HANDBOOK: Must be in the cab / canopy.**
- **LEFT HAND CONSOLE: When raised must deactivate the travel and hydraulic functions.**
- **SAFETY SIGNS (DECALS): Replace if damaged.**
- **GRAB HANDLES: Replace if damaged.**
- **INTEGRATED SLEW LOCK BRAKE.**
- **SAFETY TREAD: Replace if damaged.**

This check mark means: "Follow instructions for proper operations." Carefully read the message that follows.

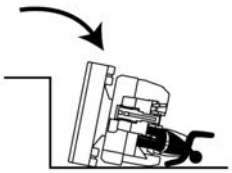
• Fasten seat belt securely.
• Operate controls only from operator's seat.

• To leave excavator, lower the work equipment and the blade to the ground.
• Stop the engine.

OPERATOR SAFETY WARNINGS

This Safety Alert Symbol means: “Attention! Be Alert! Your Safety is Involved!” Carefully read the message that follows.

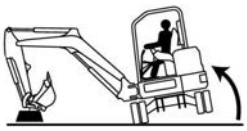
- **Do not grasp controls when entering cab / canopy.**
- **Be sure controls are in neutral before starting.**
- **Sound horn and check behind machine before starting.**



- **Never operate without approved cab / canopy.**
- **Never modify equipment.**
- **Never use attachments not approved by Bobcat Company.**

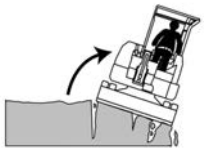
- **Never exceed a 15° slope to the side.**
- **Never travel up a slope that exceeds 15°.**
- **Never exceed 25° when going down or backing up a slope.**

- **Keep bystanders out of maximum reach area.**
- **Do not travel or turn with bucket extended.**
- **Look in the direction of rotation and make sure no bystanders are in the work area.**



- **Use caution to avoid tipping. Do not swing a heavy load over side of track.**
- **Operate on flat, level ground.**

- **Never carry riders.**



- **Avoid steep areas or banks that could break away.**


Bobcat

DECLARATION OF CONFORMITY (MACHINE)

Contents of EC Declaration of Conformity

This information is provided in the operators manual to comply with clause 1.7.4.2(c) of Annex I of Machinery Directive 2006/42/EC.

The official EC Declaration of Conformity is supplied in a separate document.

Manufacturer

Bobcat

Bobcat Company
World Headquarters
250 East Beaton Drive
West Fargo, ND 58078–6000
United States of America

Technical Documentation

Homologation Manager
Doosan Bobcat EMEA s.r.o
U Kodetky 1810
26312 Dobris
Czech Republic

Directive 2000/14/EC: Noise Emission in the Environment by Equipment For Use Outdoors

Notified Body

Technical and Test Institute for Construction Prague
Czech Republic
Notified Body Number: 1020

EC Certificate No.

1020-090-022395

Conformity Assessment Procedure(s)

2000/14/EC, Annex VIII, Full Quality Assurance

Sound Power Levels [Lw(A)]

Measured Sound Power	**95,1 db(A)**
Guaranteed Sound Power	**96 db(A)**

Description of Equipment

Type of Equipment: Excavator
Model Name: E88
Model Code: B4NL

Engine Manufacturer: Bobcat Company
Engine Model: DM02VB DM02-MFE00
Engine Power: 48.5 kW @ 2100 rpm

Equipment conforms to CE Directive(s) Listed Below

2006/42/EC: Machinery Directive
2014/30/EU: Electromagnetic Compatibility Directive

Declaration of Conformance

This equipment conforms to the requirements specified in all the EC Directives listed in this declaration.

Effective From:

30 November 2021

DECLARATION OF CONFORMITY (TOUCH DISPLAY)

Continental

EU Declaration of Conformity under the terms of Directive No. 2014/53/EU (RED directive)

1. No … (unique identification of the product)
   Multiview Media Display

2. Name and address of the manufacturer or his authorised representative:
   Continental Automotive GmbH
   Heinrich-Hertz-Str. 45
   78052 Villingen-Schwenningen
   Germany

3. This declaration of conformity is issued under the sole responsibility of the manufacturer ~~(or installer)~~:
   Continental Automotive GmbH declares as a manufacturer that the above-mentioned product complies with the necessary requirements of Directive 2014/53/EU (RED Directive) when used for its intended purpose.

4. Object of the declaration (identification of product allowing traceability. It may include a colour image of sufficient clarity to enable the identification of the product, where appropriate.)
   Not applicable.

5. The object of the declaration described in point 4 is in conformity with the relevant Union harmonisation legislation:
   Directive 2014/53/EU

   Additional relevant Union harmonisation legislation:
   None.

6. References to the relevant harmonised standards used, or references to the specifications in relation to which conformity is declared:
   - **EN 300 328 V2.1.1**
   - **DRAFT EN 301 489-1 V2.2.0; DRAFT EN 301 489-17 V3.2.0**
   - **EN 62311:2008**
   - **EN 62368-1:2014 / AC:2015 / A11:2017 / AC:2017**

7. The notified body **CTC advanced, 0682 has performed Tests** and has issued the EC approval certificate **T818817M-01-TEC**.

8. If available, a description of the accessories and the components, including the software that enables the operation of the radio system and which is covered by the EU Declaration of Conformity:
   Not applicable.

9. Additional information:
   None.

Signed for and on behalf of:
Continental Automotive GmbH
Heinrich-Hertz-Str. 45
78052 Villingen-Schwenningen
Germany

Place and date of issue:
Villingen-Schwenningen, 21 January 2021

Dr. Marion Grüner (Homologation)
(Name, function)

DECLARATION OF CONFORMITY (RADIO)

Continental

EU Declaration of Conformity under the terms of Directive No. 2014/53/EU (RED directive)

1. No … (unique identification of the product)
   Bobcat Radio
   Hardware Version: A2C 399933

2. Name and address of the manufacturer or his authorised representative:
   Continental Automotive GmbH
   Heinrich-Hertz-Str. 45
   78052 Villingen-Schwenningen
   Germany

3. This declaration of conformity is issued under the sole responsibility of the manufacturer ~~(or installer)~~:
   Continental Automotive GmbH declares as a manufacturer that the above-mentioned product complies with the necessary requirements of Directive 2014/53/EU (RED Directive) when used for its intended purpose.

4. Object of the declaration (identification of product allowing traceability. It may include a colour image of sufficient clarity to enable the identification of the product, where appropriate.)
   Not applicable.

5. The object of the declaration described in point 4 is in conformity with the relevant Union harmonisation legislation:
   Directive 2014/53/EU

   Additional relevant Union harmonisation legislation:
   None.

6. References to the relevant harmonised standards used, or references to the specifications in relation to which conformity is declared:
   - **EN 62368-1:2014/AC:2015/A11:2017/AC:2017**
   - **EN 62479:2010**
   - **Draft EN 301 489-1 V2.2.0**
   - **Draft EN 301 489-17 V3.2.0**
   - **EN 300 328 V2.1.1**
   - **Draft EN 303 345 v.1.1.7**
   - **EN 303 345-2 V1.1.1**

7. The notified body **CTC advanced, 0682 has performed Tests** and has issued the EC approval certificate **T818837N-01-TEC**.

8. If available, a description of the accessories and the components, including the software that enables the operation of the radio system and which is covered by the EU Declaration of Conformity:
   Not applicable.

9. Additional information:
   None.

Signed for and on behalf of:
Continental Automotive GmbH
Heinrich-Hertz-Str. 45
78052 Villingen-Schwenningen
Germany

Place and date of issue:
Villingen-Schwenningen, 11 February 2021

Dr. Marion Grüner (Homologation)
(Name, function)

DECLARATION OF CONFORMITY (HYDROFLUOROCARBON)

DOOSAN BOBCAT EMEA
U Kodetky 1810
Dobris, 263 12
Czech Republic
T: +420 318 532 444

www.doosanbobcat.com

Declaration of conformity with Article 14 of Regulation (EU) No 517/2014 of the European Parliament and of the Council

We Doosan Bobcat EMEA s.r.o. with VAT number CZ26489201 declare under our sole responsibility that when placing on the market pre-charged equipment, which we import to or manufacture in the Union, the hydrofluorocarbons contained in that equipment are accounted for within the quota system referred to in Chapter IV of Regulation (EU) No 517/2014 as:

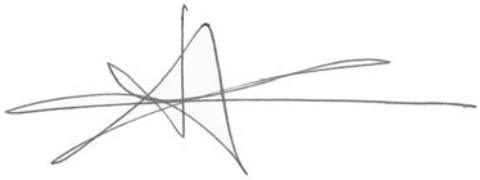
☐ A. we hold authorisation(s) issued in accordance with Article 18(2) of Regulation (EU) No 517/2014 and registered in the registry referred to in Article 17 of that Regulation, at the time of release for free circulation to use the quota of a producer or importer of hydrofluorocarbons subject to Article 15 of Regulation (EU) No 517/2014 that cover(s) the quantity of hydrofluorocarbons contained in the equipment.

☐ B. *[for importers of equipment only]* the hydrofluorocarbons contained in the equipment have been placed on the market in the Union, subsequently exported and charged into the equipment outside the Union, and the undertaking that placed the hydrofluorocarbons on the market made a declaration stating that the quantity of hydrofluorocarbons has been or will be reported as placed on the market in the Union and that it has not been and will not be reported as direct supply for export in the meaning of Article 15(2)(c) of Regulation (EU) No 517/2014 pursuant to Article 19 of Regulation (EU) No 517/2014 and Section 5C of the Annex to Commission Implementing Regulation (EU) No 1191/2014 (2).

■ C. [*for equipment manufactured in the Union only*] the hydrofluorocarbons charged into the equipment were placed on the market by a producer or importer of hydrofluorocarbons subject to Article 15 of Regulation (EU) No 517/2014.

Miguel Mallo Marcos

27th March, 2019



INTRODUCTION

This Operation & Maintenance Manual was written to give the owner / operator instructions on the safe operation and maintenance of the Bobcat machine. Read and understand this Operation & Maintenance Manual before operating your Bobcat machine. If you have any questions, see your Bobcat dealer. This manual may illustrate options and accessories not installed on your machine.

Bobcat Company Is ISO 9001 Certified

NA3495c

ISO 9001 is an international standard that specifies requirements for a quality management system that controls the processes and procedures that we use to design, develop, manufacture, and distribute Bobcat products.

British Standards Institute (BSI) is the Certified Registrar that Bobcat Company chose to assess the company's compliance with ISO 9001 at Bobcat's manufacturing facilities in Gwinner, North Dakota (U.S.A.), Pontchâteau (France), and the Bobcat corporate offices (Gwinner, Bismarck, and West Fargo) in North Dakota. TÜV Rheinland is the Certified Registrar that Bobcat Company chose to assess the company's compliance with ISO 9001 at Bobcat's manufacturing facility in Dobriš (Czech Republic). Only certified assessors, like BSI and TÜV Rheinland, can grant registrations.

ISO 9001 means that as a company we say what we do and do what we say. In other words, we have established procedures and policies, and we provide evidence that the procedures and policies are followed.

MANUFACTURING LOCATIONS

North America

Bobcat Company
250 E. Beaton Drive
West Fargo, ND 58078
USA

Czech Republic

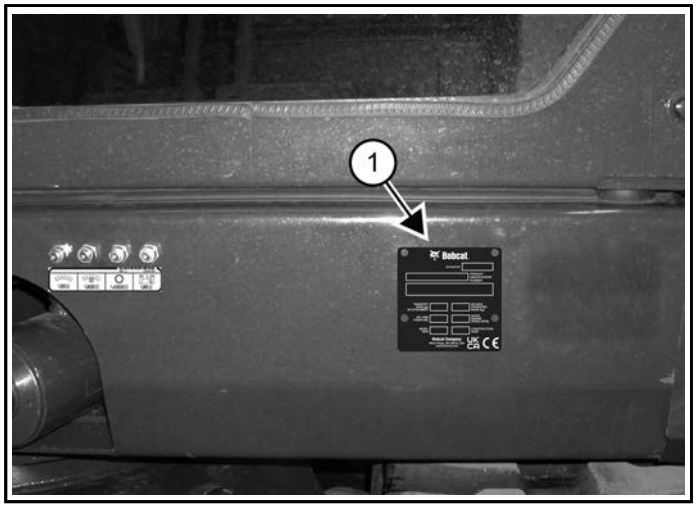
Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
263 12 Dobřiš
Czech Republic

SERIAL NUMBER LOCATIONS

Always use the serial number of the machine when requesting service information or when ordering parts. Earlier or later models (identification made by serial number) may use different parts, or it may be necessary to use a different procedure to do a specific service operation.

Machine Serial Number Location

Figure 1



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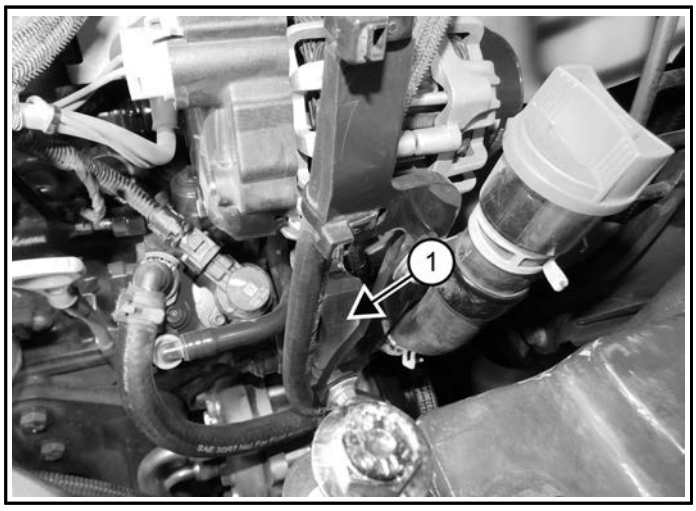
The machine serial number plate (Item 1) [Figure 1] is located on the frame of the machine in the location shown.

Engine Serial Number Location

Figure 2



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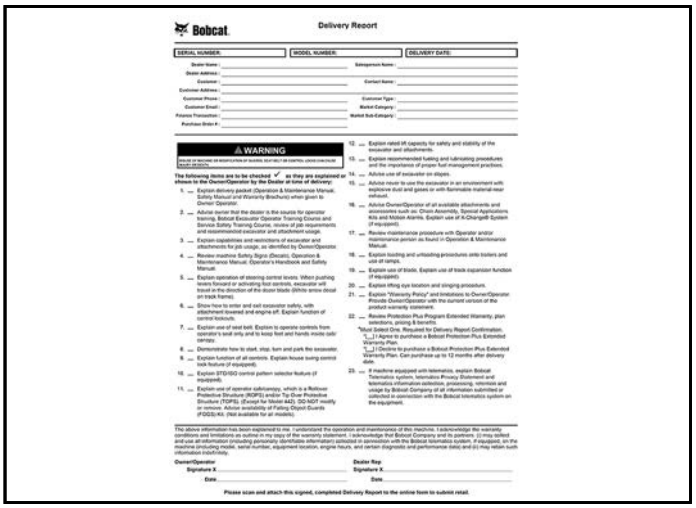
The engine serial number (Item 1) [Figure 2] is located on the side of the engine, below the alternator and next to the oil fill tube.

DELIVERY REPORT

Figure 3


Bobcat

Delivery Report

SERIAL NUMBER: | MODEL NUMBER: | DELIVERY DATE:

⚠ WARNING

NA15473

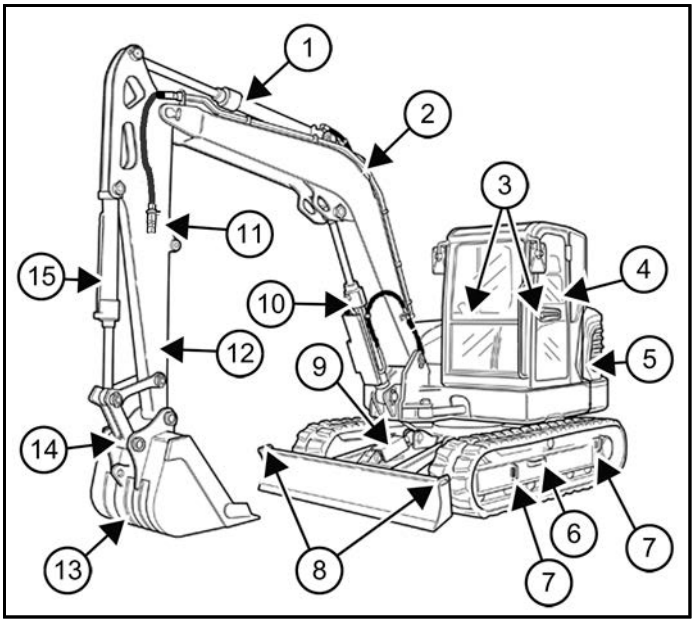
The delivery report contains a list of items that must be explained or shown to the owner or operator by the dealer when the machine is delivered.

The delivery report must be reviewed and signed by the owner or operator and the dealer.

EXCAVATOR IDENTIFICATION

Front View

Figure 4



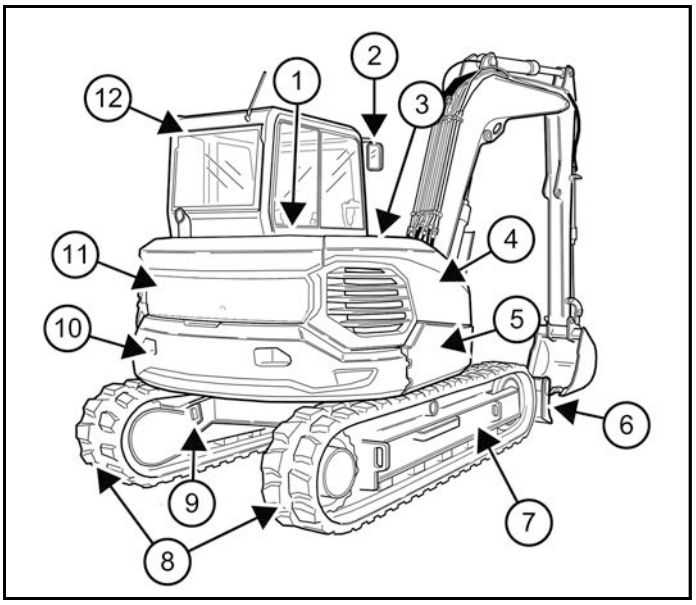
NA20187b

REF.	DESCRIPTION
1	Arm Cylinder
2	Boom
3	Joysticks
4	Operator's Seat with Seat Belt (location of Operation & Maintenance Manual)
5	Upperstructure
6	Step
7	Tie-Downs / Lift Points (both sides)
8	Tie-Downs
9	Blade Cylinder
10	Boom Cylinder
11	Auxiliary Quick Couplers
12	Arm
13	Bucket [A]
14	Attachment Mounting System (if equipped)
15	Bucket Cylinder

[A] Several different buckets and other attachments are available.

Rear View

Figure 5



NA20188b

REF.	DESCRIPTION
1	Operator's Handbook (in right console)
2	Side Mirrors (both sides)
3	Centre Cover
4	Right Side Cover
5	Right Side Panel
6	Blade
7	Track Frame
8	Tracks [A] (both sides)
9	Tie-Downs (both sides)
10	Counterweight
11	Tailgate
12	Cab (ROPS / TOPS / FOPS) [B]

[A] Optional tracks are available.

[B] Roll-Over Protective Structure (ROPS) per ISO 3471 / Tip-Over Protective Structure (TOPS) per ISO 12117–2 / Falling Object Protective Structure (FOPS) per ISO 10262 (Level I).

FEATURES, ACCESSORIES, AND ATTACHMENTS

Standard Items

The following items are standard for this model:

- Advanced Diagnostics
- Auto-Shift Drive Motors
- Battery Disconnect Switch
- Cab with Roll-Over Protective Structure (ROPS) / Tip-Over Protective Structure (TOPS) / Falling-Object Protective Structure (FOPS) Approval
- Counterweight
- Diesel Particulate Filter (DPF)
- Engine and Hydraulic System Monitor with Shut Down
- Engine Louver
- Engine Speed Control Dial with Auto Idle Feature
- Fuel Filter with Sediment Bowl
- High-Back Cloth Seat with Headrest
- Horn
- Hydraulic and Travel Control Lockouts
- Hydraulic Joystick Controls
- Keyless Start
- Long Arm
- Primary and Secondary Auxiliary Hydraulics
- Retractable Seat Belt
- Rubber Tracks
- Side Mirrors
- Standard Blade
- Standard Display
- Tool Storage Box
- Two-Speed Travel
- Work Lights

Options And Accessories

Below is a list of some equipment available from your Bobcat dealer as Dealer and/or Factory Installed Accessories and Factory Installed Options. See your Bobcat dealer for other available options, accessories, and attachments.

- Block Heater
- Cab With Auto HVAC
- Case Drain Kit
- Counterweight (Add On)
- Depth Check System
- Direct To Tank System
- Fire Extinguisher
- Fourth Auxiliary Hydraulics
- Front Guard Kit
- Fuel Fill Pump with Auto Shut-Off
- Fuel Filter Indicator Kit
- Heated High-Back Seat with Headrest
- HEPA Air Filter Kit
- Hydraulic Clamp Diverter Kit
- Hydraulic Pin Grabber Quick Coupler
- Load Holding Valve - Arm
- Load Holding Valve - Blade
- Load Holding Valve - Boom
- Mechanical Pin Grabber Coupler
- Overload Warning Device
- Radio
- Rear Cab-Mounted Lights
- Rear View Camera
- Rotating Beacon
- Seat Extension
- Segmented Tracks
- Standard Arm
- Steel Tracks
- Strobe Light
- Sunshade
- Top Guard Kit (FOPS II)
- Touch Display
- Travel Motion Alarm

Attachments

These and other attachments are approved for use on this model Bobcat excavator. Do not use unapproved attachments. Attachments not manufactured by Bobcat Company may not be approved.

The versatile Bobcat excavator quickly turns into a multi-job machine with a variety of attachments.

See your Bobcat dealer for information about approved attachments and attachment Operation & Maintenance Manuals.

- Auger
- Breaker
- Hydraulic Clamp
- Plate Compactor
- Rotary Grinder

Buckets Available

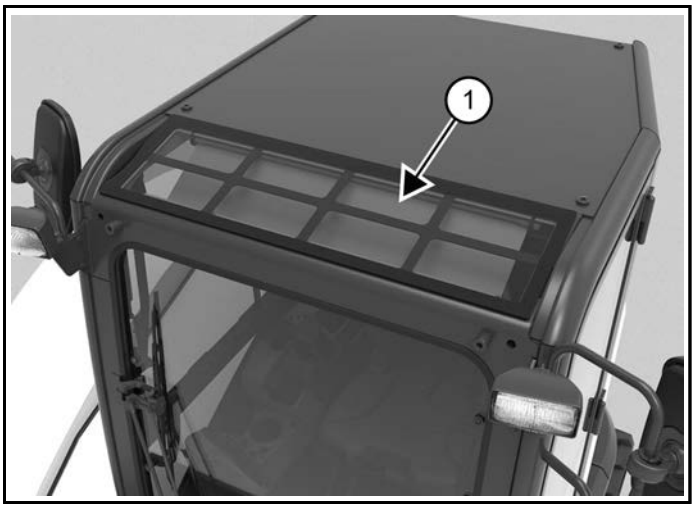
Increase the versatility of your excavator with a variety of bucket sizes.

Many bucket styles, widths, and different capacities are available for a variety of different applications. They include trenching, digging, grading, and tilt, to name a few. See your Bobcat dealer for the correct bucket for your Bobcat excavator and application.

Specifications subject to change without notice and standard items may vary.

Falling-Object Protective Structure (FOPS)

Figure 6



C133135a

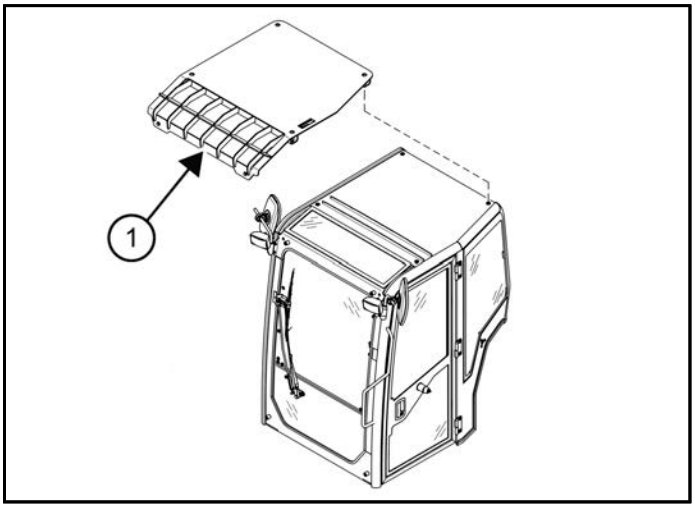
The top window (Item 1) [Figure 6] is a FOPS that meets the top guard requirements of FOPS Level I per ISO 10262.

There is a kit available that meets FOPS Level II per ISO 10262. (See Top Guard (FOPS II) Kit on Page 18)

See your Bobcat dealer for more information.

Top Guard (FOPS II) Kit

Figure 7



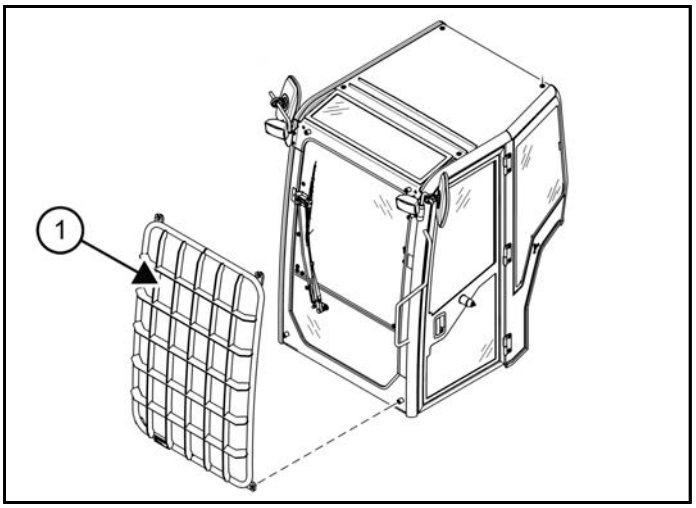
NA13738b

The excavator must have the Top Guard kit installed to meet the top guard requirements in ISO 10262 – Level II.

The kit includes an overhead guard (Item 1) [Figure 7]. See your Bobcat dealer for more information.

Front Guard Kit

Figure 8



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The Front Guard Kit is available for applications that require protection from objects entering the front of the excavator.

The excavator must have the front guard installed to meet the front guard requirements in ISO 10262 – Level II.

The kit includes a front guard (Item 1) [Figure 8]. See your Bobcat dealer for more information.

Inspecting And Maintaining The Front Guard Kit

The Front Guard Kit must be regularly inspected and maintained. Inspect the screen for damage. Replace parts as necessary.

SAFETY INSTRUCTIONS

Before Operation

Carefully follow the operating and maintenance instructions in this manual.

The Bobcat machine is highly manoeuvrable and compact. It is rugged and useful under a wide variety of conditions. This presents an operator with hazards associated with off motorway, rough terrain applications, common with Bobcat machine usage.

The Bobcat machine has an internal combustion engine with resultant heat and exhaust. All exhaust gases can kill or cause illness so use the machine with adequate ventilation.

The dealer explains the capabilities and restrictions of the Bobcat machine and attachment for each application. The dealer demonstrates the safe operation according to Bobcat instructional materials, which are also available to operators. The dealer can also identify unsafe modifications or use of unapproved attachments. The attachments and buckets are designed for a Rated Lift Capacity. They are designed for secure fastening to the machine. The user must check with the dealer, or Bobcat literature, to determine safe loads of materials of specified densities for the machine - attachment combination.

The following publications and training materials provide information on the safe use and maintenance of the Bobcat machine and attachments:

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the machine and attachment are in safe operating condition.
- The Operation & Maintenance Manual delivered with the machine or attachment gives operating information as well as routine maintenance and service procedures. It is a part of the machine and can be stored in a container provided on the machine. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.
- Machine signs (decals) instruct on the safe operation and care of your Bobcat machine or attachment. The signs and their locations are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat dealer.
- An Operator's Handbook is fastened to the operator cab of the machine. Its brief instructions are convenient for the operator. See your Bobcat dealer for more information on translated versions.

The dealer and owner / operator review the recommended uses of the product when delivered. If the owner / operator will be using the machine for a different application(s) he or she must ask the dealer for recommendations on the new use.

Safe Operation Is The Operator's Responsibility

Safety Alert Symbol

This symbol with a warning statement means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

⚠ WARNING

INSUFFICIENT INSTRUCTIONS HAZARD
Untrained operators or failure to follow instructions can cause serious injury or death.
Operators must have adequate training and instruction before operating.◂
W-2001

⚠ IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the machine.◂
I-2019

⚠ WARNING

The signal word WARNING on the machine and in the manuals indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.◂
W-2044

⚠ DANGER

The signal word DANGER on machine signs and in the manuals indicates a hazardous situation which, if not avoided, will result in death or serious injury.◂
D-1002

The machine and attachment must be in good operating condition before use.

Check all of the items on the Service Schedule decal (if equipped) in the Every 10 Hours section or as shown in the Operation & Maintenance Manual.

Safe Operation Needs A Qualified Operator

For an operator to be qualified, he or she must not use drugs or alcoholic drinks which impair alertness or co-ordination while working. An operator who is taking prescription drugs must get medical advice to determine if he or she can safely operate a machine.

A Qualified Operator Must Do The Following

- Understand the written instructions, rules, and regulations.
  - ▷ The written instructions from Bobcat Company include the Delivery Report, Operation & Maintenance Manual, Operator's Handbook, and machine signs (decals).
  - ▷ Check the rules and regulations at your location. The rules may include an employer's work safety requirements. For driving on public roads, the machine must be equipped as stipulated by the

local regulations authorising operation on public roads in your specific country. Regulations may identify a hazard such as a utility line.

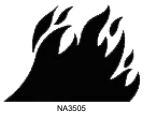
- Have training with actual operation.
  - ▹ Operator training must consist of a demonstration and verbal instruction. This training is given by your Bobcat dealer before the product is delivered.
  - ▹ The new operator must start in an area without bystanders and use all the controls until he or she can operate the machine and attachment safely under all conditions of the work area. Always fasten seat belt before operating.
- Know the work conditions.
  - ▹ Know the weight of the materials being handled. Avoid exceeding the Rated Lift Capacity of the machine. Material that is very dense will be heavier than the same volume of less dense material. Reduce the size of load if handling dense material.
  - ▹ The operator must know any prohibited uses or work areas, for example, he or she needs to know about excessive slopes.
  - ▹ Know the location of any underground lines.
  - ▹ Wear tight fitting clothing. Always wear safety glasses when doing maintenance or service. Safety glasses, respiratory equipment, hearing protection, or Special Applications Kits are required for some work. See your Bobcat dealer about Bobcat safety equipment for your model.

Silica Dust Exposure

NA3504

Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Use a respirator, water spray, or other means to control dust.

FIRE PREVENTION



NA3505

Maintenance

The machine and some attachments have components that are at high temperatures under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential fire hazard.

The operator's area, engine compartment, and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.

All fuels, most lubricants, and some coolants mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Operation

Do not use the machine where exhaust, arcs, sparks, or hot components can contact flammable material, explosive dust, or gases.

Electrical

P200082

Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part or wires that are loose or frayed.

Battery gas can explode and cause serious injury. Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting. Do not jump start or charge a frozen or damaged battery. Keep any open flames or sparks away from batteries. Do not smoke in battery charging area.

Hydraulic System

Check hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Hydraulic tubes and hoses must be properly routed and have adequate support and secure clamps. Tighten or replace any parts that show leakage.

Always clean fluid spills. Do not use petrol or diesel fuel for cleaning parts. Use commercial non-flammable solvents.

Fuelling

P200084

Stop the engine and let it cool before adding fuel. No smoking! Do not refuel a machine near open flames or sparks. Fill the fuel tank outdoors.

Ultra Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations with higher sulfur content. Avoid death or serious injury from fire or explosion. Consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fuelling standards for proper earthing and bonding practices.

Starting

Do not use ether or starting fluids on any engine that has glow plugs or air intake heater. These starting aids can cause explosion and injure you or bystanders.

Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting.

Exhaust System

The exhaust system consisting of spark arrester, DOC (Diesel Oxidation Catalyst), or DPF (Diesel Particulate Filter) is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot.

Check the spark arrester exhaust system regularly to make sure it is maintained and working properly. Use the procedure in the Operation & Maintenance Manual for cleaning the spark arrester muffler (if equipped).

Welding And Grinding

Always clean the machine and attachment, disconnect the battery, and disconnect the wiring from the Bobcat controllers before welding. Cover rubber hoses, battery, and all other flammable parts. Keep a fire extinguisher near the machine when welding.

Have good ventilation when grinding or welding painted parts. Wear a dust mask when grinding painted parts. Toxic dust or gas can be produced.

Dust generated from repairing non-metallic parts such as hoods, fenders, or covers can be flammable or explosive. Repair such components in a well ventilated area away from open flames or sparks.

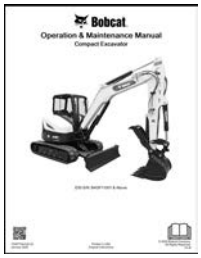
Fire Extinguishers

P200083

Know where fire extinguishers and first aid kits are located and how to use them. Inspect the fire extinguisher and service the fire extinguisher regularly. Obey the recommendations on the instructions plate.

PUBLICATIONS AND TRAINING RESOURCES

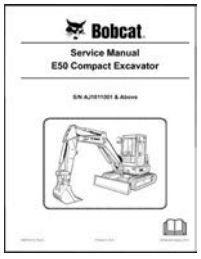
The following publications are also available for your Bobcat excavator. You can order them from your Bobcat dealer.



OPERATION & MAINTENANCE MANUAL

Complete instructions on the correct operation and the routine maintenance of your Bobcat excavator.

7433617enGB



SERVICE MANUAL

Complete maintenance instructions for your Bobcat excavator.

7433618enUS

OPERATOR'S HANDBOOK

Gives basic operation instructions and safety warnings.

7407666enGB

TOUCH DISPLAY USER GUIDE

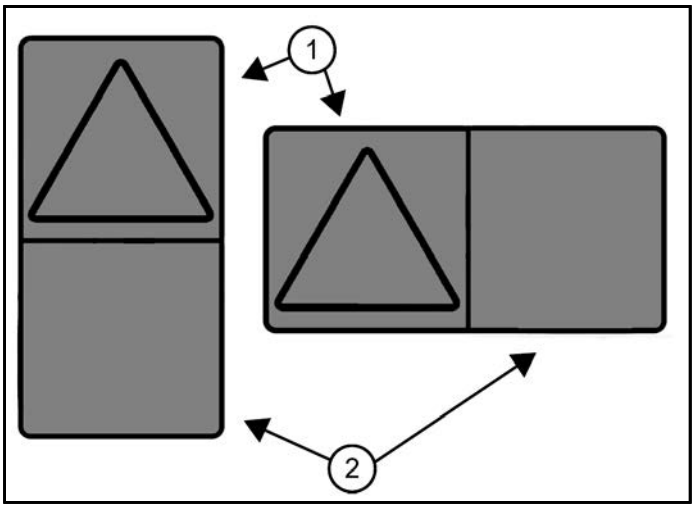
Gives instructions for pairing a cellular phone with the touch display and for operating the sound system on the touch display.

7326266enUS

PICTORIAL ONLY SAFETY SIGNS

Safety signs are used to alert the equipment operator or maintenance person to hazards that may be encountered in the use and maintenance of the equipment. The location and description of the safety signs are detailed in this section. Please become familiarised with all safety signs installed on the machine / attachment.

Figure 9



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The format consists of the hazard panel(s) (Item 1) [Figure 9] and the avoidance panel(s) (Item 2) [Figure 9].

Hazard Panels: Depict a potential hazard enclosed in a safety alert triangle.

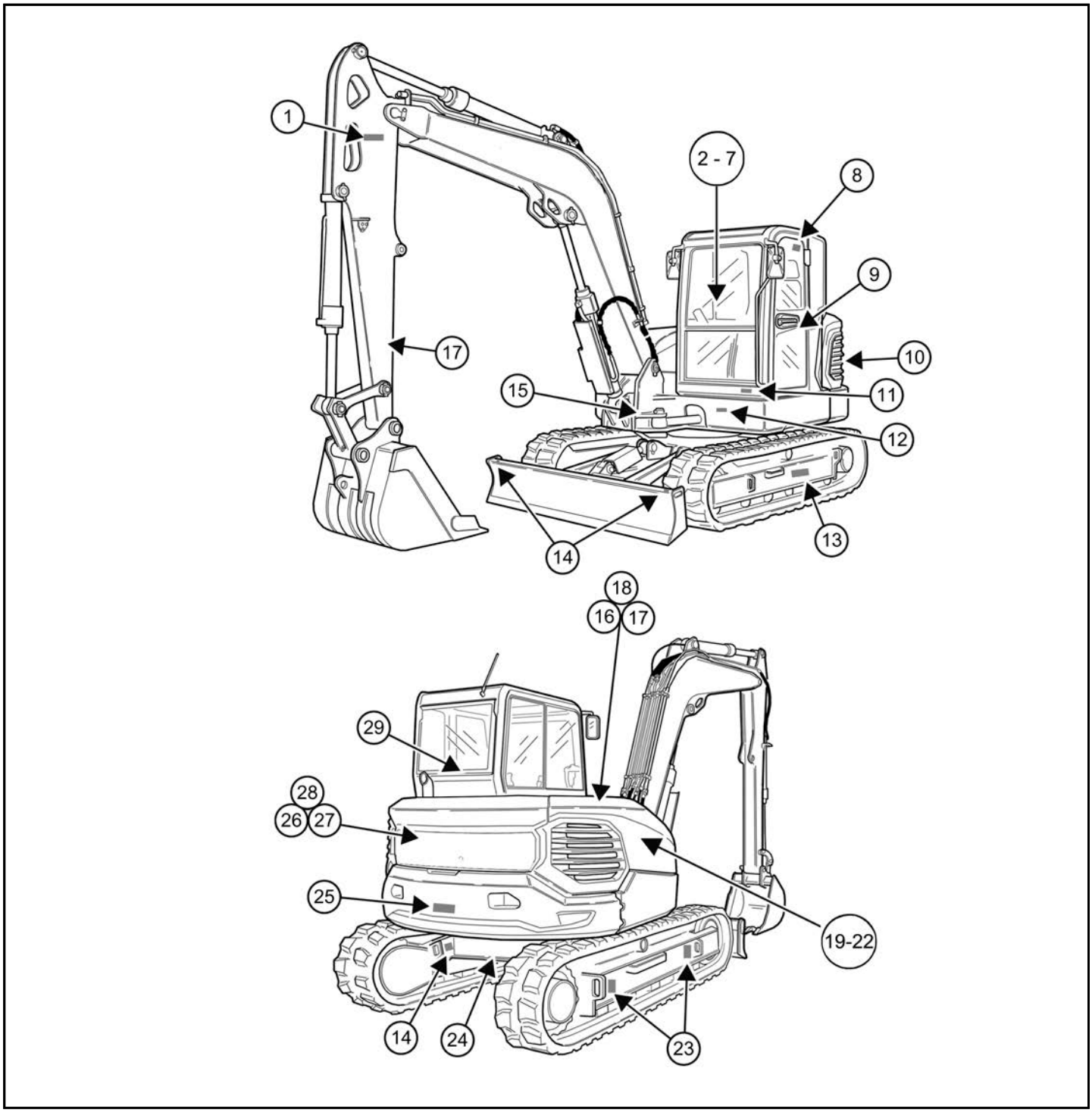
Avoidance Panels: Depict actions required to avoid the hazards.

A safety sign may contain more than one hazard panel and more than one avoidance panel.

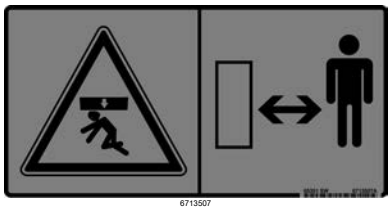
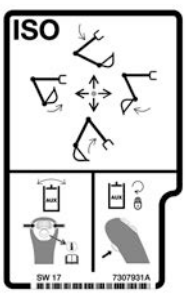
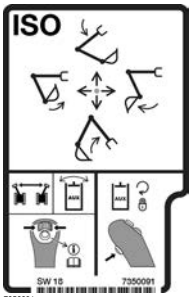
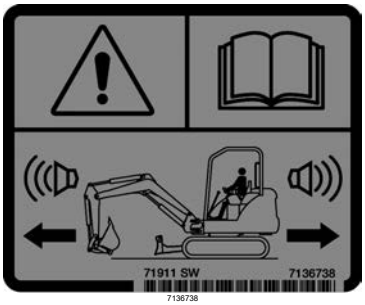
MACHINE SIGNS (DECALS)

Follow the instructions on all Machine Signs (Decals) that are on the machine. Replace any damaged machine signs and be sure they are in the correct locations. Machine signs are available from your Bobcat dealer.

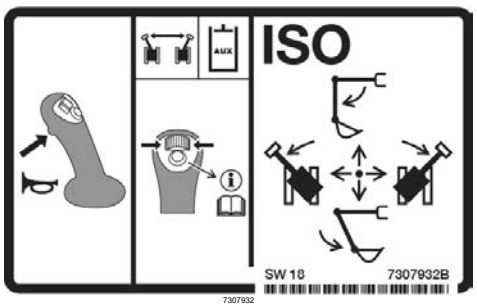
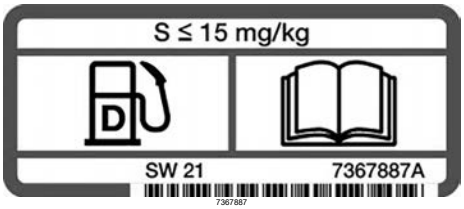
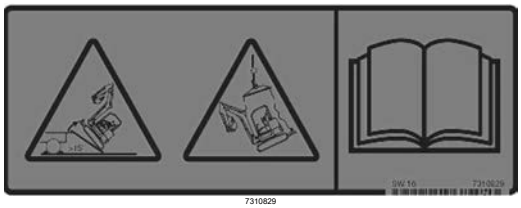
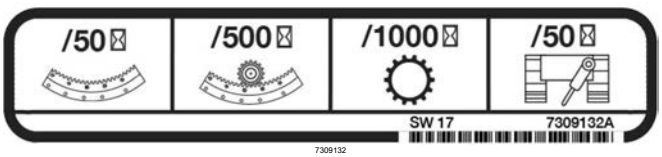
Figure 10

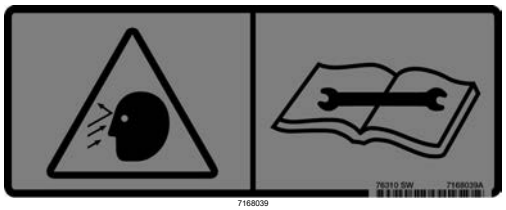
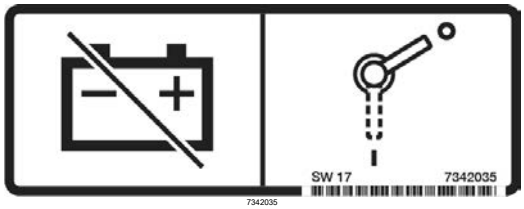
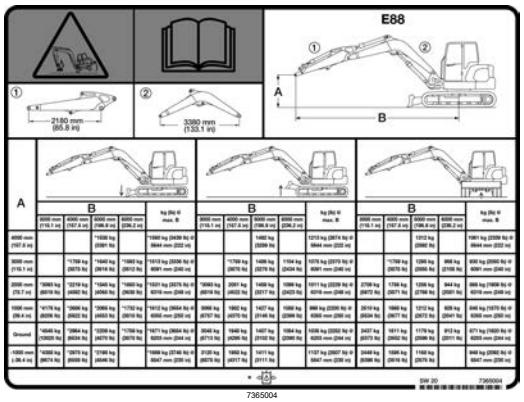


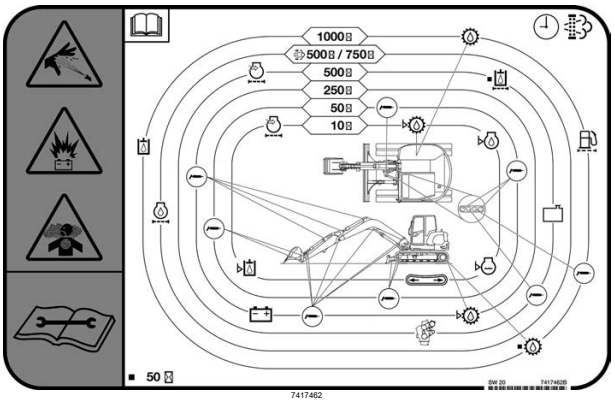
NA20187g

REF.	DECAL	WARNING (IF APPLICABLE)
1	Stay Clear (6713507)  6713507	**WARNING** **GENERAL HAZARD** **Failure to follow instruction can cause serious injury or death.** **Keep away from the operating machine.** W-2520
2	ISO Control Pattern for Right Joystick (7307931 or 7350091)  7307931  7350091	**WARNING** **UNINTENDED MOVEMENT HAZARD** **Failure to follow instructions can cause serious injury or death. Know the control pattern before operating.** **Read and understand the Operation & Maintenance manual before operating the machine.** W-3022
3	Engine Speed Control Dial / Angle Blade Control Lever (7240698)  7240698	
4	Travel Motion Alarm (7136738) (if equipped)  7136738	**WARNING** **CRUSHING HAZARD** **Failure to maintain a clear view in the direction of travel can cause serious injury or death.** • **This machine is equipped with a motion alarm. ALARM MUST SOUND! when operating forward or backward.** • **The operator is responsible for the safe operation of this machine.** W-2786

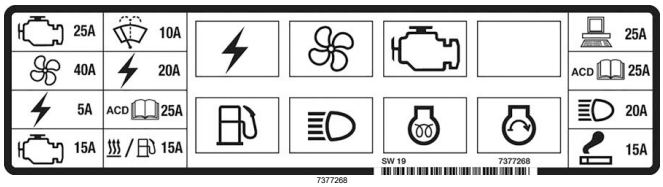
REF.	DECAL	WARNING (IF APPLICABLE)
5	General Warnings (7341643)  7341643	**⚠ WARNING** **GENERAL HAZARD** **Failure to follow instructions can cause serious injury or death.** **Read and understand the Operation & Maintenance Manual and Handbook before operating excavator.** • **Keep away from drop-offs, steep areas or banks that could break away.** • **Explosion or electrocution can occur if machine contacts utility lines or pipes. Check for overhead or underground lines before operating.** • **Keep bystanders away. No riders. Check location of blade for direction of travel before moving steering controls.** • **Operate machine from operators position only.** **To Leave Excavator** **1. Lower attachment and blade to ground.** **2. Stop engine and remove the key (if equipped.)** **3. Raise control console.** W-2518
6	Operator's Handbook (7236492)  7236492	
7	Start Switch (7186708)  7186708	

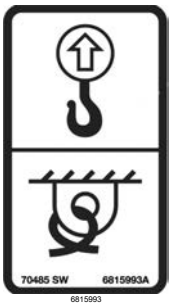
REF.	DECAL	WARNING (IF APPLICABLE)
8	Emergency Exit (7169014) 	
9	ISO Control Pattern for Left Joystick (7307932) 	**WARNING** **UNINTENDED MOVEMENT HAZARD** **Failure to follow instructions can cause serious injury or death. Know the control pattern before operating.** **Read and understand the Operation & Maintenance manual before operating the machine.** W-3022
10	Ultra Low Sulfur Diesel Fuel (7367887) 	
11	Transporting and Lifting (7310829) 	**WARNING** **GENERAL HAZARD** **Improper loading, transporting, and lifting procedures can cause serious injury or death.** **Read and understand the Operation & Maintenance Manual prior to transporting or lifting the machine.** W-2517
12	Remote Grease Location (7309132) 	

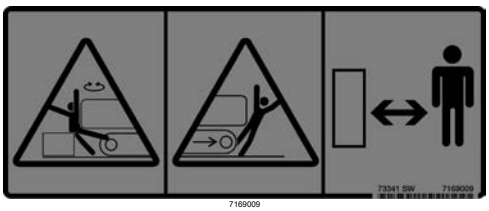
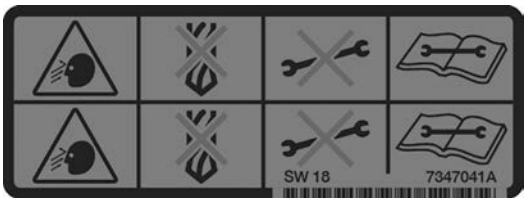
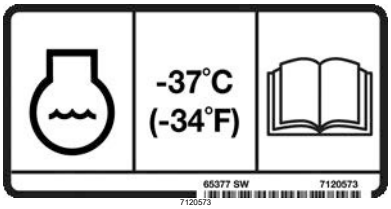
REF.	DECAL	WARNING (IF APPLICABLE)
13	High Pressure Grease (7168039) (2)  	**WARNING** **INJECTION HAZARD** **High pressure grease can penetrate skin and eyes, causing serious injury.** **Do not loosen the track tension fitting more than 1 - 1/2 turns.** W-2994
14	Tie-Down Location (6595014) (4)  	
15	Battery Disconnect (7342035) (if equipped)  	
16	Lift Capacity (7365004, 7365010, 7365051, or 7429288)  	**WARNING** **INSTABILITY HAZARD** **Overload can cause tipping or rollover leading to serious injury or death.** • **Do not lift or hold any load that exceeds these ratings at their specific load radii and height.** • **Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.** • **Read and understand the Operation & Maintenance Manual for more information.** W-2519

REF.	DECAL	WARNING (IF APPLICABLE)
17	Installing and Removing Attachment (7240582)  7240582	
18	Service Schedule (7417462)  7417462	**WARNING** **GENERAL HAZARD** **Failure to follow instructions can cause serious injury or death.** • **Leaking fluids under pressure can enter skin. Immediate medical attention is required. Wear goggles. Use cardboard to check for leaks.** • **Battery makes flammable and explosive gas. Keep arcs, sparks, flames, and lighted tobacco away. Keep away from electrical contacts.** • **Keep away from fan and moving parts. DO NOT operate with guard removed.** • **All exhaust gases can kill. Always operate machine in a well ventilated area.** • **Read and understand the Operation & Maintenance Manual for more information.** W-2522
19	Hot Surface Warning (7185935)  7185935	**WARNING** **BURN HAZARD** **Failure to follow instructions can cause serious burns.** **Stop the engine and allow it to cool before removing the radiator cap or adding coolant.** W-2070

REF.	DECAL	WARNING (IF APPLICABLE)
20	Check Hydraulic Level (7397521 and 7427959)	
21	Hydraulic Oil (7120570)	
22	Fuse / Relay (7377268)	
23	Lift / Tie-Down Location (6815993) (4)	





REF.	DECAL	WARNING (IF APPLICABLE)
24	Tow Loop (7322021)  7322021	
25	Stay Clear (7169009)  7169009	**WARNING** **CRUSHING HAZARD** **Contact with machine can cause property damage, serious injury or death.** • **Keep out of swing area or travel path.** • **Always look in the direction of travel.** • **Make sure swing area is clear of bystanders and objects.**◂ W-2775
26	High Pressure Gas (7347041) (3) 	**WARNING** **IMPACT HAZARD** **Opening cylinder can release rod and cause serious injury or death.** • **Contents under high pressure.** • **Do not open.** • **See Service Manual for additional information.** ◂ W-2523
27	Engine Coolant (7120573)  7120573	

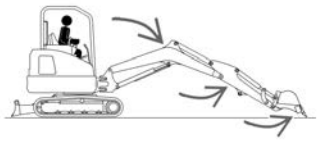
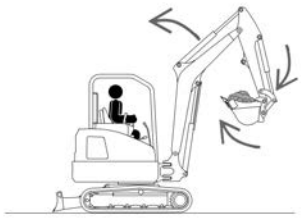
REF.	DECAL	WARNING (IF APPLICABLE)
28	Rotating Parts and Hot Surfaces (7243563)  7243563	**WARNING** **CUTTING AND BURN HAZARD** **Keep away from the operating machine.** • **Keep away from fan and moving parts. Do not operate with guard removed.** • **Do not touch hot surfaces. Allow to cool before servicing.** W-2521
29	Operator's Manual Location (6732148)  6732148	**WARNING** **INSUFFICIENT INSTRUCTIONS HAZARD** **Untrained operators or failure to follow instructions can cause serious injury or death. Read and understand the Operation & Maintenance Manual before operating the machine.** W-3021

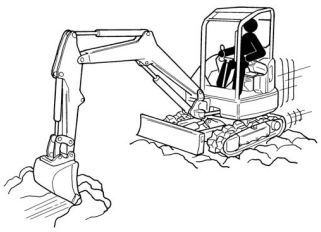
INTENDED USE

This machine is classified as an Excavator as defined in ISO 6165. This machine has tracks and commonly a mounted bucket for the principle intended functions of excavating, loading, and backfilling loose materials such as earth, gravel, or crushed rock.

Additional Bobcat approved attachments allow this machine to perform other tasks described in the attachment Operation & Maintenance Manuals.

Some examples of intended use include:

Excavating	
Excavating	
Boom Swing	
Rotating the Upperstructure	

Loading Material	
Backfilling	

⚠ WARNING

INSTABILITY HAZARD
Excessive load can cause tipping or loss of control leading to serious injury or death.
Do not exceed rated lift capacity.◂
W-2374

⚠ DANGER

EXPLOSION AND ELECTROCUTION HAZARDS
Contact with underground utility lines will cause death, serious injury, or property damage.
- **Check the work area for buried electrical, gas, utility, or other service lines before excavating or operating ground engaging equipment.**
- **Follow all local rules and regulations regarding digging or working in areas around underground utilities. Have all underground utility lines clearly marked before operating.◂**

1221-7BFCF43B

⚠ WARNING

ENTANGLEMENT AND IMPACT HAZARD
Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.◂
W-2119

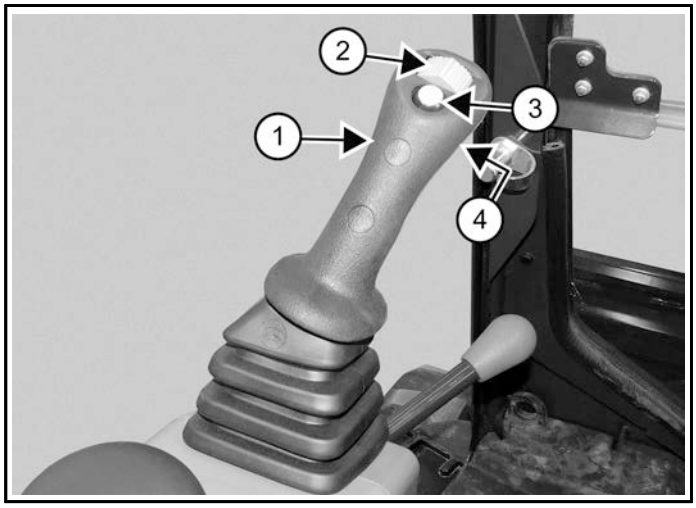
⚠ IMPORTANT

MACHINE DAMAGE HAZARD
Failure to follow instructions could result in damage to the blade and undercarriage components.
Avoid impacting objects with the blade.◂
I-2256

INSTRUMENTS AND CONSOLES

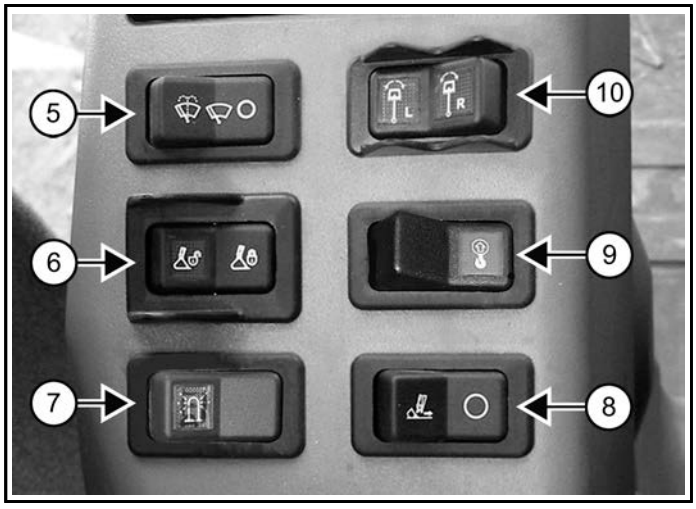
Left Console

Figure 11



P200104b

Figure 12

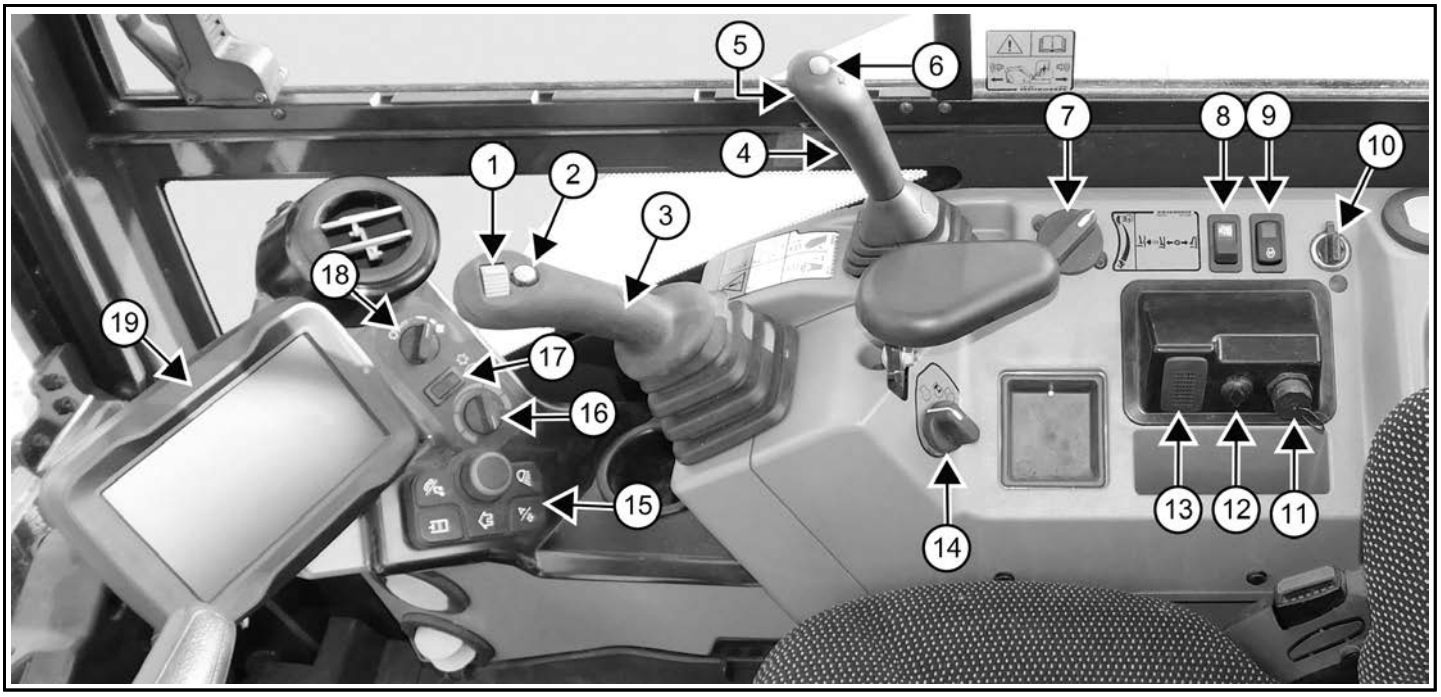


P134141g

REF.	DESCRIPTION	FUNCTION
1	Left Joystick	Operates the hydraulic controls. (See Hydraulic Controls on Page 55)
2	Left Joystick Switch	Controls boom swing and auxiliary hydraulics. (See Enabling Boom Swing on Page 73) (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59)
3	Left Joystick Button	Toggles between boom swing and auxiliary hydraulics (if equipped). (See Enabling Boom Swing on Page 73) (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59)
4	Horn	Sounds the horn.
5	Wiper / Washer Switch (if equipped)	Operates the windshield wiper and washer. (See Operating Windshield Wiper on Page 51)
6	Hydraulic Quick Coupler On / Off Switch (if equipped)	Retracts and extends hydraulic pins. (See Installing Attachments (Hydraulic Quick Coupler) on Page 100)
7	Beacon / Strobe Light (if equipped)	Turns beacon / strobe light on and off.
8	Hydraulic Quick Coupler Intent Switch (if equipped)	Initiates the quick coupler install or remove mode. (See Installing Attachments (Hydraulic Quick Coupler) on Page 100)
9	Overload Warning Device Switch (if equipped)	Operates the overload warning device. (See Overload Warning Device on Page 64)
10	Boom Swing Switch (if equipped)	Push to select boom swing offset for either the left or right joystick. (See Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics on Page 61)

Right Console

Figure 13



C200665b

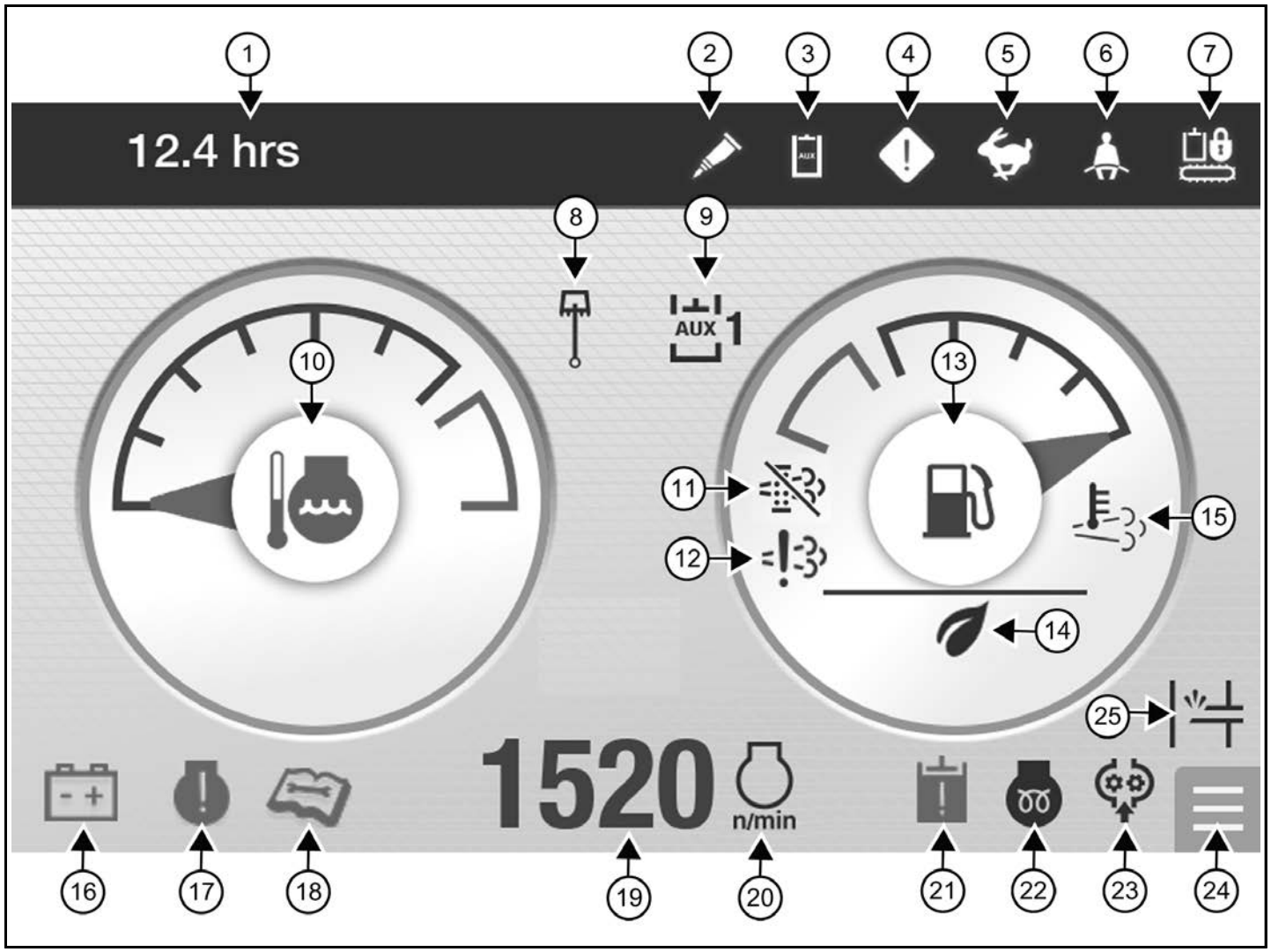
REF.	DESCRIPTION	FUNCTION
1	Right Joystick Switch	Controls auxiliary hydraulics. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 57) (See Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics on Page 61)
2	Right Joystick Button	Toggles between rear view camera (if equipped) and current screen on the display. (See Operating Rear View Camera on Page 197) Used to bench the Depth Check system (if equipped). (See Depth Check (Standard Display) on Page 112) (See Depth Check (Touch Display) on Page 125)
3	Right Joystick	Operates the hydraulic controls. (See Hydraulic Controls on Page 55)
4	Blade Control Lever	Raises and lowers the blade. (See Blade Control Lever on Page 65)
5	Two-Speed Button (With Angle Blade Option)	Engages and disengages high range travel speed (if angle blade is equipped). (See Engaging Two-Speed Travel (With Angle Blade Option) on Page 47)
6	Angle Blade Switch (With Angle Blade Option) Two-Speed Button (Without Angle Blade Option)	Operates the angle blade (if angle blade is equipped). Engages and disengages high range travel speed (if angle blade is not equipped). (See Engaging Two-Speed Travel (Without Angle Blade Option) on Page 46)
7	Engine Speed Control Dial	Controls engine rpm. (See Engine Speed Control on Page 72)
8	Travel Motion Alarm Cancel Switch	Temporarily disables the travel motion alarm. (See Disabling The Travel Motion Alarm on Page 52)
9	Wait To Start Light	When light turns off, the engine can be started. (See Starting The Engine on Page 78)
10	Auxiliary Power Outlet	12 volt receptacle for accessories.

REF.	DESCRIPTION	FUNCTION
11	USB Port (if equipped)	See the Touch Display User Guide for more information about the sound system.
12	3,5 mm (1/8 in) Auxiliary Input Jack (if equipped)	
13	Hands-Free Microphone (if equipped)	Used for hands-free talking with the touch display phone feature.
14	Key Switch or Keyless Start Switch	Used to start the engine. (See Starting The Engine on Page 78)
15	Jog Shuttle	Used to navigate the display. (See Jog Shuttle (Standard Display) on Page 40) (See Jog Shuttle (Touch Display) on Page 41)
16	Temperature Control Dial (if equipped)	Controls temperature in cab.
17	Air Conditioning Switch (if equipped)	Turns air conditioner on / off.
18	Fan Motor Dial (if equipped)	Controls fan speed.
19	Standard Display Screen	(See Standard Display on Page 36)
	Touch Display Screen	(See Touch Display on Page 38)

NOTE: Always turn key switch and all accessories to off when the engine is stopped, the battery will discharge if the key is left on.

Standard Display

Figure 14



NA3767e

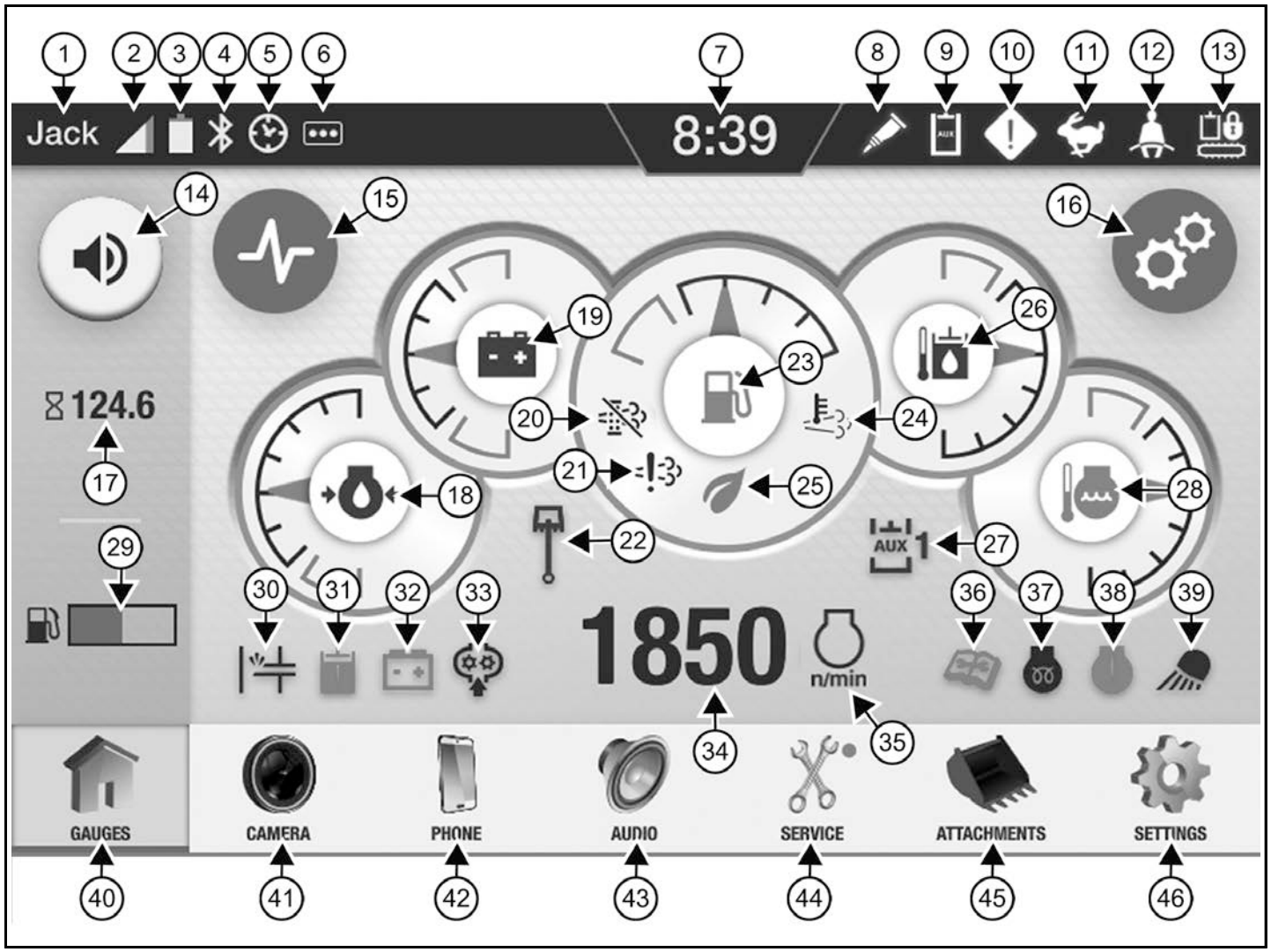
The standard display is a visual interface that provides control of certain machine settings and operating information through the use of a jog shuttle. The standard display is scratch resistant and weather resistant.

REF.	DESCRIPTION	FUNCTION
1	Machine Hours	Shows machine operating hours.
2	Direct To Tank	Indicates Direct To Tank feature has been activated. (See Enabling Direct To Tank on Page 63)
3	Auxiliary Hydraulics	Indicates Auxiliary Hydraulics are activated. The icon changes when detent flow is activated. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 57)
4	General Warning	Indicates a malfunction of one or more machine functions.
5	High Range	Indicates high range is activated. (See Two-Speed Travel on Page 46)
6	Seat Belt Reminder	Illuminates as a reminder to fasten the seat belt.
7	Control Console Raised	Indicates the left console is raised and hydraulic controls are locked out. (See Raising And Lowering The Console on Page 46)

REF.	DESCRIPTION	FUNCTION
8	Boom Swing or Auxiliary Hydraulics (if equipped)	Indicates what control the left joystick switch is operating. (See Boom Swing on Page 73) (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59) (See Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics on Page 61)
9	Boom Swing or Auxiliary Hydraulics (if equipped)	Indicates what control the right joystick switch is operating. (See Boom Swing on Page 73) (See Operating Attachments With Primary Auxiliary Hydraulics on Page 57) (See Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics on Page 61)
10	Engine Coolant Temperature Gauge	Shows the engine coolant temperature.
11	Diesel Particulate Filter (DPF)	Indicates inhibit mode has been selected. DPF icon will blink when forced regeneration is required. DPF icon will be on during regeneration. (See Diesel Particulate Filter (DPF) System on Page 66)
12	Emissions Error	Indicates emissions regulating system malfunction. (See Diesel Particulate Filter (DPF) System on Page 66)
13	Fuel Gauge	Shows the amount of fuel in the tank. Icon illuminates to indicate a malfunction.
14	Eco Mode	Indicates Eco Mode is activated. (See Eco Mode on Page 72)
15	High Exhaust System Temperature (HEST)	Indicates the exhaust temperature is higher than normal operation temperature. (See Diesel Particulate Filter (DPF) System on Page 66)
16	Battery Warning	Indicates battery voltage is low.
17	Engine Warning	Indicates the engine has malfunctioned.
18	Service Due	Indicates scheduled maintenance is due.
19	Engine RPM	Shows engine rpm.
20	Throttle Indicator	Manual throttle icon changes to Auto icon when Auto Idle is activated. (See Auto Idle on Page 48)
21	Hydraulic Warning	Indicates hydraulic fluid temperature is high.
22	Glow Plugs	Indicates glow plugs are active.
23	Secondary Auxiliary Hydraulics	Indicates Secondary Auxiliary Hydraulics are activated. (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59)
24	Navigation Handle	Brings up the navigation bar. (See Opening Navigation Bar on Page 190) Any active shortcuts will be displayed. (See Active Shortcuts on Page 190)
25	Fuel Priming	Indicates fuel priming is in process.

Touch Display

Figure 15



NA3384s

The touch display is a visual interface that provides control of certain machine settings, operating information, and entertainment through the use of a touch screen or jog shuttle control. The touch display is scratch resistant and weather resistant.

See the Touch Display User Guide for phone and sound system instructions.

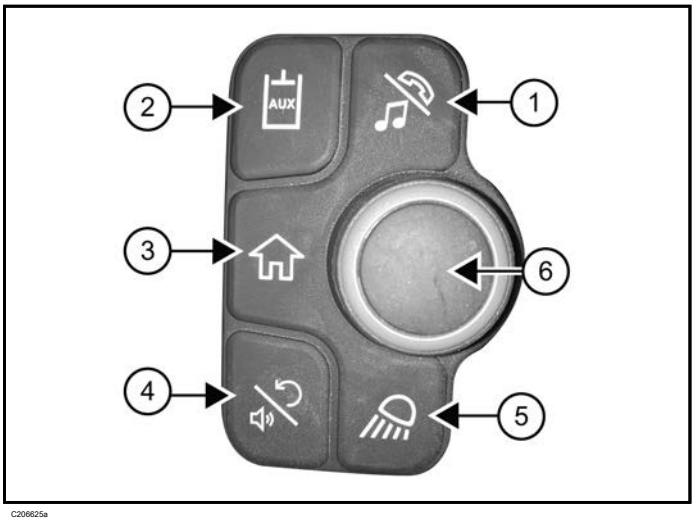
REF.	DESCRIPTION	FUNCTION
1	Operator Name	Shows the user that is currently logged into the system.
2	Connected Device Signal Strength	Indicates the signal strength of a connected device.
3	Connected Device Battery Strength	Indicates the battery strength of a connected device.
4	Bluetooth® Device	Indicates a Bluetooth Device has been connected.
5	Job Clock	Indicates one of the job clocks is running. (See Using The Job Clock on Page 209)
6	Notifications	Indicates that Notifications are available.

REF.	DESCRIPTION	FUNCTION
7	Time / Notification Drawer	Displays current time. During machine start up, “COLD” or “WAIT” may also be displayed in this area to indicate that the machine can not be started until the message is off. Provides access to Notification Drawer. (See Notification Drawer on Page 195)
8	Direct To Tank	Indicates Direct To Tank feature has been activated. (See Enabling Direct To Tank on Page 63)
9	Auxiliary Hydraulics	Indicates Auxiliary Hydraulics are activated. The icon changes when detent flow is activated. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 57)
10	General Warning	Indicates a malfunction of one or more machine functions.
11	High Range	Indicates high range is activated. (See Two-Speed Travel on Page 46)
12	Seat Belt Reminder	Illuminates as a reminder to fasten the seat belt.
13	Control Console Raised	Indicates the left console is raised and hydraulic controls are locked out. (See Raising And Lowering The Console on Page 46)
14	Volume	Press to access volume slider bar.
15	Vitals (Digital Information)	Accesses the gauge information in digital format. (See Accessing Vital Detail And Machine Performance on Page 196)
16	Machine Settings	Accesses various machine settings.
17	Machine Hours	Shows machine operating hours.
18	Engine Oil Pressure Gauge	Shows the engine oil pressure.
19	Battery Voltage Gauge	Shows the battery voltage.
20	Diesel Particulate Filter (DPF)	Indicates inhibit mode has been selected. DPF icon will blink when forced regeneration is required. DPF icon will be on during regeneration. (See Diesel Particulate Filter (DPF) System on Page 66)
21	Emissions Error	Indicates emissions regulating system malfunction. (See Diesel Particulate Filter (DPF) System on Page 66)
22	Boom Swing or Auxiliary Hydraulics (if equipped)	Indicates what control the left joystick switch is operating. (See Boom Swing on Page 73) (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59) (See Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics on Page 61)
23	Fuel Gauge	Shows the amount of fuel in the tank.
24	High Exhaust System Temperature (HEST)	Icon is on when the exhaust temperature is higher than normal operation. (See Diesel Particulate Filter (DPF) System on Page 66)
25	Eco Mode	Indicates Eco mode is activated. (See Eco Mode on Page 72)
26	Hydraulic Fluid Temperature Gauge	Shows the hydraulic fluid temperature.
27	Boom Swing or Auxiliary Hydraulics (if equipped)	Indicates what control the right joystick switch is operating. (See Boom Swing on Page 73) (See Operating Attachments With Primary Auxiliary Hydraulics on Page 57) (See Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics on Page 61)
28	Engine Coolant Temperature Gauge	Shows the engine coolant temperature.

REF.	DESCRIPTION	FUNCTION
29	Fuel Level Bar Graph	Visually shows the fuel level.
30	Fuel Priming	Indicates fuel priming is in process.
31	Hydraulic Warning	Indicates hydraulic fluid temperature is high.
32	Battery Warning	Indicates battery voltage is low.
33	Secondary Auxiliary Hydraulics	Indicates secondary auxiliary hydraulics are activated. (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59)
34	Engine RPM	Shows engine rpm.
35	Throttle Indicator	Manual throttle icon changes to Auto when Auto Idle is activated. (See Auto Idle on Page 48)
36	Service Due	Indicates scheduled maintenance is due.
37	Glow Plugs	Indicates glow plugs are active.
38	Engine Warning	Indicates the engine has malfunctioned.
39	Front Lights	Indicates front lights are on.
40	Gauges	Accesses **GAUGES** screen.
41	Camera (if equipped)	Accesses **CAMERA** screen.
42	Phone	Accesses **PHONE** screen.
43	Audio	Accesses **AUDIO** screen.
44	Service	Accesses **SERVICE** screen.
45	Attachment	Accesses **ATTACHMENT** screen.
46	Settings	Accesses **SETTINGS** screen.

Jog Shuttle (Standard Display)

Figure 16



C206625a

Navigate the display with the jog shuttle [Figure 16].

See the User Guide included with the machine's literature packet for more information.

REF.	DESC.	FUNCTION
1	Not Used	
2	Auxiliary Hydraulics	Activates auxiliary hydraulics. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 57)
3	Gauges	Opens **GAUGES** screen.
4	Back	Returns to previous screen.
5	Lights	Turns front lights on and off.
6	Rotary Knob	Used to navigate between available icons on display. Press knob to select highlighted icon.

Using The Jog Shuttle With Standard Display

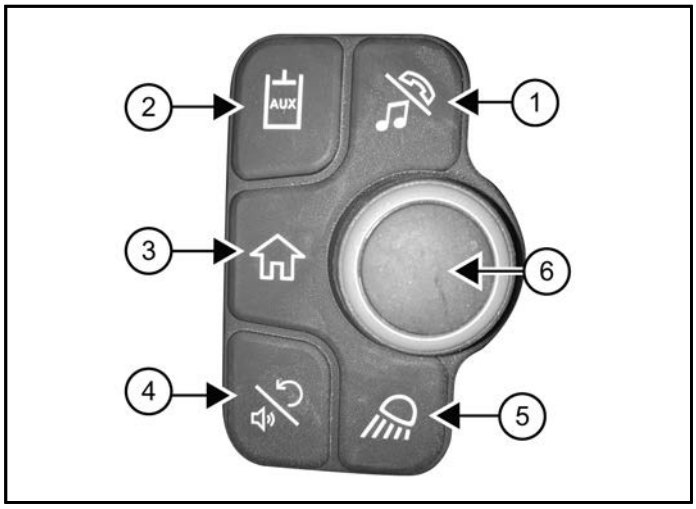
- Turn the rotary knob (Item 6) [Figure 16] to move between the icons on the screen.

  Only icons that highlight on the screen can be selected.

- Press the rotary knob (Item 6) [Figure 16] to select a highlighted icon or to turn a feature on / off.
- Press the Back button (Item 4) [Figure 16] to return to the previous screen.
- If a slider is used for changing a setting, highlight the slider and turn the rotary knob to change the slider position.

Jog Shuttle (Touch Display)

Figure 17



C208625a

Navigate the display with the jog shuttle [Figure 17].

See the User Guide included with the machine's literature packet for more information.

REF.	DESC.	FUNCTION
1	Audio / Phone	Toggles between **PHONE** screen and **AUDIO** screen. Also accepts and ends calls.
2	Auxiliary Hydraulics	Activates auxiliary hydraulics. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 57)
3	Gauges / Vital Detail	Toggles between **GAUGES** screen and **VITAL DETAIL** screen.
4	Volume / Navigation	Toggles the function of the Rotary Knob between adjusting volume and navigating through the screens on the display.
5	Lights	Turns front lights on / off.
6	Rotary Knob (Volume / Navigation)	In navigation mode, used to navigate through items on the page. In volume mode, used to adjust volume. Pressing the rotary knob will mute and unmute audio.

Using The Jog Shuttle With Touch Display

- Press the Volume / Navigation button (Item 4) [Figure 17] to highlight the first selectable icon on the display screen.
- Turn the rotary knob (Item 6) [Figure 17] to move between the icons on the screen.

  Only icons that highlight on the screen can be selected.
- Press the rotary knob (Item 6) [Figure 17] to select the highlighted icon.
- To turn a feature on / off, press the rotary knob.
- If a slider is used for changing a setting, highlight the slider and turn the rotary knob to change the slider position.

REAR VIEW CAMERA SYSTEM

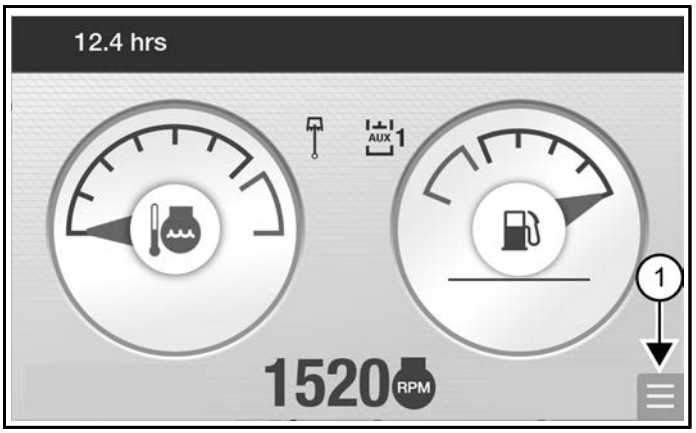
This machine may be equipped with a rear view camera system. The view from the camera is displayed on the display screen.

The rear view camera system is not a substitute for keeping bystanders away from the work area. You must remain fully aware of your surroundings using direct visibility and the rear view camera system. You must service and maintain the camera system to ensure proper function.

NOTE: Objects viewed on the display are closer than they appear.

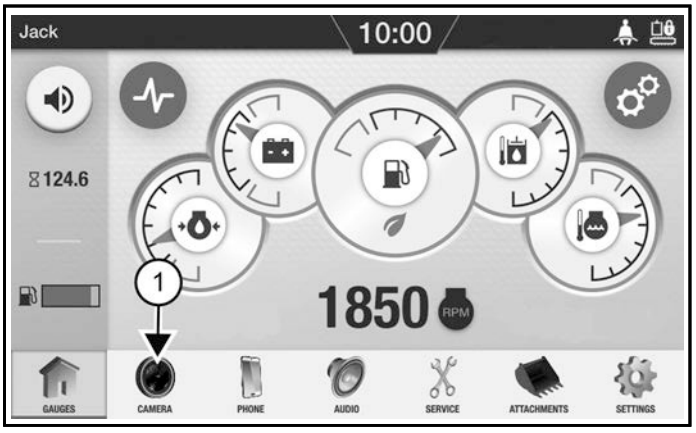
Operating Rear View Camera

Figure 18



NA3773a

Figure 19



NA3384j

- To navigate to the camera, select **[NAVIGATION HANDLE]→ [CAMERA]** (Item 1) [Figure 18] on the standard display.

  OR

  Select **[CAMERA]** on the touch display (Item 1) [Figure 19].

Figure 20

P200728a

You can also press the right joystick button (Item 1) [Figure 20] to toggle between the camera and the current screen.

Figure 21

NA3636c

The rotating spinner icon (Item 1) [Figure 21] indicates you are viewing a live broadcast from the camera.

See touch display section for additional features available on that display.
(See Camera (Touch Display) on Page 197)

Cleaning And Maintaining Rear View Camera

Perform the following daily or as needed:

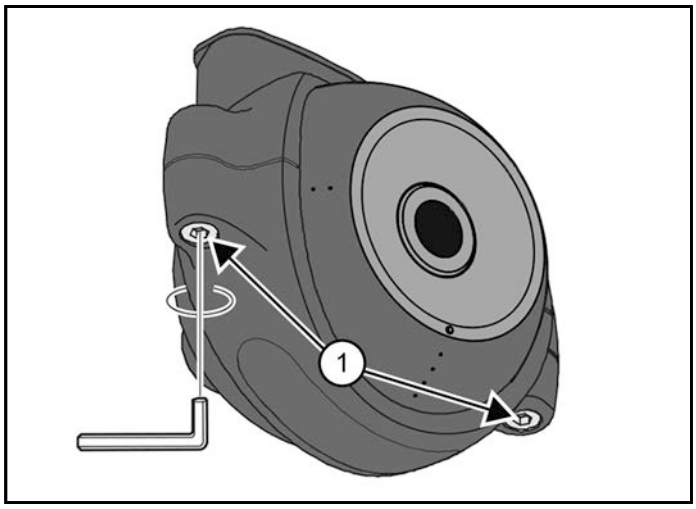
- Clean the lens of the camera using a soft cloth and clean water.
- Remove mud, snow, ice, or other debris that could affect the clear view provided by the camera system.
- Verify proper camera adjustment. Adjust camera if needed.
  (See Adjusting Rear View Camera Position on Page 43)

- Replace damaged rear view camera system components. See your Bobcat dealer for service and parts.

Adjusting Rear View Camera Position

1. Make a mark on the ground 1,25 m (4 ft) behind the machine.

Figure 22

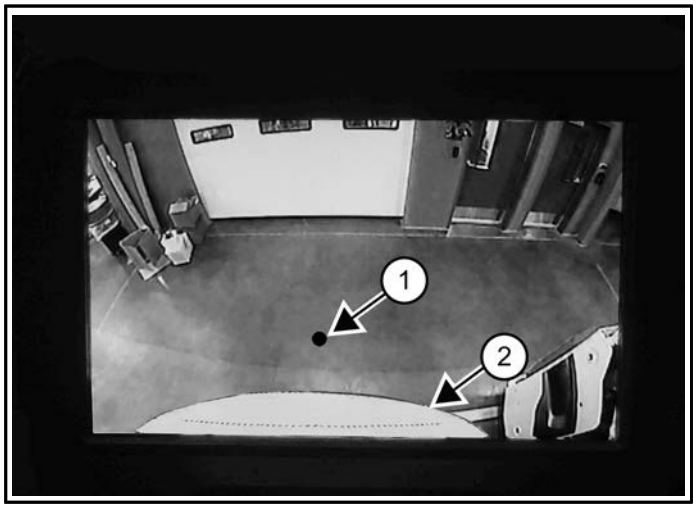


NA3351a

2. Loosen the screws (Item 1) [Figure 22] of the clamp holding the camera.
3. Turn the start switch to ON, but do not start the engine.
4. Turn the camera ON.
5. Compare the camera display with the view through the rear window of the machine. The image should be as a mirror, with an object to the left of the machine appearing on the left of the display.

   See display menu to adjust if needed.

Figure 23



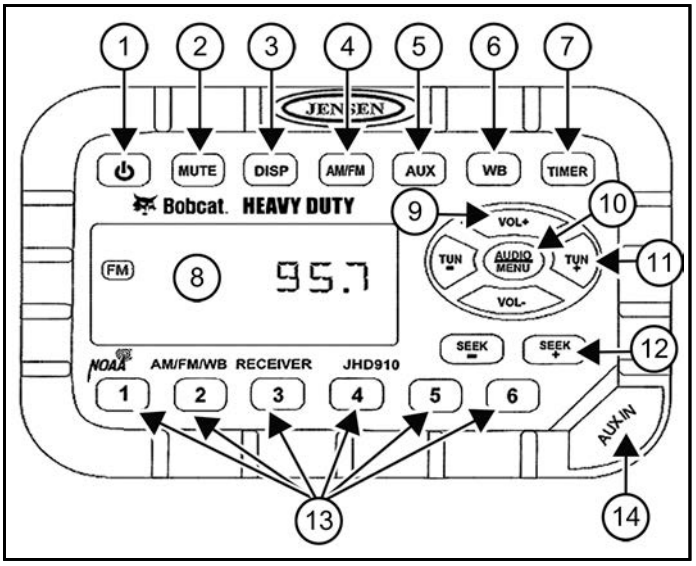
C137601a

6. Adjust the camera as follows.
   a. The mark on the ground (Item 1) [Figure 23] should be visible on the display.
   b. The tailgate (Item 2) [Figure 23] should be just visible on the display.
   c. The camera should be centred left and right.
7. Tighten the screws to 0,8 – 1,0 N•m (7 – 8.8 in-lb) torque.
8. Turn the key switch to off.

RADIO

Radio Identification

Figure 24

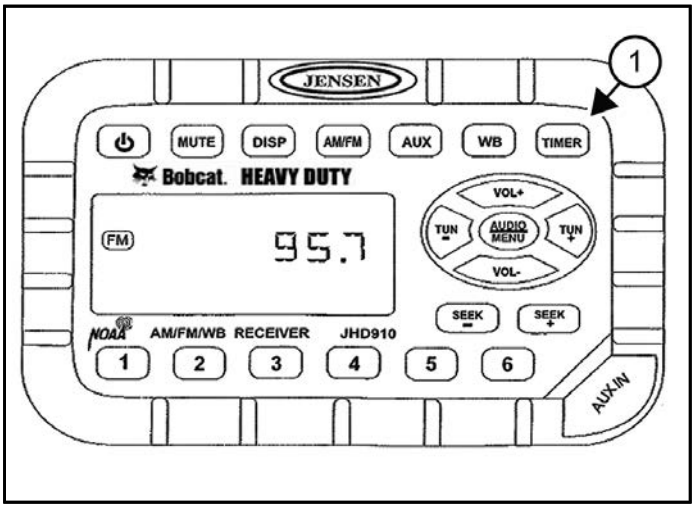


NA3090h

REF	DESC.	FUNCTION
1	POWER	Turns the radio unit ON / OFF.
2	MUTE	Mutes audio output.
3	DISP	Switches between display operation functions of the radio. (See Operating The Radio Clock on Page 45)
4	AM/FM	Switches between AM (MW) bands and three FM bands.
5	AUX	Switches to Auxiliary Input mode. Portable audio device (MP3 player, etc.) must be attached to auxiliary input jack.
6	WB	Selects weather band. The weather alert feature, if activated, will automatically switch from the current function to the weather band if a weather warning is received. (See Adjusting Radio Settings on Page 45)
7	TIMER	Accesses timer mode. (See Operating Radio Timer on Page 44)
8	DISPLAY SCREEN	Displays the time, frequency, and activated functions.
9	VOL+ / VOL-	Adjusts volume up and down. Current volume (0 – 40) will appear briefly in display screen.
10	AUDIO / MENU	Adjusts radio settings. (See Adjusting Radio Settings on Page 45)
11	TUN- / TUN+	Manually tunes the radio frequency up and down.
12	SEEK- / SEEK+	Automatically tunes frequency up or down to next strong station.
13	PRESET STATIONS	Stores and recalls stations for each AM and FM band. Press button and hold to store current station. Press button to recall station.
14	AUX IN	Connect line output of portable audio device (MP3 player, etc.) to 3,5 mm (1/8 in) jack and press AUX button.

Operating Radio Timer

Figure 25

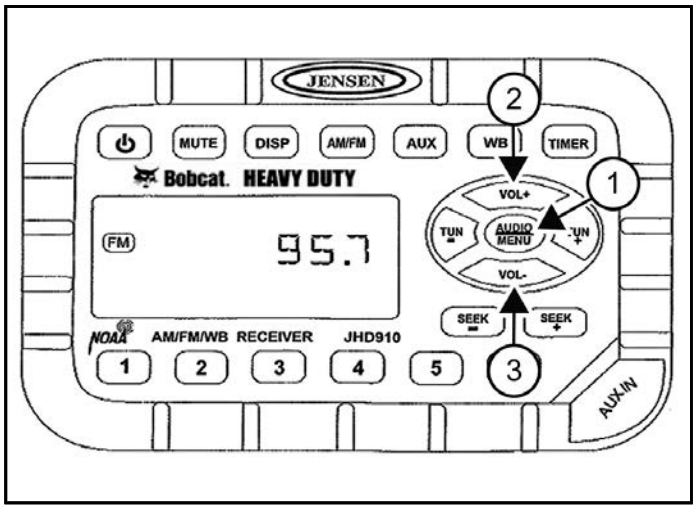


NA3090f

- Press the TIMER (Item 1) [Figure 25] button to start the timer function.
- Press TIMER (Item 1) [Figure 25] again to stop timer.
- Press and hold TIMER (Item 1) [Figure 25] to reset timer and exit from timer mode.

Adjusting Radio Settings

Figure 26



NA3090g

- Press the AUDIO / MENU button (Item 1) [Figure 26] to cycle through bass, treble, and balance settings.
  - ▹ Use the VOL+ (Item 2) and VOL- (Item 3) buttons [Figure 26] to adjust the desired option displayed.

  Normal operation will resume automatically.
- Press and hold the AUDIO / MENU button (Item 1) [Figure 26] for three seconds to enter menu adjustment settings.
  - ▹ Press the AUDIO / MENU button (Item 1) [Figure 26] to cycle through the following settings:

    Beep Confirm: Determines if beep will sound with each button press.

    Operation Region: Selects the appropriate region (USA or Europe).

    Clock Display: Selects a 12 hour or 24 hour clock display.

    Display Brightness: Set display screen brightness level (low, medium, or high).

    Backlight Colour: Set display screen backlight colour (amber or green).

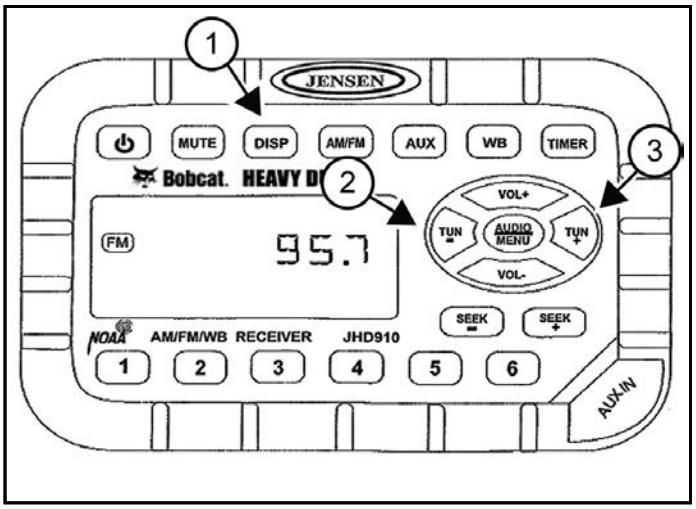
    Power On Volume: Sets default volume setting when radio is turned on.

    WB Alert: Determines if weather band alert features is activated.
  - ▹ Use the VOL+ (Item 2) and VOL- (Item 3) buttons [Figure 26] to adjust the active setting.

  Normal operation will resume automatically.

Operating The Radio Clock

Figure 27



NA3090c

- Press and hold the DISP (Item 1) button [Figure 27] to enter clock setting mode.
- Use TUN – button (Item 2) [Figure 27] to adjust hours.
- Use TUN + button (Item 3) [Figure 27] to adjust minutes.

Normal operation will resume automatically.

RAISING AND LOWERING THE CONSOLE

When the left console is raised, the hydraulic and traction system functions are locked and will not operate.

Figure 28

P134071a

- Before operating the excavator, lower the left console [Figure 28].

  Push down on the handle until the latch is engaged.

- Before exiting the cab, raise the left console by pulling up on the handle.

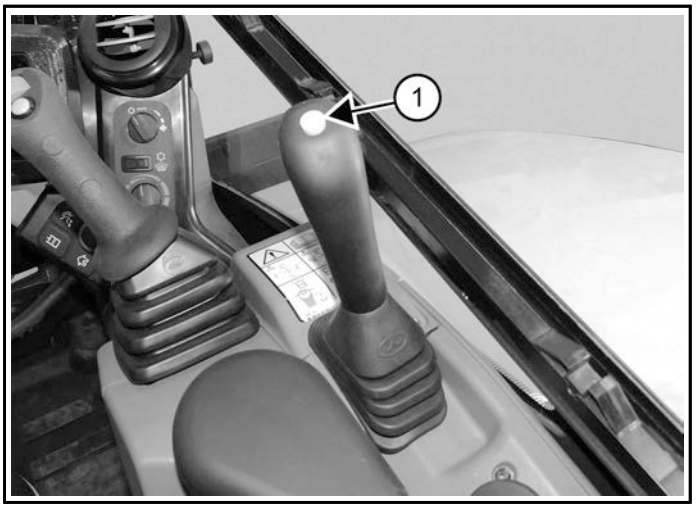
  The lift spring will assist in raising the console.

NOTE: If the engine stops, the boom / bucket (attachments) can be lowered to the ground using hydraulic pressure in the accumulator. The control console must be in the locked down position, and the key switch in the on position.

TWO-SPEED TRAVEL

Engaging Two-Speed Travel (Without Angle Blade Option)

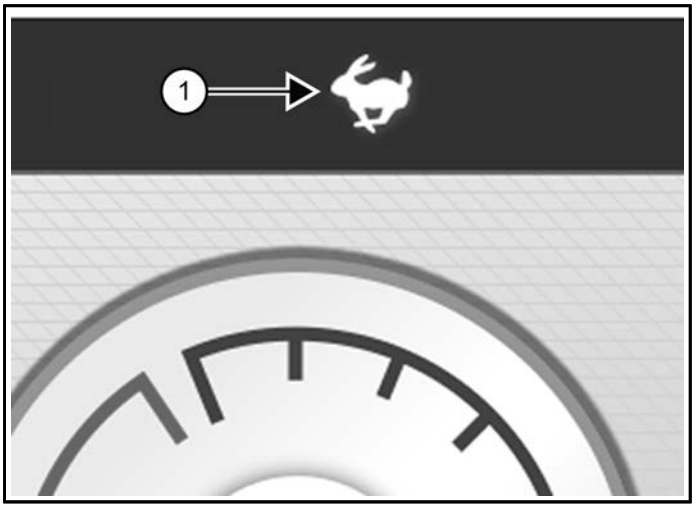
Figure 29



P200092b

- Press the button (Item 1) [Figure 29] to engage the high range.

Figure 30



NA3774

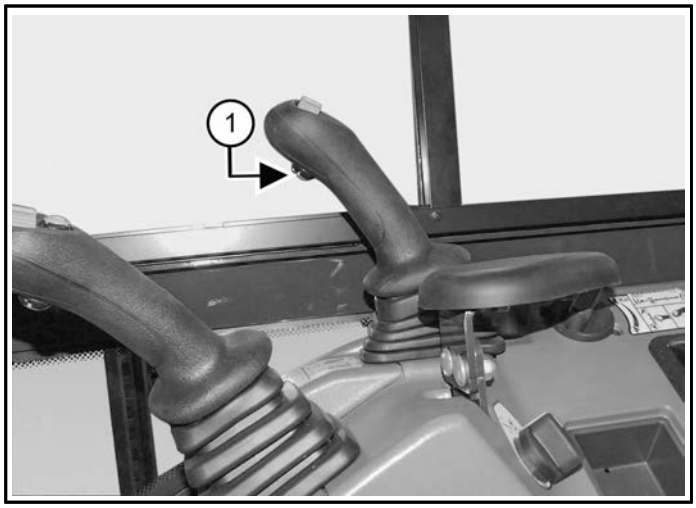
  Two beeps will be heard and the high range icon (Item 1) [Figure 30] will illuminate.

- Press the button (Item 1) [Figure 29] again to disengage.

  One beep will be heard.

Engaging Two-Speed Travel (With Angle Blade Option)

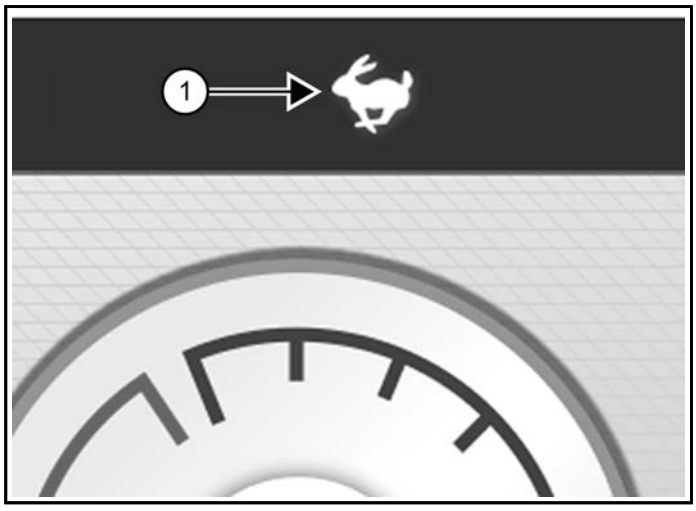
Figure 31



C201031a

- Press the button (Item 1) [Figure 31] to engage the high range.

Figure 32



NA3774

Two beeps will be heard and the high range icon (Item 1) [Figure 32] will illuminate.

- Press the button (Item 1) [Figure 31] again to disengage.

One beep will be heard.

Auto Shift Drive Motors

The travel motors are equipped with an auto shift feature that senses hydraulic pressure. When in high range, the travel motors will automatically shift to low range when more torque is required and return to high range when hydraulic pressure decreases.

NOTE: Always set the travel speed to low range when loading or unloading the excavator onto a transport vehicle.

AUTO IDLE

Auto Idle Description

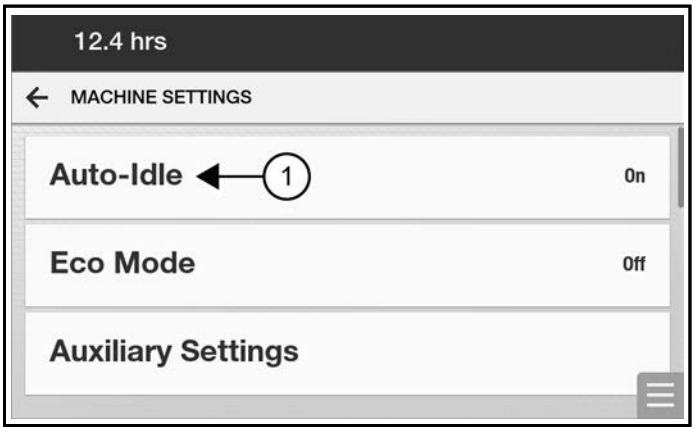
When auto idle is activated, engine speed will be reduced to low idle when the control levers (joystick, blade, travel, etc.) are in neutral and have not been used for the auto idle delay time. The engine rpm will return to the set position as soon as any control lever is activated.

NOTE: Always disengage auto idle when loading or unloading the excavator onto a transport vehicle.

Activating Auto Idle

1. Select **[SETTINGS]**→ **[MACHINE SETTINGS]**.

Figure 33



NA3742d

2. Select **[AUTO-IDLE]** to turn it on / off (Item 1) [Figure 33].

The Auto-Idle Delay Time can be changed on the touch display. (See Activating Auto Idle on Page 205)

OPERATOR CAB (ROPS / TOPS / FOPS)

The Bobcat excavator may be equipped with an operator cab (ROPS / TOPS / FOPS) to protect the operator if the excavator is tipped over or from falling objects. The seat belt must be worn for ROPS / TOPS / FOPS protection.

Check the ROPS / TOPS / FOPS cab, mounting, and hardware for damage. Never modify the ROPS / TOPS / FOPS cab. Replace the cab and hardware if damaged. See your Bobcat dealer for parts.

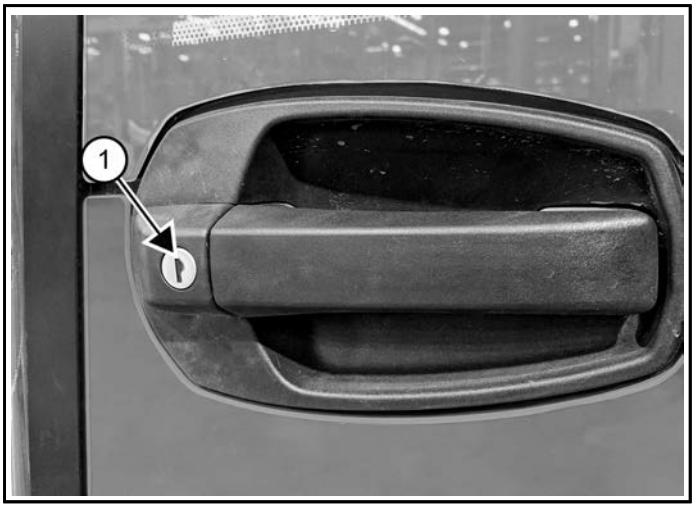
⚠ WARNING

MODIFICATION HAZARD
Cab changes can cause loss of operator protection from rollover and falling objects resulting in serious injury or death.
Never modify operator cab by welding, grinding, drilling holes or adding attachments unless instructed to do so by Bobcat Company.

W-2069

Operating The Cab Door

Figure 34

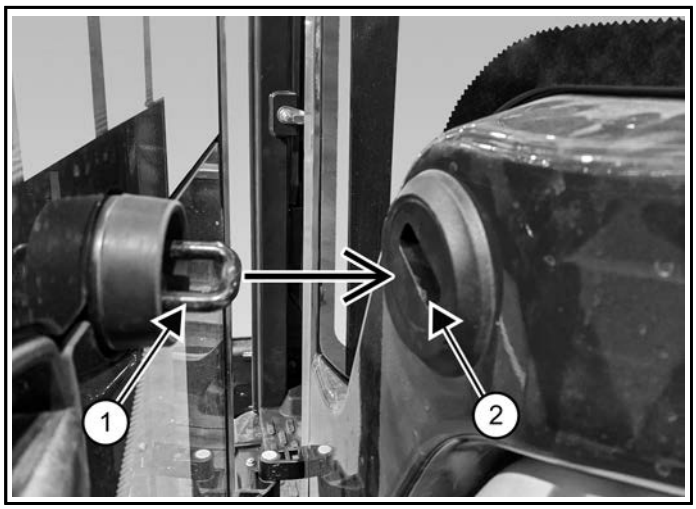


C206626a

- Pull on the latch to open the door.

  The cab door can be locked (Item 1) [Figure 34] with the same key as the starter switch.

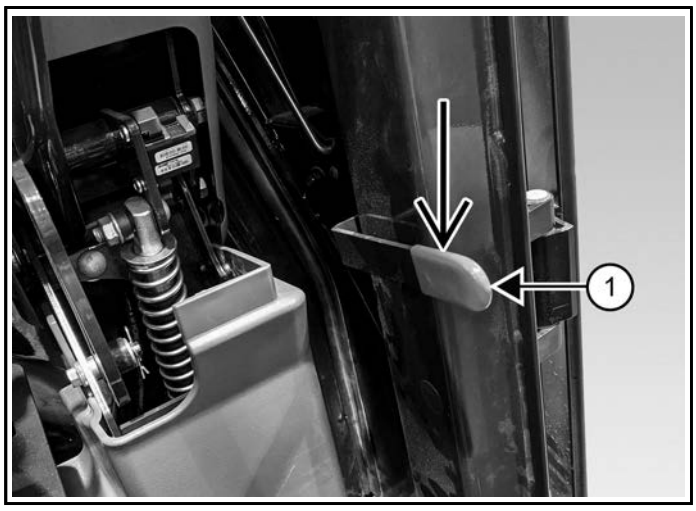
Figure 35



C206627a

- Push the door all the way open until the latch post (Item 1) engages in the latch (Item 2) to hold the door in the open position [Figure 35].

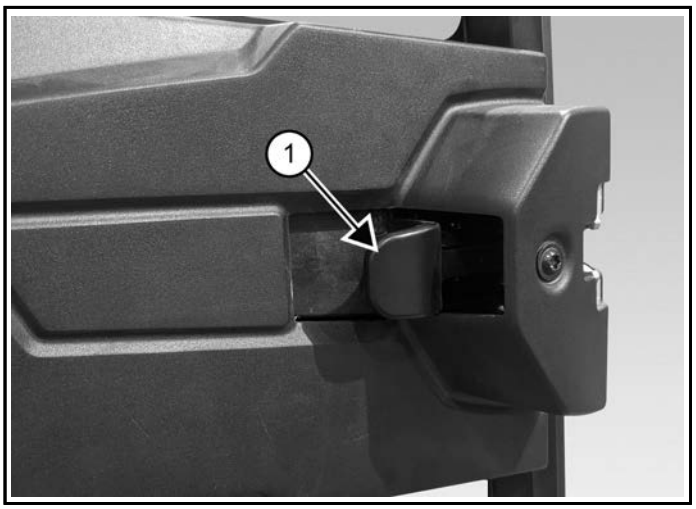
Figure 36



C206628a

- When the door is in the open position, push the latch (Item 1) [Figure 36] to release the door.

Figure 37

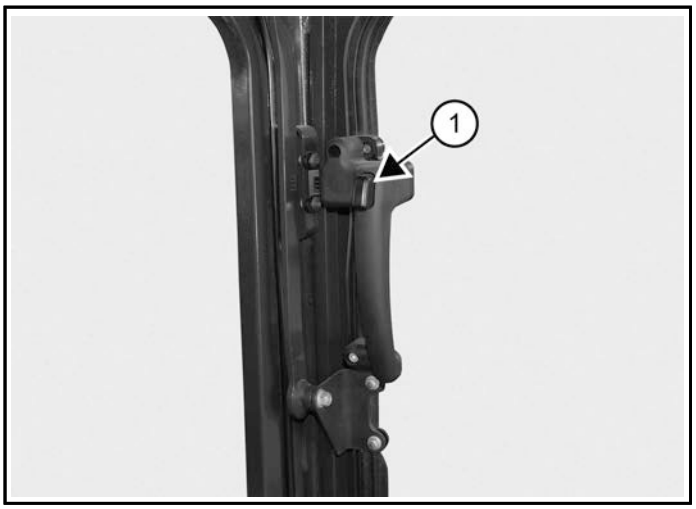


C206629a

- From inside the cab, open the door using the handle (Item 1) [Figure 37].

Operating The Front Window

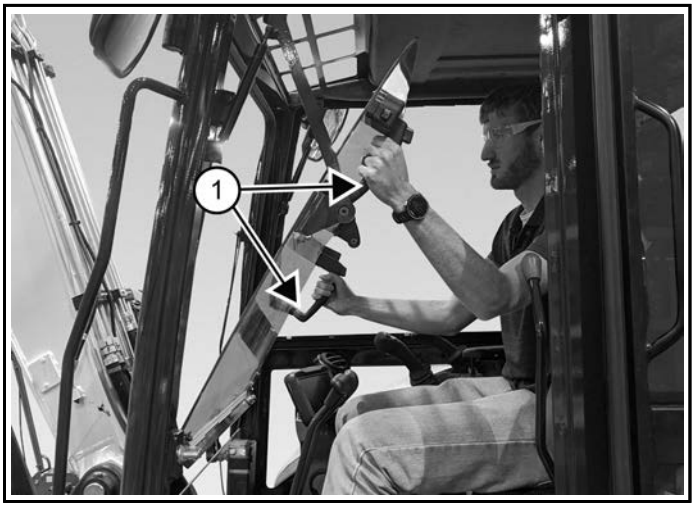
Figure 38



P20095a

1. Push the window latch buttons (Item 1) [Figure 38] on both sides.

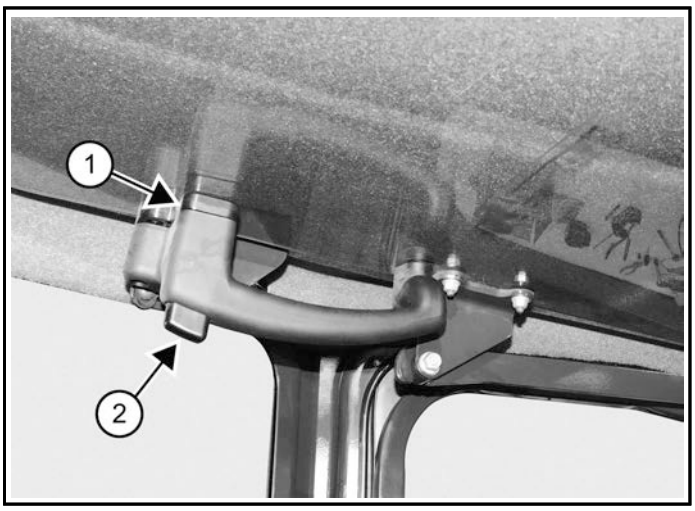
Figure 39



C206630a

2. Use both window grab handles (Item 1) [Figure 39] to pull the top of the window in.

Figure 40



P200096a

3. Continue moving the window in and up over your head until the window is fully raised.

   When the window is fully raised, the latch (Item 1) (both sides) [Figure 40] will close on the bracket in the latched position.

4. Pull down and forward slightly on the window to make sure it is fully latched.

5. To close the window, use both window grab handles to support the window while pressing the window latch button (Item 2) [Figure 40] (both sides).

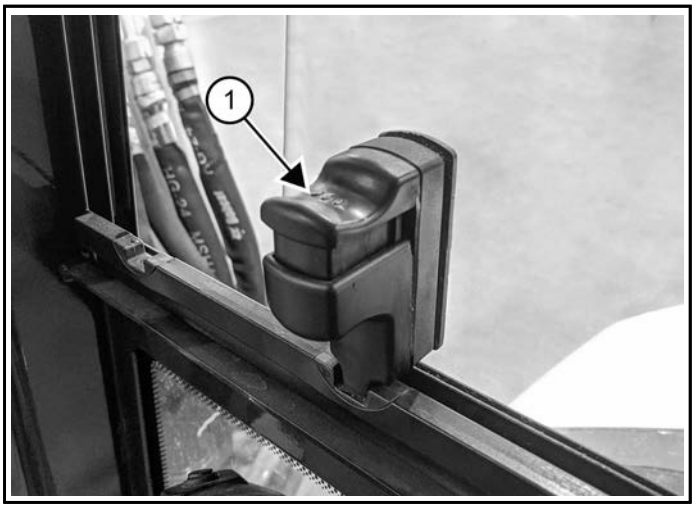
   Use both window grab handles (Item 1) [Figure 39] to pull the window down fully.

6. Press the top of the window in until the latch locks into the latched position (both sides) [Figure 38].

7. Pull inward and upward slightly on the window to make sure it is fully latched in the closed position.

Operating The Right Windows

Figure 41



C206631a

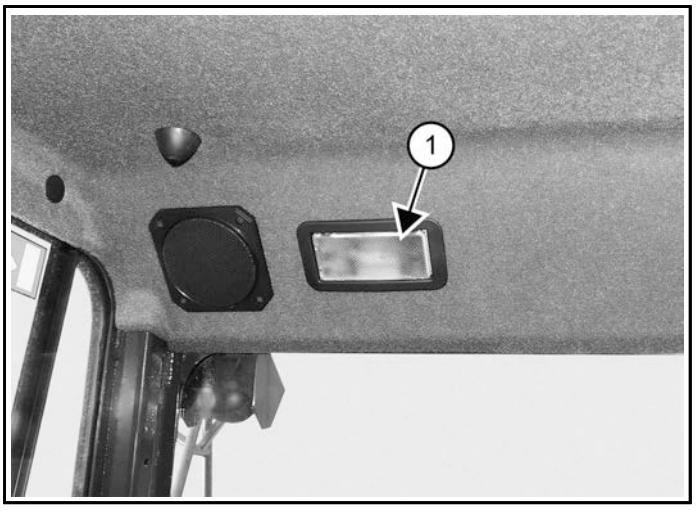
1. Pinch the latch together (Item 1) [Figure 41] and pull the window open.

2. Release the lever (Item 1) [Figure 41] into the slot to secure the window open in one of the available positions.

3. To close the window, pinch the latch together and push the window shut. Make sure the lever releases into the slot to secure the window shut.

Operating The Cab Interior Light

Figure 42



P200087a

1. Push either side of the lens (Item 1) [Figure 42] to turn the light on.

2. Return the lens to the middle position to turn the light off.

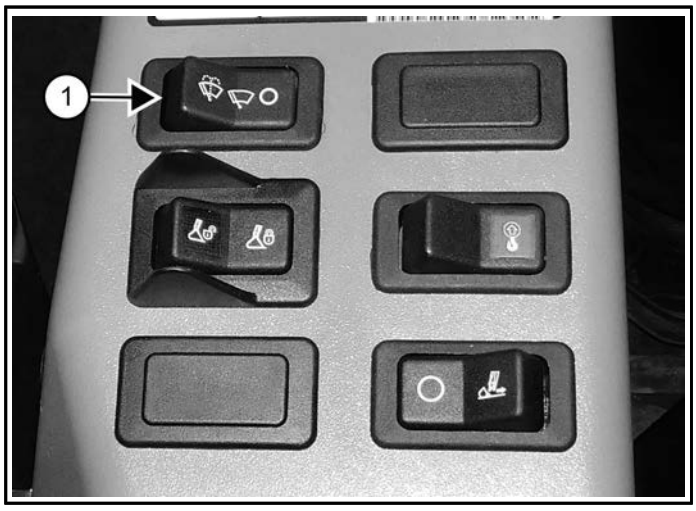
Operating Windshield Wiper

Figure 43

P200099a

The front window is equipped with a windshield wiper (Item 1) [Figure 43] and washer.

Figure 44

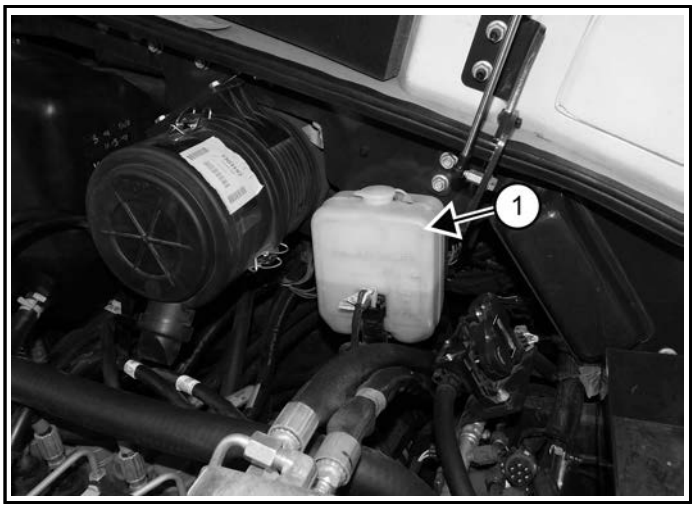


C208594d

1. Press the switch (Item 1) [Figure 44] to the left to turn the windshield wiper on.
2. Press and hold switch (Item 1) [Figure 44] to the left to activate windshield washer.
3. Press the switch (Item 1) [Figure 44] to the right to turn the windshield wiper off.

Window Washer Reservoir

Figure 45

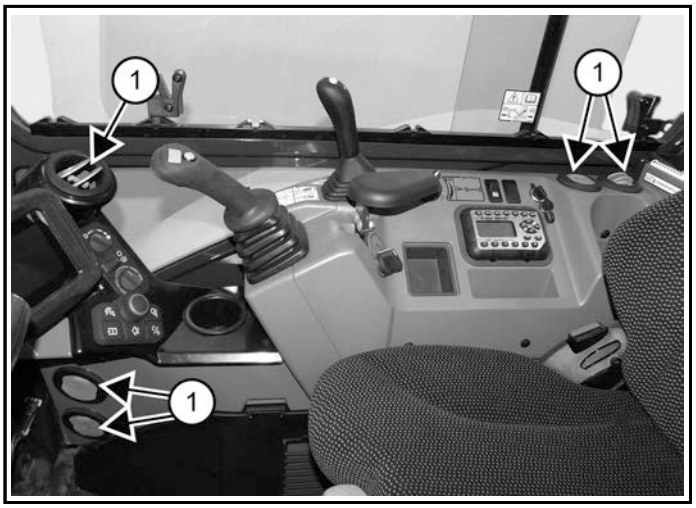


C208595a

The window washer reservoir (Item 1) [Figure 45] is located under the right side cover.

Heating, Ventilation, And Air Conditioning Ducting

Figure 46



P141329a

The HVAC louvers (Item 1) [Figure 46] can be positioned as needed to direct the air flow to various areas in the cab.

EMERGENCY EXITS

Emergency Exit Locations

The door, the right window, and the front window provide exits in case of an emergency.

Making An Emergency Exit Through The Front Window

Figure 47

C206630

You can make an emergency exit through the front window. (See Operating The Front Window on Page 49)

NOTE: If the excavator has a Front Guard Kit installed, the front window can not be used as an emergency exit.

Making An Emergency Exit Through The Right Side Window

Figure 48

C132085

You can make an emergency exit through the right window. (See Operating The Right Windows on Page 50)

TRAVEL MOTION ALARM

Travel Motion Alarm Description

This excavator may be equipped with a travel motion alarm. The travel motion alarm is located underneath the rear of the excavator.

The travel motion alarm will sound when the operator moves the travel control levers in either the forward or reverse direction.

If the alarm does not sound, see inspection instructions. (See Inspecting The Travel Motion Alarm System on Page 153)

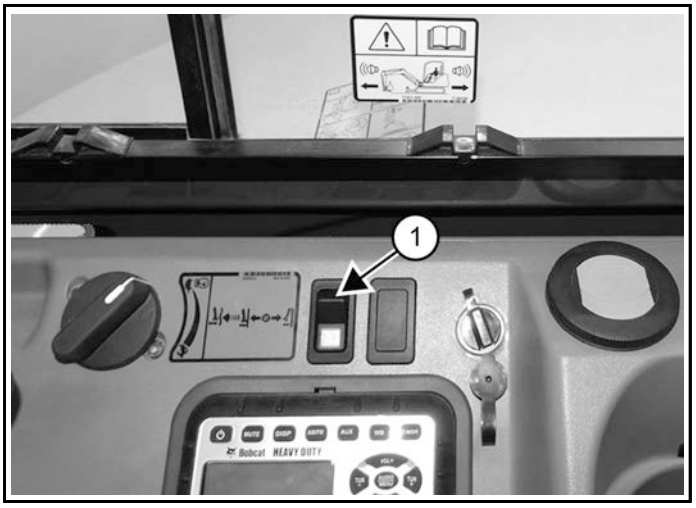
⚠ WARNING

CRUSHING HAZARD
Failure to maintain a clear view in the direction of travel can cause serious injury or death.
- **This machine is equipped with a motion alarm. ALARM MUST SOUND! when operating forward or backward.**
- **The operator is responsible for the safe operation of this machine.**

W-2786

Disabling The Travel Motion Alarm

Figure 49



C200865c

- Press the travel motion alarm switch (Item 1) [Figure 49] on the right console while the machine is moving to temporarily disable the travel motion alarm.
- Enable the travel motion alarm by returning the travel levers back to the neutral position.

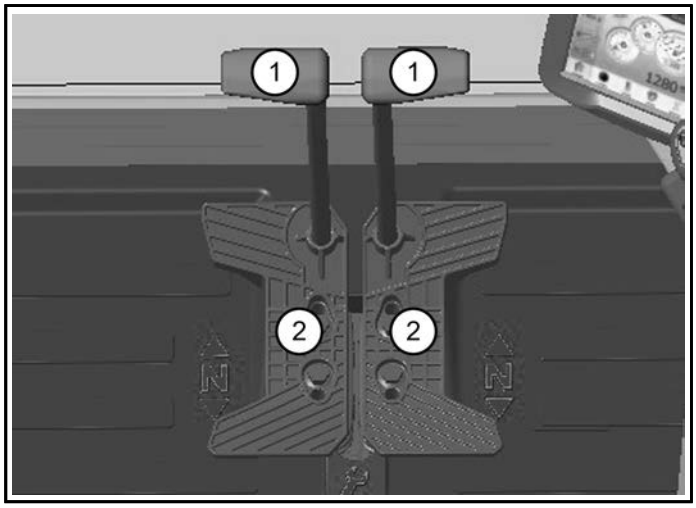
TRAVEL CONTROLS

Forward And Reverse Travel

The following procedures describe forward, reverse, left, and right as seated in the operator's seat.

1. Rotate the upperstructure, if necessary, to ensure the blade is at the front of the machine (as you sit in the operator's seat).

Figure 50



C208449a

2. Slowly move both steering levers (Item 1) [Figure 50] forward for forward travel, backward for reverse travel.

   OR

   Control travel with the foot pedals (Item 2) [Figure 50].

⚠ WARNING

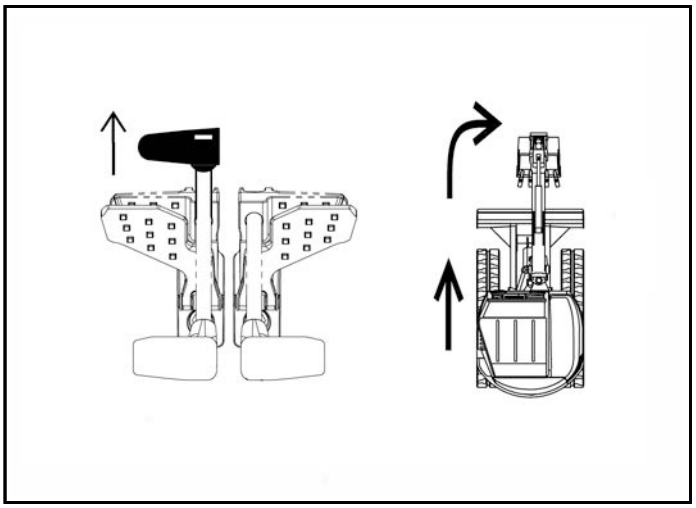
UNINTENDED MOVEMENT HAZARD
Failure to follow instructions can cause serious injury or death.

- **Check the blade location before travelling. When the blade is to the rear, operate the steering levers / foot pedals in the opposite direction to when the blade is in the front.**
- **Move the steering levers / foot pedals slowly. Abrupt lever motion will cause the machine to jerk.◂**

W-2235

Making A Right Turn

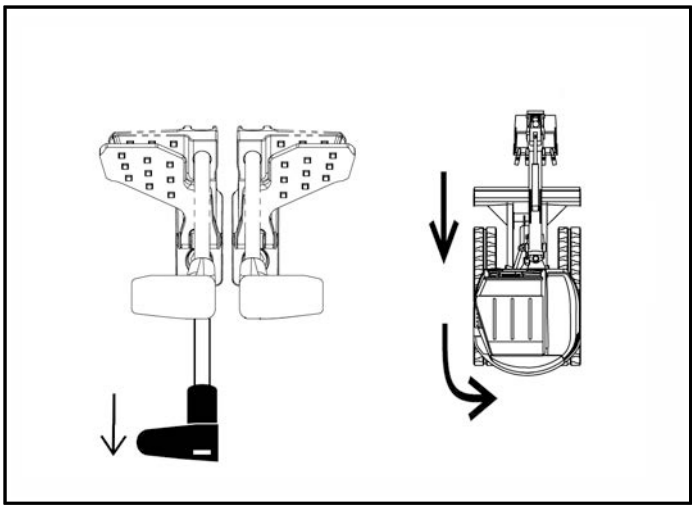
Figure 51



NA15007B

- Push the left steering lever forward to turn right while travelling forward [Figure 51].

Figure 52

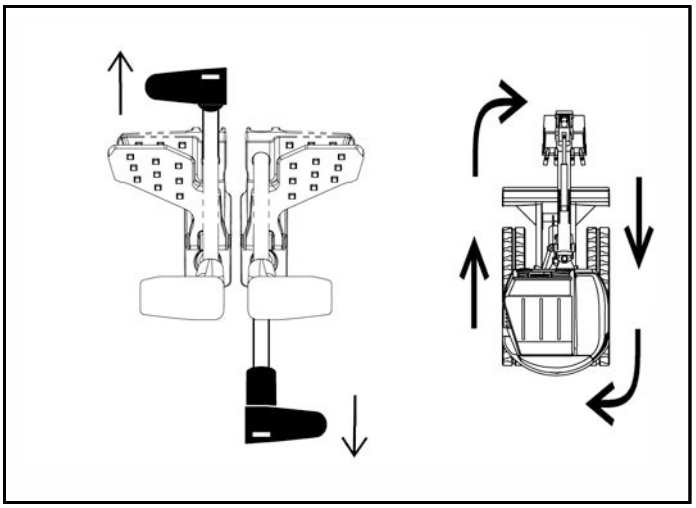


NA15010B

- Pull the left steering lever backward to turn right while travelling backward [Figure 52].

Making A Counter-Rotation Right Turn

Figure 53

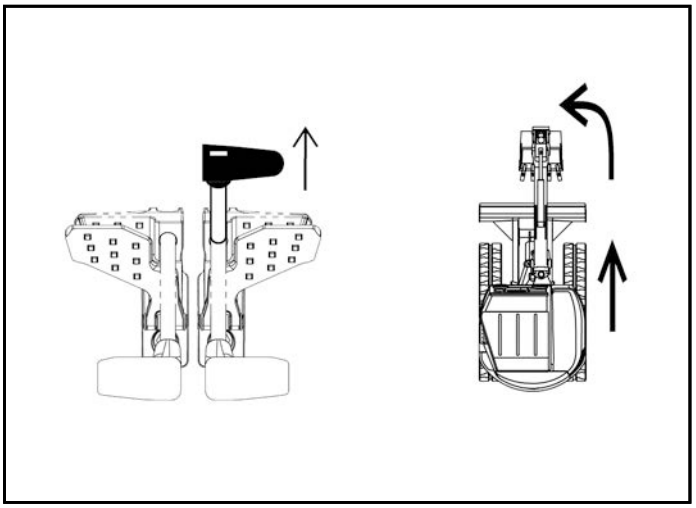


NA15007A

- Push the left steering lever forward and pull the right steering lever backward [Figure 53].

Making A Left Turn

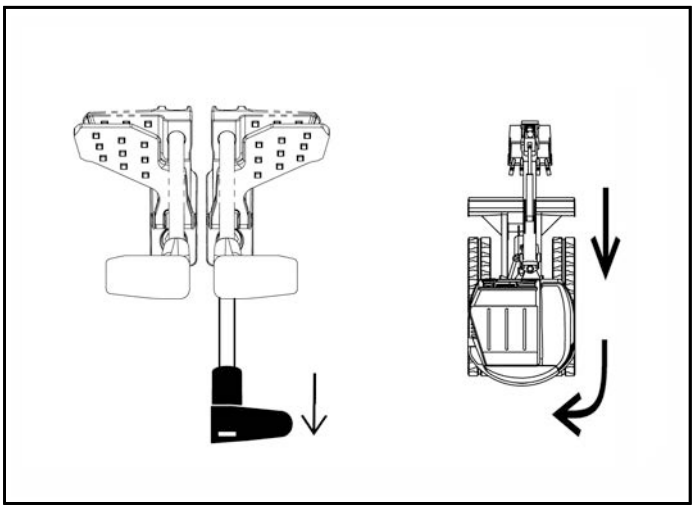
Figure 54



NA15008A

- Push the right steering lever forward to turn left while travelling forward [Figure 54].

Figure 55

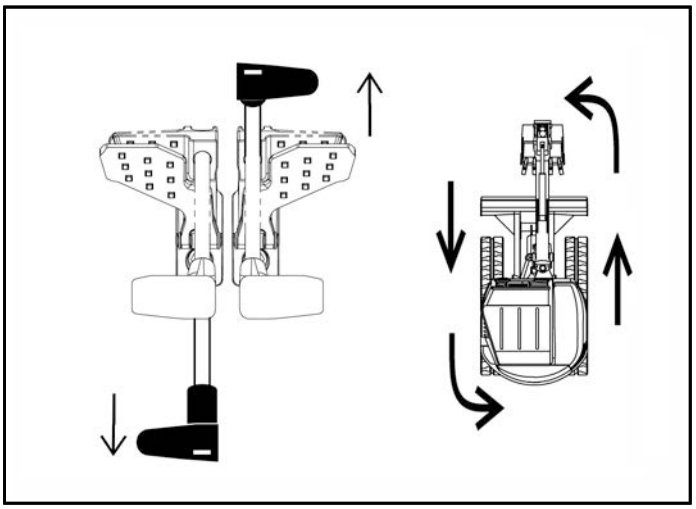


NA15009A

- Pull the right steering lever backward to turn left while travelling backward [Figure 55].

Making A Counter-Rotation Left Turn

Figure 56



NA15010A

- Push the right steering lever forward and pull the left steering lever backward [Figure 56].

HYDRAULIC CONTROLS

Hydraulic Controls Description

Operate the work equipment (boom, arm, bucket, and upperstructure slew) by using the left and right joysticks.

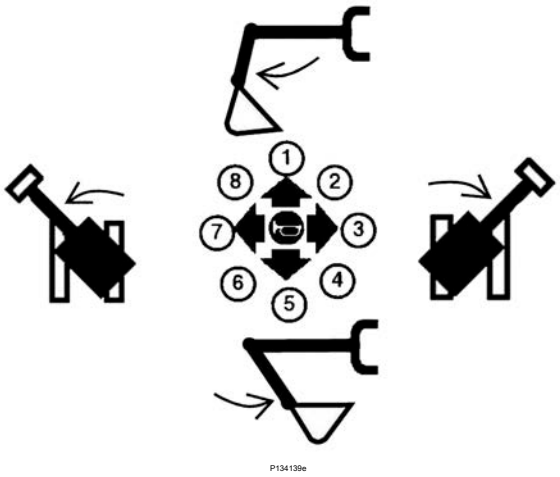
⚠ WARNING

GENERAL HAZARD
Failure to follow instructions can cause serious injury or death.
Before leaving the machine:
- **Lower the work equipment to the ground.**
- **Lower the blade to the ground.**
- **Stop the engine and remove the key.**
- **Raise the control console.**

W-2780

ISO Control Pattern

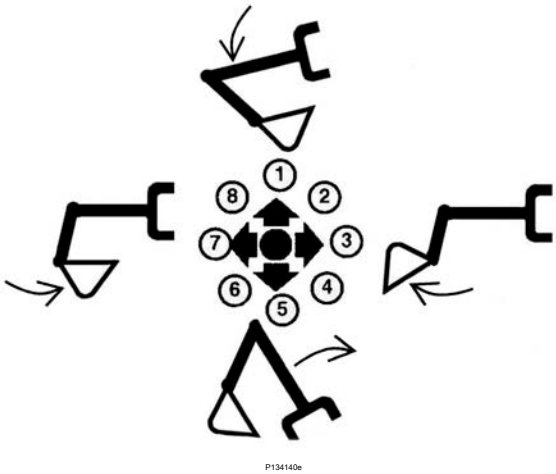
Left Joystick



P134139e

Joystick Position	Function
1	Arm out
2	Arm out and slew right
3	Slew right
4	Arm in and slew right
5	Arm in
6	Arm in and slew left
7	Slew left
8	Arm out and slew left

Right Joystick

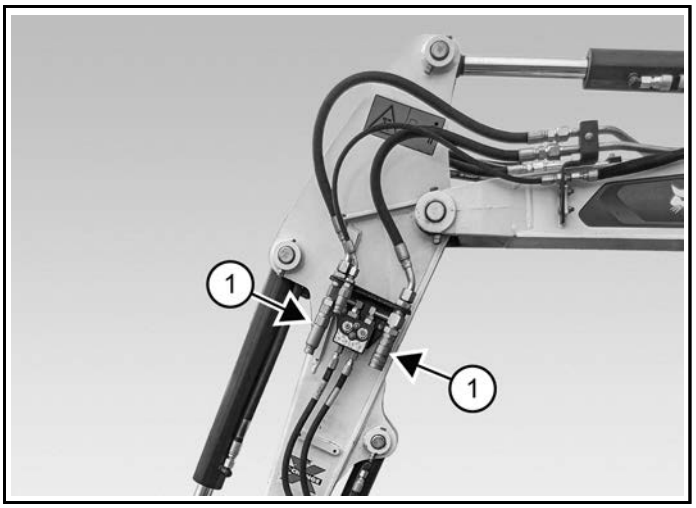


P134140e

Joystick Position	Function
1	Boom lower
2	Boom lower and bucket dump
3	Bucket dump
4	Boom raise and bucket dump
5	Boom raise
6	Boom raise and bucket curl
7	Bucket curl
8	Boom lower and bucket curl

QUICK COUPLERS

Figure 57



C212278a

The excavator and attachments are supplied with flush faced couplers. The couplers are mounted on the arm of the excavator (Item 1) [Figure 57].

⚠ WARNING

BURN HAZARD
Hydraulic fluid, tubes, fittings and quick couplers can get hot when running machine and attachments. Be careful when connecting and disconnecting quick couplers.◂

W-2220

⚠ WARNING

INJECTION HAZARD
Pressurised diesel fuel or hydraulic fluid can penetrate skin and eyes, causing serious injury or death.
Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. DO NOT use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a doctor familiar with this injury.◂

W-2072

Connecting Quick Couplers

1. Remove any dirt or debris from the surface of both the male and female couplers, and from the outside diameter of the male coupler.

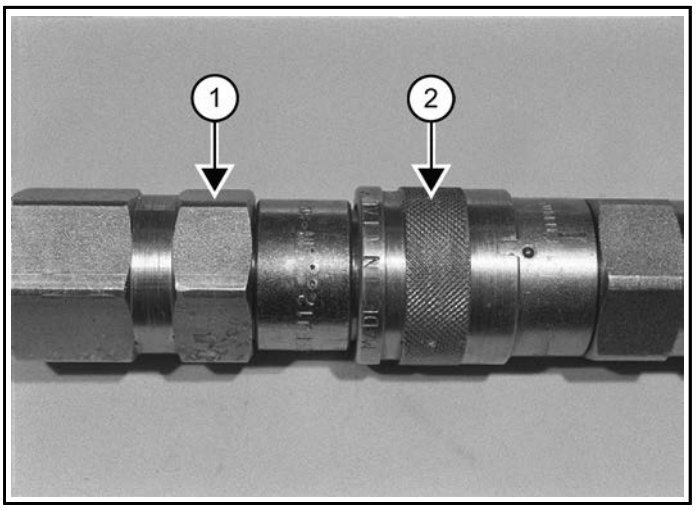
2. Visually check the couplers for corroding, cracking, damage, or excessive wear.

   If any of these conditions exist, the coupler(s) must be replaced.

3. Install the male coupler into the female coupler.

   Full connection is made when the ball release sleeve slides forward on the female coupler.

Figure 58



NA3518a

4. To disconnect, hold the male coupler (Item 1) and retract the sleeve (Item 2) on the female coupler until the couplers disconnect [Figure 58].

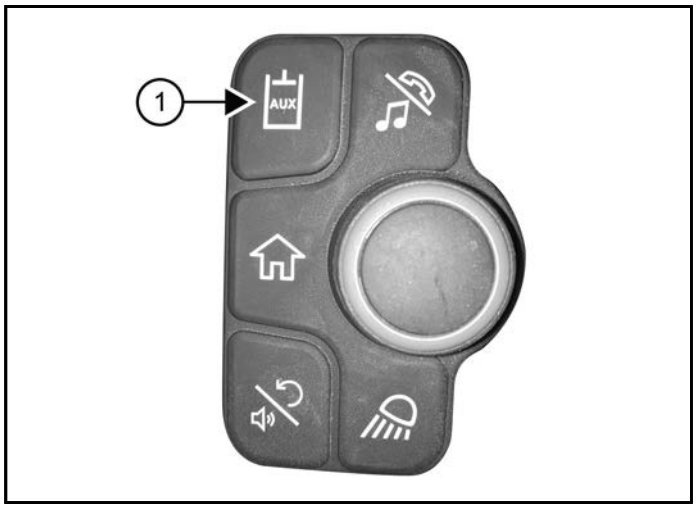
PRIMARY AUXILIARY HYDRAULICS

Operating Attachments With Primary Auxiliary Hydraulics

⚠ WARNING

MODIFICATION HAZARD
Unapproved attachments can cause serious injury or death.
Buckets and attachments for safe loads of specified densities are approved for each model. Never use attachments or buckets that are not approved by Bobcat Company.
W-2052

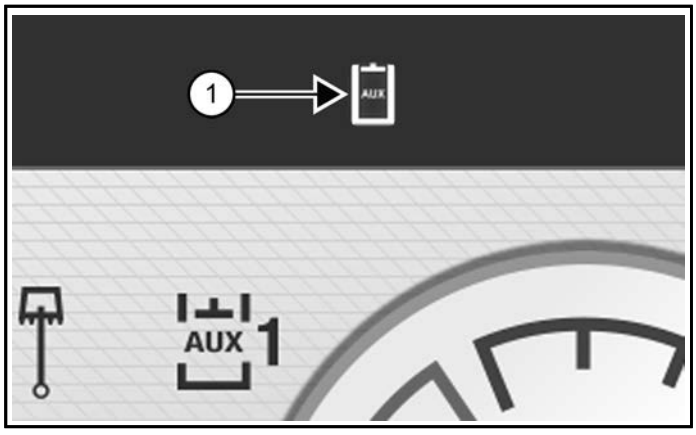
Figure 59



C206825b

1. Press the AUX button (Item 1) [Figure 59] on the jog shuttle.

Figure 60



NA3773b

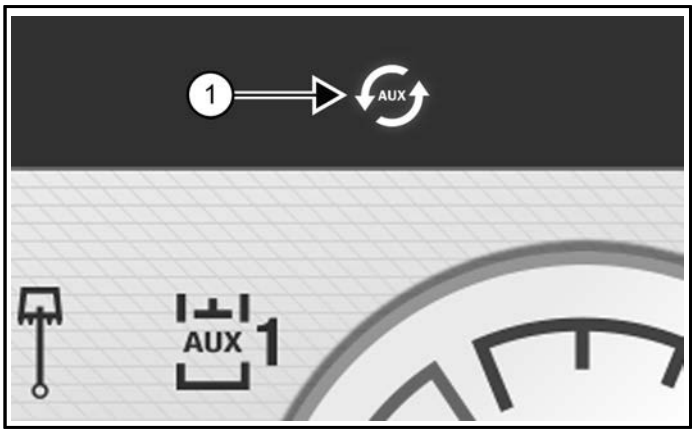
The auxiliary hydraulics icon (Item 1) [Figure 60] will turn ON.

2. For auxiliary hydraulics, continue to the next step.

OR

To activate detent mode, press and hold the AUX button (Item 1) [Figure 59] on the jog shuttle again for at least one second.

Figure 61



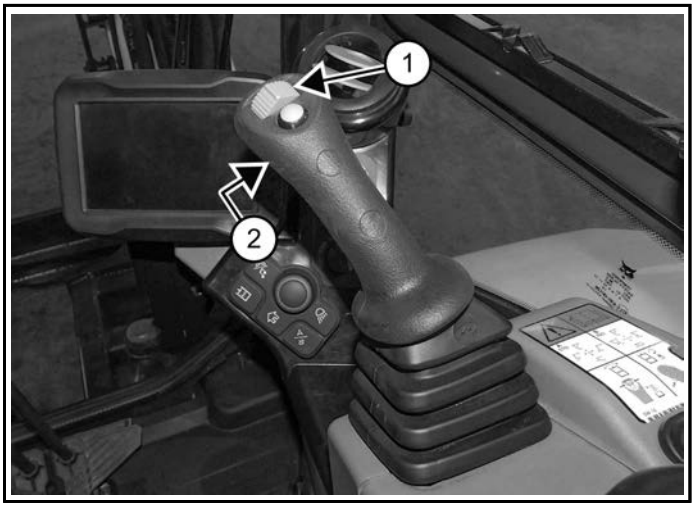
NA3773c

A beep will be heard and the detent icon (Item 1) [Figure 61] will appear. Detent mode will be active.

3. Adjust the hydraulic flow to best meet the needs of the attachment.
(See Setting Auxiliary Hydraulics Flow Rate on Page 58)

4. To operate the attachment with primary auxiliary hydraulics, see the following table:

Figure 62



P200728b

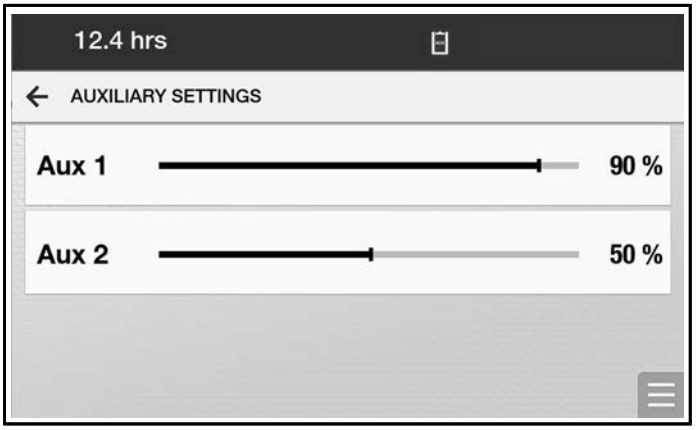
ACTION	RESULT
Move right joystick switch (Item 1) to the right.	Supply hydraulic flow to female coupler.
Move right joystick switch (Item 1) to the left.	Supply hydraulic flow to male coupler.
Move right joystick switch (Item 1) halfway.	Auxiliary functions move at approximately one-half speed.
Press front joystick button (Item 2).	Supply continuous flow to female coupler.
Move right joystick switch (Item 1) to the left while pressing front joystick button (Item 2).	Supply continuous flow to male coupler.
Press front joystick button (Item 2) a second time.	Stop auxiliary flow to couplers.

5. To turn off auxiliary hydraulics, press the AUX button (Item 1) [Figure 59] on the jog shuttle.

Setting Auxiliary Hydraulics Flow Rate

1. Select **[SETTINGS]→ [MACHINE SETTINGS]→ [AUXILIARY SETTINGS]**.

Figure 63



NA3766

2. Adjust the flow rate of the auxiliary hydraulics to best match the attachment / operator requirements [Figure 63].

RECOMMENDED FLOW RATES FOR COMMON ATTACHMENTS	
FLOW	**ATTACHMENT**
100%	Breaker, Vibratory Plate Compactor, Auger
65 – 75%	Clamp, Grapple
25 – 35%	Tilt Coupler

The touch display, if equipped, offers additional settings.
(See Setting Auxiliary Hydraulics Flow Rate on Page 204)

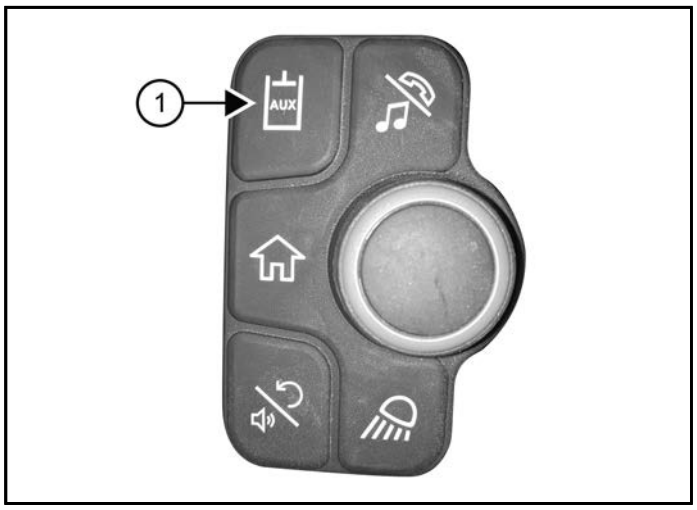
NOTE: If the auxiliary hydraulics are enabled when the engine is turned off, they will stay enabled at engine restart. If detent flow was enabled at engine off, it will be disabled at engine restart.

Releasing Hydraulic Pressure in Excavator

The engine must have been recently started to release hydraulic pressure.

1. Put the attachment flat on the ground.
2. Stop the engine and then turn the start switch to ON, but do not start the engine.
3. Make sure the left console is fully lowered.

Figure 64



C206625b

4. Press the AUX button (Item 1) [Figure 64] on the jog shuttle to enable auxiliary hydraulics.

5. Move the right joystick switch (Item 1) [Figure 62] to the right and left several times to release pressure.

The touch display, if equipped, offers an additional option for releasing pressure.
(See Releasing Hydraulic Pressure In Excavator on Page 203)

Releasing Hydraulic Pressure In Attachments

Hydraulic pressure in the auxiliary hydraulic system can make it difficult to engage quick couplers to an attachment.

1. Release hydraulic pressure in the excavator.

2. Connect the male coupler from the attachment to the female coupler of the excavator, then repeat the procedure above.

   This will relieve pressure in the attachment.

3. Connect the female coupler from the attachment.

SECONDARY AUXILIARY HYDRAULICS

Operating Attachments With Secondary Auxiliary Hydraulics

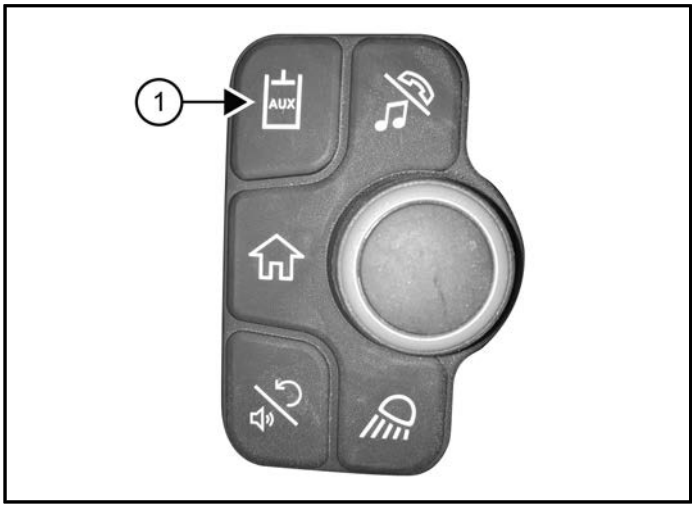
⚠ WARNING

MODIFICATION HAZARD
Unapproved attachments can cause serious injury or death.
Buckets and attachments for safe loads of specified densities are approved for each model. Never use attachments or buckets that are not approved by Bobcat Company.◂

W-2052

Secondary auxiliary hydraulics have a lower flow rate than primary auxiliary hydraulics. Attachment performance may be affected.

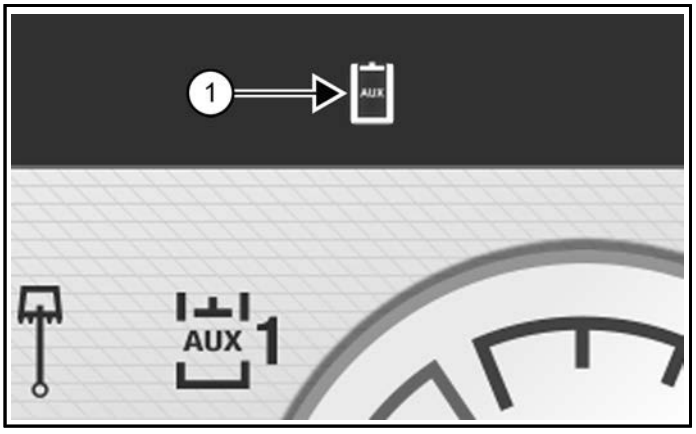
Figure 65



C206625b

1. Press the AUX button (Item 1) [Figure 65] on the jog shuttle to activate auxiliary hydraulics.

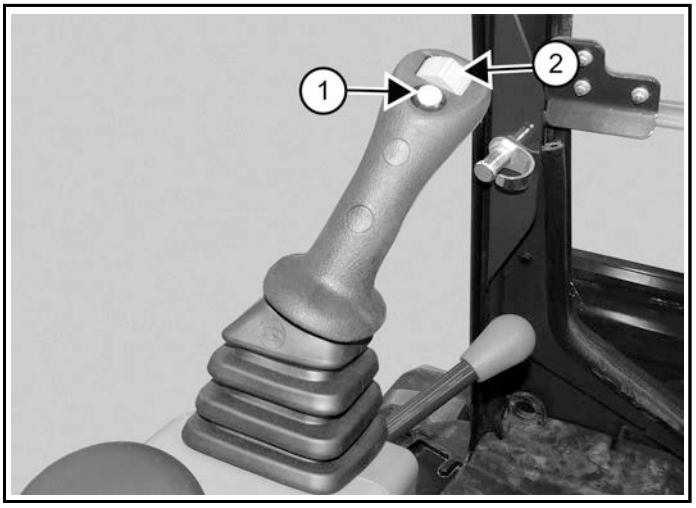
Figure 66



NA3773b

The auxiliary hydraulics icon (Item 1) [Figure 66] will turn on.

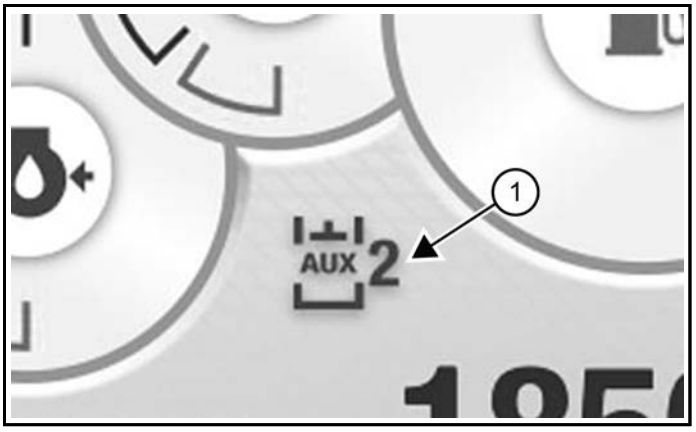
Figure 67



P200104a

2. Press and hold the button (Item 1) [Figure 67] on the left joystick until a beep is heard to switch from boom swing function to secondary auxiliary hydraulics.

Figure 68



C132982b

The second auxiliary hydraulics icon (Item 1) [Figure 68] will appear on the screen.

3. Adjust the secondary hydraulic flow to best meet the needs of the attachment.
(See Setting Auxiliary Hydraulics Flow Rate on Page 58)
(See Setting Auxiliary Hydraulics Flow Rate on Page 204)

4. Use the left joystick switch (Item 2) [Figure 67] to operate the attachment as follows:

   - Move the left joystick switch to the left to supply hydraulic flow to the female coupler.
   - Move the left joystick switch to the right to supply hydraulic flow to the male coupler.
   - Move the switch halfway, and the auxiliary functions will move at approximately one-half speed.

5. To turn off auxiliary hydraulics, press the AUX button (Item 1) [Figure 65] on the jog shuttle.

Releasing Secondary Auxiliary Hydraulic Pressure In Excavator

The engine must have been recently started to release hydraulic pressure.

1. Put the attachment flat on the ground.
2. Stop engine and then turn the start switch to on, but do not start the engine.
3. Make sure the left console is fully lowered.
4. Press and hold the left joystick button (Item 1) [Figure 67] until a beep is heard to switch to the secondary auxiliary hydraulics.

   The secondary auxiliary hydraulic icon (Item 1) [Figure 68] will be on when activated.

5. Move the left joystick switch (Item 2) [Figure 67] to the right and left several times to release pressure.

Releasing Secondary Auxiliary Hydraulic Pressure In Attachments

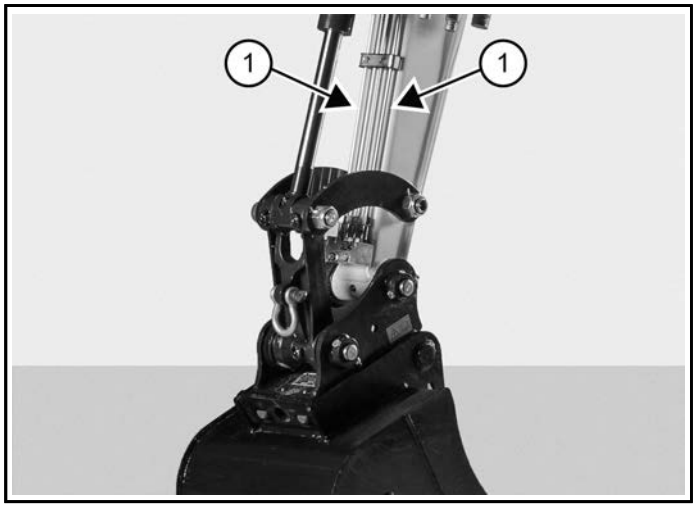
Hydraulic pressure in the auxiliary hydraulic system can make it difficult to engage quick couplers to an attachment.

1. Follow the procedure to relieve hydraulic pressure in the excavator.
2. Connect the male coupler from the attachment to the female coupler of the excavator, then repeat the procedure above. This will release pressure in the attachment.
3. Connect the female coupler from the attachment.

FOURTH AUXILIARY HYDRAULICS

Location Of Fourth Auxiliary Hydraulics Lines

Figure 69



C133922a

When the excavator is equipped with fourth auxiliary hydraulics, the fourth auxiliary hydraulics lines will be mounted on top of the arm in the outside position (Item 1) [Figure 69] and connect to the port block on the arm.

Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics

⚠ WARNING

MODIFICATION HAZARD
Unapproved attachments can cause serious injury or death.
Buckets and attachments for safe loads of specified densities are approved for each model. Never use attachments or buckets that are not approved by Bobcat Company.◂

W-2052

On machines equipped with primary, secondary, and fourth auxiliary hydraulics, you can switch control of boom swing offset and Aux 4 between the left and right joysticks. Select the joystick control configuration that best suits your attachment and operation.

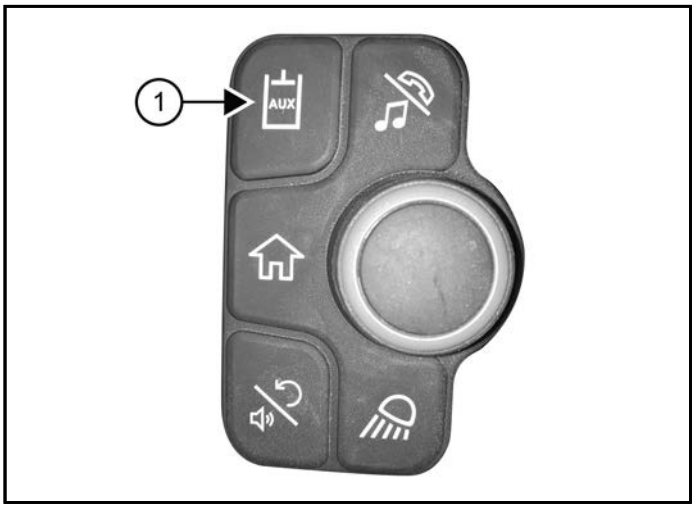
Figure 70

C208528a

1. Push the Boom Swing switch (Item 1) [Figure 70] on the left console to the left to operate boom swing with the left joystick.

   This switch can later be pushed to the right to transfer boom swing control to the right joystick.

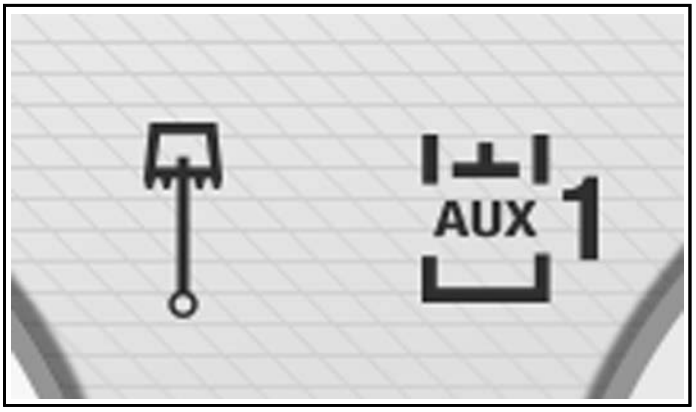
Figure 71



C206625b

2. Press the AUX button (Item 1) [Figure 71] on the jog shuttle to activate auxiliary hydraulics.

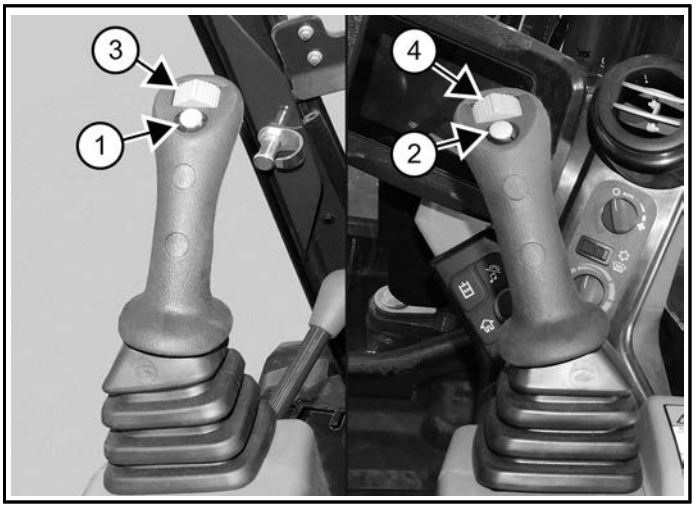
Figure 72



NA3773d

The display will indicate the left joystick controls boom swing and the right joystick controls primary auxiliary hydraulics [Figure 72].

Figure 73



C200104a

3. Press the joystick buttons to toggle to the desired joystick control configuration.
(See Auxiliary Hydraulics Settings Sequence on Page 63)

   - Press the left joystick button (Item 1) [Figure 73] until two beeps are heard to select Boom Swing, Aux 2, or Aux 4.
   - Press the right joystick button (Item 2) [Figure 73] until two beeps are heard to select Boom Swing, Aux 1, or Aux 4.

   NOTE: Boom swing will only be available for the joystick that is set with the Boom Swing switch (Item 1) [Figure 70]. Aux 4 will be available only for the other joystick.

   NOTE: The joystick switches must be in the neutral position before you press a joystick button to change to a different auxiliary.

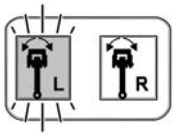
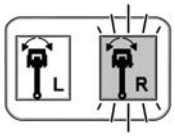
4. Operate the attachment with the joysticks.
   - Use the left joystick switch (Item 3) [Figure 73] to control the hydraulics indicated on the left side of the display panel (Boom Swing, Aux 2, or Aux 4).
   - Use the right joystick switch (Item 4) [Figure 73] to control the hydraulics indicated on the right side of the display panel (Boom Swing, Aux 1, or Aux 4).

5. When necessary, press the Boom Swing switch (Item 1) [Figure 70] to the right to transfer boom swing control to the right joystick.

   After you push the Boom Swing switch, auxiliary hydraulics will deactivate. Press the AUX button (Item 1) [Figure 71] again to reactivate auxiliary hydraulics.

To set auxiliary hydraulics flow rate, see the following for standard display:
(See Setting Auxiliary Hydraulics Flow Rate on Page 58)
See the following for touch display:
(See Setting Auxiliary Hydraulics Flow Rate on Page 204)

Auxiliary Hydraulics Settings Sequence

Boom Swing Switch	Action	Display
	1. Initial setting with Boom Swing switch set to left joystick.	
	2. Activate auxiliary hydraulics.	
	3. Press right joystick button.	
	4. Press left joystick button.	
	5. Press right joystick button.	
	6. Press Boom Swing switch to right.	
	7. Activate auxiliary hydraulics.	
	8. Press right joystick button.	
	9. Press left joystick button.	

NOTE: The combination Aux 2 and Boom Swing is not a possible setting.

DIRECT TO TANK

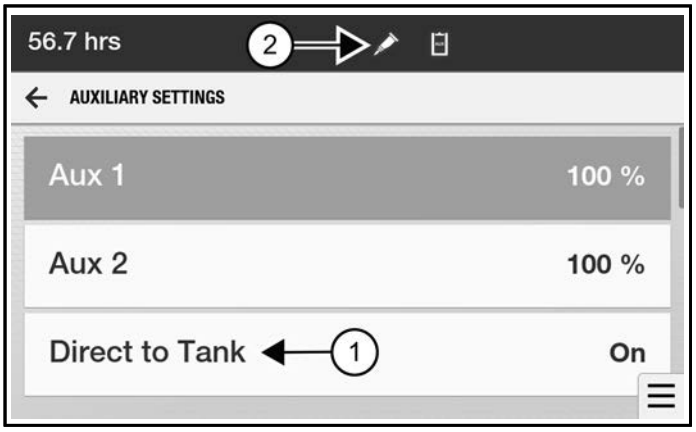
Enabling Direct To Tank

Your machine may be equipped with a direct to tank feature.

When direct to tank is turned on, the hydraulic fluid will flow from the male coupler back to the hydraulic tank, which increases fluid flow rates and attachment performance.

1. Select **[SETTINGS]**→ **[MACHINE SETTINGS]**→ **[AUXILIARY SETTINGS]**.

Figure 74



2. Select **[DIRECT TO TANK]** (Item 1) [Figure 74].

   The direct to tank icon (Item 2) [Figure 74] will illuminate.

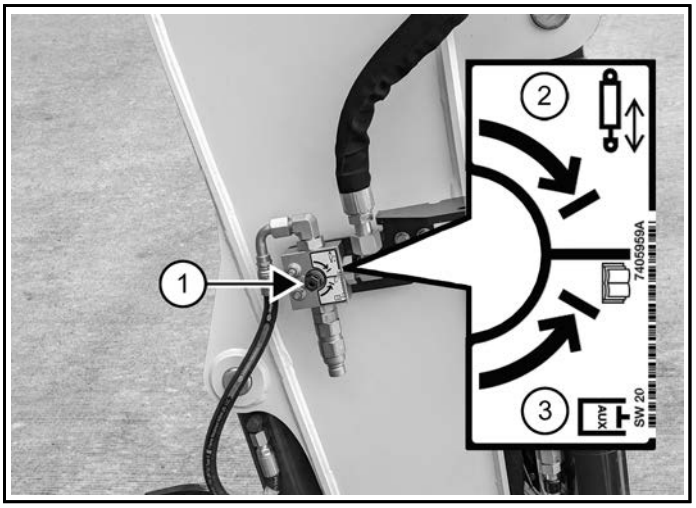
DIVERTER VALVE

Operating The Diverter Valve

The diverter valve, if equipped, allows you to leave the hydraulic clamp hoses connected to the machine while removing and installing other attachments.

1. Before diverting to the hydraulic clamp, disconnect the attachment from the primary hydraulic couplers.

Figure 75



C209546b

2. Rotate the valves (Item 1) on both sides of the arm clockwise to operate the hydraulic clamp (Item 2) [Figure 75].

3. Rotate both valves anticlockwise to operate the primary auxiliary quick couplers (Item 3) [Figure 75].

OVERLOAD WARNING DEVICE

Operating The Overload Warning Device

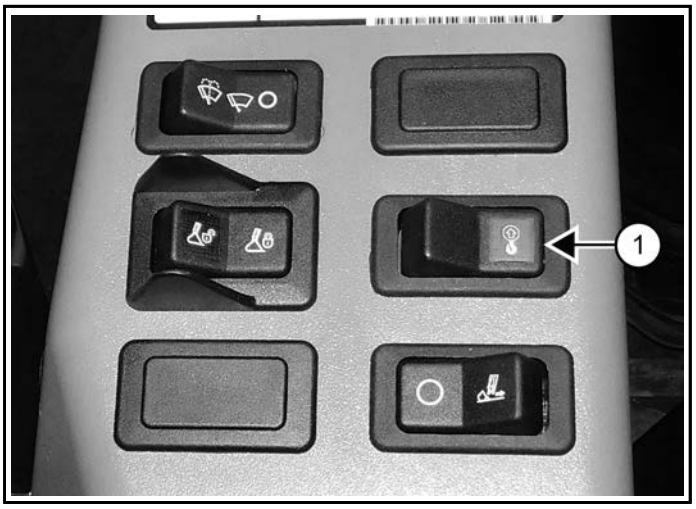
The excavator must be equipped with the boom load holding valve to install the overload warning device.

When the overload warning device (if equipped) is engaged, a warning buzzer will sound and the general warning icon will flash on the display if the work group is overloaded.

⚠ WARNING

CRUSHING HAZARD
Falling equipment can cause serious injury or death. DO NOT work or stand under raised work equipment or attachment.◂
W-2793

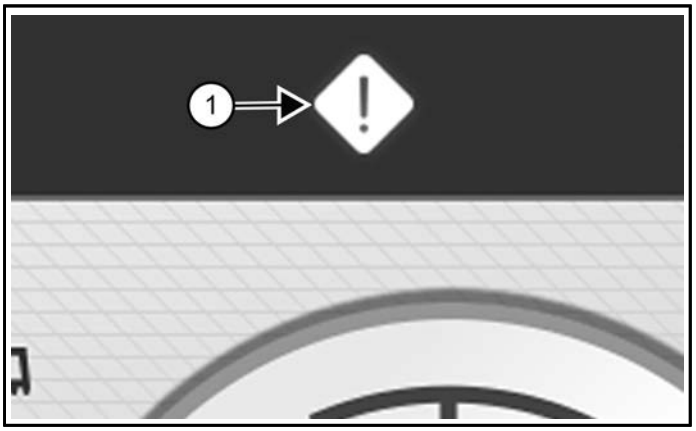
Figure 76



C208594b

1. Press the switch (Item 1) [Figure 76] to the right to enable the overload warning device.

Figure 77



NA3734f

2. If overload occurs, the general warning icon (Item 1) [Figure 77] will illuminate and a buzzer will sound.

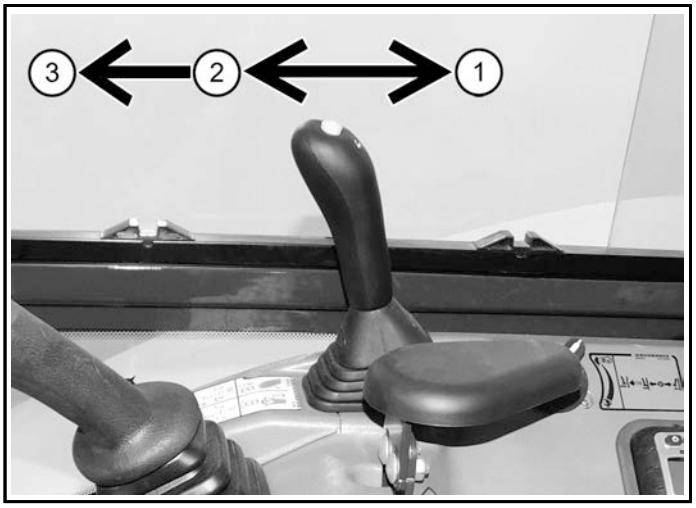
a. Immediately bring the arm toward the machine, lower the boom, and reduce the load before continuing operation.

3. Disengage the overload warning device by pressing the switch (Item 1) [Figure 76] to the left.

BLADE CONTROL LEVER

Raising And Lowering The Blade

Figure 78



P200125a

- Pull the lever backward (Item 1) [Figure 78] to raise the blade.
- Push the lever forward (Item 2) [Figure 78] to lower the blade.
- Push the lever forward until the lever is in the locked position (Item 3) [Figure 78] to put the blade in the float position.
    - ▷ Pull the lever backward to unlock from the float position.

Keep blade lowered for increased digging performance.

DIESEL PARTICULATE FILTER (DPF) SYSTEM

DPF Description

The engine exhaust system is equipped with a diesel particulate filter (DPF).

The DPF is an emissions reduction device that removes diesel particulate matter (soot) from the exhaust gases of the diesel engine. The DPF will trap and collect the soot until it is burned off.

The process of burning off the collected soot is called regeneration. There are five types of regeneration: passive, automatic, forced, forced parked, and service. An inhibit mode is also available to the operator.

Term	Description
Passive Regeneration	The engine provides adequate exhaust temperature during operation for regeneration.
Automatic Regeneration	The engine control unit (ECU) automatically controls active regeneration. Active regeneration can occur any time the engine is operating once the soot accumulated in the DPF reaches a certain level. (See Automatic Regeneration Operation on Page 68)
Forced Regeneration	The operator activates a forced regeneration. This selection requires confirmation after certain machine conditions are met. (See Forced Regeneration Operation on Page 69)
Forced Parked Regeneration	The operator activates a forced parked regeneration. This selection requires confirmation after certain machine conditions are met.
Service Regeneration	Your Bobcat dealer uses specialised equipment to perform a service regeneration. (See DPF Service Regeneration on Page 178)
Inhibit Mode	Active regeneration will not occur. This selection requires confirmation. (See Inhibit Mode Operation on Page 71)

DPF Regeneration Tables

Soot Level	0 – 75%	75 – 100%	100 – 105%	105 – 110%	110 – 120%	120 – 150%	> 150%
Active Regeneration Status	Not Required	Not Required	Regenerating	Regenerating	Regenerating	Not Regenerating	Not Regenerating
Inhibit Allowed 	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Forced Allowed 	No	Yes	Yes	Yes	Yes	No	No
Forced Parked Allowed 	No	Yes	Yes	Yes	Yes	No	No
DPF Icon 	Off	Off	On	Flashing Slowly	Flashing Slowly	Flashing Quickly	Off
HEST Icon 	Off	Off	On	On	On	Off	Off
Check Engine Icon 	Off	Off	Off	Off	On	On	On
Regeneration Type	Passive	Passive	Automatic	Automatic	Automatic	Service	None
Soot Load Bar Colour	Grey	Blue	Blue	Red	Red	Red	Red
Service Code	None	None	None	None	P2463	P24A3	P24A3
Torque Derate	None	None	None	None	Mild	Severe	Severe
Operator Action	None	None	None	Activate Forced or Forced Parked Regeneration when possible	Activate Forced or Forced Parked Regeneration when possible	Dealer Service Regeneration Required (See DPF Service Regeneration on Page 178)	Contact your Bobcat dealer to replace the DPF

NOTE: The general warning icon on the display will also turn on to alert operator of active service codes.

DPF Regeneration Status Icons

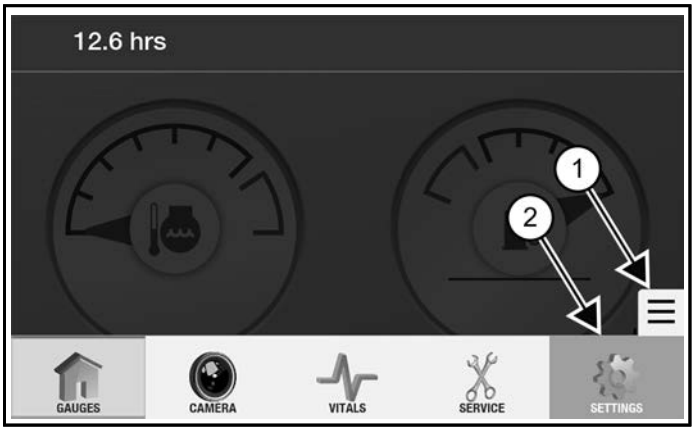
Icon	Definition
	DPF - Appears on the display during regeneration. Machine is requesting that operator activate a forced or forced parked regeneration when flashing.
	Hot Exhaust System Temperature (HEST) - Appears on the display during regeneration to indicate that exhaust and exhaust gases can be hot.
	Inhibit - Appears on the display when the operator has selected inhibit mode. Machine is indicating it would like to do regeneration when flashing.
	Emissions Error - Appears on the display to indicate a problem with the emission regulating system.

Automatic Regeneration Operation

Automatic regeneration mode is selected by default every time the machine is started.

The DPF management screen is available on the display, where you can check the status of the DPF and select the required regeneration mode.

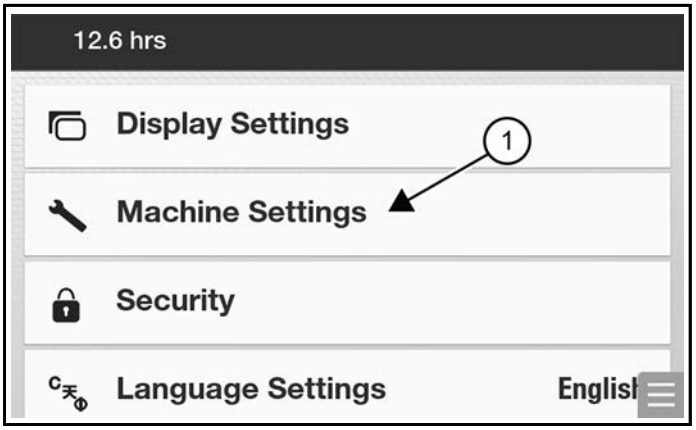
Figure 79



NA3669A

1. Select the **[NAVIGATION HANDLE]** icon (Item 1) [Figure 79].
2. Select **[SETTINGS]** (Item 2) [Figure 79].

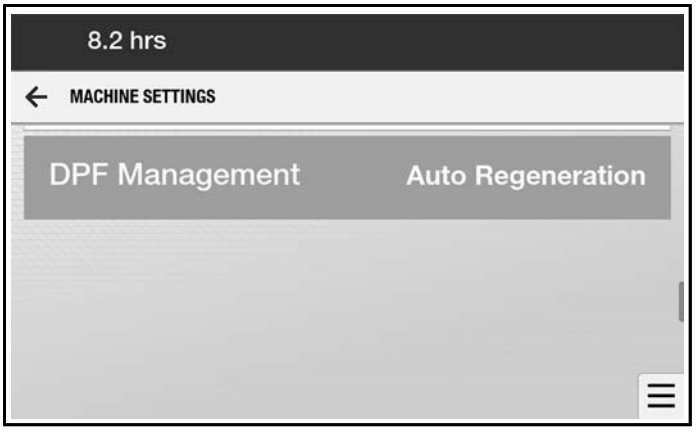
Figure 80



NA3668A

3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 80].

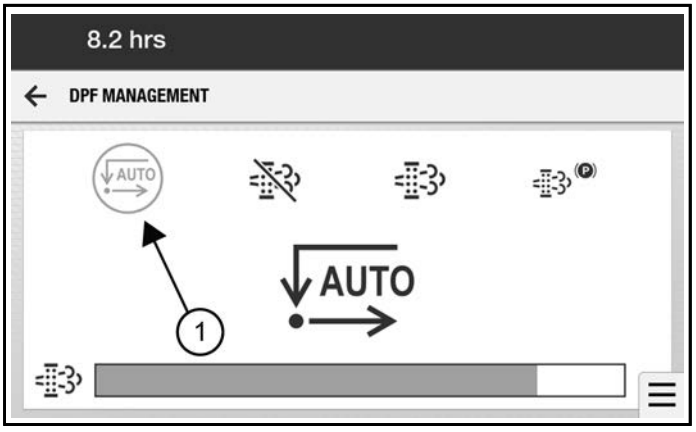
Figure 81



NA3856

4. Scroll down and select **[DPF MANAGEMENT]** [Figure 81].

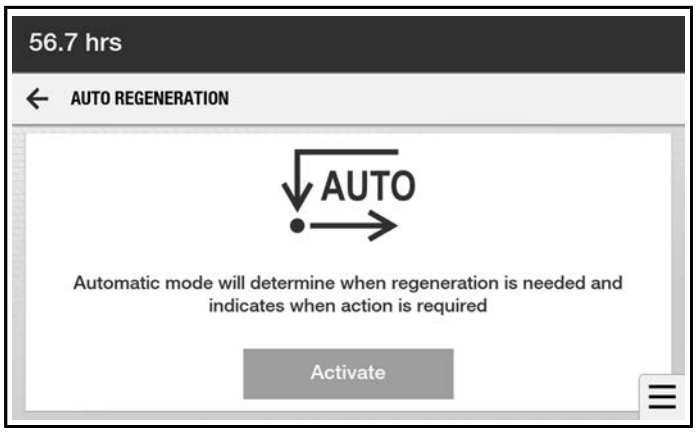
Figure 82



NA3862A

5. Select the automatic regeneration icon (Item 1) [Figure 82].

Figure 83



NA3865

6. Select **[ACTIVATE]** [Figure 83] if not already active.

   The ECU will monitor soot load and perform a regeneration automatically. The operator will be informed that an automatic regeneration has started by the HEST icon.

   The machine should be operated during this regeneration.

   NOTE: The regeneration process can last for 30 minutes or longer.

   It is recommended to increase engine speed to high idle during an automatic regeneration and operate the machine under load if possible.

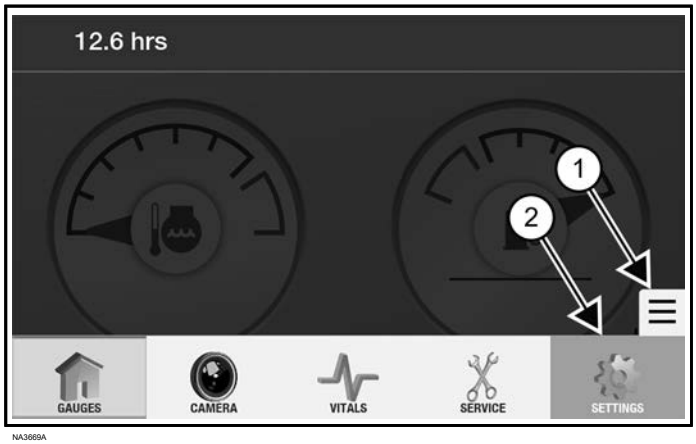
   It is recommended to allow the regeneration cycle to finish before turning the machine off.

Forced Regeneration Operation

A forced regeneration can be activated by the operator using the DPF management screen. The machine should be operated as normal during this regeneration.

NOTE: The regeneration process can last for 30 minutes or longer.

Figure 84

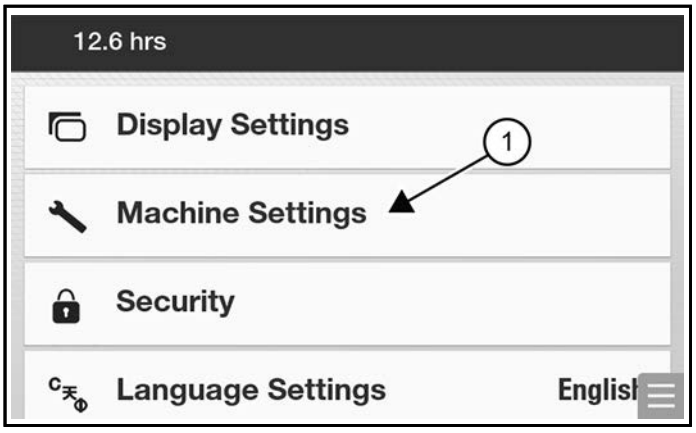


NA3669A

1. Select the **[NAVIGATION HANDLE]** icon (Item 1) [Figure 84].

2. Select **[SETTINGS]** (Item 2) [Figure 84].

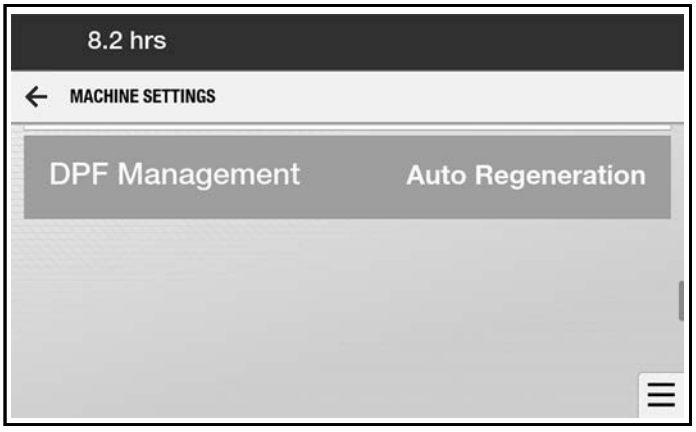
Figure 85



NA3668A

3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 85].

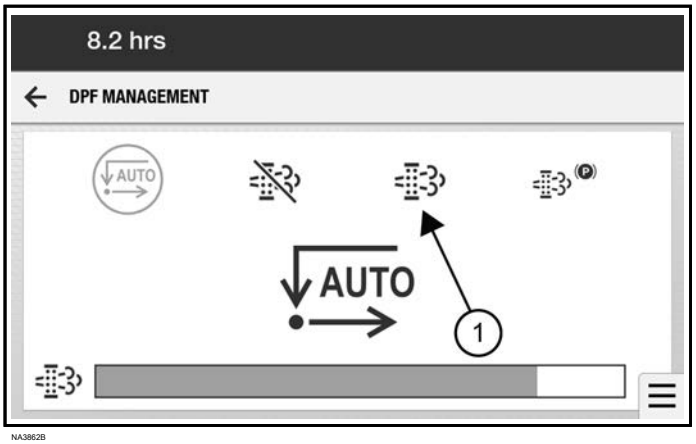
Figure 86



NA3856

4. Scroll down and select **[DPF MANAGEMENT]** [Figure 86].

Figure 87



NA3862B

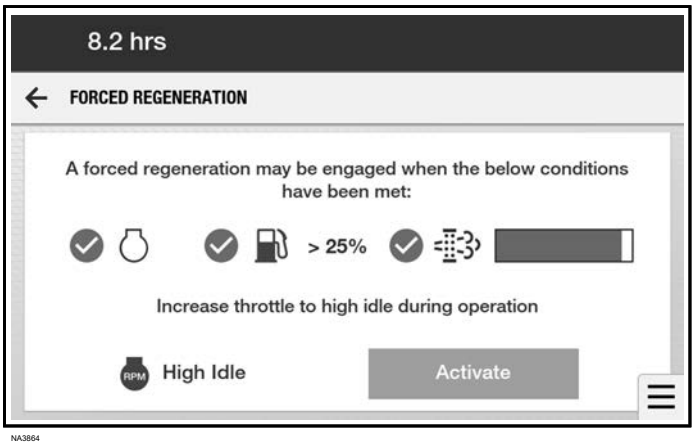
5. Select the forced regeneration icon (Item 1) [Figure 87].

   The following machine conditions must be met before forced regeneration is allowed:

   - No active DPF related service codes
   - Engine coolant temperature higher than 40°C (104°F)
   - Soot load between 75 percent and 120 percent
   - More than 25 percent fuel in the tank

6. Increase engine speed to high idle.

Figure 88



7. Select **[ACTIVATE]** [Figure 88] to start regeneration.

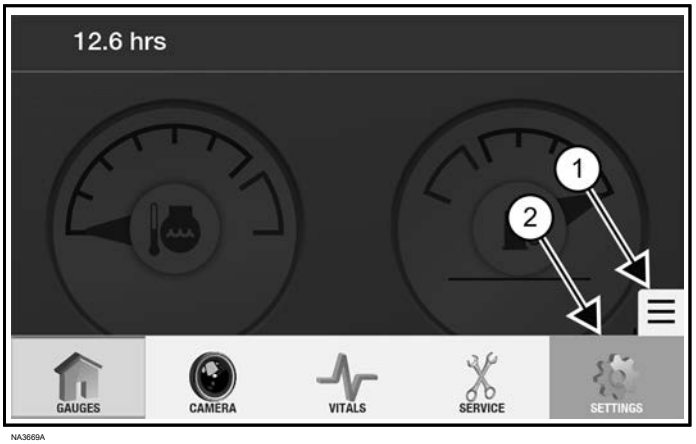
   It is recommended to allow the regeneration cycle to finish before turning the machine off.

Forced Parked Regeneration Operation

A forced parked regeneration can be activated by the operator using the DPF management screen. The machine cannot be operated during this regeneration.

NOTE: The regeneration process can last for 40 minutes or longer.

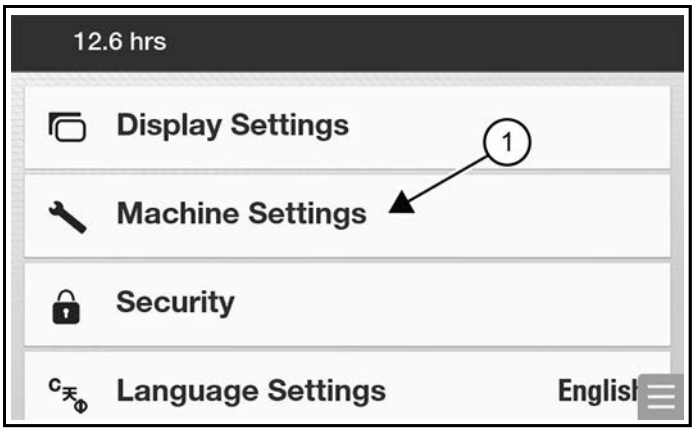
Figure 89



1. Select the **[NAVIGATION HANDLE]** icon (Item 1) [Figure 89].

2. Select **[SETTINGS]** (Item 2) [Figure 89].

Figure 90

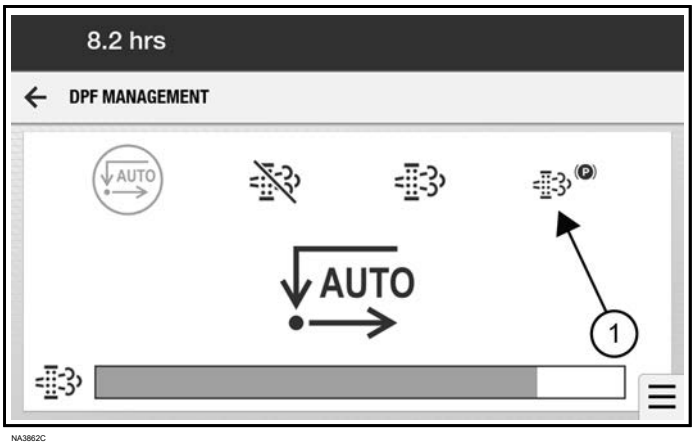


3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 90].

Figure 91

4. Scroll down and select **[DPF MANAGEMENT]** [Figure 91].

Figure 92



5. Select the forced parked regeneration icon (Item 1) [Figure 92].

⚠ IMPORTANT

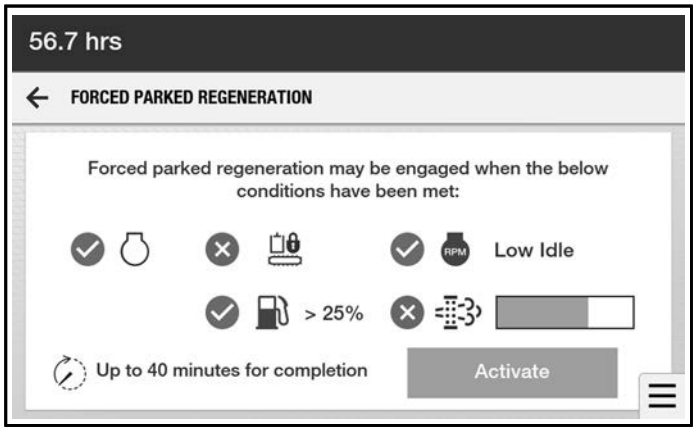
MACHINE DAMAGE HAZARD
Failure to follow directions may cause damage to the DPF.
Never stop the engine during the regeneration cycle. This will by-pass the programmed cool down cycle required after a high temperature regen.
I-2352

The following machine conditions must be met before forced parked regeneration is allowed:

- Engine coolant temperature higher than 40°C (104°F)
- Hydraulic functions disabled
- Engine speed at low idle
- More than 25 percent fuel in the tank
- Soot load between 75 percent and 120 percent
- No active DPF related service codes

6. Decrease engine speed to low idle.

Figure 93



NA3933

7. Select **[ACTIVATE]** [Figure 93] to start regeneration.

The ECU will control engine speed until the regeneration cycle is finished.

Inhibit Mode Operation

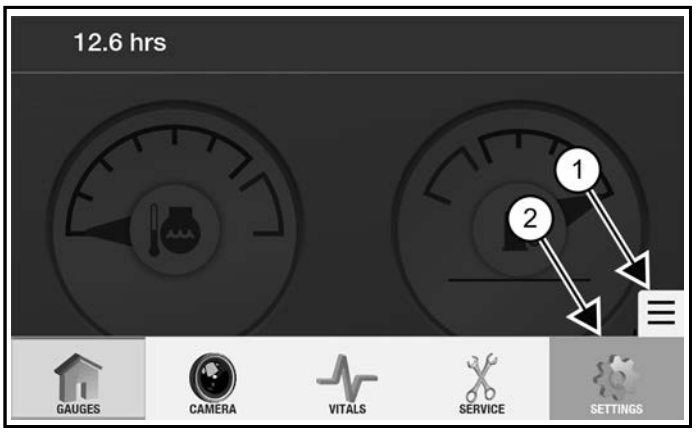
Regeneration can be prevented from occurring by selecting inhibit mode. The machine should be operated under load when inhibit mode is selected.

⚠ IMPORTANT

MACHINE DAMAGE HAZARD
Operating the machine in inhibit mode for extended periods may cause severe damage to the DPF.
I-2409

The DPF will be inhibited from actively regenerating until a regeneration mode is selected or the machine is turned OFF. The machine will revert to automatic mode the next time the machine is turned ON.

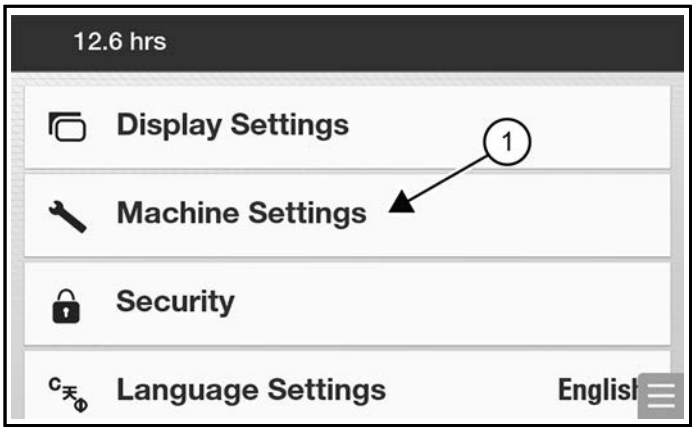
Figure 94



NA3669A

1. Select the **[NAVIGATION HANDLE]** icon (Item 1) [Figure 94].
2. Select **[SETTINGS]** (Item 2) [Figure 94].

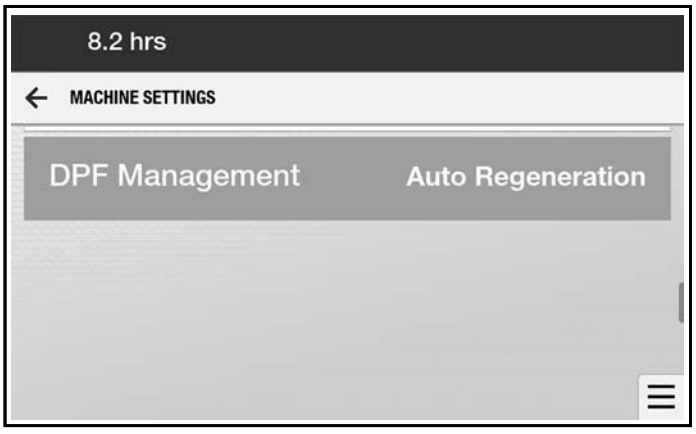
Figure 95



NA3668A

3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 95].

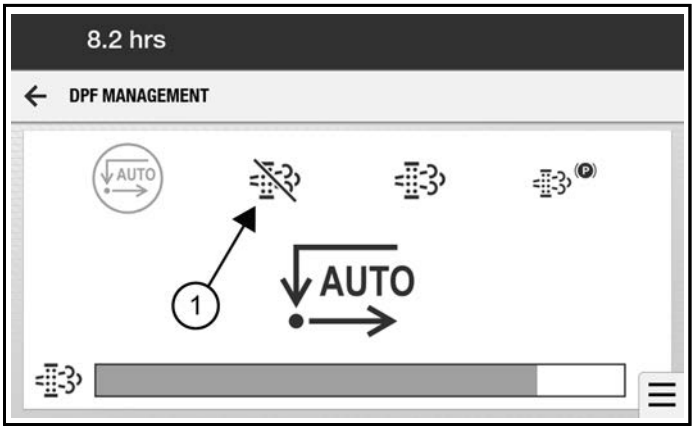
Figure 96



NA3856

4. Scroll down and select **[DPF MANAGEMENT]** [Figure 96].

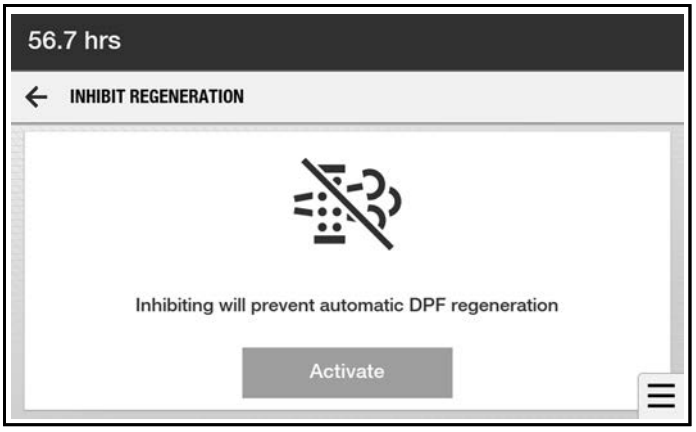
Figure 97



NA3862D

5. Select the inhibit mode icon (Item 1) [Figure 97].

Figure 98



NA3863

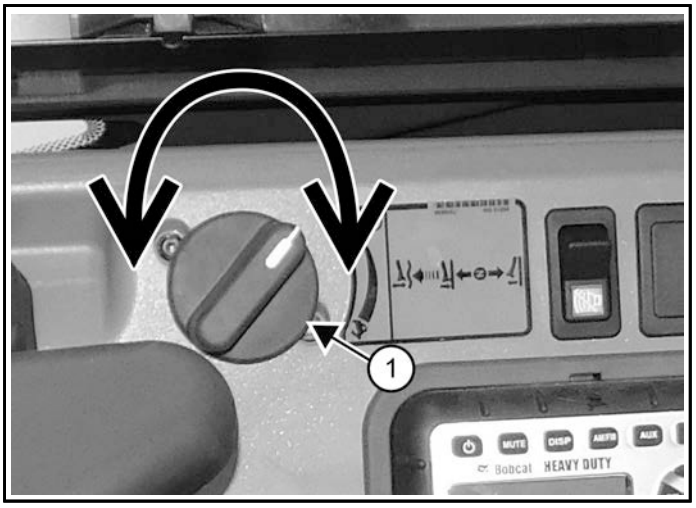
6. Select **[ACTIVATE]** [Figure 98] to inhibit regeneration.

7. After running the machine in inhibit mode, take one of the below actions as soon as possible:
   - Place the machine in automatic regeneration mode
   - Perform a forced regeneration if possible (The soot load bar must be blue or red.)
   - Perform a forced parked regeneration if possible (The soot load bar must be blue or red.)

ENGINE SPEED CONTROL

Setting Engine Speed (RPM)

Figure 99



P200090a

The engine speed control dial (Item 1) [Figure 99] controls engine rpm.

- Rotate the engine speed control dial counterclockwise to reduce engine rpm.
- Rotate the engine speed control dial clockwise to increase engine rpm.

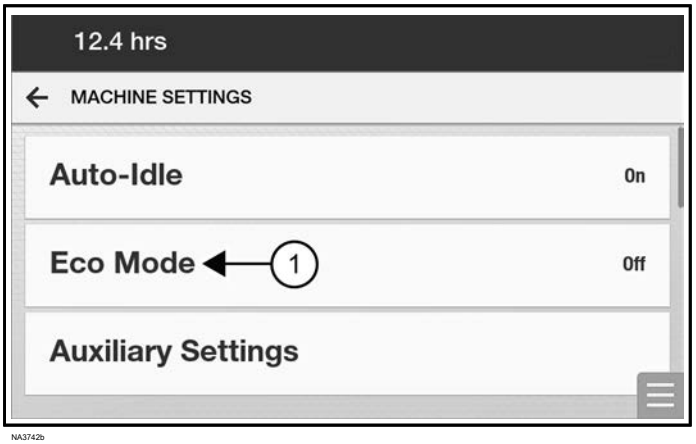
Eco Mode

Eco mode, when enabled, will reduce the high idle engine rpm and cycle times to help conserve fuel in certain operating conditions.

Activating Eco Mode

1. Select **[SETTINGS]→ [MACHINE SETTINGS]**.

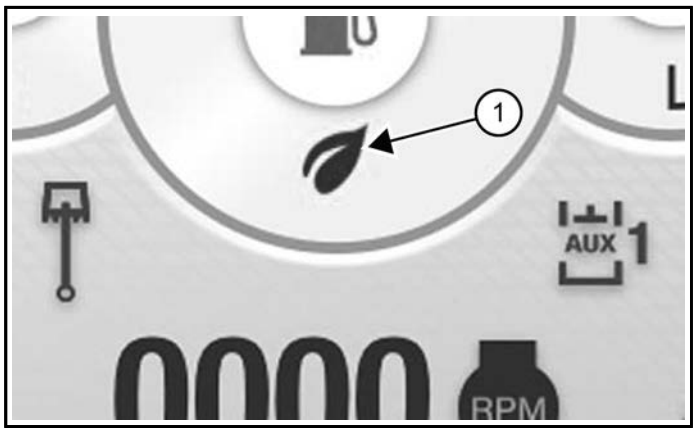
Figure 100



NA3742b

2. Select **[ECO MODE]** (Item 1) [Figure 100] to turn Eco mode on / off.

Figure 101



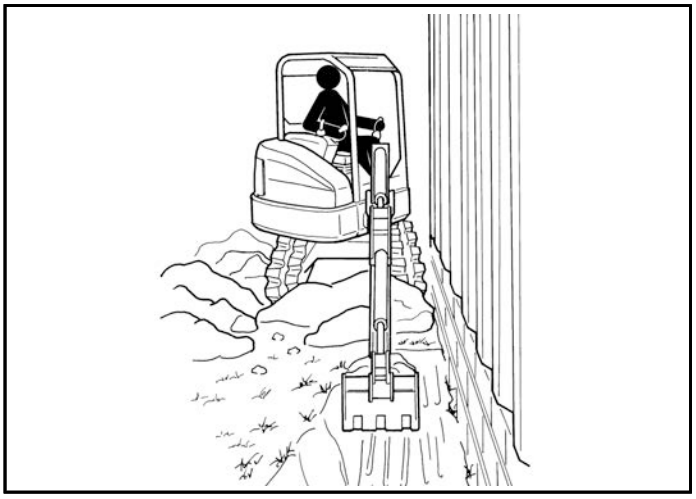
C132900g

The Eco mode icon (Item 1) [Figure 101] will be displayed on the **GAUGES** screen when Eco mode is on.

BOOM SWING

Enabling Boom Swing

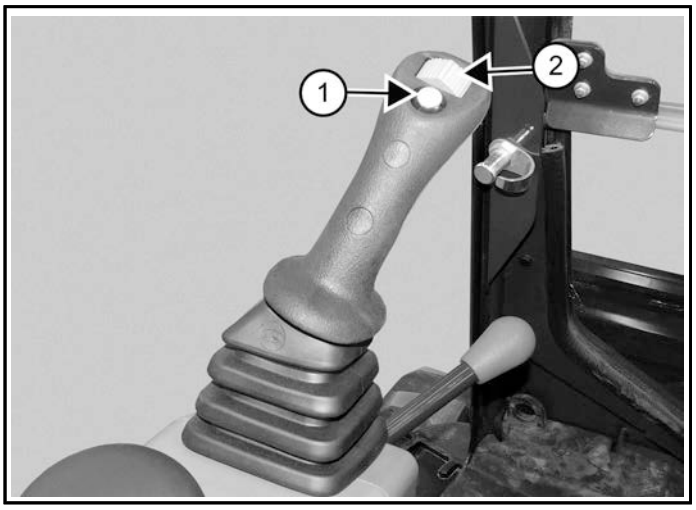
Figure 102



NA20361a

The purpose of the boom swing is to offset the boom with respect to the upperstructure for digging close to a structure [Figure 102]. Adjust the mirrors if necessary before beginning.

Figure 103



P200104a

1. If no auxiliary hydraulics are enabled, control the boom swing with the left joystick switch (Item 2) [Figure 103].

   OR

   If auxiliary hydraulics are enabled, press and hold the button (Item 1) [Figure 103] on the left joystick until a beep is heard to switch between the boom swing function and the secondary auxiliary hydraulics.
   (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59)

2. Use the switch (Item 2) [Figure 103] on the left joystick to control boom swing.

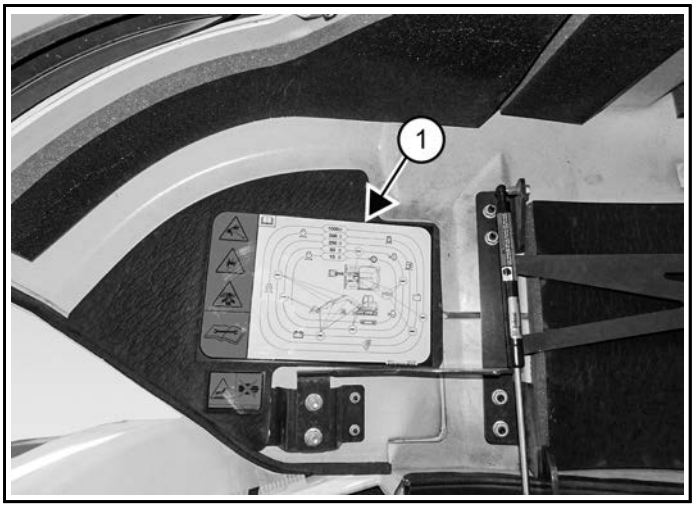
a. Move the switch to the left to swing the boom to the left.

b. Move the switch to the right to swing the boom to the right.

DAILY INSPECTION

Daily Inspection And Maintenance List

Figure 104



C209559a

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The Service Schedule is a guide for correct maintenance of the Bobcat excavator. The decal (Item 1) [Figure 104] is located inside the right cover.
(See Service Schedule on Page 148)

Do the following before each day of operation:

- Check operator canopy or cab (ROPS / TOPS / FOPS) and mounting hardware. Lubricate door hinges if necessary.
- Check seat belt and mounting hardware. Replace seat belt if damaged.
- Check for damaged decals, replace as needed.
- Check control console lockout.
- Check attachment mounting system for damage or loose parts.
- Check air cleaner and intake hoses / clamps.
- Check engine oil level and engine for leaks.
- Check engine coolant level in both the coolant recovery tank and radiator and check system for leaks.
- Check engine area for flammable materials.
- Check hydraulic fluid level and system for leaks.
- Check indicator lights for correct operation.
- Grease all pivot points.
- Check cylinder and attachment pivot points.
- Check the track tension.

- Repair broken and loose parts.
- Check or clean cab heater filters (if equipped).
- Check front horn and motion alarm (if equipped) for proper function.

Fluids such as engine oil, hydraulic fluid, coolants, etc. must be disposed of in an environmentally safe manner. Some regulations require that certain spills and leaks on the ground must be cleaned in a specific manner. See local regulations for correct disposal.

⚠ WARNING

INSUFFICIENT INSTRUCTIONS HAZARD
Untrained operators or failure to follow instructions can cause serious injury or death.
Operators must have adequate training and instruction before operating.◂

W-2001

⚠ IMPORTANT

MACHINE DAMAGE HAZARD
Improper pressure washing may lead to damage of the decal.
- **Direct the stream at a 90 degree angle and at least 300 mm (12 in) from the decal.**
- **Wash from the centre of the decal toward the edges.◂**

I-2226

⚠ WARNING

GENERAL HAZARD
Failure to follow instructions can cause serious injury or death.
- **Keep door / cover closed except for service.**
- **Keep engine clean of flammable material.**
- **Keep body, loose objects, and clothing away from electrical contacts, moving parts, hot parts, and exhaust.**
- **Do not use the machine in space with explosive dusts or gases or with flammable material near exhaust.**
- **Never use ether or starting fluid on diesel engine with glow plugs or air intake heater. Use only starting aids as approved by engine manufacturer.**
- **Leaking fluids under pressure can enter skin and cause serious injury.**
- **Battery acid causes severe burns; wear goggles. If acid contacts eyes, skin, or clothing, flush with water. For contact with eyes, flush and get medical attention.**
- **Battery makes flammable and explosive gas. Keep arcs, sparks, flames, and lighted tobacco away.**
- **For jump start, connect negative cable to the machine engine last (never at the battery). After jump start, remove negative connection at the engine first.**
- **Exhaust gases can kill. Always ventilate.◂**

W-2782

PRE-STARTING PROCEDURE

Entering The Excavator

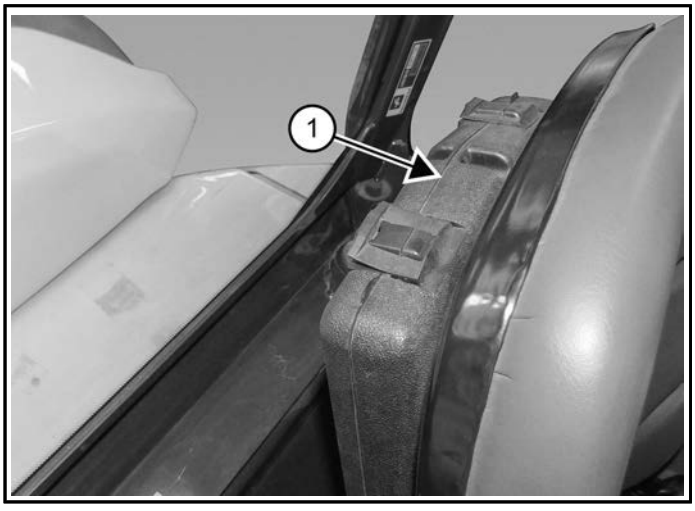
Figure 105

P132086

Use the grab handles and tracks to enter the canopy / cab [Figure 105].

Operation & Maintenance Manual And Operator's Handbook Locations

Figure 106

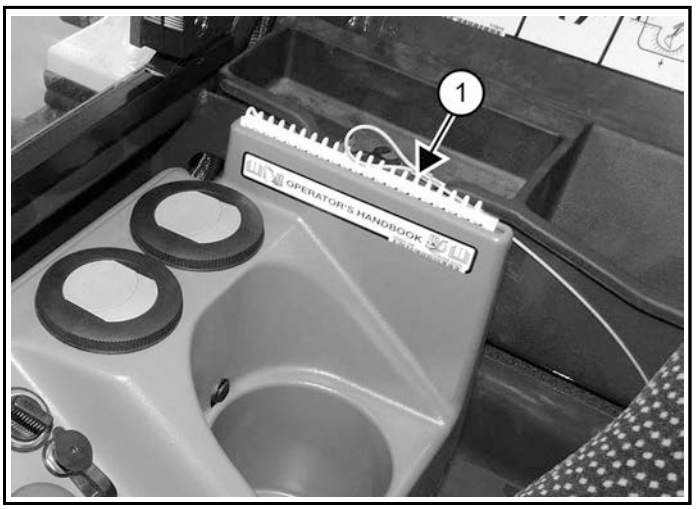


C206182a

- Read and understand the Operation & Maintenance Manual before operating the machine.

  The Operation & Maintenance Manual is located inside the storage box on the back of the operator's seat (Item 1) [Figure 106].

Figure 107



P200107a

- Read and understand the Operator's Handbook before operating the machine.

  The Operator's Handbook is located in the back of the right console (Item 1) [Figure 107].

⚠ WARNING

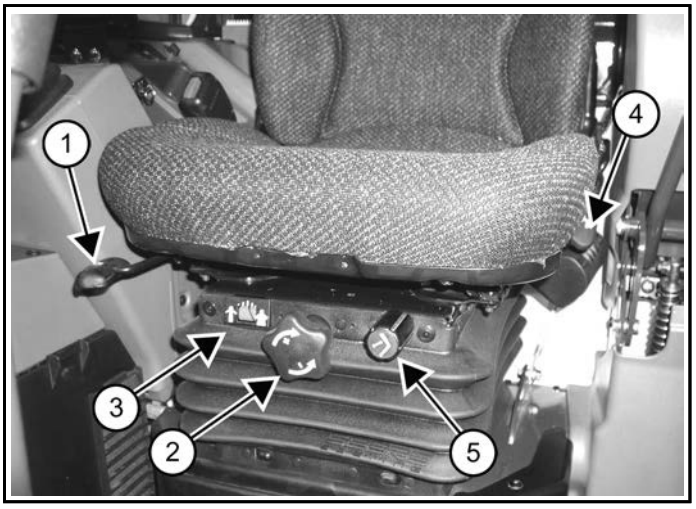
INSUFFICIENT INSTRUCTIONS HAZARD
Untrained operators or failure to follow instructions can cause serious injury or death.
- **Read and understand the Operation & Maintenance Manual, Operator's Handbook and decals on machine.**
- **Follow warnings and instructions in the manuals when making repairs, adjustments or servicing.**
- **Check for correct function after adjustments, repairs or service.**

W-2003

Seat Adjustment

Adjusting The Suspension Seat

Figure 108



C113009a

1. Release the seat lever (Item 1) [Figure 108] to adjust the seat forward or back.

2. Turn the handle (Item 2) to change the adjustment for operator weight. Turn the handle until your weight is shown in the window (Item 3) [Figure 108].

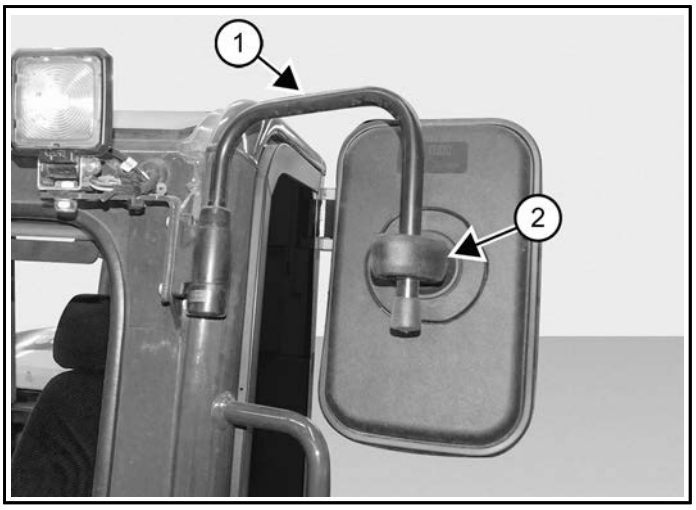
3. Release the lever (Item 4) [Figure 108] to change the incline of the seat back.

4. Turn the knob (Item 5) [Figure 108] to adjust the height of the seat.

Adjusting Mirrors

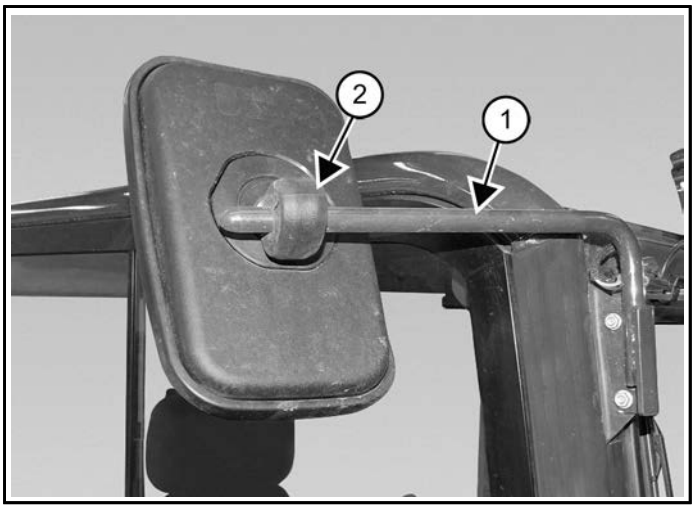
Inspect, clean, and adjust mirrors prior to operating machine.

Figure 109



C209966a

Figure 110



C208821a

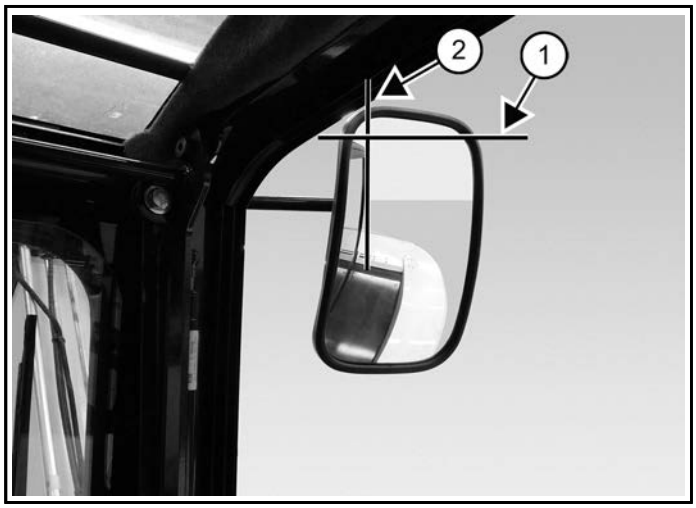
1. Before entering the cab, position the left and right mirror brackets (Item 1) [Figure 109] and [Figure 110] as shown.

   Final mirror adjustment will be made from inside the cab.

2. Tighten the mount retention screws (Item 2) [Figure 109] and [Figure 110] as needed to maintain the mirror mount in position on the bracket.

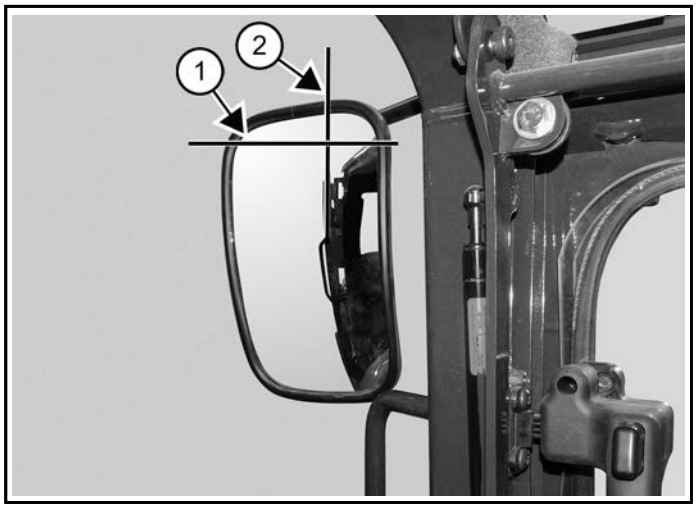
3. Sitting in the operating position with the seat adjusted, check the images in both mirrors.

Figure 111



C208823a

Figure 112



C208822a

4. Adjust both mirrors to see the top of the cab (Item 1) and the edge of the cab (Item 2) approximately as shown here [Figure 111] and [Figure 112].

Figure 113

C208824

The left mirror can be rotated into the transport position when trailering the excavator [Figure 113].

Fastening The Seat Belt

Figure 114

P113010

Fasten the seat belt [Figure 114].

STARTING THE ENGINE

Quick Start Description

The Sleep Time is the time during which the display is in sleep cycle after the machine is turned off. The Sleep Time is fixed for the standard display.

If your machine is equipped with a touch display, the Sleep Time can be adjusted.
(See Setting System Sleep Time on Page 208)

- If you turn the start switch to on during the sleep cycle, the **GAUGES** or **PASSWORD** screen will be displayed.
- If you turn the start switch to on after the sleep cycle expires, one set of icons in the following table will be displayed.

Machine Lockout Off / Quick Start On  NA3515	• Password is not required. • Engine can be started after glow plugs have cycled and wait to start light is off. • Machine functions are active immediately after engine is started.
Machine Lockout On / Quick Start On  NA3516	• Password is required (unless the machine is started within the Auto Lock Time). • Engine can be started after glow plugs have cycled and wait to start light is off. • Machine functions are disabled until a password is entered. • Machine will shut down if a valid password is not entered within 10 minutes.
Machine Lockout On / Quick Start Off  NA3517	• Password is required (unless the machine is started within the Auto Lock Time). • Engine cannot be started until a password is entered.

To turn Machine Lockout and Quick Start on and off, and to set the Auto Lock Time, see the following:
(See Settings (Standard Display) on Page 193)
(See Settings (Touch Display) on Page 203)

Starting The Engine

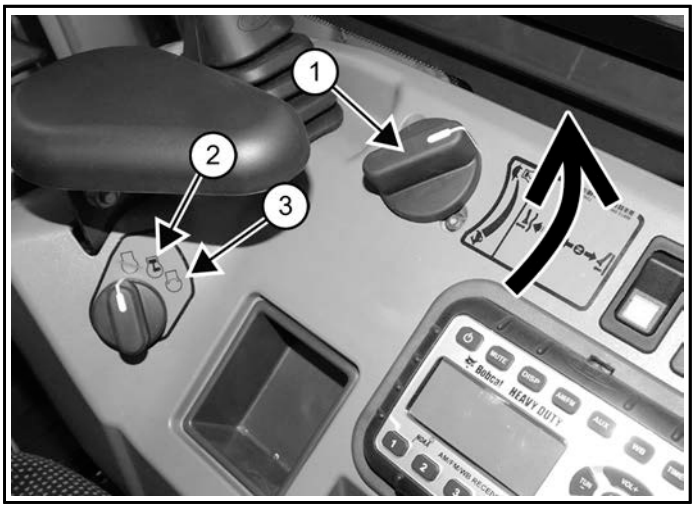
⚠ WARNING

GENERAL HAZARD
Failure to follow instructions can cause serious injury or death.
- **Fasten seat belt, start, and operate only from the operator's seat.**
- **Never wear loose clothing when working near machine.**

W-2135

1. Perform the Pre-Starting Procedure.
(See Pre-Starting Procedure on Page 75)

Figure 115



P200582a

2. Set the engine speed control (Item 1) [Figure 115] to low idle.

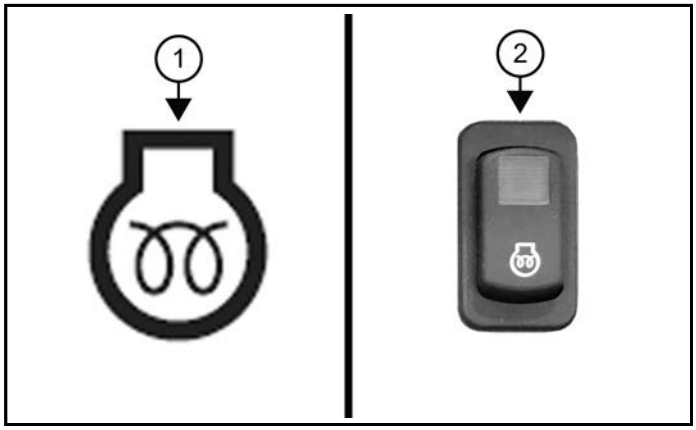
⚠ IMPORTANT

MACHINE DAMAGE HAZARD
Damage to the starter motor can occur with prolonged use.
- **Do not engage the starter for longer than 15 seconds at a time.**
- **Allow the starter motor to cool for 1 minute before using again.**

I-2034

3. Turn the start switch (or key) to on (Item 2) [Figure 115].
4. Enter the password if prompted.

Figure 116



C200593b

5. Wait while the machine cycles the glow plugs.

   The glow plugs icon (Item 1) will show on the display and the Wait To Start light (Item 2) [Figure 116] on the right console will illuminate while the glow plugs are on.

   NOTE: It is recommended in cold weather to cycle the glow plugs twice before attempting to start the engine. This will allow for additional heating time for cold weather starting.

6. When the Wait To Start light turns off, turn the start switch (or key) to the start position (Item 3) [Figure 115].

   Release the start switch (or key) when the engine starts.

7. Stop the engine if the warning lights and alarm do not go off. Check for the cause before starting the engine again.

8. Turn the start switch (or key) to off to stop the engine.

⚠ WARNING

INHALATION HAZARD
Exhaust fumes contain odorless, invisible gases that can kill without warning.
Fresh air must be added to avoid concentration of exhaust fumes when an engine is running in an enclosed area. If the engine is stationary, vent the exhaust outside.◂

W-2050

⚠ WARNING

FIRE AND EXPLOSION HAZARDS
Engines can have hot parts and hot exhaust gas that can cause serious injury or death.
- **Keep flammable material away.**
- **DO NOT use machines in an atmosphere containing explosive dust or gases.◂**

W-2051

Lowering The Control Console

Figure 117

P134071a

- Lower the left control console [Figure 117].

The console must be in the locked down position for the hydraulic joysticks and traction system to operate.

The hydraulic joysticks and traction system are deactivated when the control console is raised. If the joysticks and traction system fail to deactivate when the console is raised, see your Bobcat dealer for service.

Warming The Hydraulic System

If the temperature is below freezing, let the engine run for at least 15 minutes to warm the engine and hydraulic fluid before operating the excavator.

Cold Temperature Starting Tips

⚠ WARNING

EXPLOSION HAZARD
Failure to follow instructions can cause serious injury, death or severe engine damage.
DO NOT use ether or starting fluid with glow plug or air intake heater systems.◂

W-2071

NOTE: The display screen may not be at full intensity when the temperature is below -26°C (-15°F). The display screen may take 30 seconds to several minutes to warm up. All systems remain monitored even when the display screen is off.

If the temperature is below freezing, perform the following to make starting the engine easier:

- Replace the engine oil with the correct type and viscosity for the anticipated starting temperature. (See Engine Oil Chart on Page 165)

- Make sure the battery is fully charged.

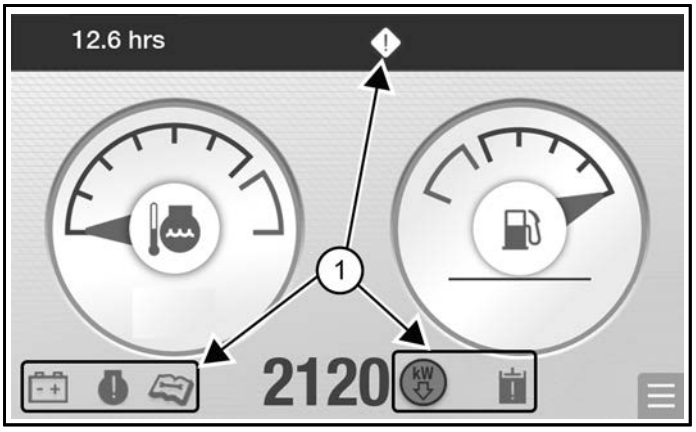
  If the battery is discharged (but not frozen), a booster battery can be used to jump start the excavator.

- Install an engine heater.

MONITORING THE DISPLAY

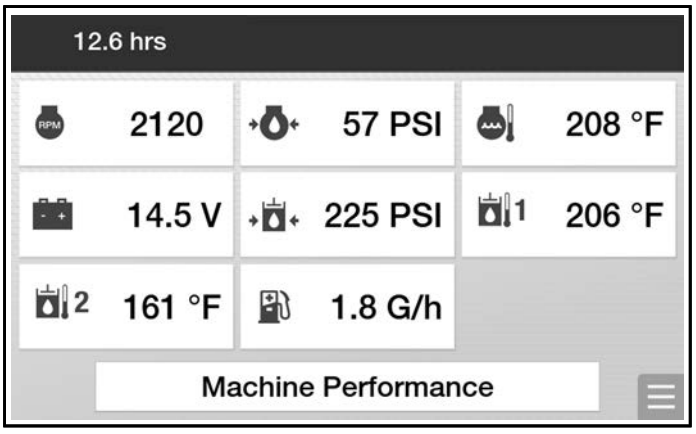
Monitoring The Standard Display During Operation

Figure 118



NA3712A

Figure 119

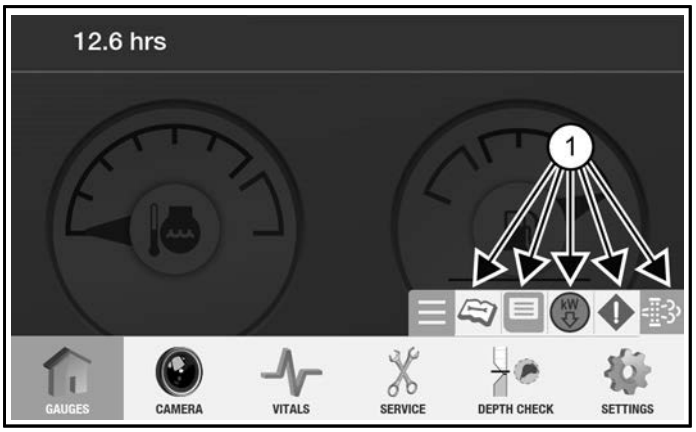


NA3701

Frequently monitor the **GAUGES** [Figure 118] and **VITAL DETAIL** [Figure 119] screens for machine condition.

These icons (Item 1) [Figure 118] indicate machine conditions that may require service.
(See Standard Display on Page 36)

Figure 120



NA3705E

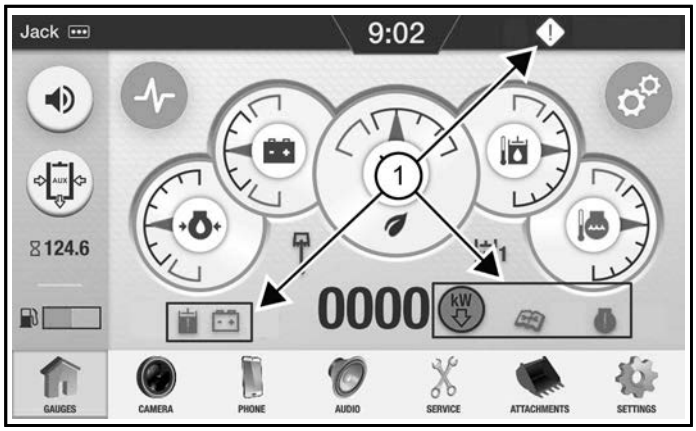
Active shortcuts (Item 1) [Figure 120] that appear also indicate a need for service.
(See Active Shortcuts on Page 190)

A red dot next to the **[SERVICE]** icon indicates an active service code. (See Viewing Service Codes on Page 192)

The fuel and engine coolant gauges will turn red when there is a problem with these systems.

Monitoring The Touch Display During Operation

Figure 121



C132900i

Figure 122

NA3762

Frequently monitor the **GAUGES** [Figure 121] and **VITAL DETAIL** [Figure 122] screens for machine condition.

These icons (Item 1) [Figure 121] indicate machine conditions that may require service.

A red dot next to the **[SERVICE]** icon indicates an active service code. (See Viewing Service Codes on Page 199)

The fuel and engine coolant gauges will turn red when there is a problem with these systems.

For more information see touch display section.
(See Accessing Vital Detail And Machine Performance on Page 196)

Derate And Shutdown Conditions

Certain machine conditions can result in a derate condition until the fault is corrected. These derates are designed to protect the machine systems from damage while a fault condition exists.

An engine shutdown can occur during certain system malfunctions. The engine can be restarted to move the machine.

OPERATING PROCEDURE

Inspect The Work Area

Before beginning operation, inspect the work area and check ground conditions for unsafe conditions:

- Look for sharp drop-offs or rough terrain.
- Have underground utility lines (gas, electrical, water, sewer, irrigation, etc.) located and marked.
- Work slowly in areas of underground utilities.
- Remove objects or other construction material that could damage the machine or cause personal injury.
- Inspect for signs of instability such as cracks or settlement.
- Be aware of weather conditions that can affect ground stability.
- Check for adequate traction if working on a slope.

Basic Operating Instructions

When operating on a public road or motorway, always follow local regulations. For example, a slow moving vehicle (SMV) emblem or direction signals may be required.

Run the engine at low idle speed to warm the engine and hydraulic system before operating the machine.

NOTE: Machines warmed up with moderate engine speed and light load have longer life.

New operators must operate the machine in an open area without bystanders. Operate the controls until the machine can be handled at an efficient and safe rate for all conditions of the work area.

Operating Near An Edge Or Water

Keep the machine as far back from the edge as possible and the machine base perpendicular to the edge so that if part of the edge collapses, the machine can be moved back.

Always move the machine back at any indication the edge may be unstable.

Lowering The Work Group If The Engine Stops

If the engine stops, you can lower the boom and attachment to the ground using hydraulic pressure in the accumulator.

Figure 123

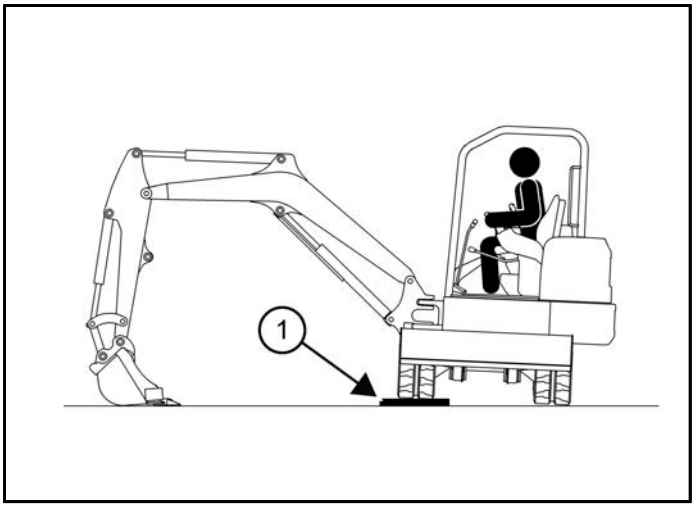
P134071a

1. Ensure the left console is down [Figure 123].
2. Turn the start switch to ON.
3. Use the joystick to lower the boom.

Driving The Excavator

- When operating on uneven ground, operate as slow as possible and avoid sudden changes in direction.
- Avoid travelling over objects such as rocks, trees, stumps, etc.

Figure 124

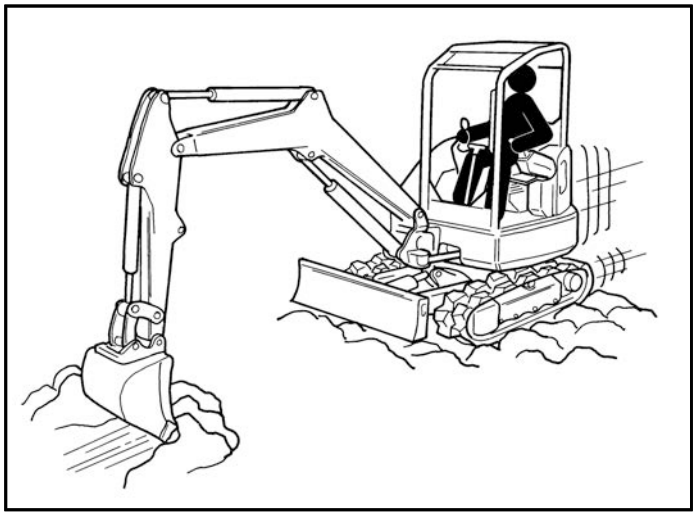


NA20364a

- When working on wet or soft ground, put planks (Item 1) [Figure 124] on the ground to provide a solid base to travel on and prevent the excavator from getting stuck.
- If one or both tracks have become stuck in soft or wet ground, raise one track at a time by turning the upperstructure and pushing the bucket against the ground.

▹ Put planks under the tracks and drive the excavator to dry ground.

Figure 125



NA20360

- The bucket may also be used to pull the excavator [Figure 125].
  - ▹ Raise the blade.
  - ▹ Extend the arm and lower the boom.
  - ▹ Operate the boom in a digging manner.

Operating On Slopes

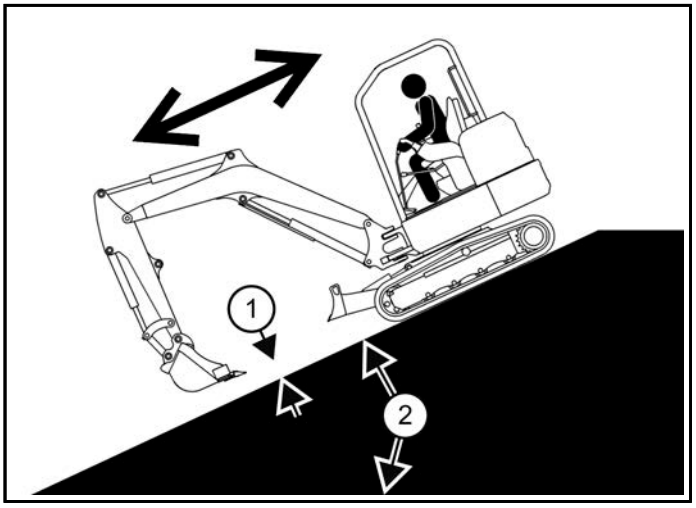
⚠ WARNING

INSTABILITY HAZARD
Machine tipping or rollover can cause serious injury or death.
- **Do not travel across or up slopes that are over 15 degrees.**
- **Do not travel down or back up slopes that exceed 25 degrees.**
- **Look in the direction of travel.**
- **Check for adequate traction.**

W-2497

- When going down a slope, control the speed with the steering levers and the speed control lever.

Figure 126



NA20370a

- When going down grades that exceed 15 degrees (Item 2), put the machine in the position shown, with the attachment no higher than 304 mm (12 in) (Item 1) off the ground [Figure 126]. Run the engine slowly.
- Do not travel down or back up slopes that exceed 25 degrees (Item 2) [Figure 126].
- Operate as slow as possible.
- Avoid sudden changes in lever directions.
- Avoid travelling over objects such as rocks, trees, stumps, etc.
- Stop the machine before moving the upper equipment controls.
- Never allow the blade to strike a solid object.

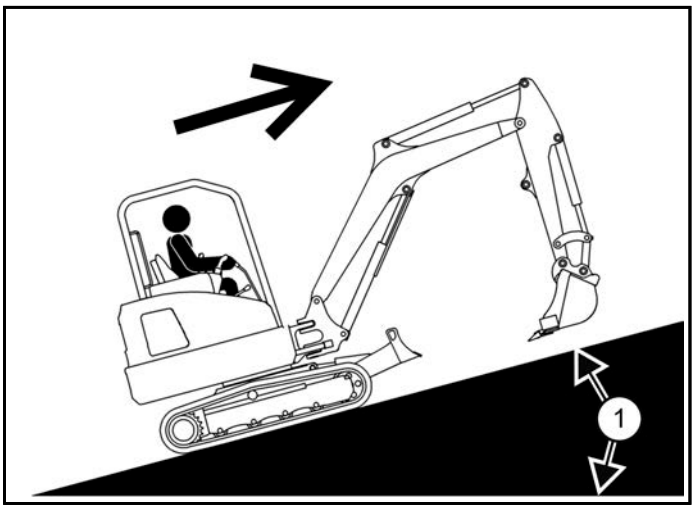
  Damage to the blade or hydraulic cylinder can result.

⚠ WARNING

INSTABILITY HAZARD
Machine tipping or rollover can cause serious injury or death.
- **Always fasten seat belt.**
- **Avoid steep areas or banks that could break away.**
- **Keep boom centred and attachments as low as possible when travelling on slopes or in rough conditions.**
- **Look in the direction of travel.**
- **Keep feet and hands on controls.**

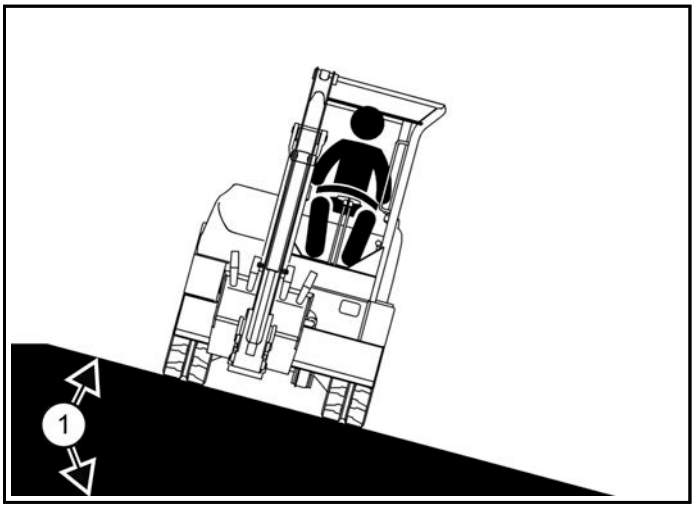
W-2498

Figure 127



NA20369a

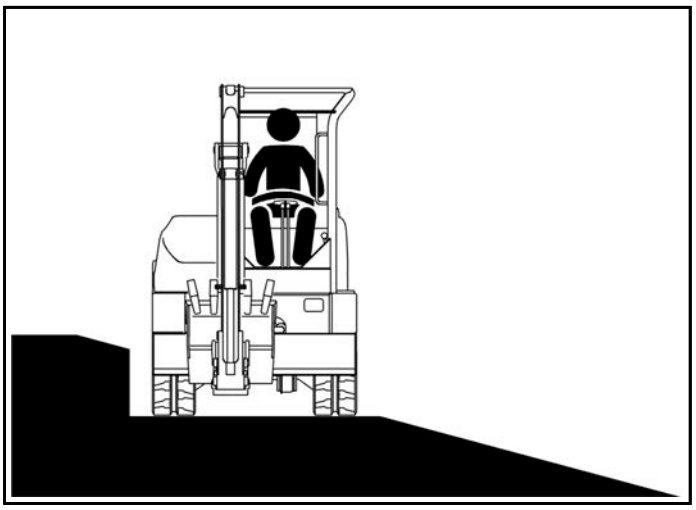
Figure 128



NA20371a

- When travelling up slopes (Item 1) [Figure 127], or on side slopes that are 15 degrees or less (Item 1) [Figure 128], position the machine as shown and run the engine slowly.

Figure 129



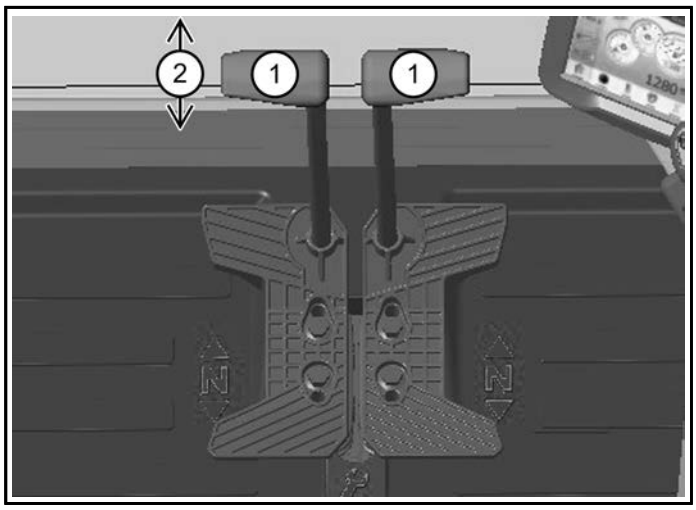
NA20372

- When operating on a slope, level the work area before beginning [Figure 129].

  If this is not possible, the following procedure should be used:

  - Do not work on slopes that are over 15 degrees (Item 1) [Figure 128].
  - Use a slow work cycle.
  - Avoid working with the tracks across the slope. This will reduce stability and increase the tendency for the machine to slide.
  - Position the excavator with the blades downhill and lowered.
  - Avoid swinging or extending the bucket more than necessary in a downhill direction.
  - When you must swing the bucket downhill, keep the arm low and skid the bucket downhill.
  - When working with the bucket on the uphill side, keep the bucket as close to the ground as possible.
  - Dump the spoil far enough away from the trench or hole to prevent the possibility of a cave in.

Figure 130



C208449b

- To brake the machine when going down a slope, move the steering levers (Item 1) to the neutral position (Item 2) [Figure 130].

  This will engage the hydrostatic braking.

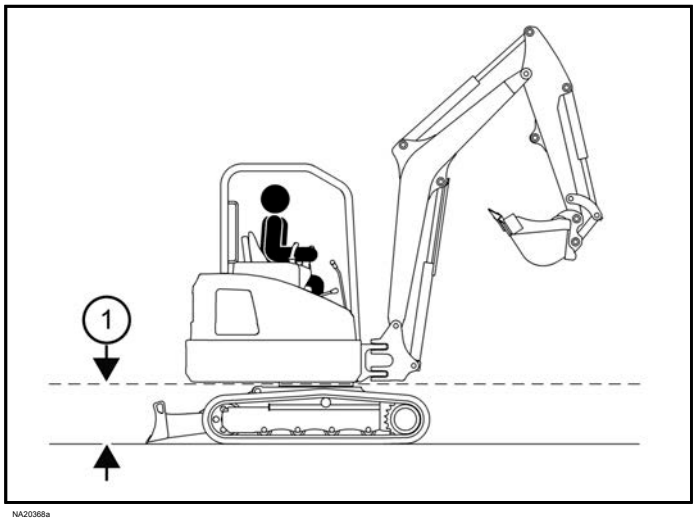
- When the engine stops on a slope, move the steering levers to the neutral position. Lower the boom / bucket to the ground.

  If the engine stops, the boom / bucket (attachments) can be lowered to the ground using the hydraulic pressure that is stored in the accumulator.

  - Ensure the console is in the locked down position, and the key is switched to the on position.
  - Use the joystick to lower the boom.
  - Start the engine and resume operation.

Operating In Water

Figure 131



NA20368a

- Do not operate or immerse the excavator in water higher than the bottom of the swing bearing (Item 1) [Figure 131].

- Remove mud and water from the machine before parking.

- In freezing temperatures, park the machine on boards or concrete to prevent the track or undercarriage from freezing to the ground and preventing machine movement.

- Grease the excavator when it has been operated or immersed in water for a period of time. Greasing forces the water out of the lubrication areas.

- Remove water from the cylinder rods.

  If water freezes to the cylinder rod, the cylinder seals can be damaged when the rod is retracted.

Protecting The Track From Damage

- In freezing temperatures, park the machine on boards or concrete.

  If you park the machine on the ground, the track or undercarriage might freeze to the ground and prevent the machine from moving.

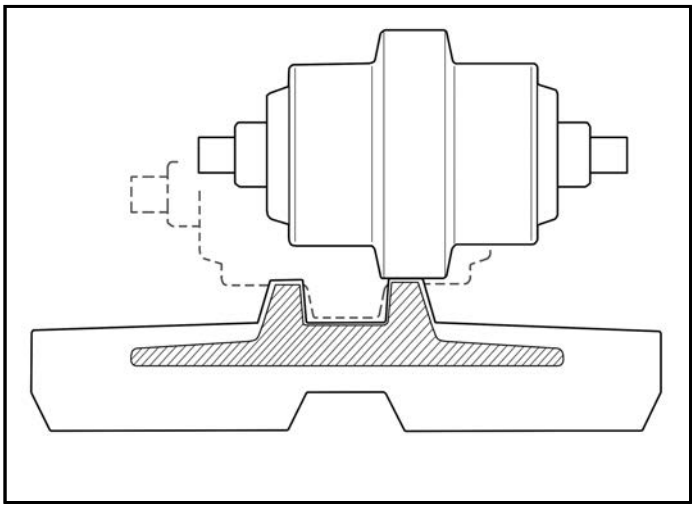
- Remove mud and water from the machine before parking.

  If moisture invades through cuts on the rubber track, the embedded steel cords will corrode. The deterioration of the design strength may cause the steel cords to break.

- Remove any stones or foreign objects that may be clogging the rubber track.

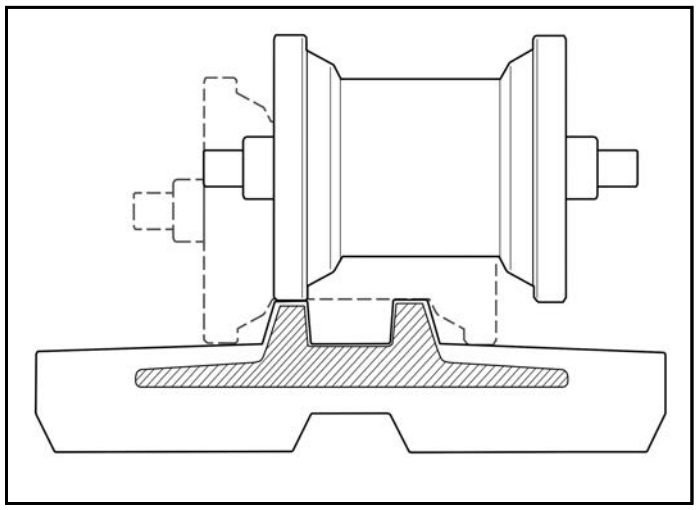
  Stones and foreign objects can become wedged between the sprocket / rollers and cause detracting and track stress.

Figure 132



NA20189

Figure 133

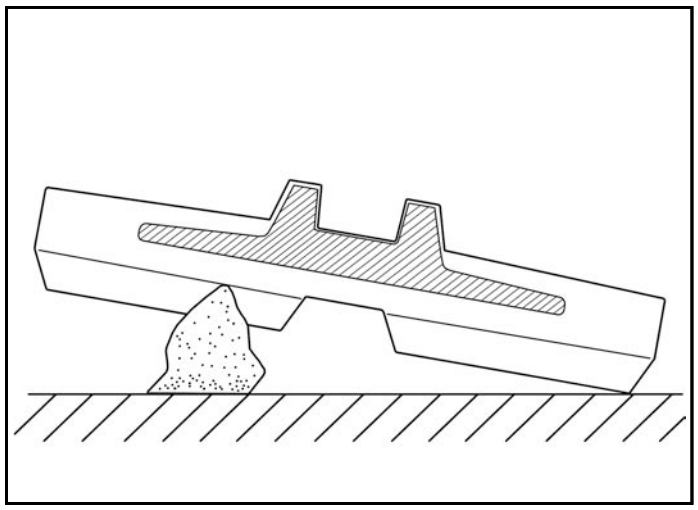


NA20190

- Maintain proper track tension.
  (See Track Tension on Page 179)

  When the rubber track detracts due to improper track tension, the idler or sprocket rides on the projections of the embedded metal causing the embedded metal to be exposed to corrosion ([Figure 132] or [Figure 133]).

Figure 134



NA20246

- Avoid driving over sharp objects.

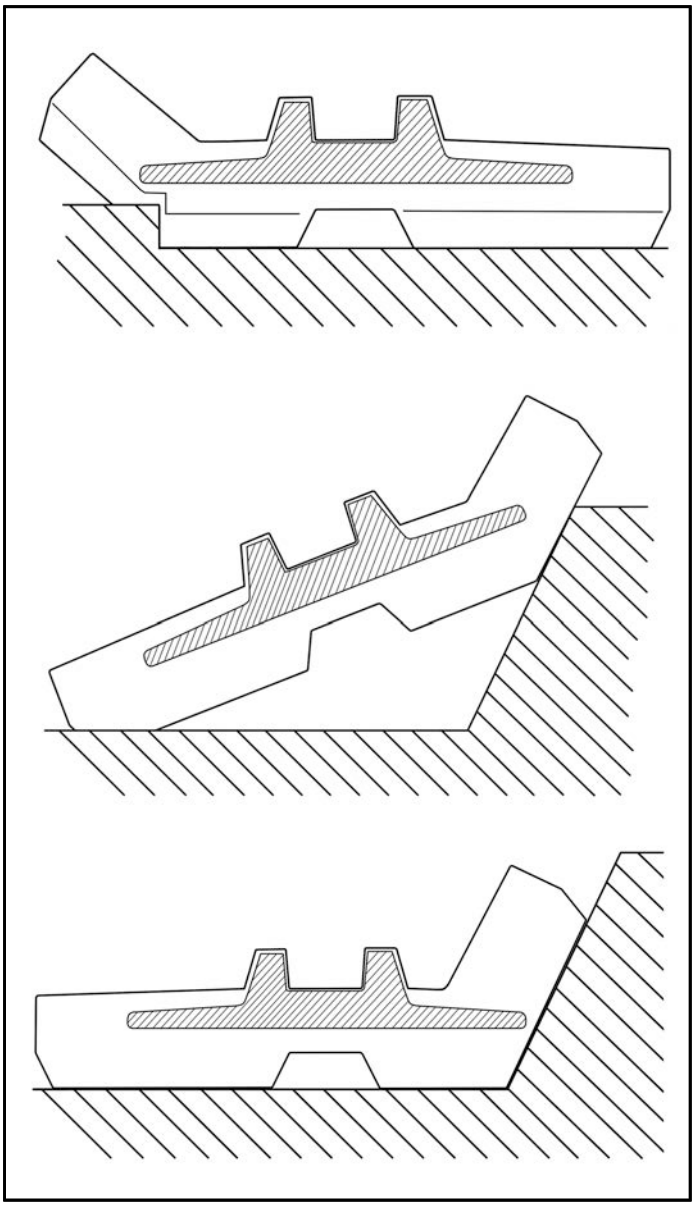
  When rubber tracks drive over sharp projections:

  - Intensive stress is applied to the lug side of the rubber surface, especially at the edges of embedded metals, causing cracks and cuts in the area around the embedded metals.
  - Concentrated forces cause cuts [Figure 134] on the lug side of the rubber surface.

- If avoiding a sharp object is impossible, do not make a turn while driving over a sharp object.

  If you make a turn on a projection, the lug side rubber surface will have an even higher chance of being cut. If the cuts run through the embedded steel cords, it might result in the steel cords breaking due to corrosion.

Figure 135



NA20247a

- Avoid driving over stumps and ridges.

  This may apply extensive stress to the lug root where metals are embedded [Figure 135].

- Avoid making quick turns on bumpy and rocky fields.

STOPPING THE ENGINE AND LEAVING THE MACHINE

Stopping The Engine And Leaving The Machine

Figure 136

C200402a

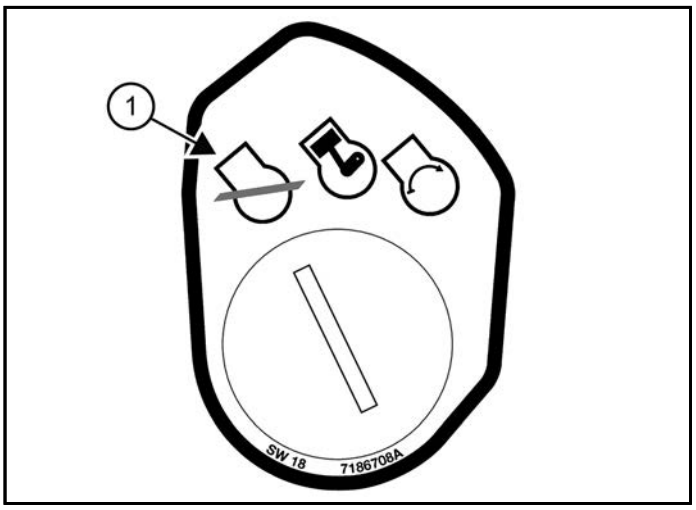
1. Stop the machine on level ground.
2. Lower the work equipment and the blade to the ground [Figure 136].

Figure 137

C208107a

3. Rotate the engine speed control dial counterclockwise to low idle [Figure 137].
4. Run the engine at idle speed for about 5 minutes to allow it to cool.

Figure 138



7186708c

5. Turn the switch to Stop (Item 1) [Figure 138].
6. Disconnect the seat belt.
7. Remove the key from the switch (if equipped) to prevent operation of machine by unauthorised personnel.
8. Raise the control console.
9. Exit the machine.

INSTALLING ATTACHMENTS (PIN-ON ATTACHMENT)

⚠ WARNING

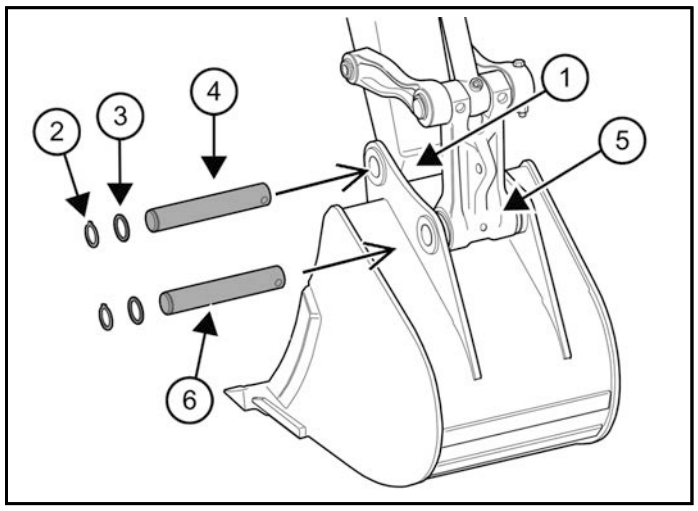
MODIFICATION HAZARD
Unapproved attachments can cause serious injury or death.
Buckets and attachments for safe loads of specified densities are approved for each model. Never use attachments or buckets that are not approved by Bobcat Company.◂
W-2052

⚠ WARNING

GENERAL HAZARD
Failure to follow instructions can cause serious injury or death.
Stop the machine on a firm flat surface. When removing or installing attachments always have a second person in the operator's seat, give clear signals and work carefully.◂
W-2140

1. Start the engine.

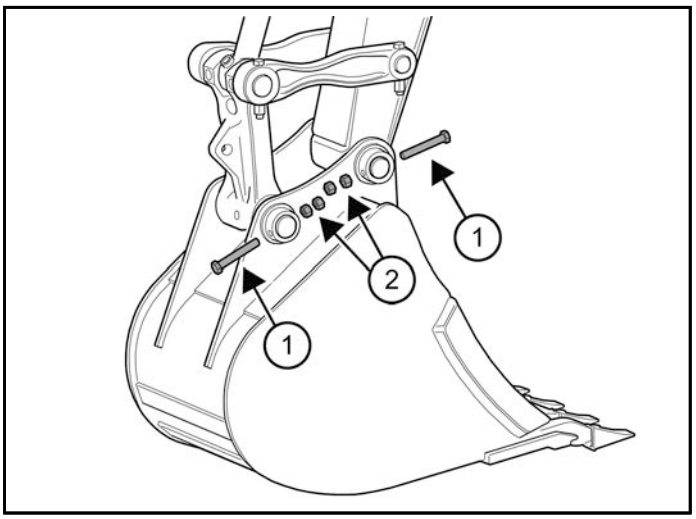
Figure 139



NA20306b

2. Move the arm toward the bucket and align the mounting hole (Item 1) [Figure 139].
3. Stop the engine and exit the excavator.
4. Install the O-rings by rolling them onto the interior bucket bushing groove.
5. Install the snap ring (Item 2) and washer (Item 3) onto the pin (Item 4) [Figure 139].
6. Push the pin (Item 4) through the bucket bushings and pivot [Figure 139].
7. Align link with bucket bushing (Item 5) [Figure 139] and washers.
8. With washer and snap ring installed, push the second pin (Item 6) through bucket bushing and link [Figure 139].

Figure 140



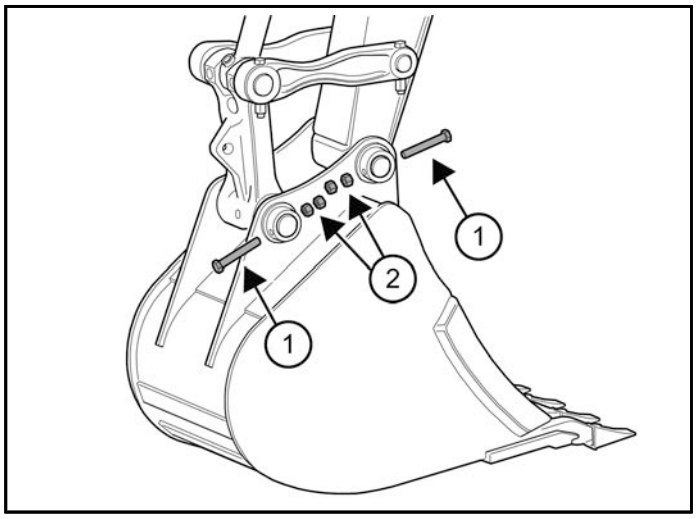
NA20307b

9. Install screws (Item 1) and double nuts (Item 2), ensuring that the screws rotate freely [Figure 140].
10. Add grease to the grease fittings.

REMOVING ATTACHMENTS (PIN-ON ATTACHMENT)

1. Park the excavator on a flat surface and lower the bucket fully.
2. Stop the engine and exit the excavator.

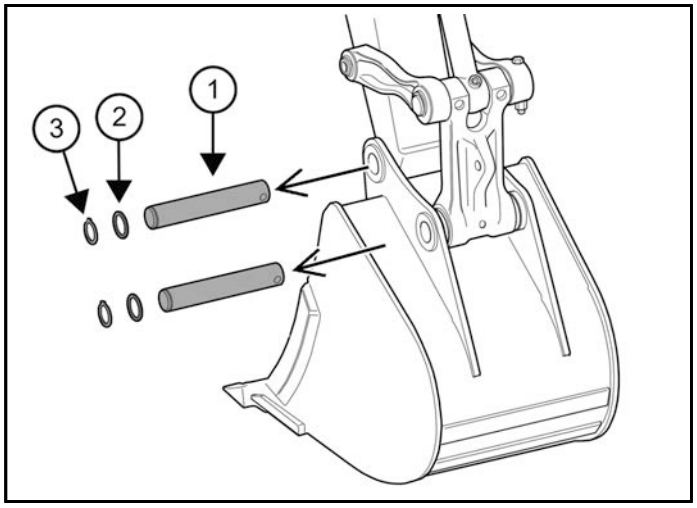
Figure 141



NA20307b

3. Remove the screws (Item 1) and double nuts (Item 2) [Figure 141].

Figure 142



NA20306c

4. Remove the pins, washers, and snap rings (Items 1, 2, and 3) [Figure 142].
5. Do not damage the O-rings in the arm.

INSTALLING ATTACHMENTS (QUICK COUPLER, KLAC SYSTEM)

Installation of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ WARNING

MODIFICATION HAZARD
Unapproved attachments can cause serious injury or death.
Buckets and attachments for safe loads of specified densities are approved for each model. Never use attachments or buckets that are not approved by Bobcat Company.◂

W-2052

⚠ WARNING

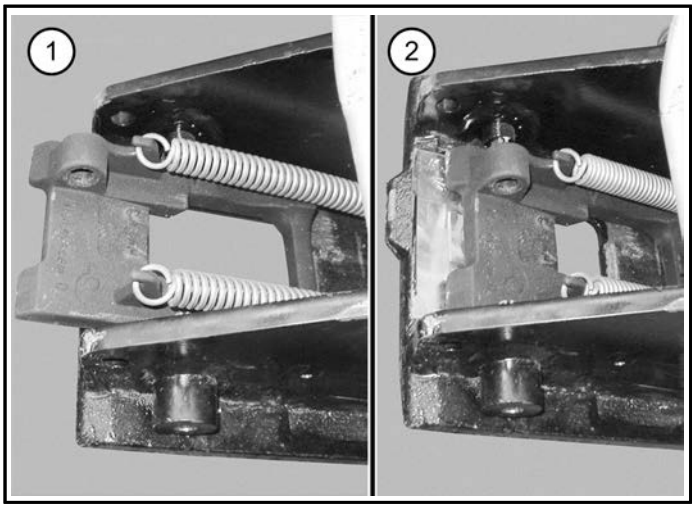
ENTANGLEMENT AND IMPACT HAZARD
Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.◂

W-2119

A coupler equipped with the lifting device can only be used on machines on which the overload warning device and boom and arm load holding valves are installed. See your Bobcat dealer for available kits.

1. Fully retract the bucket cylinder.
2. Stop the engine and exit the excavator.

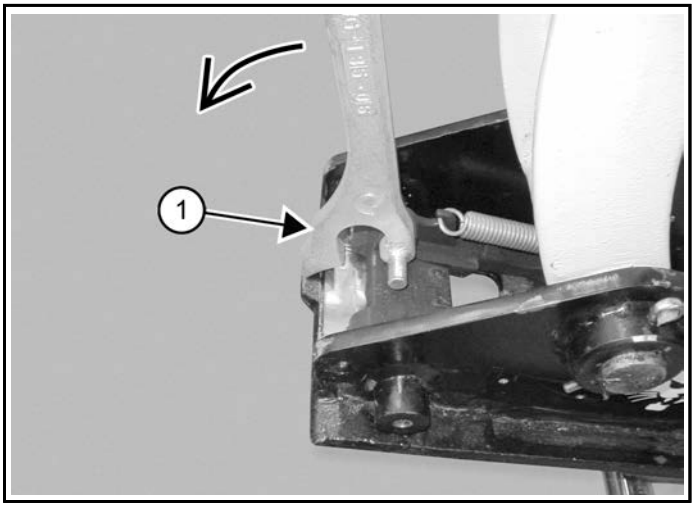
Figure 143



p72272b

3. Inspect the quick coupler [Figure 143].

Figure 144



p72273a

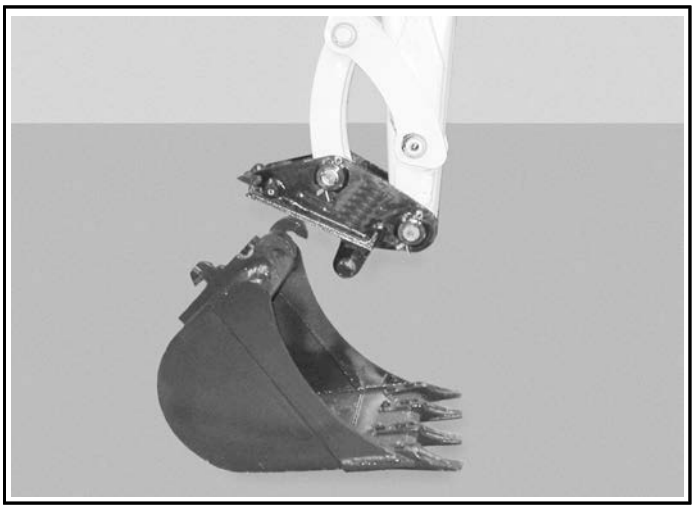
4. If the coupler is in the unlatched position (Item 1) [Figure 143], proceed to Step 5.

   OR

   If the coupler is in the latched position (Item 2) [Figure 143], install the tool (Item 1) [Figure 144] and pull the handle. The latch will move completely forward and lock in the unlatched position.

5. Enter the excavator, fasten the seat belt, and start the engine.

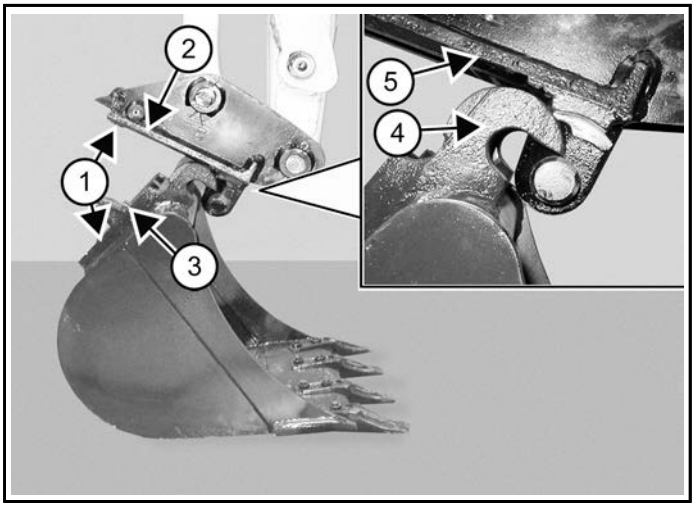
Figure 145



p-72274b

6. Position the quick coupler near the attachment [Figure 145].

Figure 146



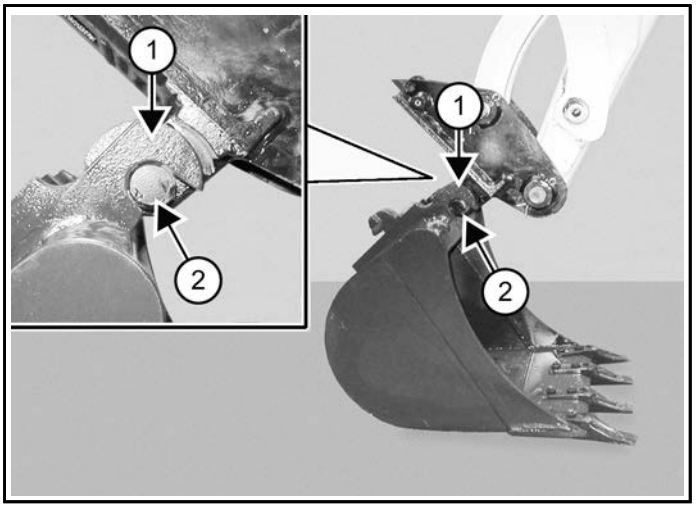
p-72275b

7. Extend the arm out until there is at least 100° (Item 1) between the quick coupler surface (Item 2) and the attachment mounting surface (Item 3) [Figure 146].

   There must be proper clearance (Item 1) between the hook (Item 4) and the quick coupler (Item 5) [Figure 146].

   Extend the arm out to get the required angle (Item 1) [Figure 146]. Damage could occur to the attachment hooks or the quick coupler without proper clearance.

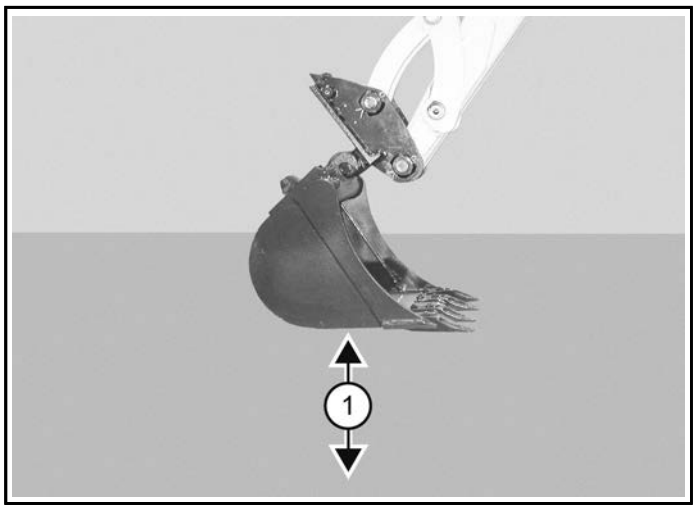
Figure 147



p-72276a

8. Raise the boom and extend the arm until the hooks of the attachment (Item 1) engage the pins (Item 2) of the quick coupler [Figure 147].

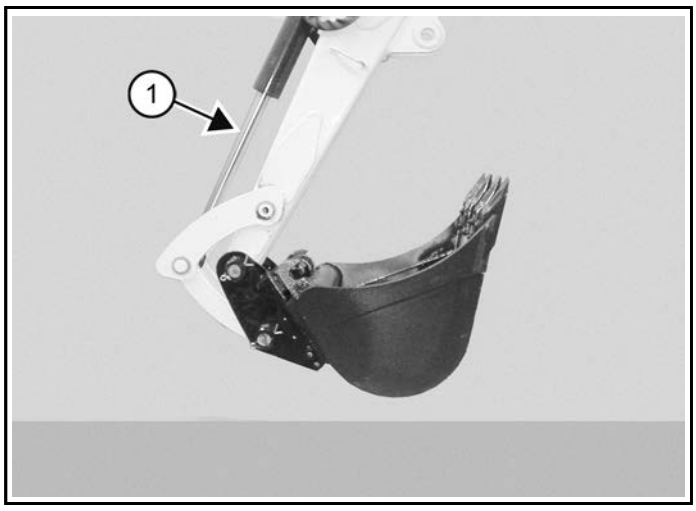
Figure 148



p-72277a

9. Raise the boom until there is approximately 500 mm (20.0 in) (Item 1) [Figure 148] of clearance between the bottom of the attachment and the ground.

Figure 149



p-72278a

10. Extend the bucket cylinder (Item 1) [Figure 149] fully.
11. Lower the attachment until it is flat on the ground.
12. Stop the engine and exit the excavator.

Inspect the quick coupler latch. Check if it has properly locked.
(See Inspecting And Adjusting The Quick Coupler Latch on Page 92)

REMOVING ATTACHMENTS (QUICK COUPLER, KLAC SYSTEM)

Removal of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

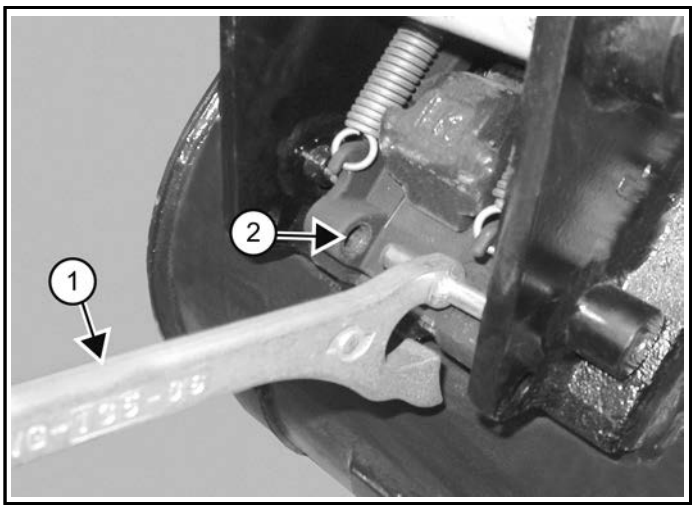
⚠ WARNING

PINCHING HAZARD
Failure to follow instructions can cause serious injury.
Keep fingers and hands out of pinch points when latching and unlatching the attachment quick coupler.

W-2541

1. Position the attachment flat on the ground.

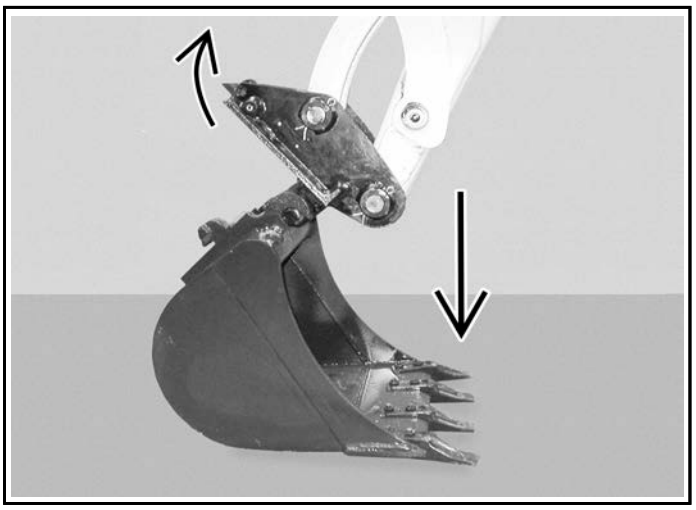
Figure 150



p-72286

2. Install the quick coupler tool (Item 1) into the hole (Item 2) in the quick coupler [Figure 150].
3. Push down on the tool (Item 1) [Figure 150] to unlock the latch.
4. Remove the tool.
5. Enter the excavator, fasten the seat belt, and start the engine.

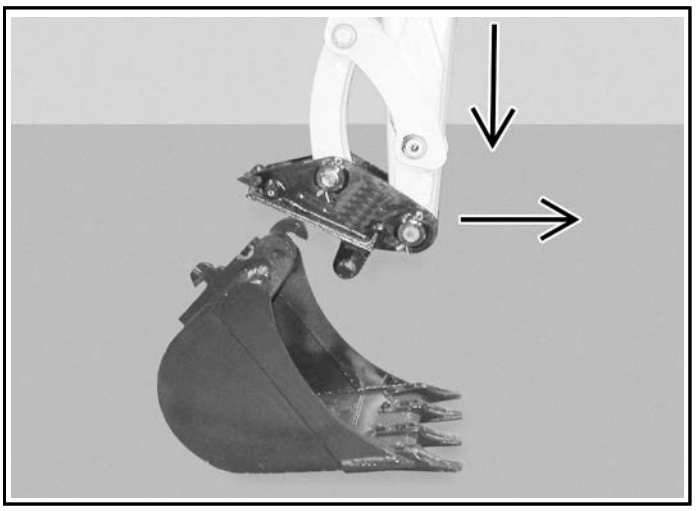
Figure 151



p-72282a

6. Retract the bucket cylinder fully and lower the boom until the attachment is on the ground [Figure 151].

Figure 152



p-72274c

7. Continue to lower the boom and move the arm towards the excavator until the quick coupler is clear of the attachment [Figure 152].

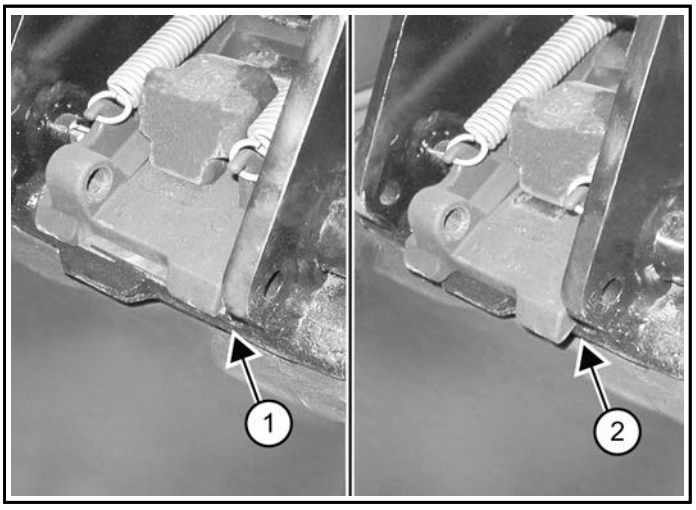
INSPECTING AND ADJUSTING THE QUICK COUPLER LATCH

⚠ WARNING

PINCHING HAZARD
Failure to follow instructions can cause serious injury.
Keep fingers and hands out of pinch points when latching and unlatching the attachment quick coupler.

W-2541

Figure 153

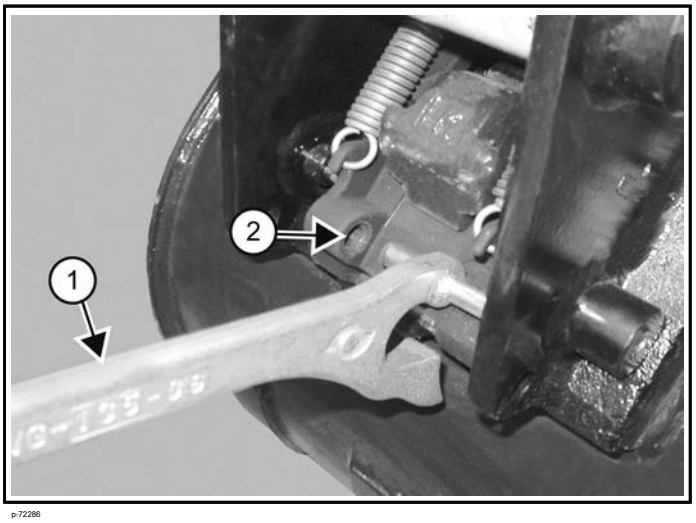


p-72279a

Visually inspect the quick coupler latch to the bucket mount [Figure 153]. The latch must be fully engaged (Item 1) [Figure 153].

If the latch is not fully engaged (Item 2) [Figure 153], proceed with the following instructions:

Figure 154



p-72286

1. Install the tool (Item 1) in the hole (Item 2) of the quick coupler [Figure 154].

2. Push the tool (Item 1) [Figure 154] down to unlatch the quick coupler.
3. Remove the tool (Item 1) [Figure 154].
4. Enter the excavator, fasten the seat belt, and start the engine.
5. Raise the boom 500 mm (20.0 in) off the ground and fully extend the bucket cylinder [Figure 149].
6. Lower the attachment until it is flat on the ground.
7. Stop the engine and exit the excavator.
8. Again, visually inspect the quick coupler to make sure the latch is fully engaged (Item 1) [Figure 153].
9. If it is not fully engaged, remove the attachment and inspect both the quick coupler and the attachment for damage or debris.

INSTALLING ATTACHMENTS (GERMAN STYLE COUPLER)

Installation of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ WARNING

MODIFICATION HAZARD
Unapproved attachments can cause serious injury or death.
Buckets and attachments for safe loads of specified densities are approved for each model. Never use attachments or buckets that are not approved by Bobcat Company.
W-2052

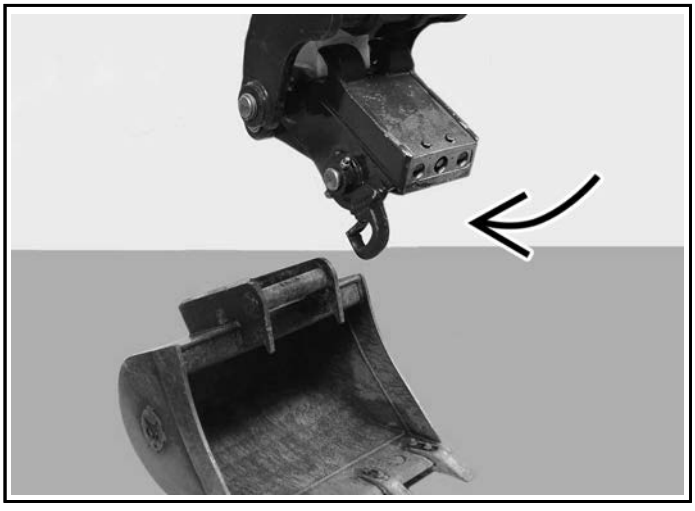
⚠ WARNING

ENTANGLEMENT AND IMPACT HAZARD
Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.
W-2119

A coupler equipped with the lifting device can only be used on machines on which the overload warning device and boom and arm load holding valves are installed. See your Bobcat dealer for available kits.

1. Start the engine.
2. If your machine is equipped with a hydraulic clamp, fully retract the hydraulic clamp cylinder so the clamp is out of the way for installing the attachment.

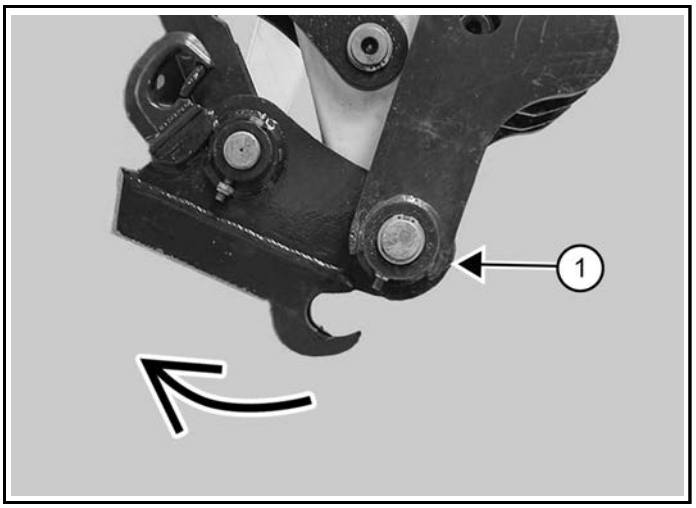
Figure 155


C113895a

3. Position the arm and quick coupler to the attachment [Figure 155].

Figure 156

Figure 157

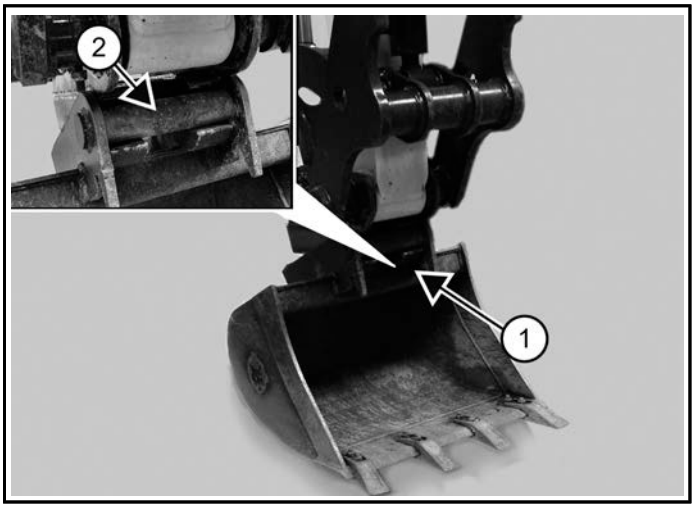


C113902c

4. Move the right joystick (Item 1) [Figure 156] to the right (OUT) to curl the coupler (Item 1) [Figure 157] back, fully away from the cab.

5. Lower the coupler onto the attachment.

Figure 158



p113898c

6. Engage the coupler hooks (Item 1) onto the attachment shaft (Item 2) [Figure 158].

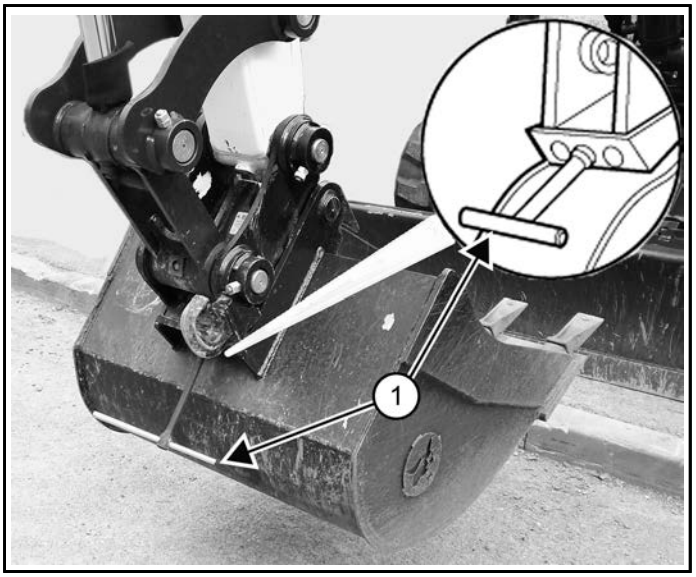
Figure 159

C113899

7. Move the right joystick to the left (IN) and curl the coupler (Item 1) [Figure 159] in toward the cab fully.

8. Stop the engine and exit the machine.

Figure 160



p113903b

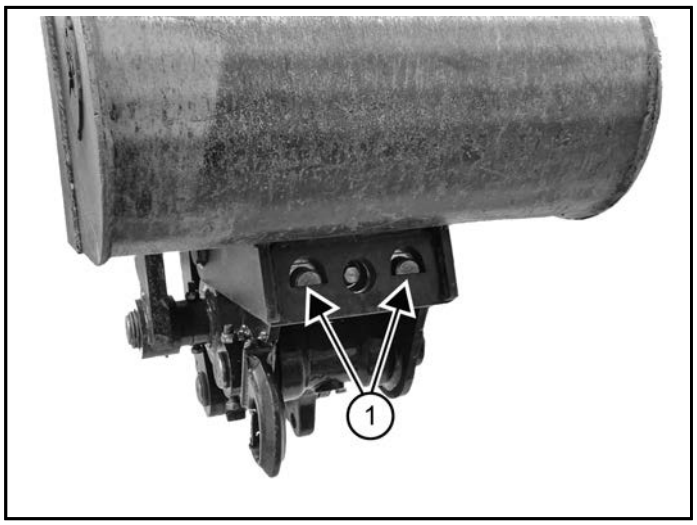
9. Use the supplied wrench (Item 1) [Figure 160] and turn the wrench clockwise until the locking pins fully engage.

⚠ WARNING

CRUSHING HAZARD
Failure to fully engage quick coupler locking pins can allow attachment to come off and can cause serious injury or death.
The locking pins must be fully engaged and locked to the attachment pins.

W-3023

Figure 161



C113900

10. Visually check that the locking pins (Item 1) [Figure 161] are extended through the holes in the attachment mounting frame, securely fastening the attachment to the coupler.

    If both locking pins do not engage in the locked position, see your Bobcat dealer for service.

11. Enter the excavator, fasten the seat belt, and start the engine.
    (See Pre-Starting Procedure on Page 75)

12. With the attachment as low to the ground as possible, curl the attachment out and in several times to ensure the attachment is secured to the coupler.

13. Lower the attachment flat to the ground.

The type of quick coupler installed on the excavator may affect the excavator's lift capacity and the availability of attachments.

See the lift capacity decal on your machine for the specific lift capacities of your machine. If this decal is missing or damaged, see your Bobcat dealer.
(See Lift Capacity on Page 107)

See your Bobcat dealer for a list of approved attachments for the type of quick coupler installed on the machine.

REMOVING ATTACHMENTS (GERMAN STYLE COUPLER)

Removal of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ WARNING

ENTANGLEMENT AND IMPACT HAZARD
Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.

W-2119

1. Enter the excavator, fasten the seat belt, and start the engine.

2. Raise the boom.

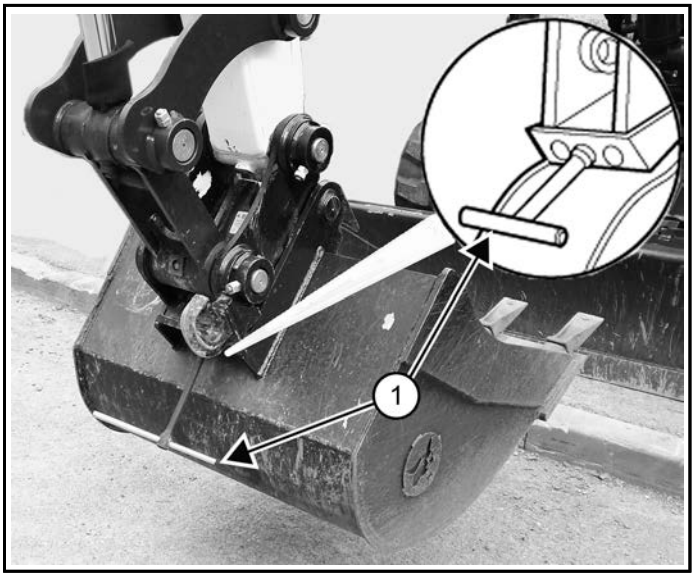
Figure 162

C113899

3. Move the right joystick to the left (IN) and curl the coupler in toward the cab fully [Figure 162].

4. Stop the engine and exit the excavator.

Figure 163



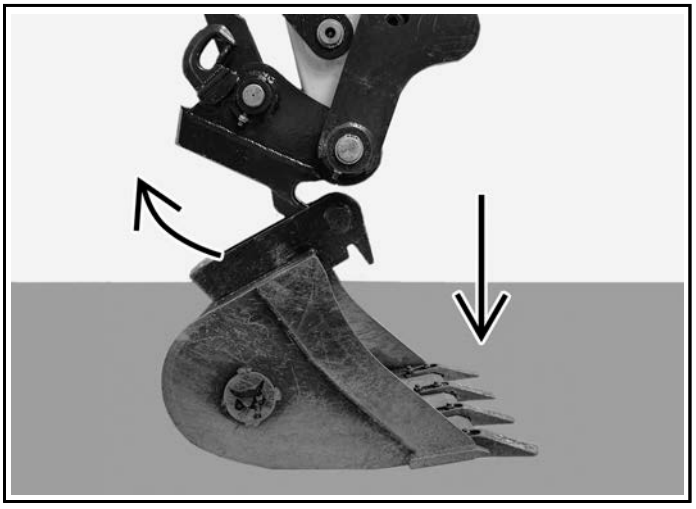
p113903b

5. Use the supplied wrench (Item 1) [Figure 163] and turn the wrench anticlockwise until the locking pins are fully disengaged.

6. Enter the excavator, fasten the seat belt, and start the engine.

7. With the attachment slightly off the ground, roll the quick coupler back until the coupler starts to disengage from the attachment.

Figure 164



p113896b

8. Roll the quick coupler back fully and lower the boom and arm until the attachment is on the ground and the quick coupler is disengaged from the attachment pins [Figure 164].

9. Move the arm away from the attachment.

INSTALLING ATTACHMENTS (MECHANICAL PIN GRABBER COUPLER)

Figure 165

C207444

You have been supplied with the release tool [Figure 165] that is required to disengage and engage the safety lock. Do not use alternative tools, as they may damage the coupler.

Installation of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ WARNING

MODIFICATION HAZARD
Unapproved attachments can cause serious injury or death.
Buckets and attachments for safe loads of specified densities are approved for each model. Never use attachments or buckets that are not approved by Bobcat Company.◂

W-2052

⚠ WARNING

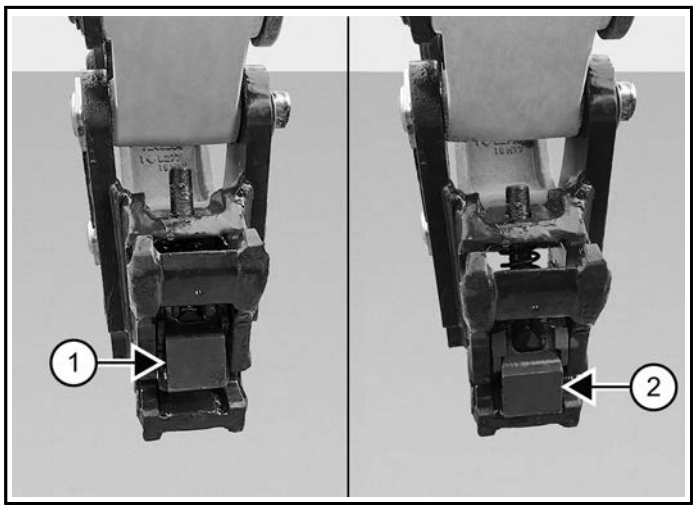
ENTANGLEMENT AND IMPACT HAZARD
Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.◂

W-2119

A coupler equipped with the lifting device can only be used on machines on which the overload warning device and boom and arm load holding valves are installed. See your Bobcat dealer for available kits.

1. If your machine is equipped with a hydraulic clamp, fully retract the hydraulic clamp cylinder so the clamp is out of the way for installing the attachment.

Figure 166



C207446b

2. Inspect the quick coupler. If the wedge and the trigger are in the primed position (Item 1) [Figure 166], proceed to Step 4.

   OR

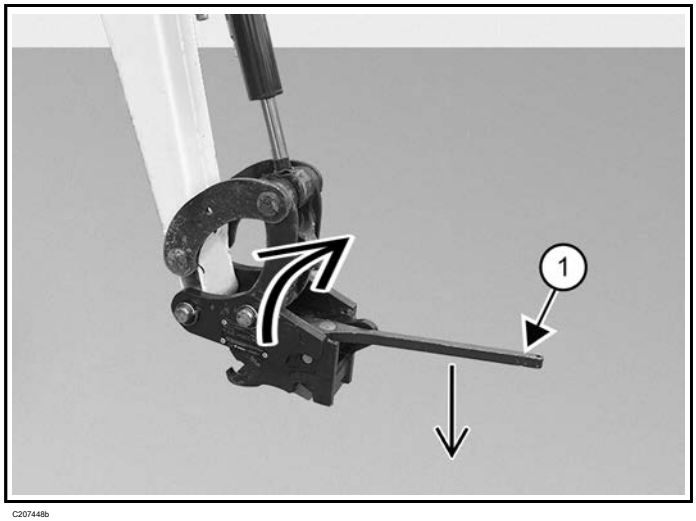
   If the wedge is in the engaged position (Item 2) [Figure 166], see Step 3.

⚠ WARNING

PINCHING HAZARD
Failure to follow instructions can cause serious injury.
Keep fingers and hands out of pinch points when latching and unlatching the attachment quick coupler.

W-2541

Figure 167



C207448b

3. To prepare the quick coupler, do the following:

   a. Stop the engine and exit the excavator.

   b. Install the release tool (Item 1) [Figure 167].

   c. Rotate the release tool clockwise and hold [Figure 167].

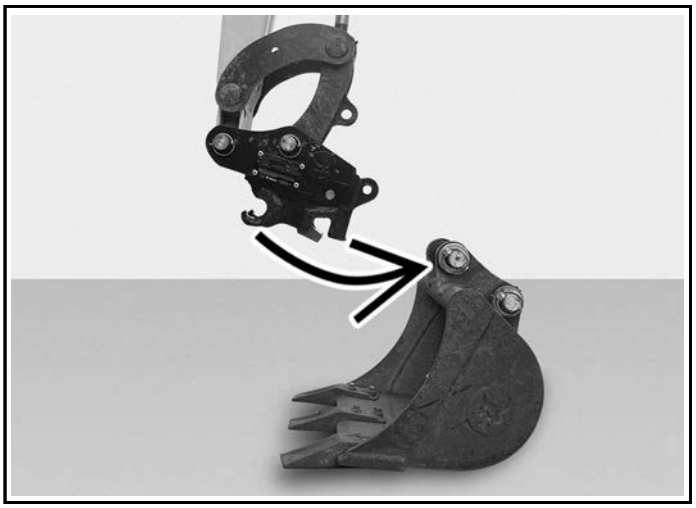
   d. Push the release tool down [Figure 167].

   e. The bottom part of the wedge will withdraw from the rear pin slot and the trigger will drop down.

   f. Remove the release tool and return it to a secure position.

   g. Enter the excavator, fasten the seat belt, and start the engine.

Figure 168

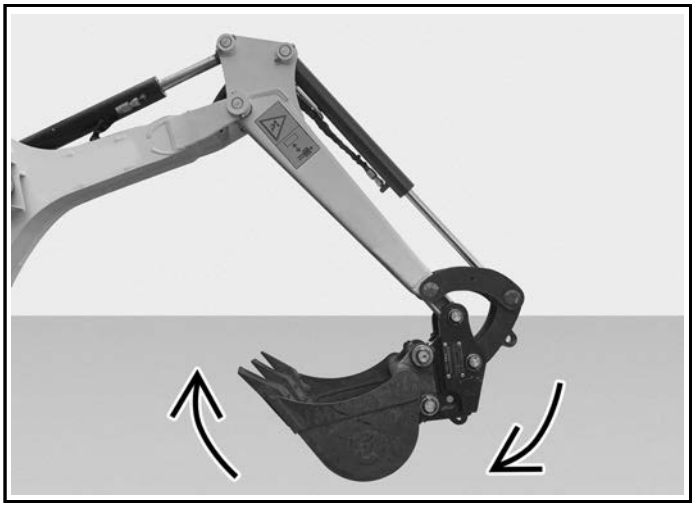


C207447a

4. Guide the coupler front hooks onto the attachment front pin [Figure 168].

5. Raise the boom until there is approximately 500 mm (20 in) of clearance between the bottom of the attachment and the ground.

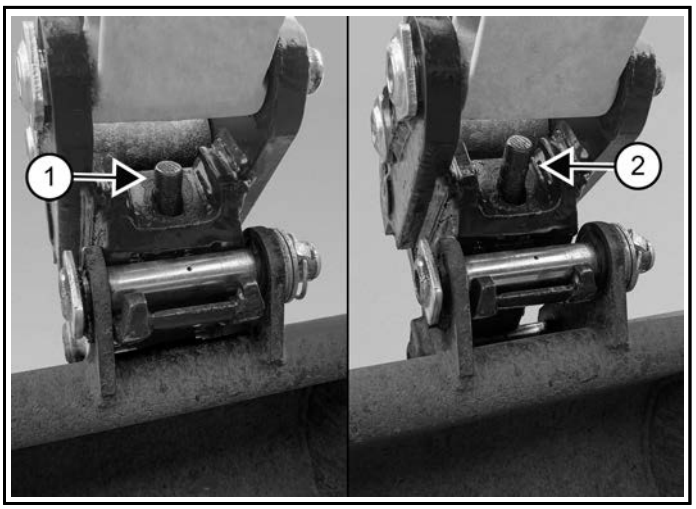
Figure 169



C207741a

6. Extend the bucket cylinder and curl in the bucket [Figure 169] until you hear the wedge engage on the attachment back pin.

Figure 170



C207449b

7. Visually inspect the indication bar to see if the coupler is fully engaged (Item 1) [Figure 170].

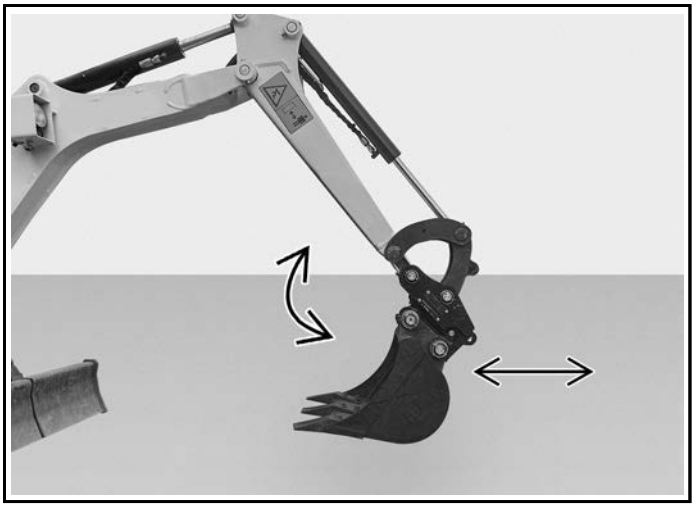
   If the visual indicator bar is not fully engaged (Item 2) [Figure 170], the attachment must not be operated. Turn off the excavator and examine the coupler for dirt build up or damage. Refer to the service manual for further information.

⚠ WARNING

CRUSHING HAZARD
Failure to fully engage quick coupler locking clasps / pins can allow attachment to come off and can cause serious injury or death.
The locking clasps / pins must be fully engaged and locked to the attachment pins.◂

W-3024

Figure 171



C207451a

8. Shake the attachment vigorously and / or carry out a bump test to ensure the attachment is secured to the coupler [Figure 171].

REMOVING ATTACHMENTS (MECHANICAL PIN GRABBER COUPLER)

Removal of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ WARNING

MODIFICATION HAZARD
Unapproved attachments can cause serious injury or death.
Buckets and attachments for safe loads of specified densities are approved for each model. Never use attachments or buckets that are not approved by Bobcat Company.◂

W-2052

⚠ WARNING

ENTANGLEMENT AND IMPACT HAZARD
Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.◂

W-2119

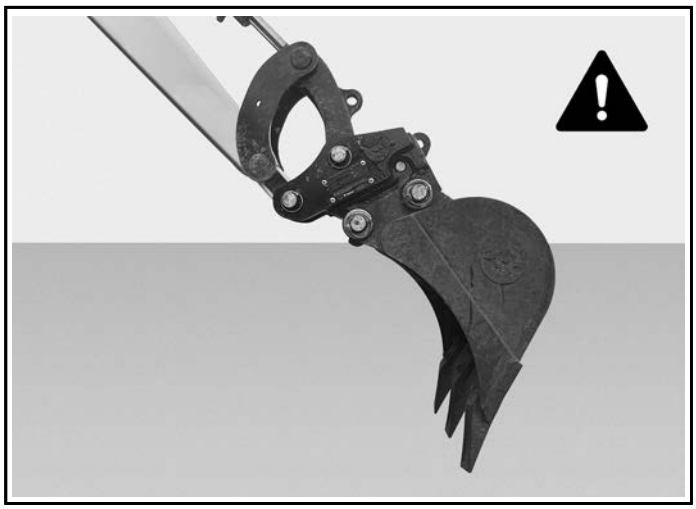
Figure 172

C207452a

1. Position the attachment close to ground level at the angle shown [Figure 172].

   The bucket / attachment pins should be approximately parallel to the ground.

Figure 173



C207453a

DO NOT RELEASE AN ATTACHMENT WITH THE COUPLER CURLED OPEN. [Figure 173]

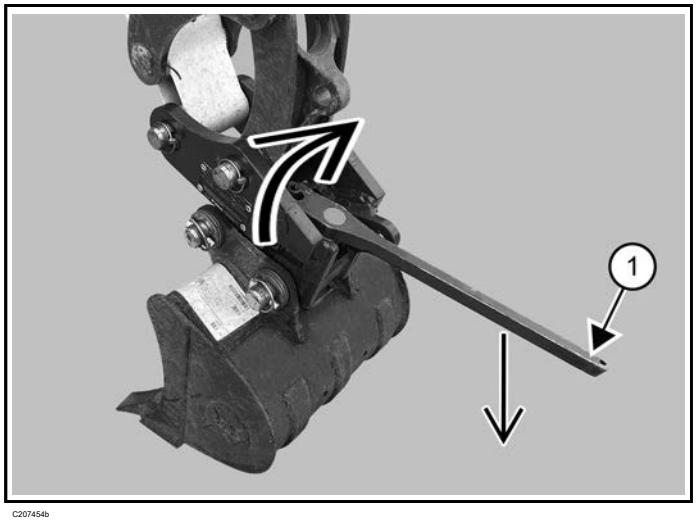
2. Stop the engine and exit the excavator.

⚠ WARNING

PINCHING HAZARD
Failure to follow instructions can cause serious injury.
Keep fingers and hands out of pinch points when latching and unlatching the attachment quick coupler.◂

W-2541

Figure 174



C207454b

3. Firmly insert the release tool (Item 1) [Figure 174].

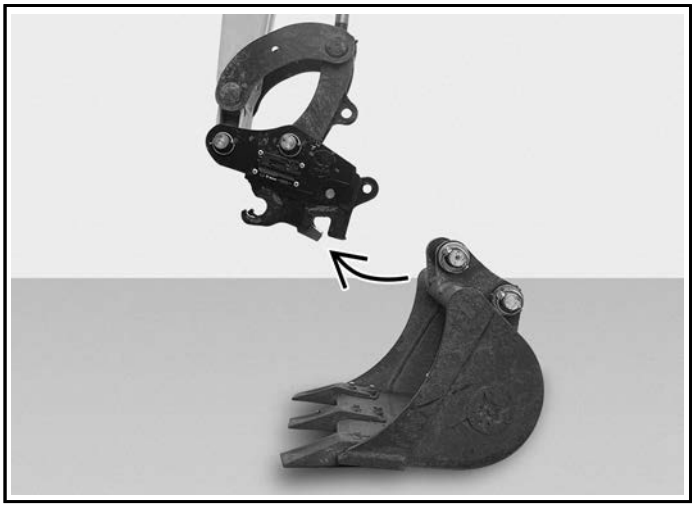
⚠ WARNING

PINCHING HAZARD
Failure to follow instructions can cause serious injury.
Keep fingers and hands out of pinch points when latching and unlatching the attachment quick coupler.◂

W-2541

4. Rotate the release tool clockwise and hold [Figure 174].
5. Press the release tool down against the wedge to disengage the attachment back pin [Figure 174].
6. Remove the release tool and return it to a secure position.
7. Enter the excavator, fasten the seat belt, and start the engine.
8. Lower the attachment to the ground.
9. Roll the coupler back until the coupler disengages from the attachment.

Figure 175



C207447b

10. Move the arm away from the attachment [Figure 175].

INSTALLING ATTACHMENTS (HYDRAULIC QUICK COUPLER)

Installation of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ WARNING

MODIFICATION HAZARD
Unapproved attachments can cause serious injury or death.
Buckets and attachments for safe loads of specified densities are approved for each model. Never use attachments or buckets that are not approved by Bobcat Company.
W-2052

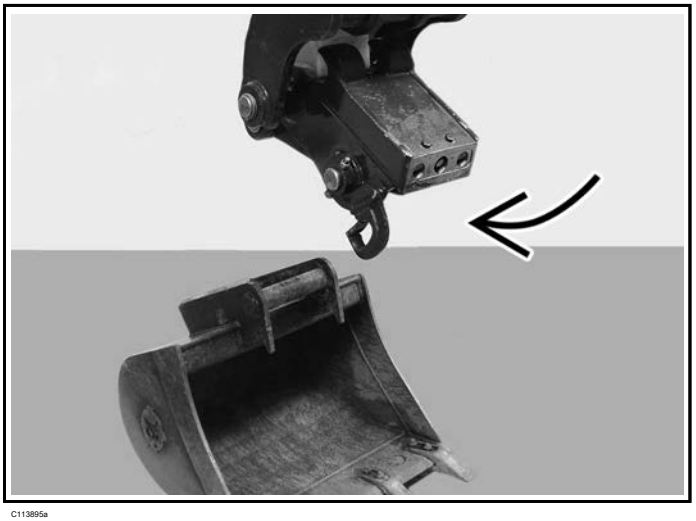
⚠ WARNING

ENTANGLEMENT AND IMPACT HAZARD
Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.
W-2119

A coupler equipped with the lifting device can only be used on machines on which the overload warning device and boom and arm load holding valves are installed. See your Bobcat dealer for available kits.

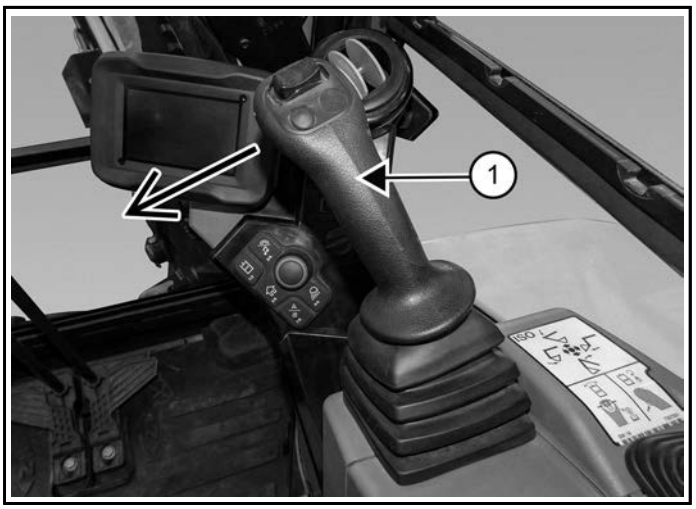
1. Start the engine.
2. If your machine is equipped with a hydraulic clamp, fully retract the hydraulic clamp cylinder so the clamp is out of the way for installing the attachment.

Figure 176


C113895a

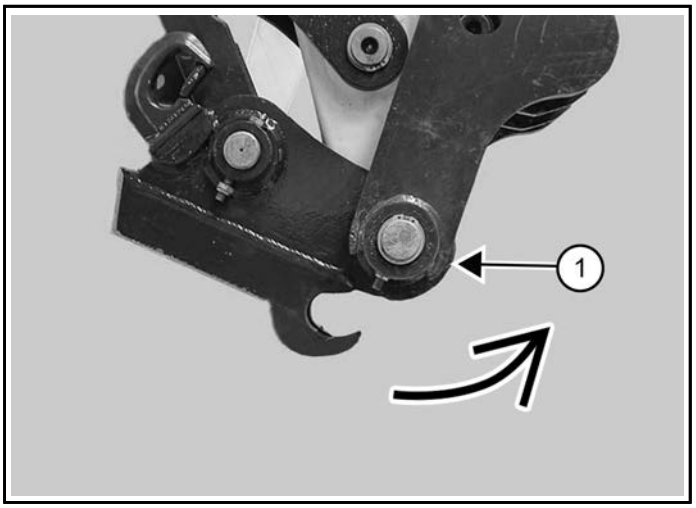
3. Position the arm and quick coupler to the attachment [Figure 176].

Figure 177



C206172e

Figure 178



C113902b

4. Move the right joystick (Item 1) [Figure 177] to the left (in) to curl the coupler (Item 1) [Figure 178] fully in toward the cab.

Figure 179

C208530a

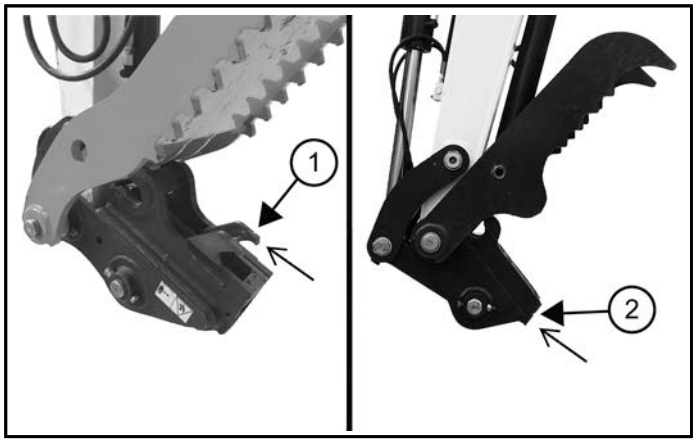
5. Press the Coupler On / Off switch (Item 1) [Figure 179] to the left (on) position to enable the quick coupler feature.

   The switch will illuminate in the on position and a buzzer will sound.

6. Within five seconds after pressing the Coupler On / Off switch (Item 1), press and release the Coupler Intent switch (Item 2) [Figure 179] while continuing to hold the right joystick to the left (in).

   The buzzer will continue to sound and the switch will stay on.

Figure 180



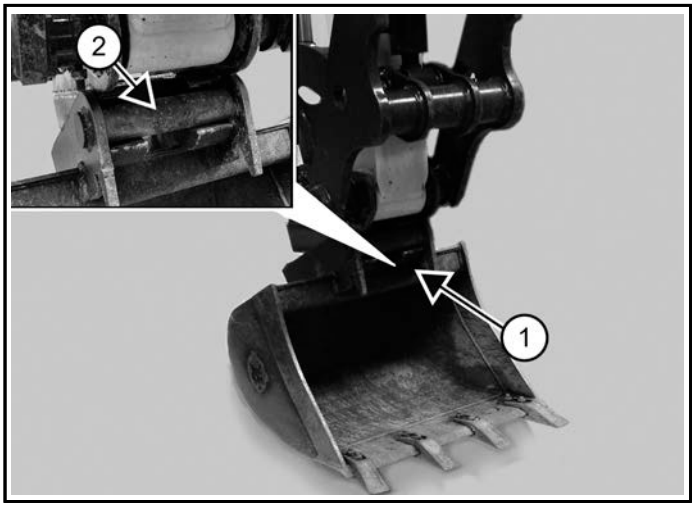
p113904b

7. For the Pin Grabber Coupler – Continue holding the right joystick to the left (in) until the locking clasp (Item 1) [Figure 180] is fully retracted.

   OR

   For the Hydraulic Quick Coupler – Continue holding the right joystick to the left (in) until the pins (Item 2) [Figure 180] are fully retracted.

Figure 181



p113898c

8. Roll the coupler out and move the arm toward the attachment. Position the boom, arm, and coupler so the coupler (Item 1) is positioned over the attachment pin (Item 2) [Figure 181].

9. Raise the attachment up slightly.

Figure 182

C113899

10. Curl the quick coupler in fully [Figure 182].

11. Press the Coupler On / Off switch (Item 1) [Figure 179] to the right, (off) position.

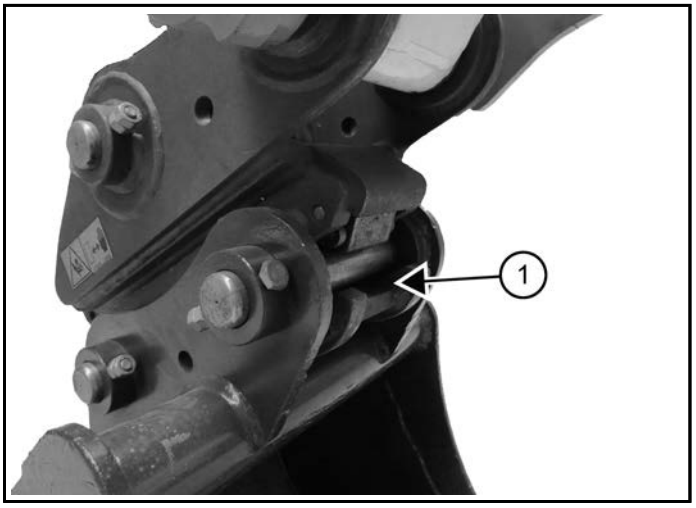
    The switch light and buzzer will turn off.

12. For the Pin Grabber Coupler – Continue to curl the bucket in for an additional 10 seconds to allow the locking clasp to move and lock to the bucket pins.

    OR

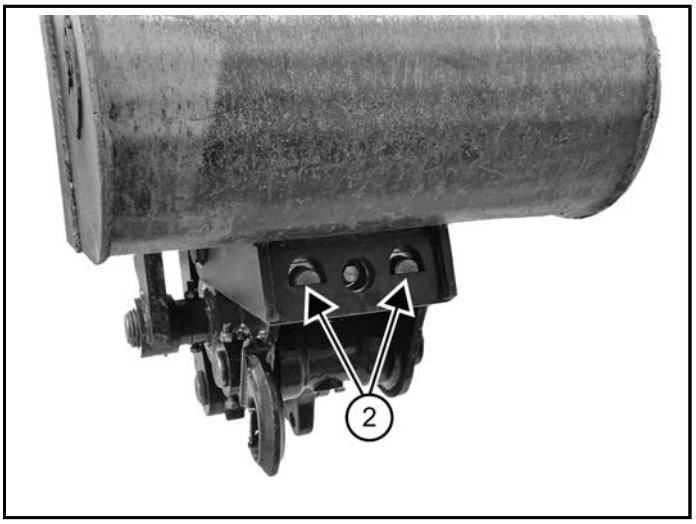
    For the Hydraulic Quick Coupler – The locking pins will extend and engage the attachment mount locking the attachment to the coupler.

Figure 183



C113664a

Figure 184



C113900a

13. For the Pin Grabber Coupler – Visually check that the locking clasp (Item 1) [Figure 183] is fully engaged and locked, securely fastening the attachment to the coupler.

    OR

    For the Hydraulic Quick Coupler – Visually check that the locking pins (Item 2) [Figure 184] are extended through the holes in the attachment mounting frame, securely fastening the attachment to the coupler.

14. With the attachment as low to the ground as possible, curl the attachment out and in several times to ensure the attachment is secured to the coupler.

    If the locking clasps do not engage in the locked position, see your Bobcat dealer for service.

15. Lower the attachment flat to the ground.

⚠ WARNING

CRUSHING HAZARD
Failure to fully engage quick coupler locking clasps / pins can allow attachment to come off and can cause serious injury or death.
The locking clasps / pins must be fully engaged and locked to the attachment pins.
W-3024

The type of quick coupler installed on the excavator may affect the excavator's lift capacity and the availability of attachments.

See the lift capacity decal on your machine for the specific lift capacities of your machine. If this decal is missing or damaged, see your Bobcat dealer.
(See Lift Capacity on Page 107)

See your Bobcat dealer for a list of approved attachments for the type of quick coupler installed on the machine.

REMOVING ATTACHMENTS (HYDRAULIC QUICK COUPLER)

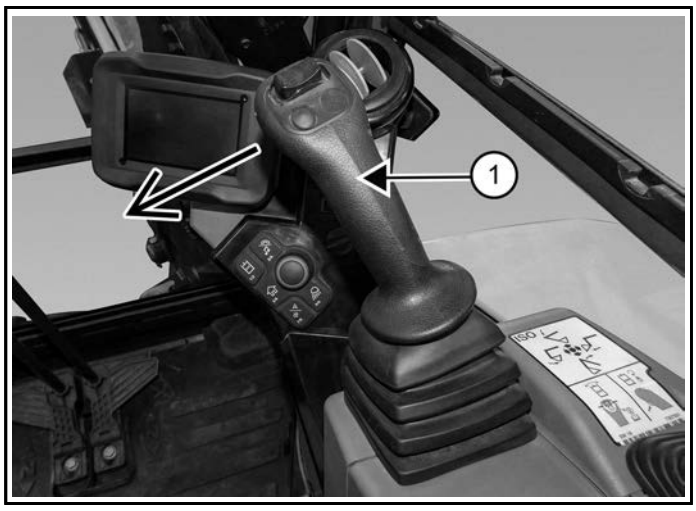
Removal of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ WARNING

ENTANGLEMENT AND IMPACT HAZARD
Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.
W-2119

1. Enter the excavator and start the engine.
2. Raise the attachment slightly off the ground.

Figure 185



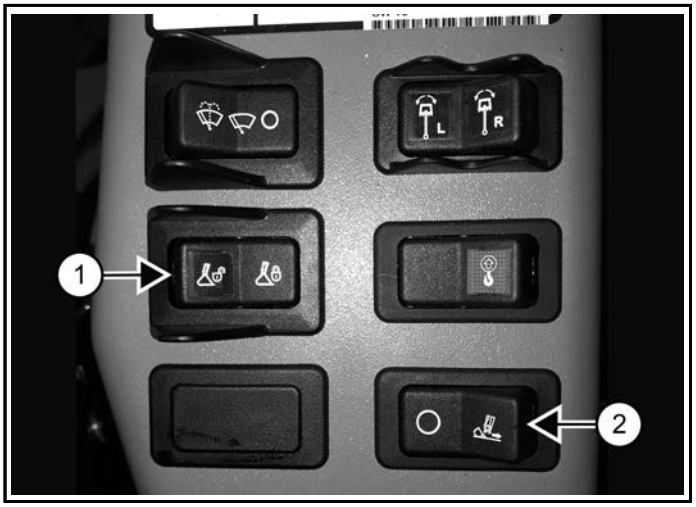
C206172e

Figure 186

C113899

3. Move the right joystick (Item 1) [Figure 185] to the left (in) to curl the coupler fully in toward the cab [Figure 186].

Figure 187



C208530a

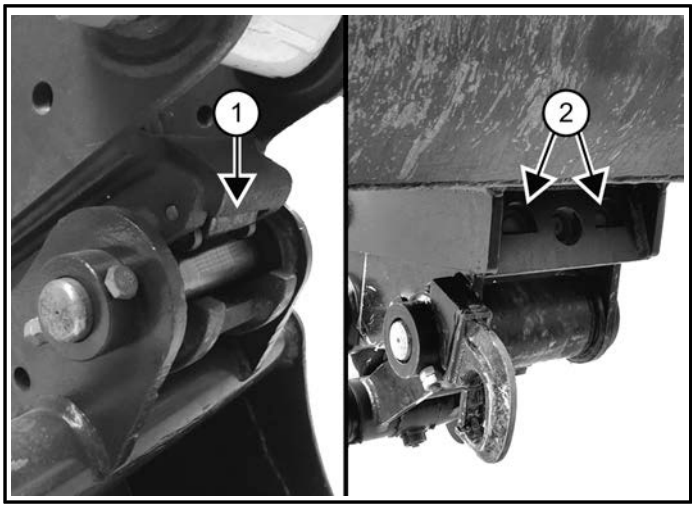
4. Press the Coupler On / Off switch (Item 1) [Figure 187] to the left (on) position to enable the quick coupler feature.

   The switch will illuminate when in the on position and a buzzer will sound.

5. Within five seconds after pressing the Coupler On / Off switch (Item 1) [Figure 187], press and release the Coupler Intent switch (Item 2) [Figure 187] while continuing to hold the right joystick to the left (in).

   The buzzer will continue to sound and the light will stay on.

Figure 188



p113905d

6. For the Pin Grabber Quick Coupler – Continue holding the right joystick to the left (in) until the locking clasp (Item 1) [Figure 188] retracts and unlocks the attachment from the quick coupler.

   OR

   For the Hydraulic Quick Coupler – Continue holding the right joystick to the left (in) until the pins (Item 2)

[Figure 188] are fully retracted to unlock the attachment from the quick coupler.

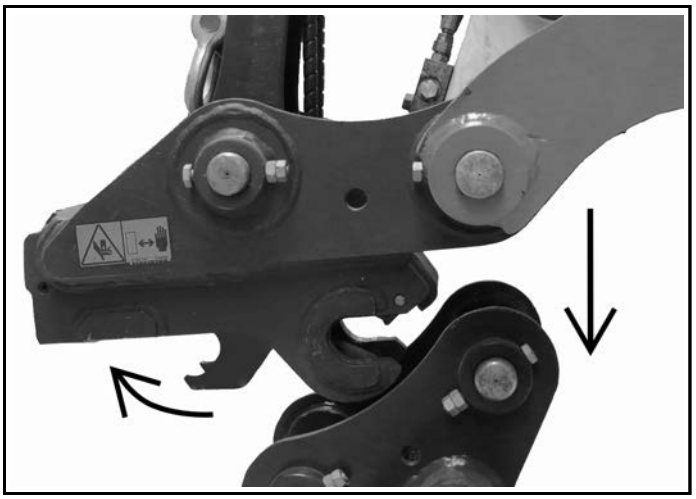
7. With the attachment slightly off the ground, roll the quick coupler back.

   The coupler will start to disengage from the attachment.

8. Roll the quick coupler back fully.

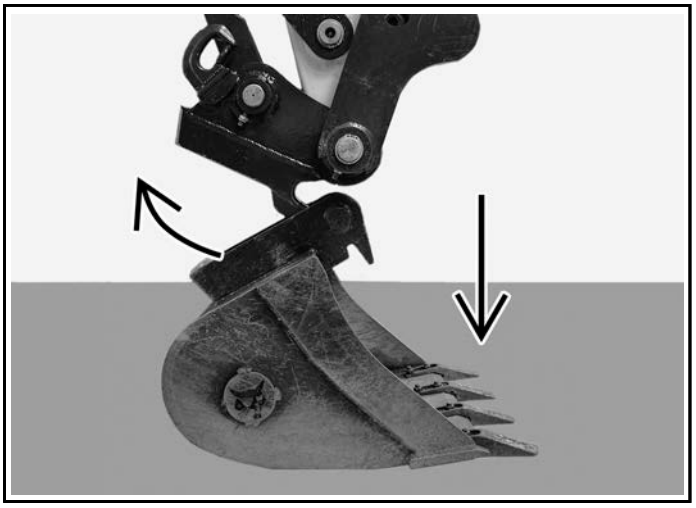
9. Lower the boom and arm until the attachment is on the ground and the quick coupler is disengaged from the attachment pins.

Figure 189



C113666a

Figure 190



p113896b

10. Move the arm away from the excavator until the quick coupler is clear of the attachment [Figure 189] or [Figure 190].

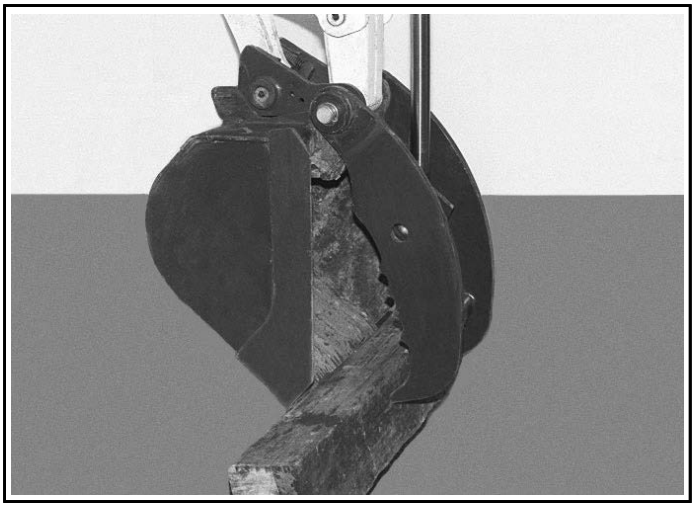
11. Press the Coupler On / Off switch (Item 1) [Figure 187] to the right, (off) position.

    The switch light and buzzer will turn off.

HYDRAULIC CLAMP

Hydraulic Clamp Operation

Figure 191



N15513a

The optional lifting clamp attachment (if equipped) gives the excavator a wider range of use and mobility for debris removal [Figure 191].

The lifting clamp cylinder must be fully retracted when the machine is being used for excavating.

The lift capacities are reduced for machines equipped with the optional lifting clamp.
(See Lift Capacity on Page 107)

⚠ IMPORTANT

MACHINE DAMAGE
Improper use of the clamp, such as prying, will result in clamp damage.
Clamp is for lifting purposes only.

1382-AF18701D

NOTE: Use care when operating the bucket and clamp functions on machines equipped with an attachment mounting system and without a bucket or attachment installed. Cylinder damage can occur due to contact between the attachment mounting system and the clamp when both cylinders are fully extended.

Using Primary Auxiliary Hydraulics To Activate Clamp

1. Engage the primary auxiliary hydraulics by pressing the AUX button on the jog shuttle.

   Set the hydraulics flow to 60 – 70%.
   (See Setting Auxiliary Hydraulics Flow Rate on Page 58) Adjust auxiliary flow as needed for optimal job performance.

Figure 192

P200728d

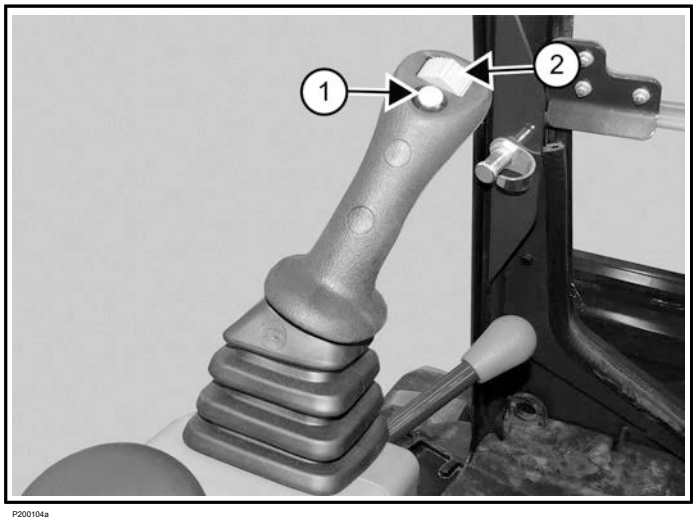
2. Move the switch (Item 1) [Figure 192] on the right joystick to the right to open the clamp.

3. Move the switch (Item 1) [Figure 192] to the left to close the clamp.

Using Secondary Auxiliary Hydraulics to Activate Clamp

1. Engage the secondary auxiliary hydraulics by pressing the AUX button on the jog shuttle.

Figure 193



P200104a

2. Press and hold the button (Item 1) [Figure 193] on the left joystick until a beep is heard to switch from boom swing to secondary auxiliary hydraulics.

3. Move the switch (Item 2) [Figure 193] on the left joystick to the left to open the clamp.

4. Move the switch (Item 2) [Figure 193] on the left joystick to the right to close the clamp.

HANDLING OBJECTS

Do not exceed the Rated Lift Capacity when handling objects.

See the lift capacity decal on your machine for the specific lift capacities of your machine in different configurations. If this decal is missing or damaged, see your Bobcat dealer.
(See Calculating Lift Capacity on Page 107)

⚠ WARNING

INSTABILITY HAZARD
Excessive load can cause tipping or loss of control leading to serious injury or death.
Do not exceed rated lift capacity.

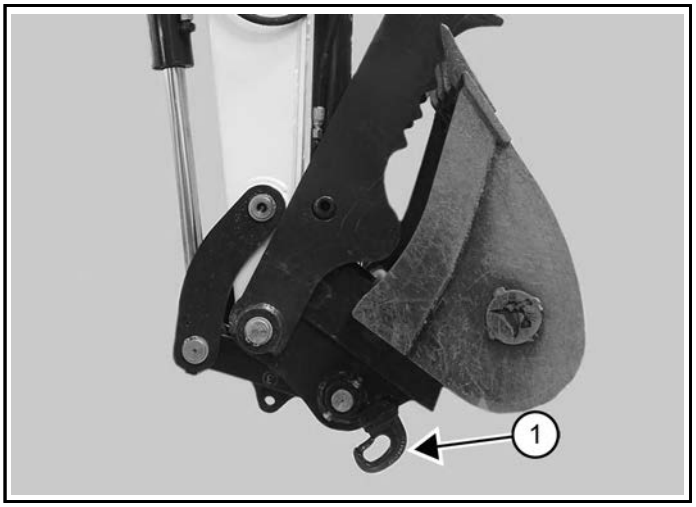
W-2374

Handling Objects With The Lifting Device

The machine must be equipped with a lifting device, boom and arm load hold valves, and the overload warning device. See your Bobcat dealer for available kits.

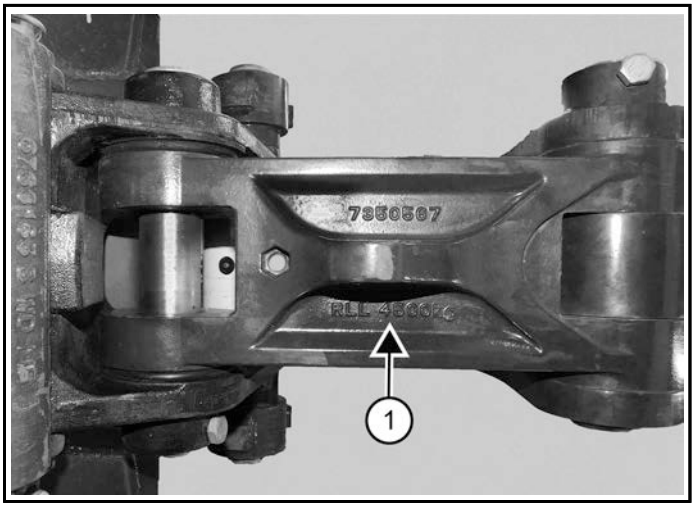
Do not exceed the machine's Rated Lift Capacity or the Rated Lift Load (RLL) of the lifting device (lift eye).

Figure 194



C135343a

Figure 195



P200410a

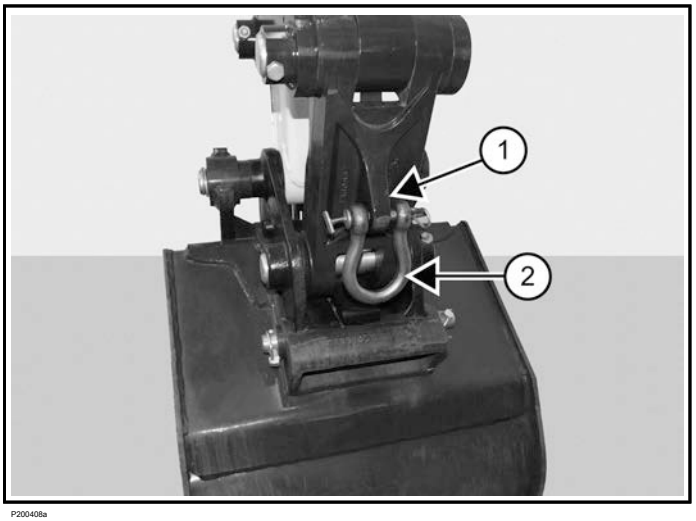
The maximum Rated Lift Capacity is shown on the lifting device (Item 1) [Figure 194] or [Figure 195].

⚠ WARNING

INSTABILITY AND CRUSHING HAZARD
Excessive load can cause tipping, loss of control or failure of the lift eye resulting in serious injury or death.
Do not exceed rated lift capacity.
W-2991

1. Extend the bucket cylinder completely and lower the boom to the ground.
2. Stop the engine and exit the excavator.

Figure 196

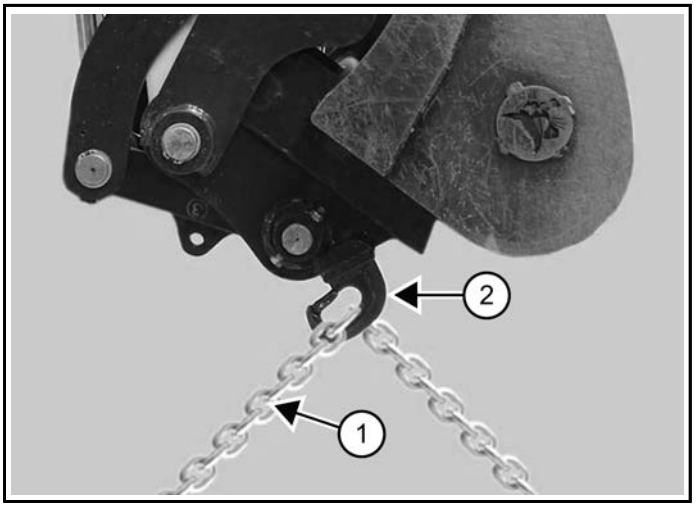


P200408a

3. For clevis lift eyes only, install the clevis (Item 2) through the lift eye (Item 1) [Figure 196].

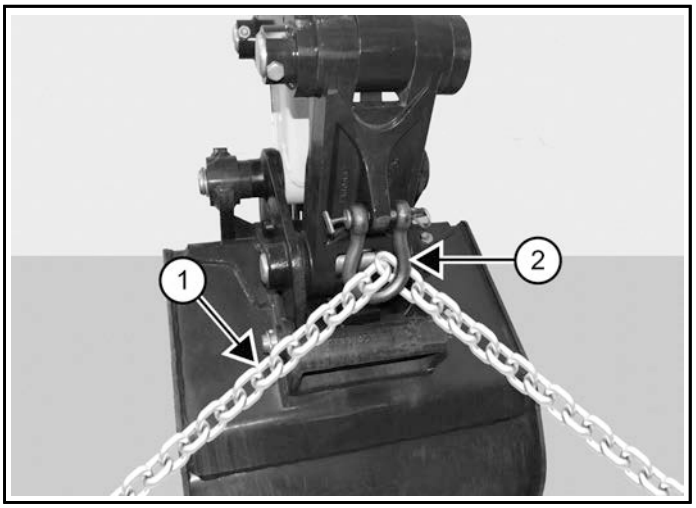
   Visually check the lift eye and secondary lifting system (chain and clevis) for any damage. Replace any damaged components before lifting. See your Bobcat dealer for replacement lift eye and clevis.

Figure 197



C135344a

Figure 198



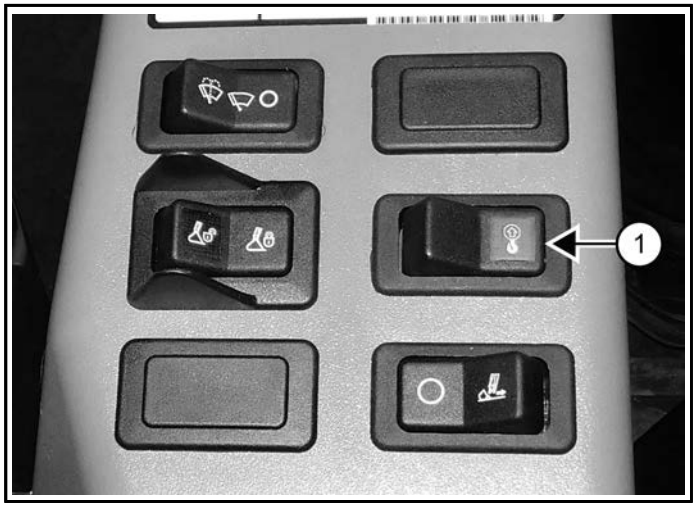
P200407a

4. Install a lift chain (Item 1) (or other type of lifting device) through the lift eye (Item 2) [Figure 197] or clevis (Item 2) [Figure 198] and connect to the object being lifted.

   Always use chains or other types of lifting devices that are intended for this type of use and that are of adequate strength for the object being lifted.

5. Enter the excavator, fasten the seat belt, and start the engine.
   (See Pre-Starting Procedure on Page 75)

Figure 199



C208594b

6. Press the overload warning device switch (Item 1) [Figure 199] on the left console to the left to activate the overload warning device.

Figure 200

P113708

7. Make sure the load is evenly weighted and centred on the lifting chain (or other type of lifting device), and is secured to prevent the load from shifting [Figure 200].

8. Operate the controls slowly and smoothly to avoid suddenly swinging the lifted load.

9. Lift and position the load.

10. When the load is placed in a secured position and tension is removed from the lift chain, remove the chain from the load and from the lifting device.

LIFT CAPACITY

Lift Capacity Description

⚠ WARNING

INSTABILITY AND CRUSHING HAZARD
Excessive load can cause tipping, loss of control or failure of the lift eye resulting in serious injury or death.
Do not exceed rated lift capacity.
W-2991

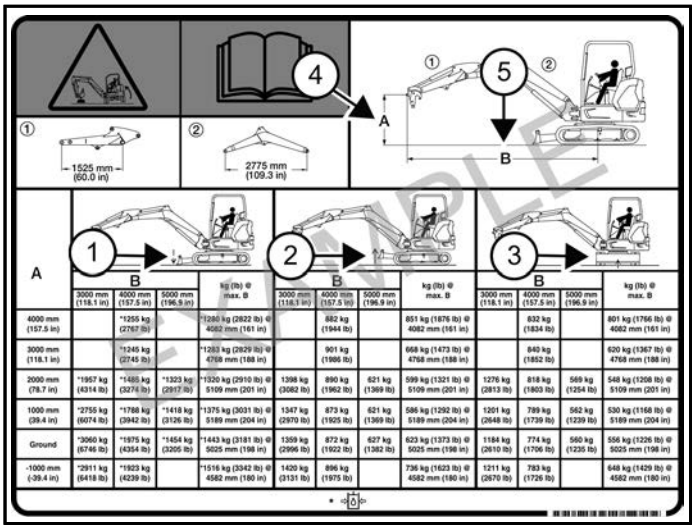
The standard lift capacities listed on the lift capacity decal are calculated for a machine equipped with no attachment mounting system and no attachment.

To obtain the actual lift capacity, subtract the weights of any optional equipment on your machine, such as bucket, coupler, or hydraulic clamp.
(See Calculating Lift Capacity on Page 107)

The weights for attachment mounting systems and hydraulic clamps can be found in documentation, including serial number plates. This manual also contains a list of weights.
(See Attachment Mounting System And Clamp Weights on Page 108)

Calculating Lift Capacity

Figure 201



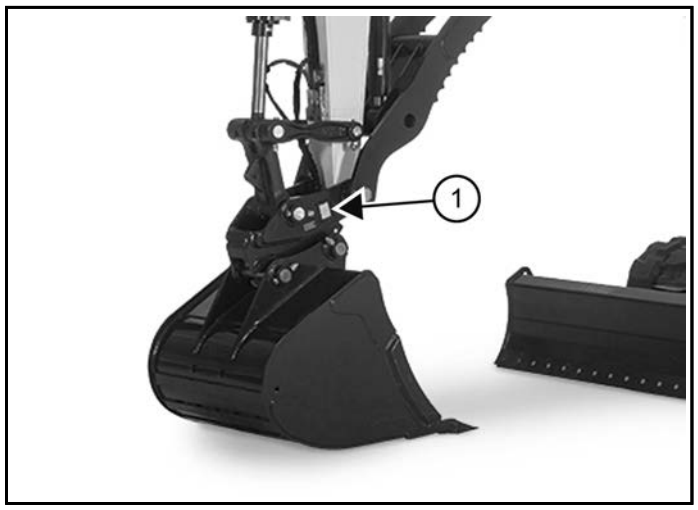
7342843c

1. Find the standard lift capacity for your working conditions on your machine's lift capacity decal [Figure 201].

   Working conditions include:

   - Blade down (Item 1) [Figure 201]
   - Blade Up (Item 2) [Figure 201]
   - Boom Over Tracks (Item 3) [Figure 201]
   - Lift Point Height (A) (Item 4) [Figure 201]
   - Lift Radius (B) (Item 5) [Figure 201]
   - Tracks Expanded / Retracted (not shown here)

Figure 202



C209365b

2. Find the weight of your attachment mounting system, which is printed on the plate as shown here (Item 1) [Figure 201].

3. Calculate the actual lift capacity for your conditions by subtracting the weights of optional equipment from the standard lift capacity on the decal.

   NOTE: For bucket weights, see your Bobcat dealer. For attachment weights, see the attachment Operation & Maintenance Manual. For hydraulic clamp weights, (See Attachment Mounting System And Clamp Weights on Page 108)

   EXAMPLE: Standard lift capacity on decal (1485 kg (3274 lb)) – Attachment Mounting System (30 kg (66 lb)) – Hydraulic Clamp and Cylinder (86 kg (190 lb)) – Bucket (117 kg (258 lb)) = 1252 kg (2760 lb)

Attachment Mounting System And Clamp Weights

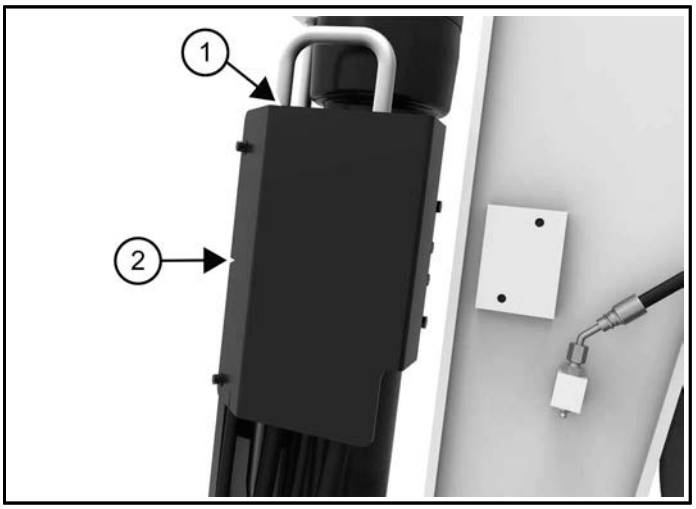
Description	Weight
Hydraulic Clamp and Cylinder	
DX17z, E17, E17z	39 kg (85 lb)
E19, E20, E20z (Pin-On)	29 kg (64 lb)
E19, E20, E20z (Klac™ System)	81 kg (179 lb)
E32, E35	52 kg (114 lb)
E42, E50, E55, E60	97 kg (214 lb)
E50z, E55z, E60 (Europe)	95 kg (210 lb)
E88	166 kg (366 lb)
Pin-On X-Change	
E32, E35	14 kg (30 lb)
E42, E50, E60	58 kg (128 lb)

BOOM LOAD HOLDING VALVE

Location Of Boom Load Holding Valve

The boom load holding valve (if equipped) will hold the boom in its current position in the event of hydraulic pressure loss.

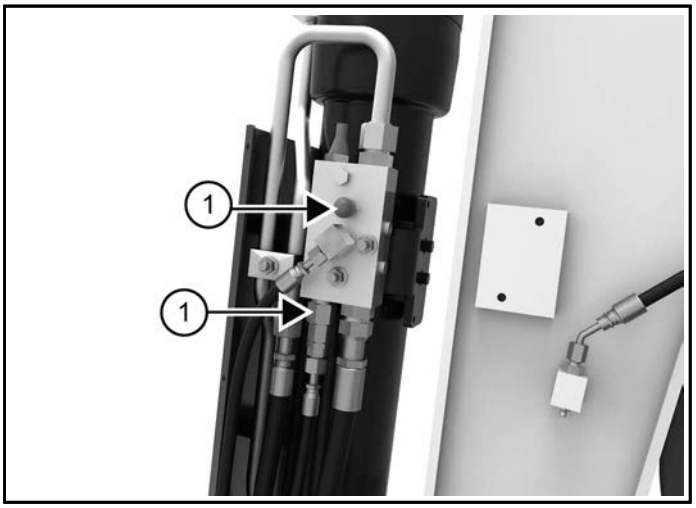
Figure 203



P132112a

If the excavator is equipped with a boom load holding valve (Item 1) [Figure 203], it will be attached to the boom cylinder at the base end.

Figure 204



P132113a

NOTE: The cover (Item 2) [Figure 203] is removed for photo clarity in [Figure 204].

Do not remove or adjust the two valves (Item 1) [Figure 204]. If these valves have been tampered with, see your Bobcat dealer for service.

⚠ WARNING

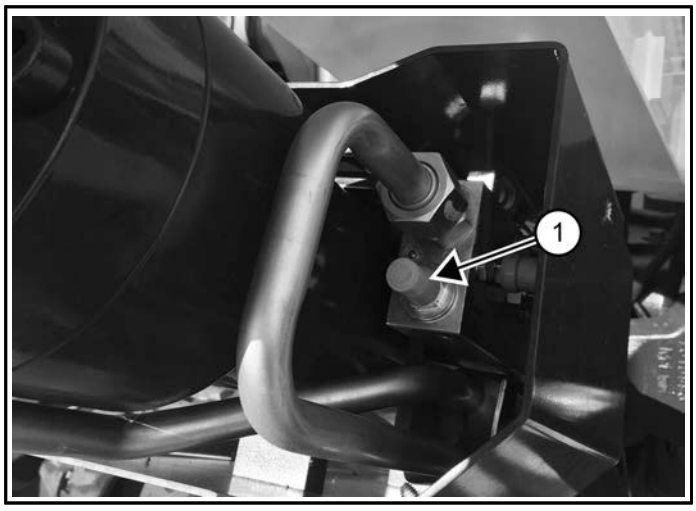
CRUSHING HAZARD
Falling equipment can cause serious injury or death.
DO NOT work or stand under raised work equipment or attachment.
W-2793

Lowering Boom With Load Holding Valve With Base End Hose Failure

NOTE: If possible, first remove the load from the work group and support the boom before proceeding.

1. Place a container under the valve and base end hose to catch any hydraulic fluid that is leaking.

Figure 205



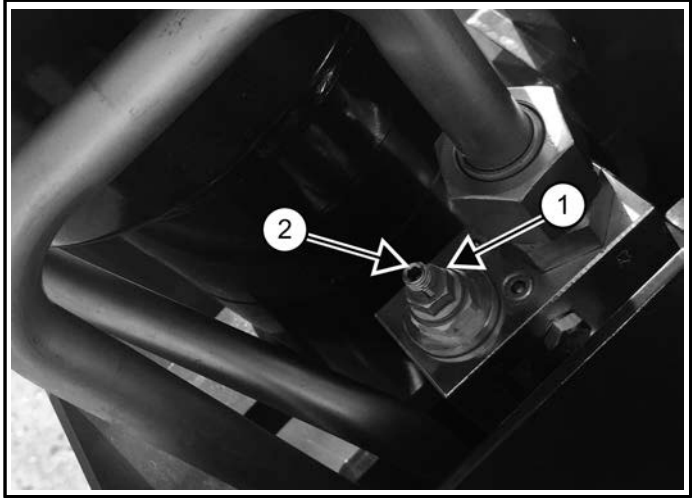
P132108a

2. Remove the plastic cap (Item 1) [Figure 205] from the valve.

⚠ WARNING

BURN HAZARD
Hydraulic fluid, tubes, fittings and quick couplers can get hot when running machine and attachments.
Be careful when connecting and disconnecting quick couplers.
W-2220

Figure 206



P132109a

3. Loosen the locknut (Item 1) [Figure 206].

4. Install a hex wrench into the valve screw (Item 2) [Figure 206] and slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the boom to lower to the ground.

5. After the boom is fully lowered, rotate the screw (Item 2) counterclockwise 1/8 to 1/4 turn and tighten the locknut (Item 1) [Figure 206].

Lowering Boom With Load Holding Valve With Rod End Hose Failure – With Accumulator Pressure

NOTE: If possible, first remove the load from the work group and support the boom before proceeding.

1. Place a container under the valve and hose end to catch any hydraulic fluid that is leaking.

2. Enter the excavator and turn the key on.

   Do not start the engine.

3. Lower the left console.

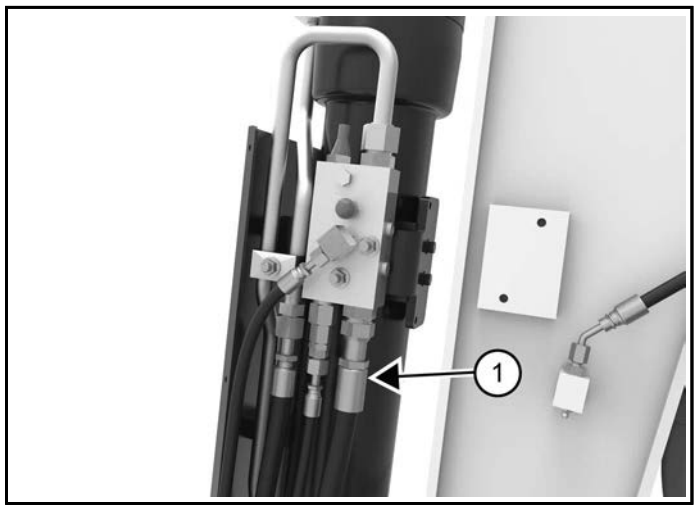
4. Slowly move the joystick boom lower function to lower the boom to the ground.

Lowering Boom With Load Holding Valve With Rod End Hose Failure And No Accumulator Pressure Or Loss Of Hydraulic Pressure

NOTE: If possible, first remove the load from the work group and support the boom before proceeding.

1. Place a container under the valve and rod end hose to catch any hydraulic fluid that is leaking.

Figure 207



C132113b

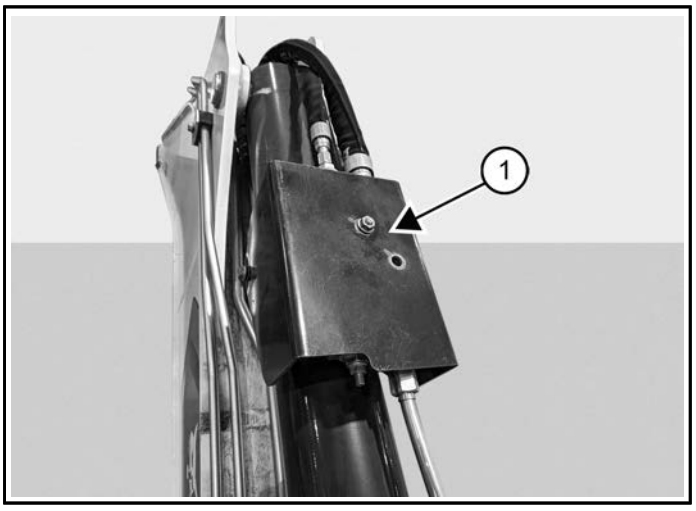
2. Remove the boom base end hose (Item 1) [Figure 207] from the boom load holding valve.
3. Loosen the locknut (Item 1) [Figure 206].
4. Install a hex wrench into the valve screw (Item 2) [Figure 206].
5. Slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the boom to lower to the ground.
6. After the boom is fully lowered, rotate the screw (Item 2) [Figure 206] counterclockwise 1/8 to 1/4 turn and tighten the locknut (Item 1) [Figure 206].
7. Reinstall the base end hose.

ARM LOAD HOLDING VALVE

Location Of Arm Load Holding Valve

The arm load holding valve (if equipped) will hold the arm in its current position in the event of hydraulic pressure loss.

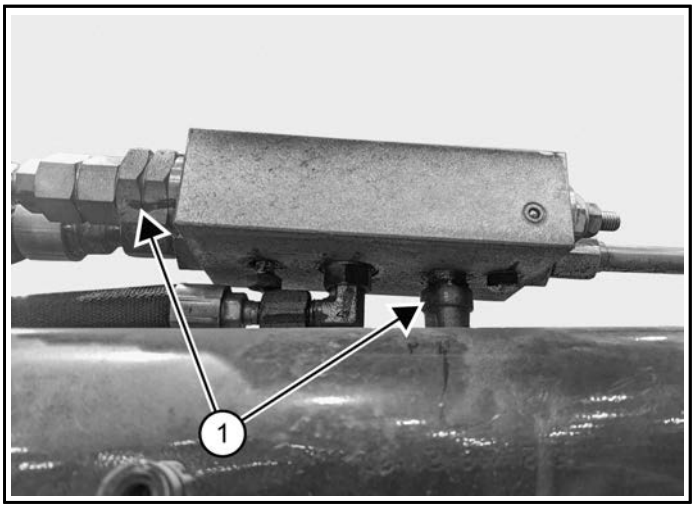
Figure 208



C206633a

If the excavator is equipped with an arm load holding valve (Item 1) [Figure 208], it will be attached to the arm cylinder base end as shown.

Figure 209



C206634a

Do not remove or adjust the two port relief valves (Item 1) [Figure 209]. If the port relief valves have been tampered with, see your Bobcat dealer for service.

⚠ WARNING

CRUSHING HAZARD
Falling equipment can cause serious injury or death. DO NOT work or stand under raised work equipment or attachment.

W-2793

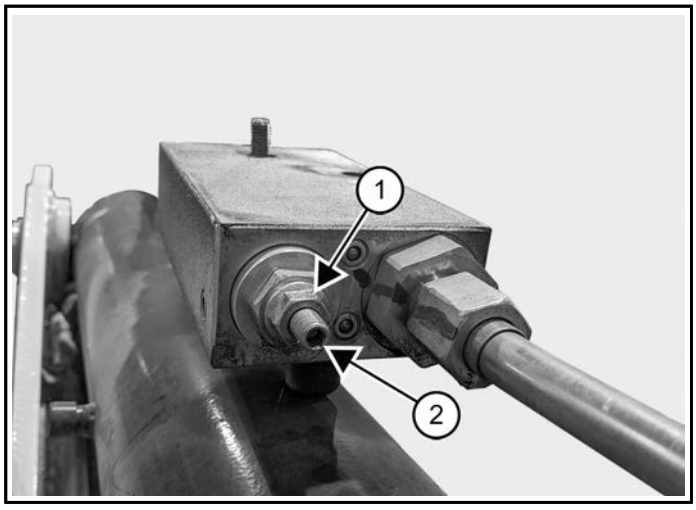
Lowering Arm with Load Holding Valve With Base End Hose Failure

1. Place a container under the valve and hose end to catch any hydraulic fluid that is leaking.

⚠ WARNING

BURN HAZARD
Hydraulic fluid, tubes, fittings and quick couplers can get hot when running machine and attachments.
Be careful when connecting and disconnecting quick couplers.
W-2220

Figure 210



C206635a

2. Loosen the locknut (Item 1) [Figure 210].
3. Install a hex wrench into the valve screw (Item 2) [Figure 210].
4. Slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the arm to lower.
5. After the arm is lowered, rotate the screw (Item 2) [Figure 210] counterclockwise the same 1/8 to 1/4 turn.
6. Tighten the locknut (Item 1) [Figure 210].

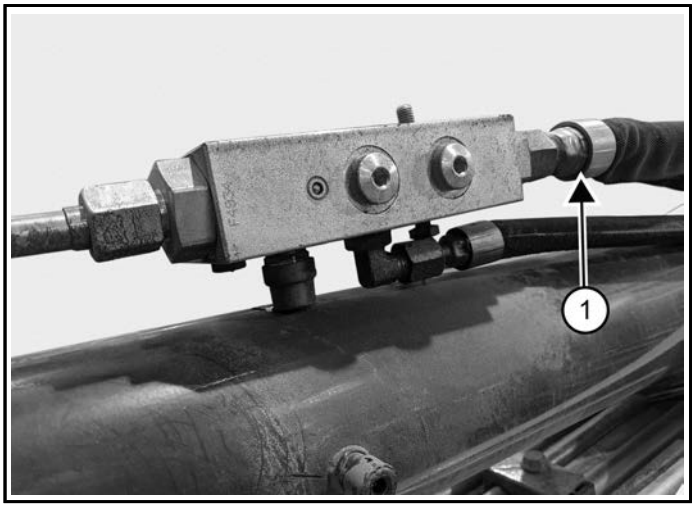
Lowering Arm With Load Holding Valve With Rod End Hose Failure – With Accumulator Pressure

1. Place a container under the valve and hose end to catch any hydraulic fluid that is leaking.
2. Enter the excavator and turn the key on.

   Do not start the engine.
3. Lower the left console.
4. Slowly move the joystick arm retract function to lower the arm.

Lowering Arm With Rod End Hose Failure And No Accumulator Pressure Or Loss Of Hydraulic Pressure

Figure 211



C206636

1. Remove the arm end hose (Item 1) [Figure 211] from the arm load holding valve.
2. Place a container under the valve and base end hose to catch any hydraulic fluid that is leaking.
3. Loosen the locknut (Item 1) [Figure 210].
4. Install a hex wrench into the valve screw (Item 2) [Figure 210].
5. Slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the arm to lower.
6. After the arm is lowered, rotate the screw (Item 2) [Figure 210] counterclockwise 1/8 to 1/4 turn.
7. Tighten the locknut (Item 1) [Figure 210].
8. Reinstall the base end hose.

DEPTH CHECK (STANDARD DISPLAY)

Depth Check Description

⚠ WARNING

INHALATION HAZARD
Exhaust fumes contain odorless, invisible gases that can kill without warning.
Fresh air must be added to avoid concentration of exhaust fumes when an engine is running in an enclosed area. If the engine is stationary, vent the exhaust outside.
W-2050

The Depth Check system provides audible and visual guidance to achieve and / or sustain a user-assigned depth target. Depth Check will display the vertical position of the bucket tip based on your initial starting point or bench point.

When the Depth Check kit was initially installed, the setup / calibration procedure should have been performed. But with usage of any attachment, the components and the cutting surfaces wear. The accuracy of the Depth Check system is affected by the wear of these components. If loss of accuracy is noticed, re-calibrate the attachment to reset the dimensions needed for the Depth Check system to operate correctly.

Two magnetic mounted tools are included with the kit for positioning the boom, arm, and bucket for calibration. These magnetic tools must be kept with the machine, as the Depth Check system should be re-calibrated on a yearly basis or sooner if slight changes in accuracy are noticed.

The Depth Check system sensors are designed for high angle stability and temperature ranges. However, with the use of any mechanical components (boom, arm, bucket, etc.), there is wear on the components and this will affect the accuracy of the Depth Check system over time. Also, if any structural changes are made, components replaced, or a new attachment is installed on the excavator, the setup / calibration procedure must be performed again.

The calibration procedure is a two-person task. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine. Make sure the second person is away from the machine when moving any of the work group components (boom, arm, bucket, etc.).

See the correct section for the type of screen equipped on your machine.
(See Depth Check (Standard Display) on Page 112)
(See Depth Check (Touch Display) on Page 125)

NOTE: The machine shown in the photos may be different than your machine and this manual, but the procedure is the same for all models.

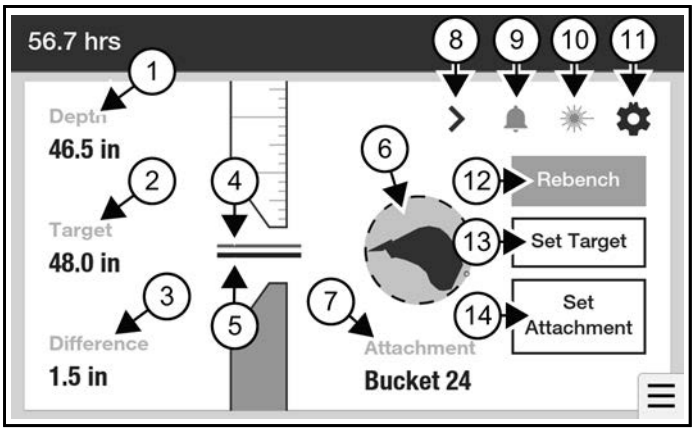
⚠ WARNING

GENERAL HAZARD
Contact with equipment can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.
W-2268

Depth Check Screen

Access the **DEPTH CHECK** screen by selecting **[NAVIGATION HANDLE]→ [DEPTH CHECK]**.

Figure 212



NA3915b

REF.	DESC.	FUNCTION
1	Depth (Dimension)	The current depth of the attachment cutting edge.
2	Target (Dimension)	Depth to dig from an established starting point set by the operator. (Example: Desired dig depth from a surveyor's elevation pin.)
3	Difference (Dimension)	The difference between the current depth and the target depth.
4	Depth (Bar Graph)	Moves up and down to show the position of the attachment to the target.
5	Target (Bar Graph)	Shows where the target is in relationship to the attachment position.
6	Attachment Rotation	A bucket is used to represent the attachment. The bucket image will rotate to represent the position of the attachment as the attachment is curled out or curled in.
7	Attachment	Displays currently selected attachment.

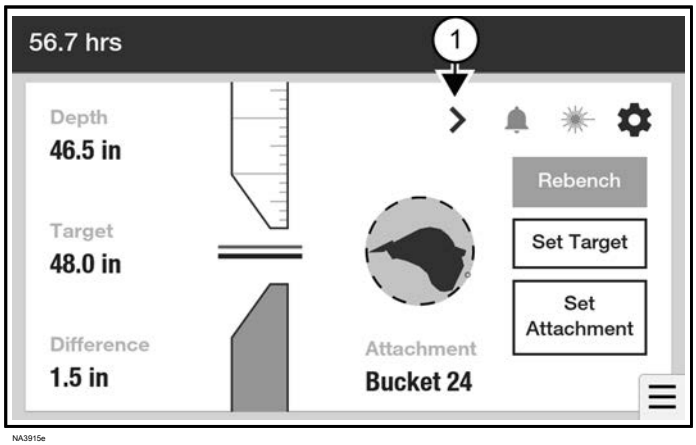
REF.	DESC.	FUNCTION
8	Arrow	Used to move between depth check screens. (See Changing The Depth Check Screen on Page 113)
9	Alarm	Turns target depth alarm on / off. (See Setting The Warning Zone on Page 120)
10	Laser	Accesses **LASER SETUP** screen where you can add the laser position dimension or turn the laser on / off. When laser is on, the icon is illuminated. (See Setting Up A Laser With Depth Check on Page 123)
11	Depth Check Settings	Accesses **DEPTH CHECK SETTINGS** screen.
12	Rebench	Press to Rebench. (See Digging To A Target Depth on Page 121)
13	Set Target	Accesses **SET TARGET DEPTH** screen. (See Setting Target Depth on Page 119)
14	Set Attachment	Accesses **SET ATTACHMENT** screen.

Changing The Depth Check Screen

There are two **DEPTH CHECK** screens:

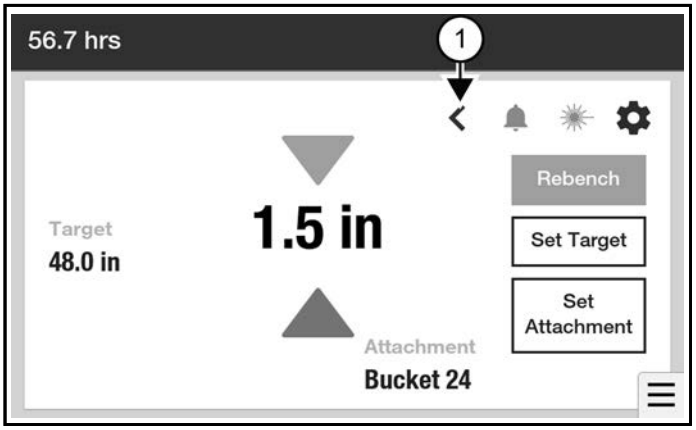
- Dig Depth [Figure 213]
- Distance to Target [Figure 214]

Figure 213



NA3915e

Figure 214



NA3914a

Press the arrow (Item 1) [Figure 213] [Figure 214] to toggle between these two screens at any time.

Calibrating The Boom

The following items are needed to complete this task:

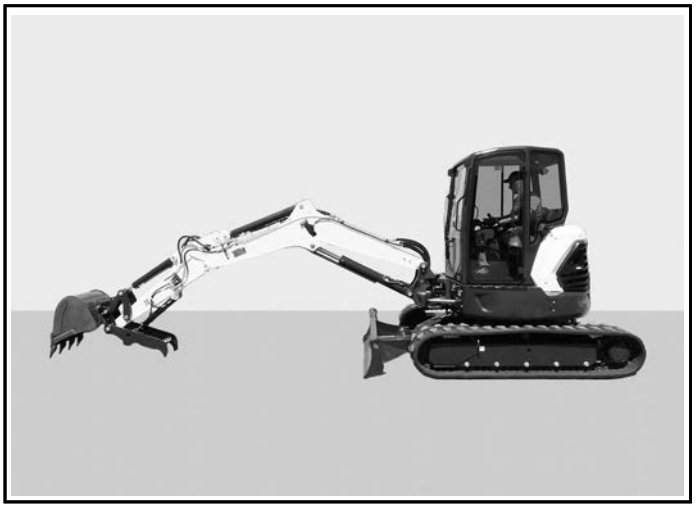
- Tape measure.
- Two magnetic tools that are included with the kit.

The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

NOTE: The owner password is needed to access the Setup and Calibration settings.

1. Move the machine to an open area where the boom and arm can be repositioned and there is fresh air, as you will need to operate the engine during this procedure.
2. Park the machine on a flat, level surface.

Figure 215

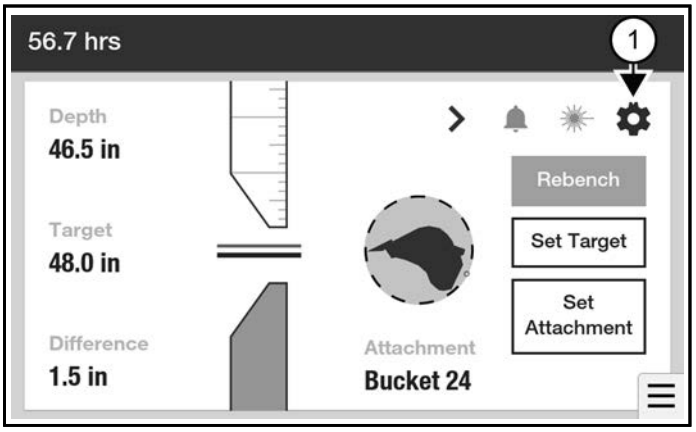


C200403a

3. Position the excavator with the bucket fully rolled out and the arm fully extended [Figure 215].

4. On the standard display select **[NAVIGATION HANDLE]→ [DEPTH CHECK]**.

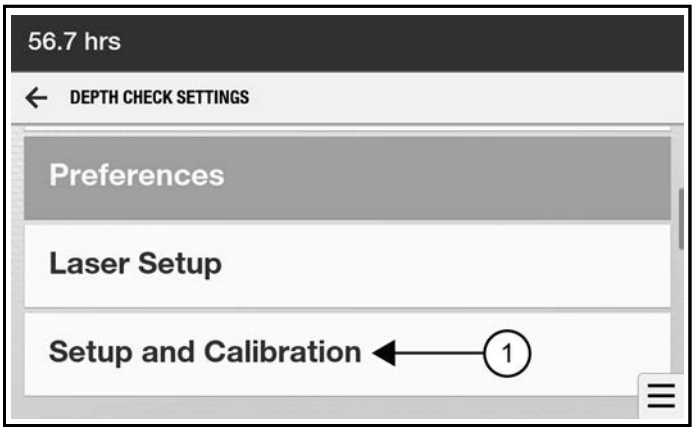
Figure 216



NA3915a

5. Select the Settings icon (Item 1) [Figure 216].

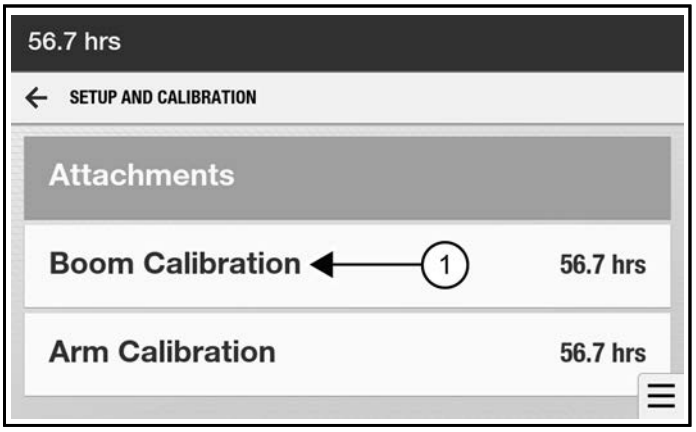
Figure 217



NA3921a

6. Select **[SETUP AND CALIBRATION]** (Item 1) [Figure 217].

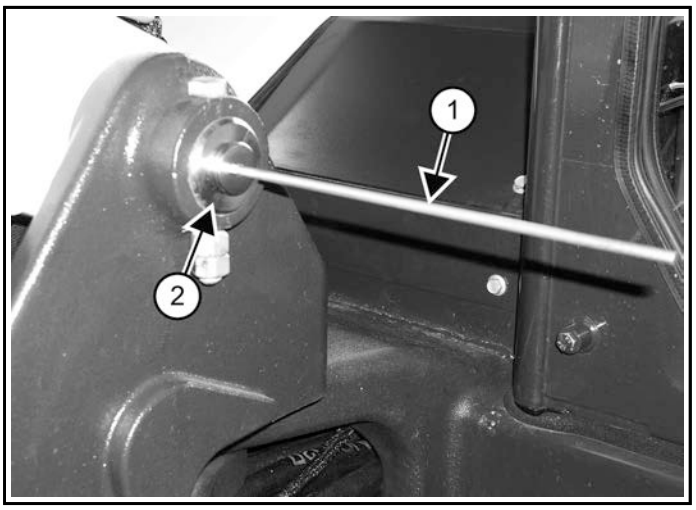
Figure 218



NA3923c

7. Select **[BOOM CALIBRATION]** (Item 1) [Figure 218].

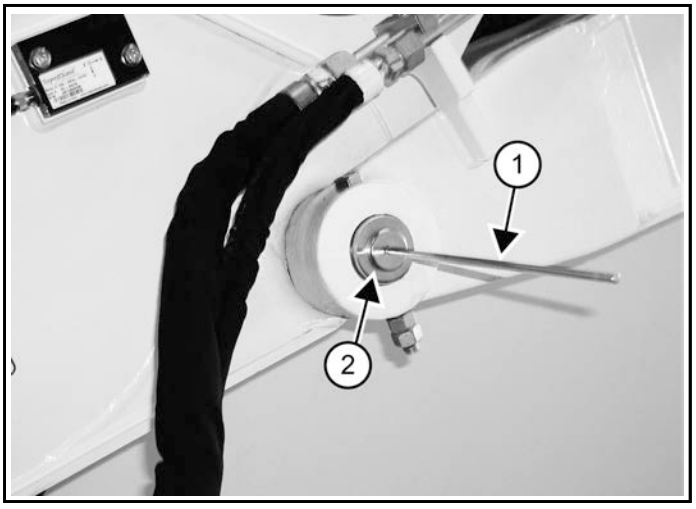
Figure 219



P131855a

8. Install one of the magnetic tools (Item 1) on the boom pivot pin (Item 2) [Figure 219]. Position the magnetic tool as close as possible to the centre of the boom pivot pin.

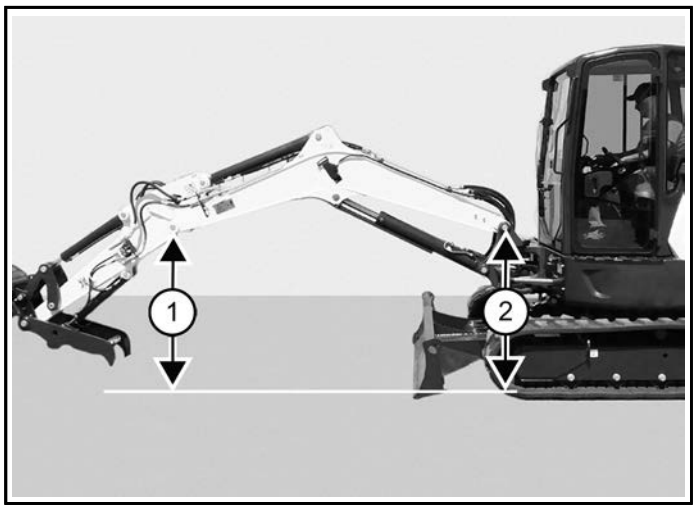
Figure 220



P131856a

9. Install the second magnetic tool (Item 1) on the arm pivot pin (Item 2) [Figure 220]. Position the magnetic tool as close as possible to the centre of the arm pin.

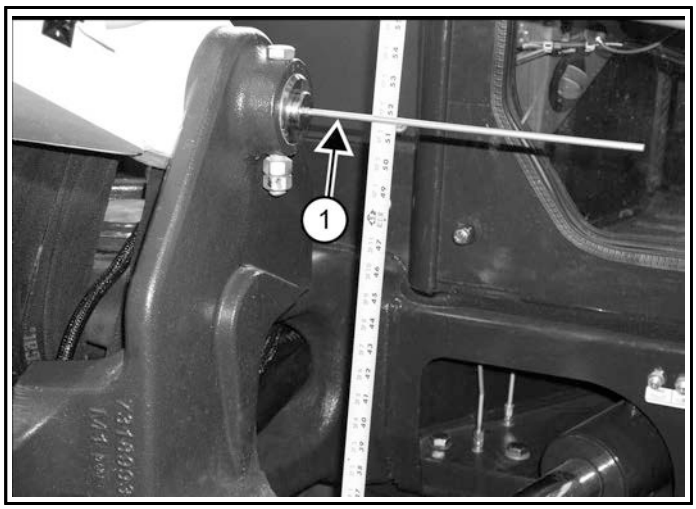
Figure 221



C200403b

10. Position the work group so the distance from the ground to the two magnetic sensors (Items 1 and 2) [Figure 221] is identical.

Figure 222

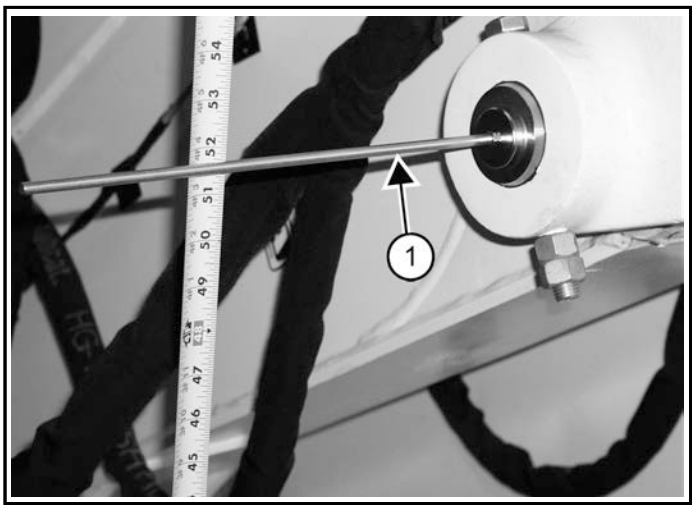


P131857a

11. Measure the distance from the centre of the boom magnetic tool (Item 1) [Figure 222] to the ground.

    Measure as close to the boom as possible without interference from components between the boom and the ground. The closer to the boom the measurement is taken, the more accurate the measurement should be. You can also use a laser level to locate the centerlines of the magnetic tools as this will eliminate any possible variation in the measurements to the ground.

Figure 223



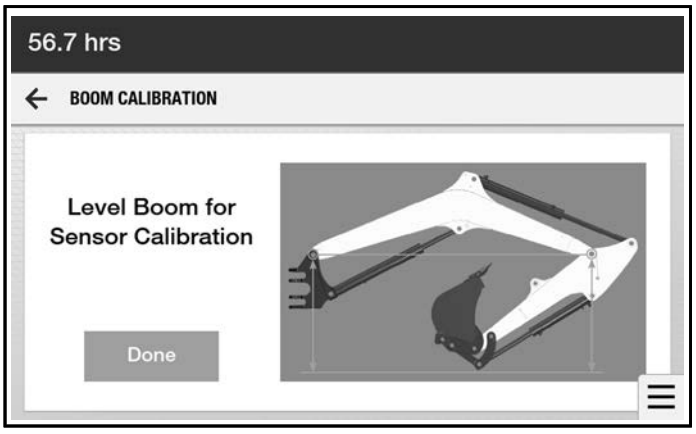
P131858a

12. Measure the distance from the centre of the arm magnetic tool (Item 1) [Figure 223] to the ground.

13. Adjust the boom up or down as needed and remeasure until both distances are the same.

    NOTE: Make sure there is no cylinder drift that could affect the calibration accuracy. The person in the cab needs to enter the information into the display in a timely manner.

Figure 224



NA3910

14. Follow the instructions on the screen and select **[DONE]** [Figure 224].

15. Proceed to calibrating the arm.
    (See Calibrating The Arm on Page 115)

Calibrating The Arm

The following items are needed to complete this task:

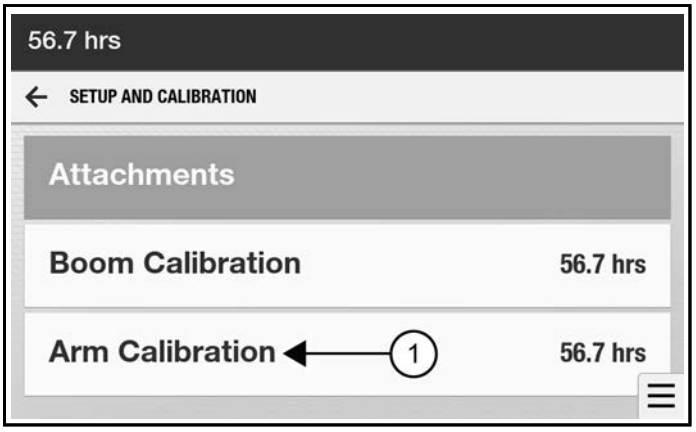
- Plumb bob.
- Magnetic tool that is included with the kit.

The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

NOTE: The owner password is needed to access the Setup and Calibration settings.

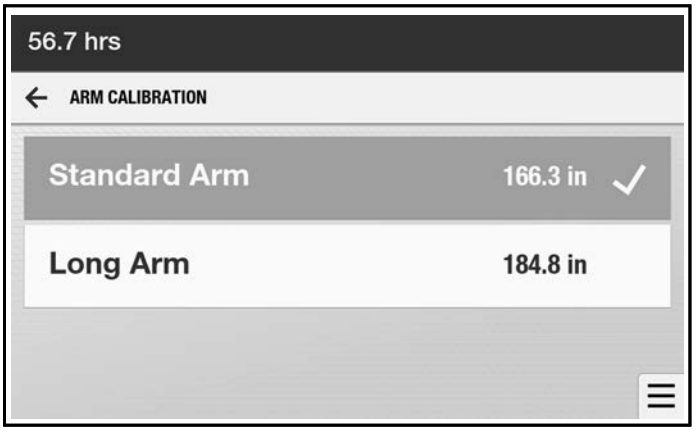
1. Select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SETTINGS]→ [SETUP AND CALIBRATION]**.

Figure 225



2. Select **[ARM CALIBRATION]** (Item 1) [Figure 225].

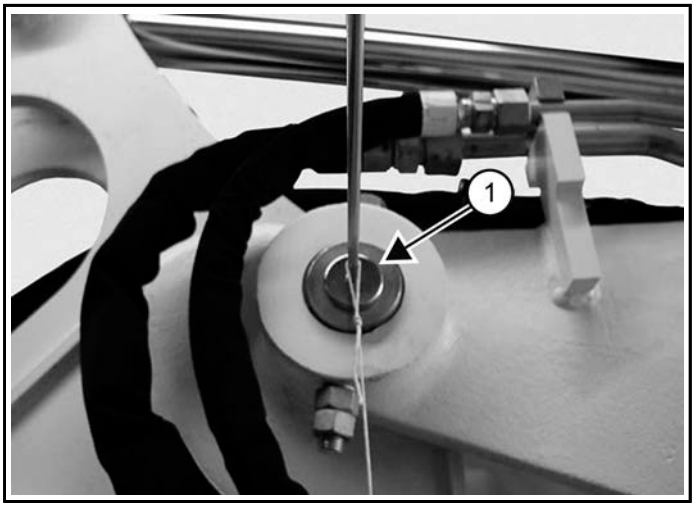
Figure 226



3. Select the arm that your machine is equipped with [Figure 226].

   NOTE: Some models only have one arm option available.

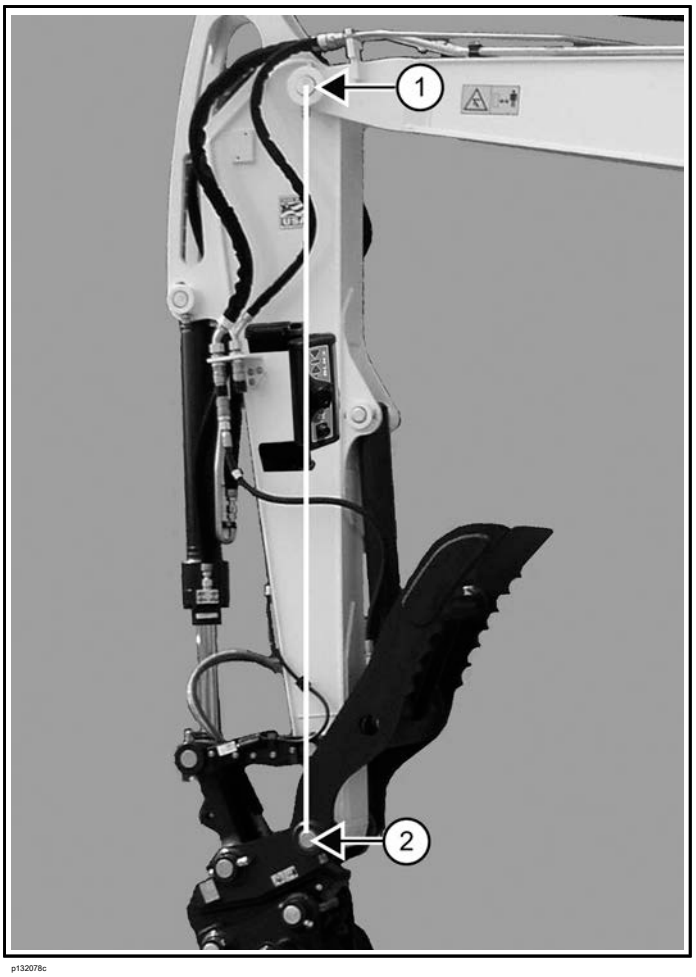
Figure 227



4. Install the magnetic tool on the arm pin (Item 1) [Figure 227].

5. Place the plumb bob on the magnetic tool that is installed on the arm pin (Item 1) [Figure 227].

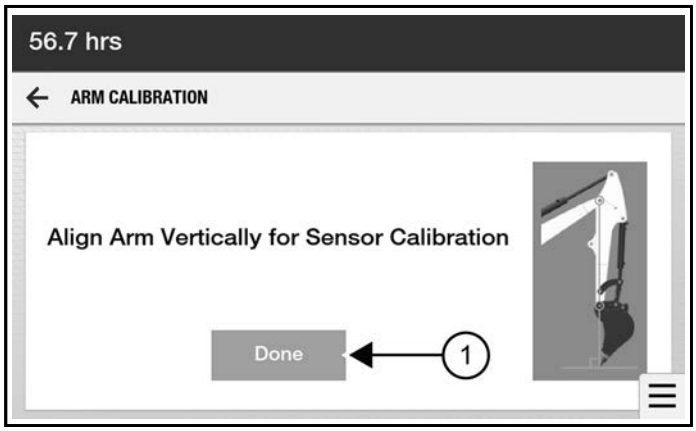
Figure 228



6. Move the arm until the plumb bob line (Item 1) is centred on the pivoting bucket pin (Item 2) [Figure 228].

   The accuracy of the arm being vertical affects the accuracy of the Depth Check system.

Figure 229



7. With the arm vertical, select **[DONE]** (Item 1) [Figure 229] to store this information.

8. Proceed to calibrating the attachment. (See Calibrating The Attachment on Page 117)

Calibrating The Attachment

The following items are needed to complete this task:

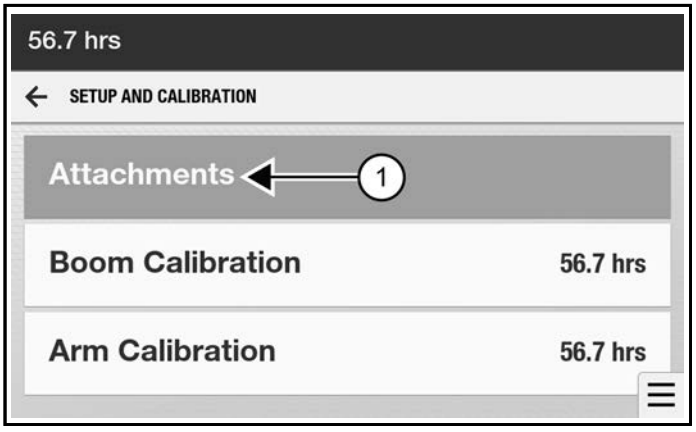
- Tape measure.
- Magnetic tool that is included with the kit.

The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

NOTE: The owner password is needed to access the Setup and Calibration settings.

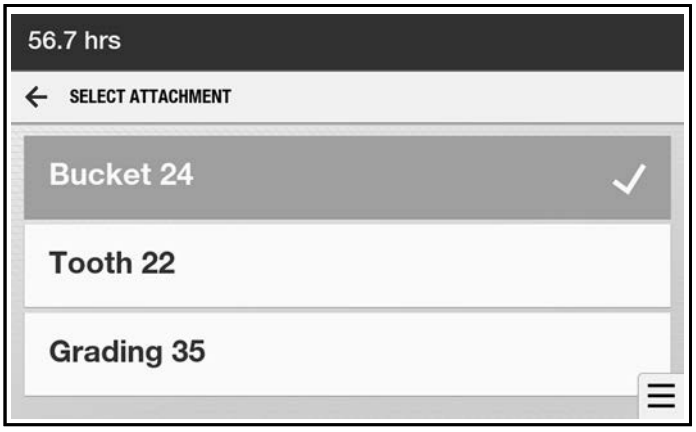
1. Select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SETTINGS]→ [SETUP AND CALIBRATION]**.

Figure 230



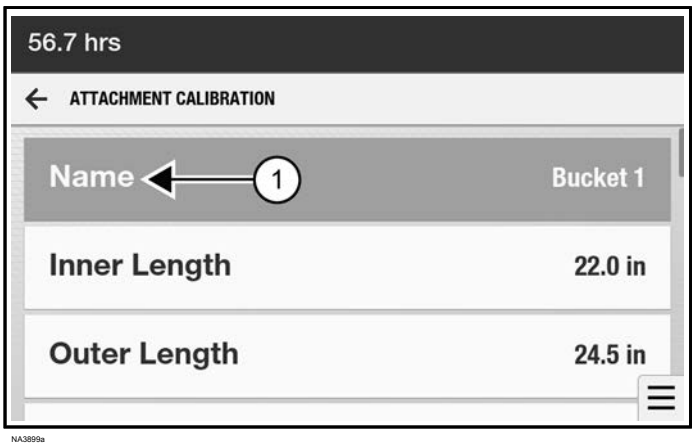
2. Select **[ATTACHMENTS]** (Item 1) [Figure 230].

Figure 231



3. Select one of the attachments [Figure 231].

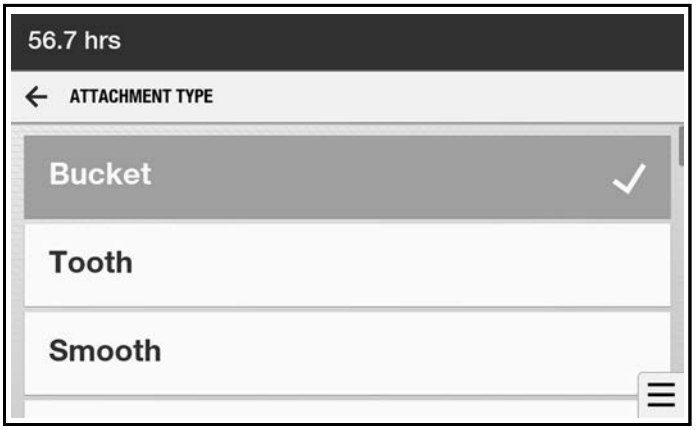
Figure 232



4. On the **ATTACHMENT CALIBRATION** screen, select **[NAME]** (Item 1) [Figure 232].

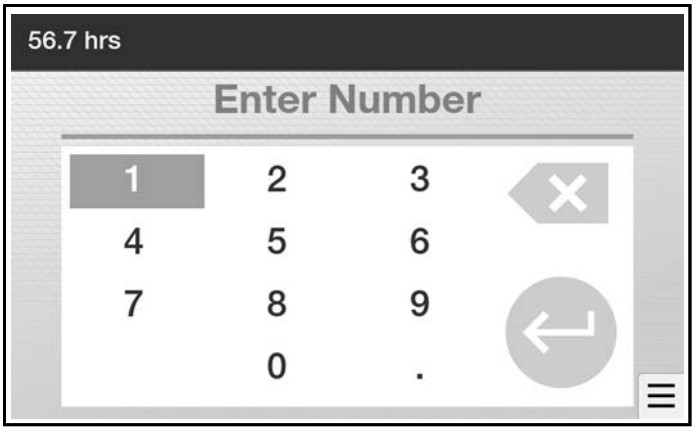
   NOTE: A bucket is used as an example here, but this setup is similar for all attachments. The accuracy of these dimensions affects the accuracy of the Depth Check.

Figure 233



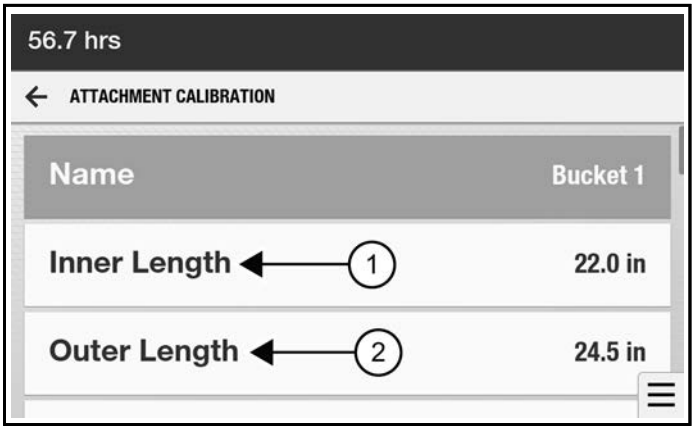
5. Select type of attachment [Figure 233].

Figure 234



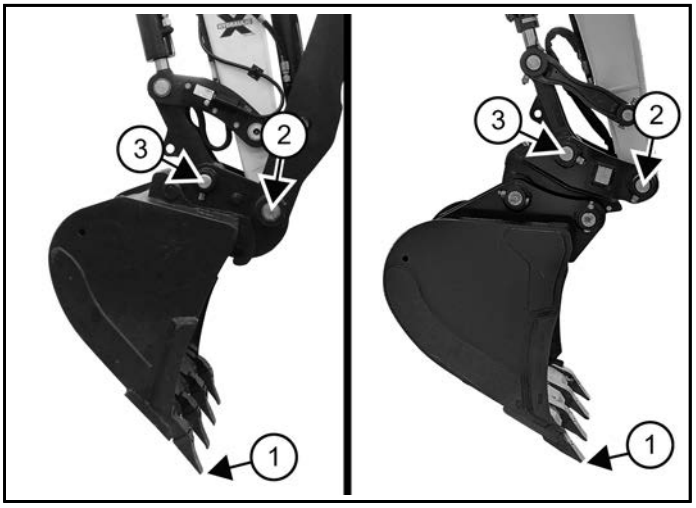
6. Enter a number to identify your attachment and select the enter icon [Figure 234].

Figure 235



7. Select **[INNER LENGTH]** (Item 1) [Figure 235].

Figure 236



8. Measure the distance from the tip of the attachment (Item 1) to the centre of the inner pin (Item 2) [Figure 236] and enter this value.

   Choose the correct pin (Item 2) [Figure 236] based on the type of attachment mounting system on your machine.

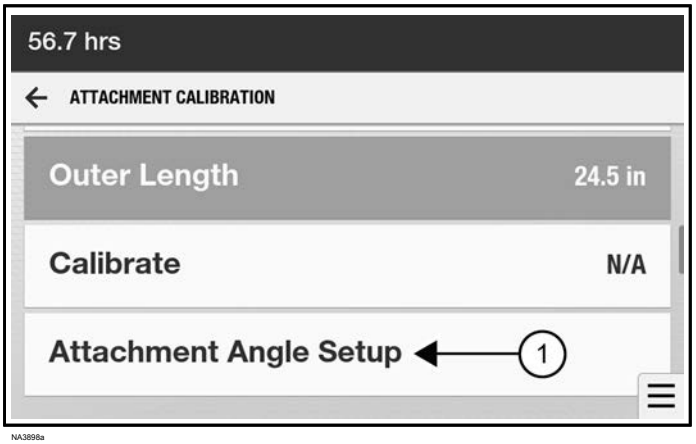
9. Select **[OUTER LENGTH]** (Item 2) [Figure 235].

   NOTE: The cutting surfaces of any attachments will wear over time. For example, the cutting edge (tooth) wears with the use of the bucket. The accuracy of the Depth Check system is affected by the wear of these components. If you notice any loss in accuracy, recalibrate the Depth Check system to reset the attachment dimensions.

10. Measure the distance from the tip of the attachment (Item 1) to the centre of the outer pin (Item 3) [Figure 236] and enter this value.

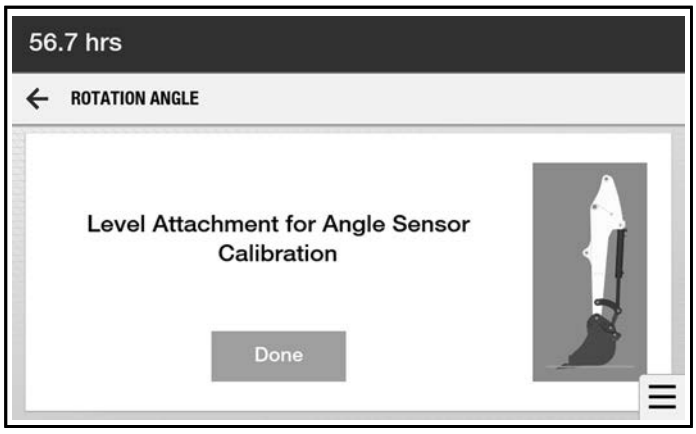
    Choose the correct pin (Item 3) [Figure 236] based on the type of attachment mounting system on your machine.

Figure 237



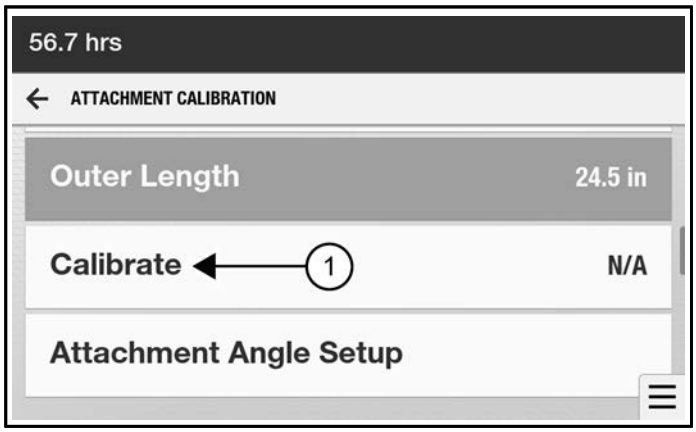
11. If you are using a non-standard bucket or attachment and want the display to more accurately reflect its rotation, select **[ATTACHMENT ANGLE SETUP]** (Item 1) [Figure 237].

Figure 238



12. Follow the instructions on the screen [Figure 238] and select **[DONE]**.

Figure 239



13. Select **[CALIBRATE]** (Item 1) [Figure 239].

Figure 240

14. Follow the instructions on the screen [Figure 240] and select **[DONE]**.

    Use the plumb bob and pin extender to vertically align the inner pin (Item 2) and the attachment tip (Item 1) [Figure 236].

The Depth Check system will not be as accurate with augers as with solid mounted attachments because all components are not rigidly mounted. The auger bit has extra movement and rotation, but the Depth Check system is designed for fixed positions. Follow these tips:

- Enter zero for both attachment dimensions.
- Try to keep the attachment mounting system horizontal to the ground during the dig cycle and monitor the screen depth.

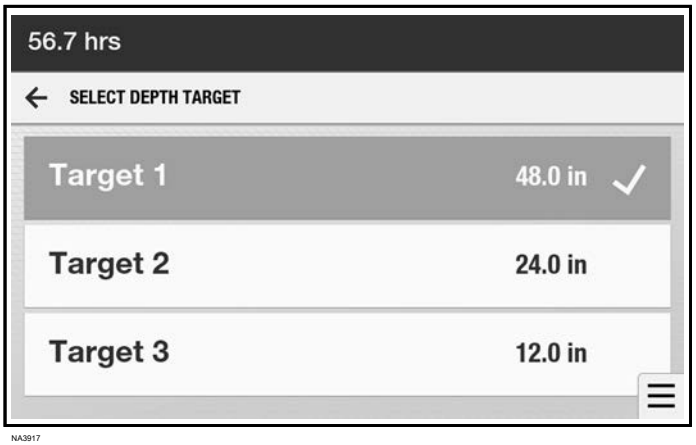
If more than one attachment is being set up, the attachments can be changed on the arm and the additional attachment dimensions can also be entered. Always measure to the cutting / work tip on the attachment when measuring the dimensions to add to the inside and outside length screens for each new attachment. The Depth Check system uses these dimensions along with the other setup points to calculate the tip position for Depth Check.

This finishes the calibration procedure, except if you are also installing a laser.
(See Setting Up A Laser With Depth Check on Page 123)

Setting Target Depth

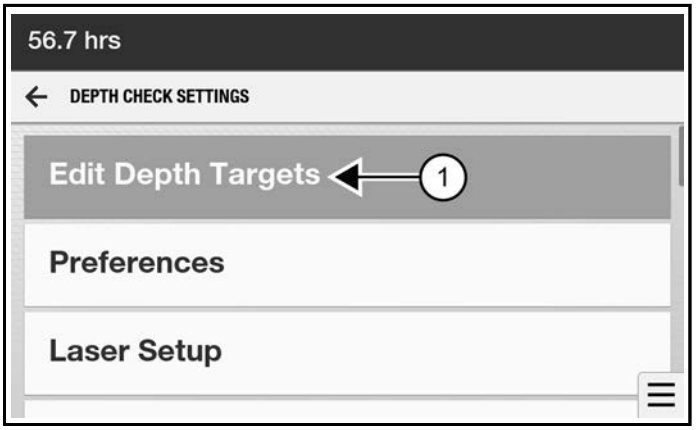
Several different target depths can be pre-set and stored in the system.

Figure 241



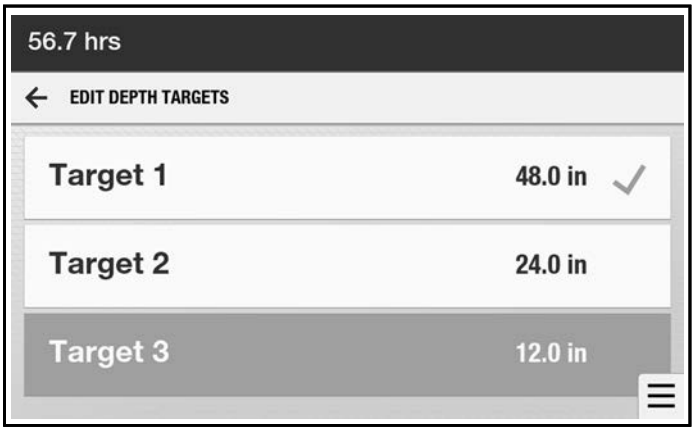
1. To select one of the preset target depths, select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SET TARGET]** and select a Target [Figure 241].
2. To change a preset target depth, select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SETTINGS]**.

Figure 242



3. Select **[EDIT DEPTH TARGETS]** (Item 1) [Figure 242].

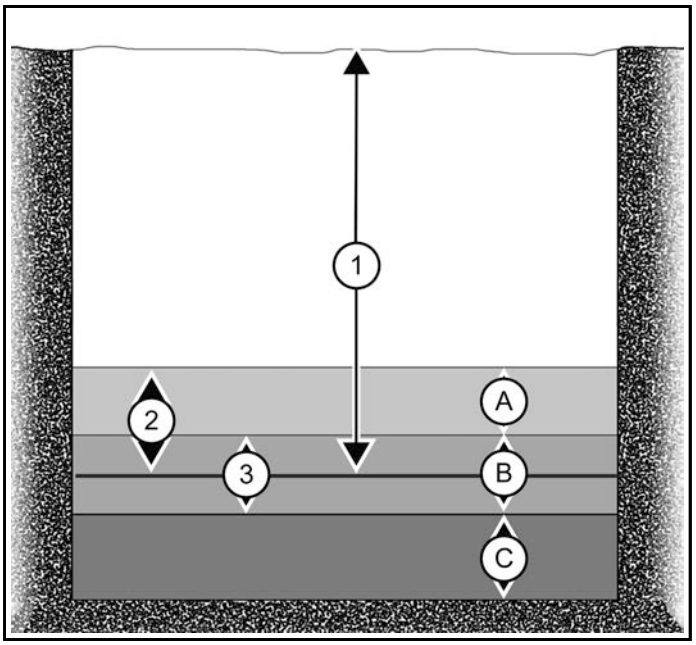
Figure 243



4. Select one of the Targets [Figure 243] and enter the new target depth on the keypad.

Description Of Grade And Warning Zones

Figure 244



The following three values can be set on the display:

ITEM	DESCRIPTION
1	Target Depth
2	Warning Zone
3	Grade Zone

After you set the target depth, warning zone, and grade zone, you will hear the following audible signals when the attachment is at each depth:

ITEM	DESCRIPTION
A	Operator hears slow beeps.
B	Operator hears solid beep.
C	Operator hears fast beeps.

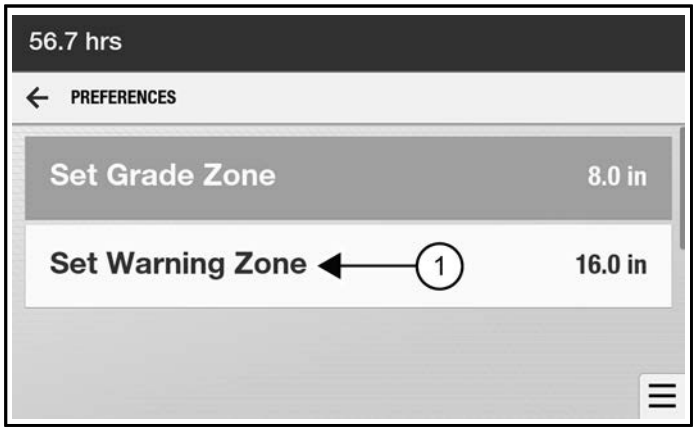
EXAMPLE: Operator sets Target Depth to 610 mm (24 in), Warning Zone to 100 mm (4 in), and Grade Zone to 50 mm (2 in). Operator will hear slow beeps from 508 – 584 mm (20 – 23 in), a solid beep from 584 – 635 mm (23 – 25 in), and fast beeps below 635 mm (25 in).

Setting The Warning Zone

The Warning Zone is the upper distance from the target depth when the warning alarm will start to beep. The closer the attachment gets to the target, the faster the beeps will be. When the attachment reaches the target depth, the alarm will be a continuous sound. If the attachment goes below the target depth, the beeps will be very fast.

1. Select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SETTINGS]→ [PREFERENCES]**.

Figure 245



NA3913b

2. Select **[SET WARNING ZONE]** (Item 1) [Figure 245] and enter the dimension.

3. Select the **[ENTER]** icon to save your changes.

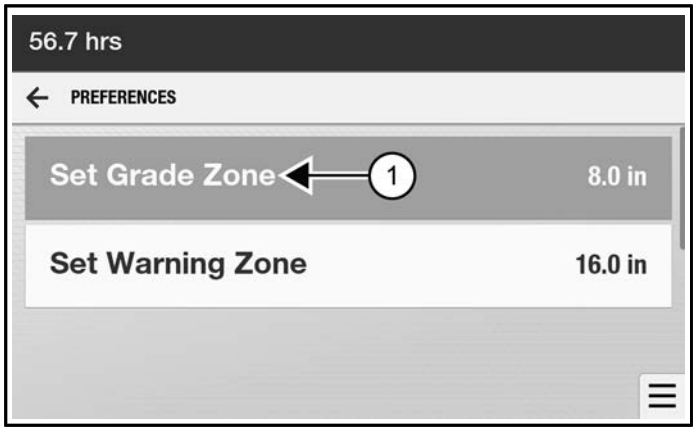
Setting The Grade Zone

The Grade Zone is the distance above and below the target depth at which the alarm will be a continuous beep.

EXAMPLE: If the grade zone is 200 mm (8 in), it will start 100 mm (4 in) above the target depth and end 100 mm (4 in) below the target depth.

1. Select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SETTINGS]→ [PREFERENCES]**.

Figure 246



NA3913a

2. Select **[SET GRADE ZONE]** (Item 1) [Figure 246] and enter the dimension.

3. Select the **[ENTER]** icon to save your changes.

Digging To A Target Depth

⚠ DANGER

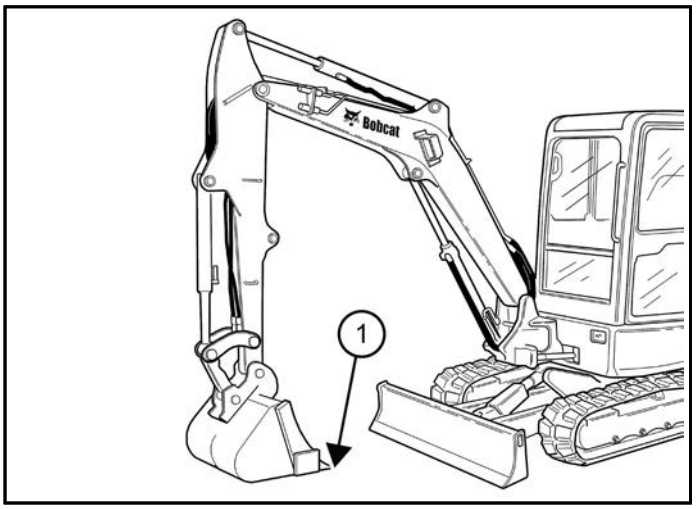
EXPLOSION AND ELECTROCUTION HAZARDS
Contact with underground utility lines will cause death, serious injury, or property damage.

- **Check the work area for buried electrical, gas, utility, or other service lines before excavating or operating ground engaging equipment.**
- **Follow all local rules and regulations regarding digging or working in areas around underground utilities. Have all underground utility lines clearly marked before operating.**
- **DO NOT depend on the Depth Check system for digging close to known utilities. The system accuracy is dependent upon calibration, slope of the ground, and other variables.**
- **Reported utility locations, such as the depth of the line, can also vary due to soil erosion, grading, and other factors.◂**

1222-7BFD3B03

NOTE: If you are not digging with a laser, make sure the laser icon is not illuminated on the **DEPTH CHECK** screen.

Figure 247

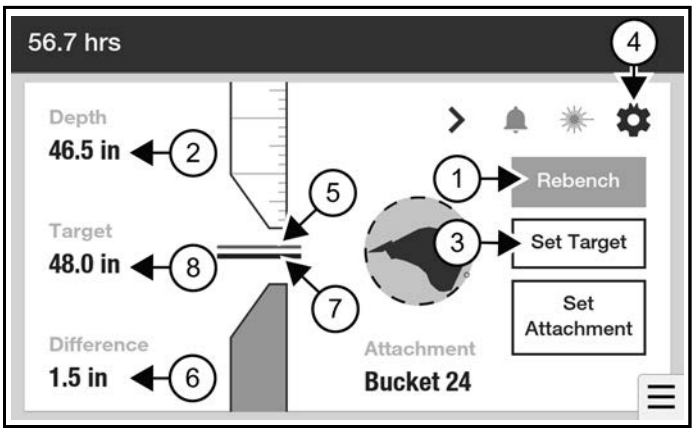


NA1400e

1. Set the bucket (Item 1) [Figure 247] on the ground surface where you are going to start the dig or on the surveyor mark to establish the starting ground position.

2. Select **[NAVIGATION HANDLE]→ [DEPTH CHECK]**.

Figure 248



NA3915c

3. Select **[REBENCH]** (Item 1) [Figure 248] on the display.

   OR

   Press the right joystick button to rebench.

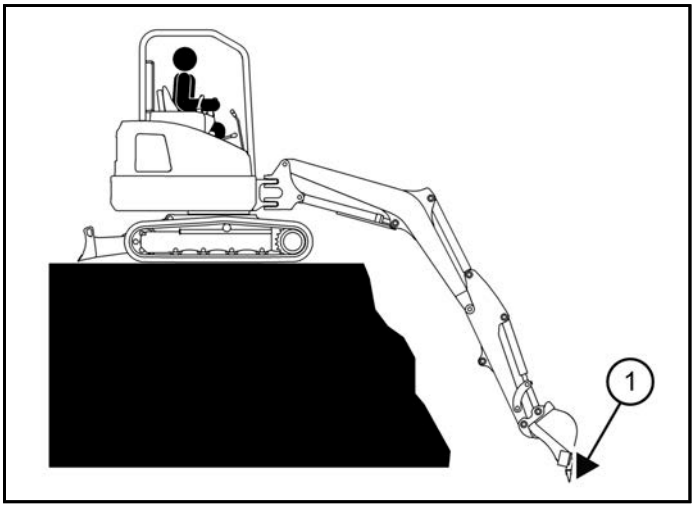
   At rebench, the depth dimension (Item 2) will set to 0.0. As the bucket is raised or lowered, the depth dimension (Item 2) will change [Figure 248].

4. Select **[SET TARGET]** (Item 3) [Figure 248] to select one of the preset depth targets.

   OR

   Select the **[SETTINGS]** icon (Item 4) [Figure 248] to change one of the preset depth targets.
   (See Setting Target Depth on Page 119)

Figure 249



NA20363a

- As the hole is being dug, the position of the bucket (Item 1) [Figure 249] is dimensionally shown (Item 2) [Figure 248] and shown on the bar graph at (Item 5) [Figure 248].
- The distance to target depth is shown dimensionally (Item 6) and on the bar graph (Item 7) [Figure 248].
- When the bucket is getting close to the target depth (Item 8) [Figure 248], a warning alarm (if activated) will start to slowly beep. The beeps will increase in frequency the closer the bucket gets to the target depth or grade zone. When the target depth or grade zone is reached, the alarm will sound continuously.
  (See Setting The Warning Zone on Page 120)
  (See Setting The Grade Zone on Page 121)

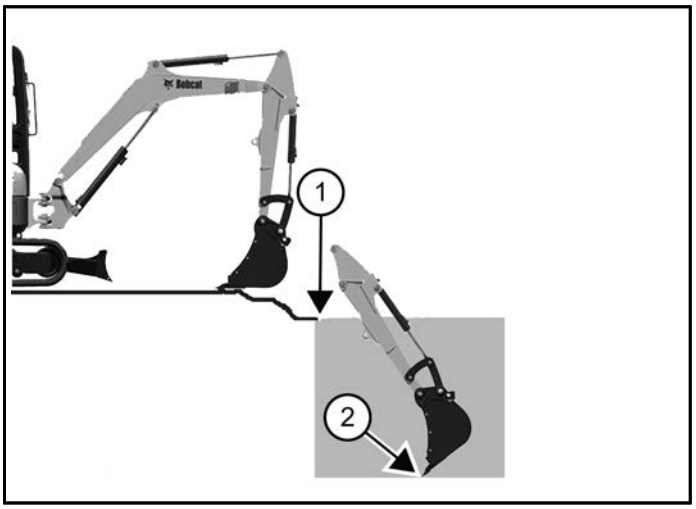
  EXAMPLE: The Target is 2 m (6.5 ft) and the Depth is 1,5 m (4.9 ft), the Difference will be 0,5 m (1.6 ft).

  2 m – 1,5 m = 0,5 m (6.5 ft – 4.9 ft = 1.6 ft).

Repositioning The Excavator And Continuing To Dig To The Original Depth

After repositioning the excavator, choose one of the following options to continue to dig to the original depth.

Figure 250



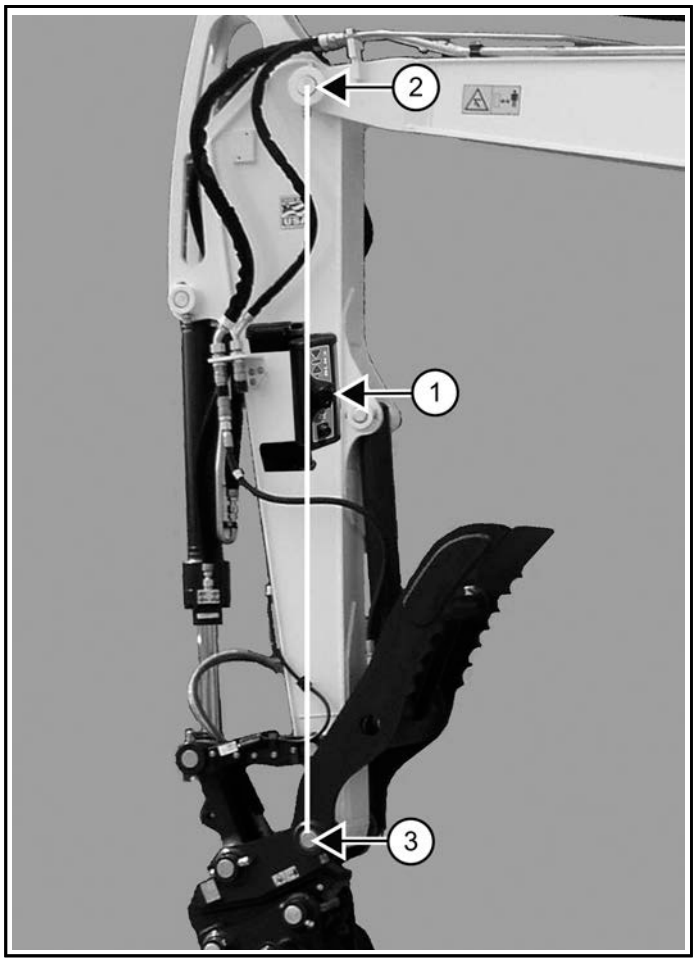
P200242b

- Reposition the excavator so the bucket can be rebenched off the original bench point (Item 1) [Figure 250].
- Position the excavator so the bucket will reach to the bottom of the hole (Item 2) [Figure 250] at an area that is known to be the correct depth. When rebenching at the bottom of the trench, set the target depth to zero to continue digging at the original depth.

NOTE: Set the distance from the target depth to the point at which the alarm starts to beep on the **WARNING ZONE** screen.

Setting Up A Laser With Depth Check

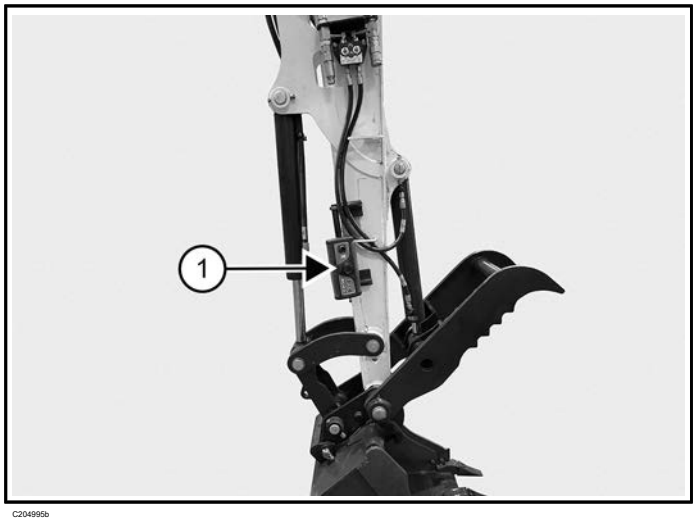
Figure 251



P132078b

1. Install the laser receiver (Item 1) as close as possible in line with the arm pin (Item 2) and the bucket pivot pin (Item 3) [Figure 251].

Figure 252



C204995b

2. If your machine is equipped with options that make it difficult to install the laser receiver in the centre of the arm, install it in an alternative location such as shown here (Item 1) [Figure 252].

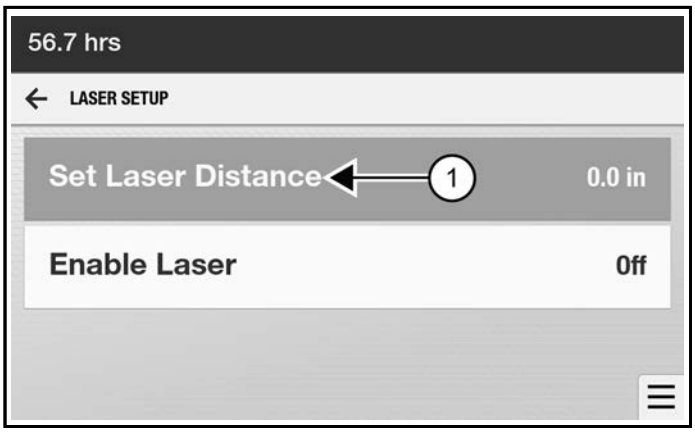
3. If your excavator is equipped with a clamp or arm that may interfere with the laser, make sure there is no hose-to-laser interference.

   a. Fully curl the arm and bucket and make sure the hoses do not interfere with the laser receiver during any arm or bucket movement.

   b. Adjust the position of the laser receiver if necessary to avoid any contact with the hoses.

4. Select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SETTINGS]→ [LASER SETUP]**.

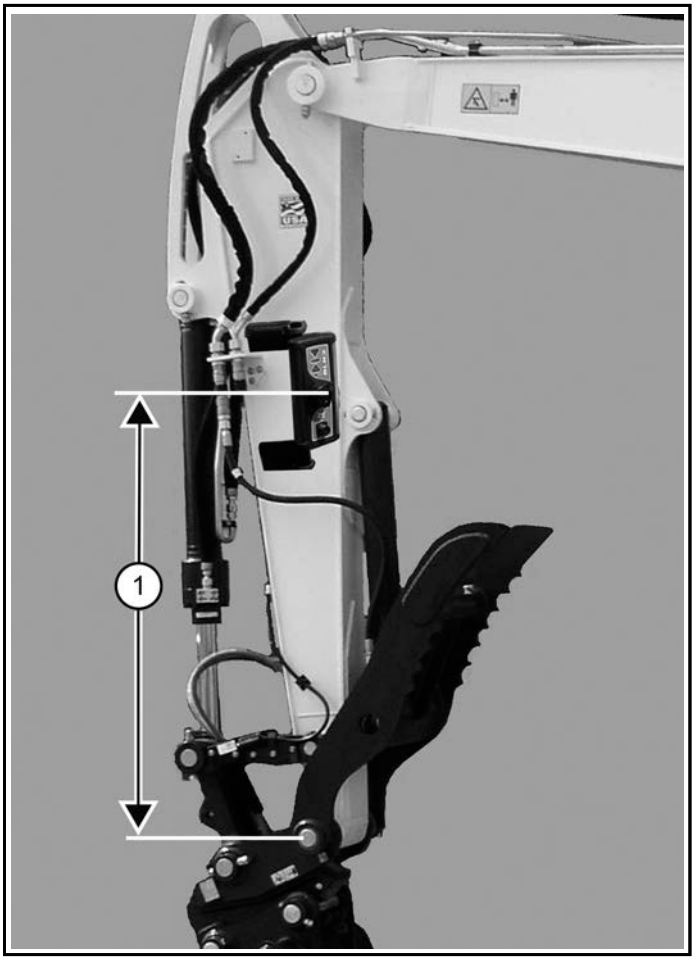
Figure 253



NA3912a

5. Select **[SET LASER DISTANCE]** (Item 1) [Figure 253].

Figure 254



p132078d

6. Measure from the centre of the laser receiver to the bucket pivot pin (Item 1) [Figure 254]

7. Enter this distance as the Laser Distance.

To dig a hole using the laser, see the following:
(See Benching With A Laser System on Page 124)

Benching With A Laser System

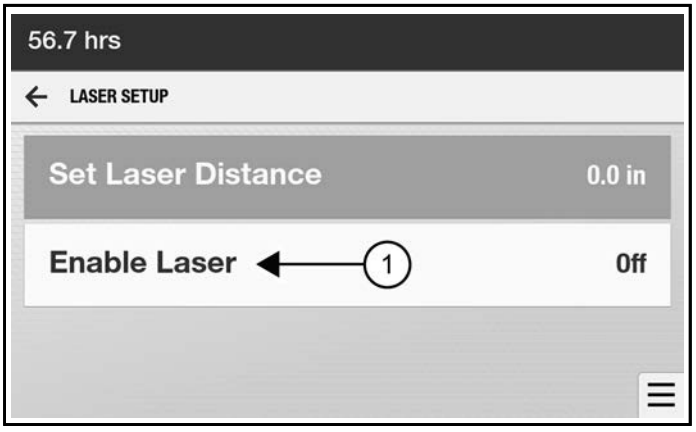
Read and understand the information supplied with the laser receiver for correctly setting up the laser system.

When the laser feature is turned on, the target depth is the distance from the laser beam to grade point. Grade must be known prior to benching with a laser system. See (Item 3) [Figure 256].

1. Make sure the laser receiver location on the arm has been entered into the Depth Check system.
(See Setting Up A Laser With Depth Check on Page 123)

2. Select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SETTINGS]→ [LASER SETUP]**.

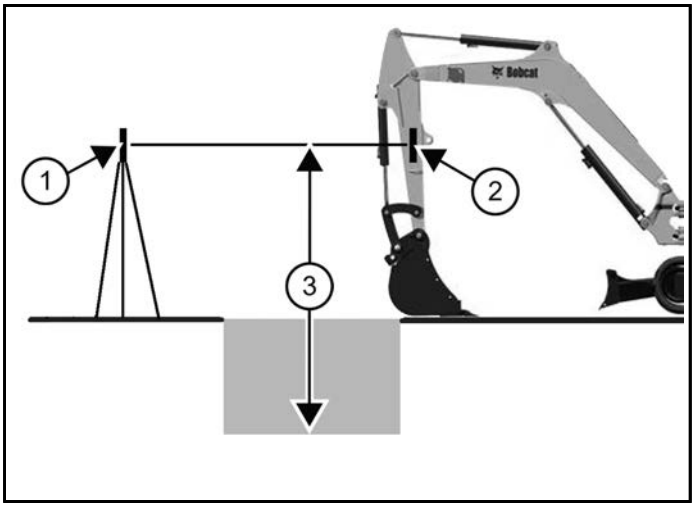
Figure 255



NA3912b

3. Select **[ENABLE LASER]** (Item 1) [Figure 255].

Figure 256



P200243a

4. With the excavator arm vertical, raise or lower the boom and arm as needed until the laser (Item 1) strikes the receiver (Item 2) [Figure 256].

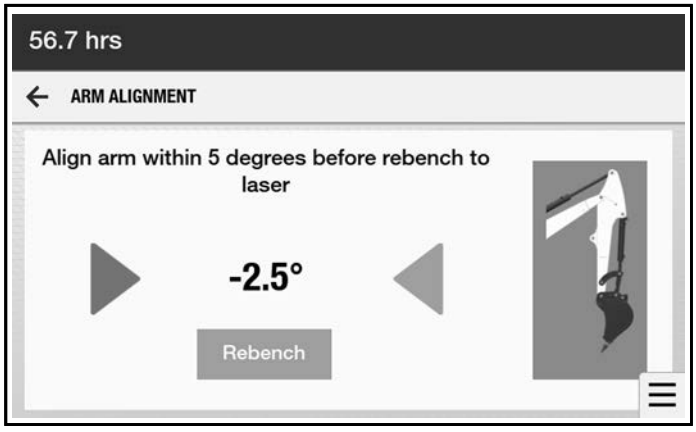
   If necessary, curl the bucket fully for increased bucket ground clearance, or dig a hole so that the bucket can be lowered to allow the laser to strike the receiver with the arm vertical.

5. When the laser strikes the receiver and the receiver light turns green, select **[REBENCH]**.

   OR

   Rebench by pressing the right joystick button.

Figure 257



NA3894

If the arm is not vertical when you try to rebench, the **ARM ALIGNMENT** screen [Figure 257] will remind you to make the arm vertical before rebenching is possible. Adjust the arm to the vertical position and select **[REBENCH]** [Figure 257].

6. Select **[SET TARGET]**.
7. Enter the distance from the laser to the target depth (Item 3) [Figure 256].
8. Adjust the Warning Zone and Grade Zone as needed. (See Setting The Grade Zone on Page 121) (See Setting The Warning Zone on Page 120)
9. Proceed to dig, referencing the display and listening for audible alerts to maintain the correct depth.

DEPTH CHECK (TOUCH DISPLAY)

Depth Check Description

⚠ WARNING

INHALATION HAZARD
Exhaust fumes contain odorless, invisible gases that can kill without warning.
Fresh air must be added to avoid concentration of exhaust fumes when an engine is running in an enclosed area. If the engine is stationary, vent the exhaust outside.

W-2050

The Depth Check system provides audible and visual guidance to achieve and / or sustain a user-assigned depth target. Depth Check will display the vertical position of the bucket tip based on your initial starting point or bench point.

When the Depth Check kit was initially installed, the setup / calibration procedure should have been performed. But with usage of any attachment, the components and the cutting surfaces wear. The accuracy of the Depth Check system is affected by the wear of these components. If loss of accuracy is noticed, re-calibrate the attachment to reset the dimensions needed for the Depth Check system to operate correctly.

Two magnetic mounted tools are included with the kit for positioning the boom, arm, and bucket for calibration. These magnetic tools must be kept with the machine, as the Depth Check system should be re-calibrated on a yearly basis or sooner if slight changes in accuracy are noticed.

The Depth Check system sensors are designed for high angle stability and temperature ranges. However, with the use of any mechanical components (boom, arm, bucket, etc.), there is wear on the components and this will affect the accuracy of the Depth Check system over time. Also, if any structural changes are made, components replaced, or a new attachment is installed on the excavator, the setup / calibration procedure must be performed again.

The calibration procedure is a two-person task. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine. Make sure the second person is away from the machine when moving any of the work group components (boom, arm, bucket, etc.).

See the correct section for the type of screen equipped on your machine.
(See Depth Check (Standard Display) on Page 112)
(See Depth Check (Touch Display) on Page 125)

NOTE: The machine shown in the photos may be different than your machine and this manual, but the procedure is the same for all models.

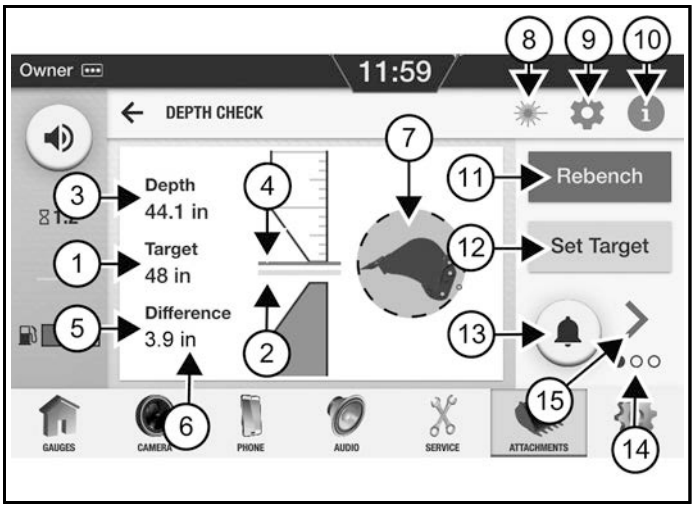
⚠ WARNING

GENERAL HAZARD
Contact with equipment can cause serious injury or death.
Keep all bystanders 6 m (20 ft) away from equipment when operating.
W-2268

Depth Check Screen

Access the **DEPTH CHECK** screen by selecting **[ATTACHMENTS]→ [DEPTH CHECK]**.

Figure 258



P132925e

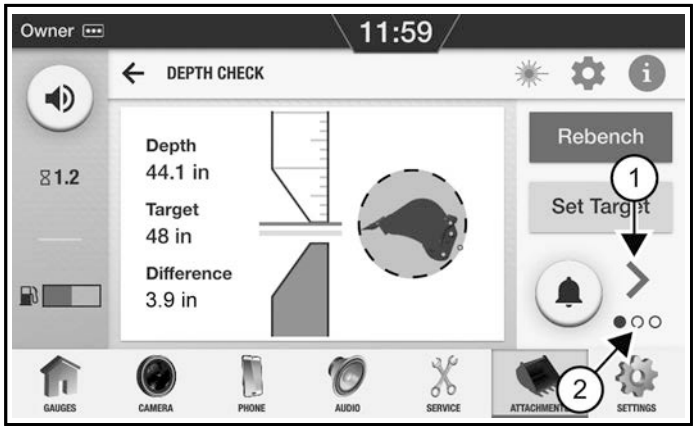
REF.	DESC.	FUNCTION
1	Target (Dimension)	Depth to dig from an established starting point set by the operator. (Example: Desired dig depth from a surveyor's elevation pin.)
2	Target (Bar Graph)	Shows where the target is in relationship to the attachment position.
3	Depth (Dimension)	The current depth of the attachment cutting edge.
4	Depth (Bar Graph)	Moves up and down to show the position of the attachment to the target.
5	Difference (Dimension)	The difference between the current depth and the target depth.
6	Units	The current selected unit of measure (meters / millimeters or feet / inches).
7	Attachment Rotation	A bucket is used to represent the attachment. The bucket image will rotate to represent the position of the attachment as the attachment is curled out or curled in.
8	Laser	Accesses **LASER SETUP** screen where you can add the laser position dimension or turn the laser on / off. When laser is on, the icon is illuminated. (See Setting Up A Laser With Depth Check on Page 137)
9	Depth Check Settings	Accesses **DEPTH CHECK SETTINGS** screen.
10	Tips	Accesses **TOOL TIPS** screen.
11	Rebench	Press to Rebench. (See Digging To A Target Depth on Page 135)
12	Set Target	Accesses **SET TARGET DEPTH** screen. (See Setting Target Depth on Page 133)
13	Alarm	Turns target depth alarm on / off. (See Setting The Warning Zone on Page 134)
14	Screen Indicator	Dots indicate which of the three screens is being displayed.
15	Arrow	Used to move between screens. You can also swipe between screens with your finger. (See Setting The Default Depth Check Screen on Page 126)

Setting The Default Depth Check Screen

The **DEPTH CHECK** screen can be set to default to one of the following screens:

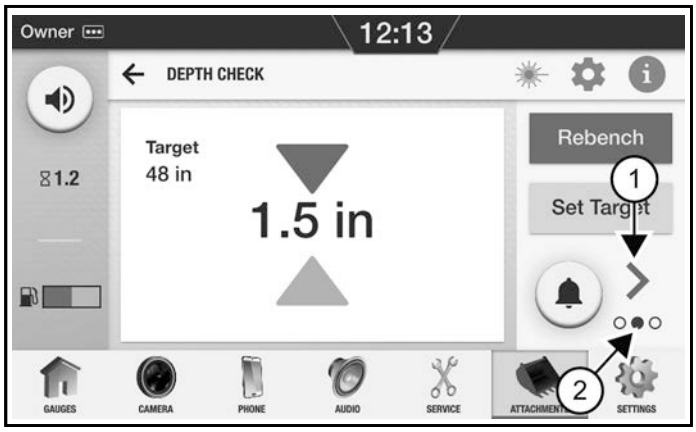
- Dig Depth [Figure 259]
- Distance to Target [Figure 260]
- Grade Check [Figure 261]

Figure 259



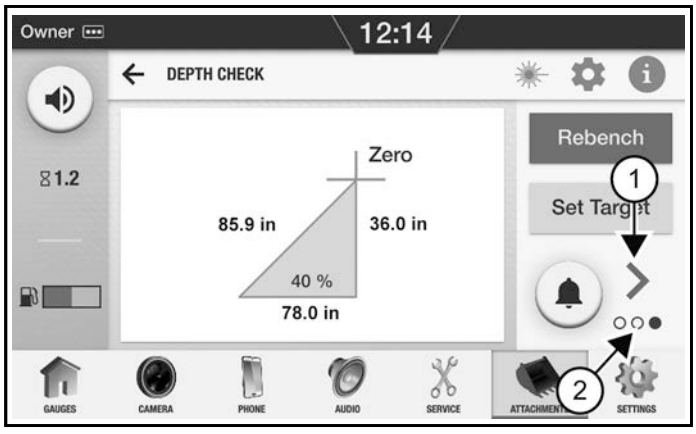
P132925b

Figure 260



NA3430b

Figure 261



NA3431b

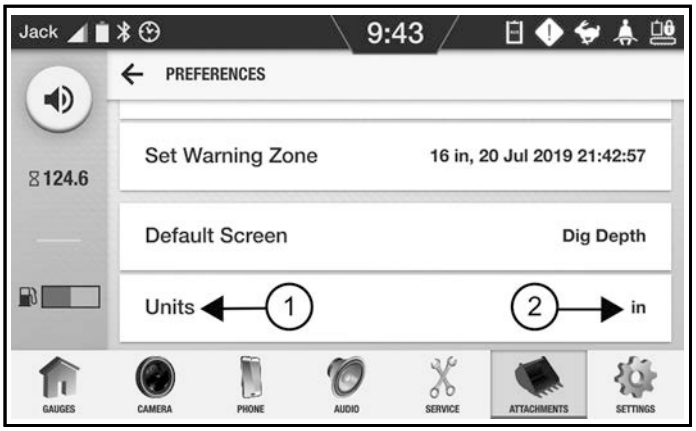
1. To select one of the three depth check screens as the default screen, select **[ATTACHMENTS]→ [DEPTH CHECK]→ [SETTINGS]→ [PREFERENCES]→ [DEFAULT SCREEN]**.

Press the arrow (Item 1) to toggle between these three screens at any time. The three dots (Item 2) change to represent which **DEPTH CHECK** screen is active: [Figure 259], [Figure 260], or [Figure 261].

Switching Unit Scale

1. Select **[ATTACHMENTS]→ [DEPTH CHECK]→ [SETTINGS]→ [PREFERENCES]**.

Figure 262



P132911a

2. Select **[UNITS]** (Item 1) to switch between meters / millimeters or feet / inches (Item 2) [Figure 262].

You can also switch between metric and English units. (See Switching Between English / Metric Units on Page 210)

Calibrating The Boom

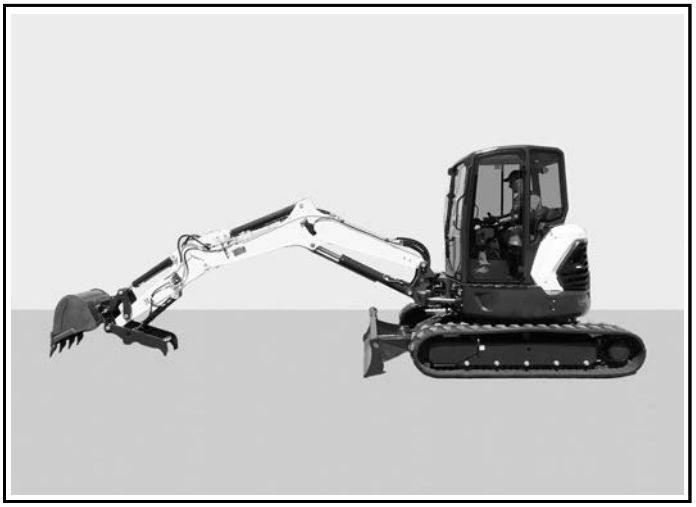
The following items are needed to complete this task:

- Tape measure.
- Two magnetic tools that are included with the kit.

The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

1. Move the machine to an open area where the boom and arm can be repositioned and there is fresh air, as you will need to operate the engine during this procedure.
2. Park the machine on a flat, level surface.

Figure 263

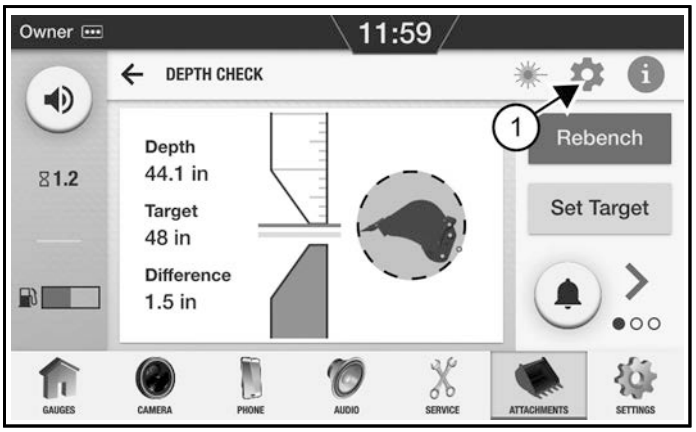


C200403a

3. Position the excavator with the bucket fully rolled out and the arm fully extended [Figure 263].

4. On the touch display select **[ATTACHMENTS]**→ **[DEPTH CHECK]**.

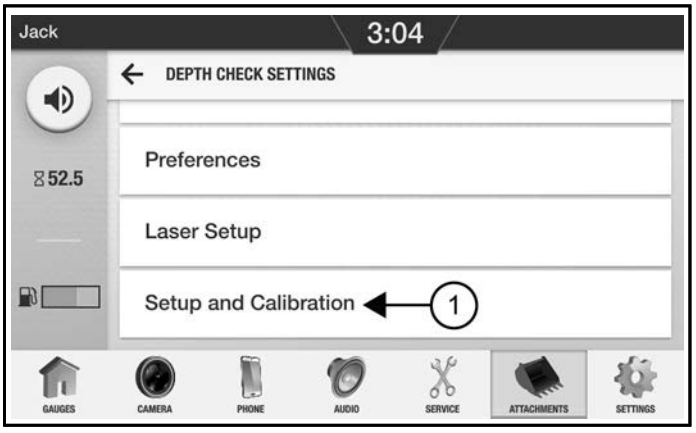
Figure 264



NA3429b

5. Select the **[SETTINGS]** icon (Item 1) [Figure 264].

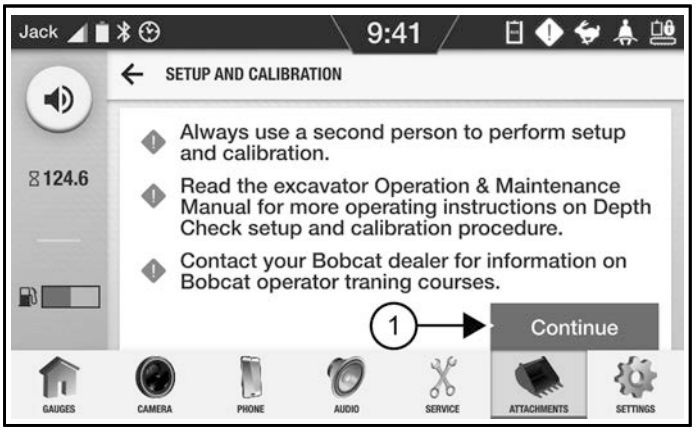
Figure 265



C132910d

6. Select **[SETUP AND CALIBRATION]** (Item 1) [Figure 265].

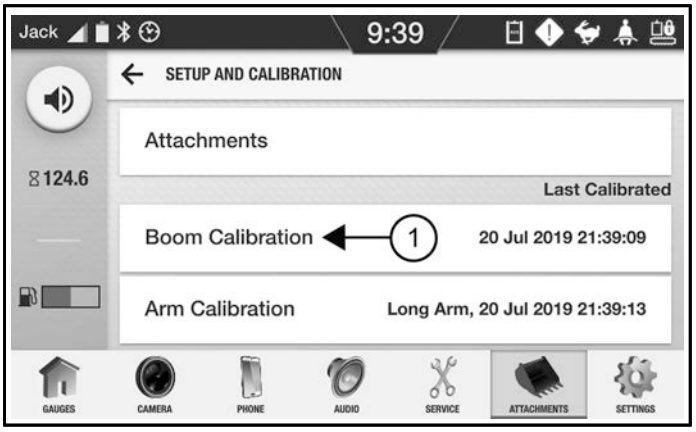
Figure 266



P132908a

7. Read the message on the screen and press **[CONTINUE]** (Item 1) [Figure 266] to proceed.

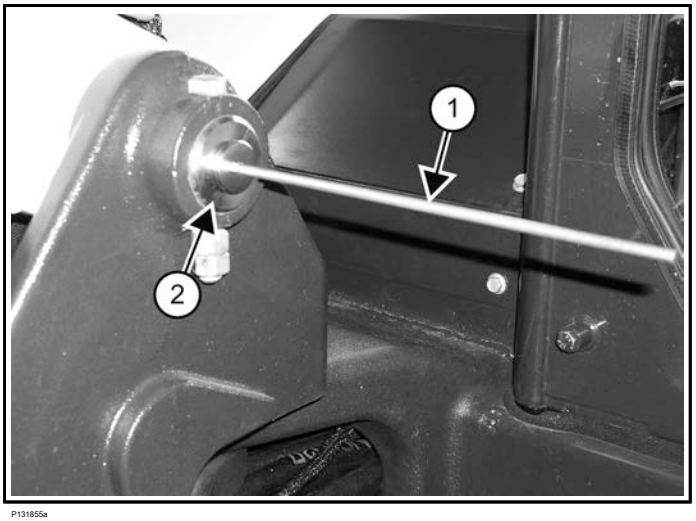
Figure 267



P132909b

8. Select **[BOOM CALIBRATION]** (Item 1) [Figure 267].

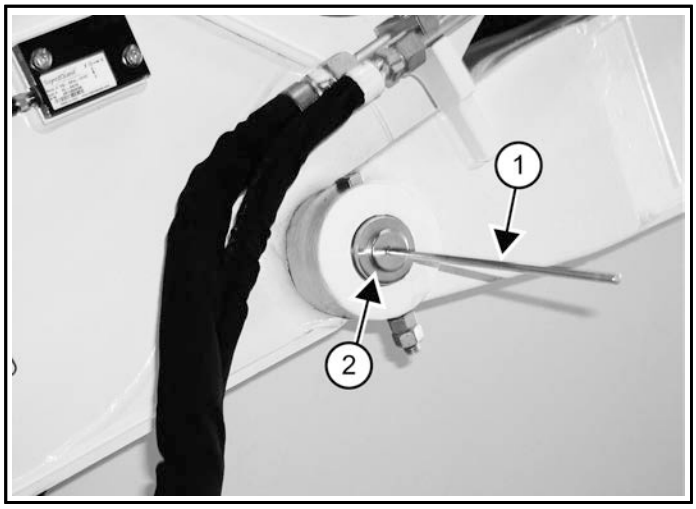
Figure 268



P131855a

9. Install one of the magnetic tools (Item 1) on the boom pivot pin (Item 2) [Figure 268]. Position the magnetic tool as close as possible to the center of the boom pivot pin.

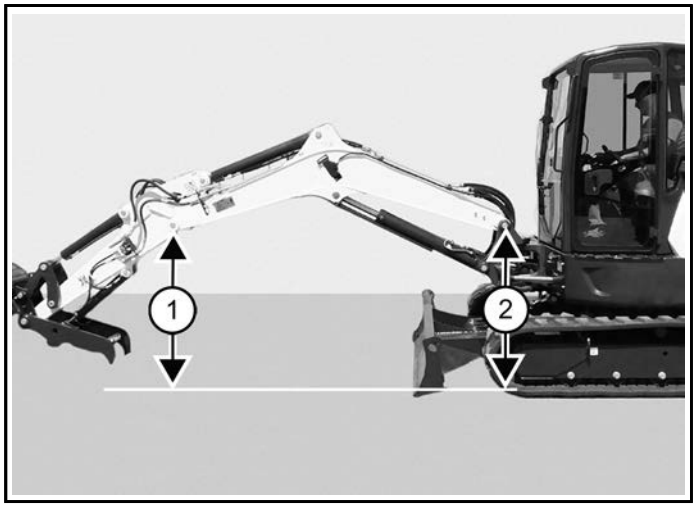
Figure 269



P131856a

10. Install the second magnetic tool (Item 1) on the arm pivot pin (Item 2) [Figure 269]. Position the magnetic tool as close as possible to the center of the arm pin.

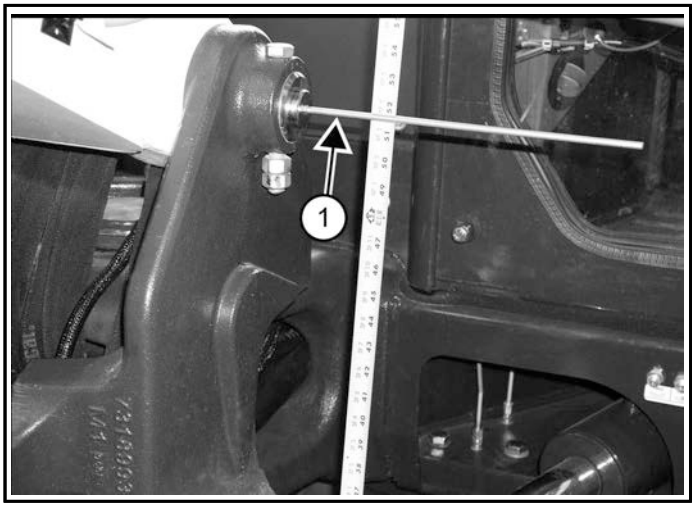
Figure 270



C200403b

11. Position the work group so the distance from the ground to the two magnetic tools (Items 1 and 2) [Figure 270] is identical.

Figure 271

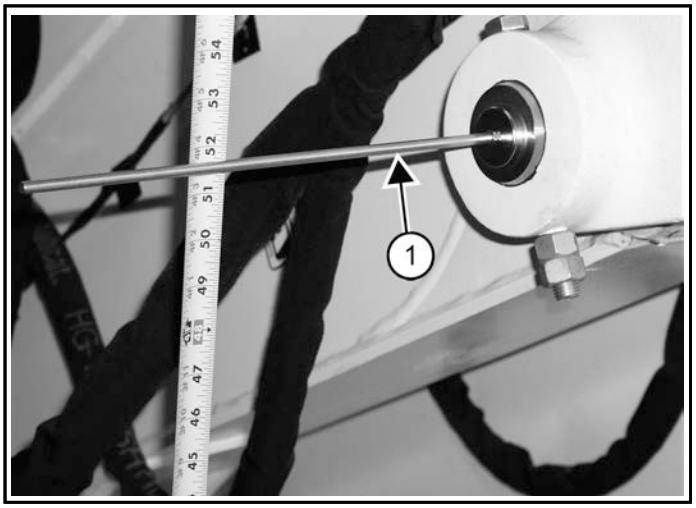


P131857a

12. Measure the distance from the center of the boom magnetic tool (Item 1) [Figure 271] to the ground.

    Measure as close to the boom as possible without interference from components between the boom and the ground. The closer to the boom the measurement is taken, the more accurate the measurement should be. You can also use a laser level to locate the centerlines of the magnetic tools as this will eliminate any possible variation in the measurements to the ground.

Figure 272



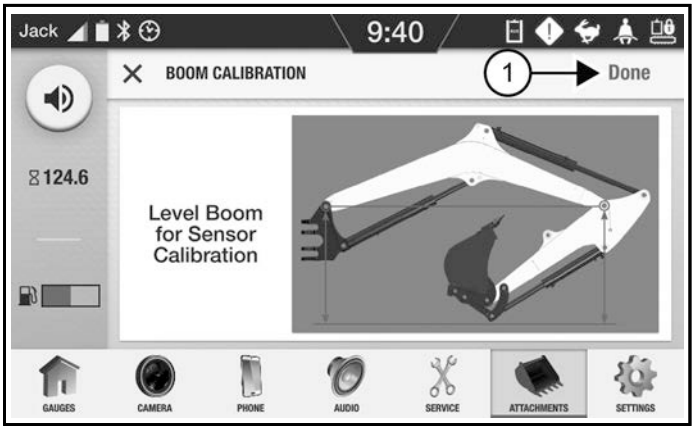
P131858a

13. Measure the distance from the center of the arm magnetic tool (Item 1) [Figure 272] to the ground.

14. Adjust the boom up or down as needed and remeasure until both distances are the same.

    NOTE: Make sure there is no cylinder drift that could affect the calibration accuracy. The person in the cab needs to enter the information into the display in a timely manner.

Figure 273



P132913a

15. Follow the instructions on the screen and select **[DONE]** (Item 1) [Figure 273].

16. Proceed to calibrating the arm.
(See Calibrating The Arm on Page 130)

Calibrating The Arm

The following items are needed to complete this task:

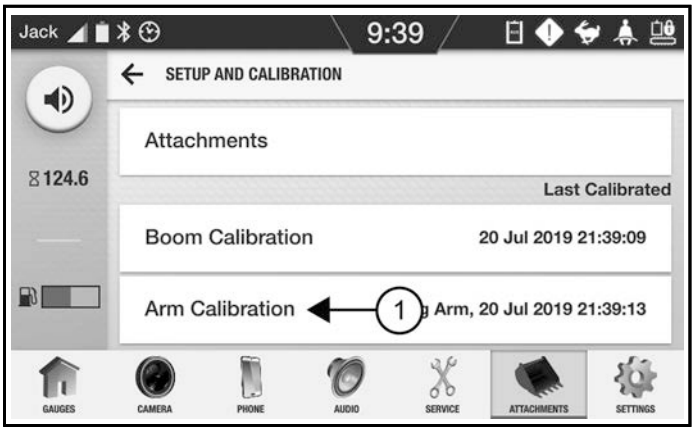
- Plumb bob.
- Magnetic tool that is included with the kit.

The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

NOTE: The owner password is needed to access the Setup and Calibration settings.

1. Select **[ATTACHMENTS]**→ **[DEPTH CHECK]**→ **[SETTINGS]**→ **[SETUP AND CALIBRATION]**.

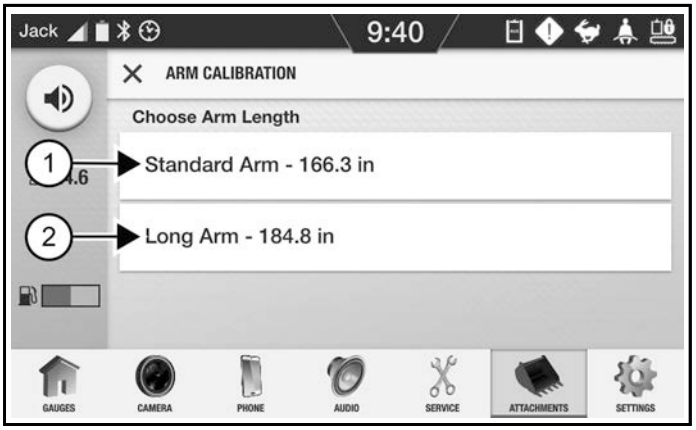
Figure 274



P132909c

2. Select **[ARM CALIBRATION]** (Item 1) [Figure 274].

Figure 275

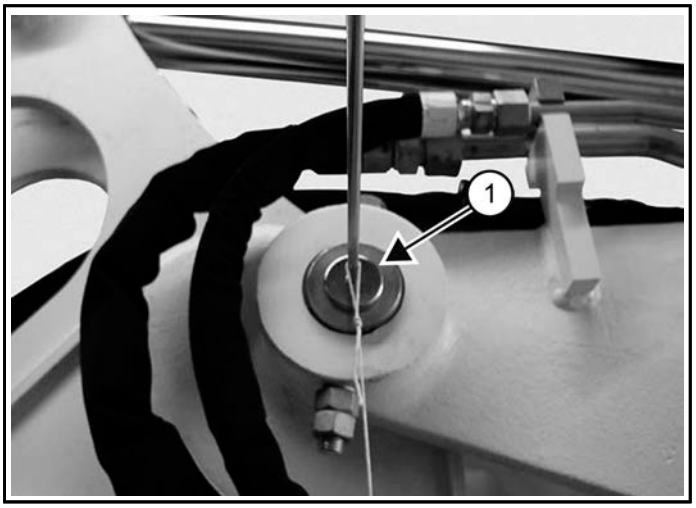


P132915a

3. Select the arm that your machine is equipped with (Item 1 or 2) [Figure 275].

   NOTE: Some models only have one arm option available.

Figure 276

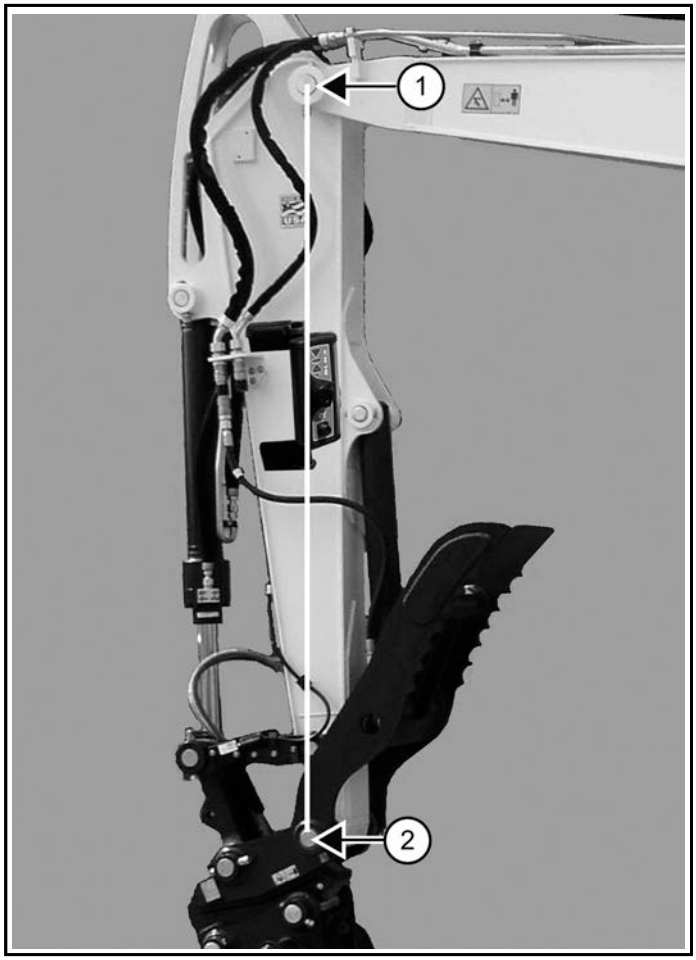


p132076b

4. Install the magnetic tool on the arm pin (Item 1) [Figure 276].

5. Place the plumb bob on the magnetic tool that is installed on the arm pin (Item 1) [Figure 276].

Figure 277

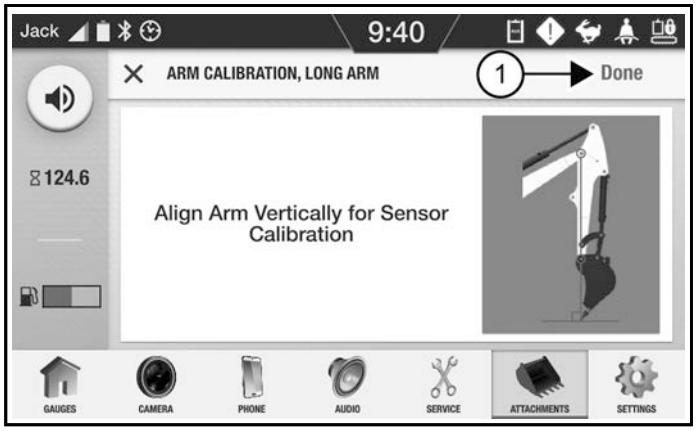


p132078c

6. Move the arm until the plumb bob line (Item 1) is centred on the pivoting bucket pin (Item 2) [Figure 277].

   The accuracy of the arm being vertical affects the accuracy of the Depth Check.

Figure 278



P132914a

7. With the arm vertical, select **[DONE]** (Item 1) [Figure 278] to store this information.

8. Proceed to calibrating the attachment.
   (See Calibrating The Attachment on Page 131)

Calibrating The Attachment

The following items are needed to complete this task:

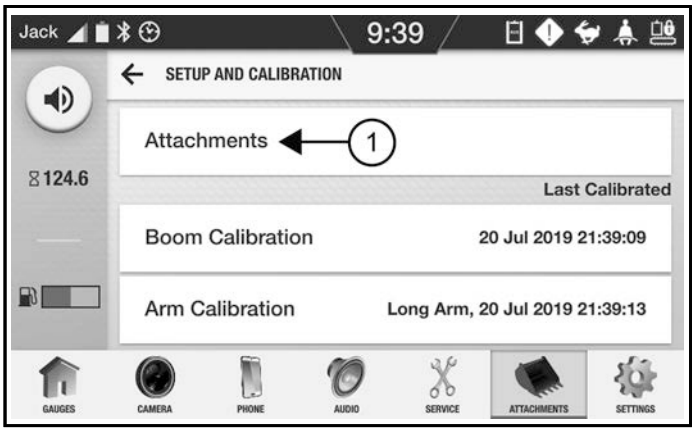
- Tape measure.
- Magnetic tool that is included with the kit.

The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

NOTE: The owner password is needed to access the Setup and Calibration settings.

1. Select **[ATTACHMENTS]**→ **[DEPTH CHECK]**→ **[SETTINGS]**→ **[SETUP AND CALIBRATION]**.

Figure 279



P132909a

2. Select **[ATTACHMENTS]** (Item 1) [Figure 279].

Figure 280

P132919a

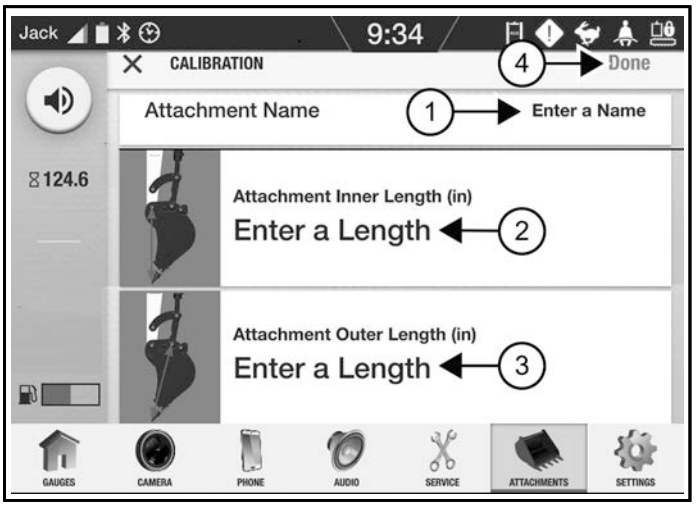
3. Select **[ADD ATTACHMENT]** (Item 1) [Figure 280].

   OR

   Select one of the existing attachments (Item 2) [Figure 280] from the list.

NOTE: When switching between attachments, just select the desired attachment and, as long as it was correctly set up, the Depth Check system will have the information needed for that attachment.

Figure 281



P132974a

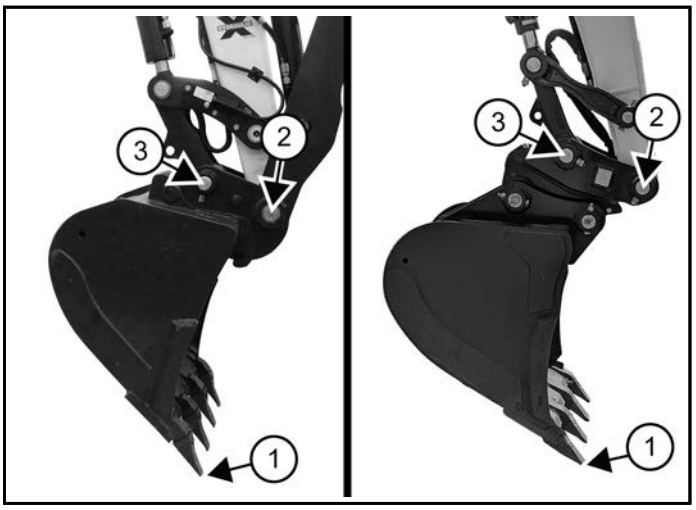
4. On the **CALIBRATION** screen, select **[ENTER A NAME]** (Item 1) [Figure 281].

   Enter a name for the attachment such as 24” Bucket, 30” Bucket, Auger, etc.

   NOTE: A bucket is used as an example here, but this setup is similar for all attachments. The accuracy of these dimensions affects the accuracy of the Depth Check.

5. Select **[ENTER A LENGTH]** (Item 2) [Figure 281] for the Attachment Inner Length.

Figure 282



C205740a

6. Measure the distance from the tip of the attachment (Item 1) to the center of the inner pin (Item 2) [Figure 282] and enter this value.

   Choose the correct pin (Item 2) [Figure 282] based on the type of attachment mounting system on your machine.

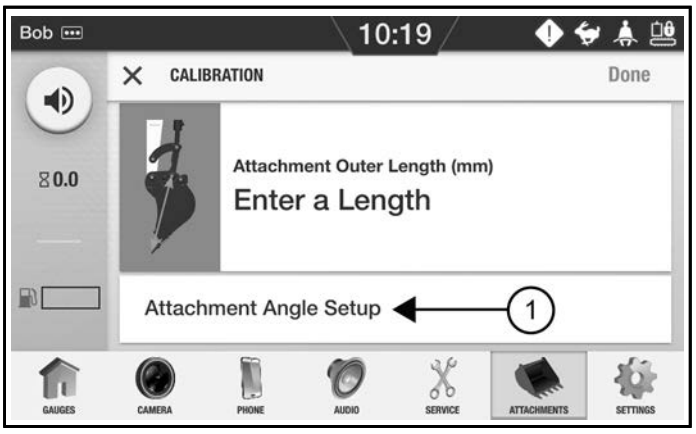
7. Select **[ENTER A LENGTH]** (Item 3) [Figure 281] for the Attachment Outer Length.

   NOTE: The cutting surfaces of any attachments will wear over time. For example, the cutting edge (tooth) wears with the use of the bucket. The accuracy of the Depth Check system is affected by the wear of these components. If you notice any loss in accuracy, recalibrate the Depth Check system to reset the attachment dimensions.

8. Measure the distance from the tip of the attachment (Item 1) to the center of the outer pin (Item 3) [Figure 282] and enter this value.

   Choose the correct pin (Item 3) [Figure 282] based on the type of attachment mounting system on your machine.

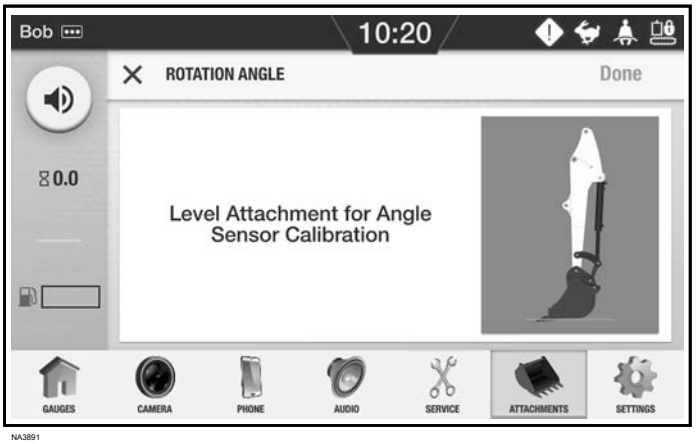
Figure 283



NA3892a

9. If you are using a non-standard bucket or attachment and want the display to more accurately reflect its rotation, select **[ATTACHMENT ANGLE SETUP]** (Item 1) [Figure 283].

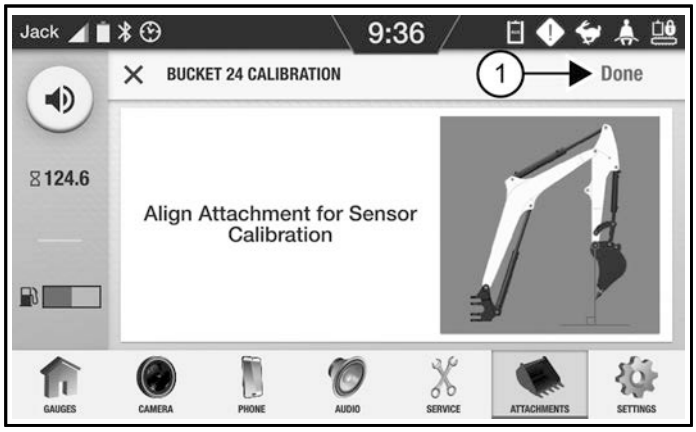
Figure 284



NA3891

10. Follow the instructions on the screen [Figure 284] and select **[DONE]**.

Figure 285



P132920a

11. Follow the instructions on the screen to align the attachment for sensor calibration.

    Use the plumb bob and pin extender to vertically align the inner pin (Item 2) and the attachment tip (Item 1) [Figure 282].

12. Select **[DONE]** (Item 1) [Figure 285] to store the calibration information.

The Depth Check system will not be as accurate with augers as with solid mounted attachments because all components are not rigidly mounted. The auger bit has extra movement and rotation, but the Depth Check system is designed for fixed positions. Follow these tips:

- Enter zero for both attachment dimensions.
- Try to keep the attachment mounting system horizontal to the ground during the dig cycle and monitor the screen depth.

If more than one attachment is being set up, the attachments can be changed on the arm and the additional attachment dimensions can also be entered. Always measure to the cutting / work tip on the attachment when measuring the dimensions to add to the inside and outside length screens for each new attachment. The Depth Check system uses these dimensions along with the other setup points to calculate the tip position for Depth Check.

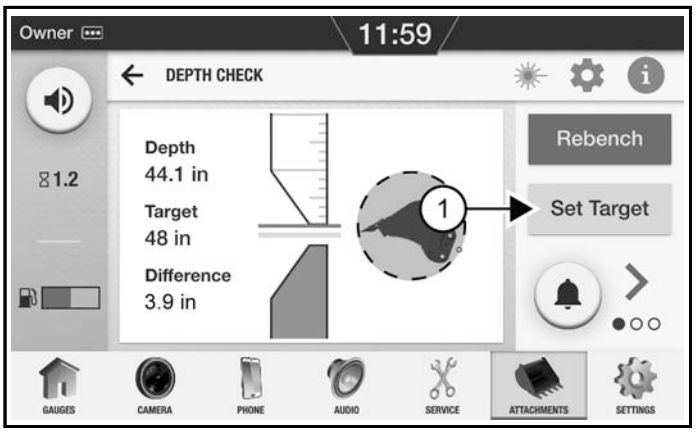
This finishes the calibration procedure, except if you are also installing a laser.
(See Setting Up A Laser With Depth Check on Page 137)

Setting Target Depth

NOTE: Twenty different target depths can be pre-set and stored in the system.

1. Select **[ATTACHMENTS]**→ **[DEPTH CHECK]**.

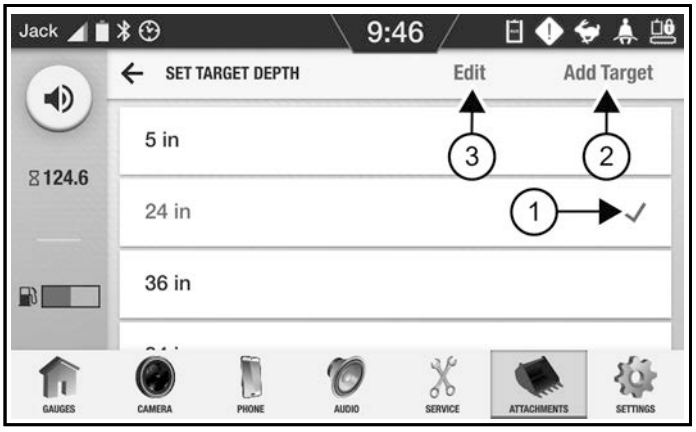
Figure 286



P132925d

2. Select **[SET TARGET]** (Item 1) [Figure 286].

Figure 287



P132927b

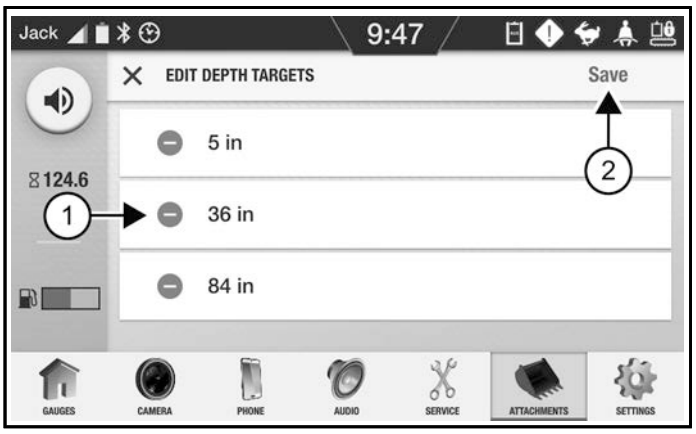
3. Select one of the existing target depths.

   OR

   Select **[ADD TARGET]** (Item 2) [Figure 287] to add a new target depth.

   A check mark will appear (Item 1) [Figure 287] by the selected target depth.

Figure 288



P132929a

4. To remove an existing target depth, select **[EDIT]** (Item 3) [Figure 287].

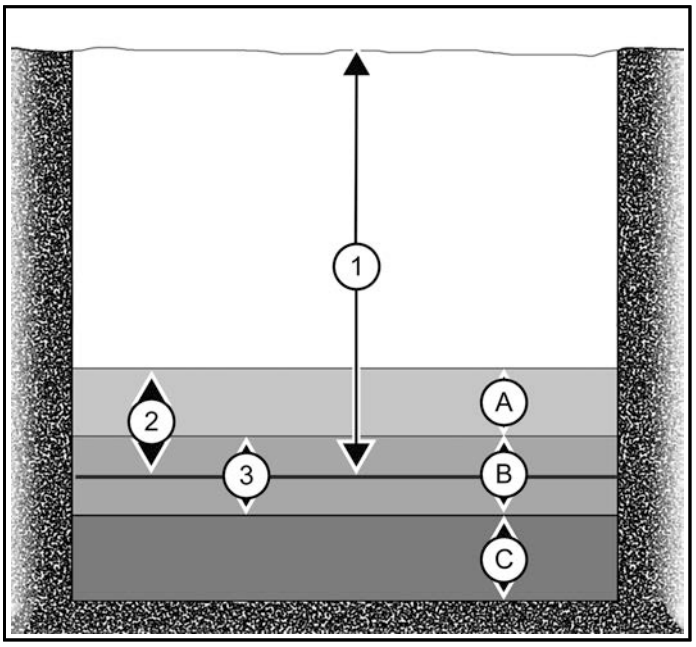
   a. Select the **[REMOVE]** icon (Item 1) [Figure 288] in front of a target depth to remove it.

      The active target depth can not be removed.

   b. Select **[SAVE]** (Item 2) [Figure 288] to confirm removal.

Description Of Grade And Warning Zones

Figure 289



NA20252a

The following three values can be set on the display:

ITEM	DESCRIPTION
1	Target Depth
2	Warning Zone
3	Grade Zone

After you set the target depth, warning zone, and grade zone, you will hear the following audible signals when the attachment is at each depth:

ITEM	DESCRIPTION
A	Operator hears slow beeps.
B	Operator hears solid beep.
C	Operator hears fast beeps.

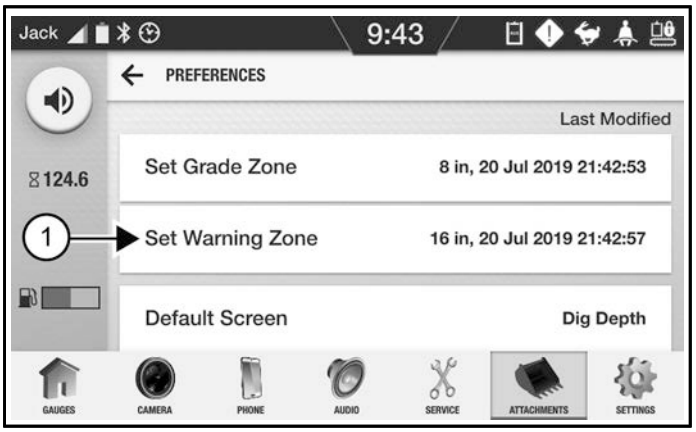
EXAMPLE: Operator sets Target Depth to 610 mm (24 in), Warning Zone to 100 mm (4 in), and Grade Zone to 50 mm (2 in). Operator will hear slow beeps from 508 – 584 mm (20 – 23 in), a solid beep from 584 – 635 mm (23 – 25 in), and fast beeps below 635 mm (25 in).

Setting The Warning Zone

The Warning Zone is the upper distance from the target depth when the warning alarm will start to beep. The closer the attachment gets to the target, the faster the beeps will be. When the attachment reaches the target depth, the alarm will be a continuous sound. If the attachment goes below the target depth, the beeps will be very fast.

1. Select **[ATTACHMENTS]→ [DEPTH CHECK]→ [SETTINGS]→ [PREFERENCES]**.

Figure 290



P132923b

2. Select **[SET WARNING ZONE]** (Item 1) [Figure 290] and enter the dimension.

3. Select **[ENTER]** to save your changes.

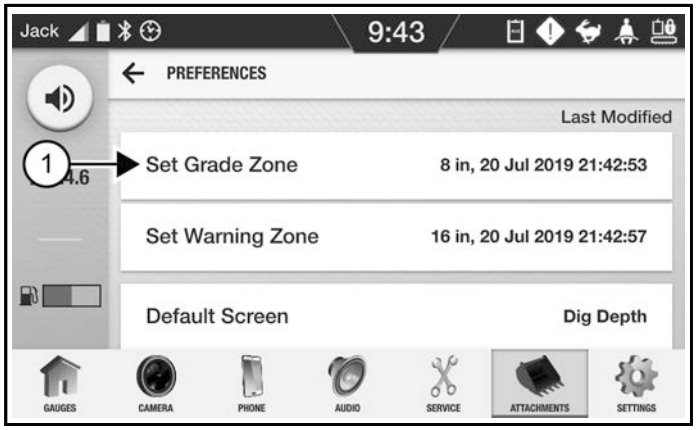
Setting The Grade Zone

The Grade Zone is the distance above and below the target depth at which the alarm will be a continuous beep.

EXAMPLE: If the grade zone is 200 mm (8 in), it will start 100 mm (4 in) above the target depth and end 100 mm (4 in) below the target depth.

1. Select **[ATTACHMENTS]→ [DEPTH CHECK]→ [SETTINGS]→ [PREFERENCES]**.

Figure 291



P132923a

2. Select **[SET GRADE ZONE]** (Item 1) [Figure 291] and enter the dimension.

3. Select **[ENTER]** to save your changes.

Digging To A Target Depth

⚠ DANGER

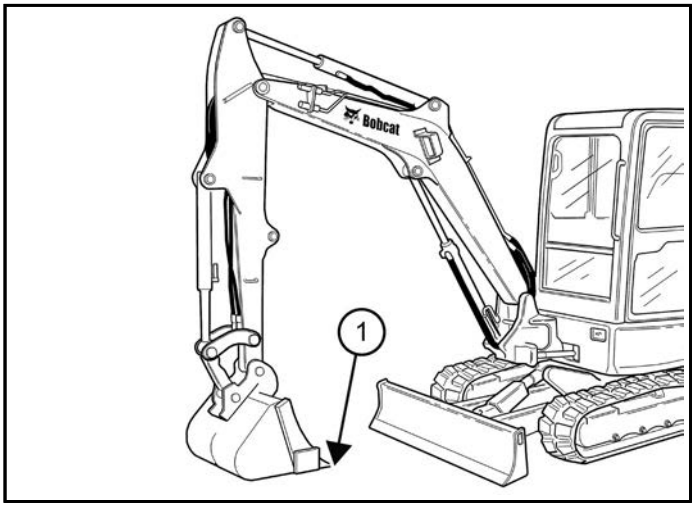
EXPLOSION AND ELECTROCUTION HAZARDS
Contact with underground utility lines will cause death, serious injury, or property damage.

- **Check the work area for buried electrical, gas, utility, or other service lines before excavating or operating ground engaging equipment.**
- **Follow all local rules and regulations regarding digging or working in areas around underground utilities. Have all underground utility lines clearly marked before operating.**
- **DO NOT depend on the Depth Check system for digging close to known utilities. The system accuracy is dependent upon calibration, slope of the ground, and other variables.**
- **Reported utility locations, such as the depth of the line, can also vary due to soil erosion, grading, and other factors.**

1222-7BFD3B03

NOTE: If you are not digging with a laser, make sure the laser icon is not illuminated on the **DEPTH CHECK** screen.

Figure 292

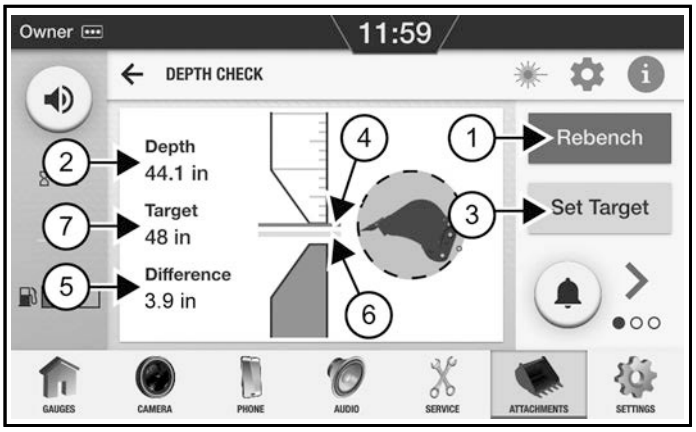


NA1400e

1. Set the bucket (Item 1) [Figure 292] on the ground surface where you are going to start the dig or on the surveyor mark to establish the starting ground position.

2. Select **[ATTACHMENTS]→ [DEPTH CHECK]**.

Figure 293



P132925c

3. Select **[REBENCH]** (Item 1) [Figure 293] on the display.

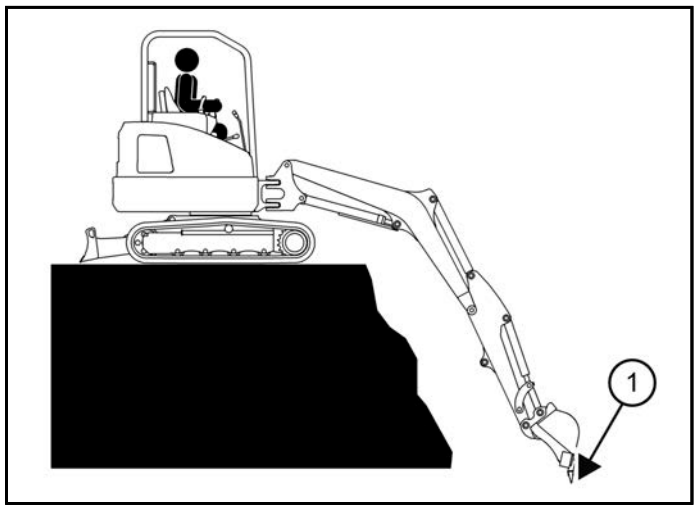
   OR

   Press the right joystick button to rebench.

   At rebench, the depth dimension (Item 2) will set to 0.0. As the bucket is raised or lowered, the depth dimension (Item 2) will change [Figure 293].

4. Select **[SET TARGET]** (Item 3) [Figure 293] to set the new depth target.

Figure 294



NA20363a

- As the hole is being dug, the position of the bucket (Item 1) [Figure 294] is dimensionally shown (Item 2) [Figure 293] and shown on the bar graph (Item 4) [Figure 293].
- The distance to target depth is shown dimensionally (Item 5) and on the bar graph (Item 6) [Figure 293].
- When the bucket is getting close to the target depth (Item 7) [Figure 293], a warning alarm (if activated) will start to slowly beep. The beeps will increase in frequency the closer the bucket gets to the target depth or grade zone. When the target depth or grade zone is reached, the alarm will sound continuously. (See Setting The Warning Zone on Page 134)
(See Setting The Grade Zone on Page 134)

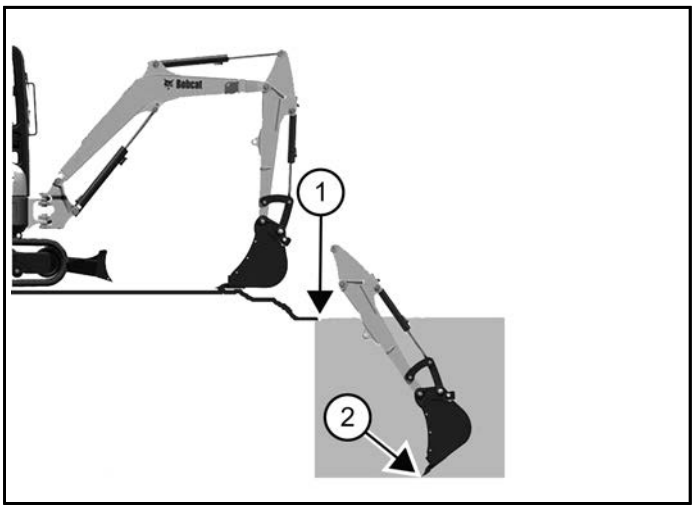
  EXAMPLE: The Target is 2 m (6.5 ft) and the Depth is 1,5 m (4.9 ft), the Difference will be 0,5 m (1.6 ft).

  2 m – 1,5 m = 0,5 m (6.5 ft – 4.9 ft = 1.6 ft).

Repositioning The Excavator And Continuing To Dig To The Original Depth

After repositioning the excavator, choose one of the following options to continue to dig to the original depth.

Figure 295



P200242b

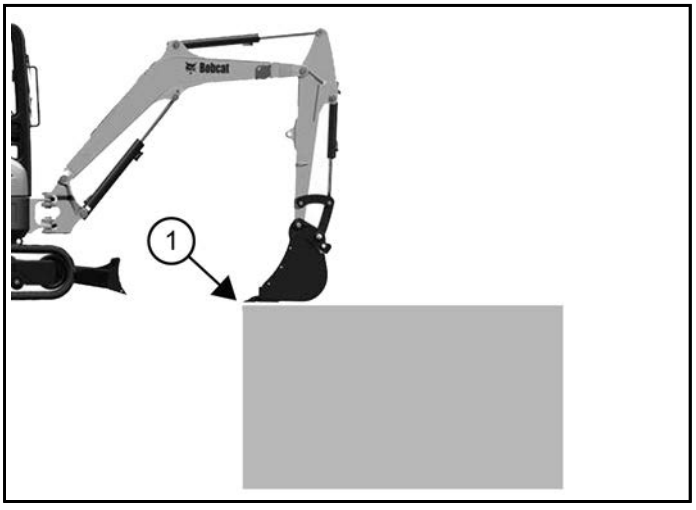
- Reposition the excavator so the bucket can be rebenched off the original bench point (Item 1) [Figure 295].
- Position the excavator so the bucket will reach to the bottom of the hole (Item 2) [Figure 295] at an area that is known to be the correct depth. When rebenching at the bottom of the trench, set the target depth to zero to continue digging at the original depth.

NOTE: Set the distance from the target depth to the point at which the alarm starts to beep on the **WARNING ZONE** screen.

Digging To A Target Depth And Width

Follow the same procedure as for digging a hole to a target depth except as follows.
(See Digging To A Target Depth on Page 135)

Figure 296

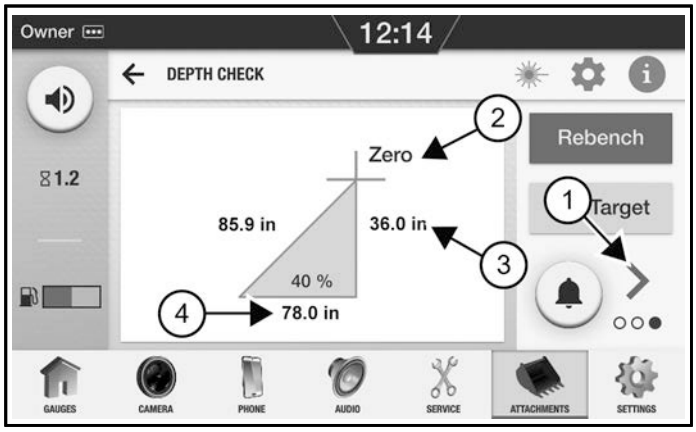


P200241a

1. When rebenching the bucket for setting to 0.0, position the bucket (Item 1) [Figure 296] at the starting point of the side of the hole.

This gives the Depth Check system the starting position of the hole.

Figure 297



NA3431c

2. Press the **[ARROW]** icon (Item 1) [Figure 297] to scroll to the **GRADE CHECK** screen [Figure 297].

   On this example screen, Zero (Item 2) is the rebench starting point, 36.0 in (Item 3) is the target depth, and 78.0 in (Item 4) is the reach (the width of the hole) [Figure 297].

The warning alarm (if activated) will start to beep when you are getting close to the target depth, will progressively beep faster until the target depth is reached, and then will sound continuously.

The alarm only activates for the depth, not for the reach (width of hole). For this, monitor the reach dimension on the screen (Item 4) [Figure 297].

⚠ DANGER

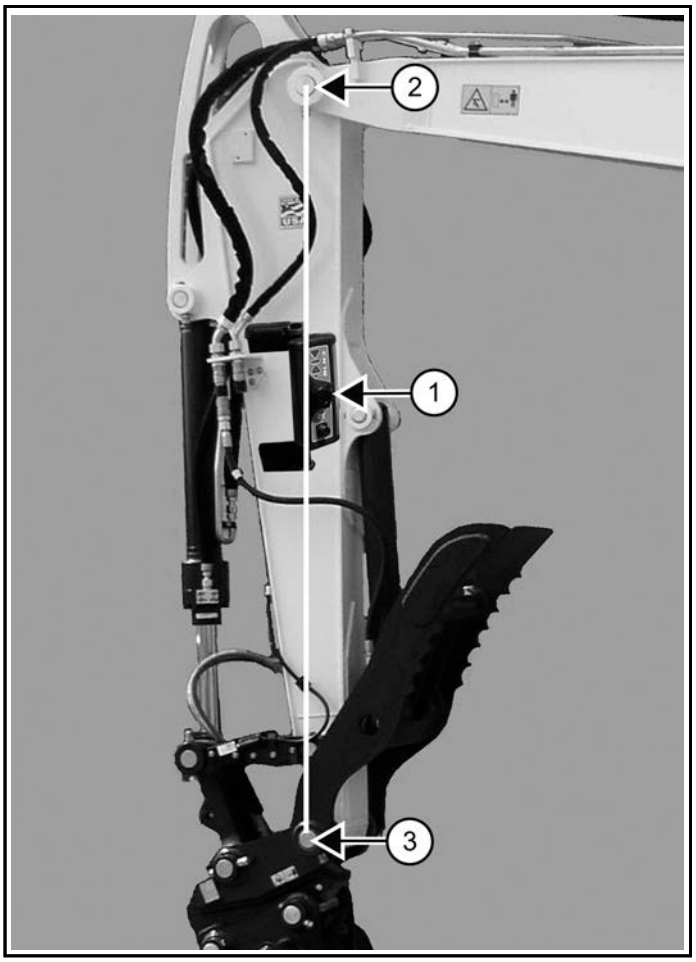
EXPLOSION AND ELECTROCUTION HAZARDS
Contact with underground utility lines will cause death, serious injury, or property damage.

- **Check the work area for buried electrical, gas, utility, or other service lines before excavating or operating ground engaging equipment.**
- **Follow all local rules and regulations regarding digging or working in areas around underground utilities. Have all underground utility lines clearly marked before operating.**
- **DO NOT depend on the Depth Check system for digging close to known utilities. The system accuracy is dependent upon calibration, slope of the ground, and other variables.**
- **Reported utility locations, such as the depth of the line, can also vary due to soil erosion, grading, and other factors.◂**

1222-7BFD3B03

Setting Up A Laser With Depth Check

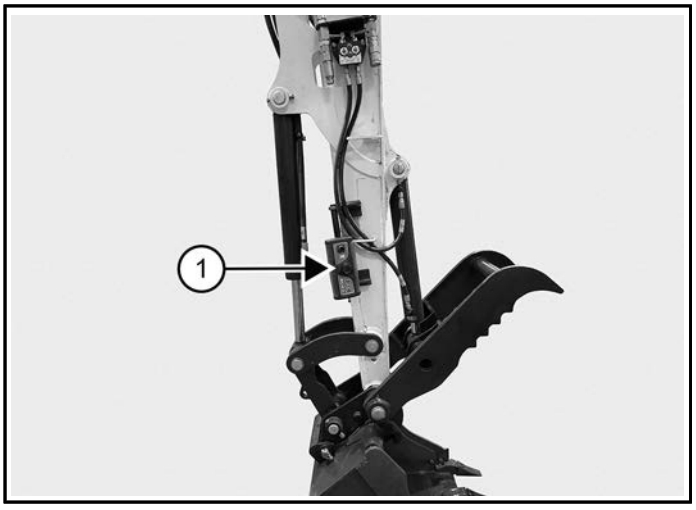
Figure 298



P132078b

1. Install the laser receiver (Item 1) as close as possible in line with the arm pin (Item 2) and the bucket pivot pin (Item 3) [Figure 298].

Figure 299



C204995b

2. If your machine is equipped with options that make it difficult to install the laser receiver in the centre of the arm, install it in an alternative location such as shown here (Item 1) [Figure 299].

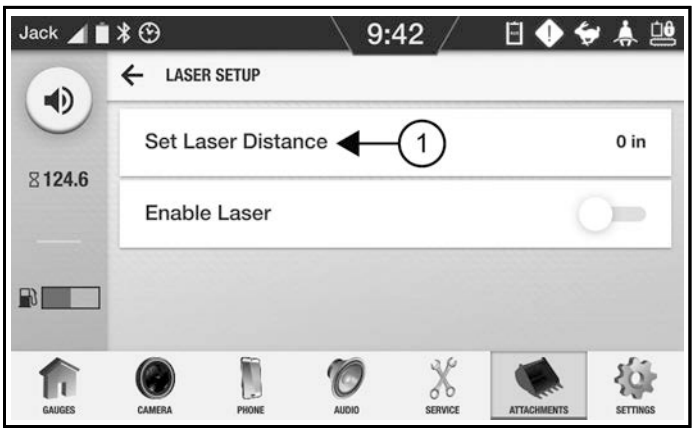
3. If your excavator is equipped with a clamp or arm that may interfere with the laser, make sure there is no hose-to-laser interference.

   a. Fully curl the arm and bucket and make sure the hoses do not interfere with the laser receiver during any arm or bucket movement.

   b. Adjust the position of the laser receiver if necessary to avoid any contact with the hoses.

4. Select **[ATTACHMENTS]→ [DEPTH CHECK]→ [SETTINGS]→ [LASER SETUP]**.

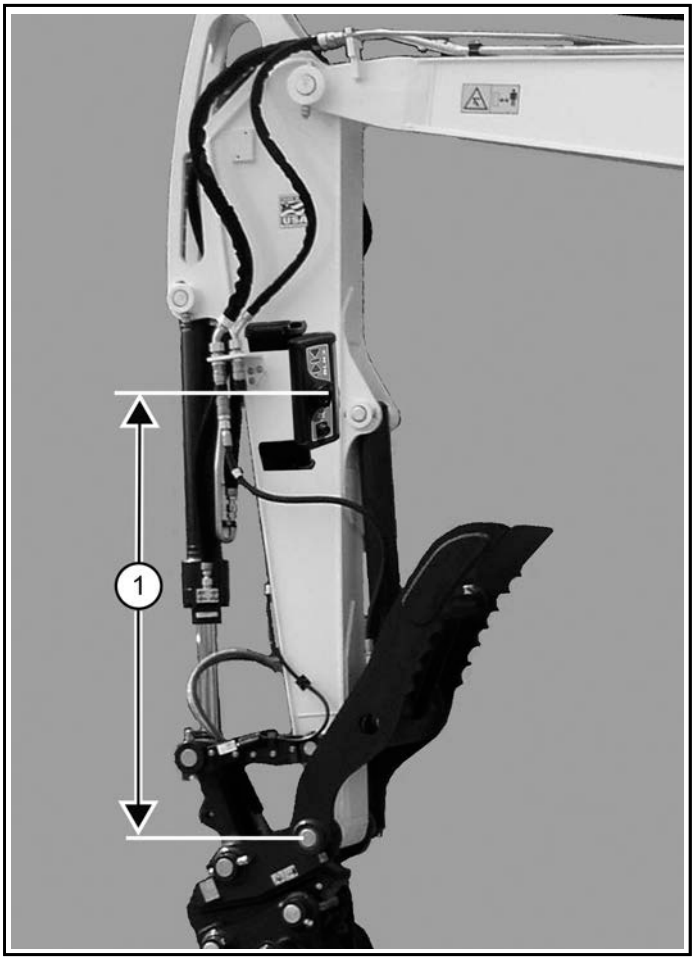
Figure 300



P132921a

5. Select **[SET LASER DISTANCE]** (Item 1) [Figure 300].

Figure 301



p132078d

6. Measure from the centre of the laser receiver to the bucket pivot pin (Item 1) [Figure 301].

7. Enter this distance as the Laser Distance.

To dig a hole using the laser, see the following:
(See Benching With A Laser System on Page 138)

Benching With A Laser System

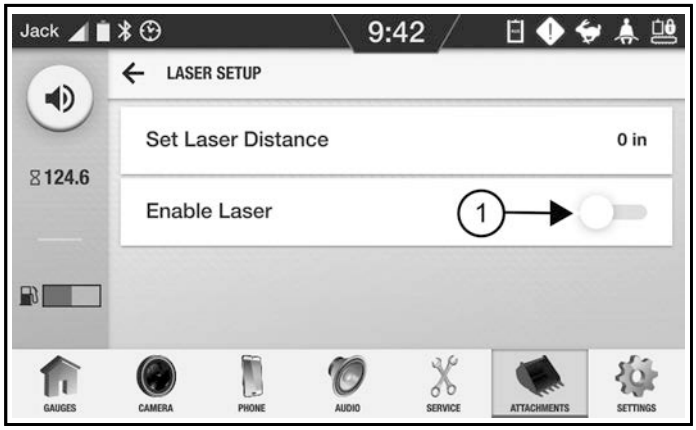
Read and understand the information supplied with the laser receiver for correctly setting up the laser system.

When the laser feature is turned on, the target depth is the distance from the laser beam to grade point. Grade must be known prior to benching with a laser system. See (Item 3) [Figure 303].

1. Make sure the laser receiver location on the arm has been entered into the Depth Check system.
(See Setting Up A Laser With Depth Check on Page 137)

2. Select **[ATTACHMENTS]→ [DEPTH CHECK]→ [SETTINGS]→ [LASER SETUP]**.

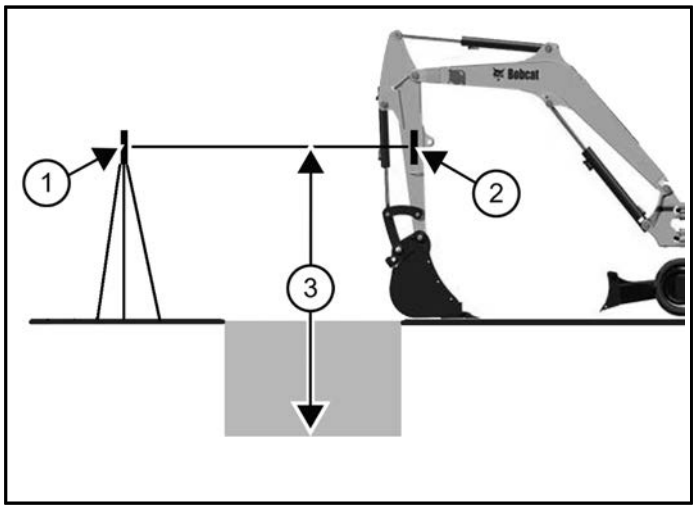
Figure 302



p132921b

3. Enable the laser by moving the slider (Item 1) [Figure 302].

Figure 303



P200243a

4. With the excavator arm vertical, raise or lower the boom and arm as needed until the laser (Item 1) strikes the receiver (Item 2) [Figure 303].

   If necessary, curl the bucket fully for increased bucket ground clearance, or dig a hole so that the bucket can be lowered to allow the laser to strike the receiver with the arm vertical.

5. When the laser strikes the receiver and the receiver light turns green, select **[REBENCH]**.

   OR

   Rebench by pressing the right joystick button.

Figure 304

NA3890

   If the arm is not vertical when you try to rebench, the **ARM ALIGNMENT** screen [Figure 304] will remind you to align the arm vertically before rebenching. Adjust the arm and select **[REBENCH]**.

6. Select **[SET TARGET]**.

7. Enter the distance from the laser to the target depth (Item 3) [Figure 303].

8. Adjust the Warning Zone and Grade Zone as needed. (See Setting The Grade Zone on Page 134) (See Setting The Warning Zone on Page 134)

9. Proceed to dig, referencing the display and listening for audible alerts to maintain the correct depth.

TROUBLESHOOTING THE DEPTH CHECK SYSTEM

Depth Check system measures inaccurately, shows the incorrect depth on the display, or gives an error code.

Cause(s)	Solution(s)
Improper calibration of boom, arm, or attachment.	Recalibrate boom, arm, and attachment. (See Depth Check (Standard Display) on Page 112) (See Depth Check (Touch Display) on Page 125)
One or more sensors are not working correctly.	Determine which sensor is not working correctly and replace. (See Checking The Bucket Sensor on Page 140) (See Checking The Arm Sensor on Page 141) (See Checking The Boom Sensor on Page 141)
Attachment was measured incorrectly.	Remeasure attachment and input new values. For standard display (See Calibrating The Attachment on Page 117) For touch display (See Calibrating The Attachment on Page 131)
Laser feature is activated but laser isn't being used.	Turn laser off. For standard display (See Benching With A Laser System on Page 124) For touch display (See Benching With A Laser System on Page 138)
Laser feature isn't activated, but a laser is being used to Rebench.	Turn laser feature on. For standard display (See Benching With A Laser System on Page 124) For touch display (See Benching With A Laser System on Page 138)
Rebenching isn't working correctly.	If you are not using a laser, make sure the laser feature is turned off. If you are using a laser, make sure the laser feature is turned on and you are benching off the laser beam, not the ground.

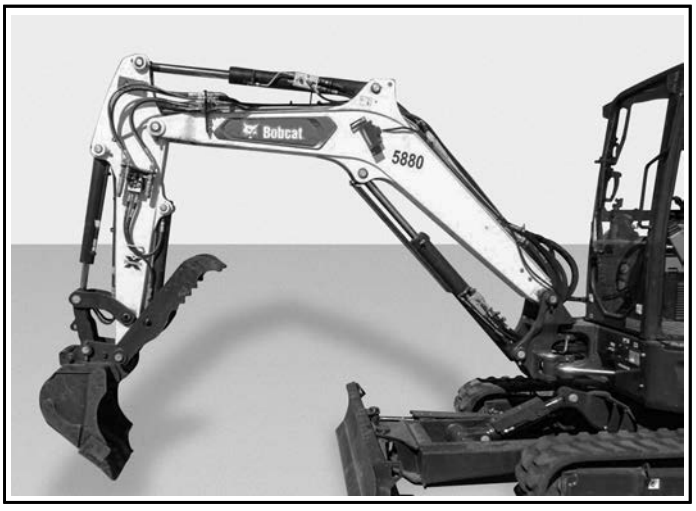
Checking The Bucket Sensor

The following item is required for this task:

- Tape measure.

The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

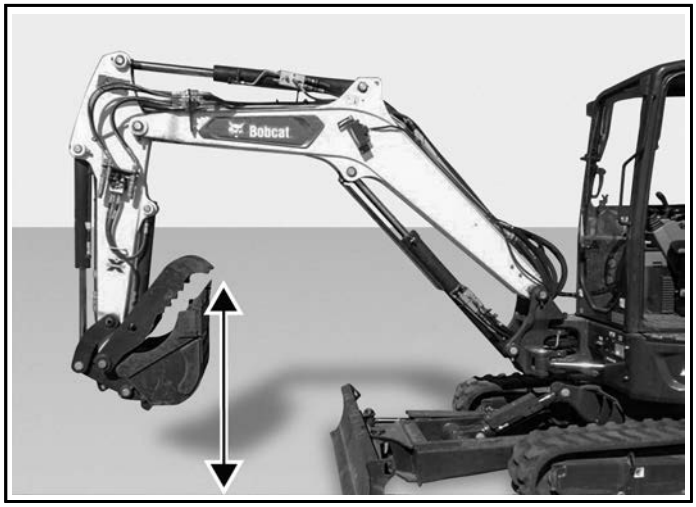
Figure 305



C209270

1. Place the bucket teeth on the ground with the teeth at the lowest point in the bucket movement arc [Figure 305].
2. Select **[REBENCH]**.

Figure 306



C209271a

3. Move only the bucket up to nearly the fully curled position [Figure 306].

   Do not move the boom or arm.

4. Measure how high the bucket teeth are off the ground [Figure 306].

5. Compare the measurement to the Depth value on the display.

If the display isn't showing the correct Depth, contact your Bobcat dealer.

Checking The Arm Sensor

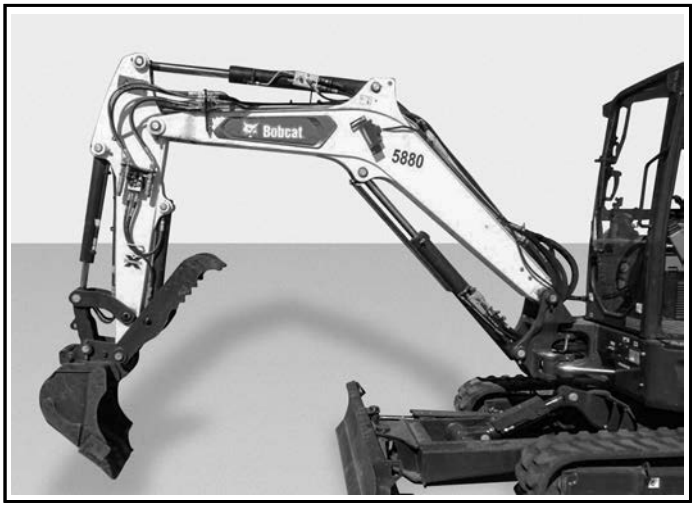
The following item is required for this task:

- Tape measure.

The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

1. First verify that the bucket sensor is working correctly.
   (See Checking The Bucket Sensor on Page 140)

Figure 307



C209270

2. Place the bucket teeth on the ground with the teeth at the lowest point in the bucket movement arc [Figure 307].

3. Select **[REBENCH]**.

Figure 308

C209385a

4. Move only the arm out, extending it as much as possible [Figure 308].

   Do not move the boom.

5. Measure how high the bucket teeth are off the ground [Figure 308].

6. Compare this result to the Depth value on the display.

If the display isn't showing the correct Depth, contact your Bobcat dealer.

Checking The Boom Sensor

The following item is required for this task:

- Tape measure.

The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

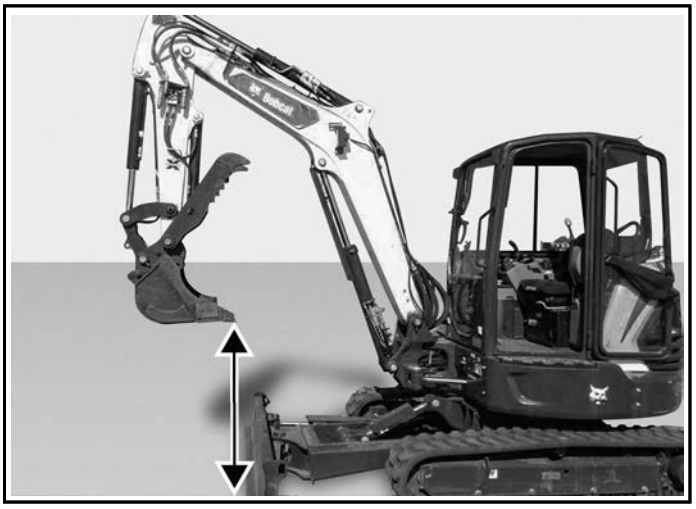
1. First verify that the bucket and arm sensors are working correctly.
   (See Checking The Bucket Sensor on Page 140)
   (See Checking The Arm Sensor on Page 141)

Figure 309

C209275

2. Set the bucket flat on the ground [Figure 309].
3. Select **[REBENCH]**.
4. Move the boom up.

Figure 310



5. Measure how high the bucket teeth are off the ground [Figure 310].
6. Compare the measurement with the Depth value on the display.

If the display isn't showing the correct Depth, contact your Bobcat dealer.

TOWING THE MACHINE

Towing The Machine

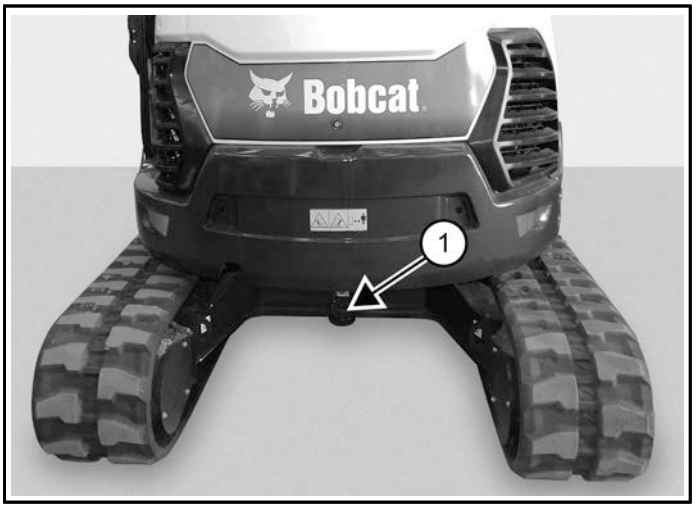
There is not a recommended towing procedure for the excavators.

- The excavator can be lifted onto the transport vehicle. (See Lifting The Machine on Page 143)
- The excavator can be skidded a short distance for service (for example, moving it onto a transport vehicle) without damaging the hydraulic system. (The tracks will not turn.)

  There might be slight wear to the tracks when the excavator is skidded.

  NOTE: Do not move travel controls during towing/skidding. It can cause damage to the drive motors.

Figure 311



P200086a

- Secure the towing chain to the loop located at the rear of the excavator (Item 1) [Figure 311].

  The towing chain (or cable) must be rated at 1.5 times the weight of the excavator.

LIFTING THE MACHINE

Lifting The Machine

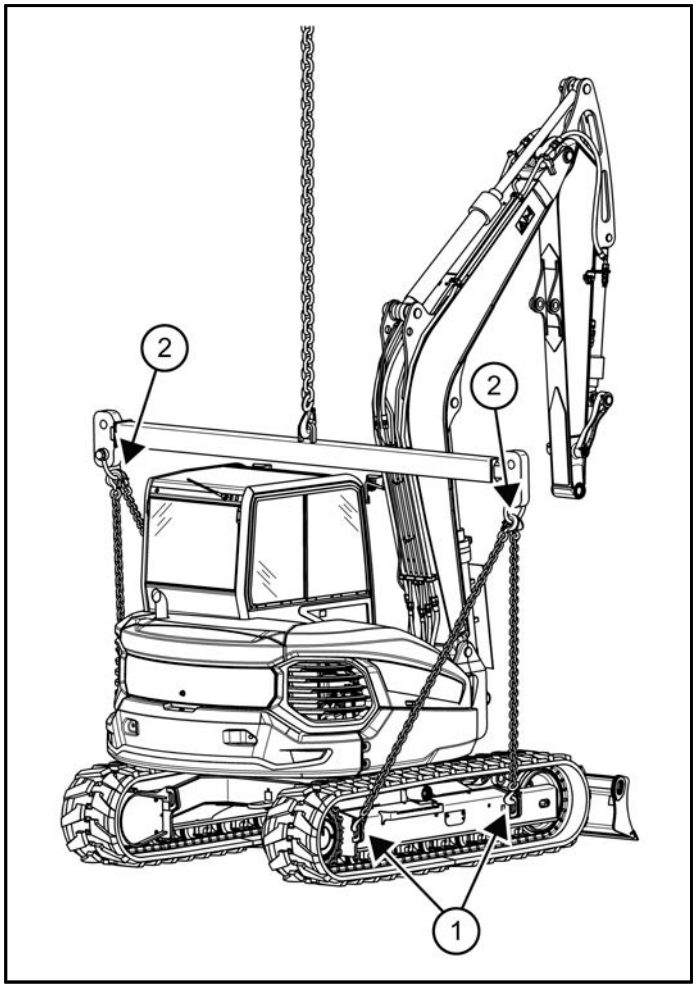
⚠ WARNING

CRUSHING HAZARD
Falling machine can cause serious injury or death.
- **Use chains and lifting equipment with sufficient capacity for the weight of the excavator plus any added attachments.**
- **Keep machine level and balanced when lifting.**
- **Do not swing boom or upperstructure.**
- **Never lift with operator on machine.**
- **Never lift with the blade angled (if equipped).**

W-2800

1. Fully extend the cylinders of the bucket, arm, and boom.
2. Raise the blade fully.
3. Put all the control levers in NEUTRAL and stop the machine.

Figure 312



NA13729a

4. Fasten chains to the outer lift eyes on the track frame (Item 1) and to a lifting fixture above the cab (Item 2) [Figure 312].

The lifting fixture must be at least 3660 mm (12 ft) wide to prevent the chains from contacting the tracks.

TRANSPORTING THE MACHINE

When transporting the machine, observe the rules, motor vehicle laws, and vehicle limit ordinances. Use a transport and towing vehicle of adequate length and capacity.

1. Secure the parking brakes and block the wheels of the transport vehicle.
2. Align the ramps with the centre of the transport vehicle.
3. Secure the ramps to the truck bed and be sure ramp angle does not exceed 15 degrees.

   Use metal loading ramps with a slip-resistant surface. Use ramps that are the correct length and width and that can support the weight of the machine.
4. Block and support the rear of the trailer during loading and unloading to prevent the front of the transport vehicle from raising.
5. Determine the direction of the track movement before moving the machine (blade forward).
6. Disengage the auto idle feature and move the two-speed travel to the low range position.

⚠ WARNING

INSTABILITY HAZARD
Wood ramps can break and cause personal injury. Use adequately designed ramps of sufficient strength to support the weight of the machine loading onto a transport vehicle.◂
W-2058

Figure 313

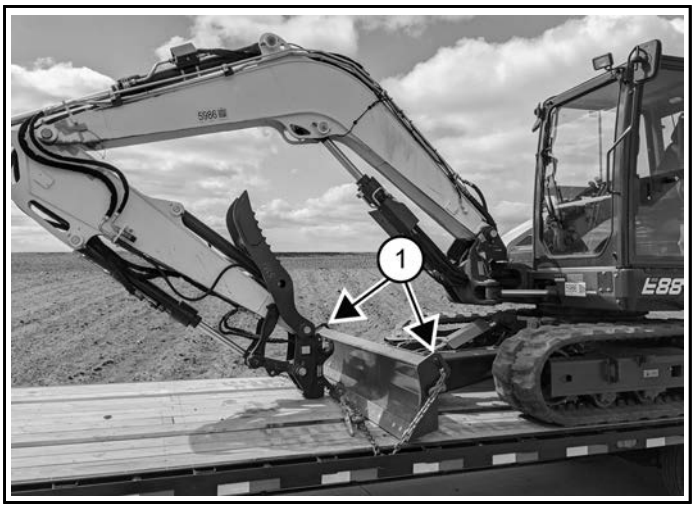
C209967

7. Move the machine forward onto the transport vehicle [Figure 313].
8. Do not change the direction of the machine while it is on the ramps.
9. Lower the boom, arm, bucket, and blade to the transport vehicle.
10. Stop the engine and remove the key (if equipped).
11. Put blocks at the front and rear of the tracks.

Fastening The Machine To A Trailer

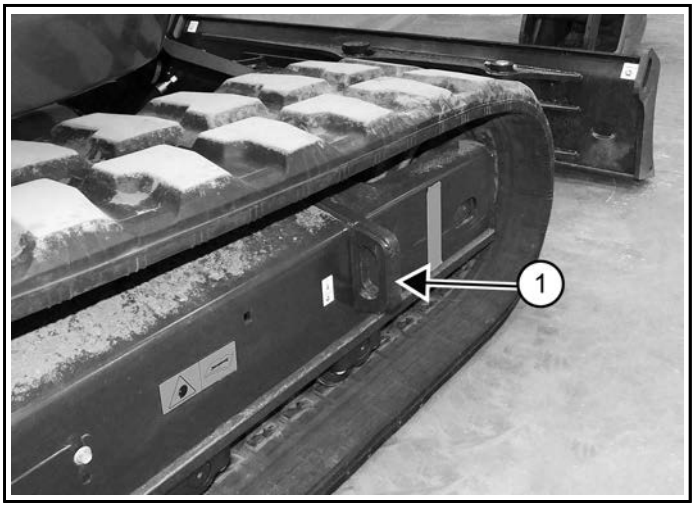
Tie down the excavator to prevent it from moving when going up or down slopes or during sudden stops. Use chain binders to tighten the chains and then safely tie the chain binder levers to prevent loosening.

Figure 314



C209968a

Figure 315



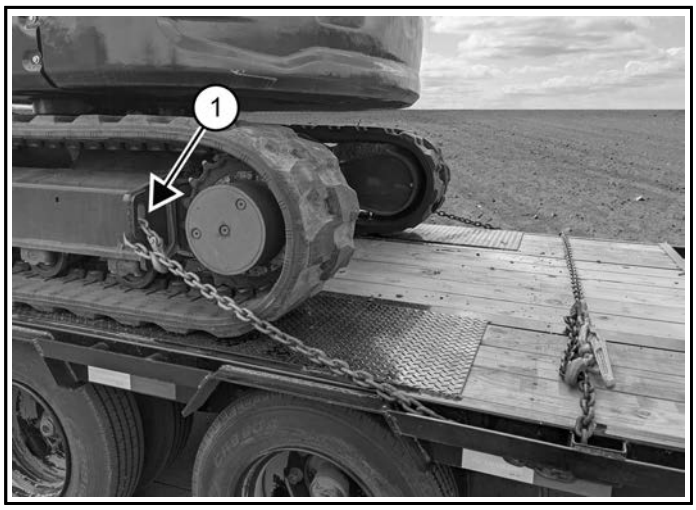
C209970a

1. At the front of the machine, fasten chains to the corners of the blade (Item 1) [Figure 314].

   OR

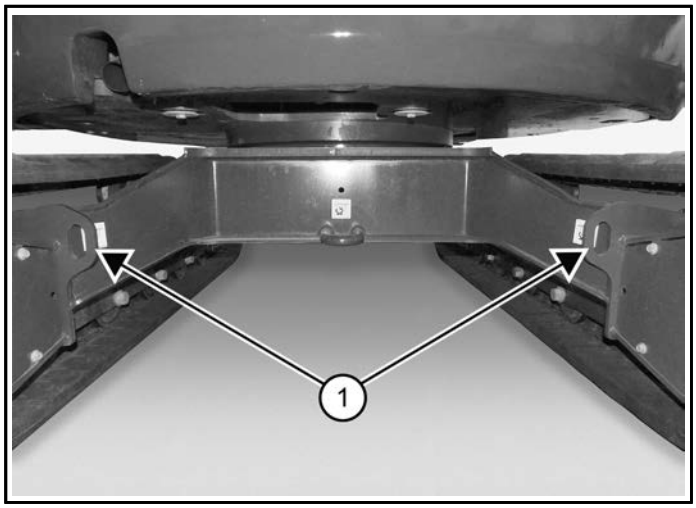
   Fasten chains to the tie-down loops on the outside of the tracks (Item 1) [Figure 315].

Figure 316



C209969a

Figure 317



C200607a

2. At the rear of the machine, fasten chains to the tie-down loops on the exterior of the track (Item 1) [Figure 316].

   OR

   Fasten chains to the tie-down loops in the interior of the track (Item 1) [Figure 317].

MAINTENANCE SAFETY WARNINGS

- **Never service the Bobcat® machine without instructions. Read and understand the Operation & Maintenance Manual, Operator's Handbook, and signs (decals) on machine. Follow warnings and instructions in manuals when making repairs, adjustments, or servicing. Check for correct function after adjustments, repairs, or service.**
- **Untrained operators and failure to follow instructions can cause injury or death.**

Maintenance procedures that are given in the Operation & Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedures that are not in the Operation & Maintenance Manual must be performed ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL. Always use genuine Bobcat replacement parts. The Service Safety Training Course is available from your Bobcat dealer.

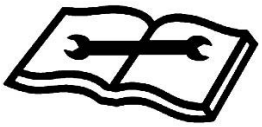
This check mark means: "Follow instructions for proper operations." Carefully read the message that follows.

- **Have good ventilation when welding or grinding painted parts.**
- **Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.**

MAINTENANCE SAFETY WARNINGS

This Safety Alert Symbol means: “Attention! Be Alert! Your Safety is Involved!” Carefully read the message that follows.

• Use the correct procedure to lift and support the machine.



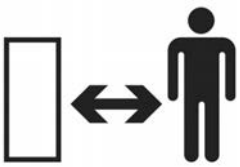
• Cleaning and maintenance are required daily.

• Vent exhaust to outside when engine must be run for service.
• Exhaust system must be tightly sealed. Exhaust fumes can kill without warning.

• Stop, cool, and clean engine of flammable materials before checking fluids.
• Never service or adjust machine with the engine running unless instructed to do so in the manual.
• Avoid contact with leaking hydraulic fluid or diesel fuel under pressure. It can penetrate the skin or eyes.
• Never fill fuel tank with engine running, while smoking, or when near open flame.

• Keep body, jewelry, and clothing away from moving parts, electrical contact, hot parts, and exhaust.
• Wear eye protection to guard from battery acid, compressed springs, fluids under pressure, and flying debris when engines are running or tools are used. Use eye protections approved for type of welding.
• Keep tailgate closed except for service. Close and latch tailgate before operating machine.

• Lead-acid batteries produce flammable and explosive gases.
• Keep arcs, sparks, flames, and lighted tobacco away from batteries.
• Batteries contain acid that burns eyes or skin on contact.
• Wear protective clothing. If acid contacts body, flush well with water. For eye contact, flush well and get immediate medical attention.



• Always lower the bucket and blade to the ground before doing any maintenance.
• Never modify equipment or add attachments not approved by Bobcat Company.

SERVICE SCHEDULE

Maintenance Intervals

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures.

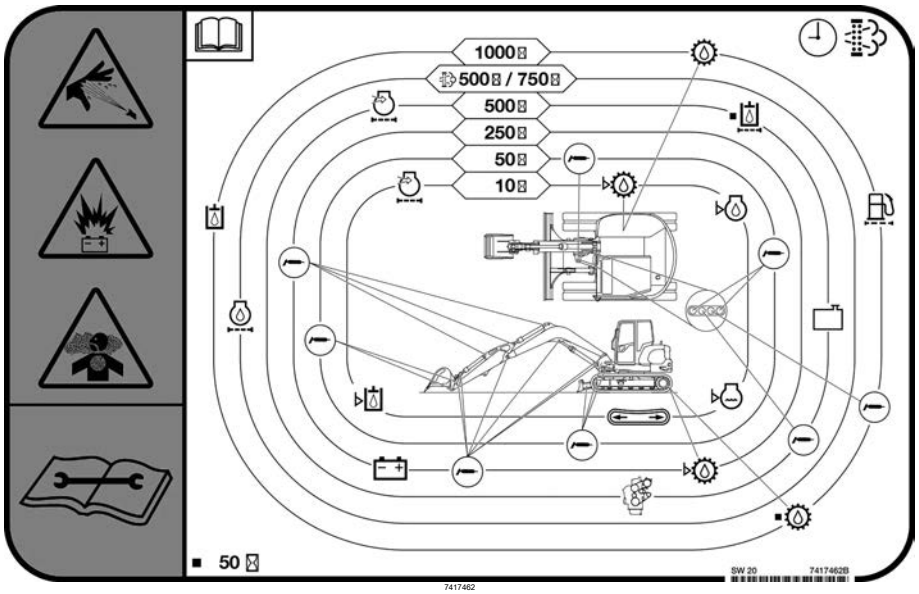
The service schedule decal is a guide for correct maintenance of the Bobcat excavator.

The maintenance items listed under the maintenance intervals on the following pages are the required tasks to be performed. Those items provide additional details and include maintenance that is not shown on the decal.

All maintenance intervals are for machines operating in general environmental conditions. Keep in mind that filter and oil life can be reduced:

- When machines are operating in high dust environments or extreme temperature applications,
- When fuel is taken from uncontrolled storage tanks,
- When other non-standard conditions exist.

For more details, contact your Bobcat dealer.



⚠ WARNING

INSUFFICIENT INSTRUCTIONS HAZARD
Untrained operators or failure to follow instructions can cause serious injury or death.
- **Read and understand the Operation & Maintenance Manual, Operator's Handbook and decals on machine.**
- **Follow warnings and instructions in the manuals when making repairs, adjustments or servicing.**
- **Check for correct function after adjustments, repairs or service.**

W-2003

Service Schedule

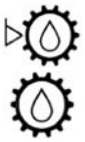
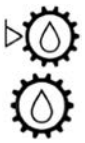
Explanation of the service intervals:

- **10:** Every 10 hours or daily (before starting the machine).
- **50:** Every 50 hours.
- **250:** Every 250 hours or every 12 months, whichever comes first.
- **500:** Every 500 hours or every 12 months, whichever comes first.
- **1000:** Every 1000 hours or every 12 months, whichever comes first.
- **2000:** Every 2000 hours or every 24 months, whichever comes first.

Service Schedule			
O	Check condition / proper operation. Adjust or replace as needed.	V	Refill as needed.
D	Check the display. Service only when required.	C	Clean.
W	Service every 10 hours when operating in water.	R	Replace.
F	First time only.	G	Grease.

Item	Service Required	Service Interval (hours)					
		10	50	250	500	1000	2000
Fuel Filter	(See Page 163) • Fuel Filter (7336334)	D					
Tracks 	Tension (See Page 179)	O					
Operator Cab and HVAC	Filters (See Page 158) • HVAC Air Filter (If Equipped): ▷ Fresh Air (7176099) ▷ Recirculation (7222791)	C O					
Safety Signs (decals)		C O					
Seat Belt	Seat belt, mounting hardware, and seat belt retractors (See Page 152)	C O					
Control Console Lockout	(See Page 152)	O					
Attachment Mounting System	(See Page 185)	O					
Travel Motion Alarm and Horn	(See Page 153)	O					
Operator Cab	Mounting hardware (See Page 48)	O					
Indicators and Lights		O					
Engine Air Filters and Air System 	(See Page 159) • Outer Air Filter (6666375) • Inner Air Filter (6666376)	D			C O		
Engine Oil and Filter  	(See Page 165) • Engine Oil (Packaging: A = 5 L can, B = 25 L container, C = 209 L drum, D = 1000 L tank): ▷ SAE 15W-40 (-20°C – +40°C) (7395725) ▷ SAE 10W-30 (-25°C – +30°C) (7341377) • Engine Oil Filter (7343102)	V			R		

Service Schedule			
O	Check condition / proper operation. Adjust or replace as needed.	V	Refill as needed.
D	Check the display. Service only when required.	C	Clean.
W	Service every 10 hours when operating in water.	R	Replace.
F	First time only.	G	Grease.

Item	Service Required	Service Interval (hours)					
		10	50	250	500	1000	2000
Hydraulic Fluid 	Fluid (See Page 174) • Hydraulic Fluid (Packaging: A = 5 L can, B = 20 L container, C = 210 L drum, D = 1000 L tank): ▷ Bobcat Superior SH Hydraulic (-35°C – +50°C) (6987791)	V				R	
Swing Motor Gear Box 	Fluid (See Page 177) • Transmission Fluid (Packaging: A = 5 L, B = 20 L, C = 210 L) ▷ 80W-90 API GL-5 LS (6987805)	V				R	
Engine Coolant 	Coolant level (check cold)(See Page 167) • Coolant (Packaging: A = 5 L can, B = 20 L container, C = 210 L drum, D = 1000 L tank): ▷ Bobcat PG Coolant Premix (6987793)	V					R
Lubrication 	Blade, boom swing, boom swing cylinder, bucket pivot points, and swing bearing (See Page 186)		G				
Travel Motors (Final Drive) 	Fluid (See Page 182) • Transmission Fluid (Packaging: A = 5 L, B = 20 L, C = 210 L) ▷ 80W-90 API GL-5 LS (6987805)		F R	V		R	
Alternator and Starter	Electrical connections		F O		O		
Hydraulic Filters 	Hydraulic filter and case drain filter (See Page 174) • Primary Hydraulic Filter (6670207) • Case Drain Filter (6686217)		F R		R		
Lubrication 	Boom, boom cylinder, arm, arm cylinder, bucket link, bucket cylinder, and articulated boom (if equipped)(See Page 186)			G			
Battery 	Cables and electrical connections (See Page 170) • Battery (7306047)			O			

Service Schedule			
O	Check condition / proper operation. Adjust or replace as needed.	V	Refill as needed.
D	Check the display. Service only when required.	C	Clean.
W	Service every 10 hours when operating in water.	R	Replace.
F	First time only.	G	Grease.

Item	Service Required	Service Interval (hours)					
		10	50	250	500	1000	2000
Hydraulic Reservoir 	Breather cap (See Page 174) • Hydraulic Fill / Breather Cap (6692836)				R		
Engine Cooling System 	Radiator, fuel cooler, hydraulic fluid cooler, air conditioning condenser (if equipped) (See Page 167) • Radiator Cap (7337382)				C		
Alternator 	Belt (See Page 183)				O		
Air Conditioning (if equipped)	Belt (See Page 183)				O		
HVAC	Housing and coils (See Page 158)				C		
Lubrication 	Swing pinion (See Page 186)				G		
Fuel Pre-Filter 	Fuel pre-filter (See Page 164) • Fuel Pre-Filter (7348032)					R	
Fuel Tank	Vent filter (See Page 165) • Fuel Tank Vent Filter (7340277)					R	
Lubrication 	Swing reduction gear (See Page 186)					G	

NOTE: The DPF icon  denotes machines equipped with a Diesel Particulate Filter.

Inspection Checkbook

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures.

The service schedule is a guide for the correct maintenance of the Bobcat machine.

The Inspection Checkbook contains the following information:

- Doosan Bobcat EMEA s.r.o. Warranty Policy
- Doosan Bobcat EMEA s.r.o. Extended Warranty Policy

The inspection checkbook has to be filled in by the dealer for any maintenance and service work of your Bobcat machine. This book may be required anytime by an authorised dealer or by Bobcat Europe, should be a breakdown occur on the Bobcat equipment.

Your Bobcat dealer can order the Inspection Checkbook. The part number is 7296478.

CONTROL CONSOLE LOCKOUTS

Inspecting And Maintaining The Control Console Lockouts

Figure 318

P200109a

When the left console is raised [Figure 318], the hydraulic joysticks and traction system must not function.

1. Sit in the operator's seat, fasten the seat belt, and start the engine.
2. Keep the left console raised [Figure 318].
3. Move the joysticks.

   There should be no movement of the boom, arm, slew, or bucket.
4. Move the steering control levers.

   There should be no movement of the excavator tracks.

If these controls do not deactivate when the left console is raised, see your Bobcat dealer for service.

SEAT BELT

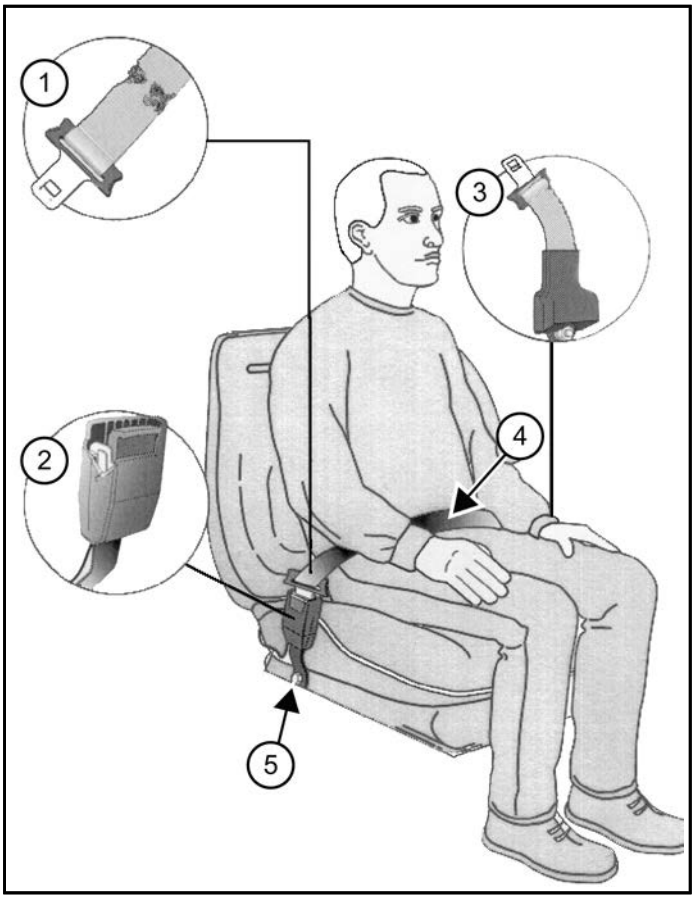
Inspecting And Maintaining The Seat Belt

⚠ WARNING

GENERAL HAZARD
Failure to properly inspect and maintain the seat belt can cause lack of operator restraint resulting in serious injury or death.

W-2466

Figure 319



NA3113c

Check the seat belt daily for correct function. Inspect the seat belt system thoroughly at least once each year or more often if the machine is exposed to severe environmental conditions or applications.

The items below are referenced in [Figure 319].

1. Check the webbing. If the system is equipped with a retractor, pull the webbing completely out and inspect the full length of the webbing. Look for cuts, wear, fraying, dirt, and stiffness.
2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn or deformed, buckle is not damaged, and casing is not broken.
3. Check the retractor web storage device (if equipped) by extending webbing to determine if it looks correct and that it spools out and retracts webbing correctly.

4. Check webbing in areas exposed to ultraviolet (UV) rays from the sun or extreme dust or dirt. If the original colour of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength may have deteriorated.

5. Check the hardware on both sides of the seat. Hardware should be tight. Hardware must not be missing, rusted, corroded, or damaged.

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discolourations due to ultraviolet UV exposure, dusty / dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor (if equipped), hardware or any other obvious problem should be replaced immediately.

See your Bobcat dealer for seat belt system replacement parts for your machine.

TRAVEL MOTION ALARM

Travel Motion Alarm Description

This excavator may be equipped with a travel motion alarm. The travel motion alarm is located underneath the rear of the excavator.

The travel motion alarm will sound when the operator moves the travel control levers in either the forward or reverse direction.

If the alarm does not sound, see inspection instructions. (See Inspecting The Travel Motion Alarm System on Page 153)

⚠ WARNING

CRUSHING HAZARD
Failure to maintain a clear view in the direction of travel can cause serious injury or death.
- **This machine is equipped with a motion alarm. ALARM MUST SOUND! when operating forward or backward.**
- **The operator is responsible for the safe operation of this machine.**

W-2786

Inspecting The Travel Motion Alarm System

You will need to move the machine slightly in the forward and reverse directions to test the travel motion alarm. Keep all bystanders away from machine during test.

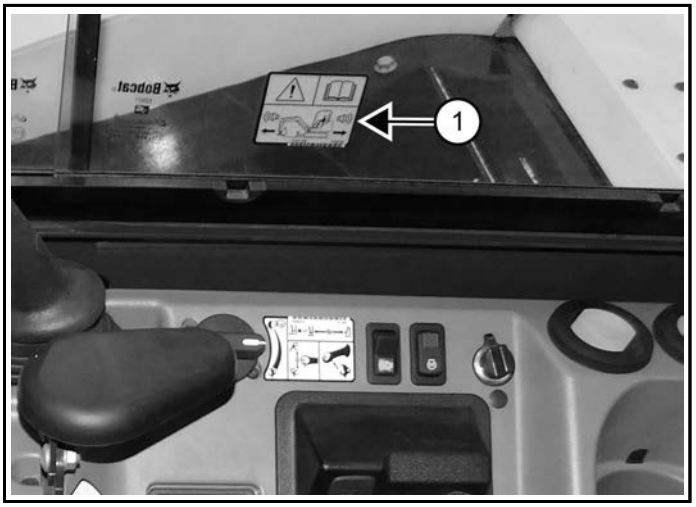
⚠ WARNING

CRUSHING HAZARD
Failure to maintain a clear view in the direction of travel can cause serious injury or death.
- **This machine is equipped with a motion alarm. ALARM MUST SOUND! when operating forward or backward.**
- **The operator is responsible for the safe operation of this machine.**

W-2786

1. Sit in the operator’s seat and fasten the seat belt. (See Pre-Starting Procedure on Page 75)

Figure 320



C208728a

2. Inspect for damaged or missing travel motion alarm decal (Item 1) [Figure 320] .

   Replace if required.

3. Start the engine.
   (See Starting The Engine on Page 78)

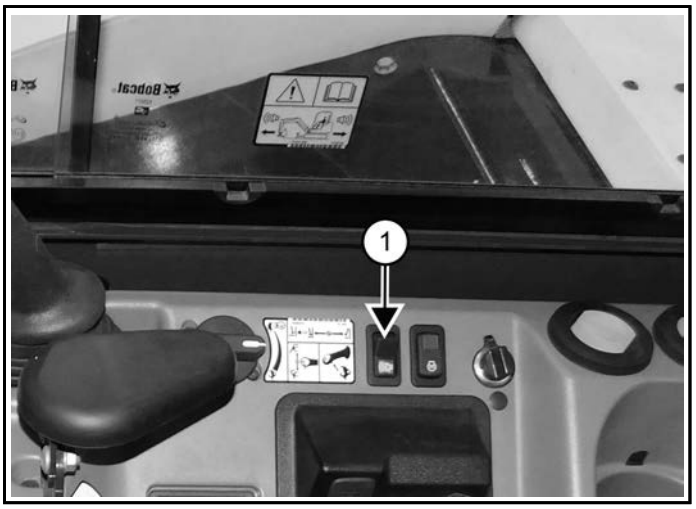
4. Move the travel control levers (one lever at a time) in the forward direction.

   The travel motion alarm must sound.

5. Move the travel control levers (one lever at a time) in the reverse direction.

   The travel motion alarm must sound.

Figure 321



C208728b

6. Slightly move both travel control levers in the forward direction (until the machine is slowly moving forward) and then press the travel motion alarm cancel switch (Item 1) [Figure 321].

   The travel motion alarm will shut off.

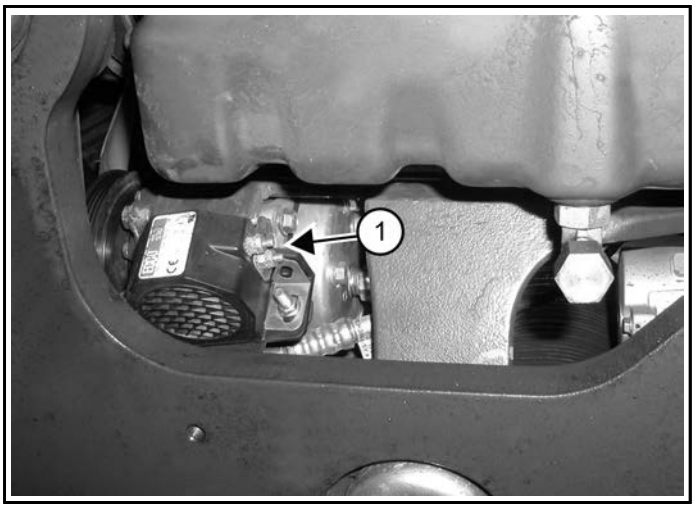
7. Slightly move both travel control levers in the reverse direction (until the machine is slowly moving backward) and then press the travel motion alarm cancel switch (Item 1) [Figure 321].

   The travel motion alarm will shut off.

8. Return both levers to neutral and turn excavator key to the off position.

9. Exit the excavator.
   (See Stopping The Engine And Leaving The Machine on Page 87)

Figure 322



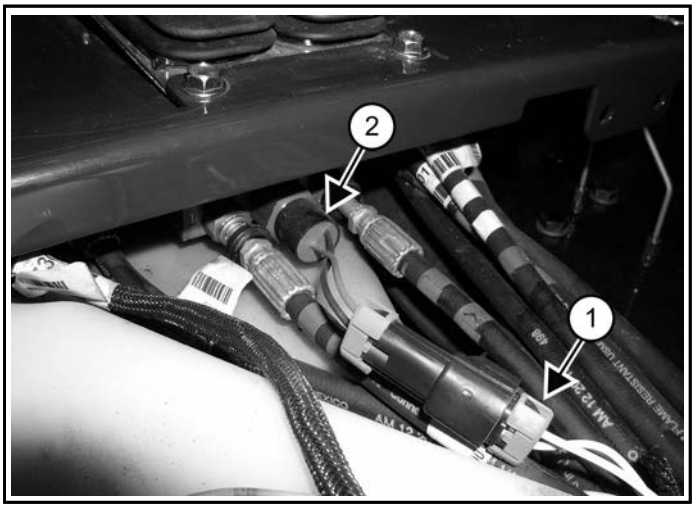
C132009a

10. Locate the travel motion alarm, which is mounted in the bottom rear of the excavator to the front of the engine oil pan [Figure 322].

11. Inspect the travel motion alarm electrical connections and wire harness (Item 1) [Figure 322] for tightness and damage.

    a. Repair or replace any damaged components.

Figure 323



C132027a

12. Locate the travel motion alarm switch, which is in the travel control valve under the floorplate [Figure 323].

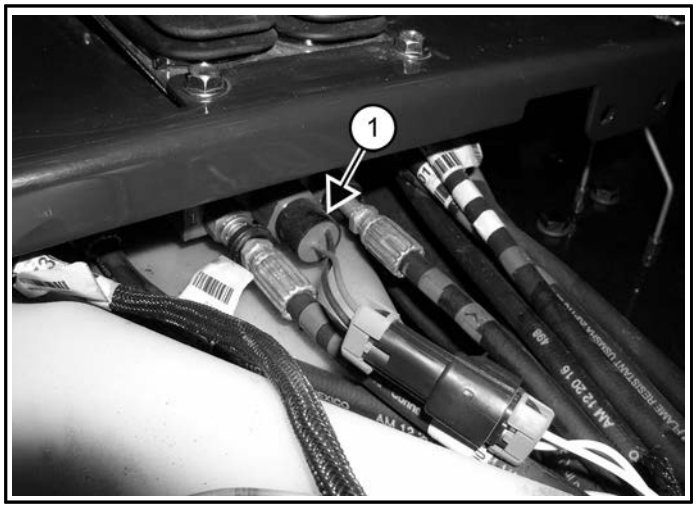
    a. Remove the floor mat and the floorplate to access the switch.

13. Inspect the wire harness (Item 1) and travel motion alarm switch (Item 2) for tightness and damage [Figure 323].

If the travel motion alarm switch requires service, see your Bobcat dealer.

Maintaining The Travel Motion Alarm Switch

Figure 324



C132027b

The travel motion alarm switch (Item 1) [Figure 324] is located in the travel control valve located under the floorplate. In the event the travel motion alarm is not sounding, inspect the switch.

1. Remove the floor mat and the floorplate to access the switch.

2. Check that the switch is fully installed into the travel control valve housings and tightened.

   Tighten the switch to 18 – 20 N•m (13 – 15 ft-lb).

3. Recheck the travel motion alarm.

   If the travel motion alarm still does not sound, replace the switch.

TAILGATE

Opening And Closing The Tailgate

⚠ WARNING

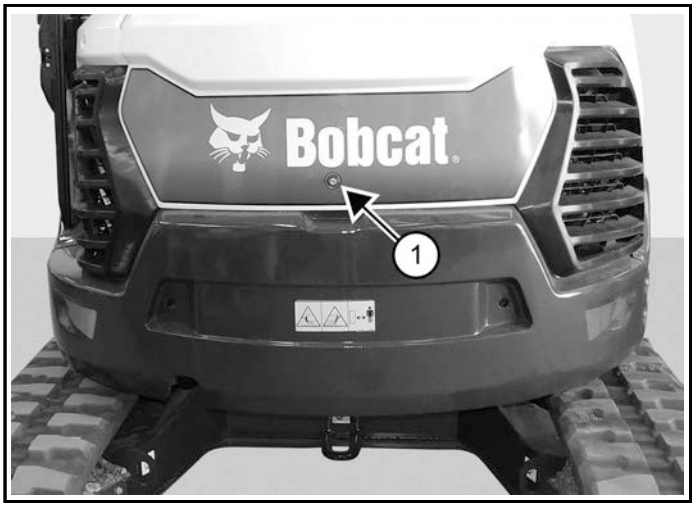
GENERAL HAZARD
Failure to follow instructions can cause serious injury or death.
Never service or adjust the machine when the engine is running unless instructed to do so in the manual.
W-2012

⚠ WARNING

IMPACT HAZARD
Swinging rear door can seriously injure a bystander. Keep the rear door closed when operating the machine.
W-2020

The tailgate can be locked and unlocked using the start key.

Figure 325



P200085a

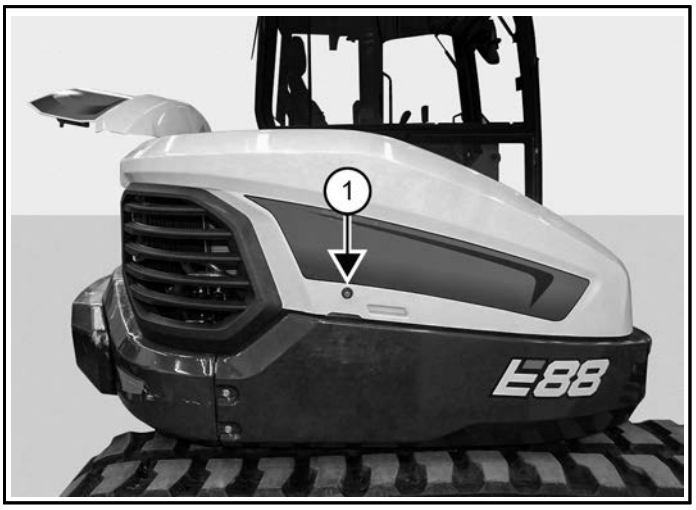
- Push the button (Item 1) [Figure 325] and pull the tailgate open.
- Push firmly to close the tailgate.

RIGHT SIDE COVER

Opening And Closing The Right Side Cover

1. Open the tailgate. (See Tailgate on Page 155)

Figure 326

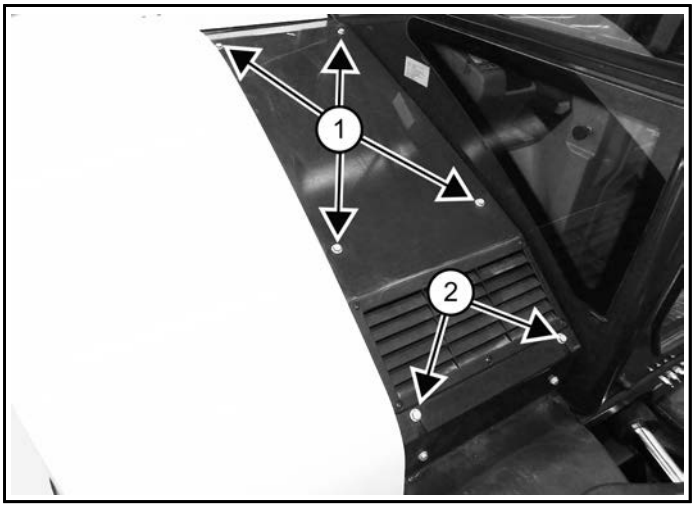


2. Push the button (Item 1) [Figure 326] on the right side cover and allow the cover to rise slowly.
3. To close the right side cover, rotate the cover back until it is in the fully closed position and you hear the latch snap into place.

CENTRE COVER

Removing And Installing The Centre Cover

Figure 327



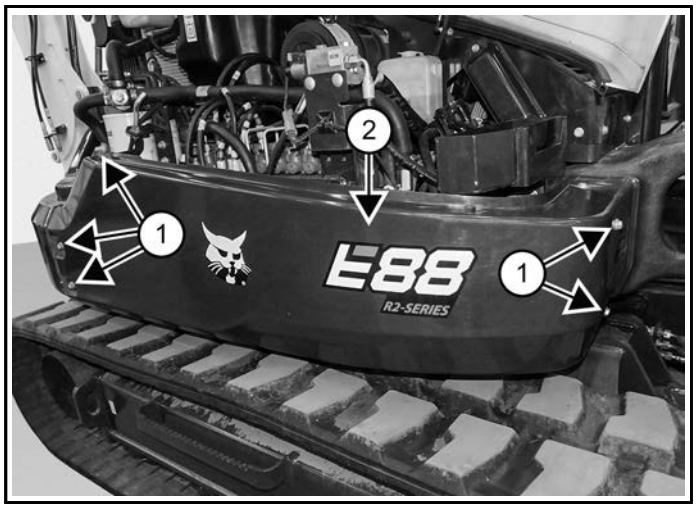
1. Remove the four top bolts (Item 1) [Figure 327].
2. Loosen the two bottom bolts (Item 2) [Figure 327].
3. Slide the centre cover off the two bottom bolts (Item 2) [Figure 327].
4. To install, slide the cover slots into the two bottom bolts (Item 2) [Figure 327].
5. Tighten the bottom two bolts (Item 2) [Figure 327].
6. Install the four bolts (Item 1) [Figure 327] and tighten.

RIGHT SIDE PANEL

Removing And Installing The Right Side Panel

1. Open the tailgate. (See Tailgate on Page 155)
2. Open the right side cover.
   (See Right Side Cover on Page 156)

Figure 328



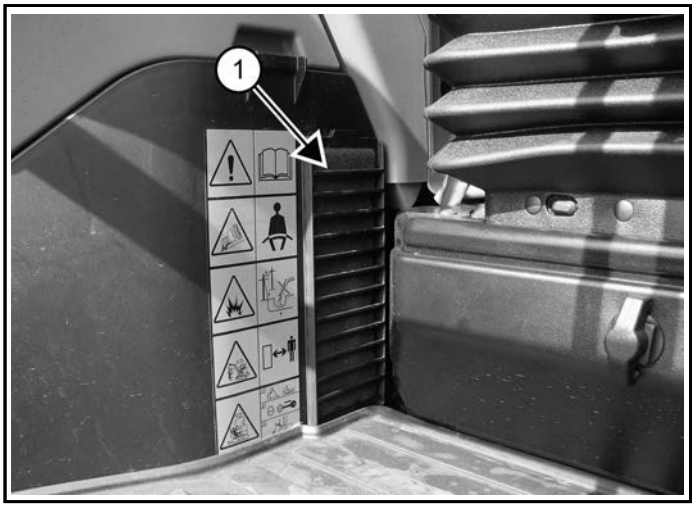
C208825a

3. Remove the five bolts (Item 1) on the right side panel (Item 2) and remove the panel [Figure 328].
4. To reinstall the panel, fit the panel back into place and tighten the bolts (Item 1) [Figure 328].

CAB FILTERS

Cleaning And Maintaining The Recirculation Filter

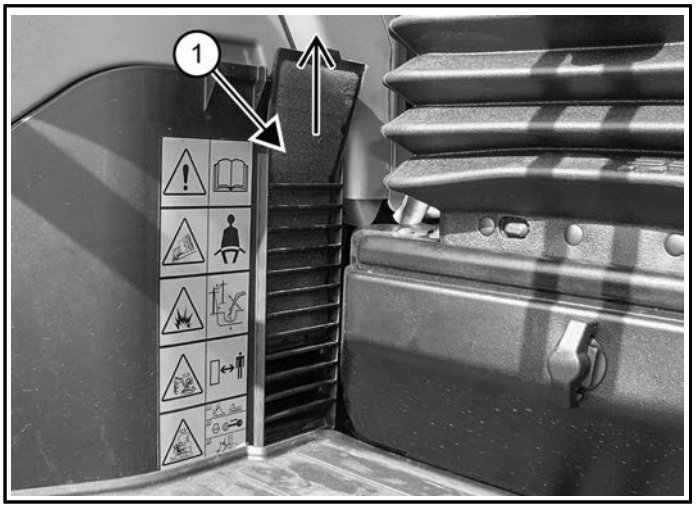
Figure 329



C206255a

The recirculation filter is located to the right of the operator seat (Item 1) [Figure 329]. It must be cleaned regularly.

Figure 330



C206256a

1. Pull up on the filter (Item 1) [Figure 330] until it is removed from the housing.
2. Shake the filter or use low pressure air to clean the filter.

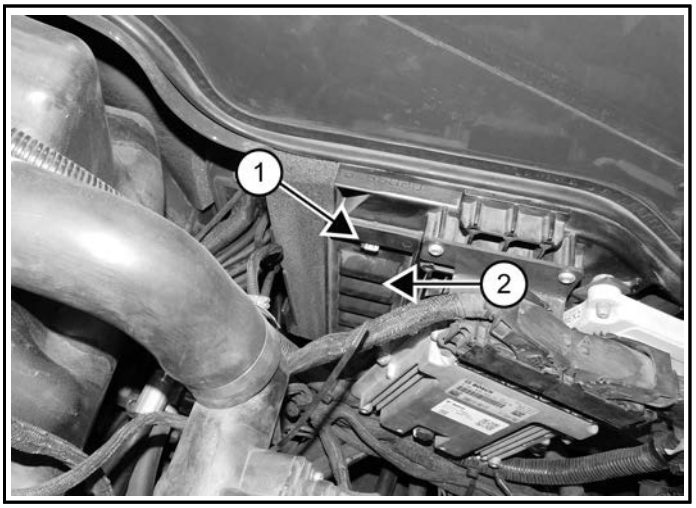
   Replace the filter if it is very dirty or damaged.
3. To reinstall the filter, position the bottom of the filter on the housing and slowly push the filter down fully.

Cleaning And Maintaining The Fresh Air Filter

The fresh air filter is located under the centre cover. It must be cleaned regularly.

1. Remove the centre cover.
(See Centre Cover on Page 156)

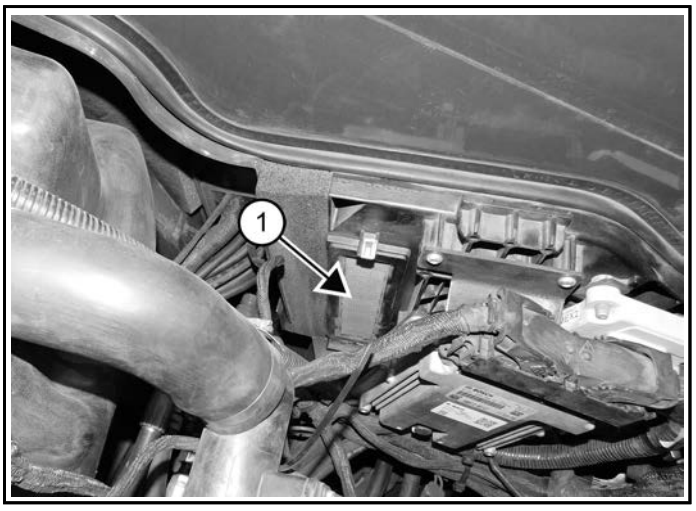
Figure 331



C208765a

2. Pull out on the tab (Item 1) [Figure 331] of the fresh air filter cover and remove the cover.

Figure 332



C208766a

3. Pull the filter (Item 1) [Figure 332] out of the housing.
4. Gently tap the sides of the filter and / or use low pressure compressed air from the back side of the filter to remove debris.

   Do not use solvents. Do not use a brush on the filter as it can push debris into the filter.

   Replace the filter if it is very dirty or damaged.
5. To reinstall the filter, position the filter on the housing and slowly push the filter in fully.
6. Place the bottom tabs of the filter cover into the frame and push the top in until the tab locks to the frame.

HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)

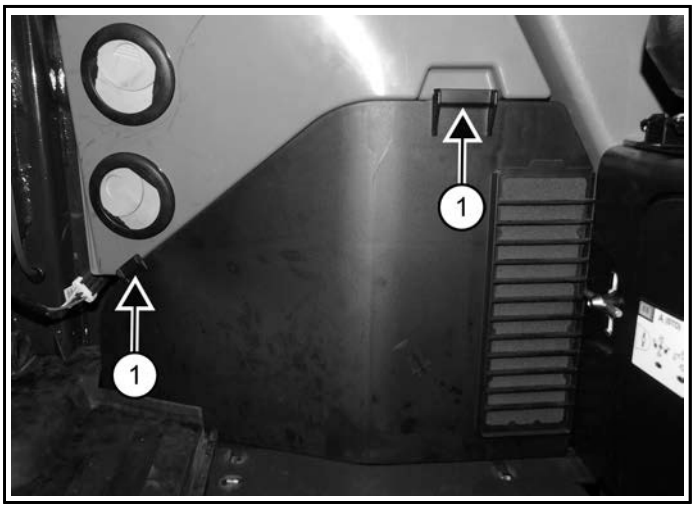
Cleaning HVAC Filters

The inside of the HVAC housing needs to be cleaned regularly. Dust will accumulate over time inside the housing. A dusty heater and evaporator coil will reduce heating and cooling efficiency.
(See Service Schedule on Page 148)

The HVAC housing is located to the right of the operator seat.

1. Rotate the upperstructure 90° to the right to allow water to drain from the housing during the cleaning process.
2. Use the blade to raise the front of the excavator so that water can run out of the housing.
3. Use jackstands to support the front of the undercarriage.
4. Remove the floor mat.

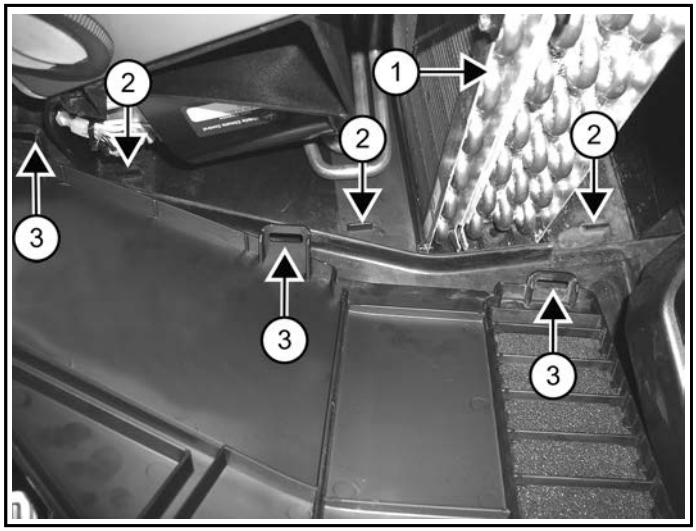
Figure 333



P200301a

5. Pull back on the two latches (Item 1) [Figure 333] and remove the HVAC side cover.

Figure 334



P113083d

6. Use a lower pressure air or low pressure water stream to remove debris and clean the coils (Item 1) [Figure 334].
7. After the housing has been cleaned and flushed, remove the jackstands and raise the blade so the front of the excavator is flat on the ground.
8. Stop the engine.
9. Access two of the rubber drain valves by opening the right side cover. The drain valves are located below the HVAC housing on the right side.
10. Clean the rubber drain valves by pinching the drain valves on the flat sides to open the valves and allow dirt and moisture to exit from the end of the valves.
11. Remove the center floorplate to access the third rubber drain valve that is located below the left rear corner of the HVAC housing.
12. Clean the rubber drain valve by pinching the drain valve on the flat side to open the valve and allow dirt and moisture to exit from the end of the valve.

    The rubber drain valves allow condensation to drain from the housing during normal usage. These drain valves can get clogged with dirt and should be cleaned at the same time the housing is cleaned.
13. Reinstall the center floorplate and close the right cover.
14. Fit the three retainers (Item 3) of the HVAC side cover into the three tabs on the bottom of the HVAC housing (Item 2) [Figure 334].
15. Press on the front of the cover to secure the front latch (Item 1) [Figure 333].
16. Press on the top edge of the side cover and work back to the rear of the cover and secure the rear latch.
17. Reinstall the floor mat.

ENGINE AIR CLEANER

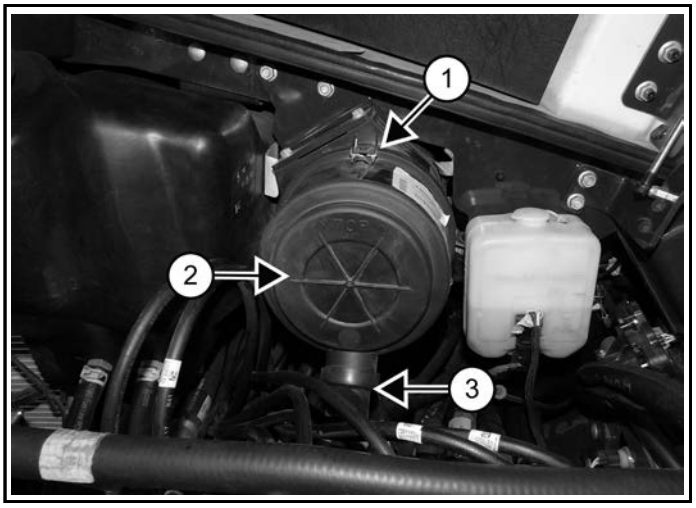
Replacing The Outer Filter Of The Air Cleaner

See the Service Schedule for the correct service interval. (See Service Schedule on Page 148)

The general warning icon and service code “M–0117 – Air Filter Plugged” will appear on the screen when air filter replacement is necessary.

1. Open the tailgate. (See Tailgate on Page 155)
2. Open the right side cover. (See Right Side Cover on Page 156)

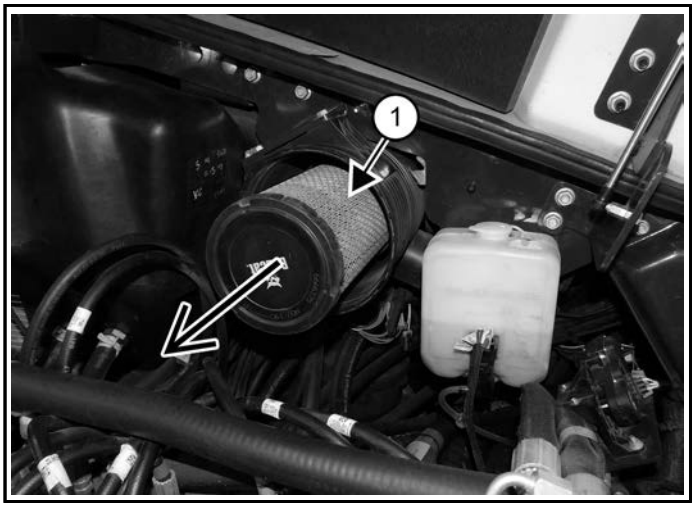
Figure 335



C208767a

3. Release the three fasteners (Item 1) [Figure 335].
4. Remove and clean the dust cup (Item 2) [Figure 335].

Figure 336



C208768a

5. Pull the outer filter (Item 1) [Figure 336] from the air cleaner housing.

6. Check the housing for damage.
7. Clean the housing and the seal surface. Do not use compressed air.
8. Install a new filter.
9. Install the dust cup (Item 2), and position the evacuator (Item 3) so that it is pointing down [Figure 335].
10. Fasten the three fasteners (Item 1) [Figure 335] to secure the dust cup.
11. Check the air intake hose and the air cleaner housing for damage. Make sure all connections are tight.
12. Close the right side cover.
13. Close the tailgate.

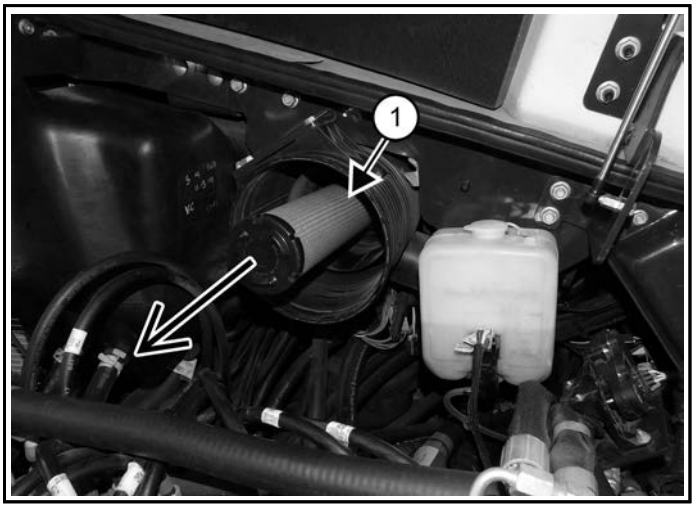
Replacing The Inner Filter Of The Air Cleaner

Replace the inner filter only under the following conditions:

- Replace the inner filter every second time the outer filter is replaced.
- After the outer filter has been replaced, start the engine and operate at full rpm. If service code “M–0117 – Air Filter Plugged” is still displayed, replace the inner filter.

1. Open the tailgate. (See Tailgate on Page 155)
2. Open the right side cover. (See Right Side Cover on Page 156)
3. Remove the dust cup and the outer filter. (See Replacing The Outer Filter Of The Air Cleaner on Page 159)

Figure 337



C208769a

4. Remove the inner filter (Item 1) [Figure 337].
5. Check the housing for damage.
6. Clean the housing and the seal surfaces. Do not use compressed air.
7. Install a new inner filter.
8. Install the outer filter and dust cup.
9. Close the right side cover.
10. Close the tailgate.

FUEL SYSTEM

Fuel Specifications

NOTE: Contact your local fuel supplier to receive recommendations for your region.

U.S. Standard (ASTM D975)

Use only clean, high quality diesel fuel, grade number 2-D or grade number 1-D.

Ultra-low sulfur diesel fuel must be used in this machine. Ultra-low sulfur is defined as 15 mg/kg (15 ppm) sulfur maximum.

The following is one suggested blending guideline that should prevent fuel gelling during cold temperatures:

TEMPERATURE	GRADE 1–D	GRADE 2–D
Above -9°C (+15°F)	0%	100%
Down to -21°C (-5°F)	50%	50%
Below -21°C (-5°F)	100%	0%

NOTE: Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than five percent biodiesel mixed with ultra-low sulfur petroleum based diesel. This biodiesel blend fuel is commonly marketed as B5 blended diesel fuel. B5 blended diesel fuel must meet ASTM specifications.

E.U. Standard (EN590)

Use only clean, high quality diesel fuel that meets the EN590 specifications listed below:

- Sulfur-free diesel fuel defined as 10 mg/kg (10 ppm) sulfur maximum.
- Diesel fuel with cetane number of 51.0 and above.

NOTE: Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than seven percent biodiesel mixed with sulfur-free petroleum based diesel. This biodiesel blend fuel is commonly marketed as B7 blended diesel fuel. B7 blended diesel fuel must meet EN590 specifications.

Biodiesel Blend Fuel

Biodiesel blend fuel has unique qualities that should be considered before using in this machine:

- Cold weather conditions can lead to plugged fuel system components and hard starting.
- Biodiesel blend fuel is an excellent medium for microbial growth and contamination, which can cause corrosion and plugging of fuel system components.
- Use of biodiesel blend fuel may result in premature failure of fuel system components, such as plugged fuel filters and deteriorated fuel lines.
- Shorter maintenance intervals may be required, such as cleaning the fuel system and replacing fuel filters and fuel lines.
- Using biodiesel blended fuels containing more than the recommended amount of biodiesel can affect engine life and cause deterioration of hoses, tubelines, injectors, injector pump, and seals. (See Fuel Specifications on Page 161)

Apply the following guidelines if biodiesel blend fuel is used:

- Ensure the fuel tank is as full as possible at all times to prevent moisture from collecting in the fuel tank.
- Ensure that the fuel tank cap is securely tightened.
- Biodiesel blend fuel can damage painted surfaces. Remove all spilled fuel from painted surfaces immediately.
- Drain all water from the fuel filter daily before operating the machine.
- Do not exceed engine oil change interval. Extending oil change intervals can cause engine damage.
- Before vehicle storage, drain the fuel tank, refill with 100% petroleum diesel fuel, add fuel stabiliser, and run the engine for at least 30 minutes.

NOTE: Biodiesel blend fuel does not have long-term stability and should not be stored for more than three months.

Filling The Fuel Tank

⚠ WARNING

FIRE AND EXPLOSION HAZARDS
Failure to follow instructions can cause serious injury or death.
Stop and cool the engine before adding fuel. NO SMOKING!
W-2063

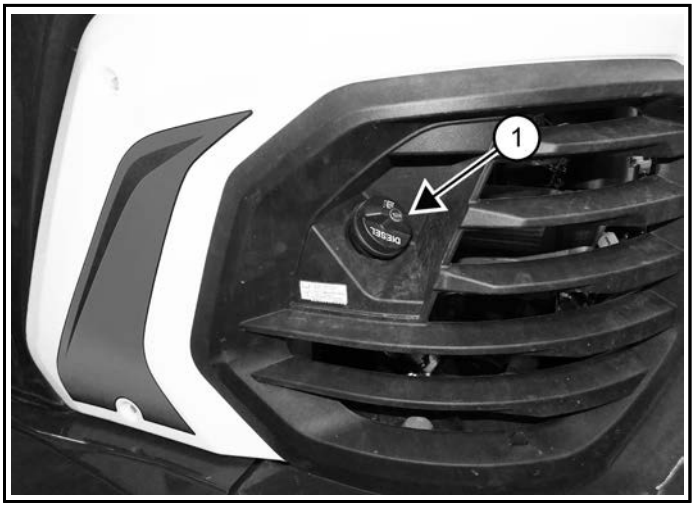
⚠ WARNING

FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.
W-2103

NOTE: When filling the fuel tank, with the left console raised, turn the start switch to on but do not start the engine. As fuel is added to the tank, a buzzer will beep, and the closer the tank gets to full, the quicker it will beep. When the tank is full, the buzzer will sound continuously. Stop fuelling when buzzer sounds continuously. Turn the start switch off.

1. Use the start key to unlock the fuel cap.

Figure 338



C208770a

2. Remove the fuel fill cap (Item 1) [Figure 338].
3. Use a clean, approved safety container to add fuel.
4. Add fuel only in an area that has a free movement of air and no flames or sparks. Do not smoke.
5. Install and tighten the fuel fill cap.
6. Clean up any spilled fuel.

See the Service Schedule for the service interval for removing water from the filter or replacing the filter. (See Service Schedule on Page 148)

Using The Fuel Fill Pump

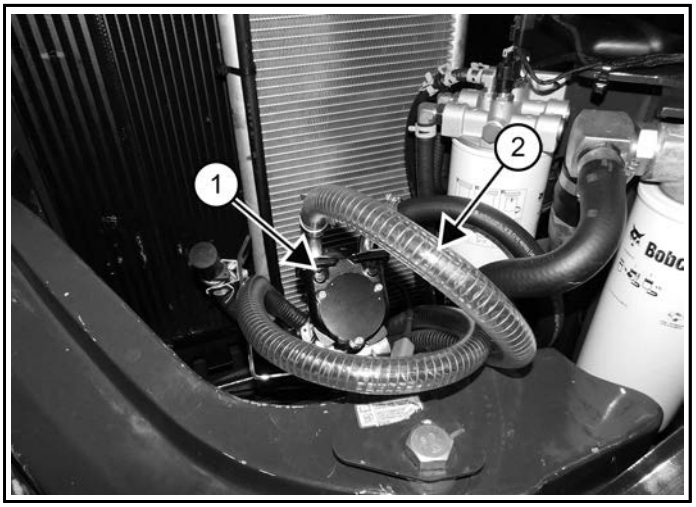
⚠ WARNING

FIRE AND EXPLOSION HAZARDS
Failure to follow instructions can cause serious injury or death.
Stop and cool the engine before adding fuel. NO SMOKING!
W-2063

⚠ WARNING

FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.
W-2103

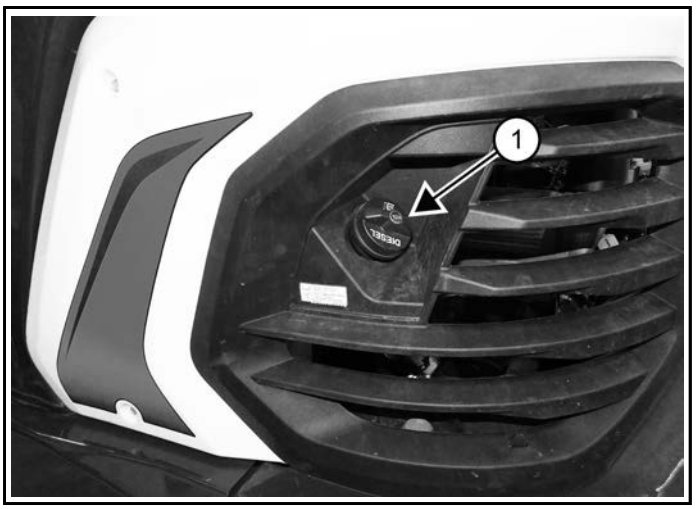
Figure 339



C208772a

Your machine may be equipped with a battery-operated fuel fill pump (Item 1) [Figure 339] located under the right side cover.

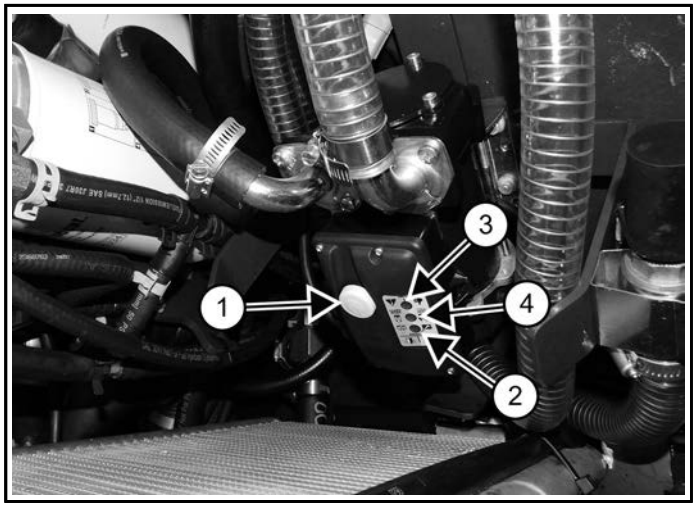
Figure 340



1. Loosen the fuel fill cap (Item 1) [Figure 340] using the start key.
2. Open the right side cover.
(See Right Side Cover on Page 156)
3. Pull out the suction hose (Item 2) [Figure 339].
4. Ensure the suction hose (Item 2) [Figure 339] is clean.

   If necessary, wipe the suction hose with a clean, dry cloth to remove any contaminants.
5. Put the end of the hose into an external fuel resupply container.
   - Add fuel only in an area that has a free movement of air and no flames or sparks.
   - Do not smoke.

Figure 341



C208807a

6. Briefly push the button (Item 1) [Figure 341] on the fuel pump to wake the system from stand-by mode.

   The green light (Item 2) [Figure 341] will turn on.

7. Push the button (Item 1) [Figure 341] on the fuel pump to start fuel transfer.

   The red light (Item 3) [Figure 341] will turn on.

8. The yellow light (Item 4) [Figure 341] will turn on when the fuel tank is full and fuel transfer will stop automatically.

   OR

   Push the button (Item 1) [Figure 341] for several seconds to stop fuel transfer at any time.

9. When fuel transfer is done, place the suction hose back into its holder.

10. Close the right side cover.

11. Tighten the fuel fill cap (Item 1) [Figure 340].

Removing Water From The Fuel Filter

Monitor the display for notifications. Remove water from the fuel filter when indicated on the display.

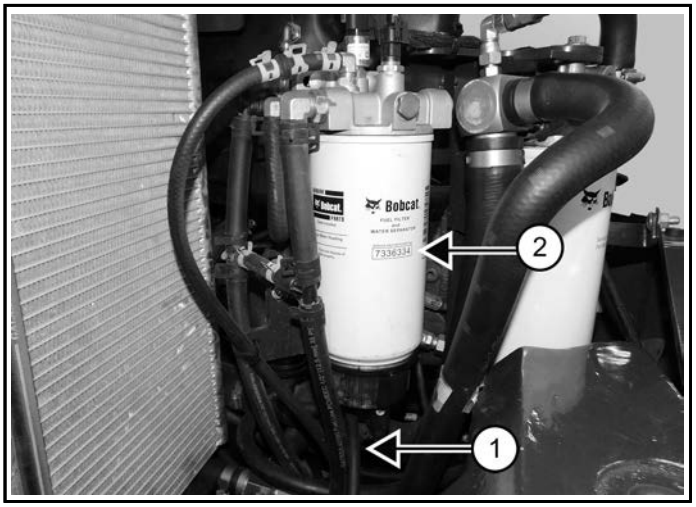
1. Rotate the upperstructure 90°.

2. Turn off the engine and exit the excavator.

3. Open the tailgate. (See Tailgate on Page 155)

4. Open the right side cover.
   (See Right Side Cover on Page 156)

Figure 342



C208771a

5. Locate the hose (Item 1) under the fuel filter (Item 2) and put a container underneath the upperstructure (hose should be routed down through the frame) [Figure 342].

6. Loosen the drain at the bottom of the filter to remove trapped water from the filter.

7. Tighten the drain.

8. Close the right side cover.

9. Close the tailgate.

⚠ WARNING

FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.◂

W-2103

Replacing The Fuel Filter

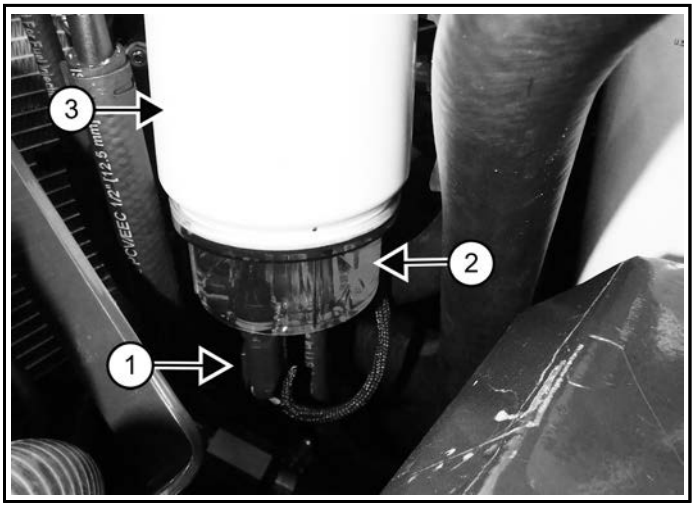
Monitor the display for notifications. Replace fuel filter when indicated on the display.

1. Stop the engine.

2. Open the tailgate. (See Tailgate on Page 155)

3. Open the right side cover.
   (See Right Side Cover on Page 156)

Figure 343



C209206a

4. Disconnect the electric connector (Item 1) [Figure 343] from the bottom of the fuel filter.
5. Unscrew and remove the water separator (Item 2) [Figure 343].
6. Remove the fuel filter (Item 3) [Figure 343].
7. Screw the water separator onto the replacement filter.

   Do not fill the new fuel filter with fuel at this time.
8. Put clean oil on the two new fuel filter O-rings.
9. Install the replacement filter and torque to 13,5 N•m (10 ft-lb).
10. Connect the electrical connector (Item 1) [Figure 343].
11. Turn the starter switch on to let the electronic fuel pump purge the air.
12. Start the engine and let it run for a few minutes.
13. Stop the engine and check for leaks at the filter.
14. Close the right side cover.
15. Close the tailgate.

⚠ WARNING

INJECTION HAZARD
Pressurised diesel fuel or hydraulic fluid can penetrate skin and eyes, causing serious injury or death.
Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. DO NOT use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a doctor familiar with this injury.◂

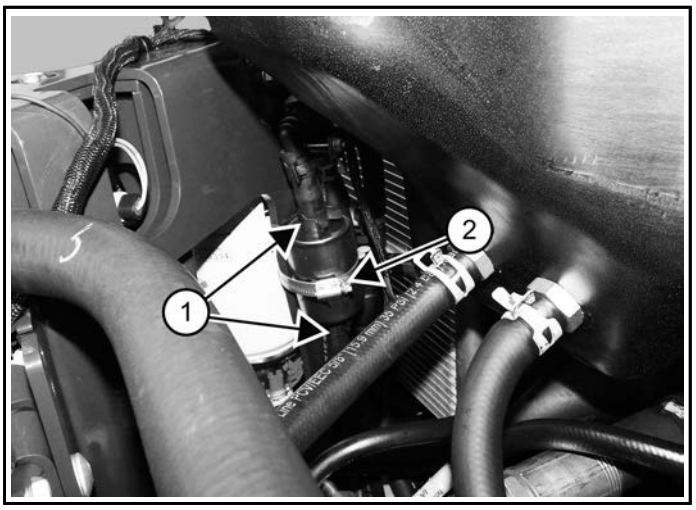
W-2072

Replacing The Fuel Pre-Filter

See the Service Schedule for the correct service interval. (See Service Schedule on Page 148)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 155)
3. Open the right side cover. (See Right Side Cover on Page 156)

Figure 344



C209207a

4. Pinch off the upper and lower hoses (Item 1) [Figure 344] to prevent spilled fuel while the hoses are disconnected from the pre-filter.
5. Reposition the upper and lower hose clamps (Item 1) [Figure 344] and remove the hoses from the pre-filter.
6. Loosen the clamp (Item 2) [Figure 344].
7. Remove the pre-filter and discard.
8. Install the new pre-filter into the clamp (Item 2) [Figure 344] and tighten the clamp.
9. Install the upper and lower hoses.
10. Move the hose clamps (Item 1) [Figure 344] back into the correct position as shown.
11. Remove tools used to pinch off the upper and lower hoses.

⚠ WARNING

FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.◂

W-2103

12. Turn the start switch to on to let the electronic fuel pump purge the air.

⚠ WARNING

INJECTION HAZARD
Pressurised diesel fuel or hydraulic fluid can penetrate skin and eyes, causing serious injury or death.
Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. DO NOT use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a doctor familiar with this injury.◂
W-2072

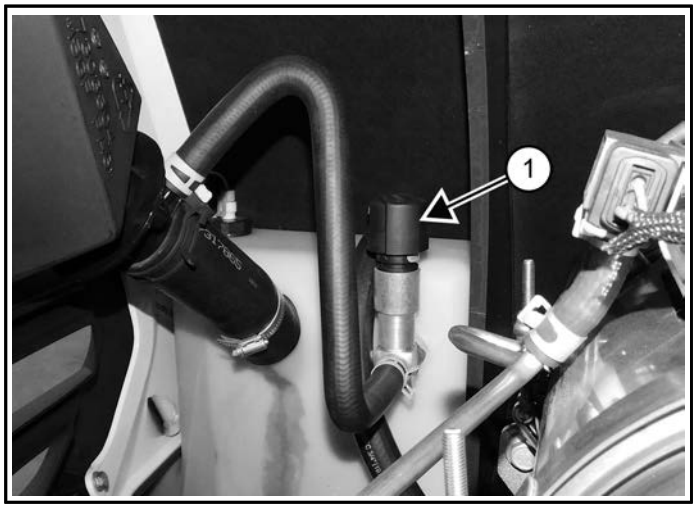
13. Turn the switch to off and check for leaks at the filter.
14. Close the right side cover.
15. Close the tailgate.

Replacing The Fuel Tank Vent Filter

See the Service Schedule for the correct service interval. (See Service Schedule on Page 148)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 155)

Figure 345



C211705a

3. Locate the fuel tank vent filter (Item 1) [Figure 345], which is near the fuel fill.
4. Remove the fuel tank vent filter (Item 1) [Figure 345].
5. Install the new fuel tank vent filter and tighten.
6. Close the tailgate.

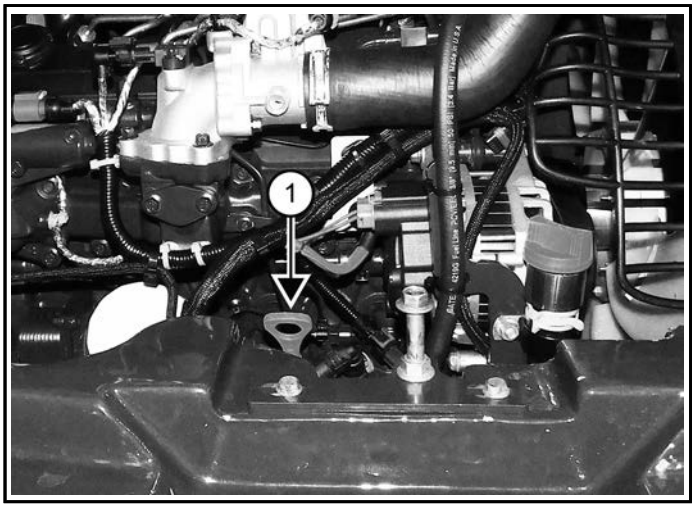
ENGINE LUBRICATION SYSTEM

Checking And Adding Engine Oil

See the Service Schedule for the correct service interval. (See Service Schedule on Page 148)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 155)

Figure 346

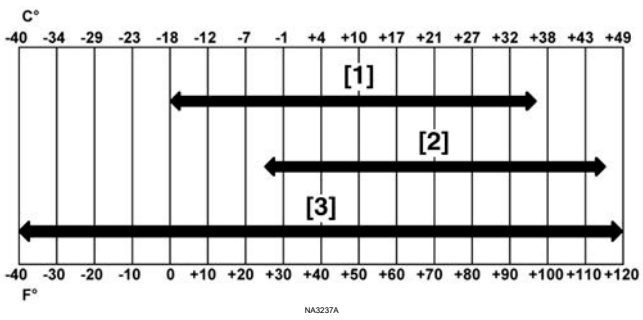


C211706a

3. Remove the dipstick (Item 1) [Figure 346].
4. Keep the oil level between the marks on the dipstick.

   Use a good quality motor oil that meets the correct API Service Classification.

Engine Oil Chart

ENGINE CRANKCASE OIL
Recommended SAE Viscosity Number

Refer to the temperature range anticipated before next oil change.
Must use API Category CK-4 or better or ACEA E9 or better.
Do not use API category FA-4 engine oil.
[1] SAE 10W-30

ENGINE CRANKCASE OIL
[2] SAE 15W-40
[3] Bobcat Synthetic Oil (SAE 5W-40)

Bobcat engine oils are recommended for use in this machine. If Bobcat engine oil is not available, use a good quality engine oil that meets API Service Category of CK-4 or better, or ACEA E9 or better.

⚠ IMPORTANT

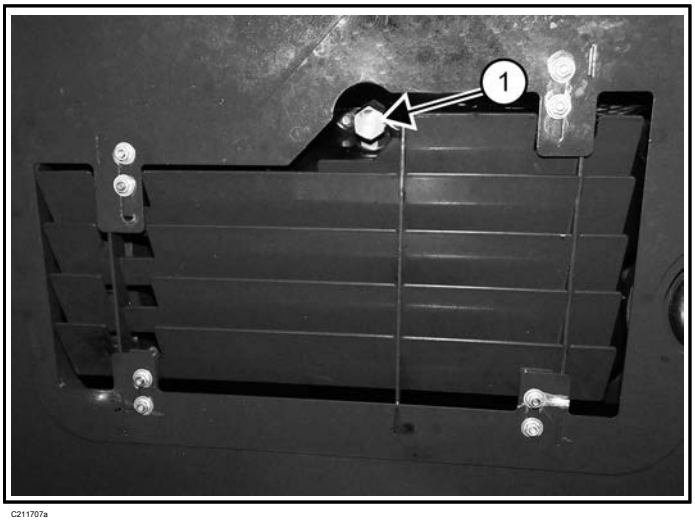
MACHINE DAMAGE HAZARD
Failure to follow directions may result in severe engine damage.
Use of API Service Category FA-4 engine oil is not approved and may cause irreversible damage to the engine. ◂
I-2384

Replacing Engine Oil And Filter

See the Service Schedule for the correct service interval. (See Service Schedule on Page 148)

1. Run the engine until coolant is at operating temperature.
2. If necessary, rotate the upperstructure so that the oil drain plug is between the rear tracks.
3. Stop the engine.
4. Open the tailgate. (See Tailgate on Page 155)
5. Place a container under the oil pan.

Figure 347



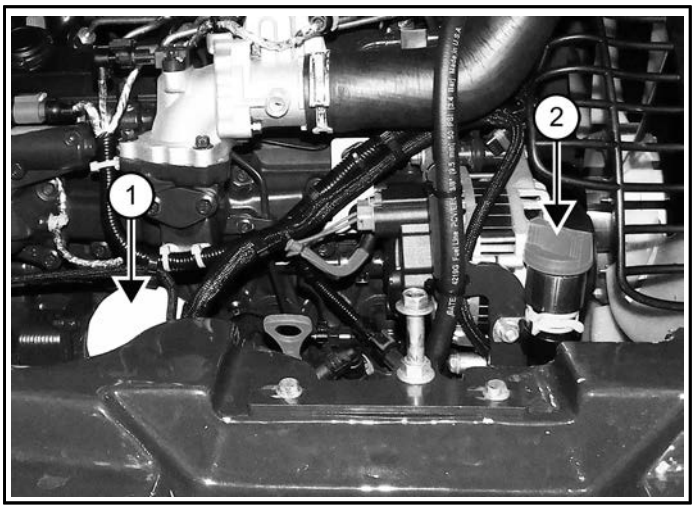
C211707a

6. Remove the drain plug (Item 1) [Figure 347] from the engine oil pan and drain the oil.
7. Recycle or dispose of used oil in an environmentally safe manner.

⚠ WARNING

FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. ◂
W-2103

Figure 348



C211706b

8. Remove the oil filter (Item 1) [Figure 348] and clean the filter housing surface.
9. Put clean oil on the replacement filter gasket.

   Use a genuine Bobcat replacement filter.
10. Install the filter and hand tighten.
11. Reinstall the drain plug (Item 1) [Figure 347].
12. Remove the fill cap (Item 2) [Figure 348].
13. Put oil in the engine.
    (See Capacities Specifications on Page 223)

    Do not overfill.
14. Install the fill cap (Item 2) [Figure 348].
15. Start the engine and let it run for several minutes.
16. Stop the engine.
17. Check for leaks at the oil drain plug and the oil filter.
18. Check the oil level.
19. Add oil as needed if it is not at the top mark on the dipstick.

ENGINE COOLING SYSTEM

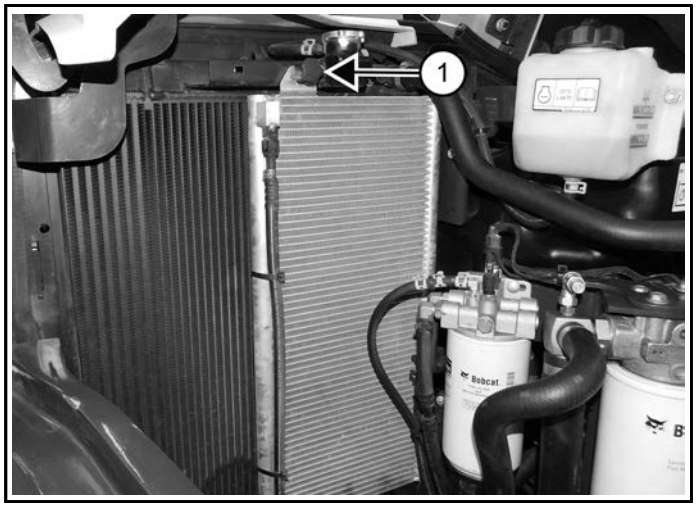
Cleaning The Engine Cooling System

Allow the cooling system and engine to cool before servicing or cleaning the cooling system.

Check the cooling system every day to prevent over-heating, loss of performance, or engine damage. (See Service Schedule on Page 148)

1. Stop the engine.
2. Open the right side cover. (See Right Side Cover on Page 156)

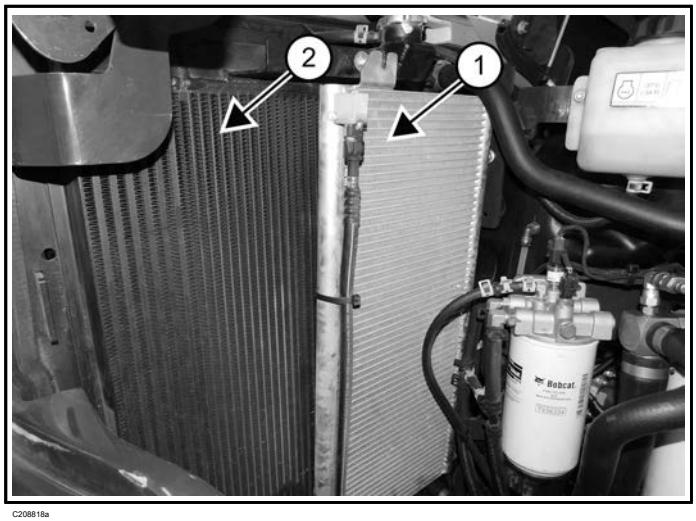
Figure 349



C208817a

3. Remove the knob (Item 1) [Figure 349] on the condenser (if equipped).

Figure 350



C208818a

4. Separate the condenser (Item 1) (if equipped) from the radiator (Item 2) [Figure 350].

   Be careful not to damage fins.

5. Use air pressure or water pressure to clean the condenser (Item 1) and the radiator (Item 2) [Figure 350].

   Be careful not to damage fins when cleaning

6. Reposition the condenser (Item 1) [Figure 350] to the radiator.
7. Install and tighten the knob (Item 1) [Figure 349].

Checking Coolant Level

Check the coolant level when the coolant is cold.

⚠ WARNING

BURN HAZARD
Failure to follow instructions can cause serious burns.
Stop the engine and allow it to cool before removing the radiator cap or adding coolant.

W-2070

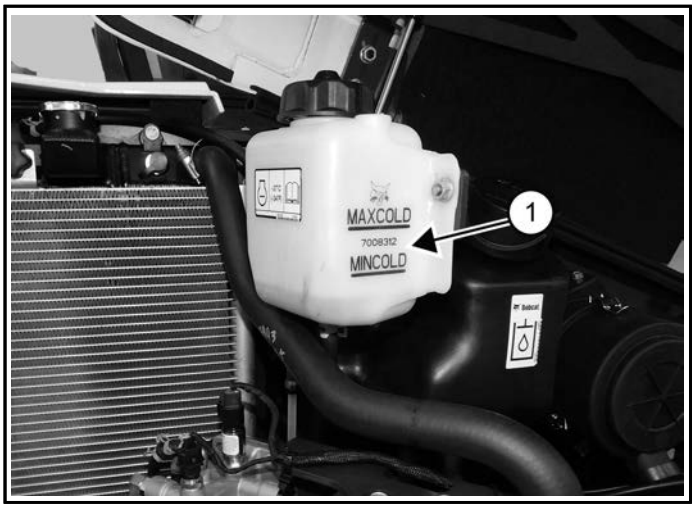
⚠ WARNING

IMPACT AND INJECTION HAZARDS
Flying debris or pressurised fluids can cause serious injury or death.
Wear safety glasses to prevent eye injury when any of the following conditions exist:
- **When fluids are under pressure.**
- **Flying debris or loose material.**
- **Engine is running.**
- **Tools are being used.**

W-2019

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 155)

Figure 351



C209214a

3. Check the coolant level in the coolant recovery tank (Item 1) [Figure 351].

   It should be between the MAX and MIN marks.

4. Add fluid as needed.
(See Capacities Specifications on Page 223)

NOTE: The cooling system is factory filled with propylene glycol (purple colour). Do not mix propylene glycol with ethylene glycol.

⚠ IMPORTANT

MACHINE DAMAGE HAZARD
The incorrect ratio of water to coolant will reduce cooling system efficiency and may lead to premature engine failure.
- **Always use the correct ratio of water to coolant.**
- **Always add a premixed solution.**

I-2124

Replacing Coolant

The following items are needed to complete this task:

- Container to catch the coolant
- Locking hose pinching pliers or a similar tool.

See the Service Schedule for correct service interval.
(See Service Schedule on Page 148)

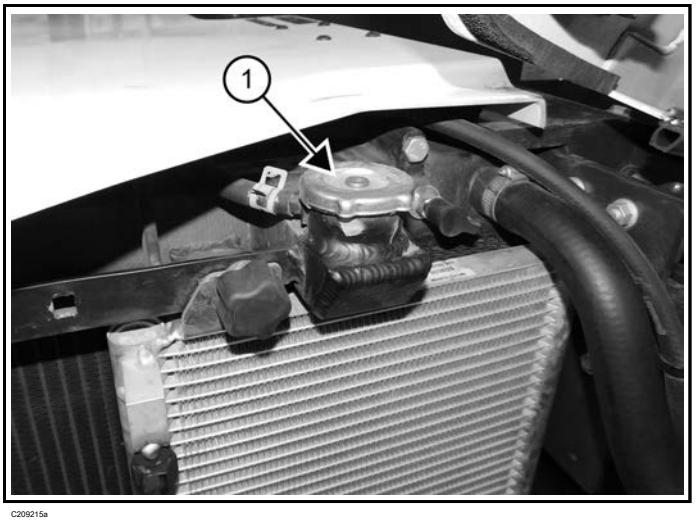
1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 155)
3. Open the right side cover.
(See Right Side Cover on Page 156)
4. Remove the right side panel.
(See Right Side Panel on Page 157)

⚠ WARNING

BURN HAZARD
Failure to follow instructions can cause serious burns.
Stop the engine and allow it to cool before removing the radiator cap or adding coolant.

W-2070

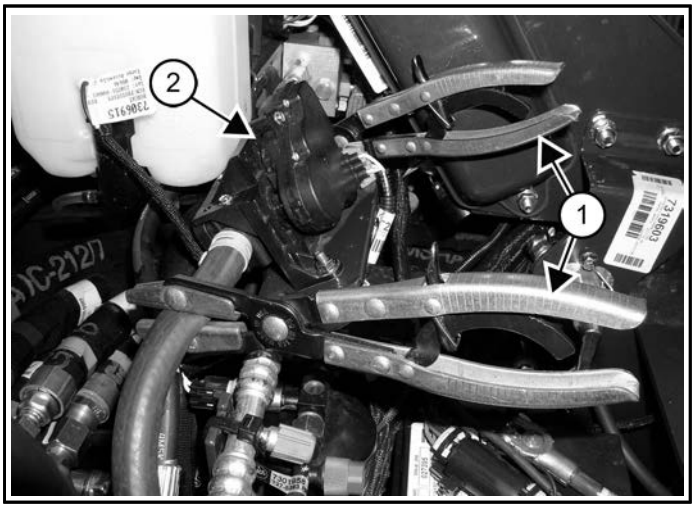
Figure 352



C209215a

5. When the engine is cool, loosen and remove the radiator cap (Item 1) [Figure 352].

Figure 353



C132032a

6. Put locking hose pinching pliers (Item 1) on both sides of the heater valve (Item 2) [Figure 353].
7. Disconnect the hose clamps from the heater valve (Item 2) [Figure 353].
8. Route the hoses out of the upperstructure.
9. Remove the two locking hose pinching pliers (Item 1) [Figure 353] and drain the coolant into a container.
10. Install the two heater hoses onto the heater valve (Item 2) [Figure 353].
11. Install the two hose clamps on the heater hoses.
12. Recycle or dispose of used coolant in an environmentally safe manner.
13. Mix new coolant in a separate container.
(See Capacities Specifications on Page 223)

    The correct mixture of coolant to provide a -37°C (-34°F) freeze protection is 5 L propylene glycol mixed with 4,4 L of water or 1 U.S. gal propylene glycol mixed with 3.5 qt of water.

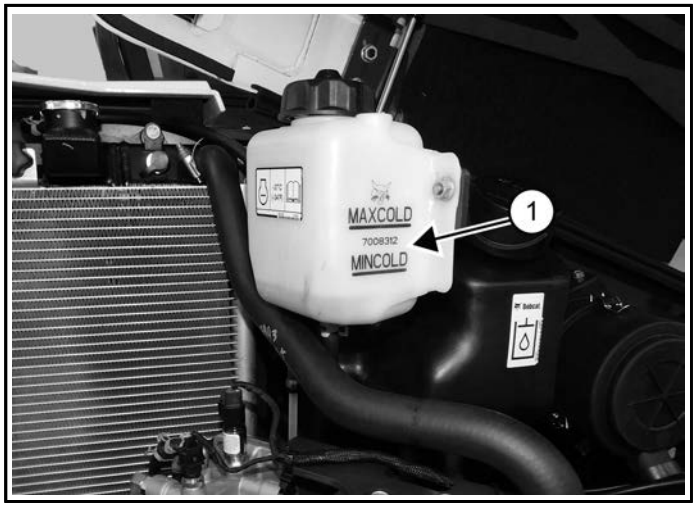
⚠ IMPORTANT

MACHINE DAMAGE HAZARD
The incorrect ratio of water to coolant will reduce cooling system efficiency and may lead to premature engine failure.
- **Always use the correct ratio of water to coolant.**
- **Always add a premixed solution.**

I-2124

14. Add premixed coolant (47% water and 53% propylene glycol) to the radiator until the coolant level reaches the top of the radiator.
15. Install the radiator cap (Item 1) [Figure 352].

Figure 354



C209214a

16. Add premixed coolant (47% water and 53% propylene glycol) to the recovery tank (Item 1) [Figure 354] until it is between the MAX and MIN marks.
17. Run the engine until it is at operating temperature.
18. Stop the engine.
19. Add coolant to the recovery tank (Item 1) [Figure 354] as needed.
20. Reinstall the right side panel. Close the right side cover and tailgate.

ELECTRICAL SYSTEM

Electrical System Description

The excavator has a 12 volt, negative earth, alternator charging system.

The electrical system is protected by fuses located in a master fuse panel, an operator cab fuse panel, and a mainframe fuse panel.

The fuses will protect the electrical system when there is an electrical overload. The reason for the overload must be found and corrected before starting the engine again.

Fuse And Relay Identification

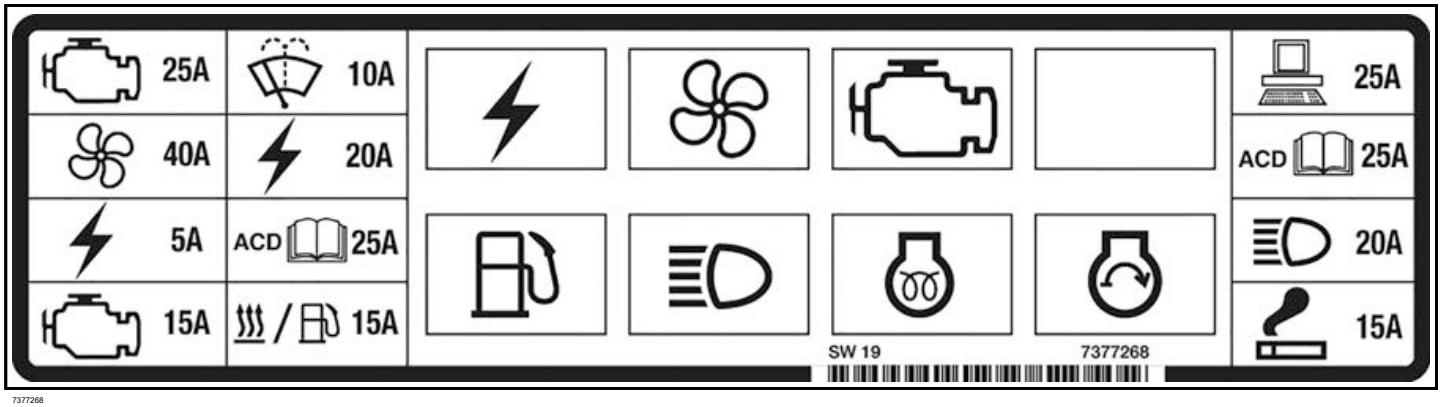
Figure 355

C132034a

The decal inside the fuse cover (Item 1) [Figure 355] shows the location and amp ratings of the fuses.

Remove the cover to check or replace the fuses and relays.

Figure 356



7377268

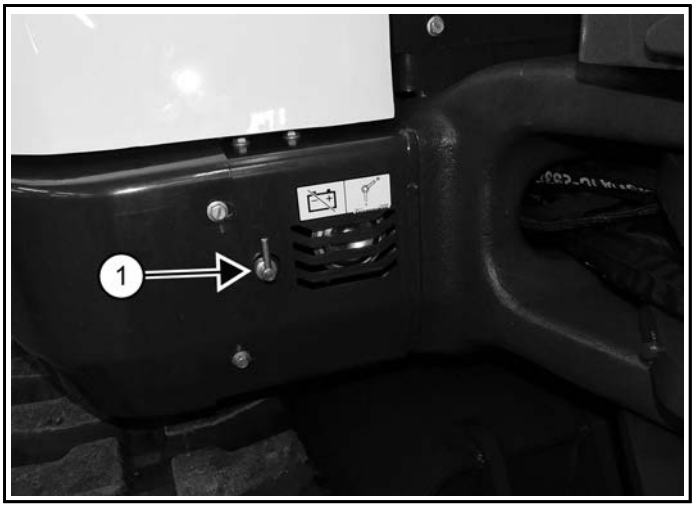
The location and sizes are shown in the table below and on the decal [Figure 356]. Always replace fuses using the same type and capacity. Relays are identified by the letter “R” in the Amp column.

ICON	DESCRIPTION	AMP
	Engine ECU	25
	Heat	40
	Ignition	5
	ECU Sensor	15
	Wiper / Washer	10
	Switched Power	20
ACD	Attachment Control Device (ACD)	25
	Alternator / Fuel Pump	15
	Switched Power	R
	HVAC	R
	Engine ECU	R
	Fuel Lift Pump	R
	Lights	R
	Glow Plugs	R
	Starter	R
	Controller	25

ICON	DESCRIPTION	AMP
ACD	Attachment Control Device (ACD)	25
	Lights	20
	ACC	15

Battery Disconnect Switch

Figure 357



C209217a

Turn the battery disconnect switch to the off position before disconnecting or connecting the battery cables.

The battery disconnect switch (Item 1) [Figure 357] (if equipped) is located on the right front of the excavator.

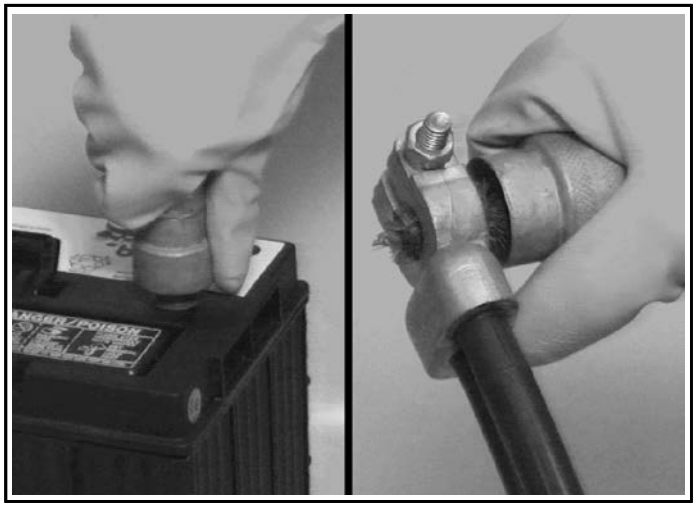
- Rotate the switch (Item 1) [Figure 357] anticlockwise to turn the switch to the off position.
- Rotate the switch (Item 1) [Figure 357] clockwise to turn to the on position (shown here in the on position).

Battery Maintenance

See the Service Schedule for the correct service interval. (See Service Schedule on Page 148)

The Bobcat brand battery supplied with your machine is sealed and does not require watering. Proper charging and storage are important to maximise the life of all batteries.

Figure 358



P200188

Simple steps for reliability and long battery life:

- Keep battery posts and terminals clean [Figure 358].
- Keep terminals tight.
- Remove corrosion from battery and terminals with sodium bicarbonate (baking soda) and water solution.
- Put Bobcat Battery Saver or grease on the battery terminals and cable ends to prevent corrosion.
- Operate the machine for at least 15 minutes to recover from the battery drain caused by engine start up whenever practical.
- Maintain the battery charge level. This is a key factor for long battery life.
- Charge a severely discharged battery with a battery charger instead of relying on the machine charging system. (See Battery Charging on Page 172)
- Check the battery state of charge every 30 days on machines that are not frequently used. (See Testing The Battery on Page 171)

⚠ WARNING

CHEMICAL HAZARD
Contact with or ingestion of battery acid can cause serious injury or death.

- **Batteries contain acid that burns eyes and skin on contact. Wear safety goggles, protective clothing, and rubber gloves to keep acid off body.**
- **In case of acid contact, wash immediately with water. In case of eye contact, get prompt medical attention and wash eye with clean, cool water for at least 5 minutes.**
- **If electrolyte is ingested, drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention.**

W-2065

Maintaining Battery Charge Level

All batteries will self-discharge over time. This machine has features that require battery power even when the machine is not being used. Use of a quality battery maintainer is highly recommended to ensure that your machine is ready to start when you need it and avoid costly battery replacement.

Battery Maintainers

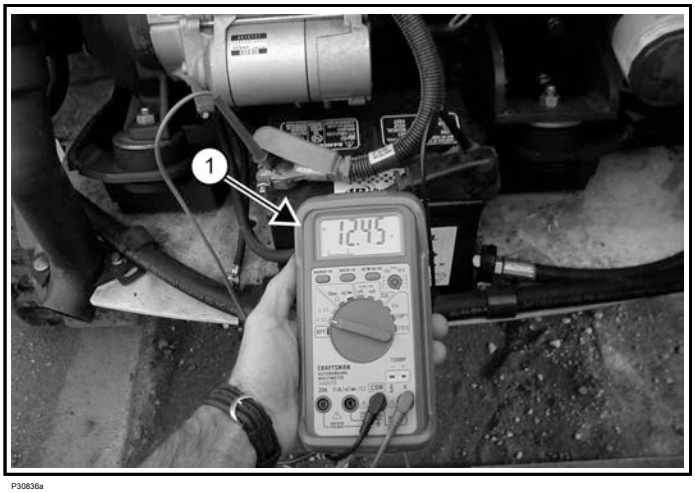
Use a good quality battery maintainer to keep the battery above 12.4 volts for machines that are not frequently used. Batteries below 12.4 volts must first be charged using a battery charger. Solar maintainers should have a minimum capacity of 10 watts to be effective.

Battery Service During Machine Storage

- Remove the battery if storing the machine for an extended period of time.
- Fully charge the battery.
- Store the battery in a cool dry place above freezing and boost charge periodically.
- If battery removal is not desired, a good quality battery maintainer must be used to compensate for battery self-discharge and parasitic loads from machine controllers, accessories, and features such as connected machine intelligence.

Testing The Battery

Figure 359



P30836a

The simplest and most common check to determine battery state of charge is to use a digital multimeter or voltmeter (Item 1) [Figure 359].

A battery found below 12.4 volts must be charged to 100% charge per the battery charger's recommendation. Allow at least 60 minutes after operating the machine or charging the battery to get an accurate reading.

If the reading is less than 12.4 volts after the battery has been charged for several hours, see your Bobcat dealer to have a more thorough battery test performed.

The freezing point of battery electrolyte is dependent on the battery state of charge. Keeping the battery voltage above 12.4 volts will help prevent batteries from freezing, even at extremely low temperatures.

If the battery freezes, the internal grid may be damaged and the case will be distorted or cracked. If this happens, dispose of the battery according to local regulations.

Battery Charging

A battery charger designed for 12 volt charging systems is recommended. Follow the battery charger manufacturer's instructions to charge the battery to 12.6 volts (100% charge). Batteries should be charged at room temperature to avoid an undercharge or overcharge condition. Never attempt to charge a frozen battery.

The following table can be used to identify the approximate amount of time required to charge a discharged battery. Allow at least 60 minutes after operating the machine or charging the battery to get an accurate reading.

Battery Voltage	State of Charge	Charger Maximum Rate		
		30 Amps	20 Amps	10 Amps
12.6 V	100%	Ready to Use		
12.4 V	75%	0.9 hr	1.3 hr	2.5 hr
12.2 V	50%	1.9 hr	2.7 hr	5.1 hr
12.0 V	25%	2.9 hr	4.3 hr	7.8 hr
11.8 V	0%	4.0 hr	5.7 hr	10.7 hr

NOTE: Use a good quality charger to avoid battery damage from overcharging.

⚠ WARNING

EXPLOSION HAZARD
Battery gas can explode and cause serious injury or death.

- **Keep arcs, sparks, flames and lighted tobacco away from batteries. When jumping from booster battery make final connection (negative) at machine frame.**
- **Do not jump start or charge a frozen or damaged battery. Warm battery to 16°C (60°F) before connecting to a charger. Unplug charger before connecting or disconnecting cables to a battery. Never lean over battery while boosting, testing or charging.◂**

W-2066

Using A Booster Battery (Jump Starting)

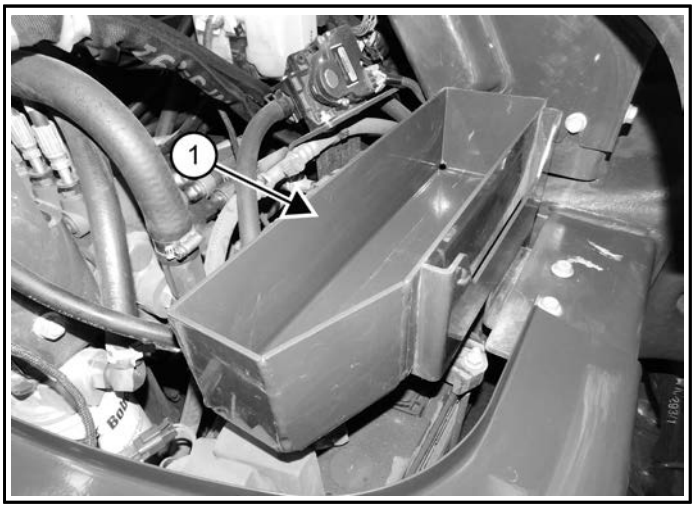
The following item is needed to complete this task:

- 12 volt booster battery.

If it is necessary to use a booster battery to start the engine, be careful! There must be one person in the operator's seat and one person to connect and disconnect the battery cables.

1. Be sure the key switch is OFF.
2. Open the tailgate. (See Tailgate on Page 155)
3. Open the right side cover.
   (See Right Side Cover on Page 156)

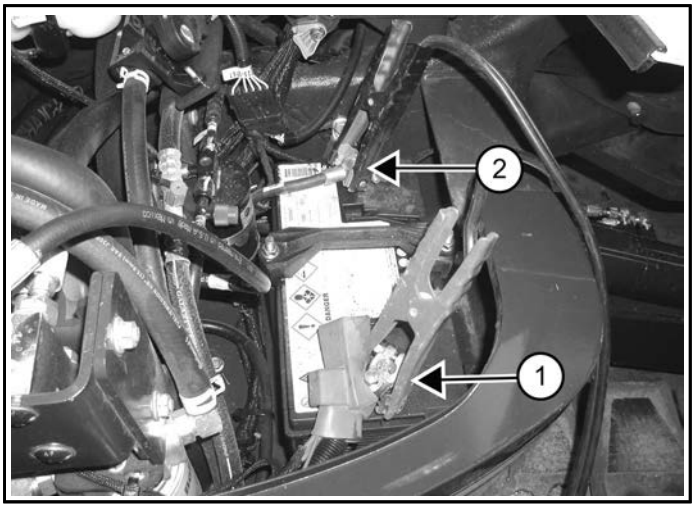
Figure 360



C209218a

4. Remove the tool box (if equipped) (Item 1) [Figure 360] by pulling it upwards.

Figure 361



C132071a

5. Connect the cable to the positive (+) terminal (Item 1) [Figure 361] of the excavator starter.
6. Connect the other cable to a good engine earth (Item 2) [Figure 361].
7. Start the engine.
8. After the engine has started, remove the negative (earth) cable first (Item 2) [Figure 361].

9. Disconnect the cable from the positive terminal.

⚠ IMPORTANT

MACHINE DAMAGE HAZARD
Damage to the alternator can occur
Do not operate machine if:
- **Engine is operated with battery cables disconnected.**
- **Battery cables are connected when using a fast charger or when welding on the machine. Remove both cables from the battery.**
- **Extra battery cables (booster cables) are connected wrong.◂**

I-2023

⚠ WARNING

CHEMICAL HAZARD
Contact with or ingestion of battery acid can cause serious injury or death.
- **Batteries contain acid that burns eyes and skin on contact. Wear safety goggles, protective clothing, and rubber gloves to keep acid off body.**
- **In case of acid contact, wash immediately with water. In case of eye contact, get prompt medical attention and wash eye with clean, cool water for at least 5 minutes.**
- **If electrolyte is ingested, drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention.◂**

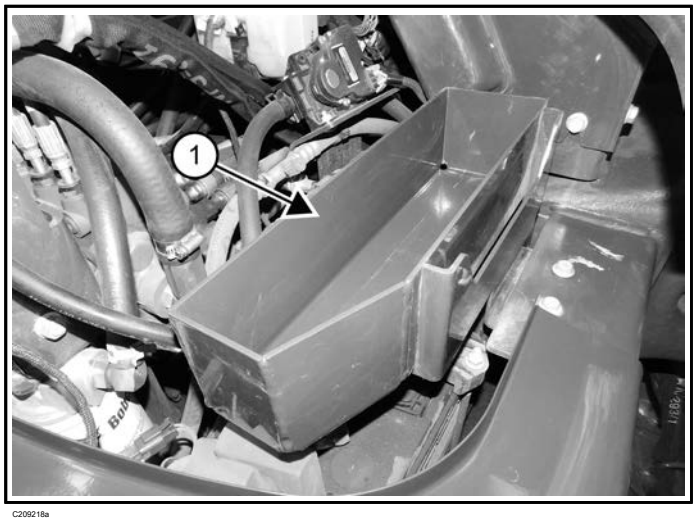
W-2065

Removing And Installing The Battery

1. Open the tailgate. (See Tailgate on Page 155)

2. Open the right side cover.
(See Right Side Cover on Page 156)

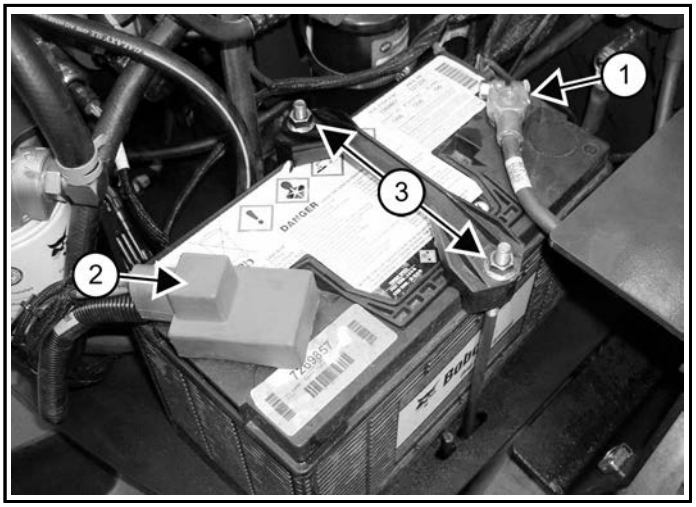
Figure 362



C209218a

3. Remove the tool box (if equipped) (Item 1) [Figure 362] by pulling it upwards.

Figure 363



4. Disconnect the negative (-) cable (Item 1) [Figure 363].

5. Disconnect the positive (+) cable (Item 2) [Figure 363].

6. Remove the bolts (Item 3) [Figure 363] on both sides of the battery and remove the hold-down clamp.

7. Remove the battery.

   Always clean the terminals and the cable ends, even when installing a new battery.

8. Install the battery.

9. Install the hold-down clamp and tighten the bolts.

10. Connect the positive (+) cable (Item 2) [Figure 363].

11. Connect the negative (-) cable (Item 1) [Figure 363] last to prevent sparks.

⚠ WARNING

CHEMICAL HAZARD
Contact with or ingestion of battery acid can cause serious injury or death.
- **Batteries contain acid that burns eyes and skin on contact. Wear safety goggles, protective clothing, and rubber gloves to keep acid off body.**
- **In case of acid contact, wash immediately with water. In case of eye contact, get prompt medical attention and wash eye with clean, cool water for at least 5 minutes.**
- **If electrolyte is ingested, drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention.◂**

W-2065

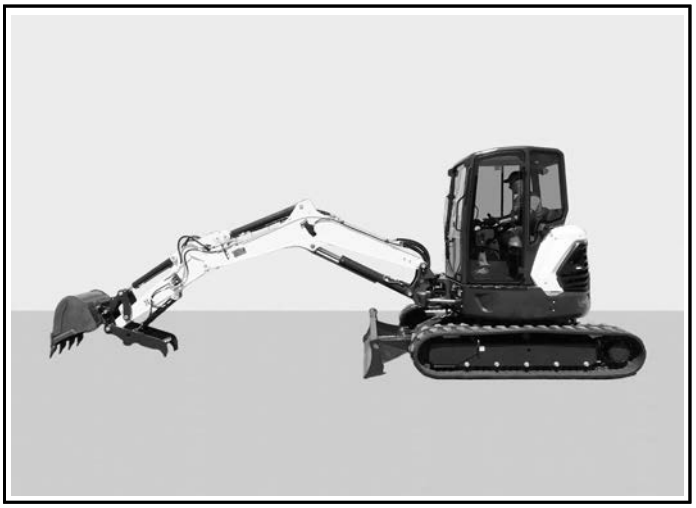
HYDRAULIC SYSTEM

Checking And Adding Hydraulic Fluid

The preferred method is to check the hydraulic fluid when it is cold. See the Service Schedule for the correct service interval. (See Service Schedule on Page 148)

1. Park the machine on a flat surface.

Figure 364



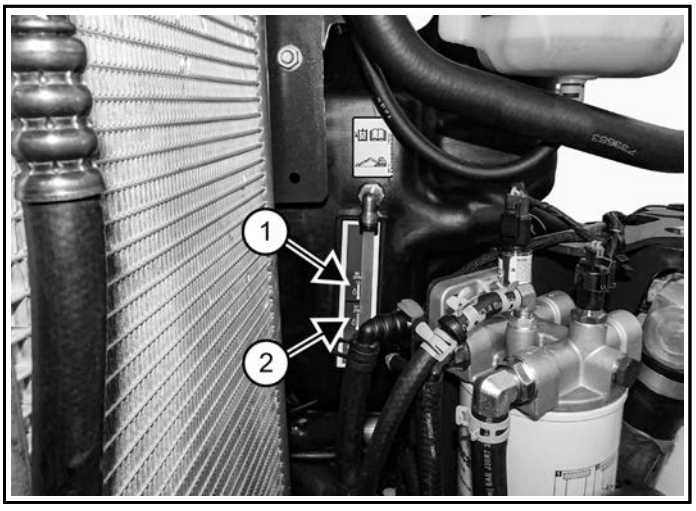
C200403a

2. Extend the boom, arm, and bucket. Lower the bucket to the ground and lower the blade so the machine is in the position shown [Figure 364].

3. Open the tailgate. (See Tailgate on Page 155)

4. Open the right side cover.
(See Right Side Cover on Page 156)

Figure 365



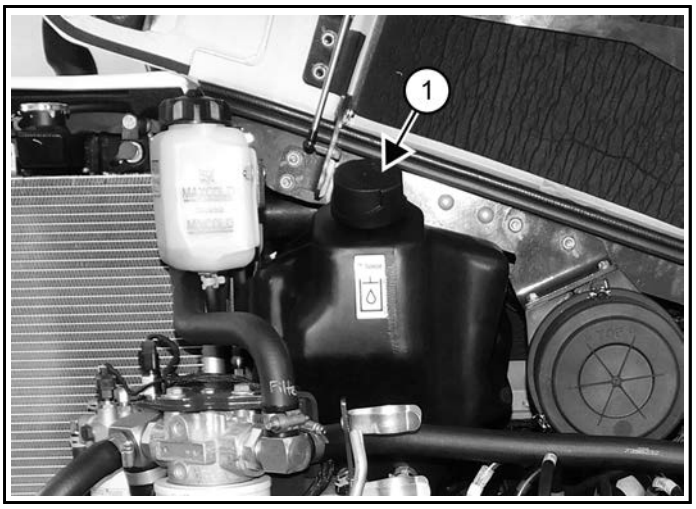
C209464a

5. Check the hydraulic fluid level. It must be visible in the sight gauge (Item 1) [Figure 365].

The decal on the hydraulic tank shows the correct fill level.

- Item 1 [Figure 365] is the correct fluid level when the machine is HOT (optional).
- Item 2 [Figure 365] is the correct fluid level when the machine is COLD (preferred).

Figure 366



C209380a

6. Clean the surface around the fill cap and remove the cap from the tank (Item 1) [Figure 366].

Figure 367

C209381a

7. Check the condition of the fill strainer screen (Item 1) [Figure 367].

⚠ WARNING

FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.

W-2103

Clean or replace as necessary.

8. Add the correct fluid to the tank until it is visible in the sight gauge.
(See Capacities Specifications on Page 223)

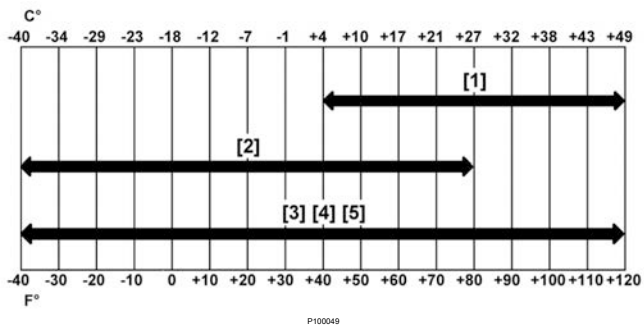
   Be sure the screen is installed before adding fluid.

9. Check the fill cap (Item 1) [Figure 366].

   Clean or replace as necessary.

10. Install the fill cap (Item 1) [Figure 366].
11. Close the right side cover.
12. Close the tailgate.

Hydraulic Fluid Chart

HYDRAULIC FLUID
Recommended ISO Viscosity Grade (VG) and Viscosity Index (VI)
 P100049
Refer to the temperature range anticipated before next oil change.
[1] VG 100; Minimum VI 130 [2] VG 46; Minimum VI 150 [3] Bobcat All-Season Fluid [4] Bobcat Synthetic Fluid [5] Bobcat Biodegradable Hydraulic / Hydrostatic Fluid (Unlike biodegradable fluids that are vegetable based, Bobcat biodegradable fluid is formulated to prevent oxidation and thermal breakdown at operating temperatures.)

Use only recommended fluid in the hydraulic system.

Replacing The Hydraulic Filter

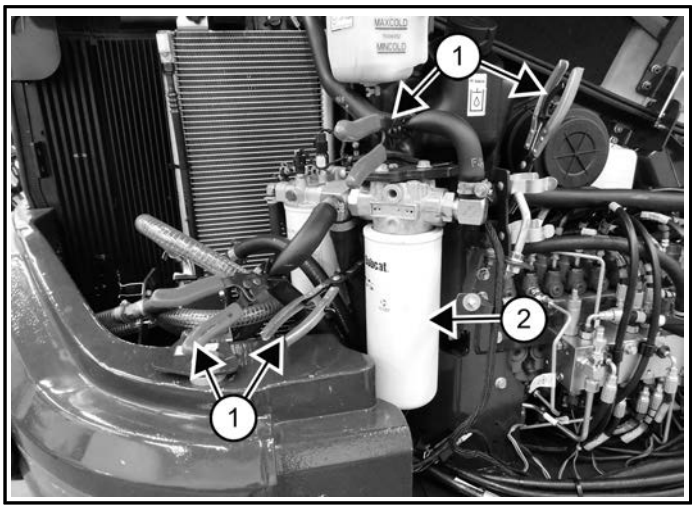
⚠ WARNING

FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.
W-2103

See the Service Schedule for the correct service interval.
(See Service Schedule on Page 148)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 155)
3. Open the right side cover.
(See Right Side Cover on Page 156)
4. Remove the right side panel.
(See Right Side Panel on Page 157)

Figure 368



C209382a

5. Install locking hose pliers (Item 1) [Figure 368] on the hoses running to the filter housing.
6. Remove the hydraulic filter (Item 2) [Figure 368].
7. Clean the housing where the filter gasket makes contact.
8. Apply clean hydraulic fluid to the filter gasket.
9. Install the new filter.

   Use a genuine Bobcat replacement filter.

   Tighten until the gasket first makes contact plus 1/2 turn.

10. Remove locking hose pliers (Item 1) [Figure 368].
11. Install the right side panel.
12. Close the right side cover.
13. Close the tailgate.

Replacing The Case Drain Filter

⚠ WARNING

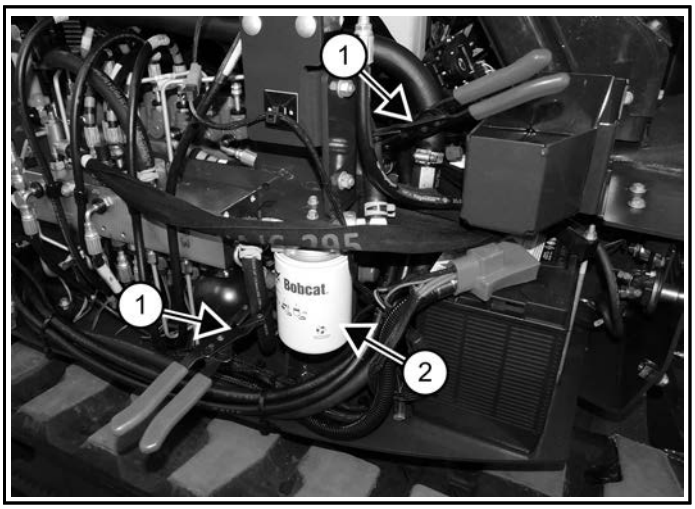
FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.
W-2103

See the Service Schedule for the correct service interval. (See Service Schedule on Page 148)

The case drain filter is located in the right front corner of the excavator.

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 155)
3. Open the right side cover.
   (See Right Side Cover on Page 156)
4. Remove the right side panel.
   (See Right Side Panel on Page 157)

Figure 369



C209290a

5. Install locking hose pliers (Item 1) [Figure 369] on the hoses running to the filter housing.
6. Remove the case drain filter (Item 2) [Figure 369].
7. Clean the housing where the filter gasket makes contact.
8. Apply clean hydraulic fluid to the filter gasket.
9. Install the new filter.

   Use a genuine Bobcat replacement filter.

   Tighten until the gasket first makes contact plus 3/4 turn.
10. Remove locking hose pliers (Item 1) [Figure 369].
11. Install the right side panel.
12. Close the right side cover.
13. Close the tailgate.

Replacing Hydraulic Fluid

The following items are needed to complete this task:

- Container for the hydraulic fluid
- Hose with female quick coupler on one end.

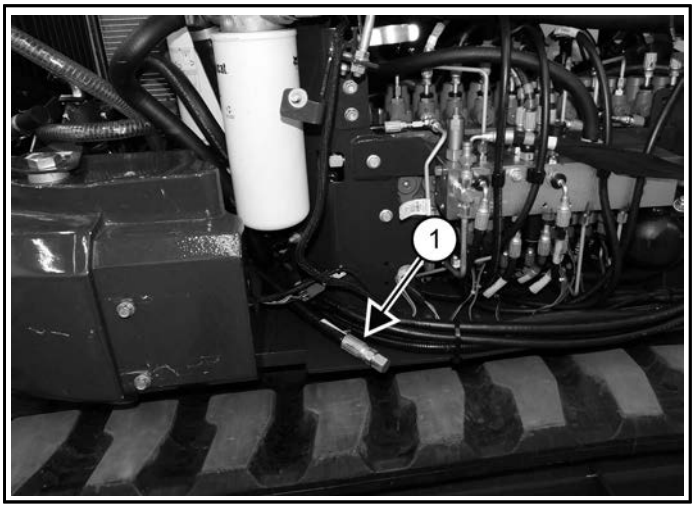
⚠ WARNING

INJECTION HAZARD
Pressurised diesel fuel or hydraulic fluid can penetrate skin and eyes, causing serious injury or death.
Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. DO NOT use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a doctor familiar with this injury.
W-2072

See the Service Schedule for the correct service interval. (See Service Schedule on Page 148)

1. Extend the boom, arm, and bucket. Lower the bucket to the ground and lower the blade so the machine is in the position shown [Figure 364].
2. Stop the engine.
3. Open the tailgate. (See Tailgate on Page 155)
4. Open the right side cover.
   (See Right Side Cover on Page 156)
5. Remove the right side panel.
   (See Right Side Panel on Page 157)

Figure 370

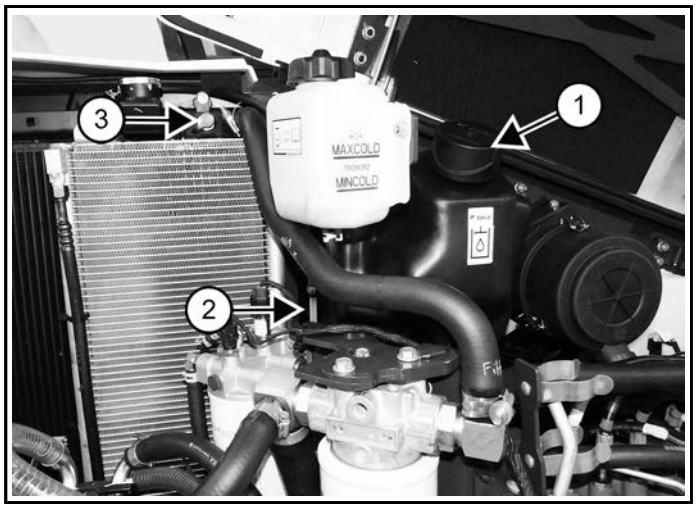


C209304a

6. Locate the drain hose (Item 1) [Figure 370], which is clamped in place under the hydraulic filter.
7. Place a container under the hose.

8. Unscrew the plug at the end of the drain hose and drain the fluid into the container.
9. Recycle or dispose of the fluid in an environmentally safe manner.
10. Put the plug back on the end of the drain hose and install the drain hose back in the storage position.

Figure 371

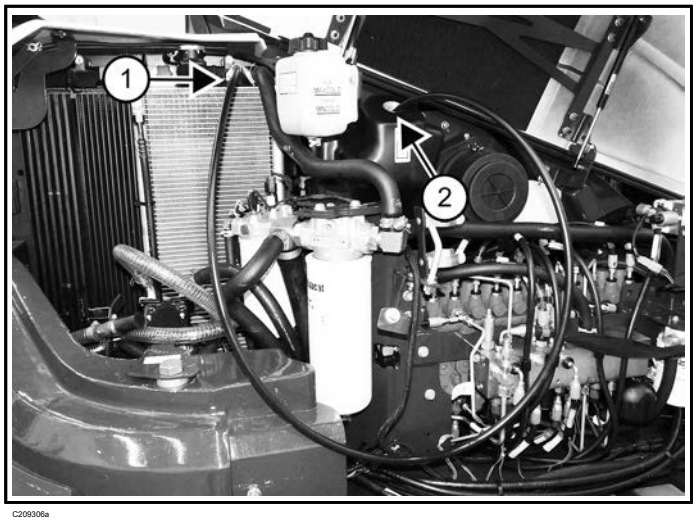


C209305a

11. Remove the fill cap and add fluid to the hydraulic tank (Item 1) [Figure 371].
(See Capacities Specifications on Page 223)

    The level should be between the hot fill and cold fill marks (Item 2) [Figure 371].
12. Locate the male coupler (Item 3) [Figure 371] that is to the left of the hydraulic tank and remove the cap.

Figure 372



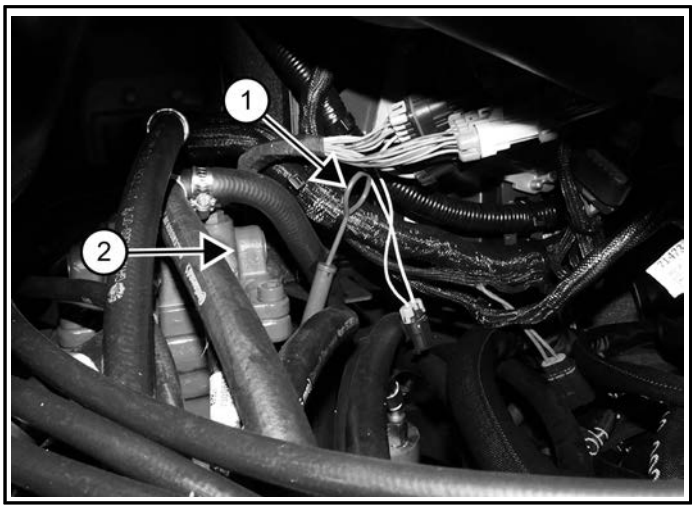
C209306a

13. Install a female quick coupler and hose on the male quick coupler (Item 1) [Figure 372].
14. Route the hose (Item 1) from the male quick coupler into the hydraulic tank (Item 2) [Figure 372].
15. Start the machine.
16. Remove the female quick coupler (Item 1) [Figure 372] after a steady stream of hydraulic fluid, free of any air bubbles, drains from the hose.
17. Reinstall the fill cap (Item 1) [Figure 371] on the hydraulic tank.
18. Operate the machine through the hydraulic functions.
19. Stop the engine.
20. Check the hydraulic fluid level and add as needed.
21. Install the right side panel.
22. Close the right side cover.
23. Close the tailgate.

Checking The Fluid Level Of The Swing Motor Gear Box

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 155)
3. Open the right side cover.
(See Right Side Cover on Page 156)

Figure 373



C209307a

4. Pull out the dipstick (Item 1) of the swing motor gear box (Item 2) to check fluid level [Figure 373].
5. Keep the oil level between the marks on the dipstick.

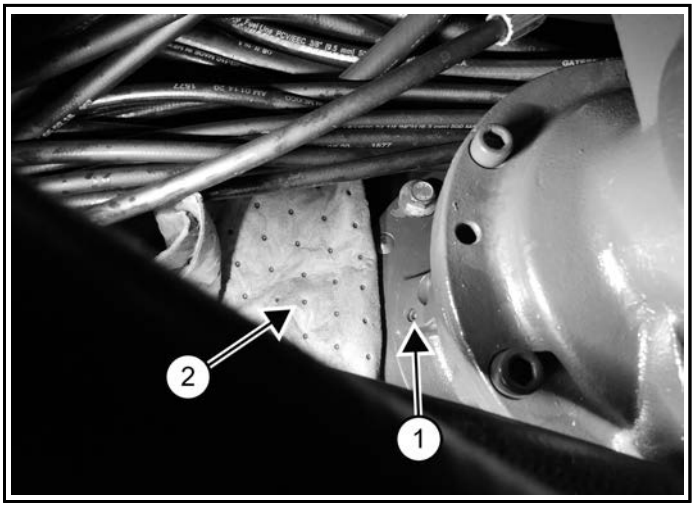
Replacing Swing Motor Gear Box Fluid

The following item is needed to complete this task:

- Fluid containment mat.

1. Remove the centre cover.
(See Centre Cover on Page 156)

Figure 374



C209308a

2. The swing motor carrier drain plug (Item 1) [Figure 374] is located on the side of the swing motor carrier.
3. Place a fluid containment mat (Item 2) [Figure 374] in the upperstructure by the drain plug to collect the fluid.
4. Remove the drain plug (Item 1) [Figure 374] and drain the swing motor carrier fluid onto the containment mat.
5. Reinstall the drain plug (Item 1) [Figure 374].
6. Recycle or dispose of the fluid in an environmentally safe manner.
7. Remove the dipstick (Item 1) [Figure 373] and add gear lube (80W-90) until the fluid is at the correct mark on the dipstick.
(See Capacities Specifications on Page 223)
8. Reinstall the centre cover.

DIESEL PARTICULATE FILTER (DPF) SYSTEM

DPF Service Description

The engine exhaust system is equipped with a diesel particulate filter (DPF). The DPF is an emissions reduction device that removes diesel particulate matter (soot) from the exhaust gases of the diesel engine. The DPF will trap and collect the soot until it is burned off. The process of burning off the collected soot is called regeneration.

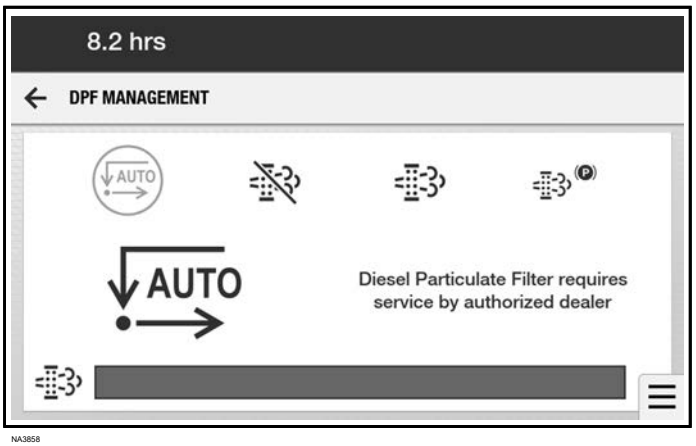
A service regeneration cycle may be required if too much soot is allowed to accumulate in the DPF. This can occur in the following situations:

- The machine is often operated for brief periods (less than 30 minutes) that do not allow sufficient time for the DPF to complete an automatic or operator activated forced regeneration cycle.
- The inhibit mode is used for an extended period of time. This will inhibit the DPF from actively regenerating and burning off the collected soot.

Ash residue will remain after the regeneration process is complete. The ash must be periodically removed from the DPF.

DPF Service Regeneration

Figure 375



NA3858

The machine will alert the operator when DPF service is required [Figure 375].

Service code “P24A3” “Very High DPF Soot Mass - Service Regen Required” will be accompanied by a severe torque reduction.

Service regeneration requires the use of specialised equipment. See your Bobcat dealer for service regeneration.

DPF Cleaning

Contact your Bobcat dealer to arrange the cleaning of the DPF when indicated.

Service code “P242F” “High DPF Ash Content - Ash Cleaning Needed” will show in the display screen when DPF cleaning is necessary.

The DPF is a critical component of the engine exhaust system and must be properly maintained. Specialised equipment is required to clean the ash from the DPF. See your Bobcat dealer for DPF cleaning.

TRACK TENSION

Track Tension Description

The wear of the pins and bushings on the undercarriage vary with working conditions and different types of soil conditions. It is necessary to inspect track tension and maintain the correct tension. See the Service Schedule for the correct service interval.
(See Service Schedule on Page 148)

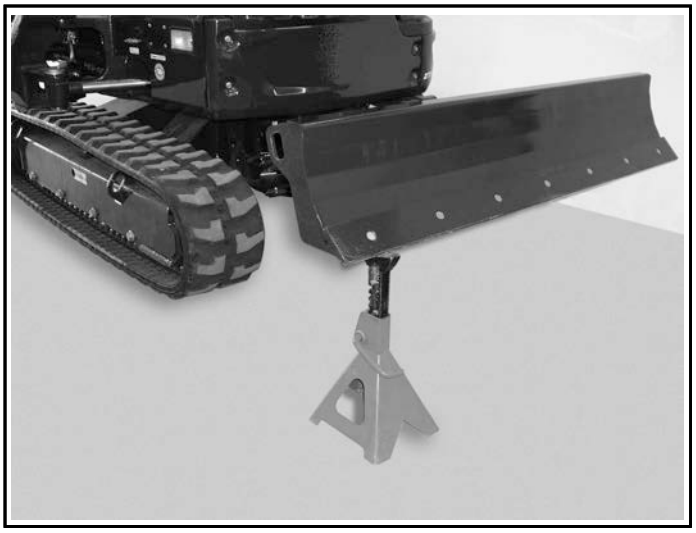
Adjusting Track Tension Manually

The following item is needed to complete this task:

- Bleed tool to decrease track tension. The bleed tool will direct the flow of grease to aid in cleanup. See your Bobcat dealer to order a bleed tool.

1. Raise one side of the machine approximately 100 mm (4 in) using the boom and arm.

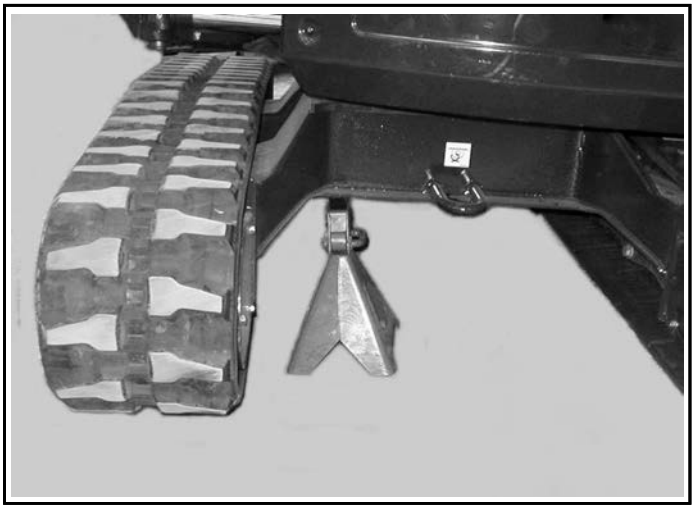
Figure 376



P128643b

2. Raise the blade fully and install jackstands under the blade [Figure 376].

Figure 377



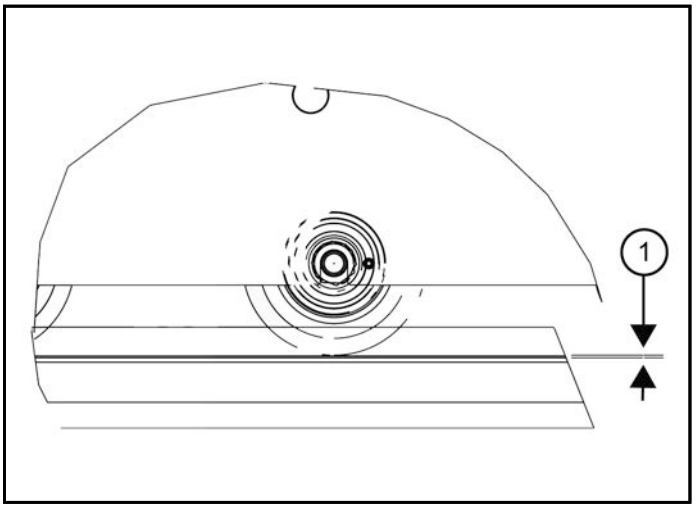
P91969a

3. Install jackstands under the track frame [Figure 377].
4. Raise the boom until all machine weight is on the jackstands.
5. Stop the engine.

⚠ WARNING

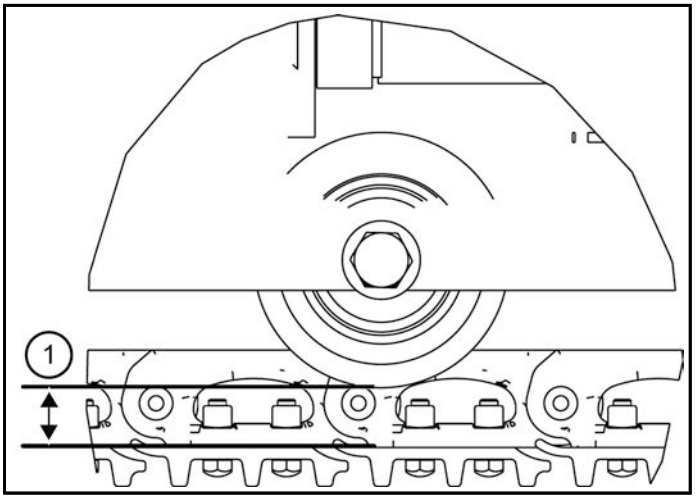
PINCHING HAZARD
Keep finger and hands out of pinch points when checking the track tension.
W-2142

Figure 378



NA15893a

Figure 379



NA15892a

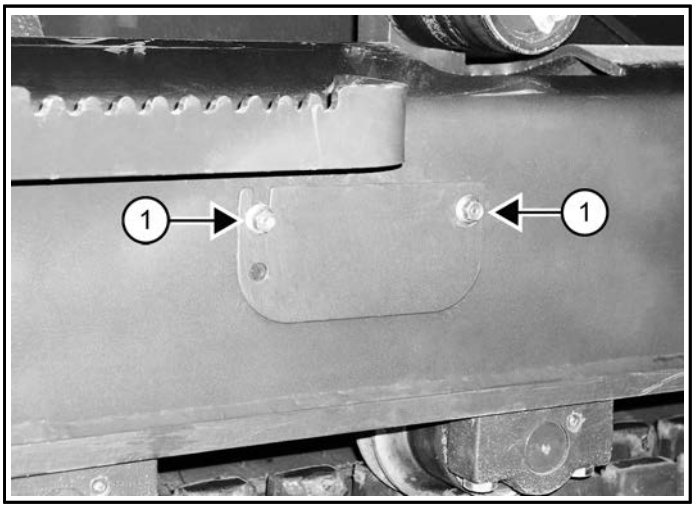
6. Measure the track clearance at the middle track roller.

   Use a bolt or dowel of the appropriate size to check the gap.

   a. For rubber tracks, measure the gap between the contact surface of the roller and the track. The clearance (Item 1) [Figure 378] should be 25 – 35 mm (1.0 – 1.4 in).

   b. For steel or segmented tracks, measure the gap between the external roller flange and the track grouser. The clearance (Item 1) [Figure 379] should be 86 – 106 mm (3.4 – 4.2 in).

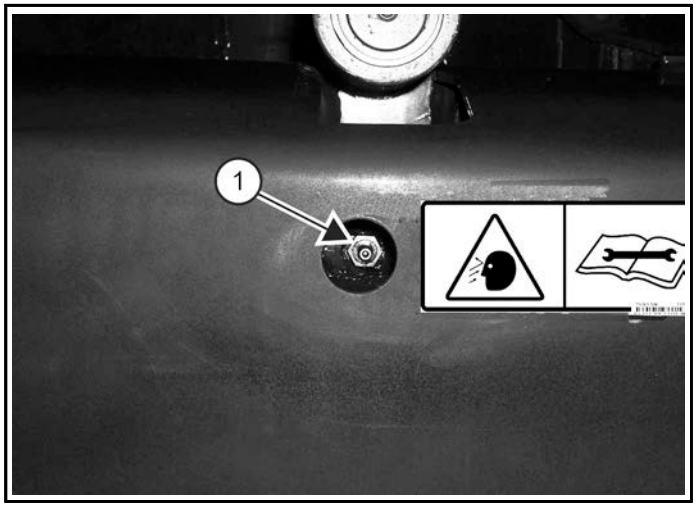
Figure 380



C131511a

7. Loosen the two bolts (Item 1) [Figure 380] and rotate the cover (if equipped) to access the bleed screw / grease fitting.

Figure 381



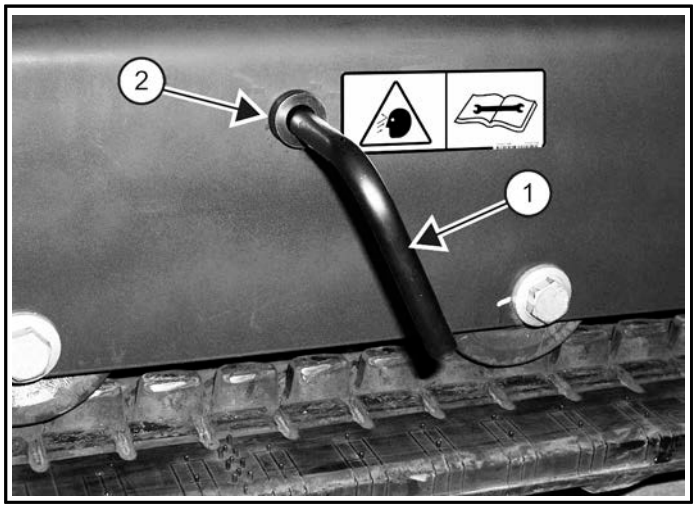
P113853a

8. To **increase track tension**, add grease to the track tension fitting (Item 1) [Figure 381] until the track tension is correct.

⚠ WARNING

INJECTION HAZARD
High pressure grease can penetrate skin and eyes, causing serious injury.
Do not loosen the track tension fitting more than 1 - 1/2 turns.
W-2994

Figure 382



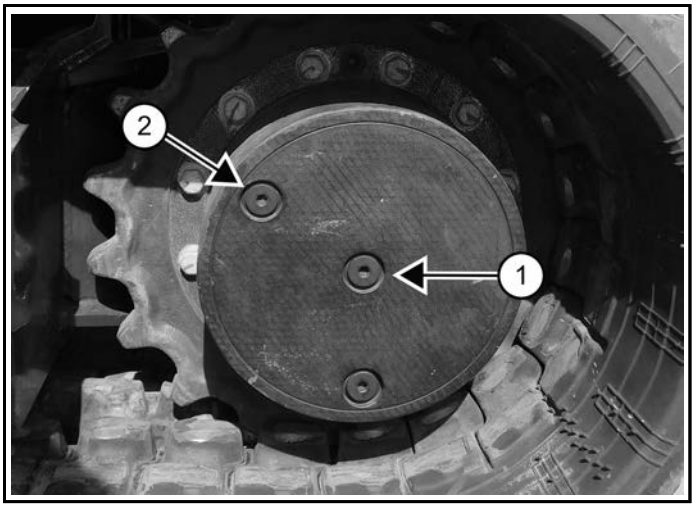
P113854a

9. To **decrease track tension**, install the bleed tool (Item 1) [Figure 382] on the track tension fitting.
   a. Turn the tool 90° anticlockwise and let the grease flow into a container.
   b. Continue to release pressure until the track tension is correct.
   c. Dispose of the grease in an environmentally friendly manner.
10. Tighten the track tension fitting to 23 N·m (17 ft-lb) torque.
11. Repeat the procedure for the opposite side.

TRAVEL MOTOR

Checking And Adding Travel Motor Fluid

Figure 383



C209319b

1. Park the excavator on a level surface with the plugs (Items 1 and 2) [Figure 383] positioned as shown.
2. Remove the plug (Item 1) [Figure 383].

   The fluid level must be at the bottom edge of the hole.
3. If the fluid level is low, remove the top plug (Item 2) [Figure 383] and add lubricant through the hole.

   Lubricant should be API GL-4 or 5 containing extreme pressure additive (SAE 80W90).
4. Install the plugs (Items 1 and 2) [Figure 383].
5. Repeat the procedure for the opposite travel motor.

Replacing Travel Motor Fluid

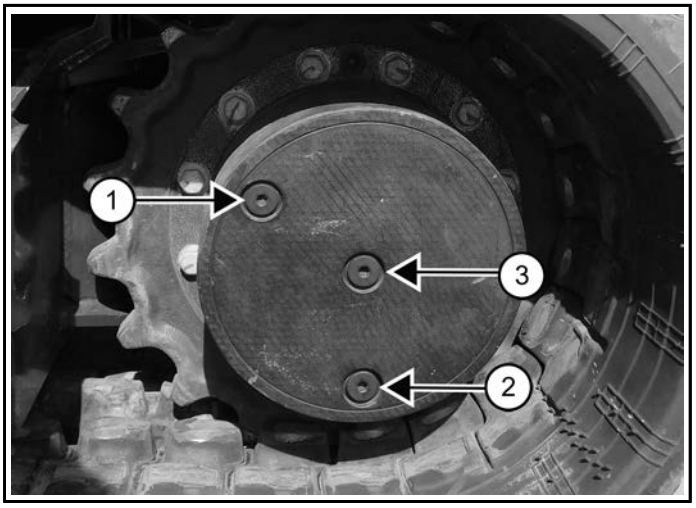
See the Service Schedule for the correct service interval.
(See Service Schedule on Page 148)

⚠ WARNING

FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.◂

W-2103

Figure 384



C209319c

1. Park the excavator on a level surface with plugs (Items 1, 2, and 3) [Figure 384] positioned as shown.
2. Remove top and bottom plugs (Items 1 and 2) [Figure 384] and drain the lubricant into a container.
3. Install the bottom plug (Item 2) [Figure 384].
4. Remove the middle plug (Item 3) [Figure 384].
5. Add lubricant through the top hole (Item 1) until the lube level is at the bottom edge of the check hole (Item 3) [Figure 384].
   (See Capacities Specifications on Page 223)

   Lubricant should be API GL-4 or 5 containing extreme pressure additive (SAE 80W90).
6. Install the plugs (Items 1 and 3) [Figure 384].
7. Repeat the procedure for the opposite travel motor.

BELTS

Adjusting Alternator Belt

The alternator belt is a special maintenance-free type that is pretensioned over the pulleys. This belt eliminates the need for a tensioning device and does not require periodic adjustment. Contact your Bobcat dealer for replacement parts.

Replacing Alternator Belt

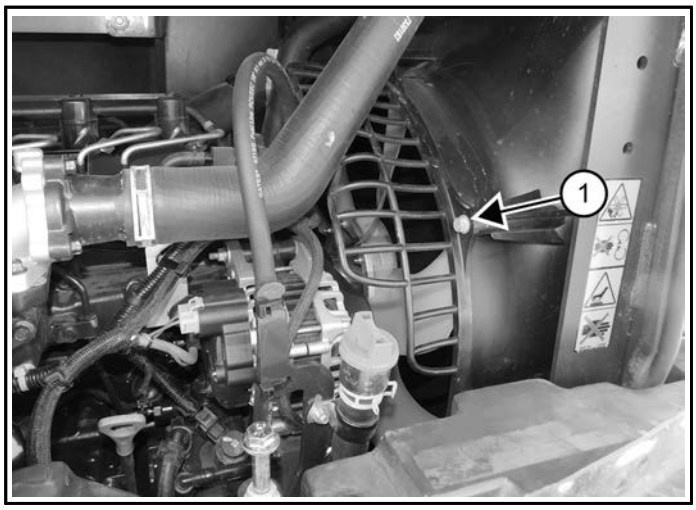
The following item is needed to complete this task:

- Alternator belt installation tool. See your local Bobcat dealer.

If your machine is equipped with air conditioning, see your Bobcat dealer for belt replacement.

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 155)

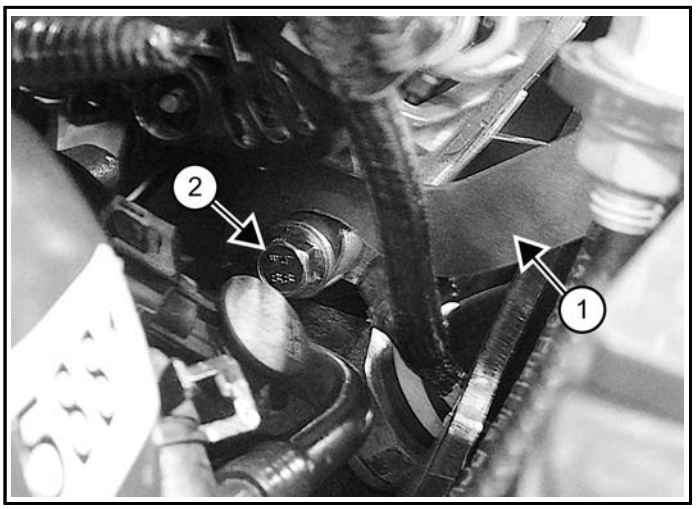
Figure 385



C209320a

3. Remove the three bolts (Item 1) [Figure 385] on the fan guard and slide the fan guard off.

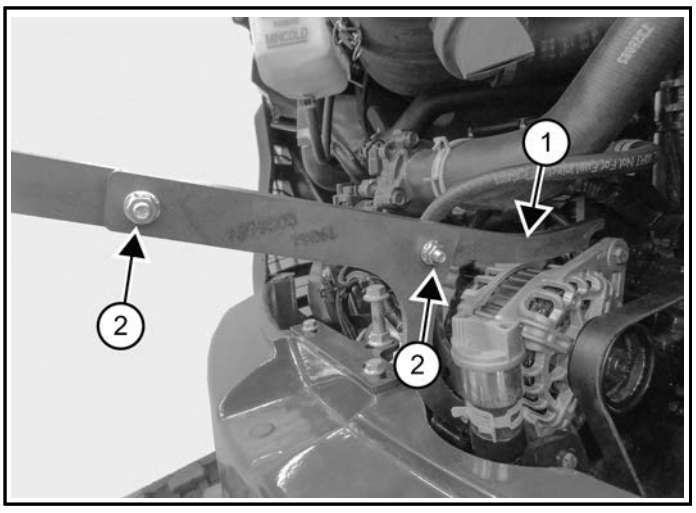
Figure 386



C143842b

4. Position the lower alternator tool (Item 1) around the spacer (Item 2) [Figure 386].

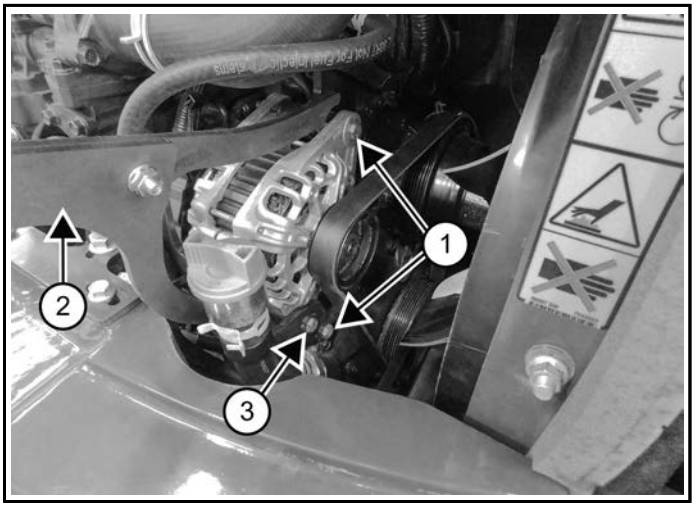
Figure 387



C143843b

5. Position the upper alternator tool (Item 1) and install the bolts and nuts on the tool (Item 2) [Figure 387].

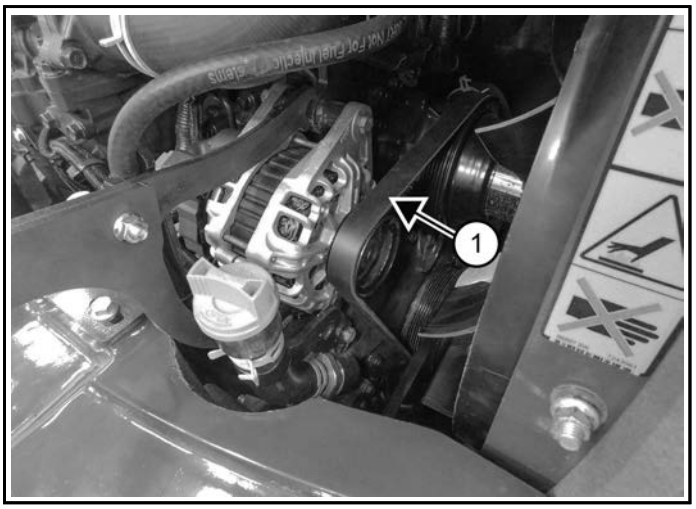
Figure 388



C143844b

6. Loosen the top and bottom bolts (Item 1) [Figure 388].
7. Lift up on the alternator tool (Item 2) and remove the bolt (Item 3) [Figure 388].

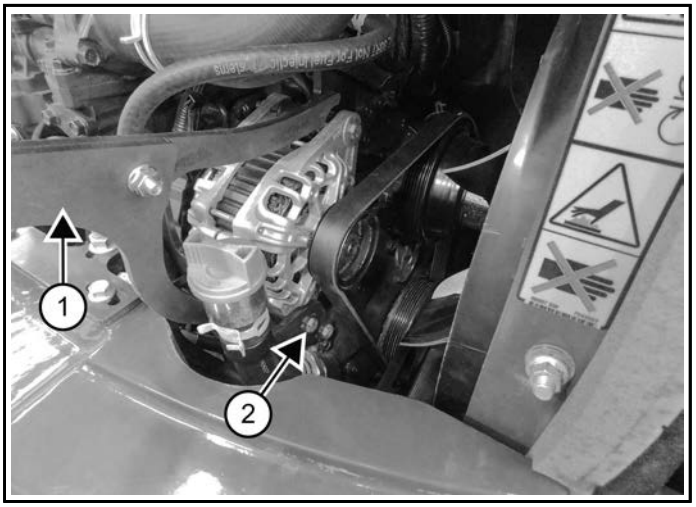
Figure 389



C143845b

8. Cut the old belt (Item 1) [Figure 389] and remove the belt from the pulleys.
9. Inspect the pulleys for wear.
10. Install the new belt.

Figure 390



C143844d

11. Use the alternator tool (Item 1) to align the alternator to the alternator mounting bolt (Item 2) [Figure 390].
12. Tighten all three alternator mounting bolts.
13. Install the fan guard and tighten the bolts to 10 – 12 N ·m (7 – 9 ft-lb) torque.
14. Close the tailgate.

Adjusting Air Conditioning Belt

This machine may be equipped with air conditioning.

The air conditioning belt is a special maintenance-free type that is pretensioned over the pulleys. This belt eliminates the need for a tensioning device and does not require periodic adjustment. Contact your Bobcat dealer for replacement parts.

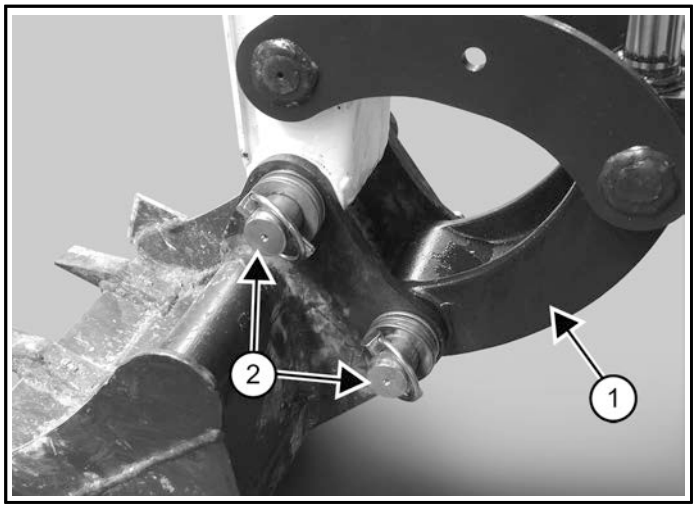
Replacing Air Conditioning Belt

See your Bobcat dealer for air conditioning belt replacement.

QUICK COUPLER

Inspecting And Maintaining The Bucket Link And Coupler

Figure 391

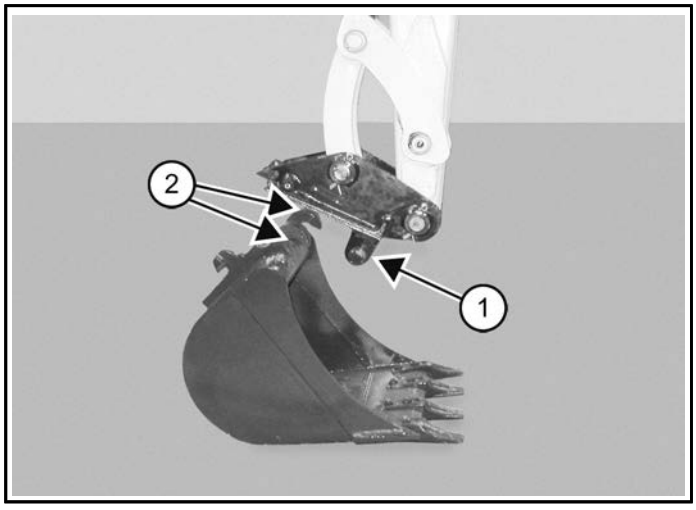


S35382a

- Inspect the bucket link (Item 1) [Figure 391] for wear or damage.
- Inspect the attachment pins (Item 2) [Figure 391] for wear or damage.

  Repair or replace damaged parts.

Figure 392



p-72274d

- Inspect the quick coupler for wear or damage. Inspect the quick coupler pins (Item 1) and the hooks (Item 2) (on the attachment) for wear or damage [Figure 392].

  Repair or replace damaged parts.

BUCKET TEETH

Replacing Bucket Teeth

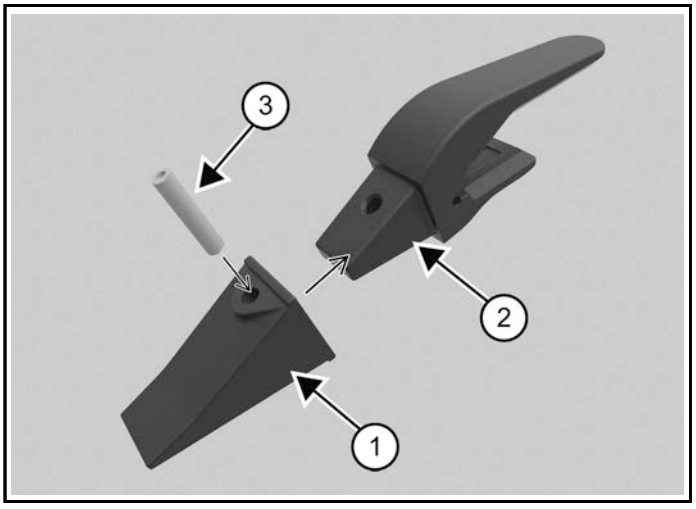
⚠ WARNING

IMPACT AND INJECTION HAZARDS
Flying debris and high pressure fluids can cause serious injury eye injury.
Wear safety glasses to prevent eye injury when any of the following conditions exist:
- **High pressure fluids, springs or other stored energy components.**
- **Flying debris or loose material.**
- **Engine is running.**
- **Tools are being used.**

W-2505

1. Position the bucket so the bucket teeth are at a 30° angle up from the ground to better access the teeth.
2. Lower the boom until the bucket is fully on the ground.
3. Stop the engine and exit the excavator.
4. Inspect the pins and teeth of the bucket.

Figure 393



P131734a

5. To remove any damaged teeth, drive the retaining pin (Item 3) out of the tooth (Item 1) and remove the tooth [Figure 393].
6. Position the new tooth (Item 1) on the shank (Item 2) and install a new retaining pin (Item 3) [Figure 393].
7. Push the retaining pin in until it is flush with the top of the tooth.

MACHINE LUBRICATION

Grease Fitting Locations

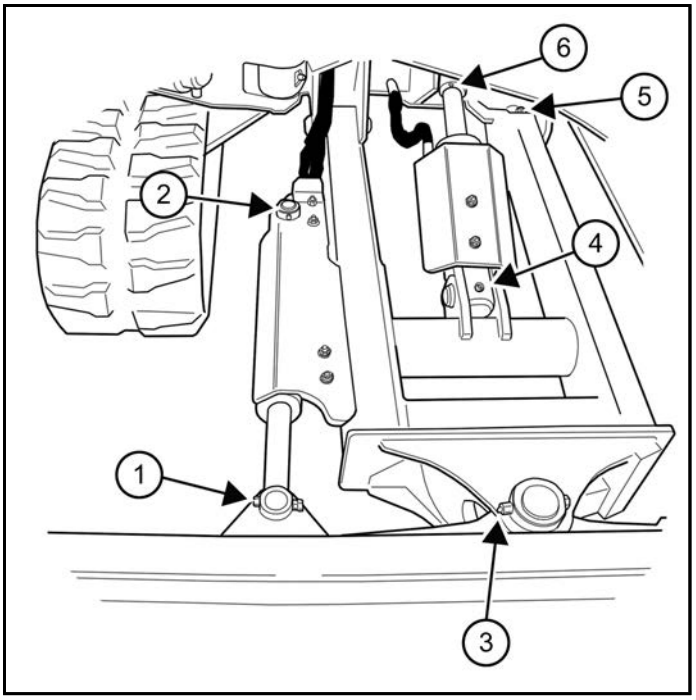
Always use a good quality lithium-based multipurpose grease when lubricating the machine. Apply the lubricant until extra grease shows.

Lubricate As Indicated

Lubricate the excavator at the intervals specified in the Service Schedule and on the service schedule decal. (See Service Schedule on Page 148)

Blade Cylinder

Figure 394

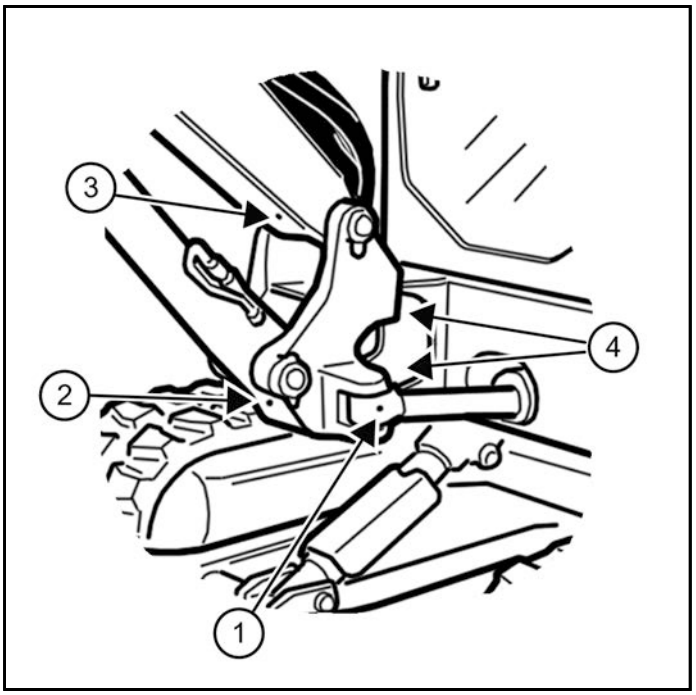


NA20141a

REF.	DESCRIPTION	QTY.
1	Angle Blade Cylinder Rod End (Angle Blade Only)	1
2	Angle Blade Cylinder Base End (Angle Blade Only)	1
3	Angle Blade Pivot (Angle Blade Only)	1
4	Blade Cylinder Base End	1
5	Blade Pivots	2
6	Blade Cylinder Rod End	1

Boom Base

Figure 395

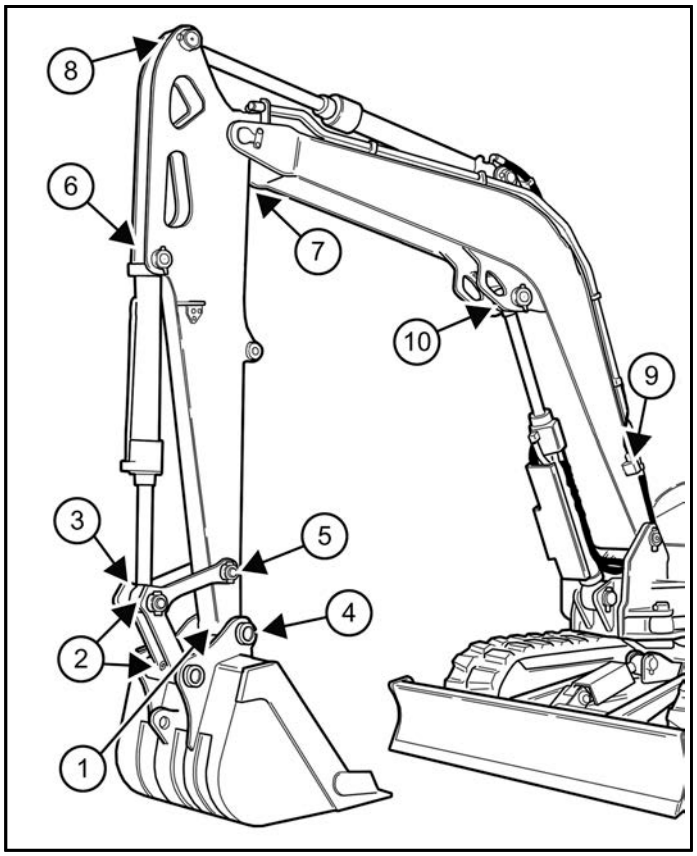


NA18172i

REF.	DESCRIPTION	QTY.
1	Boom Swing Cylinder Rod End	1
2	Boom Cylinder Base End	1
3	Boom Pivot	1
4	Boom Swing Pivot	2

Bucket, Arm, and Boom

Figure 396



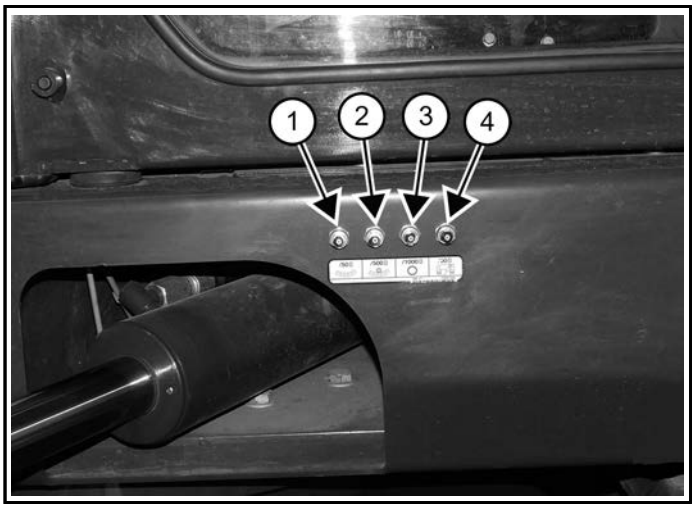
NA20187e

REF.	DESCRIPTION	QTY.
1	Bucket Pivot	1
2	Bucket Link	3
3	Bucket Cylinder Rod End	1
4	Hydraulic Clamp Pivot (if equipped)	2
5	Arm Link	1
6	Bucket Cylinder Base End	1
7	Arm Pivot	1
8	Arm Cylinder Rod End	1
9	Arm Cylinder Base End	1
10	Boom Cylinder Rod End	1

NOTE: The hydraulic clamp cylinder (if equipped) does not require lubrication.

Remote Lubrication

Figure 397



C208557a

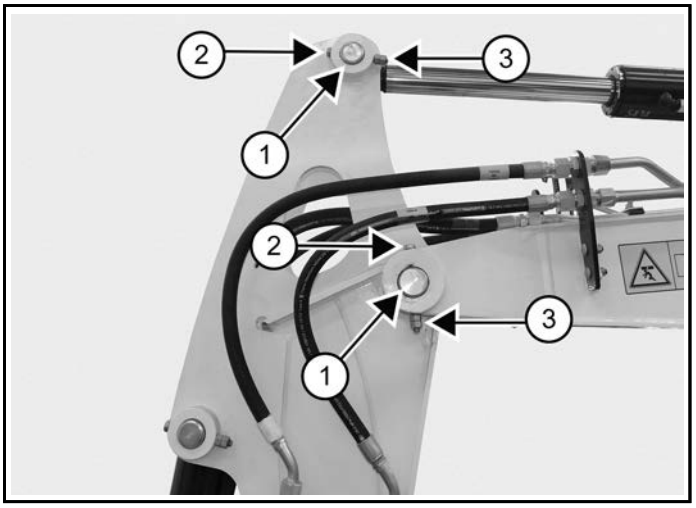
REF.	DESCRIPTION	QTY.	FREQUENCY
1	Swing Circle	1	Every 50 hours
2	Swing Pinion [A]	1	Every 500 hours
3	Swing Reduction Gear	1	Every 1000 hours
4	Swing Cylinder (base end)	1	Every 50 hours

[A] Install three to four pumps of grease then rotate the upperstructure 90°. Install three to four pumps of grease and again rotate the upperstructure 90°. Repeat this until the swing pinion has been greased at four positions.

PIVOT PINS

Pivot Pin Inspection And Maintenance

Figure 398



P200155a

The pivots and cylinders (Item 1) have a large pin held in position with a bolt (Item 2) and double nuts (Item 3) [Figure 398] securing the pin.

After the nuts (Item 3) and bolt (Item 2) [Figure 398] are installed and nuts are tightened together, the bolt should be free to spin.

See your Bobcat dealer for replacement parts.

STORAGE AND RETURN TO SERVICE

Extended Storage Procedure

Sometimes it may be necessary to store your machine for an extended period of time. Below is a list of items to perform before storage.

- Thoroughly clean the machine including the engine compartment.
- Lubricate the machine.
- Replace worn or damaged parts.
- Drive the machine onto planks in a dry protected shelter.
- Lower the boom fully with the bucket flat on the ground.
- Put grease on any exposed cylinder rods.
- Put fuel stabiliser in the fuel tank and run the engine a few minutes to circulate the stabiliser to the pump and fuel injectors.

  NOTE: If biodiesel blend fuel has been used, perform the following:

  - Drain the fuel tank, refill with 100% petroleum diesel fuel, add fuel stabiliser and run the engine for at least 30 minutes.
- Drain and flush the cooling system. Refill with premixed coolant.
- Replace all fluids and filters (engine, hydraulic).
- Replace air cleaner, heater, and air conditioning filters.
- Put all controls in NEUTRAL position.
- Remove the battery. Charge the battery. Store the battery in a cool dry location above freezing temperatures and charge it periodically during storage.
- Cover the exhaust pipe opening.
- Tag the machine to indicate that it is in storage condition.
- Clean HVAC drain valves (if equipped).

Returning Machine To Service

Follow this list of items to return the machine to service after it has been in extended storage.

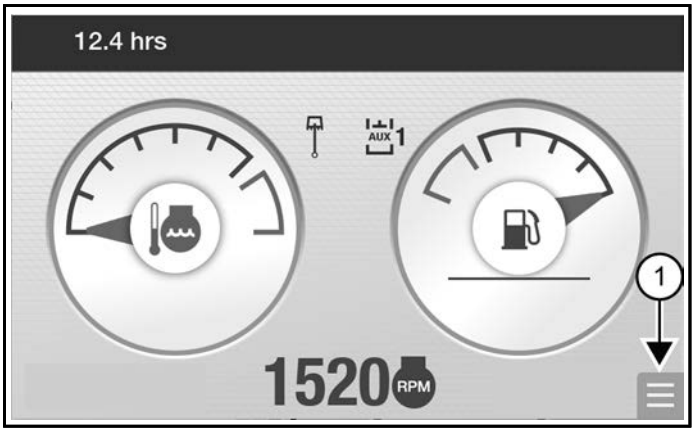
- Check the engine and hydraulic oil levels.
- Check coolant level.
- Install a fully charged battery.
- Remove grease from exposed cylinder rods.

- Check all belt tensions.
- Be sure all shields and guards are in place.
- Lubricate the machine.
- Remove cover from exhaust pipe opening.
- Start the engine and let run for a few minutes while observing the instrument panels and systems for correct operation.
- Drive machine off the planks.
- Operate machine, check for correct function.
- Stop the engine and check for leaks. Repair as needed.

NAVIGATION (STANDARD DISPLAY)

Opening Navigation Bar

Figure 399



NA3773a

1. Select the navigation handle (Item 1) [Figure 399] to open the navigation bar.
2. Select one of the following screens that appear on the navigation bar:
    1. **GAUGES** screen
    2. **CAMERA** screen
    (See Operating Rear View Camera on Page 42)
    3. **VITALS** screen
    (See Vitals (Standard Display) on Page 191)
    4. **SERVICE** screen
    (See Service (Standard Display) on Page 192)
    5. **DEPTH CHECK** screen (if equipped)
    (See Depth Check (Standard Display) on Page 112)
    6. **SETTINGS** screen
    (See Settings (Standard Display) on Page 193)

Active Shortcuts

Figure 400

NA3705

The following icons can appear in the navigation handle position [Figure 400]. Selecting an icon will take you directly to the indicated screen.

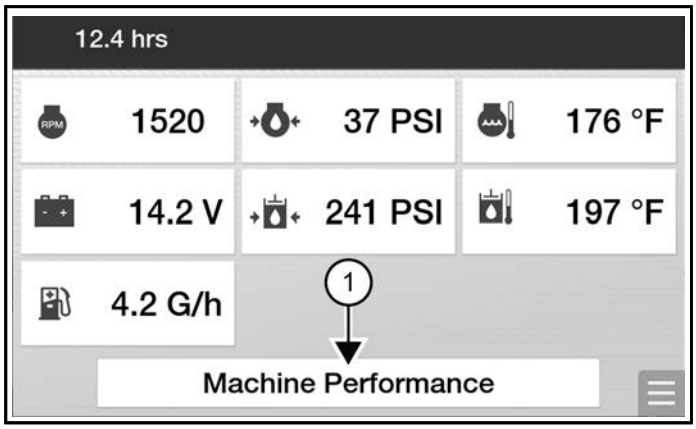
ICON	DESCRIPTION	FUNCTION
	Navigation Handle	Opens and closes the navigation bar.
	Service Due	Opens **SERVICE** screen.
	Software Update	Opens **SOFTWARE** screen.
	Machine Derate	Opens **MACHINE PERFORMANCE** screen.
	Warning	Opens **SERVICE CODES** screen.

VITALS (STANDARD DISPLAY)

Accessing Vital Detail And Machine Performance

1. Select **[NAVIGATION HANDLE]→ [VITALS]**.

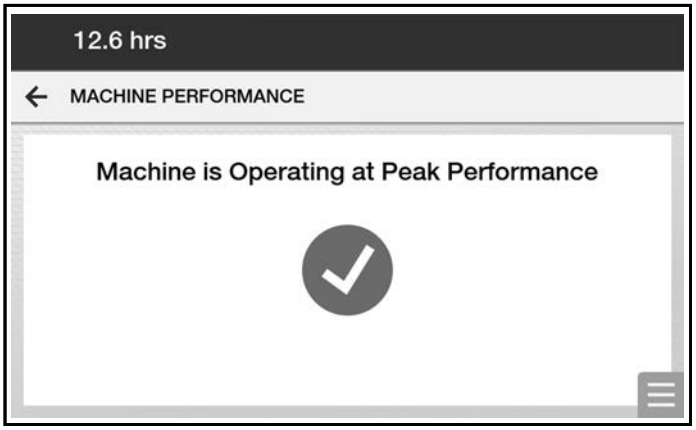
Figure 401



NA3752b

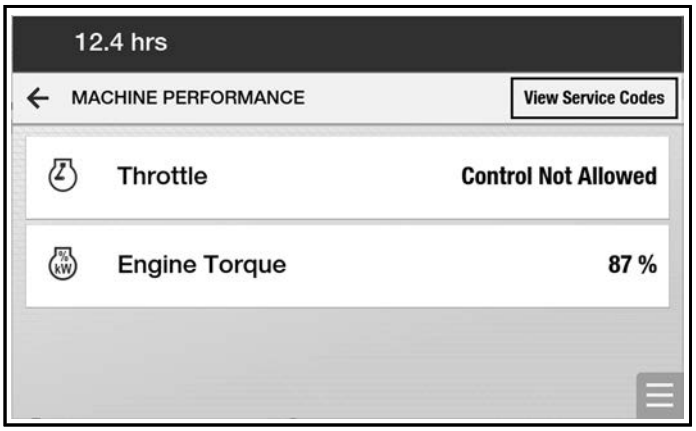
2. On the **VITAL DETAIL** screen [Figure 401], view a digital readout of the gauges. The screen provides real-time monitoring of:
   - Engine Speed (RPM)
   - Engine Oil Pressure
   - Engine Coolant Temperature
   - System Voltage
   - Hydraulic Fluid Pressure
   - Hydraulic Fluid Temperature
   - Fuel Usage (G/h or L/h)
3. Select **[MACHINE PERFORMANCE]** (Item 1) [Figure 401] to view any limitations or restrictions that prevent machine damage.

Figure 402



NA3702

Figure 403



NA3785

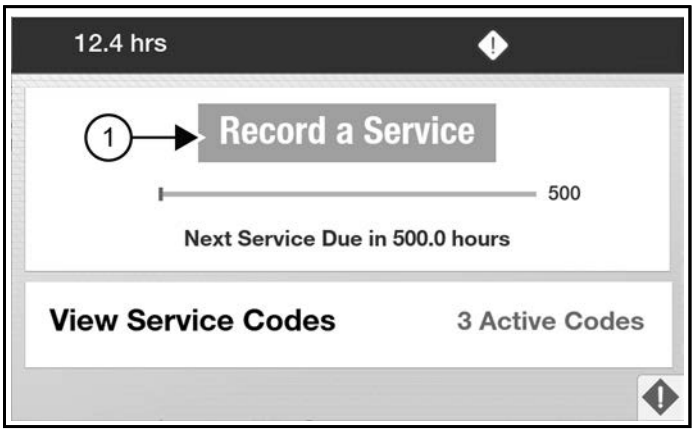
Examples of machine performance screens are shown in [Figure 402] and [Figure 403].

SERVICE (STANDARD DISPLAY)

Recording A Service

1. Select **[NAVIGATION HANDLE]→ [SERVICE]**.

Figure 404

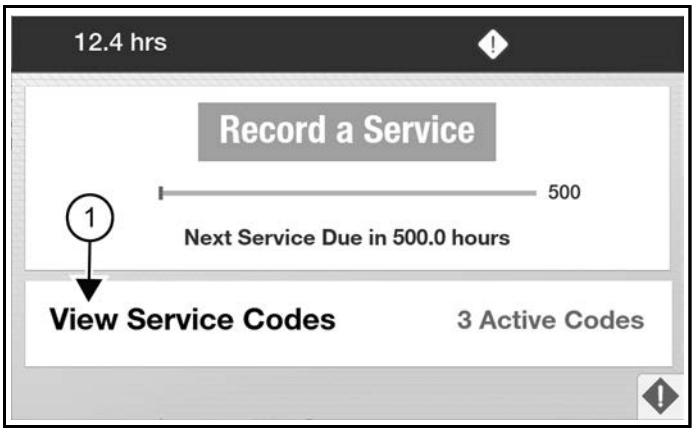


2. Select **[RECORD A SERVICE]** (Item 1) [Figure 404] to record the service as completed.

Viewing Service Codes

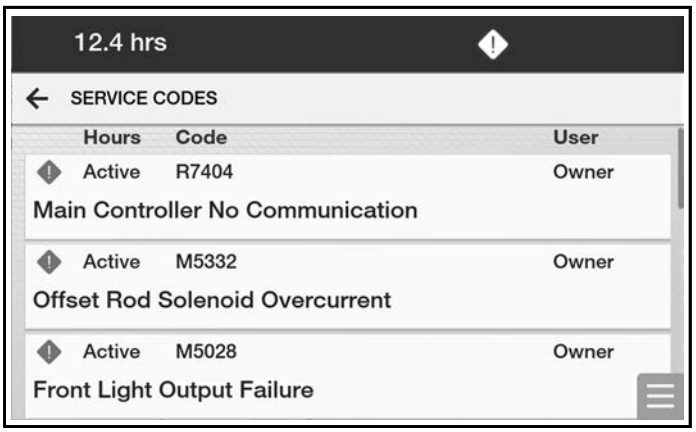
1. Select the **[NAVIGATION HANDLE]→ [SERVICE]**.

Figure 405



2. Select **[VIEW SERVICE CODES]** (Item 1) [Figure 405].

Figure 406



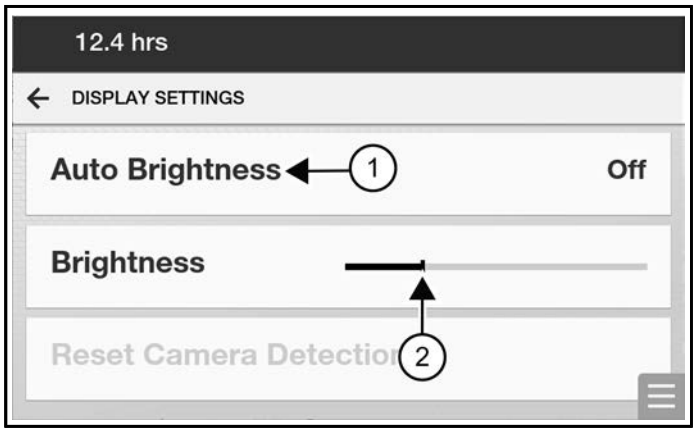
3. Scroll down if necessary to view service codes [Figure 406].

SETTINGS (STANDARD DISPLAY)

Adjusting Display Brightness

1. Select **[NAVIGATION HANDLE]**→ **[SETTINGS]**→ **[DISPLAY SETTINGS]**.

Figure 407



2. Select **[AUTO BRIGHTNESS]** (Item 1) [Figure 407] to turn it on / off. When on, the brightness will automatically adjust according to the ambient light.

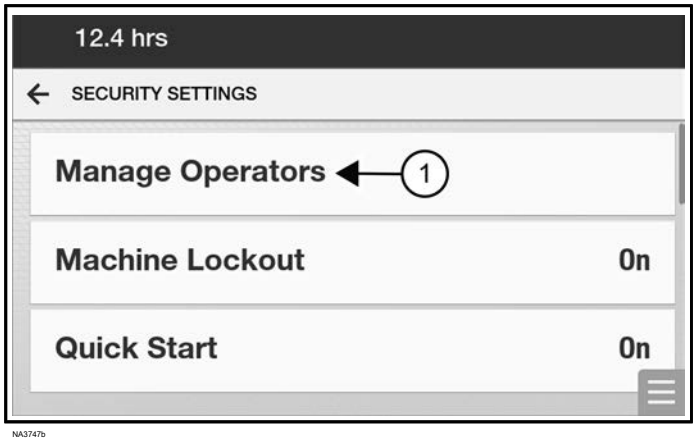
   OR

   To adjust the display brightness, move the slider (Item 2) [Figure 407] to the left to dim, to the right to brighten.

Managing Operators

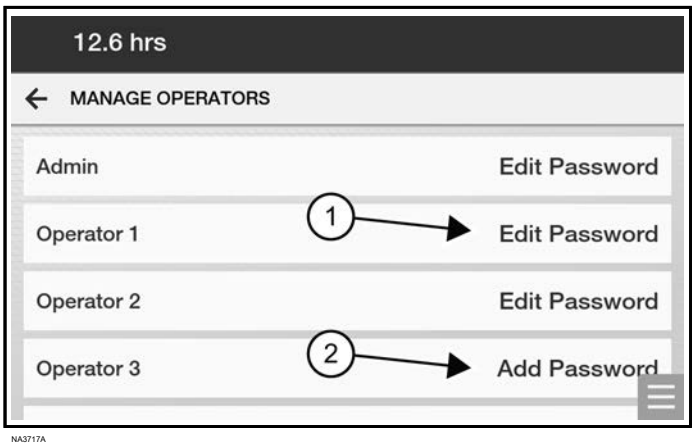
1. Select **[NAVIGATION HANDLE]**→ **[SETTINGS]**→ **[SECURITY SETTINGS]**.
2. Enter the password and select the **[ENTER]** icon.

Figure 408



3. Select **[MANAGE OPERATORS]** (Item 1) [Figure 408].

Figure 409



4. Select **[EDIT PASSWORD]** (Item 1) [Figure 409] to change a password or remove an operator.

   OR

   Select **[ADD PASSWORD]** (Item 2) [Figure 409] to enter a password for a new operator.

Machine Lockout And Quick Start

The owner can enable Machine Lockout:

- If Machine Lockout is on, a password must be entered before the machine can be operated. A password is not required if the machine is started within the Auto Lock Time.
  (See Setting Auto Lock Time on Page 194)
- If Machine Lockout is off, the machine can be operated without a password.

The owner also has the option to enable Quick Start:

- If Quick Start is on, the machine can be started before the display is fully booted up.
- If Quick Start is off, the machine can't be started until the display is fully booted up.

The machine will not start if engine fuel priming or pre-heat is required. When the Wait to Start light turns off, the machine can be started.
(See Starting The Engine on Page 78)

Password Description

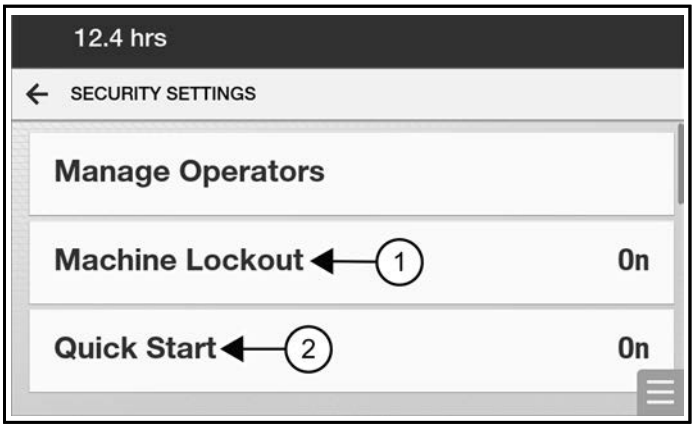
Owner Password: Allows for full use of the machine and to set up the display security settings. There is only one owner password. The owner password must be used to change the owner or operator passwords. If this password is lost, contact your Bobcat dealer to unlock the machine.

Operator Passwords: Allows starting and operating of the machine. The owner password is needed to change an operator password. There can be multiple operator passwords.

Enabling Machine Lockout And Quick Start

1. Select **[NAVIGATION HANDLE]→ [SETTINGS]→ [SECURITY SETTINGS]**.

Figure 410



2. Select **[MACHINE LOCKOUT]** (Item 1) [Figure 410] to turn on / off.
3. Select **[QUICK START]** (Item 2) [Figure 410] to turn on / off.

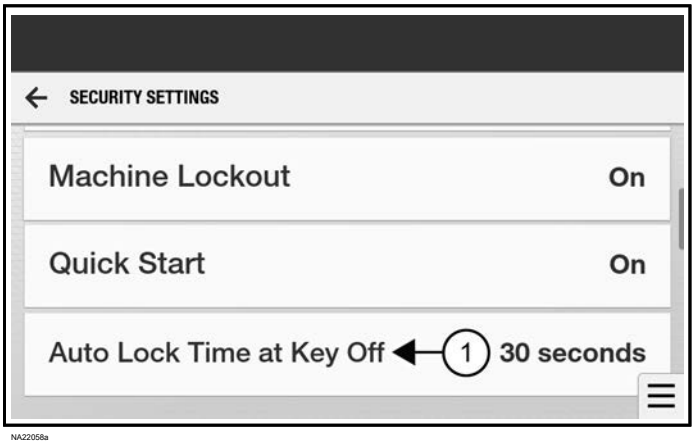
   Quick Start is always enabled when the Machine Lockout is off.

Setting Auto Lock Time

Auto Lock Time is the amount of time the operator has to start the machine without needing to re-enter a password.

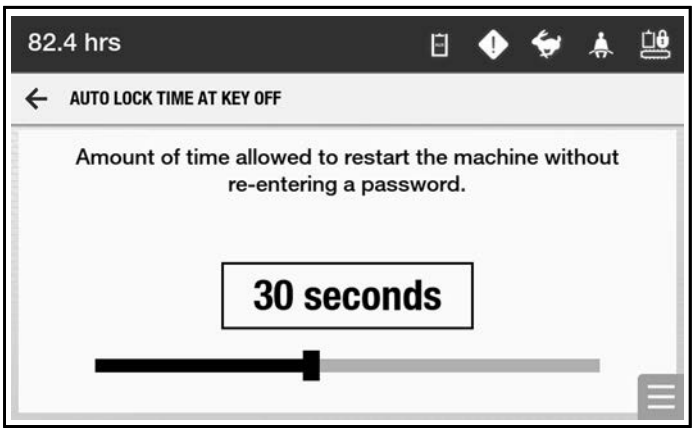
1. Select **[NAVIGATION HANDLE]→ [SETTINGS]→ [SECURITY SETTINGS]**.

Figure 411



2. Select **[AUTO LOCK TIME AT KEY OFF]** (Item 1) [Figure 411].

Figure 412



3. Use the slider to set the Auto Lock Time [Figure 412].

Setting The System Language

1. Select **[NAVIGATION HANDLE]→ [SETTINGS]→ [LANGUAGE SETTINGS]**.

Figure 413

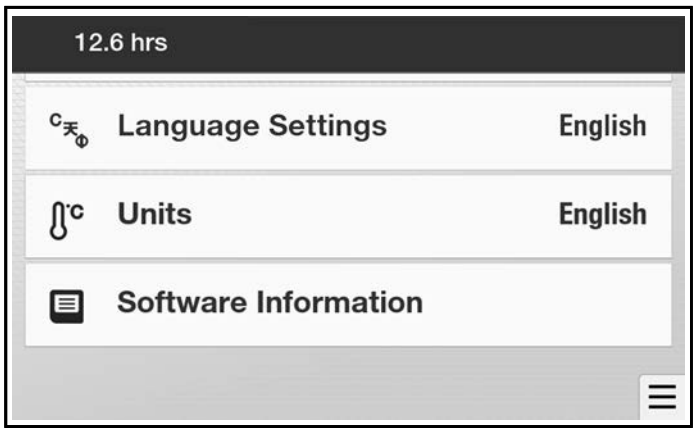
2. On the **SET LANGUAGE** screen, scroll through the languages and select the desired language.

   The selected language will take effect immediately and can be different for each operator.

Switching Between English / Metric Units

1. Select **[NAVIGATION HANDLE]→ [SETTINGS]**.

Figure 414



NA3678

2. Scroll down and select **[UNITS]** (Item 1) [Figure 414] to toggle between English and metric units.

Software Version

1. Select **[NAVIGATION HANDLE]**→ **[SETTINGS]**→ **[SOFTWARE INFORMATION]**.

Figure 415

NA3751

2. Use the **SOFTWARE** screen to find your software version and check for updates.

   To update the software, see your Bobcat dealer.

GAUGES (TOUCH DISPLAY)

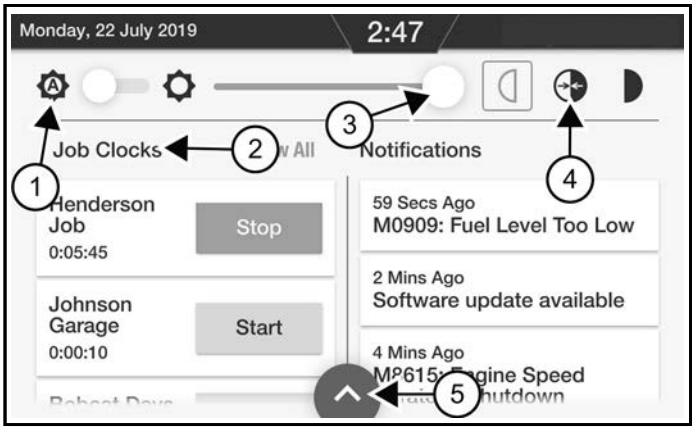
Notification Drawer

Figure 416

NA3384r

1. Press the clock (Item 1) [Figure 416] to open the notification drawer.

Figure 417



C132984b

2. Use the notification drawer to gain quick access to:
   - Auto Brightness (Item 1)
   - Job Clocks (Item 2)
   - Screen Brightness (Item 3)
   - Night Mode Adjustment (Item 4)
3. Press the up arrow (Item 5) [Figure 417] to close the drawer.

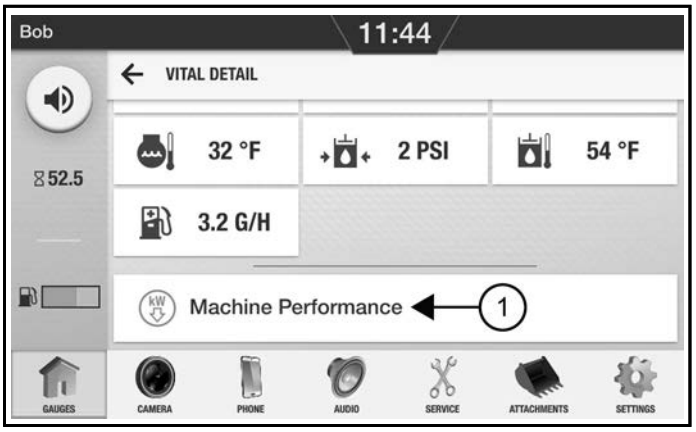
Accessing Vital Detail And Machine Performance

Figure 418

NA3384q

1. Select the vitals icon (Item 1) [Figure 418] to navigate to the **VITAL DETAIL** screen.

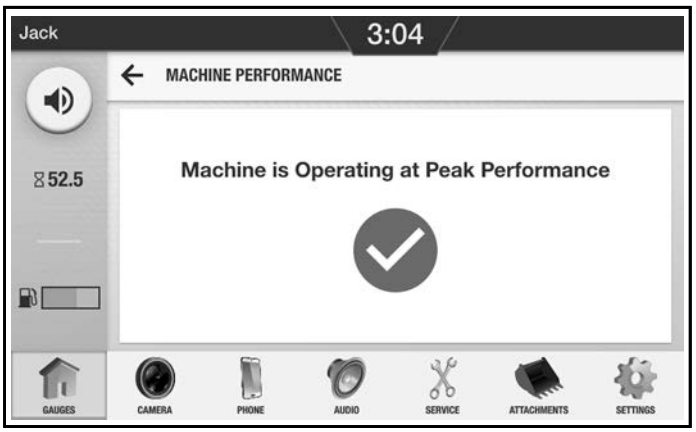
Figure 419



NA3762b

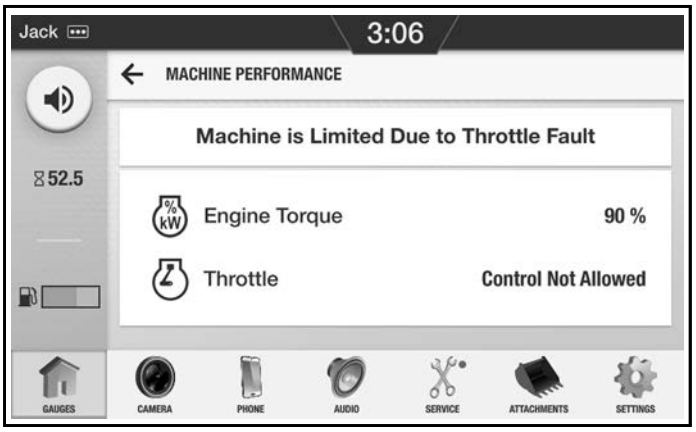
2. On the **VITAL DETAIL** screen, view a digital readout of the gauges. The screen provides real-time monitoring of:
   - Engine Speed (RPM)
   - Engine Oil Pressure
   - Engine Coolant Temperature
   - System Voltage
   - Hydraulic Fluid Pressure
   - Hydraulic Fluid Temperature
   - Fuel Usage (G/h or L/h)
3. Select **[MACHINE PERFORMANCE]** (Item 1) [Figure 419] to view any limitations or restrictions that prevent machine damage.

Figure 420



NA3786

Figure 421



NA3787

Examples of machine performance screens are shown in [Figure 420] and [Figure 421].

CAMERA (TOUCH DISPLAY)

Operating Rear View Camera

Figure 422

NA3384j

Figure 423

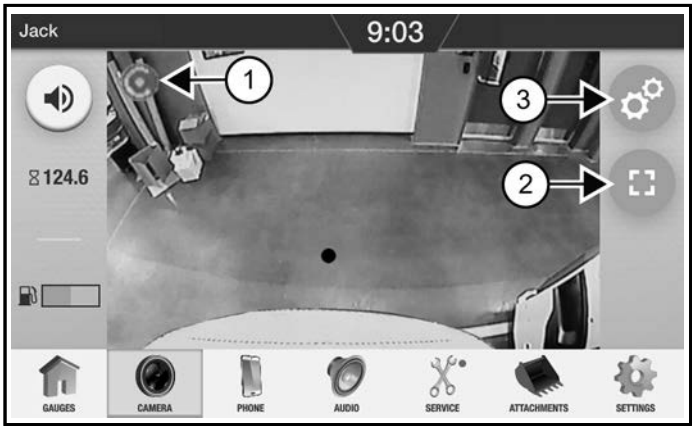
P200728a

- Select **[CAMERA]** (Item 1) [Figure 422] to access the **CAMERA** screen.

  OR

  Press the right joystick button (Item 1) [Figure 423] to toggle between the **CAMERA** screen and the current screen.

Figure 424



NA3428b

The rotating spinner icon (Item 1) [Figure 424] indicates you are viewing a live broadcast from the camera.

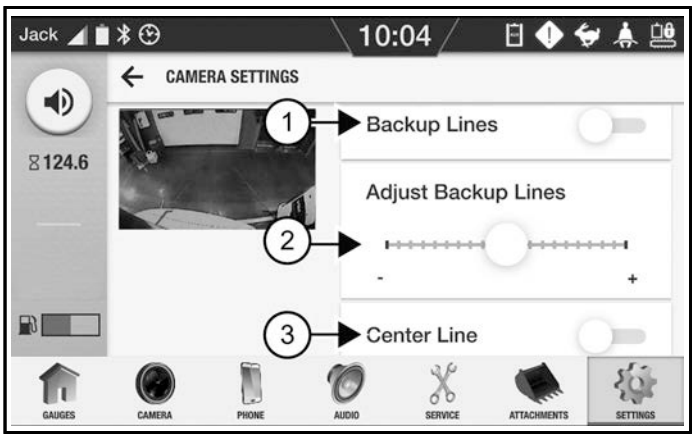
- Select the **[FULL SCREEN]** icon (Item 2) [Figure 424] to make the camera view full screen. Touch anywhere on the screen to go back to the view shown.
- Select the **[SETTINGS]** icon (Item 3) [Figure 424] to go to the **CAMERA SETTINGS** screen.

  (See Adjusting Rear View Camera Settings on Page 197)

Adjusting Rear View Camera Settings

Select the **[SETTINGS]** icon on the **CAMERA** screen (Item 3) [Figure 424] to go to the **CAMERA SETTINGS** screen.

Figure 425



P132904a

- Select **[BACKUP LINES]** (Item 1) [Figure 425] to turn the lines on / off.
- Use the slider (Item 2) [Figure 425] to adjust the Backup Lines in or out.
- Select **[CENTER LINE]** (Item 3) [Figure 425] to turn the centre line on / off.

PHONE (TOUCH DISPLAY)

See your Touch Display User Guide for more information about phone settings.

AUDIO (TOUCH DISPLAY)

See your Touch Display User Guide for more information about audio settings.

SERVICE (TOUCH DISPLAY)

Viewing Service Codes

The most recent service codes are stored in history and can be viewed on the display.

Figure 426

NA3384i

1. Select **[SERVICE]** (Item 1) [Figure 426] and then navigate to **[VIEW SERVICE CODES]**.

Figure 427

P132935a

2. Select a code (Item 1) [Figure 427] to go to the **SERVICE CODE DETAILS** screen.

Figure 428

P132977a

3. On the **SERVICE CODE DETAIL** screen, you can select **[CALL DEALER]** (Item 1) [Figure 428] (if a phone is paired, and the dealer information is entered).

   OR

   Scroll down to see code history. This will show when the code was activated in the past. It will show the machine hours, date, and the operator for each time the code was activated.

Viewing And Adjusting Service Schedule

The Service Schedule information on the display is based off the machine's Service Schedule. The service times show when the maintenance interval for each component is due. The display will notify the operator shortly before the next service is due and continue until the service is performed.

Figure 429

NA3384i

1. Select **[SERVICE]** (Item 1) [Figure 429].

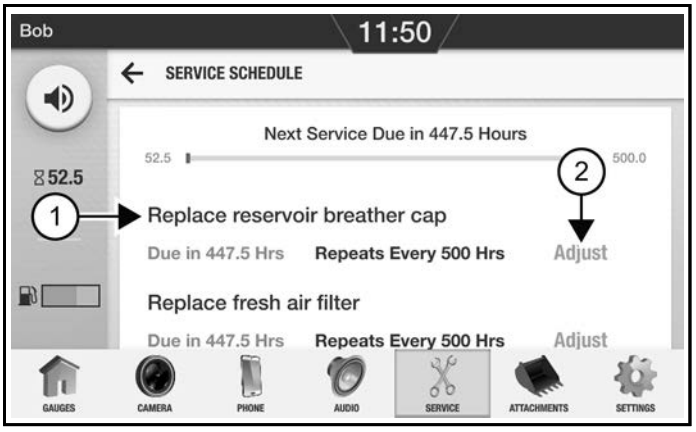
Figure 430

C132961b

2. View the hours remaining until next scheduled service is due (Item 1) [Figure 430] and any overdue service on the service screen.

3. Select **[VIEW SERVICE SCHEDULE]** (Item 2) [Figure 430].

Figure 431



NA3759b

4. On the **SERVICE SCHEDULE** screen, view the next scheduled maintenance (Item 1) [Figure 431].

5. To make the maintenance interval more frequent, select **[ADJUST]** (Item 2) [Figure 431].

    a. Select a new service interval and select **[ACCEPT]**.

Recording A Service

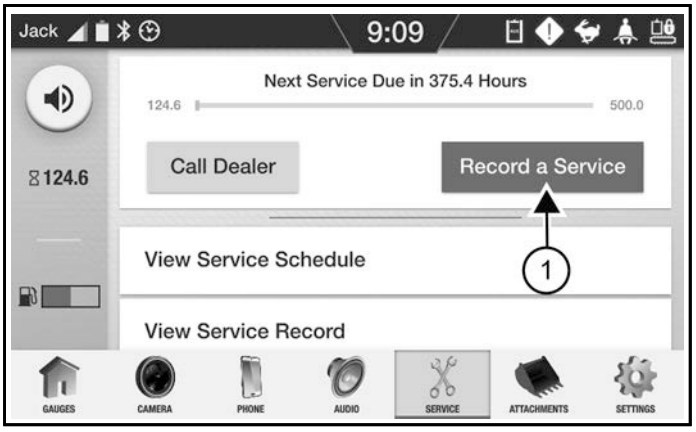
After a service has been completed, you can create a record of what was done.

Figure 432

NA3384i

1. Select **[SERVICE]** (Item 1) [Figure 432].

Figure 433



P132961c

2. Select **[RECORD A SERVICE]** (Item 1) [Figure 433].

Figure 434

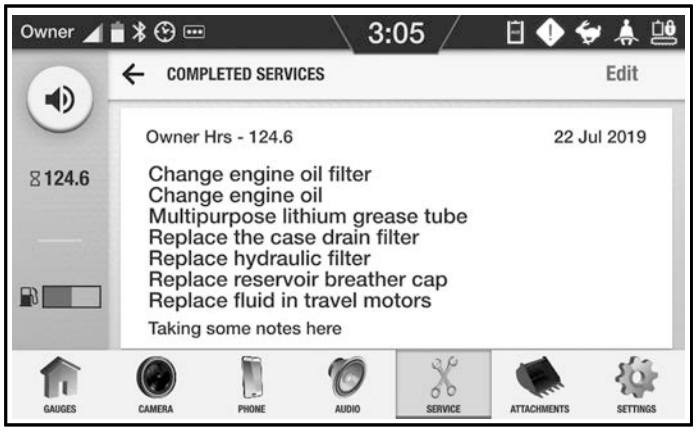
P132988a

3. Select **[+ADD SERVICE ITEM]** (Item 1) [Figure 434] to add additional items that were performed.

4. Select **[ADD NOTES]** (Item 2) [Figure 434] to add notes to the record.

5. Select **[RECORD SERVICE]** (Item 3) [Figure 434] to save the service record.

Figure 435



P132990

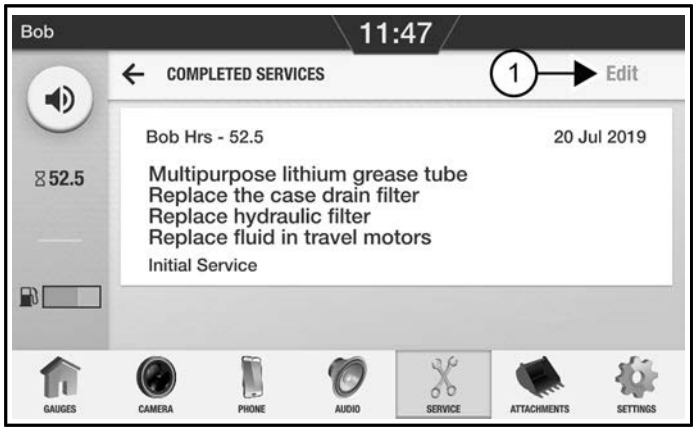
The Service Record will now list all the items that were marked as completed [Figure 435].

Removing Service Records

You must be logged in as the owner to complete this task.

1. Select **[SERVICE]**→ **[VIEW SERVICE RECORD]**.

Figure 436

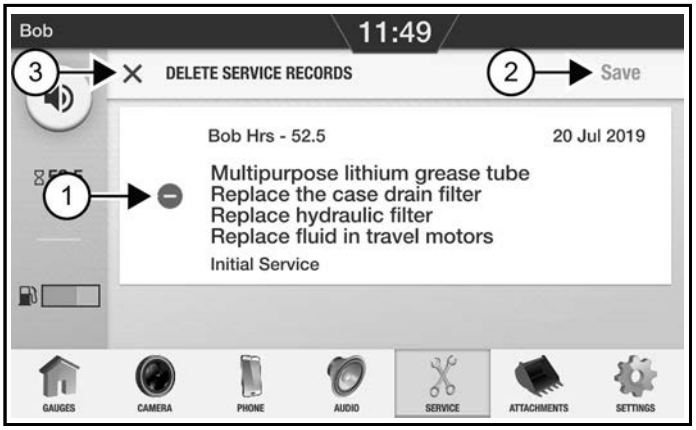


NA3758b

2. Select **[EDIT]** (Item 1) [Figure 436] to remove a service record.

3. After entering the password, select the **[ENTER]** icon.

Figure 437



NA3757b

4. Select the **[DELETE]** icon (Item 1) [Figure 437] to remove a service record.

5. Select **[SAVE]** (Item 2) [Figure 437] to confirm.

   OR

   Select **[X]** (Item 3) [Figure 437] to cancel.

ATTACHMENTS (TOUCH DISPLAY)

Accessing Attachment Information

The display shows basic attachment information, including the joystick switches that are used to control the attachments. The tooltips screens give information on using the attachment.

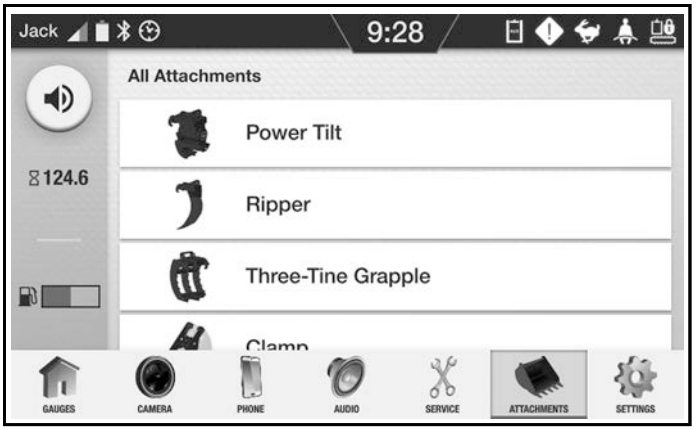
Always read and understand your Attachment Operator & Maintenance Manual before using attachments.

Figure 438

NA3384h

1. Select **[ATTACHMENTS]** (Item 1) [Figure 438].

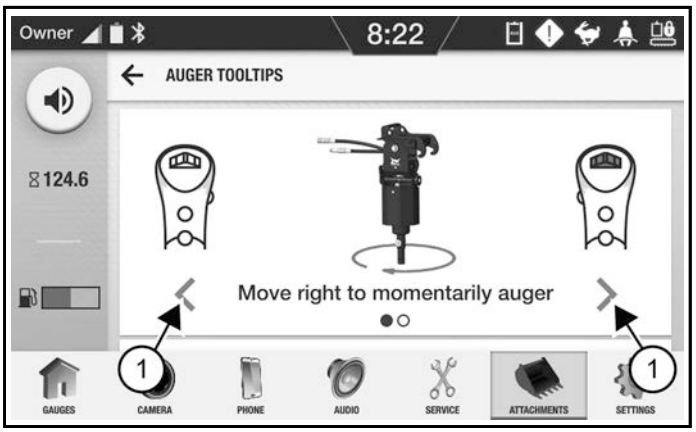
Figure 439



P132992

2. Select one of the available attachments [Figure 439].

Figure 440



P132968a

The basic joystick information is shown on the tooltips screens [Figure 440].

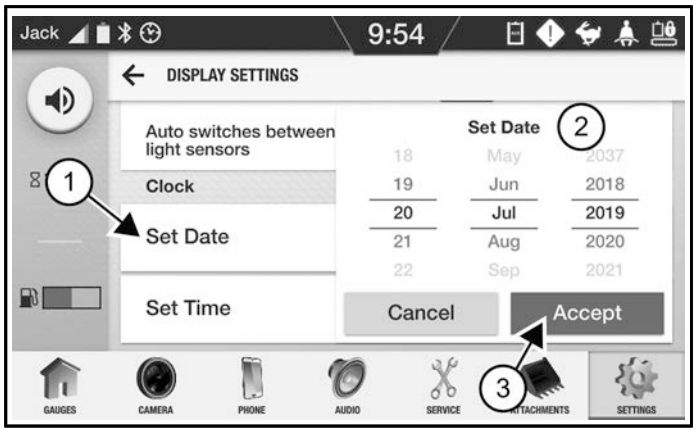
- Select the arrows (Item 1) [Figure 440] to access additional information.
- Scroll down to find the tooltips.

SETTINGS (TOUCH DISPLAY)

Setting Date And Time

1. Select **[SETTINGS]**→ **[DISPLAY SETTINGS]**.

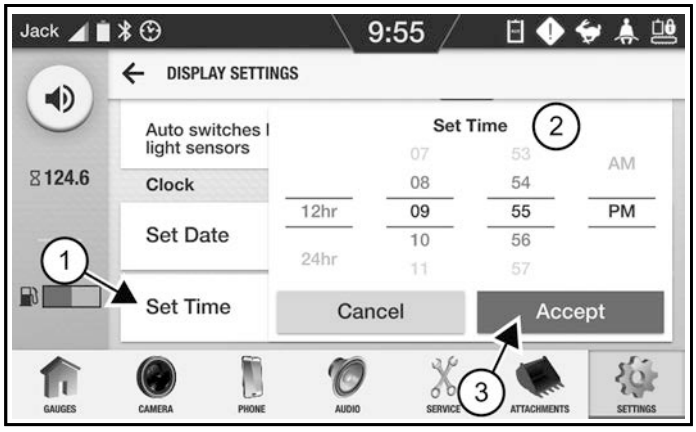
Figure 441



P132938a

2. Select **[SET DATE]** (Item 1) [Figure 441].
   a. Scroll to set the day, month, and year (Item 2) [Figure 441].
   b. Select **[ACCEPT]** (Item 3) [Figure 441] to save the change.

Figure 442



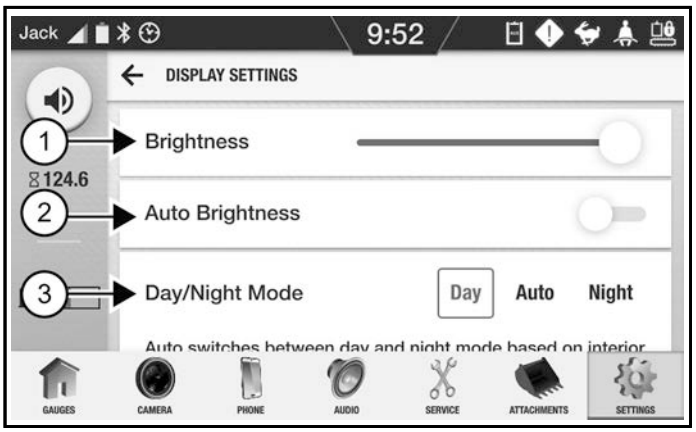
P132939a

3. Select **[SET TIME]** (Item 1) [Figure 442].
   a. Scroll to choose between a 12 hr or 24 hr clock (Item 2) [Figure 442].
   b. Scroll to set hour, minute, and AM / PM (Item 2) [Figure 442].
   c. Select **[ACCEPT]** (Item 3) [Figure 442] to save the change.

Adjusting Display Brightness

1. Select **[SETTINGS]**→ **[DISPLAY SETTINGS]**.

Figure 443



P132942a

2. To adjust the display brightness, move the slider (Item 1) [Figure 443] to the left to dim, to the right to brighten.

   OR

   Select **[AUTO BRIGHTNESS]** (Item 2) [Figure 443] to turn it on / off. When on, the brightness will automatically adjust according to the ambient light.

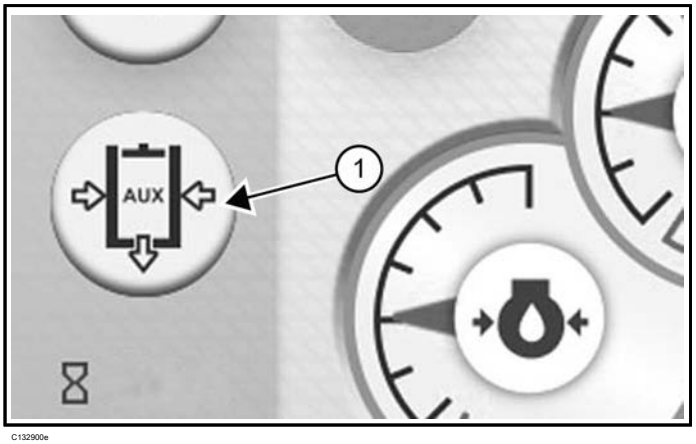
   OR

   Select **[DAY]**, **[AUTO]**, or **[NIGHT]** (Item 3) [Figure 443] mode. Auto mode automatically switches between Day and Night modes.

Releasing Hydraulic Pressure In Excavator

The engine must have been recently started to relieve hydraulic pressure.

Figure 444



C132900e

The Auxiliary Pressure Release icon (Item 1) [Figure 444] will be visible when releasing auxiliary pressure is possible.

1. Put the attachment flat on the ground.
2. Stop engine and then turn start switch to on, but do not start the engine.
3. Make sure the left console is fully lowered.

4. To release auxiliary pressure, select the Auxiliary Pressure Release icon (Item 1) [Figure 444].

   OR

   Select **[SETTINGS]**→ **[MACHINE SETTINGS]**→ **[AUXILIARY PRESSURE RELEASE]**.

   Either will bring you to the **AUXILIARY PRESSURE RELEASE** screen.

Figure 445

P132896

5. To release auxiliary pressure, press the AUX button on the jog shuttle as shown on the screen [Figure 445].

Figure 446

P132897a

The spinner (Item 1) [Figure 446] will rotate until the Auxiliary Pressure Release procedure is complete.

You will get a message on the display if the auxiliary pressure cannot be released.

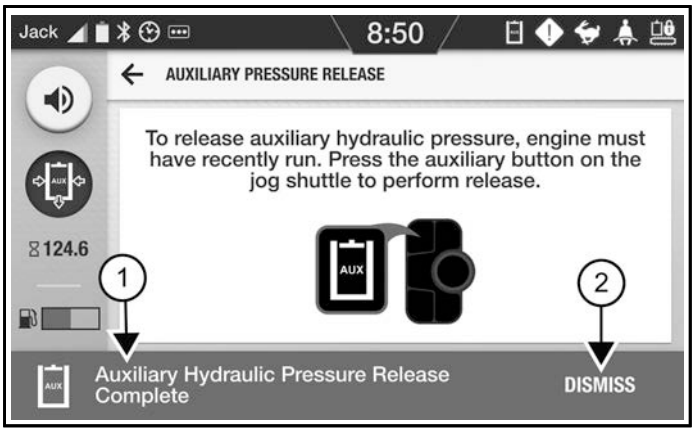
Possible reasons for a failure to release auxiliary pressure include:

- Insufficient hydraulic pressure in the accumulator to activate the pressure release feature.
- Operator attempted to release the hydraulic pressure while the engine was running.

If there is not enough pressure in the accumulator to release the hydraulic pressure, start the excavator for a short period of time to recharge the accumulator. Stop the engine, and then repeat the auxiliary pressure release procedure.

Some fault codes can also prevent the auxiliary pressure release feature from functioning correctly.

Figure 447

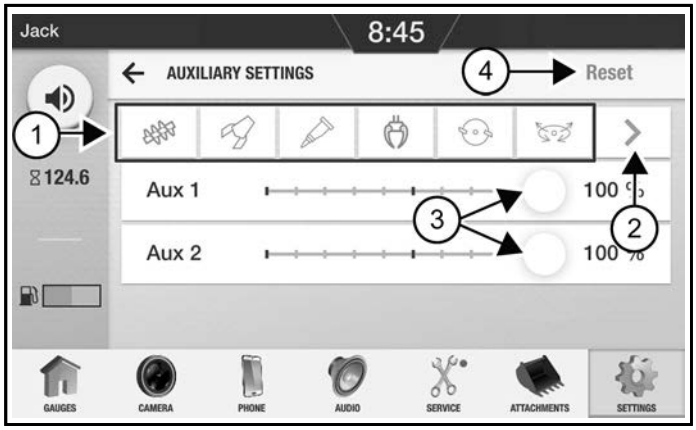


When the process is completed, a notification (Item 1) [Figure 447] will appear indicating that the auxiliary pressure has been released. Press **[DISMISS]** (Item 2) [Figure 447].

Setting Auxiliary Hydraulics Flow Rate

1. Select **[SETTINGS]**→ **[MACHINE SETTINGS]**→ **[AUXILIARY SETTINGS]**.

Figure 448



C132895b

The **AUXILIARY SETTINGS** screen shows six commonly used attachments (Item 1) [Figure 448].

Each attachment icon is preset with the recommended hydraulic flow.

See the table below to identify icons.

ICON	ATTACHMENT
	Auger
	Cutter / Crusher
	Breaker
	Rotating Grapple
	Brush Cutter
	Tilt Coupler

2. Choose the flow that best matches the attachment / operator requirements by selecting a pre-set hydraulic flow icon (Item 1) [Figure 448].

   OR

   Press the arrow (Item 2) [Figure 448] to select a custom-set hydraulic flow icon. Adjust the hydraulic flow by moving the slider (Item 3) [Figure 448] from 0% flow (off) to 100% flow in 10% increments.

3. If necessary, press **[RESET]** (Item 4) [Figure 448] to revert the selected flow setting back to the original factory setting.

NOTE: Operators can set and save their own flows for the pre-set and custom-set flows.

NOTE: If the auxiliary hydraulics are enabled when the engine is turned off, they will stay enabled at engine restart. If detent flow was enabled at engine off, it will be disabled at engine restart.

Activating Auto Idle

Figure 449

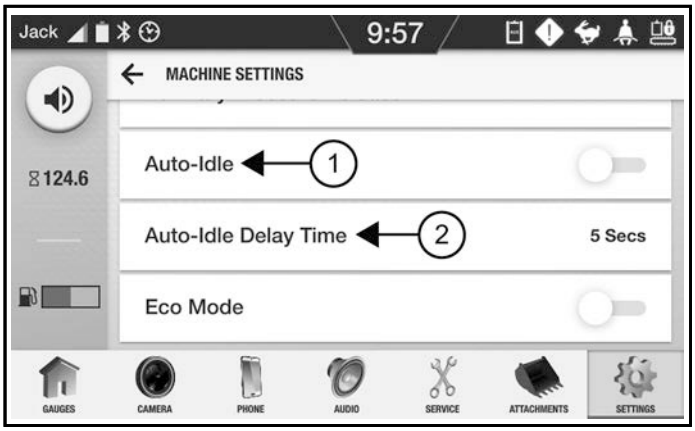
NA3384k

1. Select **[SETTINGS]→ [MACHINE SETTINGS]**.

   OR

   Select the **[MACHINE SETTINGS]** icon (Item 1) [Figure 449].

Figure 450

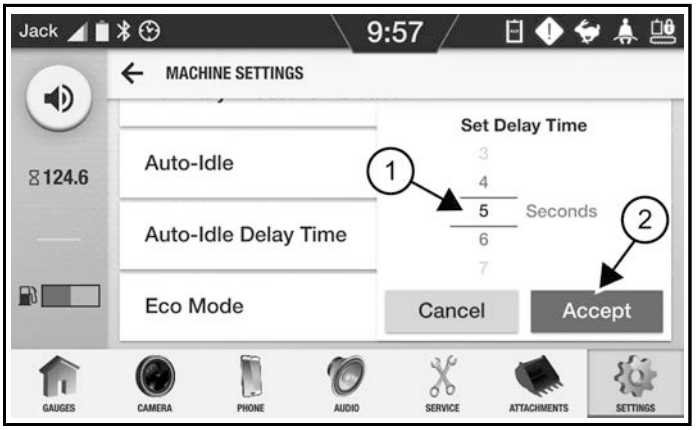


P132943b

2. Select **[AUTO-IDLE]** (Item 1) [Figure 450] to turn it on / off.

3. Select **[AUTO-IDLE DELAY TIME]** (Item 2) [Figure 450] to set the delay time.

Figure 451



P132944a

4. Swipe up or down (Item 1) [Figure 451] to select the auto-idle delay time to best suit the operating conditions.
5. Select **[ACCEPT]** (Item 2) [Figure 451] to set the new time delay setting.

Password Description

Owner Password: Allows for full use of the machine and to set up the display security settings. There is only one owner password. The owner password must be used to change the owner or operator passwords. If this password is lost, contact your Bobcat dealer to unlock the machine.

Operator Passwords: Allows starting and operating of the machine. The owner password is needed to change an operator password. There can be multiple operator passwords.

Changing The Owner And Operator Passwords

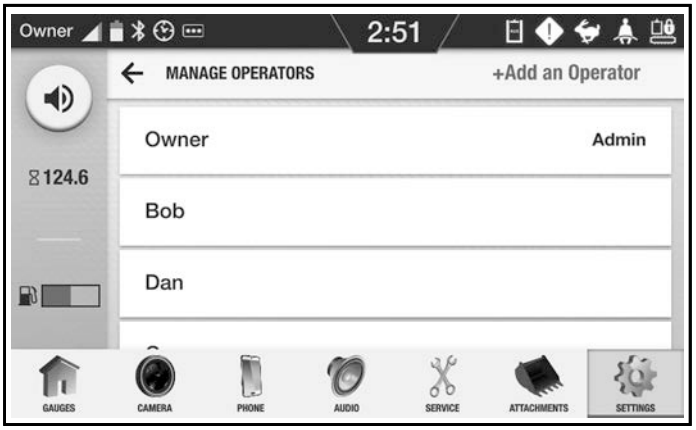
1. Select **[SETTINGS]**→ **[SECURITY SETTINGS]**.
2. Enter the password if prompted.

Figure 452

P132953e

3. Select **[MANAGE OPERATORS]** (Item 1) [Figure 452].

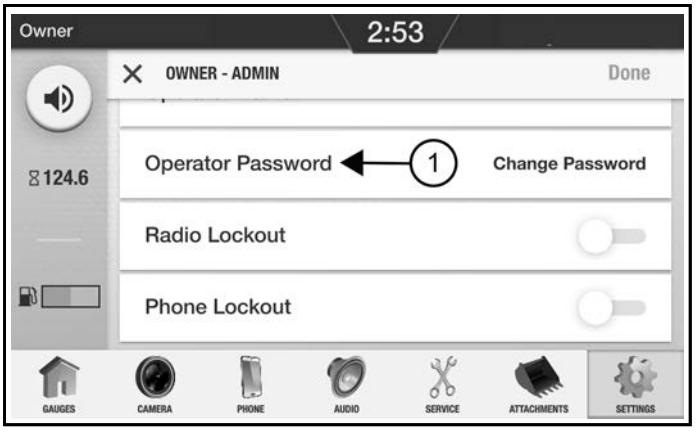
Figure 453



P132958a

4. Select the owner or an operator [Figure 453].

Figure 454



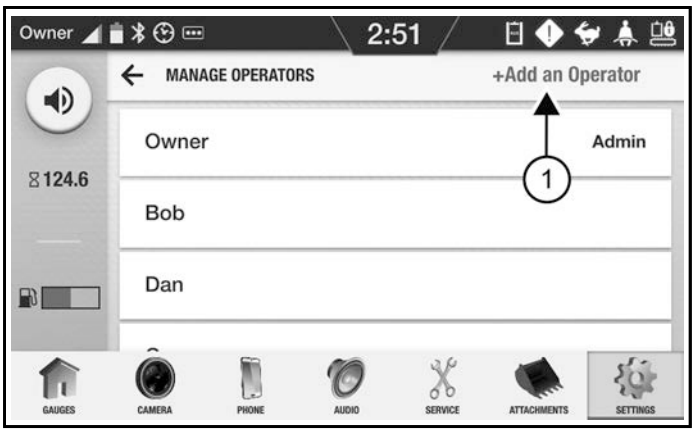
C132959a

5. Select **[OPERATOR PASSWORD]** (Item 1) [Figure 454].
6. Enter a new password and select **[ENTER]**.

Adding An Operator

1. Select **[SETTINGS]**→ **[SECURITY SETTINGS]**→ **[MANAGE OPERATORS]**.

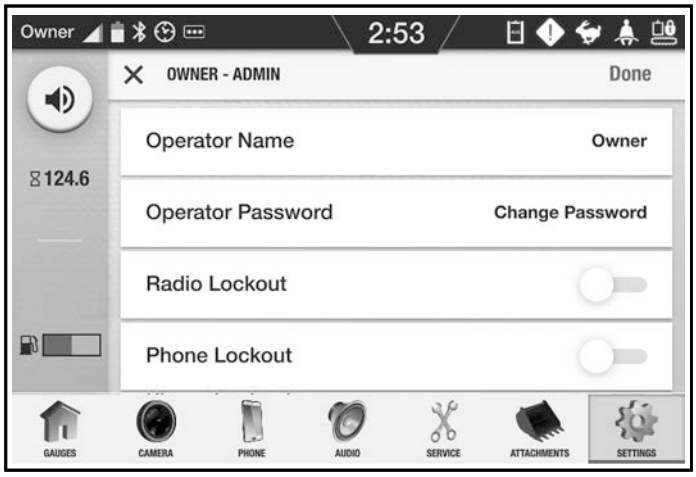
Figure 455



P132958b

2. Select **[+ADD AN OPERATOR]** (Item 1) [Figure 455].

Figure 456



P132959a

3. Select **[OPERATOR NAME]** and enter the new operator name.

4. Select **[OPERATOR PASSWORD]** and assign the operator password.

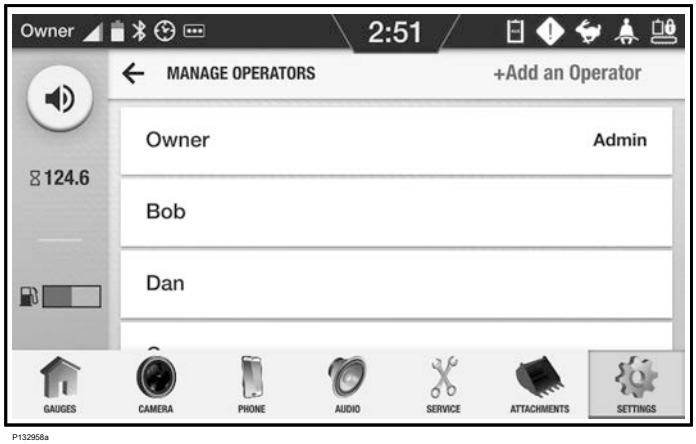
5. Select **[RADIO LOCKOUT]** and / or **[PHONE LOCKOUT]** if you want to prohibit the operator from using these functions.

6. Select **[DONE]**.

Removing An Operator

1. Select **[SETTINGS]→ [SECURITY SETTINGS]→ [MANAGE OPERATORS]**.

Figure 457



P132958a

2. Select an operator [Figure 457].

Figure 458

P132985a

3. Scroll down and select **[DELETE OPERATOR]** (Item 1) [Figure 458].

Machine Lockout And Quick Start

The owner can enable Machine Lockout:

- If Machine Lockout is on, a password must be entered before the machine can be operated. A password is not required if the machine is started within the Auto Lock Time.
(See Setting Auto Lock Time on Page 208)

- If Machine Lockout is off, the machine can be operated without a password.

The owner also has the option to enable Quick Start:

- If Quick Start is on, the machine can be started before the display is fully booted up.

- If Quick Start is off, the machine can't be started until the display is fully booted up.

The machine will not start if engine fuel priming or pre-heat is required. When the Wait to Start light turns off, the machine can be started.
(See Starting The Engine on Page 78)

Enabling Machine Lockout and Quick Start

1. Select **[SETTINGS]→ [SECURITY SETTINGS]**.

Figure 459

C132953b

2. Select **[MACHINE LOCKOUT]** (Item 1) [Figure 459] to turn on / off.
3. Select **[QUICK START]** (Item 2) [Figure 459] to turn on / off.

   Quick Start is always enabled when Machine Lockout is off.

Setting Auto Lock Time

Auto Lock Time is the amount of time the operator has to start the machine without needing to re-enter a password.

1. Select **[SETTINGS]→ [SECURITY SETTINGS]**.

Figure 460

P132953c

2. Select **[AUTO LOCK TIME AT KEY OFF]** (Item 1) [Figure 460].

Figure 461

C132955

3. Swipe up or down to set the Auto Lock Time (Item 1) [Figure 461].
4. Select **[ACCEPT]** (Item 2) [Figure 461].

Setting System Sleep Time

System Sleep Time is the length of time the display will be in sleep mode when the machine is turned off. When in sleep mode, the display can quickly boot up when the machine is turned on. When the start switch is turned on after being off for a period longer than System Sleep Time, it will take several seconds for the display to boot up.

System Sleep Time can be changed using the owner password.

Setting System Sleep Time to a shorter time will conserve the battery.

1. Select **[SETTINGS]→ [SECURITY SETTINGS]**.

Figure 462

P132953d

2. Select **[SYSTEM SLEEP TIME AT KEY OFF]** (Item 1) [Figure 462].

Figure 463

C132954a

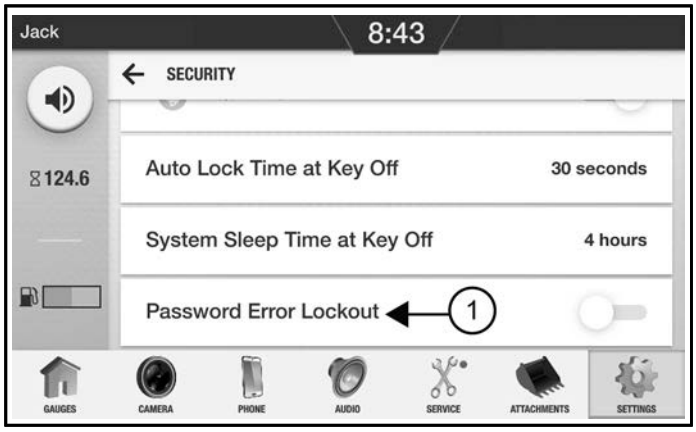
3. Swipe up or down to set System Sleep Time (Item 1) [Figure 463].
4. Select **[ACCEPT]** (Item 2) [Figure 463].

Enabling Password Error Lockout

When Password Error Lockout is on, the operator will have only five attempts to enter the password before being locked out.

1. Select **[SETTINGS]**→ **[SECURITY SETTINGS]**.

Figure 464



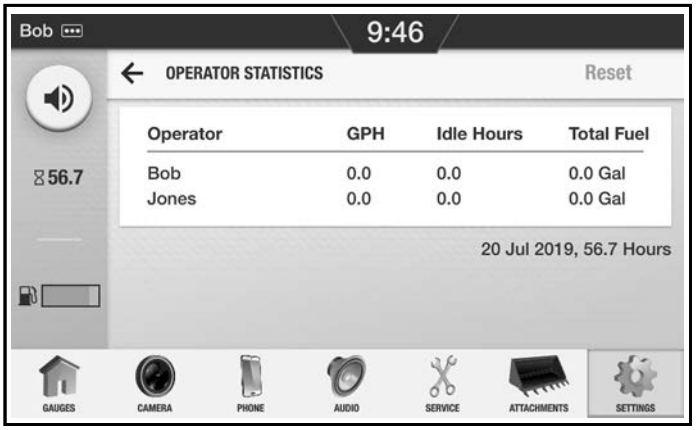
C132953c

2. Select **[PASSWORD ERROR LOCKOUT]** (Item 1) [Figure 464] to turn on / off.

Accessing Operator Statistics

1. Select **[SETTINGS]**→ **[OPERATOR STATISTICS]**.

Figure 465



NA3764

2. Use the **OPERATOR STATISTICS** screen [Figure 465] to view:
   - Operator Name
   - Fuel Used Per Hour (GPH or LPH)
   - Idle Hours
   - Total Fuel

Using The Job Clock

Figure 466

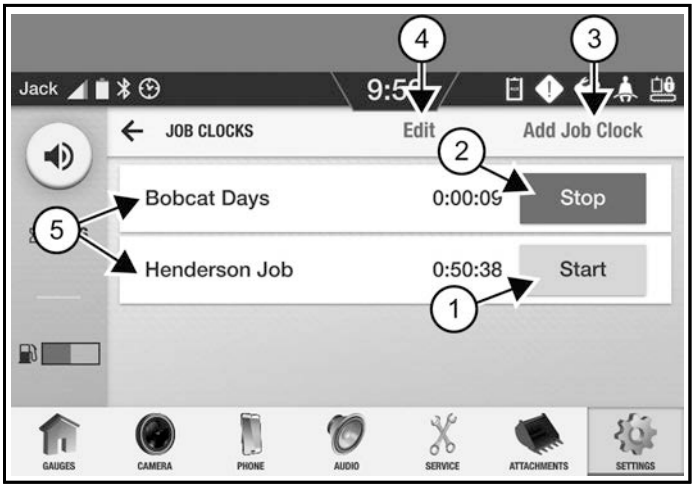
NA3384m

1. To open the **JOB CLOCK** screen, select the clock icon (Item 1) [Figure 466] and then **[VIEW ALL]**.

   OR

   Select **[SETTINGS]** (Item 2) [Figure 466] and then **[JOB CLOCKS]**.

Figure 467



P132946a

2. To start an existing job clock, select **[START]** (Item 1) [Figure 467].
3. Select **[STOP]** (Item 2) [Figure 467] to stop the job clock.

   OR

   Key off will also stop the job clock automatically.

   The total job hours will be displayed.
4. To add a new job clock, select **[ADD JOB CLOCK]** (Item 3) [Figure 467].

   a. Type in the new job clock name and select **[ENTER]**.
5. To delete an existing job clock, select **[EDIT]** (Item 4) [Figure 467].

   a. Select the delete icon by the job clock you want to delete.

   b. Select **[SAVE]**.
6. Select a job clock (Item 5) [Figure 467] to view the associated **JOB CLOCK DETAIL** screen [Figure 468].

Figure 468

C132948

The **JOB CLOCK DETAIL** [Figure 468] screen will show:

- Job Name
- Job Total Time
- Job Engine Hours
- Job Engine Idle Hours
- Total Fuel
- Fuel Used Per Hour (GPH or LPH)
- History by user

Setting The System Language

1. Select **[SETTINGS]**→ **[LANGUAGE SETTINGS]**.

Figure 469

P132941a

2. On the **SET LANGUAGE** screen, scroll through the languages and select the desired language.

   A check mark (Item 1) [Figure 469] will appear when accepted.

Switching Between English / Metric Units

1. Select **[SETTINGS]**.

Figure 470

P132940a

2. Scroll down and select **[UNITS]** (Item 1) [Figure 470] to toggle between English and metric units.

Dealer Information

Your dealer must have entered their contact information into the display for the following information to be available.

1. Select **[SETTINGS]**→ **[DEALER]**.

Figure 471

C132951a

2. Use the **DEALER** screen to find your dealer information. You can call your dealer if a phone is paired (Item 1) [Figure 471].

Software Version

1. Select **[SETTINGS]**→ **[SOFTWARE]**.

Figure 472

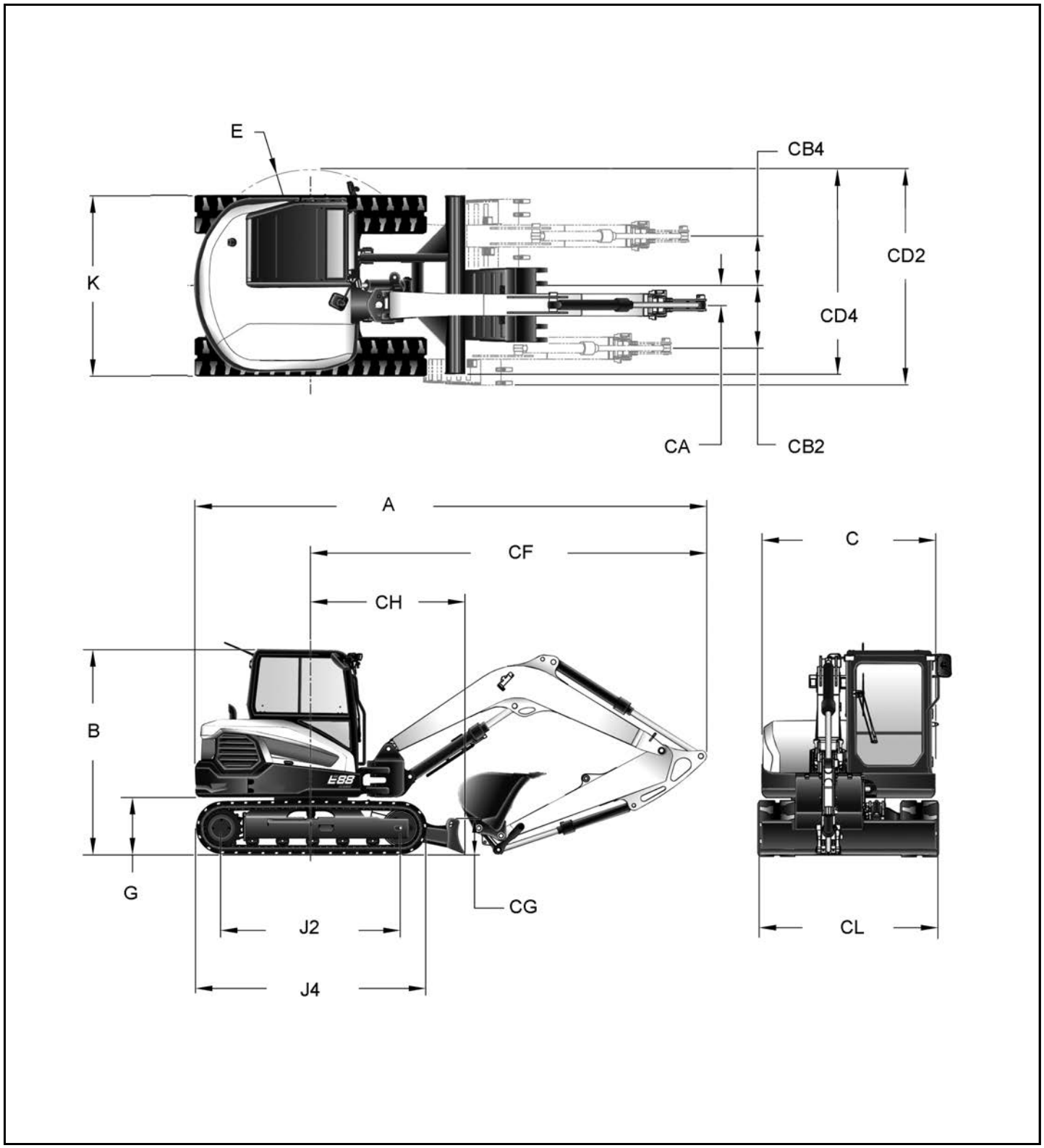
P132952

2. Use the **SOFTWARE** screen to find your software version and check for updates.

   To update the software, see your Bobcat dealer.

MACHINE DIMENSIONS

Figure 473

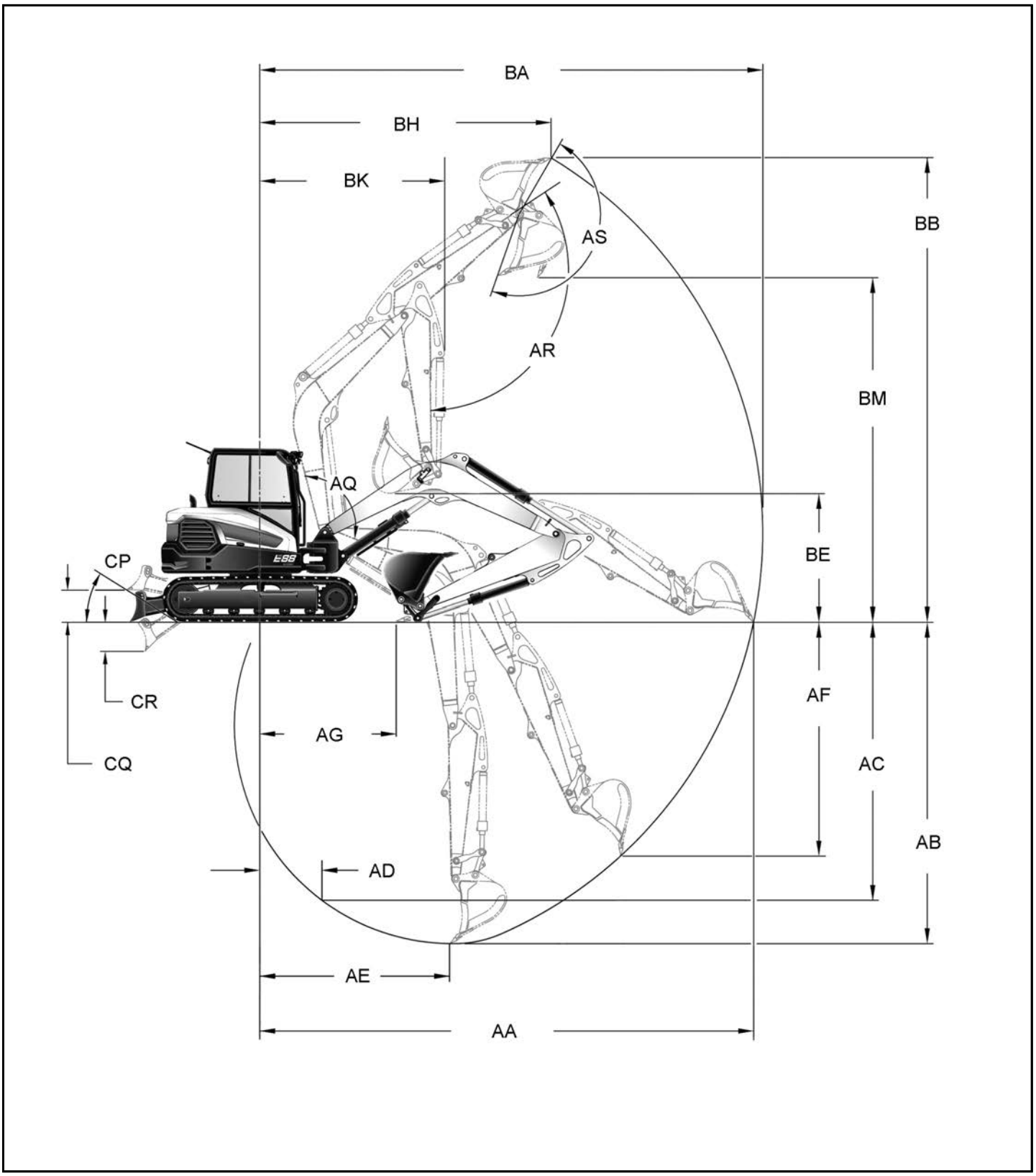


NA20185

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

REF.	DESCRIPTION	LONG ARM	STANDARD ARM
A	OVERALL LENGTH	6341 mm (249.6 in)	6329 mm (249.2 in)
B	OVERALL HEIGHT	2540 mm (100.0 in)	2540 mm (100.0 in)
C	WIDTH OF UPPERSTRUCTURE	2200 mm (86.6 in)	2200 mm (86.6 in)
E	SLEW CLEARANCE, REAR OF UPPERSTRUCTURE	1448 mm (57.0 in)	1448 mm (57.0 in)
G	CLEARANCE, UPPERSTRUCTURE TO GROUNDLINE	710 mm (28.0 in)	710 mm (28.0 in)
J2	NOMINAL DISTANCE BETWEEN CENTERLINES OF DRIVE SPROCKETS AND IDLERS	2311 mm (91.0 in)	2311 mm (91.0 in)
J4	NOMINAL OVERALL LENGTH OF TRACK ASSEMBLY	2896 mm (114.0 in)	2896 mm (114.0 in)
K	OVERALL WIDTH OF CRAWLER	2200 mm (86.6 in)	2200 mm (86.6 in)
CA	MACHINE CENTERLINE TO WORKING EQUIPMENT CENTERLINE, NORMAL OPERATION	250 mm (9.8 in)	250 mm (9.8 in)
CB2	MACHINE CENTERLINE TO WORKING EQUIPMENT CENTERLINE, WORK WIDTH AT MAX RH ROTATION	907 mm (35.7 in)	907 mm (35.7 in)
CB4	MACHINE CENTERLINE TO WORKING EQUIPMENT CENTERLINE, WORK WIDTH AT MAX LH ROTATION	622 mm (24.5 in)	622 mm (24.5 in)
CD2	WORKING WIDTH MAX RH ROTATION	2600 mm (102.4 in)	2600 mm (102.4 in)
CD4	WORKING WIDTH MAX LH ROTATION	2525 mm (99.4 in)	2525 mm (99.4 in)
CF	MIN. RADIUS IN TRAVEL POSITION	4886 mm (192.4 in)	4872 mm (191.8 in)
CG	BLADE HEIGHT	462 mm (18.2 in)	462 mm (18.2 in)
CH	MACHINE CENTERLINE TO BLADE	2009 mm (79.1 in)	2009 mm (79.1 in)
CL	BLADE WIDTH	2200 mm (86.6 in)	2200 mm (86.6 in)

Figure 474



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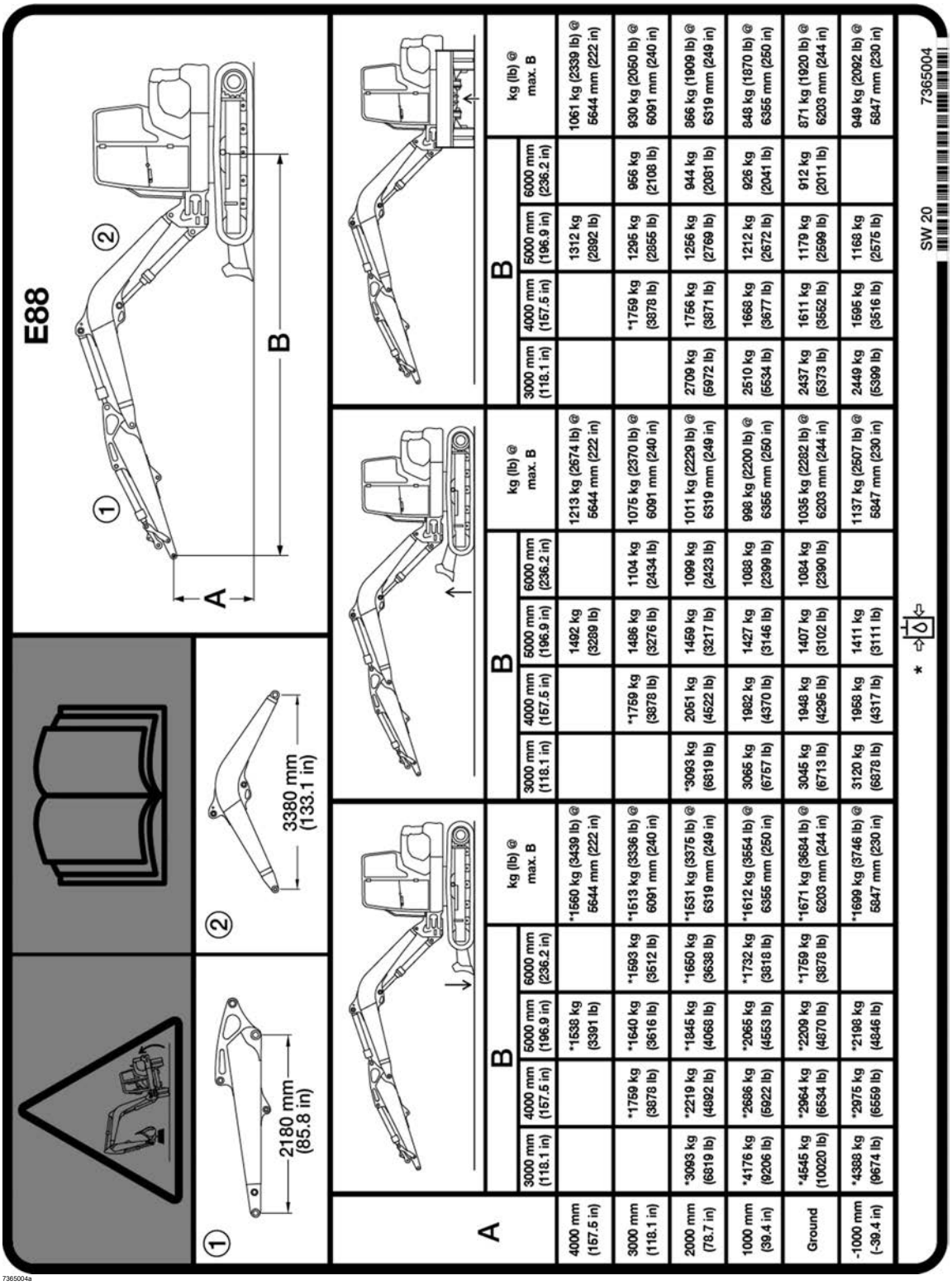
Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

REF.	DESCRIPTION	LONG ARM	STANDARD ARM
AA	MAX. RADIUS AT GROUNDLINE	7418 mm (292.0 in)	7087 mm (279.0 in)
AB	MAX. DIGGING DEPTH	4859 mm (191.2 in)	4519 mm (177.9 in)
AC	MAX. DEPTH FOR 2500 MM (98.4 IN) LEVEL CUT	4559 mm (179.5 in)	4186 mm (164.8 in)
AD	MIN. RADIUS OF 2500 MM (98.4 IN) LEVEL CUT	1463 mm (57.6 in)	1474 mm (58.0 in)
AE	RADIUS OF MAX. DIGGING DEPTH	2854 mm (112.4 in)	2854 mm (112.4 in)
AF	MAX. DEPTH OF VERTICAL WALL THAT CAN BE EXCAVATED	2883 mm (113.5 in)	2587 mm (101.9 in)
AG	BUCKET FLAT ON GROUNDLINE	2315 mm (91.1 in)	2478 mm (97.6 in)
AQ	BOOM PIVOT ANGLE	126°	126°
AR	ARM PIVOT ANGLE	122°	122°
AS	BUCKET PIVOT ANGLE	170°	170°
BA	MAX. RADIUS OF WORKING EQUIPMENT	7549 mm (297.2 in)	7225 mm (284.4 in)
BB	MAX. HEIGHT OF WORKING EQUIPMENT	7115 mm (280.1 in)	6887 mm (271.1 in)
BE	MIN. CLEARANCE OF FULLY CURLED BUCKET AT MAX. BOOM HEIGHT	1786 mm (70.3 in)	2147 mm (84.5 in)
BH	RADIUS OF BUCKET TEETH AT MAX. HEIGHT	3943 mm (155.2 in)	3692 mm (145.4 in)
BK	MAX. WORKING EQUIPMENT RADIUS WITH BOOM AT MAX. HEIGHT AND WITH ARM FULLY RETRACTED	2964 mm (116.7 in)	2659 mm (104.7 in)
BM	MIN. CLEARANCE OF FULLY CURLED BUCKET AT MAX. ARM HEIGHT	4765 mm (187.6 in)	4537 mm (178.6 in)
CP	MAX. APPROACH ANGLE	30°	30°
CQ	MAX. BLADE HEIGHT	479 mm (18.9 in)	479 mm (18.9 in)
CR	MAX. BLADE DEPTH	410 mm (16.1 in)	410 mm (16.1 in)

RATED LIFT CAPACITY – LONG ARM

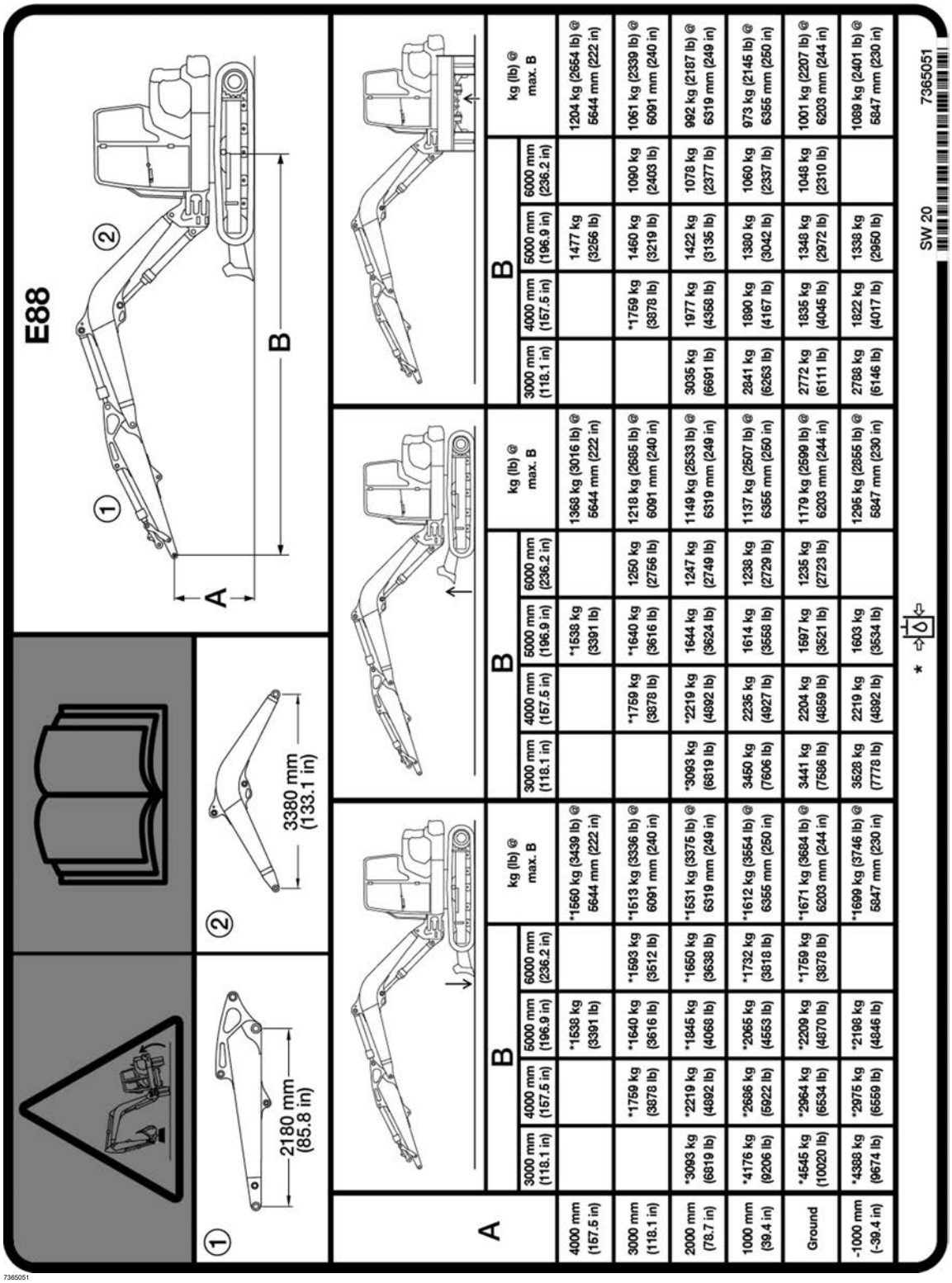
Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.



A	B											
	3000 mm (118.1 in)	4000 mm (157.5 in)	5000 mm (196.9 in)	6000 mm (236.2 in)	kg (lb) @ max. B	3000 mm (118.1 in)	4000 mm (157.5 in)	5000 mm (196.9 in)	6000 mm (236.2 in)	kg (lb) @ max. B	3000 mm (118.1 in)	4000 mm (157.5 in)	5000 mm (196.9 in)	6000 mm (236.2 in)	kg (lb) @ max. B
4000 mm (157.5 in)			*1538 kg (3391 lb)		*1560 kg (3439 lb) @ 5644 mm (222 in)			1492 kg (3289 lb)		1213 kg (2674 lb) @ 5644 mm (222 in)			1312 kg (2892 lb)		1061 kg (2339 lb) @ 5644 mm (222 in)
3000 mm (118.1 in)		*1759 kg (3878 lb)	*1640 kg (3616 lb)	*1593 kg (3512 lb)	*1613 kg (3336 lb) @ 6091 mm (240 in)		*1759 kg (3878 lb)	1486 kg (3276 lb)	1104 kg (2434 lb)	1075 kg (2370 lb) @ 6091 mm (240 in)		*1759 kg (3878 lb)	1295 kg (2855 lb)	956 kg (2108 lb)	930 kg (2050 lb) @ 6091 mm (240 in)
2000 mm (78.7 in)	*3093 kg (6819 lb)	*2219 kg (4892 lb)	*1845 kg (4068 lb)	*1650 kg (3638 lb)	*1531 kg (3375 lb) @ 6319 mm (249 in)	*3093 kg (6819 lb)	2051 kg (4522 lb)	1459 kg (3217 lb)	1099 kg (2423 lb)	1011 kg (2229 lb) @ 6319 mm (249 in)	2709 kg (5972 lb)	1766 kg (3871 lb)	1256 kg (2769 lb)	944 kg (2081 lb)	866 kg (1909 lb) @ 6319 mm (249 in)
1000 mm (39.4 in)	*4176 kg (9206 lb)	*2686 kg (5922 lb)	*2065 kg (4553 lb)	*1732 kg (3818 lb)	*1612 kg (3554 lb) @ 6355 mm (250 in)	3065 kg (6757 lb)	1982 kg (4370 lb)	1427 kg (3146 lb)	1088 kg (2399 lb)	998 kg (2200 lb) @ 6355 mm (250 in)	2510 kg (5534 lb)	1668 kg (3677 lb)	1212 kg (2672 lb)	926 kg (2041 lb)	848 kg (1870 lb) @ 6355 mm (250 in)
Ground	*4545 kg (10020 lb)	*2964 kg (6534 lb)	*2209 kg (4870 lb)	*1759 kg (3878 lb)	*1671 kg (3684 lb) @ 6203 mm (244 in)	3045 kg (6713 lb)	1948 kg (4295 lb)	1407 kg (3102 lb)	1084 kg (2390 lb)	1035 kg (2282 lb) @ 6203 mm (244 in)	2437 kg (5373 lb)	1611 kg (3552 lb)	1179 kg (2599 lb)	912 kg (2011 lb)	871 kg (1920 lb) @ 6203 mm (244 in)
-1000 mm (-39.4 in)	*4388 kg (9674 lb)	*2975 kg (6559 lb)	*2198 kg (4846 lb)		*1699 kg (3746 lb) @ 5847 mm (230 in)	3120 kg (6878 lb)	1958 kg (4317 lb)	1411 kg (3111 lb)		1137 kg (2507 lb) @ 5847 mm (230 in)	2449 kg (5399 lb)	1595 kg (3516 lb)	1168 kg (2576 lb)		949 kg (2092 lb) @ 5847 mm (230 in)

RATED LIFT CAPACITY – LONG ARM AND ADD ON COUNTERWEIGHT

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.



A	B											
	3000 mm (118.1 in)	4000 mm (157.5 in)	5000 mm (196.9 in)	6000 mm (236.2 in)	kg (lb) @ max. B	3000 mm (118.1 in)	4000 mm (157.5 in)	5000 mm (196.9 in)	6000 mm (236.2 in)	kg (lb) @ max. B	3000 mm (118.1 in)	4000 mm (157.5 in)	5000 mm (196.9 in)	6000 mm (236.2 in)	kg (lb) @ max. B
4000 mm (157.5 in)			*1538 kg (3391 lb)		*1560 kg (3439 lb) @ 5644 mm (222 in)			*1538 kg (3391 lb)		1368 kg (3016 lb) @ 5644 mm (222 in)			1477 kg (3256 lb)		1204 kg (2654 lb) @ 5644 mm (222 in)
3000 mm (118.1 in)		*1759 kg (3878 lb)	*1640 kg (3616 lb)	*1593 kg (3512 lb)	*1513 kg (3336 lb) @ 6091 mm (240 in)		*1759 kg (3878 lb)	*1640 kg (3616 lb)	1250 kg (2756 lb)	1218 kg (2685 lb) @ 6091 mm (240 in)		*1759 kg (3878 lb)	1460 kg (3219 lb)	1090 kg (2403 lb)	1061 kg (2339 lb) @ 6091 mm (240 in)
2000 mm (78.7 in)	*3093 kg (6819 lb)	*2219 kg (4892 lb)	*1845 kg (4068 lb)	*1650 kg (3638 lb)	*1531 kg (3375 lb) @ 6319 mm (249 in)	*3093 kg (6819 lb)	*2219 kg (4892 lb)	1644 kg (3624 lb)	1247 kg (2749 lb)	1149 kg (2533 lb) @ 6319 mm (249 in)	3035 kg (6691 lb)	1977 kg (4358 lb)	1422 kg (3135 lb)	1078 kg (2377 lb)	992 kg (2187 lb) @ 6319 mm (249 in)
1000 mm (39.4 in)	*4176 kg (9206 lb)	*2686 kg (5922 lb)	*2065 kg (4553 lb)	*1732 kg (3818 lb)	*1612 kg (3554 lb) @ 6355 mm (250 in)	3450 kg (7606 lb)	2236 kg (4927 lb)	1614 kg (3558 lb)	1238 kg (2729 lb)	1137 kg (2507 lb) @ 6355 mm (250 in)	2841 kg (6263 lb)	1890 kg (4167 lb)	1360 kg (3042 lb)	1060 kg (2337 lb)	973 kg (2145 lb) @ 6355 mm (250 in)
Ground	*4545 kg (10020 lb)	*2964 kg (6534 lb)	*2209 kg (4870 lb)	*1759 kg (3878 lb)	*1671 kg (3684 lb) @ 6203 mm (244 in)	3441 kg (7586 lb)	2204 kg (4859 lb)	1597 kg (3521 lb)	1235 kg (2723 lb)	1179 kg (2599 lb) @ 6203 mm (244 in)	2772 kg (6111 lb)	1835 kg (4045 lb)	1348 kg (2972 lb)	1048 kg (2310 lb)	1001 kg (2207 lb) @ 6203 mm (244 in)
-1000 mm (-39.4 in)	*4388 kg (9674 lb)	*2975 kg (6559 lb)	*2198 kg (4846 lb)		*1699 kg (3746 lb) @ 5847 mm (230 in)	3528 kg (7778 lb)	2219 kg (4892 lb)	1603 kg (3534 lb)		1295 kg (2855 lb) @ 5847 mm (230 in)	2788 kg (6146 lb)	1822 kg (4017 lb)	1338 kg (2950 lb)		1089 kg (2401 lb) @ 5847 mm (230 in)

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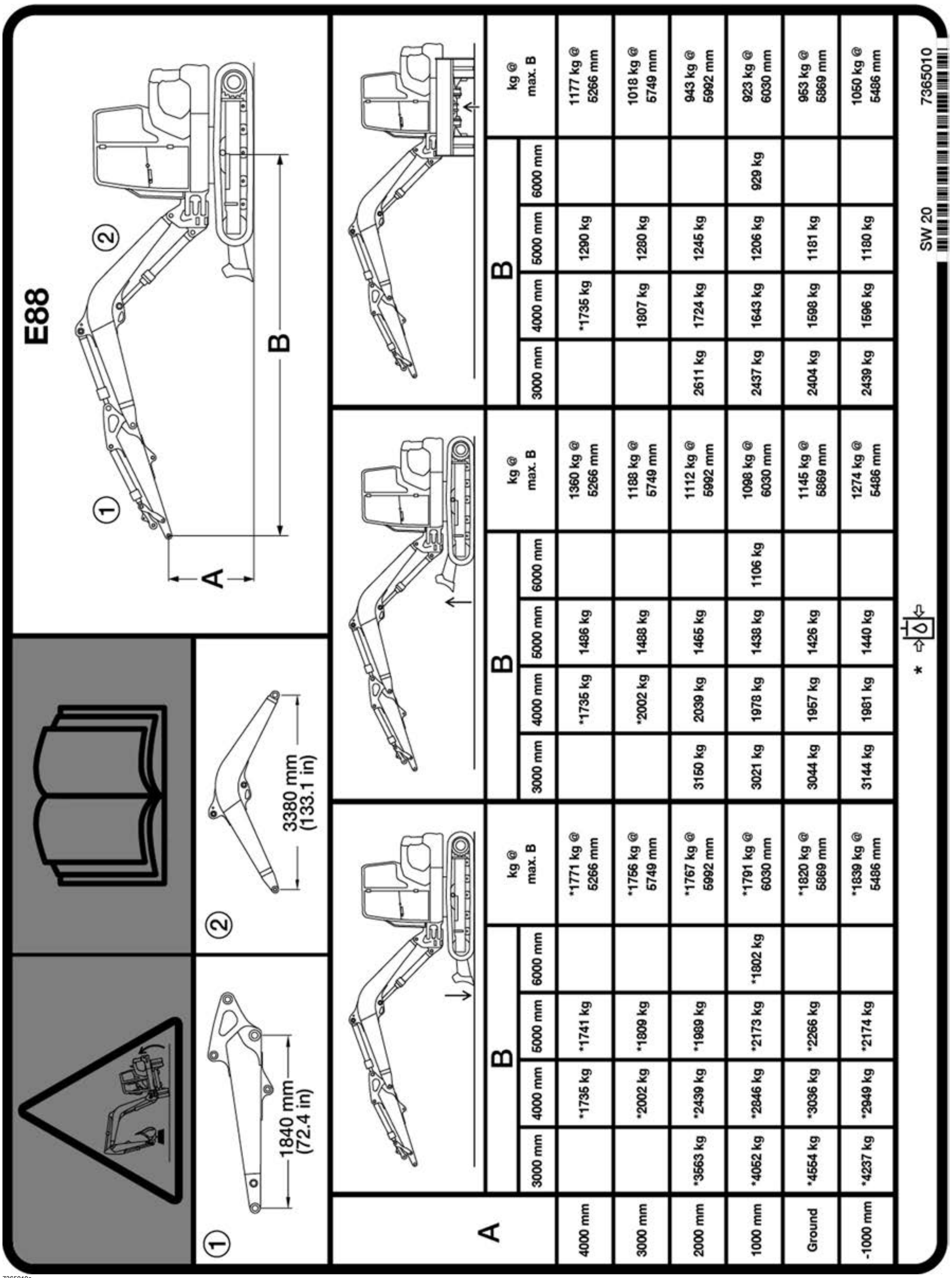
RATED LIFT CAPACITY – STANDARD ARM

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.



A	Blade down: B 3000 mm	4000 mm	5000 mm	6000 mm	kg @ max. B	Over front: B 3000 mm	4000 mm	5000 mm	6000 mm	kg @ max. B	Over side: B 3000 mm	4000 mm	5000 mm	6000 mm	kg @ max. B
4000 mm		*1735 kg	*1741 kg		*1771 kg @ 5266 mm		*1735 kg	1486 kg		1360 kg @ 5266 mm		*1735 kg	1290 kg		1177 kg @ 5266 mm
3000 mm		*2002 kg	*1809 kg		*1756 kg @ 5749 mm		*2002 kg	1488 kg		1188 kg @ 5749 mm		1807 kg	1280 kg		1018 kg @ 5749 mm
2000 mm	*3563 kg	*2439 kg	*1989 kg		*1767 kg @ 5992 mm	3150 kg	2039 kg	1465 kg		1112 kg @ 5992 mm	2611 kg	1724 kg	1245 kg		943 kg @ 5992 mm
1000 mm	*4052 kg	*2846 kg	*2173 kg	*1802 kg	*1791 kg @ 6030 mm	3021 kg	1978 kg	1438 kg	1106 kg	1098 kg @ 6030 mm	2437 kg	1643 kg	1206 kg	929 kg	923 kg @ 6030 mm
Ground	*4554 kg	*3036 kg	*2266 kg		*1820 kg @ 5869 mm	3044 kg	1957 kg	1426 kg		1145 kg @ 5869 mm	2404 kg	1598 kg	1181 kg		953 kg @ 5869 mm
-1000 mm	*4237 kg	*2949 kg	*2174 kg		*1839 kg @ 5486 mm	3144 kg	1981 kg	1440 kg		1274 kg @ 5486 mm	2439 kg	1596 kg	1180 kg		1050 kg @ 5486 mm

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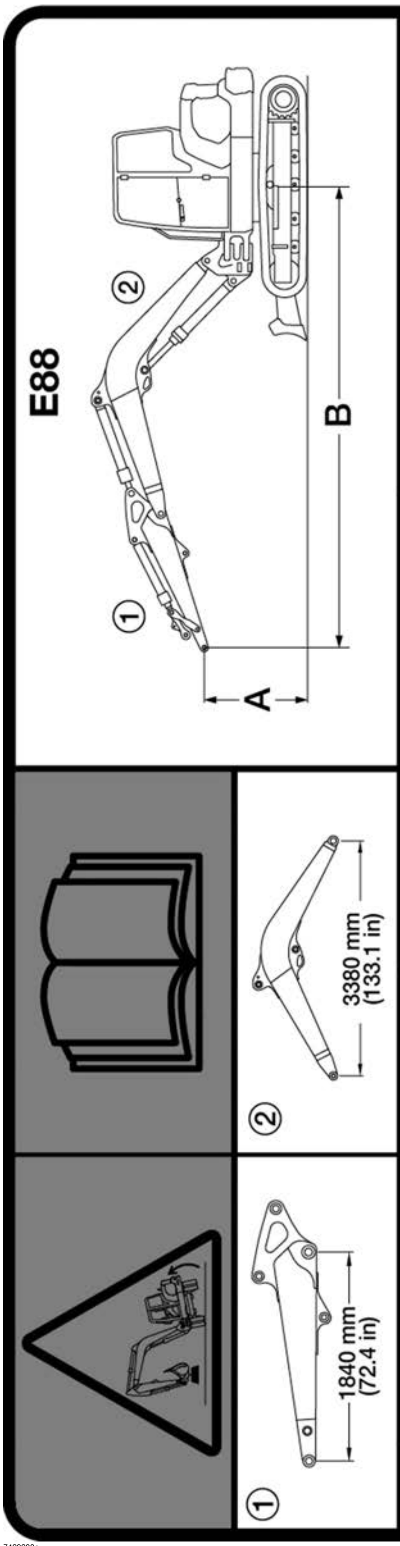
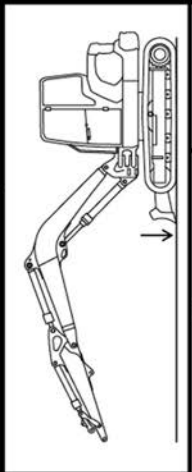
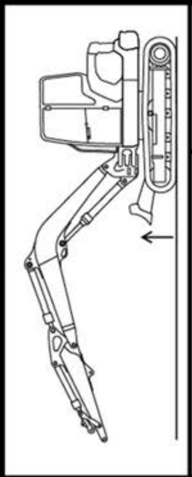
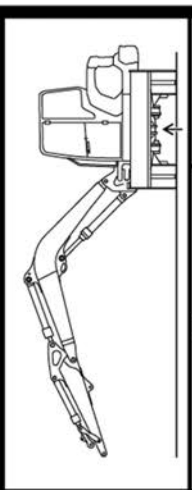
RATED LIFT CAPACITY – STANDARD ARM AND ADD ON COUNTERWEIGHT

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.









A	B 3000 mm	B 4000 mm	B 5000 mm	B 6000 mm	kg @ max. B	B 3000 mm	B 4000 mm	B 5000 mm	B 6000 mm	kg @ max. B	B 3000 mm	B 4000 mm	B 5000 mm	B 6000 mm	kg @ max. B
4000 mm		*1735 kg	*1741 kg		*1771 kg @ 5266 mm		*1735 kg	1667 kg		1529 kg @ 5266 mm		*1735 kg	1455 kg		1332 kg @ 5266 mm
3000 mm		*2002 kg	*1809 kg		*1756 kg @ 5749 mm		*2002 kg	1671 kg		1342 kg @ 5749 mm		*2002 kg	1446 kg		1158 kg @ 5749 mm
2000 mm	*3563 kg	*2439 kg	*1989 kg		*1767 kg @ 5992 mm	3525 kg	2287 kg	1650 kg		1260 kg @ 5992 mm	2938 kg	1945 kg	1412 kg		1077 kg @ 5992 mm
1000 mm	*4052 kg	*2846 kg	*2173 kg	*1802 kg	*1791 kg @ 6030 mm	3406 kg	2231 kg	1626 kg	1255 kg	1246 kg @ 6030 mm	2768 kg	1865 kg	1374 kg	1064 kg	1056 kg @ 6030 mm
Ground	*4554 kg	*3036 kg	*2266 kg		*1820 kg @ 5869 mm	3440 kg	2214 kg	1616 kg		1299 kg @ 5869 mm	2739 kg	1823 kg	1350 kg		1092 kg @ 5869 mm
-1000 mm	*4237 kg	*2949 kg	*2174 kg		*1839 kg @ 5486 mm	3552 kg	2243 kg	1632 kg		1445 kg @ 5486 mm	2778 kg	1823 kg	1350 kg		1201 kg @ 5486 mm

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EXCAVATOR SPECIFICATIONS

Certain specification(s) are based on engineering calculations and are not actual measurements. Specification(s) are provided for comparison purposes only and are subject to change without notice. Specification(s) for your individual Bobcat equipment will vary based on normal variations in design, manufacturing, operating conditions, and other factors.

Performance Specifications

Operating weight (for cab with HVAC, standard arm, rubber tracks, counterweight, standard bucket, and 75 kg (165 lb) operator)	8994 kg (19827 lb)
If equipped with the following	Steel Tracks, add 16 kg (35 lb) Add-On Counterweight, add 407 (897 lb) Long Arm, add 37 kg (82 lb)
Travel speed (Low / High)	2,5 km/h / 4,4 km/h (1.6 mph / 2.7 mph)
Digging Force (per ISO 6015)	
— Long Arm	35315 N (7939 lbf)
— Standard Arm	39073 N (8784 lbf)
— Bucket	55582 N (12495 lbf)

Controls Specifications

Steering	Two hand levers and foot pedals
Hydraulics	Two hand-operated joysticks control boom, bucket, arm, and upperstructure slew.
Standard Blade	Hand lever
Angle Blade (if equipped)	Switch on blade lever
Two-Speed Travel	Switch on blade lever
Boom Swing	Electric switch on left joystick
Auxiliary Hydraulics	Electric switches on joysticks
Engine	Engine speed control dial with auto idle feature, key or keyless start switch.
Starting Aid	Glow Plugs activated by start switch
Travel Brakes (Service & Parking)	Hydraulic lock in motor circuit
Swing Brakes (Service)	Hydraulic lock on motor
Swing Brakes (Holding)	Spring applied - hydraulic release

Engine Specifications

Make / Model	2.4 L Bobcat Engine, V2, Stage 5
Fuel	Ultra Low Sulfur Fuel
Cooling	Liquid, Forced Circulation
Horsepower: – Gross power (ISO 14396)	48,5 kW (65.0 hp)

– Gross power (SAE J1995)	48,7 kW (65.4 hp)
– Rated Power (SAE J1349)	48,5 kW (65.0 hp)
Torque:	
– Gross Torque (ISO 14396)	248,0 N•m (182.9 lb-ft)
– Gross Torque (SAE J1995)	249,2 N•m (183.8 lb-ft)
– Rated Torque	248,0 N•m (182.9 lb-ft)
Number Of Cylinders	4
Displacement	2,392 L (146.0 in³)
Bore / Stroke	90,0 x 94,0 mm (3.54 x 3.70 in)
Lubrication	Forced lubrication / cartridge type
Crankcase Ventilation	Closed breathing
Air Filter	Dual dry replacement paper elements
Ignition	Compression (diesel)
Low Idle Speed	1200 ± 25 rpm
High Idle Speed	2100 ± 25 rpm
Engine Coolant	Propylene Glycol / water mixture (53% PG / 47% water)

Hydraulic System Specifications

Pump Type	engine driven, variable displacement piston pump with pressure-compensating, load-sensing, and torque-limiter control
Pump Capacity	149 L/min (39.4 U.S. gpm)
Auxiliary Flow	95 L/min (25.1 U.S. gpm)
Secondary Auxiliary Flow	
– Base (Female Coupler)	62 L/min (16.4 U.S. gpm)
– Rod (Male Coupler)	41 L/min (10.8 U.S. gpm)
Control Valves	closed centre individually compensated
System Relief Pressure	295 bar (4279 psi)
Slew Relief Pressure	215,7 psi (3129 psi)
Joystick Control Pressure	30 bar (435 psi)
Arm Port Relief, Base End And Rod End	340 bar (4931 psi)
Boom Port Relief, Base End And Rod End	340 bar (4931 psi)
Bucket Port Relief, Base End And Rod End	340 bar (4931 psi)
Blade Port Relief, Base End	380 bar (5511 psi)
4th Auxiliary Hydraulics (If Equipped) Port Relief, Base End And Rod End	210 bar (3045 psi)

Offset Port Relief, Base End And Rod End	380 bar (5511 psi)
Main Hydraulic Filter Bypass	3,4 bar (50 psi)
Case Drain Filter Bypass	1,7 bar (25 psi)
Auxiliary Relief	210 bar (3045 psi)

Hydraulic Cylinders

Cylinder	Bore	Rod	Stroke
Boom (cushion up)	115,0 mm (4.53 in)	70,0 mm (2.76 in)	775,0 mm (30.51 in)
Arm (cushion retract / extend)	100,0 mm (3.94 in)	65,0 mm (2.56 in)	838,0 mm (32.99 in)
Bucket	90,0 mm (3.54 in)	60,0 mm (2.36 in)	690,0 mm (27.17 in)
Boom Swing	101,6 mm (4.00 in)	57,2 mm (2.25 in)	697,2 mm (27.45 in)
Blade	125,0 mm (4.92 in)	70,0 mm (2.76 in)	199,0 mm (7.83 in)

Hydraulic Cycle Times

Bucket Curl	2.3 seconds
Bucket Dump	3.1 seconds
Arm Retract	3.8 seconds
Arm Extend	3.9 seconds
Boom Raise	4.1 seconds
Boom Lower	4.9 seconds
Boom Swing Left	6.5 seconds
Boom Swing Right	5.9 seconds
Blade Raise	2.8 seconds
Blade Lower	2.3 seconds

Electrical System Specifications

Starting Aid	Glow Plugs
Alternator	12 volt, 90 amp open frame with internal regulator
Battery	12 volt negative earth, 1000 CCA at -18ºC (0ºF), 186 min reserve capacity at 25 amp
Starter	12 volt, 2.0 kW reduction drive
LED Lights	20 watts, 1800 lumens

Drive System Specifications

Final Drive	Each track driven by hydraulic axial piston motor
Drive Reduction	50,579:1 two-stage planetary

Gradeability	30°
Travel Brakes	Hydraulic lock on motor

Slew System Specifications

Slew Motor	Axial piston connected to a planetary drive
Slew Circle	Single-row shear-type ball bearings with internal gear
Slew Speed	9,0 rpm

Undercarriage Specifications

Crawler Track Design	Sealed track rollers with box-section track roller frame
Track Adjuster	Grease type track adjusters with shock absorbing recoil springs
Width of Crawler	2200 mm (86.6 in)

Capacities Specifications

Fuel Tank	116 L (30.6 U.S. gal)
Hydraulic Reservoir	21,4 L (5.65 U.S. gal)
Hydraulic System Capacity (Centre of Sight Glass)	81,4 L (21.5 U.S. gal)
Cooling System	9,5 L (2.5 U.S. gal)
Engine Oil and Filter	9,8 L (10.35 qt)
Slew Motor Gear Box	1,5 L (1.60 qt)
Final Drive (each)	1,3 L (1.37 qt)
Air Conditioning Refrigerant (R-134a)	1,18 kg (2.6 lb)

Track Specifications

Track Type	Rubber	Steel	Segmented
Width	450 mm (17.7 in)	450 mm (17.7 in)	450 mm (17.7 in)
Number of Shoes	Single Assembly	39	39
Number of Track Rollers (per side)	5	5	5

Ground Pressure Specifications

Machine Option	Rubber Tracks	Steel Tracks	Segmented Tracks
Long Arm	39,3 kPa (5.70 psi)	40,0 kPa (5.80 psi)	39,9 kPa (5.79 psi)
Standard Arm	39,2 kPa (5.68 psi)	39,8 kPa (5.78 psi)	39,8 kPa (5.77 psi)

Environmental Specifications

DECLARED SINGLE-NUMBER NOISE EMISSION VALUES In accordance with ISO 6395	
Bystander noise level per Directive 2000/14/EC – L_{wA}	96 dB(A)
Operator noise level per Directive 2006/42/EC – L_{pA}	77 dB(A)

DECLARED VIBRATION EMISSION VALUES In accordance with EN 12096	
Whole-body vibration per ISO 2631-1	0,20 m/s^2 (0.66 ft/s^2)
Hand/arm vibration per ISO 5349-1	0,41 m/s^2 (1.35 ft/s^2)

FLUORINATED GREENHOUSE GAS (F-GAS) VALUES (for machines equipped with HVAC)	
F-gas type	HFC-134a
F-gas mass (kg)	1,18 kg
CO_2 equivalent (t)	1,69 t
GWP	1430

ENGINE CO_2 EMISSION VALUES	
CO_2 emission	818 g/kWh
This CO_2 measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.	

Temperature Range

Operation and storage	-17° – +43°C (-1.3° – +109.4°F)

BOBCAT® EXCAVATORS WARRANTY

Doosan Bobcat EMEA s.r.o. (“Bobcat”) warrants that this Bobcat® Excavator will be free from defects in design, material or workmanship for twenty four (24) months from the retail date to the owner or 2000 hours of machine usage, whichever occurs first. During the warranty period, only official Bobcat dealers (as listed on www.bobcat.com) are entitled to deal with warranty claims and shall repair or replace, at Bobcat’s option, without charge for parts, labour or travel of technicians, any part of the Bobcat® equipment which fails because of defects in design, material or workmanship. The owner shall provide any official Bobcat dealer with prompt written notice of the defect and allow reasonable time for replacement or repair. Bobcat may, at its option, request failed parts to be returned to the factory or to any other designated location. Transportation of the Bobcat® equipment to the official Bobcat dealer for warranty work is not the responsibility of Bobcat. Service schedules must adhere to prescribed intervals and Bobcat® genuine parts/lubricants must be used. The warranty does not apply to tires, tracks or other accessories not manufactured by Bobcat. For warranty coverage on engines, consult with your official Bobcat dealer. For these non-covered items, the owner shall refer solely to the warranty, if any, of the respective manufacturers thereof, in accordance with the respective manufacturers warranty statement. Coverage for air-conditioning refill and couplers is limited as failures generally originate from factors not under Bobcat’s control such as, but not limited to, prolonged storage or abuse. This limited coverage is, depending on the component, 50 to 500 hours of machine usage. The warranty does not cover: (i) Oils and lubricants, coolant fluids, filter elements, brake linings, tune-up parts, bulbs, fuses, alternator fan belts, drive belts, pins, bushings and other high-wear items. (ii) Damages resulting from abuse, misuse, accidents, alterations, use of non-genuine Bobcat parts, use of the product with any bucket or attachment not approved by Bobcat, air flow obstructions, or failure to maintain or use the Bobcat product according to the instructions applicable to it. (iii) Ground engaging parts such as bucket teeth and cutting edges. (iv) Fuel or hydraulic system cleaning, engine tune-up, brake inspection or adjustment. (v) Adjustments or slight defects which generally do not affect the stability or reliability of the machine. (vi) Damage or defect resulting from improper storage, weathering, lack of use, use and operation in a corrosive or chemical environment. (vii) Damage or defect caused by operation of the product under extreme weather or geographical conditions without the written agreement of Bobcat.

BOBCAT EXCLUDES OTHER CONDITIONS, WARRANTIES OR REPRESENTATIONS OF ALL KINDS, EXPRESSED OR IMPLIED, STATUTORY OR OTHERWISE (EXCEPT THAT OF TITLE) INCLUDING ALL IMPLIED WARRANTIES AND CONDITIONS RELATING TO MERCHANTABILITY, SATISFACTORY QUALITY AND FITNESS FOR A PARTICULAR PURPOSE. CORRECTIONS BY BOBCAT OF NON-CONFORMITIES WHETHER PATENT OR LATENT, IN THE MANNER AND FOR THE WARRANTY PERIOD PROVIDED ABOVE, SHALL CONSTITUTE FULFILLMENT OF ALL LIABILITIES OF BOBCAT FOR SUCH NON-CONFORMITIES, WHETHER BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE WITH RESPECT TO OR ARISING OUT OF SUCH PRODUCT. THE REMEDIES OF THE END-USER/OWNER SET FORTH UNDER THE PROVISIONS OF THE WARRANTY OUTLINED ABOVE ARE EXCLUSIVE AND THE TOTAL LIABILITY OF BOBCAT INCLUDING ANY HOLDING, SUBSIDIARY, ASSOCIATED OR AFFILIATED COMPANY OR DISTRIBUTOR WITH RESPECT TO THIS SALE OR THE PRODUCT AND SERVICE FURNISHED HEREUNDER IN CONNECTION WITH THE PERFORMANCE OR BREACH THEREOF, OR FROM DELIVERY, INSTALLATION, REPAIR OR TECHNICAL DIRECTION COVERED BY OR FURNISHED UNDER THIS SALE, WHETHER BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE SHALL NOT EXCEED THE PURCHASE PRICE OF THE PRODUCT UPON WHICH SUCH LIABILITY IS BASED. BOBCAT INCLUDING ANY HOLDING, SUBSIDIARY, ASSOCIATED OR AFFILIATED COMPANY AND DISTRIBUTOR SHALL IN NO EVENT BE LIABLE TO THE END-USER/OWNER, ANY SUCCESSORS IN INTEREST OR ANY BENEFICIARY OR ASSIGNEE RELATING TO THIS SALE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES ARISING OUT OF THIS SALE OR BY ANY BREACH THEREOF, OR ANY DEFECT IN, OR FAILURE OF, OR MALFUNCTION OF THE PRODUCT UNDER THIS SALE, WHETHER BASED UPON LOSS OF USE, LOST PROFITS OR REVENUE, INTEREST, LOST GOODWILL, WORK STOPPAGE, IMPAIRMENT OF OTHER GOODS, LOSS BY REASON OF SHUTDOWN OR NON-OPERATION, INCREASED EXPENSES OF OPERATION OR CLAIMS OF USER OR CUSTOMERS OF THE USER FOR SERVICE INTERRUPTION WHETHER OR NOT SUCH LOSS OR DAMAGE IS BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE.

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Contents of UK Declaration of Conformity

This information is provided in the operator's manual to comply with clause 1.7.4.2(c) of Schedule 2, Part 1 of The Supply of Machinery (Safety) Regulations 2008.

The official UK Declaration of Conformity is supplied in a separate document.

Manufacturer

Bobcat

Bobcat Company
World Headquarters
250 East Beaton Drive
West Fargo, ND 58078-6000
UNITED STATES OF AMERICA

Technical Documentation
Homologation Manager
Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
26312 Dobříš
CZECH REPUBLIC

Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001

Notified Body
Technical and Test Institute for Construction Prague
Czech Republic

Notified Body Number: 1020

EC Certificate No.
1020-090-022395

Conformity Assessment Procedure(s)
2000/14/EC, Annex VIII, Full Quality Assurance

Sound Power Levels [Lw(A)]

Measured sound Power	**95.1 dBA**
Guaranteed sound Power	**96 dBA**

Description of Equipment
Type of Equipment: Excavator
Model Name: E88
Model Code: B4NL

Engine Manufacturer: Bobcat Company
Engine Model: DM02VB DM02-MFE00
Engine Power: 48.5 kW @ 2100 RPM

Equipment conforms to UK Regulations(s) Listed Below

Supply of Machinery (Safety) Regulations 2008
Electromagnetic Compatibility Regulations 2016

Declaration of Conformance

This equipment conforms to the requirements specified in all the UK Regulations listed in this declaration.

Effective From:

30 July 2022


Bobcat®


Bobcat

Reference Information

Compact Excavator Serial Number:

Engine Serial Number:

NOTES:

YOUR BOBCAT DEALER NAME:

Dealer Address:

Affix Business Card Here or enter dealer information

Sales Contact (Name): _____
(Phone): _____
(Email): _____

Rental Contact (Name): _____
(Phone): _____
(Email): _____

Affix Business Card Here or enter dealer information

Service Contact (Name): _____
(Phone): _____
(Email): _____

Parts Contact (Name): _____
(Phone): _____
(Email): _____