



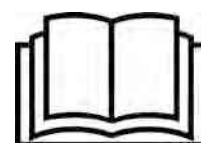
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Operation & Maintenance Manual

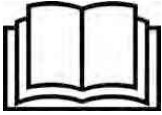
Compact Excavator



E88 S/N: B4NL11001 & Above



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.

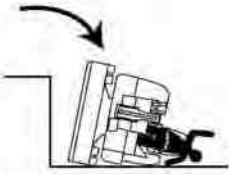
OPERATOR SAFETY WARNINGS



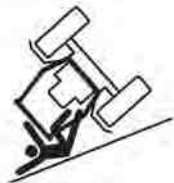
This Safety Alert Symbol means: "Attention! Be Alert! Your Safety is Involved!" Carefully read the message that follows.



- 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.



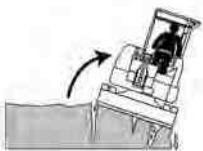
- Keep bystanders out of maximum reach area.
- Do not travel or turn with bucket extended.
- Look in the direction of rotation and make sure no bystanders are in the work area.



- 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.



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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.

MANUFACTURER

North America

Bobcat Company
250 E. Beaton Drive
West Fargo, ND 58078
USA
1-800-743-4340, option 3

Czech Republic

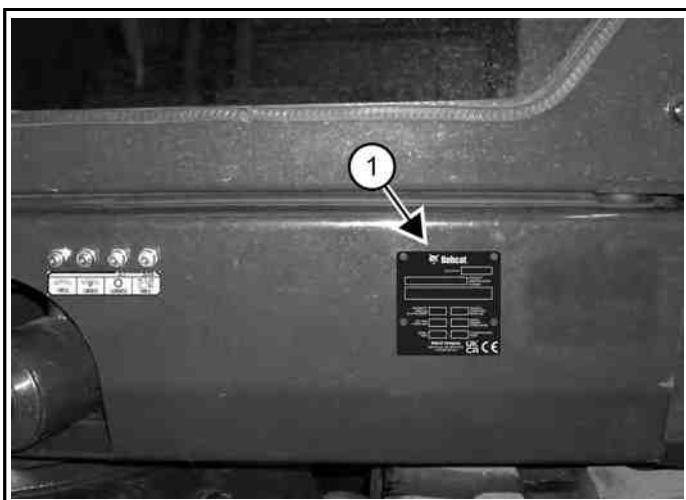
Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
263 12 Dobříš
Czech Republic

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



C1320006

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



C206558a

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

NA15473

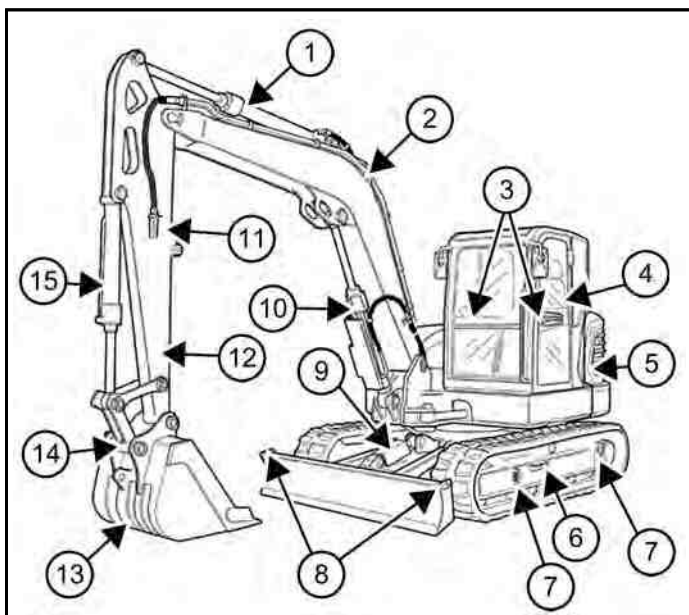
The delivery report contains a list of items that must be explained or shown to the owner or operator by the dealer when the machine is delivered.

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

EXCAVATOR IDENTIFICATION

Front View

Figure 4



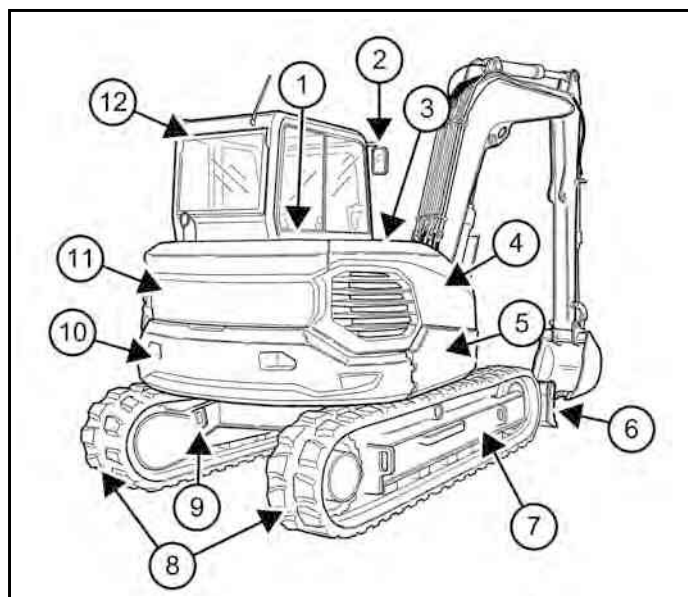
NA20187b

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.

- Articulated Boom
- 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
- Lift Pump Kit
- 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
- Top Guard Kit (FOPS II)
- Touch Display
- Travel Motion Alarm
- Window Shade

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.

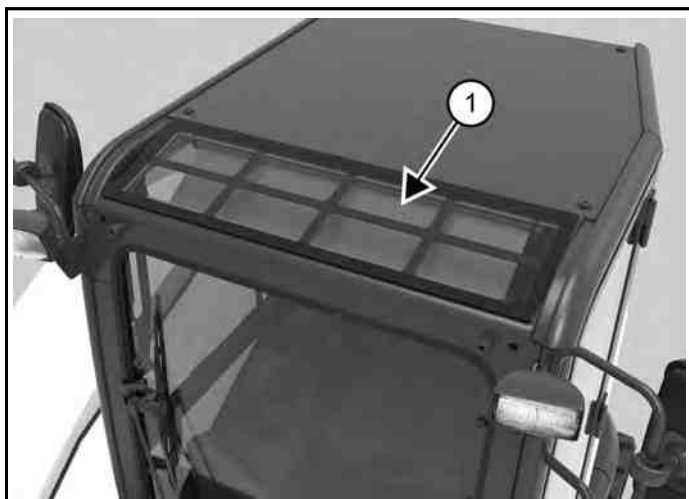
Many bucket styles, widths, and different capacities are available for a variety of different applications. They include trenching, digging, grading, and tilt, to name a

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

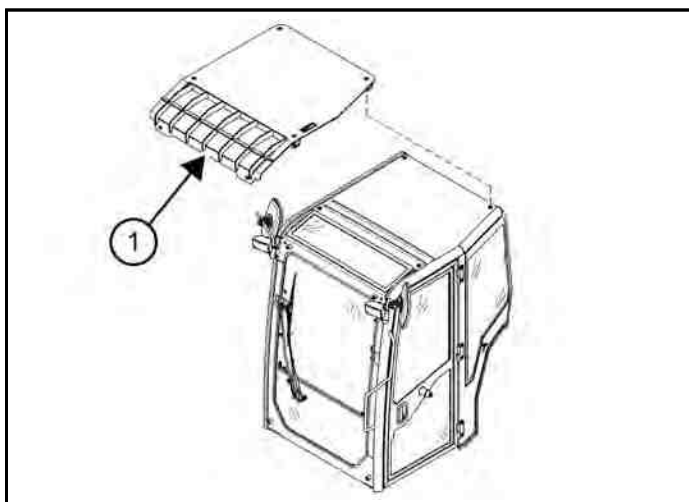
The top window (Item 1) [Figure 6] is a FOPS that meets the top guard requirements of FOPS Level I per ISO 10262.

There is a kit available that meets FOPS Level II per ISO 10262. (See Top Guard (FOPS II) Kit on Page 14)

See your Bobcat dealer for more information.

Top Guard (FOPS II) Kit

Figure 7



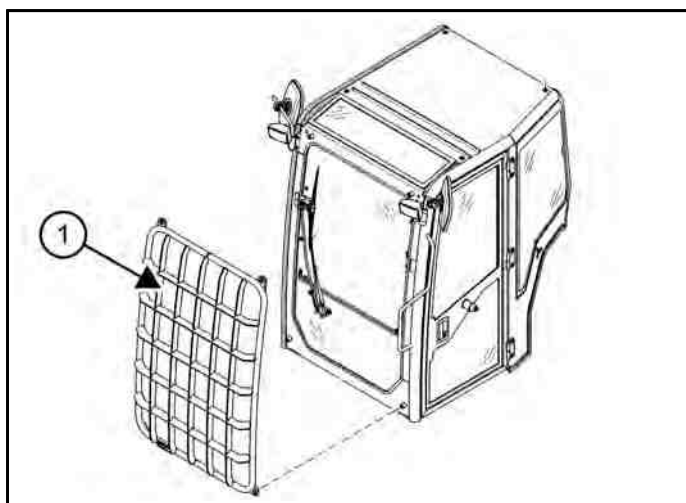
NA13738b

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



NA13738a

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

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

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 highway, 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.

DANGER

The signal word DANGER on safety signs and in the manuals indicates a hazardous situation which, if not avoided, will result in serious injury or death. ◀

D-1002

WARNING

The signal word WARNING on the safety signs and in the manuals indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death. ◀

W-2044

IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the machine. ◀

I-2019

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 8 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



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



Maintenance

The machine, some attachments, and some implements 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 coolant 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



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 (Diesel)



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 an 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 nonmetallic 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



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

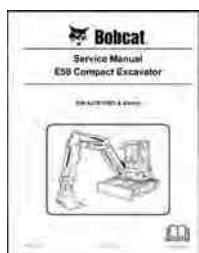
The following publications are also available for your Bobcat excavator. You can order them from your Bobcat dealer.



OPERATION & MAINTENANCE MANUAL

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

7433617



SERVICE MANUAL

Complete maintenance instructions for your Bobcat excavator.

7433618



OPERATOR'S HANDBOOK

Gives basic operation instructions and safety warnings.

7407666



TOUCH DISPLAY USER GUIDE

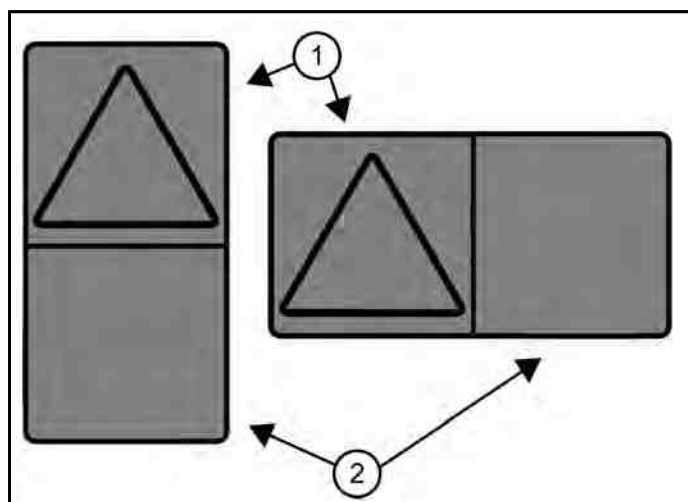
Gives instructions for pairing a cellular phone with the touch display and for operating the sound system on the touch display.

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 the safety signs section. Please become familiarised with all safety signs installed on the machine / attachment.

Figure 9



C200466a

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.

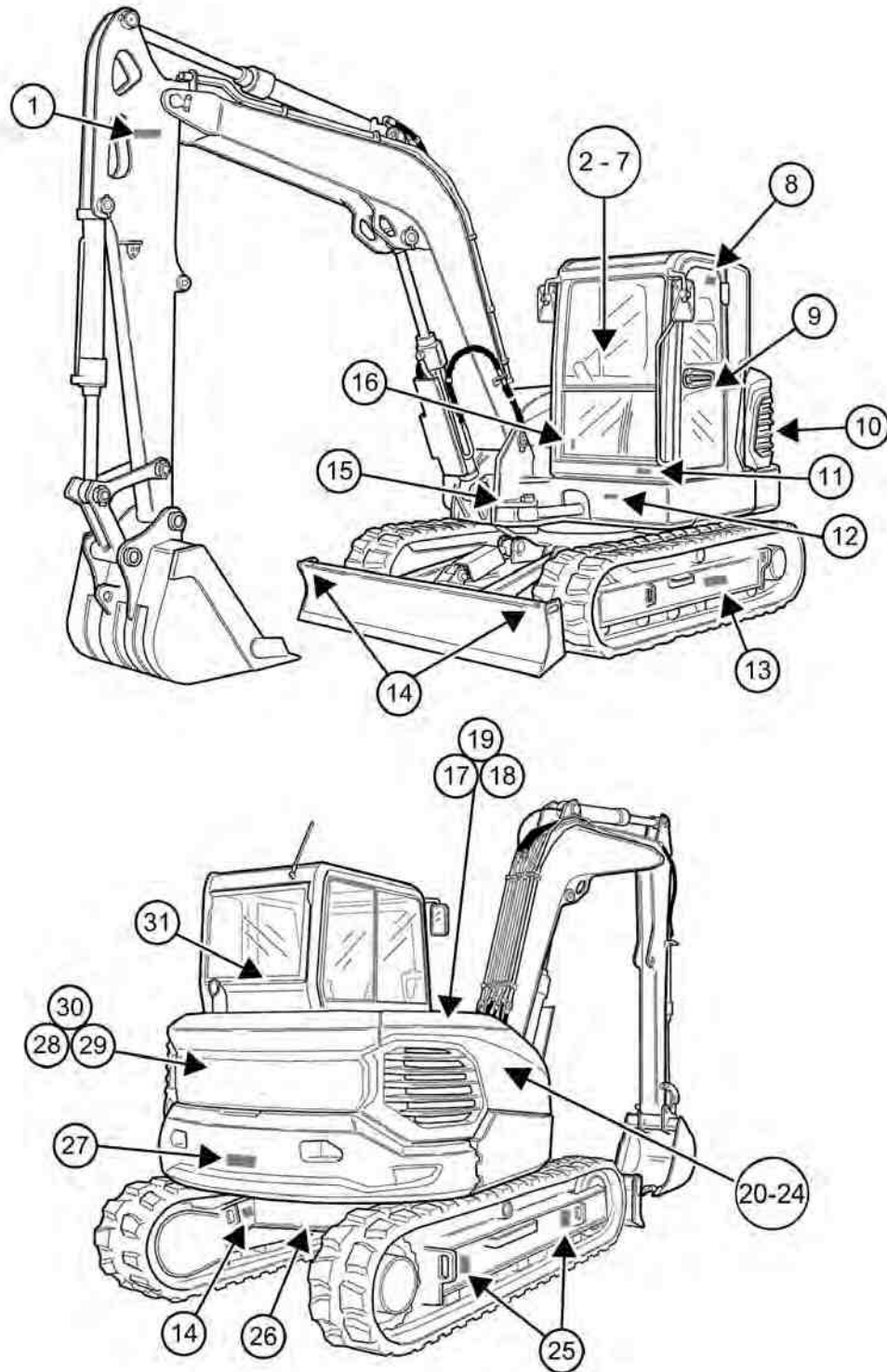
Avoidance Panels: Depict actions required to avoid the hazards.

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

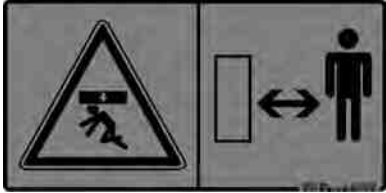
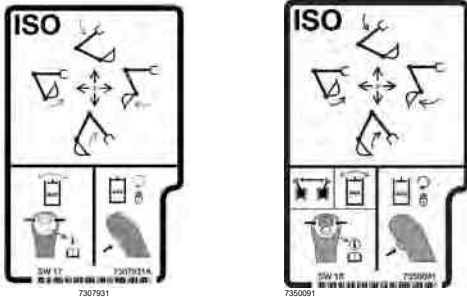
SAFETY SIGNS (DECALS)

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

Figure 10



NA201871

REF.	DECAL	WARNING (IF APPLICABLE)
1	Stay Clear (6713507) This safety sign is located on the upper arm. 	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) This safety sign is located on the right console. 	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) This machine sign is located on the right console. 	
4	Travel Motion Alarm (7136738) (if equipped) This safety sign is located on the right window. 	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)
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5

General Warnings (7341643)

This safety sign is located inside the cab on the left column.



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

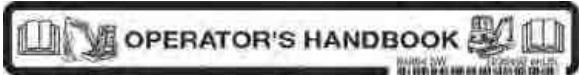
1. Lower attachment and blade to ground.
2. Stop engine and remove the key (if equipped).
3. Raise control console. ◀

W-2518

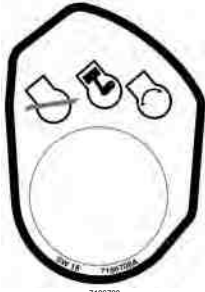
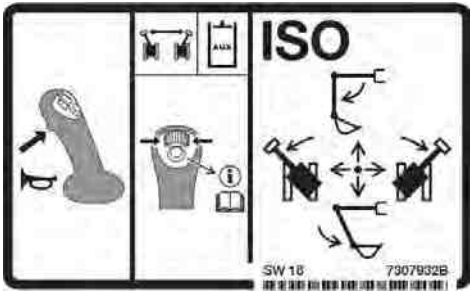
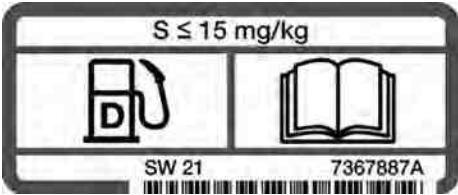
6

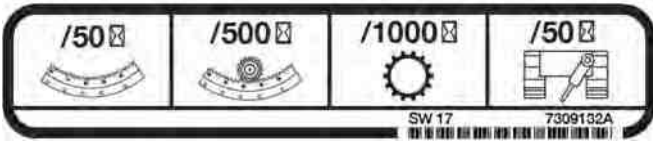
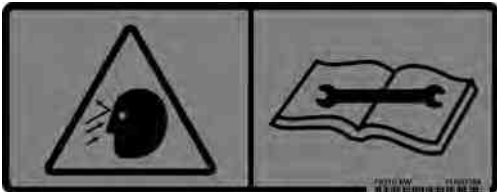
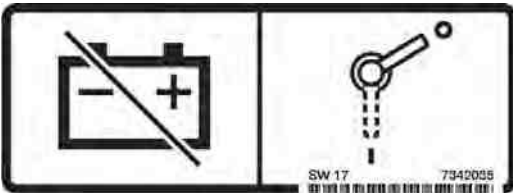
Operator's Handbook (7236492)

This machine sign is located on the right console.



7236492

REF.	DECAL	WARNING (IF APPLICABLE)
7	Start Switch (7186708) This machine sign is located on the right console. 	
8	Emergency Exit (7169014) This machine sign is located on the right window. 	
9	ISO Control Pattern for Left Joystick (7307932) This machine sign is located on the left console. 	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.
10	Ultra Low Sulfur Diesel Fuel (7367887) This machine sign is located near the fuel fill. 	

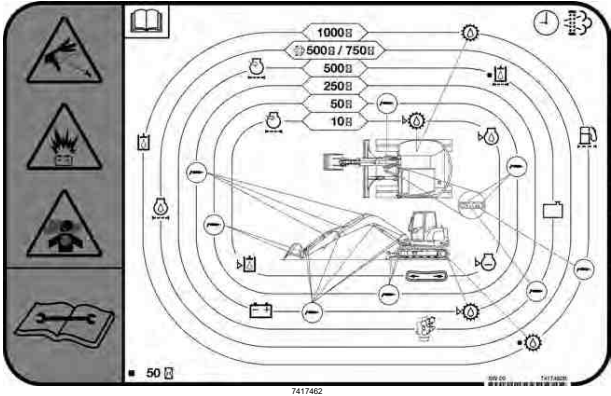
REF.	DECAL	WARNING (IF APPLICABLE)
11	Transporting and Lifting (7310829) This safety sign is located on the front of the cab.  7310829	 WARNING GENERAL HAZARD Improper loading, transporting, and lifting procedures can cause serious injury or death. Read and understand the Operation & Maintenance Manual prior to transporting or lifting the machine. ◀ W-2517
12	Remote Grease Location (7309132) This machine sign is located on the front of the cab.  7309132	
13	High Pressure Grease (7168039) (2) This safety sign is located on the outside of the tracks.  7168039	 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-2554
14	Tie-Down Location (6595014) (4) This machine sign is located on the track frame.  6595014	
15	Battery Disconnect (7342035) (if equipped) This machine sign is located on the front of the upperstructure.  7342035	

W 2510

REF.	DECAL	WARNING (IF APPLICABLE)
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19 Service Schedule (7417462)

This safety sign is located on top of the right side cover.



! 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. ◀

20 Hot Surface Warning (7185935)

This safety sign is located under the right side cover.

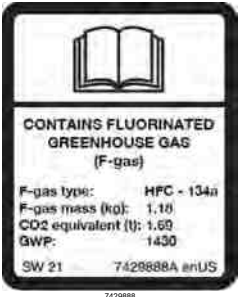


! WARNING

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. ◀

21 Fluorinated Greenhouse Gas (7429888)

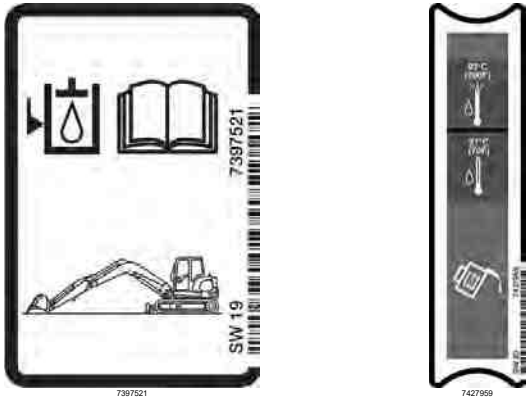
This machine sign is located on the side of the HVAC condenser.



REF.	DECAL	WARNING (IF APPLICABLE)
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22 Check Hydraulic Level (7397521 and 7427959)

These machine signs are located on the hydraulic tank.



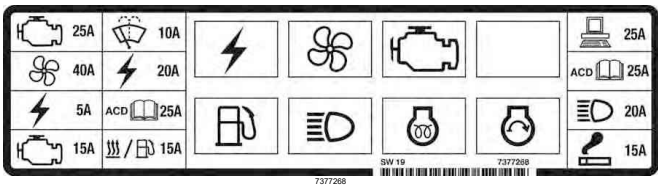
23 Hydraulic Fluid (7375038)

This machine sign is located on the hydraulic tank.



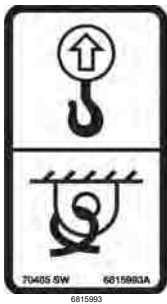
24 Fuse / Relay (7377268)

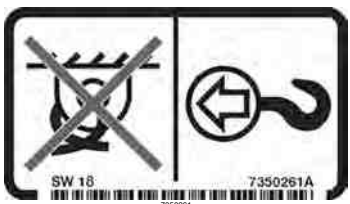
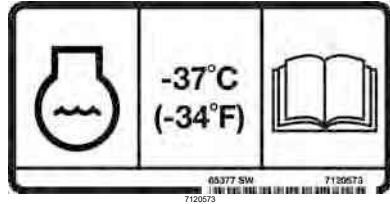
This machine sign is located on the fuse cover.



25 Lift / Tie-Down Location (6815993) (4)

This machine sign is located on the side of the tracks.



REF.	DECAL	WARNING (IF APPLICABLE)
26	Tow Loop (7350261) This machine sign is located near the tow loop. 	
27	Stay Clear (7169009) This safety sign is located on the rear of the excavator. 	 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
28	High Pressure Gas (7347041) (3) This safety sign is located on the gas springs. 	 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
29	Engine Coolant (7120573) This machine sign is located on the coolant tank. 	

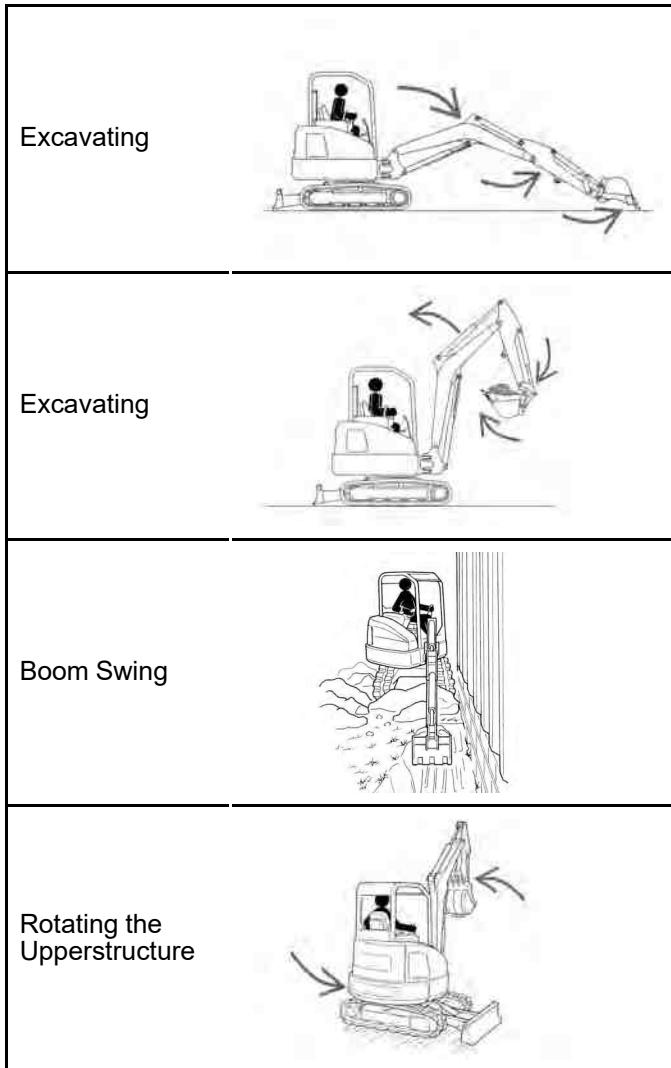
REF.	DECAL	WARNING (IF APPLICABLE)
30	Rotating Parts and Hot Surfaces (7243563) This safety sign is located inside the rear compartment. 	 WARNING CUTTING AND BURN HAZARD Keep away from the operating machine. • Keep away from fan and moving parts. Do not operate with guard removed. • Do not touch hot surfaces. Allow to cool before servicing. ◀ W-2521
31	Operator's Manual Location (6732148) This safety sign is located behind the operator's seat. 	 WARNING INSUFFICIENT INSTRUCTIONS HAZARD Untrained operators or failure to follow instructions and machine signs 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.

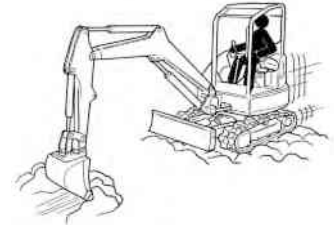
Some examples of intended use include:



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. ◀

D-1052

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-2258

INSTRUMENTS AND CONSOLES

Left Console

Figure 11

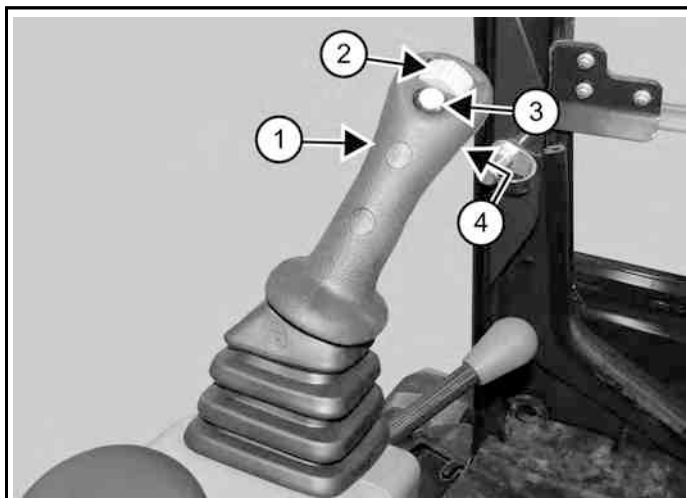


Figure 12

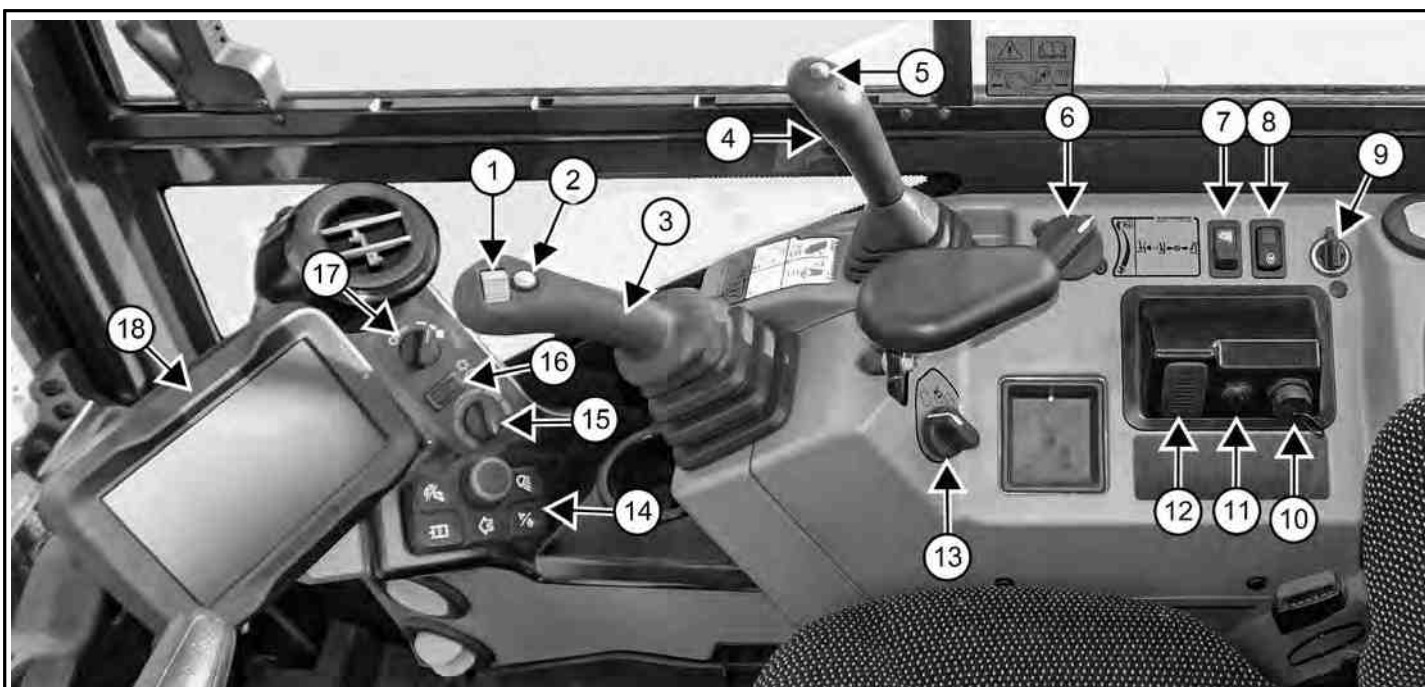


REF.	DESCRIPTION	FUNCTION
1	Left Joystick	Operates the hydraulic controls. (See Hydraulic Controls on Page 56)
2	Left Joystick Switch	Controls boom swing and auxiliary hydraulics. (See Enabling Boom Swing on Page 84) (See Secondary Auxiliary Hydraulics (Deluxe Panel) on Page 63) (See Secondary Auxiliary Hydraulics (Display) on Page 64)

REF.	DESCRIPTION	FUNCTION
3	Left Joystick Button	Toggles between boom swing and auxiliary hydraulics (if equipped). (See Enabling Boom Swing on Page 84) (See Secondary Auxiliary Hydraulics (Deluxe Panel) on Page 63) (See Secondary Auxiliary Hydraulics (Display) on Page 64)
4	Horn	Sounds the horn.
5	Wiper / Washer Switch (if equipped)	Operates the windshield wiper and washer. (See Operating Windshield Wiper on Page 52)
6	Hydraulic Quick Coupler On / Off Switch (if equipped)	Retracts and extends hydraulic pins. (See Installing Attachments (Hydraulic Quick Coupler) on Page 113)
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 113)
9	Overload Warning Device Switch (if equipped)	Operates the overload warning device. (See Overload Warning Device on Page 69)
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 66)

Right Console

Figure 13



REF.	DESCRIPTION	FUNCTION
1	Right Joystick Switch	Controls auxiliary hydraulics. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 60)
2	Right Joystick Button	Toggles between rear view camera (if equipped) and current screen on the display. (See Operating Rear View Camera on Page 249) Used to bench the Depth Check system (if equipped). (See Depth Check (Deluxe Panel) on Page 128) (See Depth Check (Standard Display) on Page 146) (See Depth Check (Touch Display) on Page 161)
3	Right Joystick	Operates the hydraulic controls. (See Hydraulic Controls on Page 56)
4	Blade Control Lever	Raises and lowers the blade. (See Blade Control Lever on Page 70)
5	Two-Speed Button	Engages and disengages high range travel speed.
6	Engine Speed Control Dial	Controls engine rpm. (See Engine Speed Control on Page 82)
7	Travel Motion Alarm Cancel Switch	Temporarily disables the travel motion alarm. (See Disabling The Travel Motion Alarm on Page 53)
8	Wait To Start Light	When light turns off, the engine can be started. (See Starting The Engine on Page 91)
9	Auxiliary Power Outlet	12 volt receptacle for accessories.
10	USB Port (if equipped)	See the Touch Display User Guide for more information about the sound system.
11	3,5 mm (1/8 in) Auxiliary Input Jack (if equipped)	
12	Hands-Free Microphone (if equipped)	Used for hands-free talking with the touch display phone feature.

REF.	DESCRIPTION	FUNCTION
13	Key Switch or Keyless Start Switch	Used to start the engine. (See Starting The Engine (Deluxe Panel) on Page 88) (See Starting The Engine (Display) on Page 90)
14	Jog Shuttle (if equipped)	Used to navigate the display. (See Jog Shuttle (Standard Display) on Page 37) (See Jog Shuttle (Touch Display) on Page 40)
15	Temperature Control Dial (if equipped)	Controls temperature in cab.
16	Air Conditioning Switch (if equipped)	Turns air conditioner on / off.
17	Fan Motor Dial (if equipped)	Controls fan speed.
18	Deluxe Panel	
	Standard Display Screen	(See Standard Display on Page 35)
	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.

Deluxe Panel

Figure 14



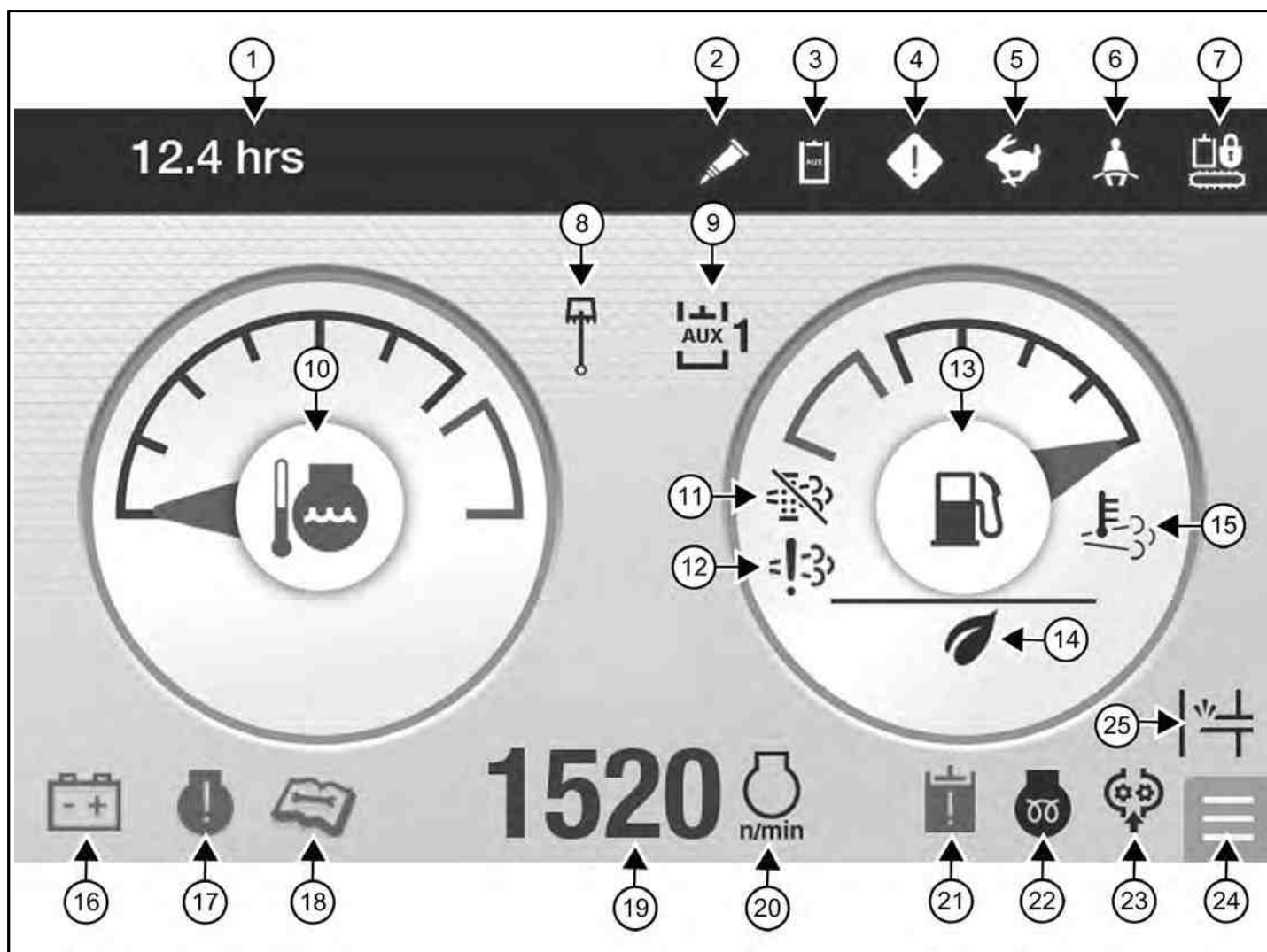
C205071g

REF.	DESCRIPTION	FUNCTION
1	Direct To Tank	Turns direct to tank on / off. (See Direct To Tank (Deluxe Panel) on Page 68)
2	Lights	Turns front lights on / off.
3	Time / Date	Displays current time and date.
4	Operator	Displays current operator and operator hours.
5	Machine Hours	Displays total machine hours.
6	Auxiliary Hydraulics	Activates auxiliary hydraulics. (See Primary Auxiliary Hydraulics (Deluxe Panel) on Page 58) (See Secondary Auxiliary Hydraulics (Deluxe Panel) on Page 63)
7	Auxiliary Settings	Opens the AUXILIARY SETTINGS screen.
8	Engine Warning	Indicates the engine has malfunctioned.
9	General Warning	Indicates a malfunction of one or more machine functions.
10	Hydraulic Warning	Indicates hydraulic fluid temperature is high.
11	Battery Warning	Indicates battery voltage is low.
12	Seat Belt Reminder	Illuminates as a reminder to fasten the seat belt.

REF.	DESCRIPTION	FUNCTION
13	Control Console Raised	Indicates the left console is raised and hydraulic controls are locked out. (See Raising And Lowering The Console on Page 47)
14	High Range	Indicates high range is activated. (See Two-Speed Travel on Page 47)
15	Engine RPM	Shows engine rpm.
16	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 (Deluxe Panel) on Page 73)
17	High Exhaust System Temperature (HEST)	Indicates the exhaust temperature is higher than normal operation temperature. (See Diesel Particulate Filter (DPF) System (Deluxe Panel) on Page 73)
18	Engine Coolant Temperature Gauge	Shows engine coolant temperature.
19	Boom Swing or Auxiliary Hydraulics	Indicates what control the left joystick switch is operating. (See Boom Swing on Page 84) (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 63)
20	Auxiliary Hydraulics	Indicates what control the right joystick switch is operating. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 58)
21	Fuel Gauge	Shows the amount of fuel in the tank. Icon illuminates to indicate a malfunction.
22	Eco Mode	Indicates Eco Mode is activated. (See Eco Mode (Deluxe Panel) on Page 83)
23	Emissions Error	Indicates emissions regulating system malfunction. (See Diesel Particulate Filter (DPF) System (Deluxe Panel) on Page 73)
24	Home Icon	Returns to MAIN screen.
25	Active Warnings	Accesses the list of active service codes.
26	Vitals	Accesses gauge information in digital format.
27	Service	Accesses SERVICE screen.
28	Auto Idle	Select to engage auto idle. (See Auto Idle (Deluxe Panel) on Page 48)
29	Attachments	Accesses ATTACHMENTS screen.
30	Machine Settings	Accesses various settings.
31	Scroll Buttons	Scrolls through the screen icons.
32	Enter Button	Select to view a screen or enter information.

Standard Display

Figure 15



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 68)
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 60)
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 47)
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 47)

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 84) (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 64)
9	Boom Swing or Auxiliary Hydraulics (if equipped)	Indicates what control the right joystick switch is operating. (See Boom Swing on Page 84) (See Operating Attachments With Primary Auxiliary Hydraulics on Page 60)
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 (Display) on Page 77)
12	Emissions Error	Indicates emissions regulating system malfunction. (See Diesel Particulate Filter (DPF) System (Display) on Page 77)
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 (Display) on Page 83)
15	High Exhaust System Temperature (HEST)	Indicates the exhaust temperature is higher than normal operation temperature. (See Diesel Particulate Filter (DPF) System (Display) on Page 77)
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 (Display) on Page 49)
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 64)
24	Navigation Handle	Brings up the navigation bar. (See Opening Navigation Bar on Page 242) Any active shortcuts will be displayed. (See Active Shortcuts on Page 242)
25	Fuel Priming	Indicates fuel priming is in process.

Jog Shuttle (Standard Display)

Figure 16



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

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

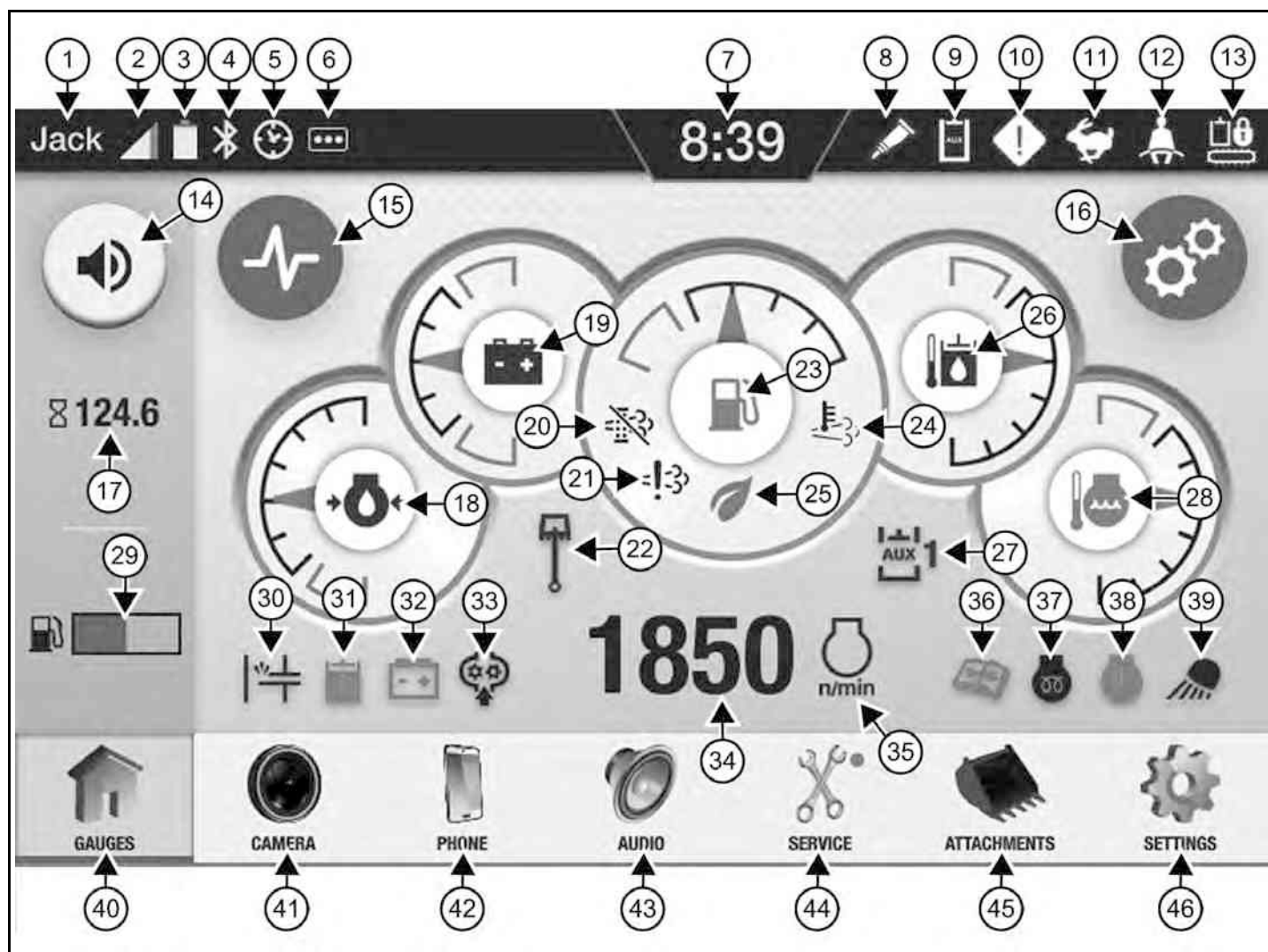
REF.	DESC.	FUNCTION
1	Not Used	
2	Auxiliary Hydraulics	Activates auxiliary hydraulics. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 60)
3	Gauges	Opens GAUGES screen.
4	Back	Returns to previous screen.
5	Lights	Turns front lights on and off.
6	Rotary Knob	Used to navigate between 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.

Touch Display

Figure 17



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 262)
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 248)
8	Direct To Tank	Indicates Direct To Tank feature has been activated. (See Enabling Direct To Tank on Page 68)
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 60)
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 47)
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 47)
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 248)
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 (Display) on Page 77)
21	Emissions Error	Indicates emissions regulating system malfunction. (See Diesel Particulate Filter (DPF) System (Display) on Page 77)
22	Boom Swing or Auxiliary Hydraulics (if equipped)	Indicates what control the left joystick switch is operating. (See Boom Swing on Page 84) (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 64)
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 (Display) on Page 77)
25	Eco Mode	Indicates Eco mode is activated. (See Eco Mode (Display) on Page 83)
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 84) (See Operating Attachments With Primary Auxiliary Hydraulics on Page 60)
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 64)
34	Engine RPM	Shows engine rpm.
35	Throttle Indicator	Manual throttle icon changes to Auto when Auto Idle is activated. (See Auto Idle (Display) on Page 49)
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 (Touch Display)

Figure 18



Navigate the display with the jog shuttle [Figure 18].

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 60)
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 18] to highlight the first selectable icon on the display screen.
- Turn the rotary knob (Item 6) [Figure 18] 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 18] 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 19

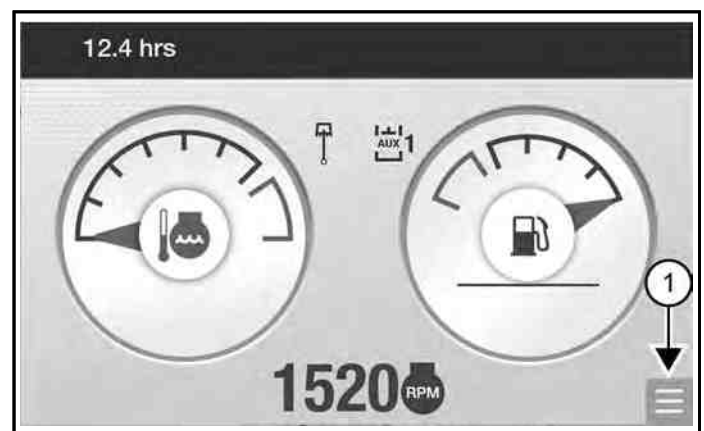


Figure 20



- To navigate to the camera, select **[NAVIGATION HANDLE]** → **[CAMERA]** (Item 1) [Figure 19] on the standard display.

OR
Select **[CAMERA]** on the touch display (Item 1) [Figure 20].

Figure 21



You can also press the right joystick button (Item 1) [Figure 21] to toggle between the camera and the current screen.

Figure 22



The rotating spinner icon (Item 1) [Figure 22] 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 249)

Cleaning And Maintaining Rear View Camera

Perform the following daily or as needed:

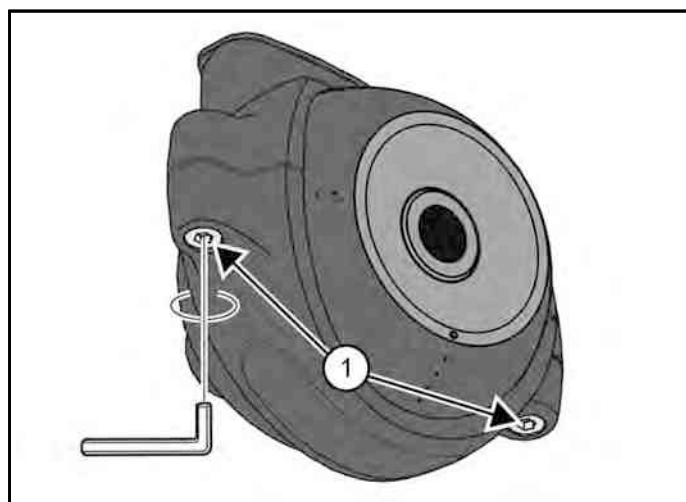
- Clean the lens of the camera using a soft cloth and clean water.
- Remove mud, snow, ice, or other debris that could affect the clear view provided by the camera system.
- Verify proper camera adjustment. Adjust camera if needed.
(See Adjusting Rear View Camera Position on Page 42)

- 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.

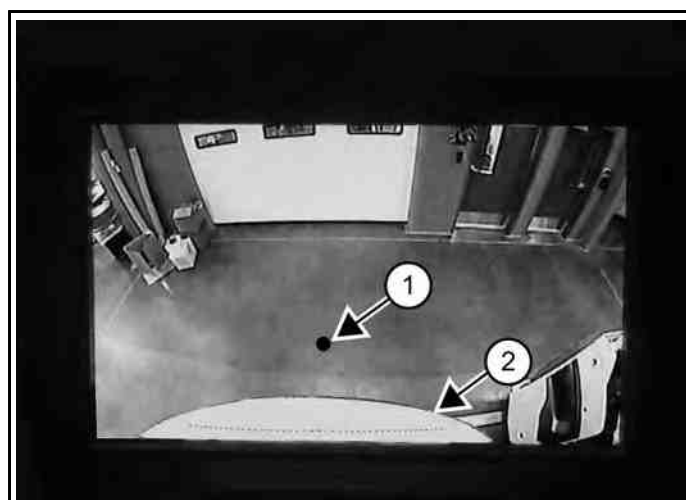
Figure 23



2. Loosen the screws (Item 1) [Figure 23] 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 24

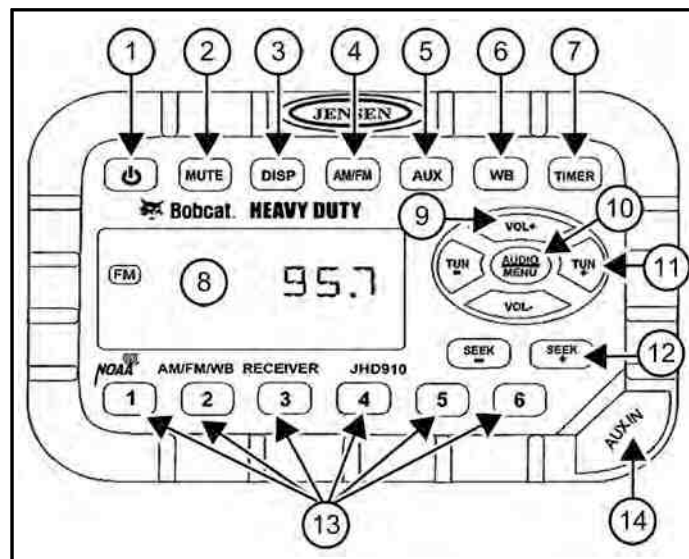


6. Adjust the camera as follows.
 - a. The mark on the ground (Item 1) [Figure 24] should be visible on the display.
 - b. The tailgate (Item 2) [Figure 24] should be just visible on the display.
 - c. The camera should be centred left and right.
7. Tighten the screws to 0,8 – 1,0 N•m (7 – 8.8 in-lb) torque.
8. Turn the key switch to off.

RADIO

Radio Identification

Figure 25



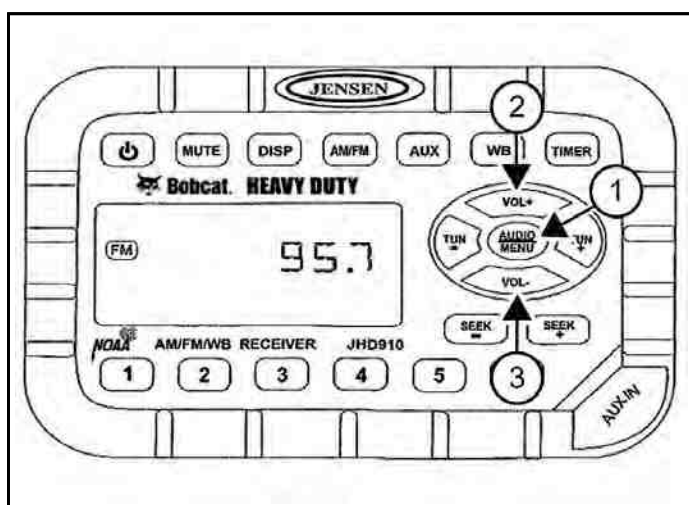
NA3090h

REF.	DESCRIPTION	FUNCTION
1	POWER	Turns the radio on / off.
2	MUTE	Mutes audio output.
3	DISP	Switches between display operation functions of the radio.
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.
7	TIMER	Accesses timer mode.
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.
11	TUN- / TUN+	Manually tunes the radio frequency up and down.
12	SEEK- / SEEK+	Automatically tunes frequency up or down to next strong station.

REF.	DESCRIPTION	FUNCTION
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.

Adjusting Radio Settings

Figure 26



- 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.

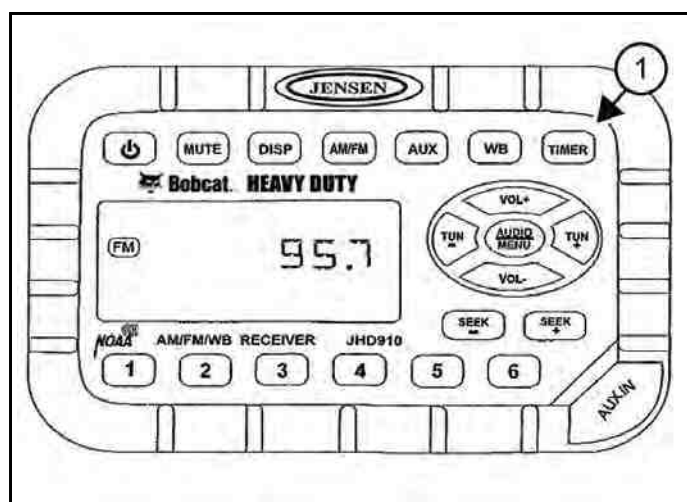
WB Alert: Determines if weather band alert features is activated.

- ▷ Use the VOL+ (Item 2) and VOL- (Item 3) buttons [Figure 26] to adjust the active setting.

Normal operation will resume automatically.

Operating Radio Timer

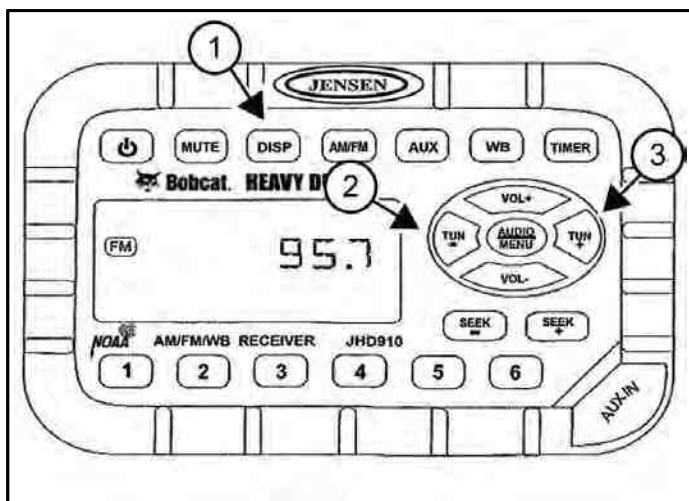
Figure 27



- Press the TIMER (Item 1) [Figure 27] button to start the timer function.
- Press TIMER (Item 1) [Figure 27] again to stop timer.
- Press and hold TIMER (Item 1) [Figure 27] to reset timer and exit from timer mode.

Operating The Radio Clock

Figure 28



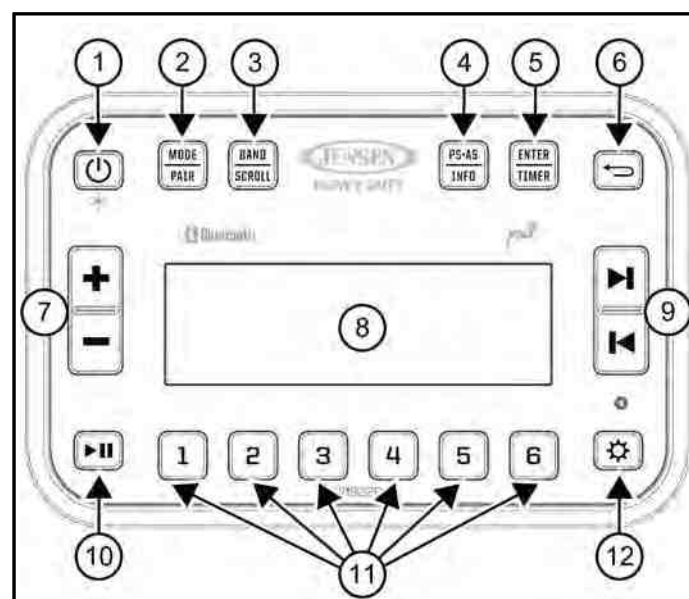
- Press and hold the DISP (Item 1) button [Figure 28] to enter clock setting mode.
- Use TUN – button (Item 2) [Figure 28] to adjust hours.
- Use TUN + button (Item 3) [Figure 28] to adjust minutes.

Normal operation will resume automatically.

RADIO (BLUETOOTH)

Radio Identification

Figure 29



REF.	DESCRIPTION	FUNCTION
1		Power button.
2		Press to select mode or to pair device.
3		Press to select band: FM1, FM2, AM1, AM2.
4		Present Scan / Automatically Store Press to scan stations stored in the current band. Press and hold for 2 seconds to store a station.
5		(See Navigating System Menu on Page 46)
6		Press to select option.
7		Press to adjust ranges or volume.
8	Display Screen	Displays the time, frequency, and activated functions.
9		Press to navigate menu. (See Navigating System Menu on Page 46)

REF.	DESCRIPTION	FUNCTION
10		Press to pause or mute audio output.
11	Preset Stations	Press and hold to store current station. Press to recall station.
12		Press to access menu. (See Navigating System Menu on Page 46)

Navigating Audio Menu

1. Press the  button to access the audio menu.
2. Navigate through the audio menu by pressing the  and  buttons.
3. Once the desired menu item appears on the display, adjust that option by pressing  or  buttons within 5 seconds.

The following items can be adjusted:

- Loudness
- Bass Level
- Treble Level
- Balance.

Navigating System Menu

1. Press and hold the  button for more than 2 seconds to access the system menu.
2. Navigate through the system menu by pressing the  or  buttons.
3. Once the desired menu item appears on the display, adjust that option by pressing the  button.

ENTER

4. Press **TIMER** to select the desired item.

The following items can be adjusted:

- LCD Dimmer
- Bluetooth Devices
- Clock Set
- Low Voltage Alarm (On / Off)
- Low Voltage Auto Off (On / Off)
- Preset-Only Tuning (On / Off)
- Tuning Region
- USA Tuning Region
- Europe or Japan Tuning Regions

Pairing A Bluetooth Device

1. On your personal Bluetooth device, enter the Bluetooth settings list. Make sure your device has Bluetooth turned on and is searching for new devices.
2. Press and hold **MODE** **PAIR** for 3 seconds to make the radio available on your Bluetooth device.
3. Select JHD922BT on your Bluetooth device.
Enter pairing password (0000) if requested.
4. During playback, press the  or  buttons to play the previous or next track.
5. During playback, press the  button to pause the Bluetooth player.

Press again to resume playback.

RAISING AND LOWERING THE CONSOLE

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

Figure 30



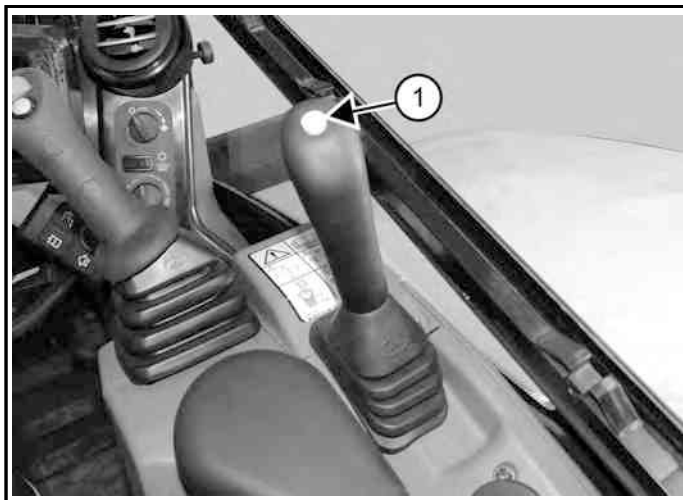
- Before operating the excavator, lower the left console [Figure 30].
Push down on the handle until the latch is engaged.
- Before exiting the cab, raise the left console by pulling up on the handle.
The lift spring will assist in raising the console.

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

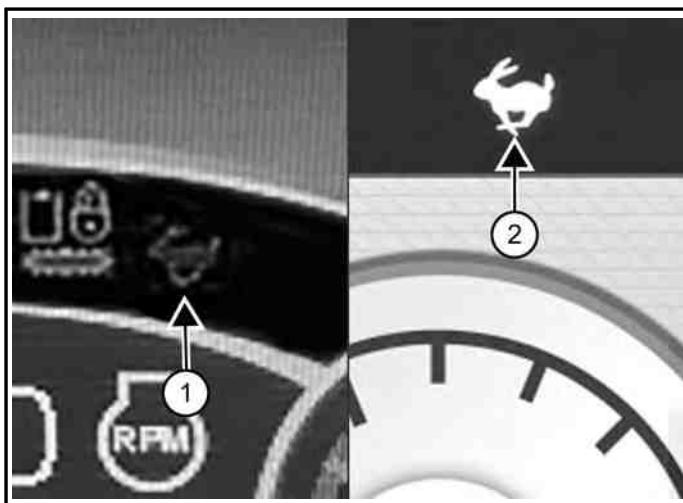
Engaging Two-Speed Travel (Without Angle Blade Option)

Figure 31



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

Figure 32



Two beeps will be heard.

The high range icon ((Item 1) for the panel or (Item 2) for the display) will illuminate [Figure 32].

2. 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 (DELUXE PANEL)

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. Press the arrow buttons to scroll to the auto idle icon.

Figure 33



P97990b

2. Press the Enter button (Item 1) [Figure 33] once to engage automatic idle.
3. Press the Enter button (Item 1) [Figure 33] again to turn auto idle off.

NOTE: The time delay for auto idle to activate can be adjusted.
(See Setting Auto Idle Time Delay on Page 239) \

AUTO IDLE (DISPLAY)

Auto Idle Description

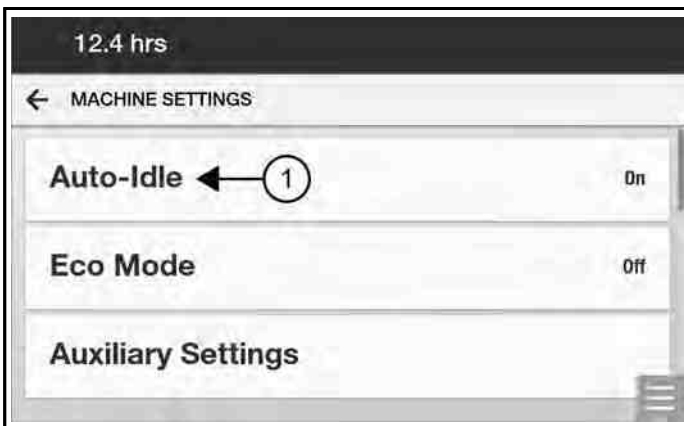
When auto idle is activated, engine speed will be reduced to low idle when the control levers (joystick, blade, travel, etc.) are in neutral and have not been used for the auto idle delay time. The engine rpm will return to the set position as soon as any control lever is activated.

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

Activating Auto Idle

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

Figure 34



2. Select **[AUTO-IDLE]** to turn it on / off (Item 1) [Figure 34].

The Auto-Idle Delay Time can be changed on the touch display. (See Activating Auto Idle on Page 258)

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

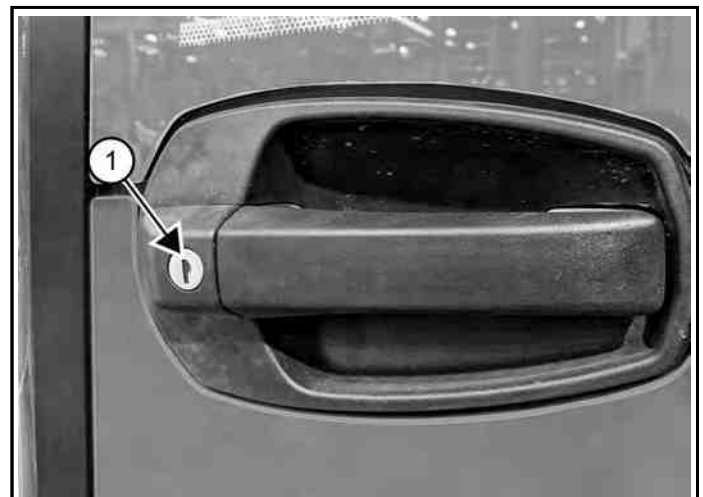
MODIFICATION HAZARD

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.

Operating The Cab Door

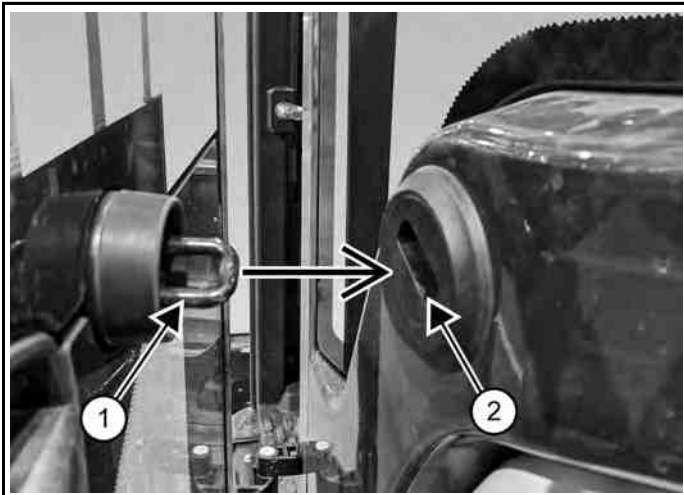
Figure 35



- Pull on the latch to open the door.

The cab door can be locked (Item 1) [Figure 35] with the same key as the starter switch.

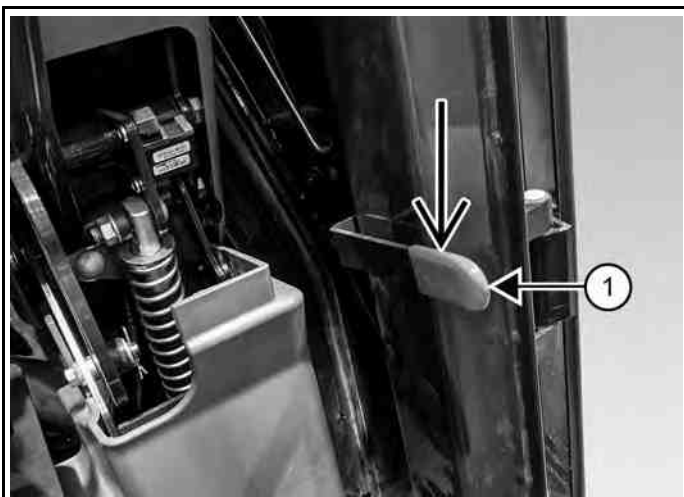
Figure 36



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 36].

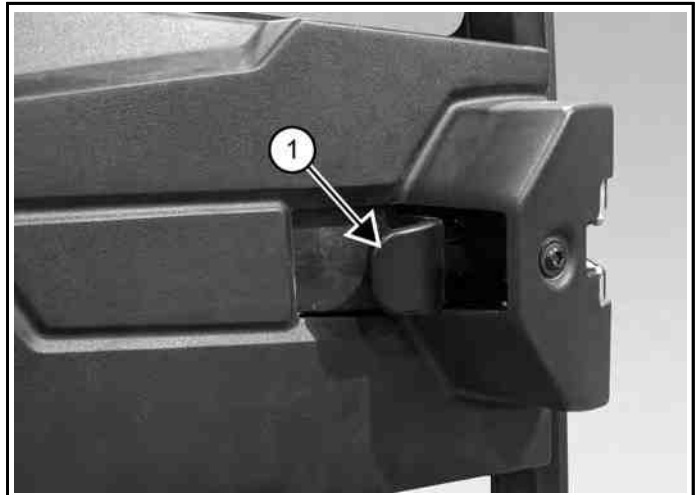
Figure 37



C206628a

- When the door is in the open position, push the latch (Item 1) [Figure 37] to release the door.

Figure 38

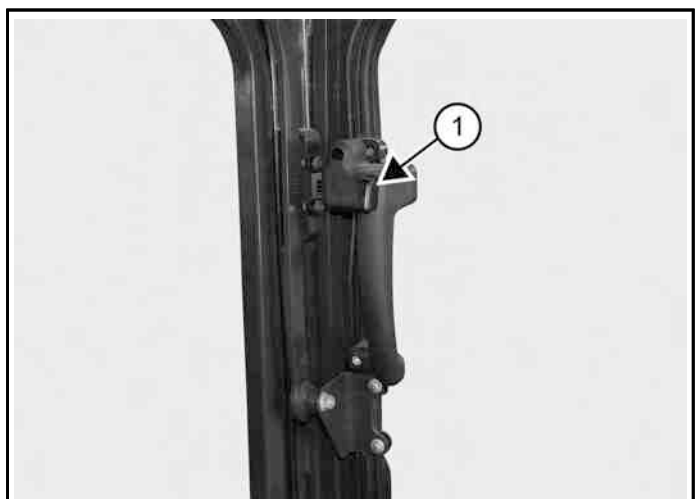


C206629a

- From inside the cab, open the door using the handle (Item 1) [Figure 38].

Operating The Front Window

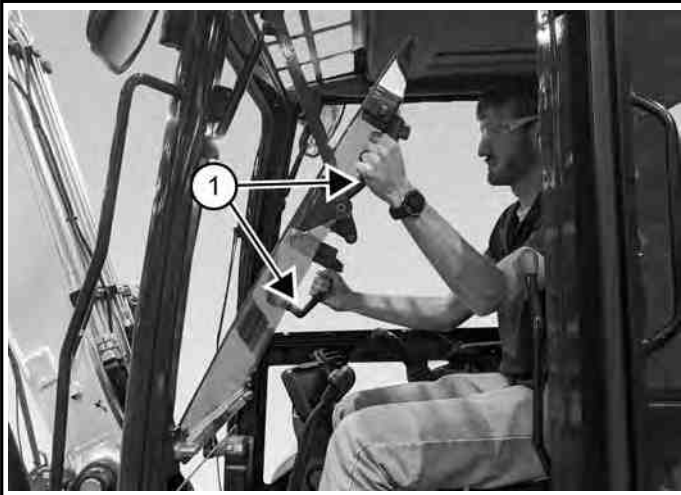
Figure 39



P20095a

1. Push the window latch buttons (Item 1) [Figure 39] on both sides.

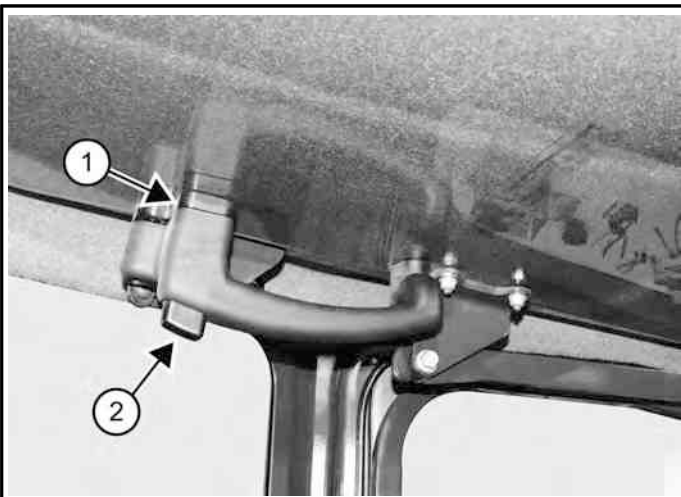
Figure 40



C206630a

2. Use both window grab handles (Item 1) [Figure 40] to pull the top of the window in.

Figure 41



P200096a

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

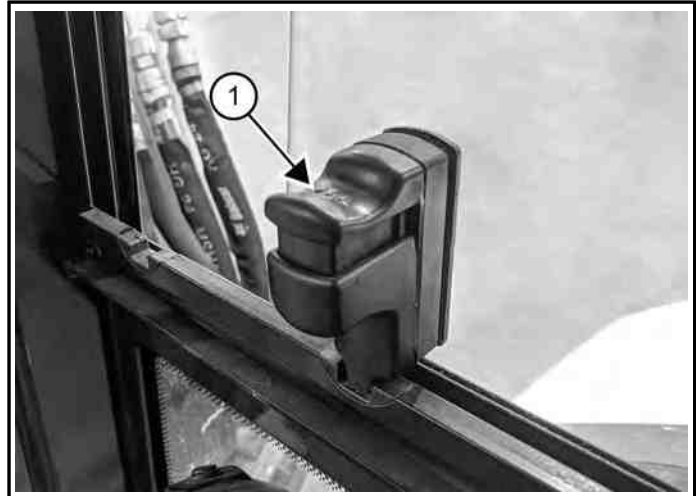
When the window is fully raised, the latch (Item 1) (both sides) [Figure 41] will close on the bracket in the latched position.
4. Pull down and forward slightly on the window to make sure it is fully latched.
5. To close the window, use both window grab handles to support the window while pressing the window latch button (Item 2) [Figure 41] (both sides).

Use both window grab handles (Item 1) [Figure 40] 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 39].

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 42

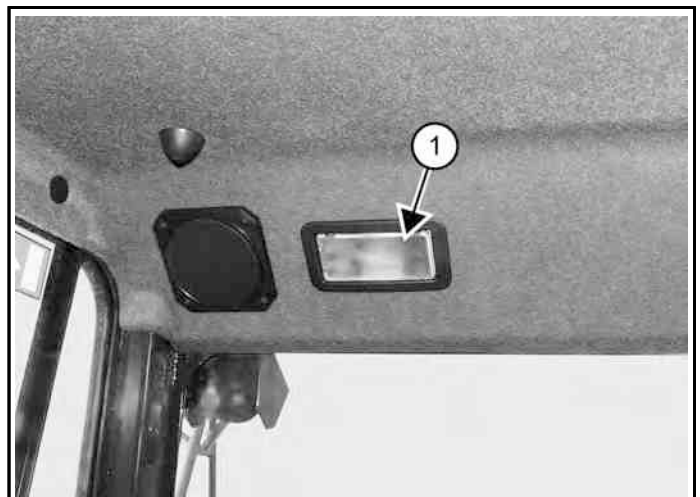


C206631a

1. Pinch the latch together (Item 1) [Figure 42] and pull the window open.
2. Release the lever (Item 1) [Figure 42] 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 43

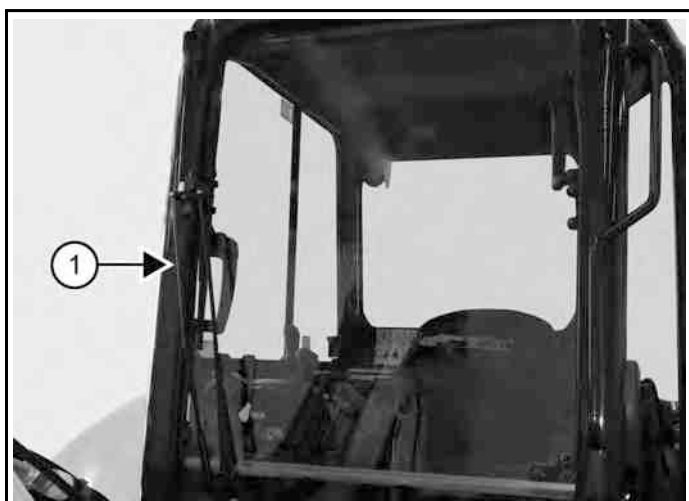


P200087a

1. Push either side of the lens (Item 1) [Figure 43] to turn the light on.
2. Return the lens to the middle position to turn the light off.

Operating Windshield Wiper

Figure 44



The front window is equipped with a windshield wiper (Item 1) [Figure 44] and washer.

Figure 45



1. Press the switch (Item 1) [Figure 45] to the left to turn the windshield wiper on.
2. Press and hold switch (Item 1) [Figure 45] to the left to activate windshield washer.
3. Press the switch (Item 1) [Figure 45] to the right to turn the windshield wiper off.

Window Washer Reservoir

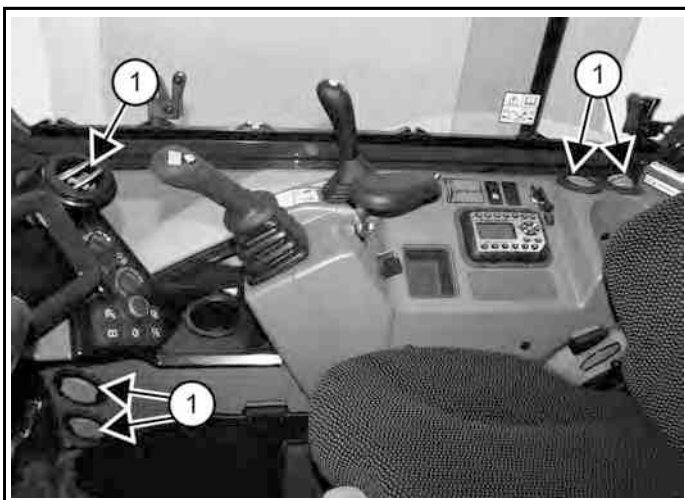
Figure 46



The window washer reservoir (Item 1) [Figure 46] is located under the right side cover.

Heating, Ventilation, And Air Conditioning Ducting

Figure 47



The HVAC louvers (Item 1) [Figure 47] 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 48



C206630

You can make an emergency exit through the front window. (See Operating The Front Window on Page 50)

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 49



C132085

You can make an emergency exit through the right window. (See Operating The Right Windows on Page 51)

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 controls 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 192)

⚠ WARNING

CRUSHING HAZARD

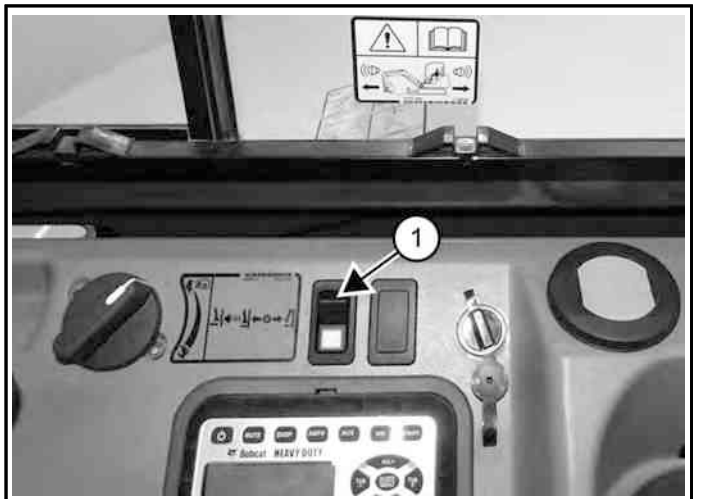
Failure to maintain a clear view in the direction of travel can cause serious injury or death.

- 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 50



C200665c

- Press the travel motion alarm switch (Item 1) [Figure 50] 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.

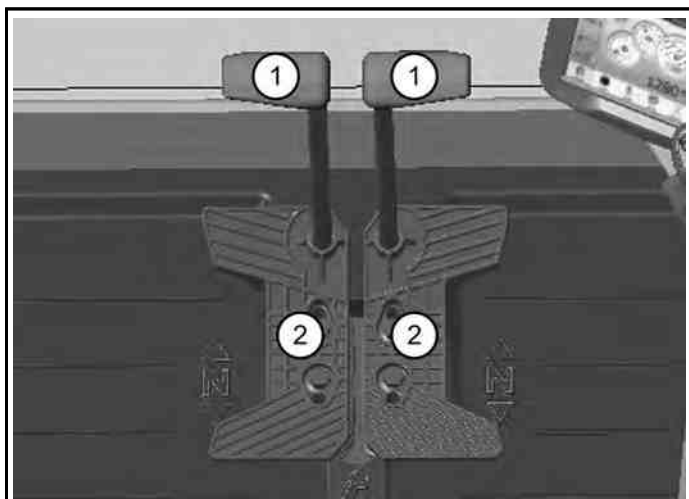
TRAVEL CONTROLS

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 51



2. Slowly move both steering levers (Item 1) [Figure 51] forward for forward travel, backward for reverse travel.

OR

Control travel with the foot pedals (Item 2) [Figure 51].

WARNING

UNINTENDED MOVEMENT HAZARD

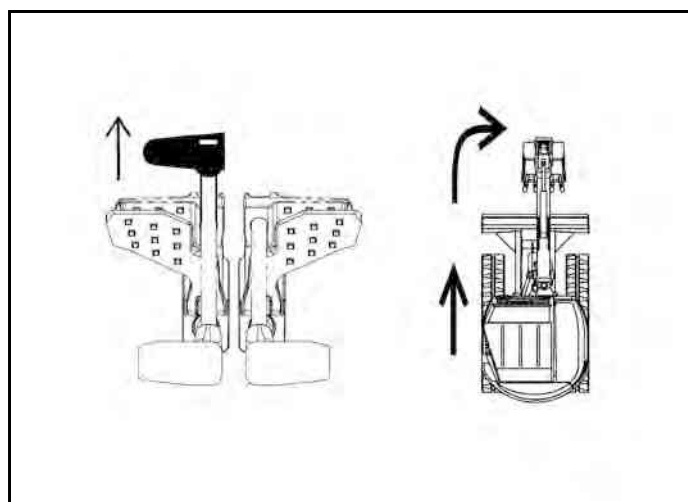
Failure to follow instructions can cause serious injury or death.

- 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

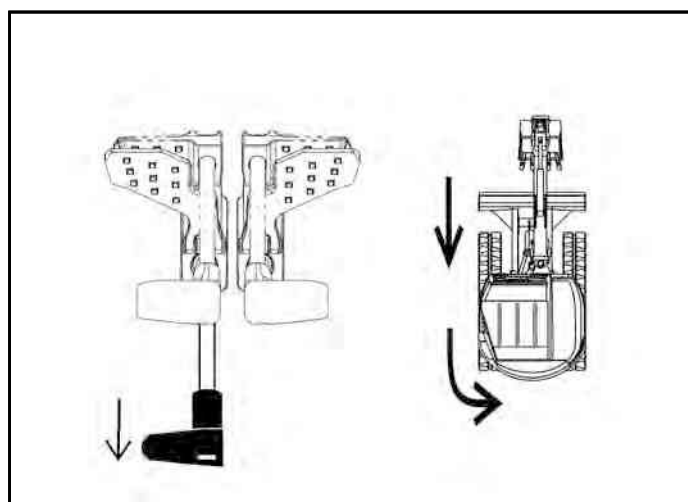
Figure 52



NA15007B

- Push the left steering lever forward to turn right while travelling forward [Figure 52].

Figure 53

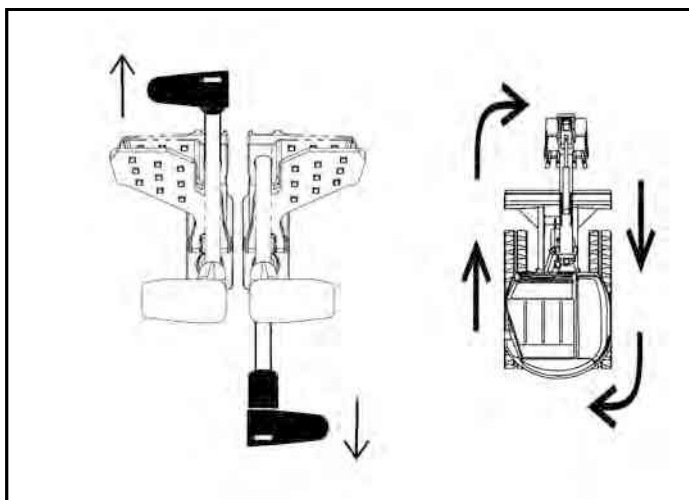


NA15010B

- Pull the left steering lever backward to turn right while travelling backward [Figure 53].

Making A Counter-Rotation Right Turn

Figure 54

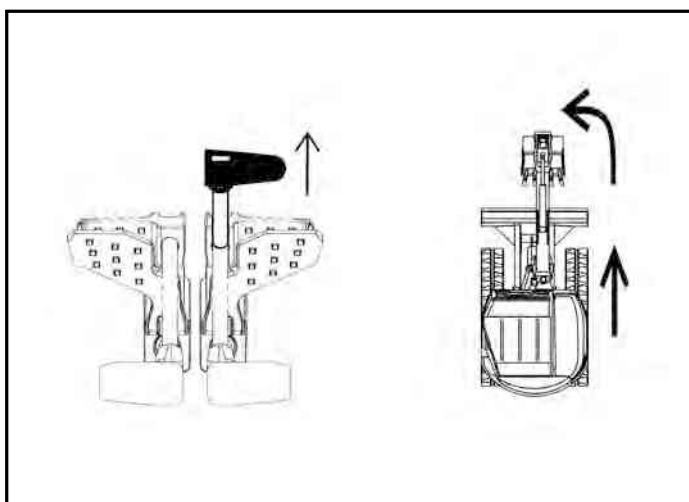


NA15007A

- Push the left steering lever forward and pull the right steering lever backward [Figure 54].

Making A Left Turn

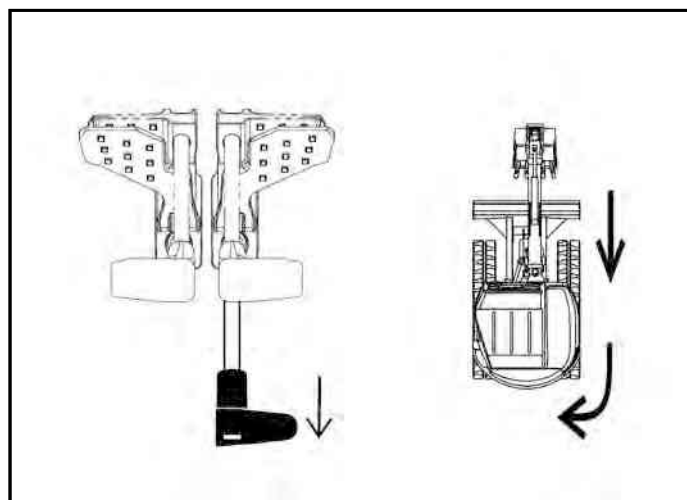
Figure 55



NA15008A

- Push the right steering lever forward to turn left while travelling forward [Figure 55].

Figure 56

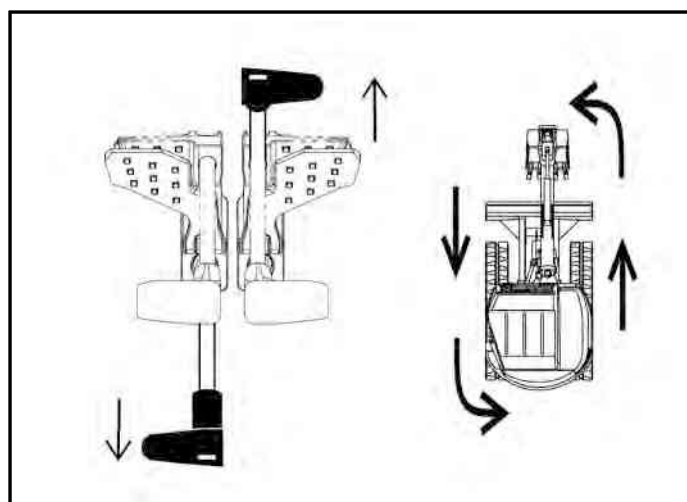


NA15009A

- Pull the right steering lever backward to turn left while travelling backward [Figure 56].

Making A Counter-Rotation Left Turn

Figure 57



NA15010A

- Push the right steering lever forward and pull the left steering lever backward [Figure 57].

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

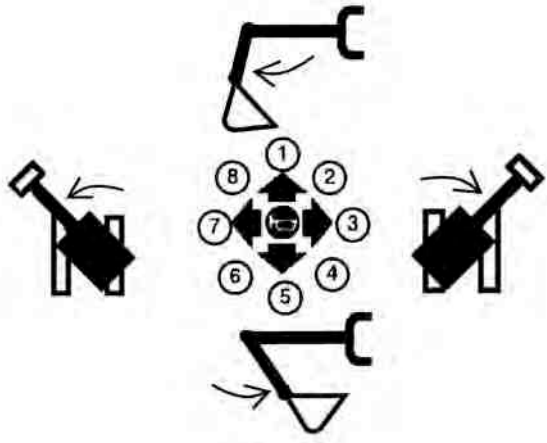
Failure to follow instructions can cause serious injury or death.

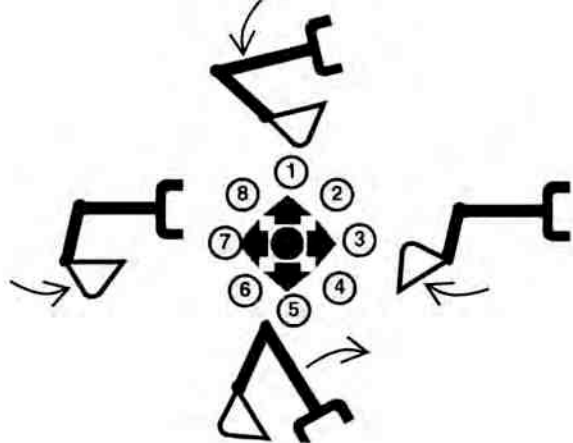
Before leaving the machine:

- 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

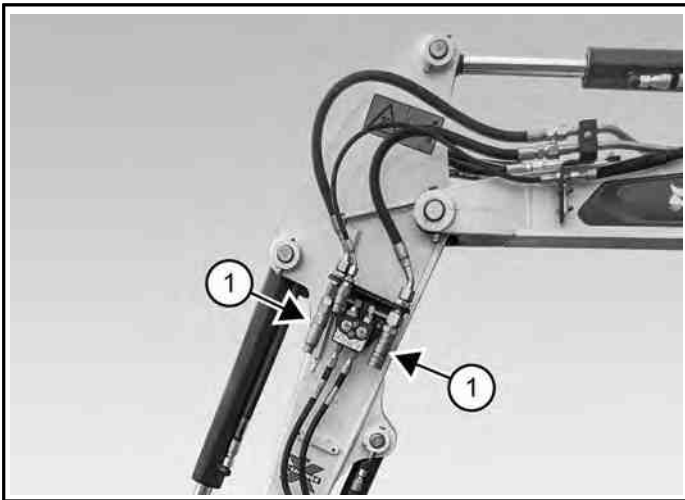
LEFT JOYSTICK	
 P134139e	
JOYSTICK POSITION	FUNCTION
1	Arm out
2	Arm out and slew right
3	Slew right
4	Arm in and slew right
5	Arm in
6	Arm in and slew left
7	Slew left
8	Arm out and slew left

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 COUPLER

Quick Coupler Description

Figure 58



C212278a

The excavator and attachments are supplied with flush faced couplers. The couplers are mounted on the arm of the excavator (Item 1) [Figure 58].

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

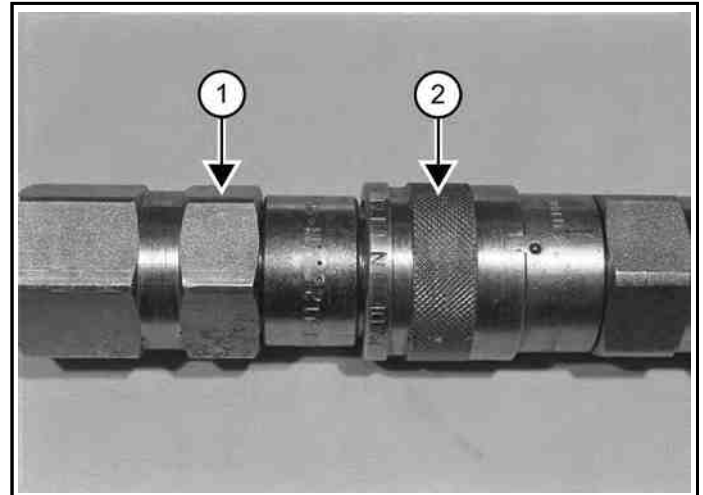
1. Remove any dirt or debris from the surface of both the male and female couplers, and from the outside diameter of the male coupler.
2. Visually check the couplers for corroding, cracking, damage, or excessive wear.

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 59



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 59].

Pressure can build up in the auxiliary hydraulic lines, making it difficult to connect or disconnect the auxiliary quick couplers. Release hydraulic pressure in the lines when necessary.
(See Releasing Hydraulic Pressure in Excavator on Page 62)
(See Releasing Hydraulic Pressure In Excavator on Page 59)

PRIMARY AUXILIARY HYDRAULICS
(DELUXE PANEL)

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. ◀

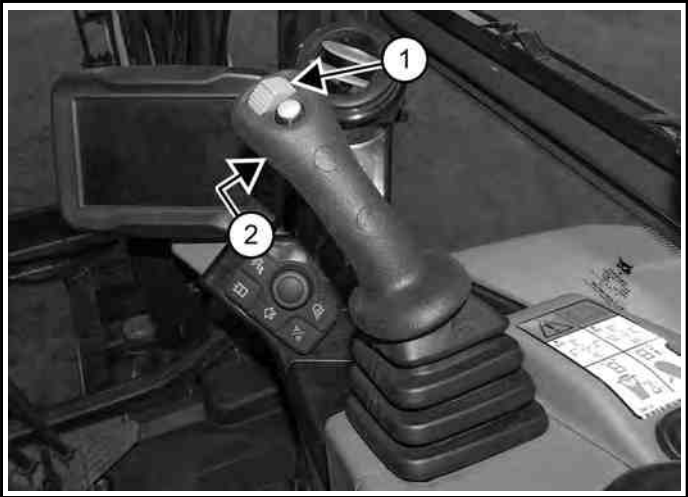
Either Selectable Auxiliary Hydraulic Flow or Continuous Auxiliary Hydraulic Flow can be used for primary auxiliary hydraulics. Choose the hydraulic flow that best matches your attachment's hydraulic requirements.

Figure 60



1. Press button 6 (Item 1) [Figure 60] to enable **Selectable Auxiliary Hydraulics Flow**.
2. Press and hold button 6 (Item 1) [Figure 60] for more than one second to enable **Continuous Auxiliary Hydraulics Flow**.
3. Adjust the hydraulic flow to best meet the needs of the attachment.
(See Setting Auxiliary Hydraulics Flow Rate on Page 58)

Figure 61



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

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.

Setting Auxiliary Hydraulics Flow Rate

1. Press button 7 (Item 2) [Figure 60] to open the **AUXILIARY SETTINGS** screen.

Figure 62



2. On the **AUXILIARY SETTINGS** screen, press buttons 1 or 6 to scroll through the settings [Figure 62]. See the table below for an explanation of the icons.
3. Select the icon that corresponds to your attachment or select one of the Custom settings to save your own flow rates.
4. Adjust the flow rate percentages with buttons 2 – 4 and 7 – 9.

After changing a flow rate, press the save icon to save the setting.

5. Press button 0 to return to the **GAUGE** screen.
6. Press button 5 to return settings to the default setting.

ICON	DESCRIPTION
	Selectable Flow
	Continuous Flow
	Secondary Flow
	Auger
	Cutter / Crusher
	Breaker

ICON	DESCRIPTION
	Rotating Grapple
	Flail Mower
	Tilt Coupler
	Custom Setting 1
	Custom Setting 2
	Custom Setting 3

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 63



4. Press either scroll button (Item 1) [Figure 63] until the screen is visible.
5. Press button 6 and the **[AUX PRESSURE RELEASE]** screen will appear.

Figure 64



6. Press the Enter button (Item 1) [Figure 64] to release auxiliary pressure in the excavator.

An hour glass symbol will appear. When pressure is released, the screen will display **[AUXILIARY PRESSURE RELEASE]**.

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. (See Releasing Hydraulic Pressure in Excavator on Page 62)
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.

PRIMARY AUXILIARY HYDRAULICS (DISPLAY)

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. ◀

Figure 65



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

Figure 66



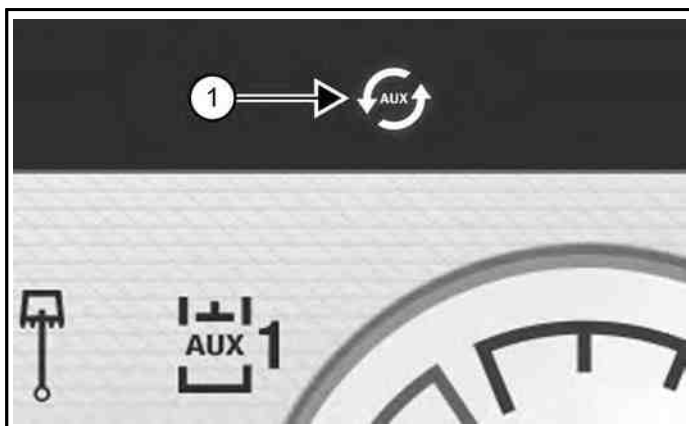
The auxiliary hydraulics icon (Item 1) [Figure 66] will turn ON.

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

OR

To activate detent mode, press and hold the AUX button (Item 1) [Figure 65] on the jog shuttle again for at least one second.

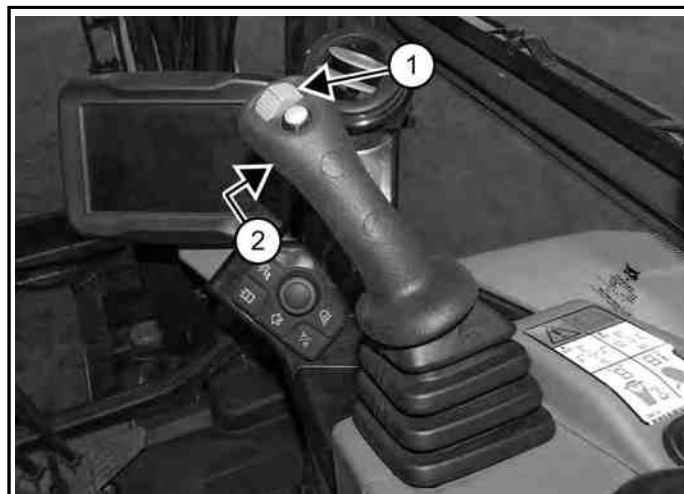
Figure 67



A beep will be heard and the detent icon (Item 1) [Figure 67] 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 61)
(See Setting Auxiliary Hydraulics Flow Rate on Page 257)
4. To operate the attachment with primary auxiliary hydraulics, see the following table:

Figure 68



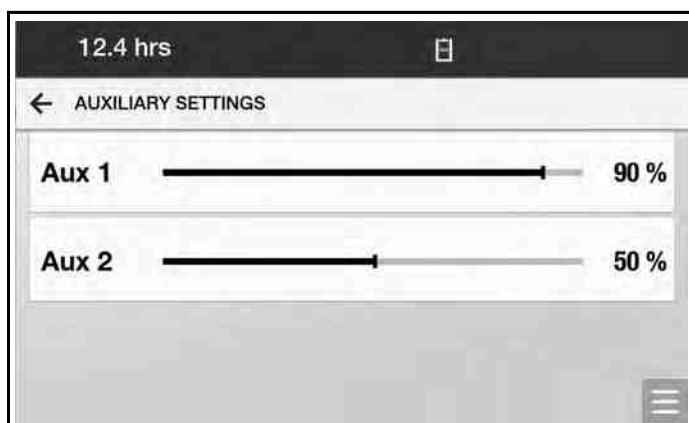
ACTION	RESULT
Move right joystick switch (Item 1) to the right.	Supply hydraulic flow to female coupler.
Move right joystick switch (Item 1) to the left.	Supply hydraulic flow to male coupler.
Move right joystick switch (Item 1) halfway.	Auxiliary functions move at approximately one-half speed.
Press 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 65] on the jog shuttle.

Setting Auxiliary Hydraulics Flow Rate

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

Figure 69



- Adjust the flow rate of the auxiliary hydraulics to best match the attachment / operator requirements [Figure 69].

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 257)

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.

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

Figure 70



- Press the AUX button (Item 1) [Figure 70] on the jog shuttle to enable auxiliary hydraulics.
- Move the right joystick switch (Item 1) [Figure 68] 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 256)

Releasing Hydraulic Pressure In Attachments

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

- Release hydraulic pressure in the excavator.
(See Releasing Hydraulic Pressure in Excavator on Page 62)
- 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.
- Connect the female coupler from the attachment.

SECONDARY AUXILIARY HYDRAULICS (DELUXE PANEL)

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

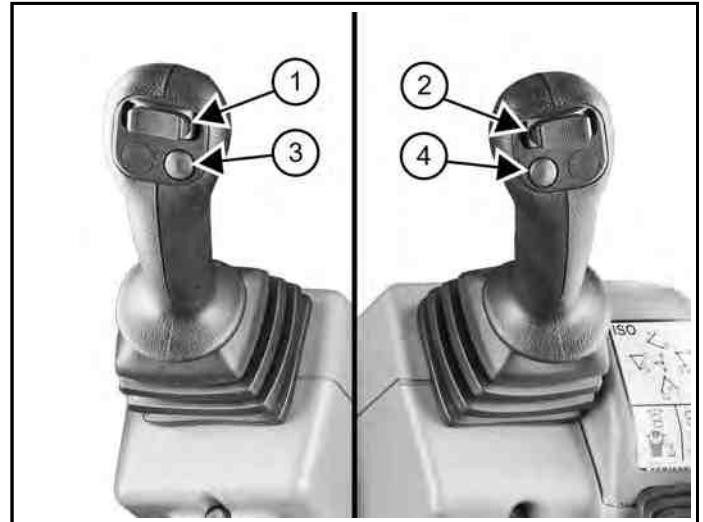
Figure 71



1. Activate auxiliary hydraulics by pressing button 6 (Item 1) [Figure 71].

The display will indicate the left joystick controls boom swing offset and the right joystick controls primary auxiliary hydraulics (Aux 1) (Item 2) [Figure 71].

Figure 72



2. Press the left joystick button (Item 3) [Figure 72] until two beeps are heard to select Aux 2.

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

Figure 73



The display will indicate the left joystick controls secondary auxiliary hydraulics (Aux 2) and the right joystick controls primary auxiliary hydraulics (Aux 1) (Item 1) [Figure 73].

3. Operate the attachment with the joysticks.

- Use the left joystick switch (Item 1) [Figure 72] to control the hydraulics indicated on the left side of the display panel (OF, or Aux 2).
- Use the right joystick switch (Item 2) [Figure 72] to control the hydraulics indicated on the right side of the display panel (Aux 1).

Set the auxiliary hydraulic flow rate.
(See Setting Auxiliary Hydraulics Flow Rate on Page 58)

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 76] until a beep is heard to switch to the secondary auxiliary hydraulics.

The secondary auxiliary hydraulic icon (Item 1) [Figure 77] will be on when activated.

5. Move the left joystick switch (Item 2) [Figure 76] 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.

SECONDARY AUXILIARY HYDRAULICS (DISPLAY)

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 74



C206625a

1. Press the AUX button (Item 1) [Figure 74] on the jog shuttle to activate auxiliary hydraulics.

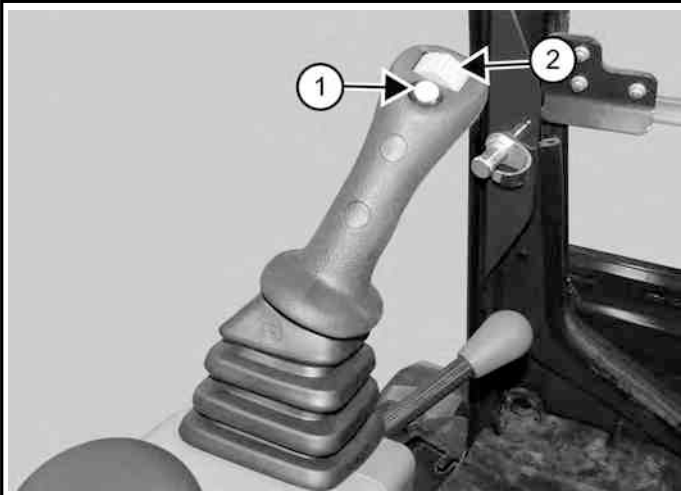
Figure 75



NA3773b

The auxiliary hydraulics icon (Item 1) [Figure 75] will turn on.

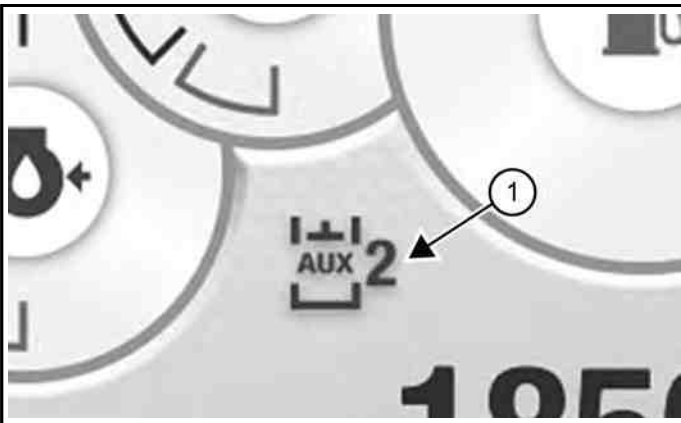
Figure 76



P200104a

2. Press and hold the button (Item 1) [Figure 76] on the left joystick until a beep is heard to switch from boom swing function to secondary auxiliary hydraulics.

Figure 77



C132982b

The second auxiliary hydraulics icon (Item 1) [Figure 77] 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 61)
(See Setting Auxiliary Hydraulics Flow Rate on Page 257)
4. Use the left joystick switch (Item 2) [Figure 76] 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 74] 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 76] until a beep is heard to switch to the secondary auxiliary hydraulics.

The secondary auxiliary hydraulic icon (Item 1) [Figure 77] will be on when activated.

5. Move the left joystick switch (Item 2) [Figure 76] to the right and left several times to release pressure.

Releasing Secondary Auxiliary Hydraulic Pressure In Attachments

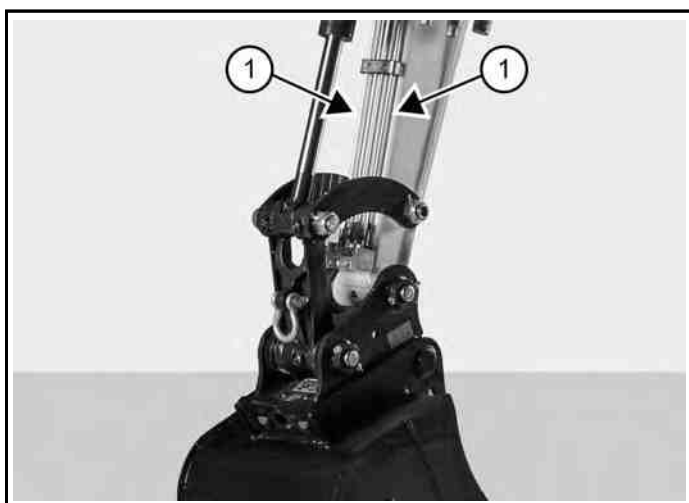
Hydraulic pressure in the auxiliary hydraulic system can make it difficult to engage quick couplers to an attachment.

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 78



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 78] and connect to the port block on the arm.

Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics

⚠ WARNING

MODIFICATION HAZARD

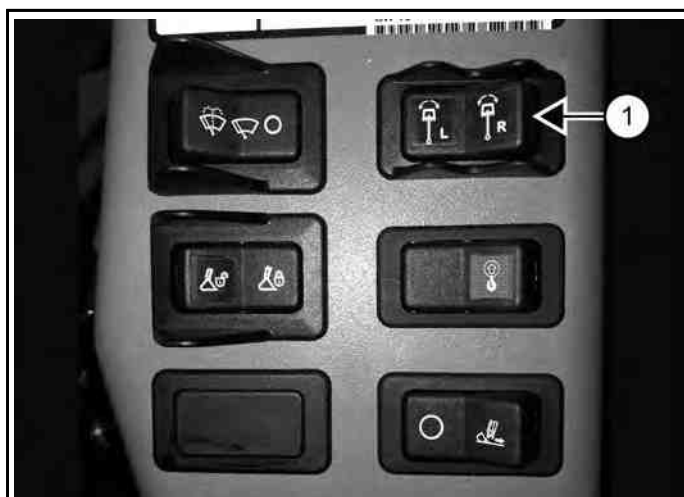
Unapproved attachments can cause serious injury or death.

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 79



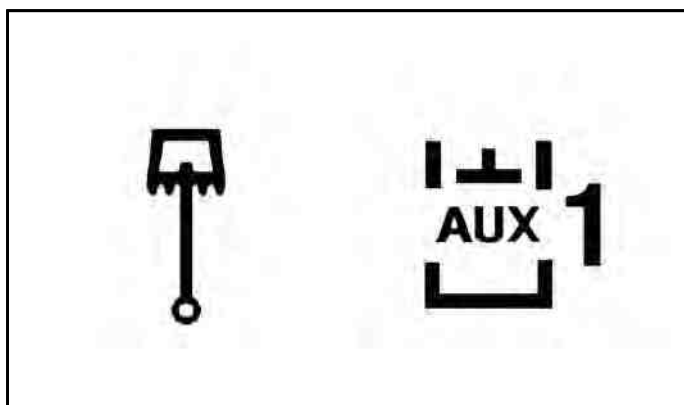
C208528a

1. Push the Boom Swing switch (Item 1) [Figure 79] 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.

2. Activate auxiliary hydraulics.
(See Primary Auxiliary Hydraulics (Deluxe Panel) on Page 58)
(See Primary Auxiliary Hydraulics (Display) on Page 60)

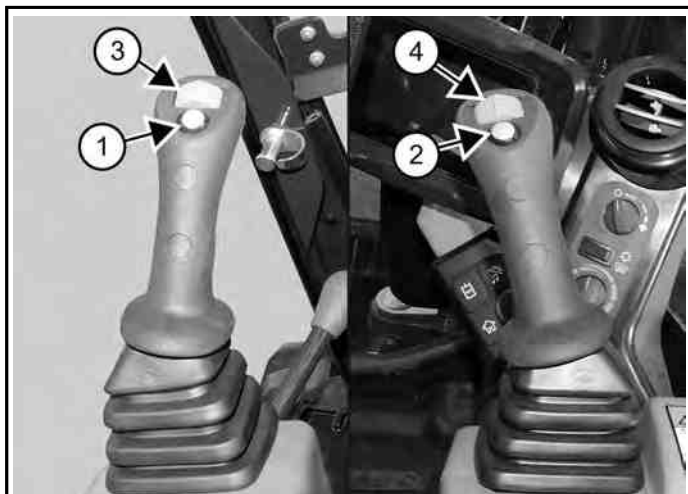
Figure 80



NA3773e

The display will indicate the left joystick controls boom swing and the right joystick controls primary auxiliary hydraulics [Figure 80].

Figure 81



3. Press the joystick buttons to toggle to the desired joystick control configuration. (See Auxiliary Hydraulics Settings Sequence on Page 67)

- Press the left joystick button (Item 1) [Figure 81] until two beeps are heard to select Boom Swing, Aux 2, or Aux 4.
- Press the right joystick button (Item 2) [Figure 81] 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 79]. 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 81] 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 81] 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 79] to the right to transfer boom swing control to the right joystick.

After you push the Boom Swing switch, auxiliary hydraulics will deactivate. Push the button again to reactivate auxiliary hydraulics.

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 (DELUXE PANEL)

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.

Figure 82



C20507 th

1. Press button 2 (Item 1) [Figure 82] to turn direct to tank on.
The direct to tank icon will illuminate.
2. Press button 2 (Item 1) [Figure 82] again to turn direct to tank off.

DIRECT TO TANK (DISPLAY)

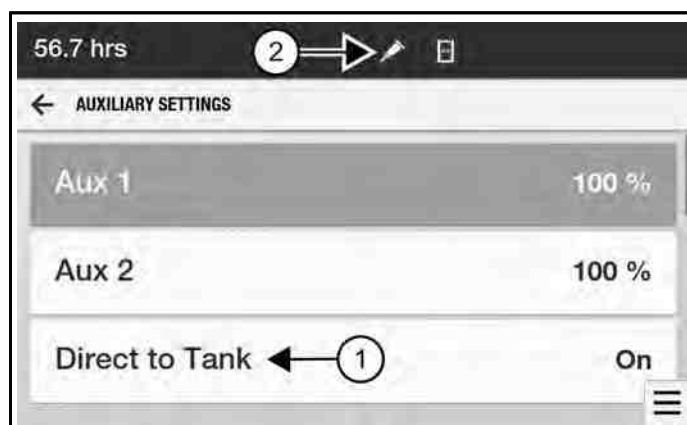
Enabling Direct To Tank

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 83



NA3984

2. Select **[DIRECT TO TANK]** (Item 1) [Figure 83].
The direct to tank icon (Item 2) [Figure 83] will illuminate.

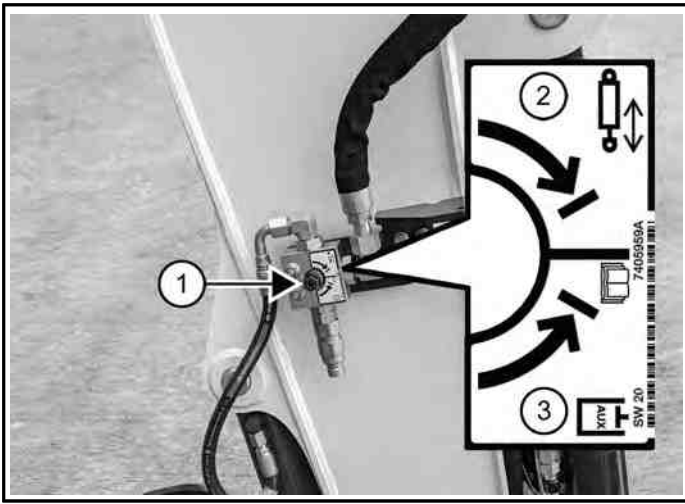
DIVERTER VALVE

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. Release hydraulic pressure in the excavator.
(See Releasing Hydraulic Pressure in Excavator on Page 62)
2. Before diverting to the hydraulic clamp, disconnect the attachment from the primary hydraulic couplers.

Figure 84



3. Rotate the valves (Item 1) on both sides of the arm clockwise to operate the hydraulic clamp (Item 2) [Figure 84].
4. Rotate both valves anticlockwise to operate the primary auxiliary quick couplers (Item 3) [Figure 84].

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.

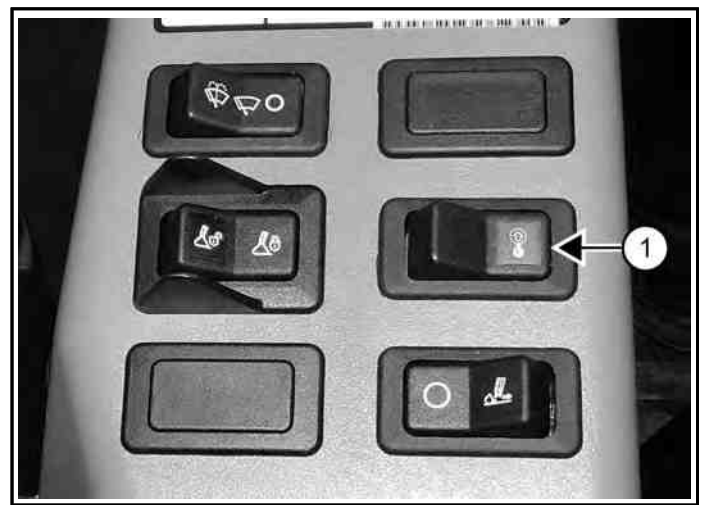
When the overload warning device (if equipped) is engaged, a warning buzzer will sound and the general warning icon will flash on the display if the work group is overloaded.

⚠ WARNING

CRUSHING HAZARD

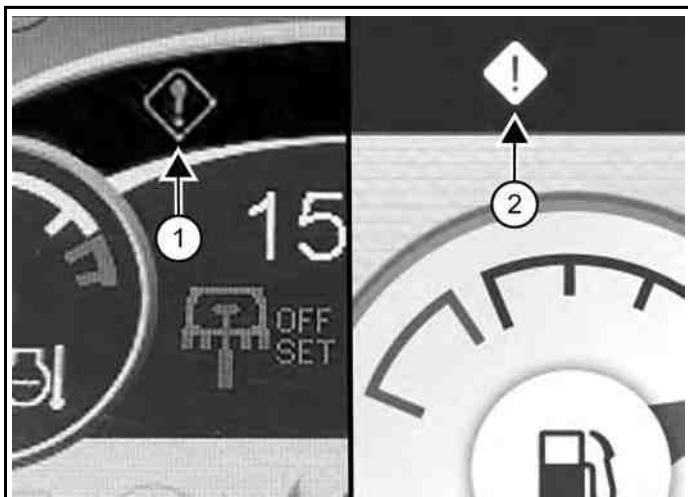
Falling equipment can cause serious injury or death. DO NOT work or stand under raised work equipment or attachment. ◀

Figure 85



1. Press the switch (Item 1) [Figure 85] to the right to enable the overload warning device.

Figure 86



C205071f

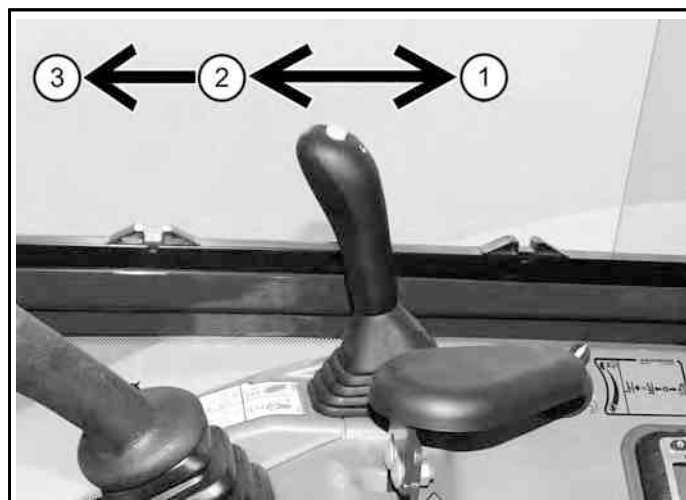
If the boom is overloaded, the general warning icon will illuminate (Item 1) (panel) or (Item 2) (display) [Figure 86]. A buzzer will sound.

2. Disengage the overload warning device by pressing the switch (Item 1) [Figure 85] to the left.
3. Immediately bring the arm toward the machine, lower the boom, and reduce the load before continuing operation.
4. Disengage the overload warning device by pressing the switch (Item 1) [Figure 85] to the left.

BLADE CONTROL LEVER

Raising And Lowering The Blade

Figure 87



P200125a

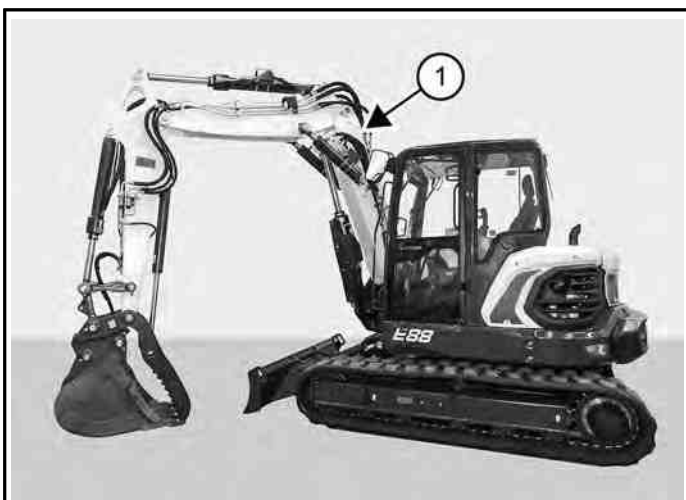
- Pull the lever backward (Item 1) [Figure 87] to raise the blade.
- Push the lever forward (Item 2) [Figure 87] to lower the blade.
- Push the lever forward until the lever is in the locked position (Item 3) [Figure 87] to put the blade in the float position.
 - ▷ Pull the lever backward to unlock from the float position.

Keep blade lowered for increased digging performance.

ARTICULATED BOOM

Operating The Articulated Boom

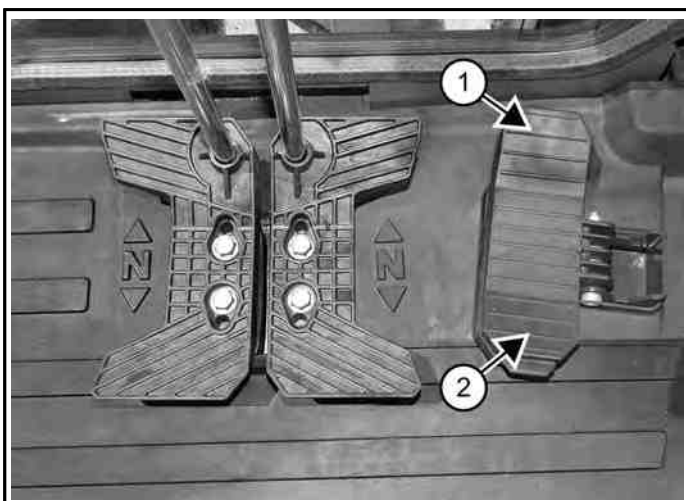
Figure 88



C211704a

Your excavator may be equipped with an articulated boom (Item 1) [Figure 88]. The articulated boom is controlled by a pedal located to the right of the travel control pedals.

Figure 89



C215837a

1. Push the toe of the pedal (Item 1) [Figure 89] to extend the articulated boom.
2. Push the heel of the pedal (Item 2) [Figure 89] to retract the articulated boom.

DIESEL PARTICULATE FILTER (DPF) SYSTEM DESCRIPTION

DPF Description

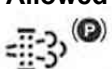
The engine exhaust system is equipped with a Diesel Particulate Filter (DPF).

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 77)
Forced Regeneration	The operator activates a forced regeneration. This selection requires confirmation after certain machine conditions are met. (See Forced Regeneration Operation on Page 78)
Forced Parked Regeneration	The operator activates a forced parked regeneration. This selection requires confirmation after certain machine conditions are met. (See Forced Parked Regeneration Operation on Page 79)
Service Regeneration	Your Bobcat dealer uses specialized equipment to perform a service regeneration.
Inhibit Mode	Active regeneration will not occur. This selection requires confirmation. (See Inhibit Mode Operation on Page 80)

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	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 slowly.
	Hot Exhaust System Temperature (HET) - 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 DPF icon is flashing.
	Emissions Error - Appears on the display to indicate a problem with the emission regulating system.

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. ◀

1-2352

DIESEL PARTICULATE FILTER (DPF) SYSTEM (DELUXE PANEL)

Automatic Regeneration Operation

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

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

Figure 90



1. Press a scroll button until the machine settings icon (Item 1) [Figure 90] is highlighted.

Figure 91



2. Press button 4 to open the **DPF MANAGEMENT** screen [Figure 91].

Figure 92



3. Press button 6 to select automatic regeneration [Figure 92].

Figure 93



4. Press the Enter button (Item 2) [Figure 93] to engage automatic mode

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.

Press the left scroll button (Item 1) [Figure 93] to return to the gauges screen.

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 94



1. Press a scroll button until the machine settings icon (Item 1) [Figure 94] is highlighted.

Figure 95



2. Press button 4 to open the **DPF MANAGEMENT** screen [Figure 95].

Figure 96



3. Press button 7 to activate forced regeneration [Figure 96].

Figure 97



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
4. Increase engine speed to high idle.
 5. Press the Enter button (Item 2) [Figure 97] to start regeneration.

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

Press the left scroll button (Item 1) [Figure 97] to return to the gauges screen without starting regeneration.

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 30 minutes or longer.

Figure 98



1. Press a scroll button until the machine settings icon (Item 1) [Figure 98] is highlighted.

Figure 99



2. Press button 4 to open the **DPF MANAGEMENT** screen [Figure 99].

! 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.

1-2352

Figure 100



3. Press button 8 to activate forced parked regeneration [Figure 100].

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

Figure 101



4. Press the Enter button (Item 2) [Figure 101] to start regeneration.

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

Press the left scroll button (Item 1) [Figure 101] to return to the gauges screen without starting regeneration.

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.

NOTE: Understand the work environment. The inhibit function is intended to temporarily delay the exhaust emissions system regeneration process when operating in heat sensitive areas where regeneration is not advisable.

IMPORTANT

MACHINE DAMAGE HAZARD

Operating the machine in inhibit mode for extended periods may cause severe damage to the DPF.

12409

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 102



1. Press a scroll button until the machine settings icon (Item 1) [Figure 102] is highlighted.

Figure 103



2. Press button 4 to open the **DPF MANAGEMENT** screen [Figure 103].

Figure 104



3. Press button 9 to select inhibit mode [Figure 104].

Figure 105



4. Press the Enter button (Item 2) [Figure 105] to inhibit regeneration.
5. 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.)

Press the left scroll button (Item 1) [Figure 105] to return to the gauges screen without selecting inhibit mode.

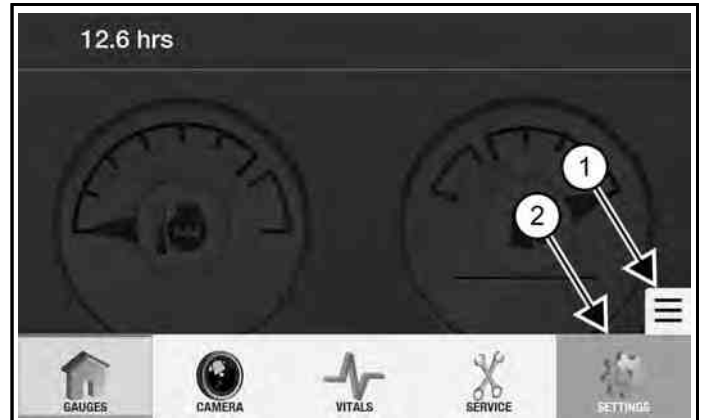
DIESEL PARTICULATE FILTER (DPF) SYSTEM (DISPLAY)

Automatic Regeneration Operation

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

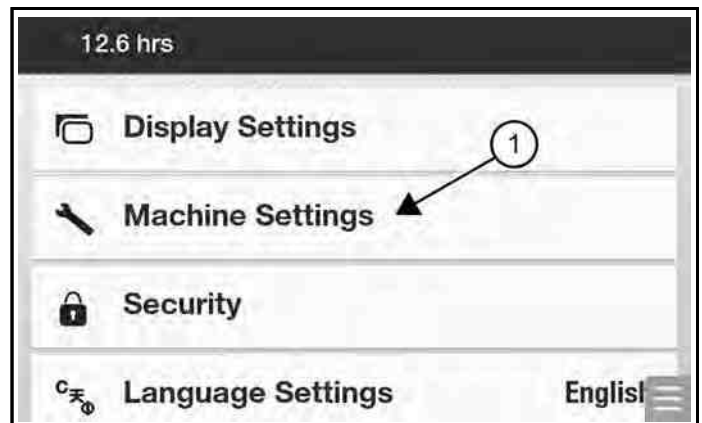
The DPF management screen is available on the display, where you can check the status of the DPF and select the required regeneration mode.

Figure 106



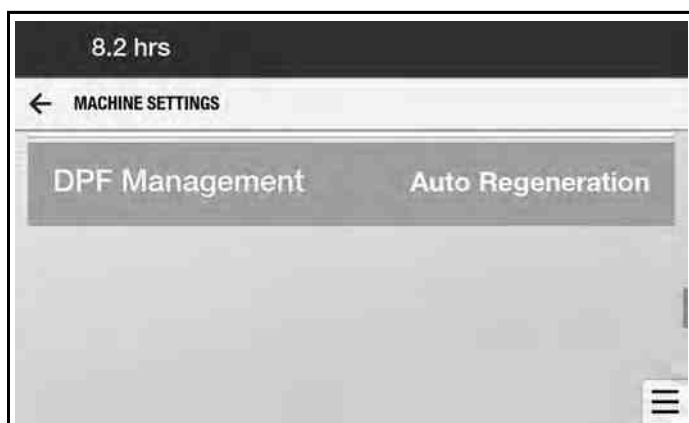
1. Select the [NAVIGATION HANDLE] icon (Item 1) [Figure 106].
2. Select [SETTINGS] (Item 2) [Figure 106].

Figure 107



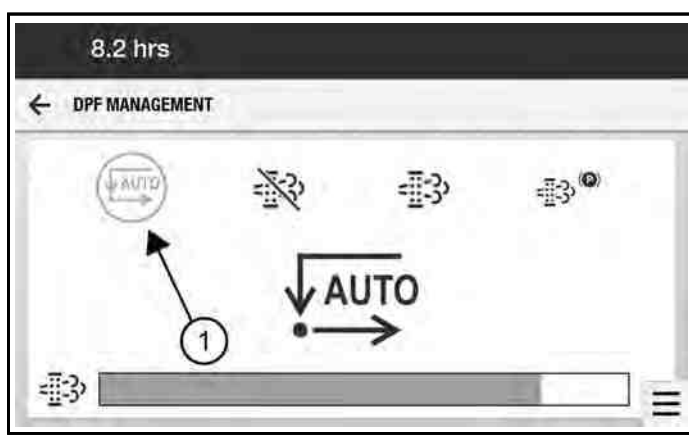
3. Select [MACHINE SETTINGS] (Item 1) [Figure 107].

Figure 108



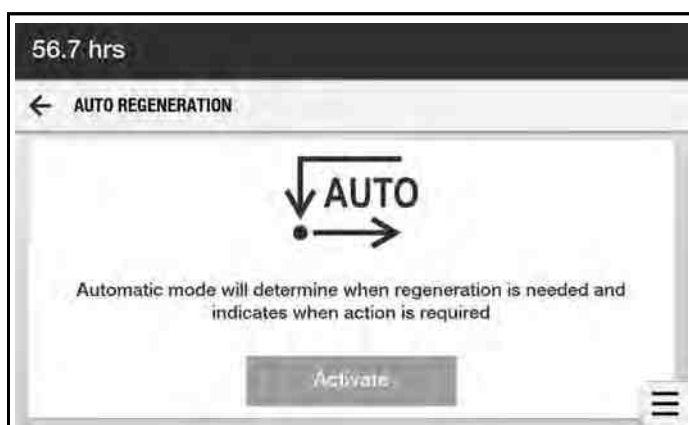
4. Scroll down and select **[DPF MANAGEMENT]** [Figure 108].

Figure 109



5. Select the automatic regeneration icon (Item 1) [Figure 109].

Figure 110



6. Select **[ACTIVATE]** [Figure 110] 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.

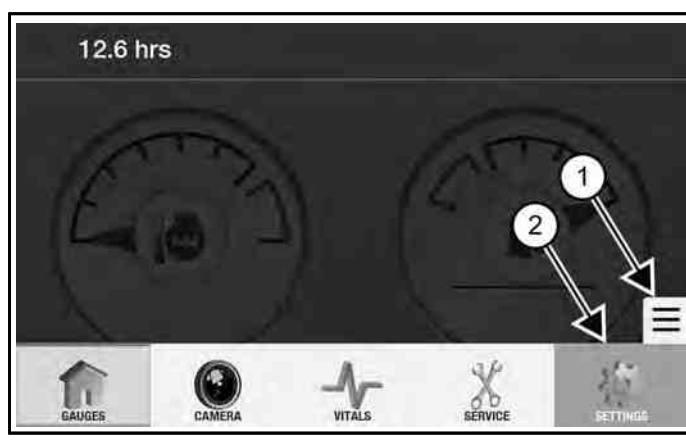
It is recommended to allow the regeneration cycle to finish before turning the machine off.

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.

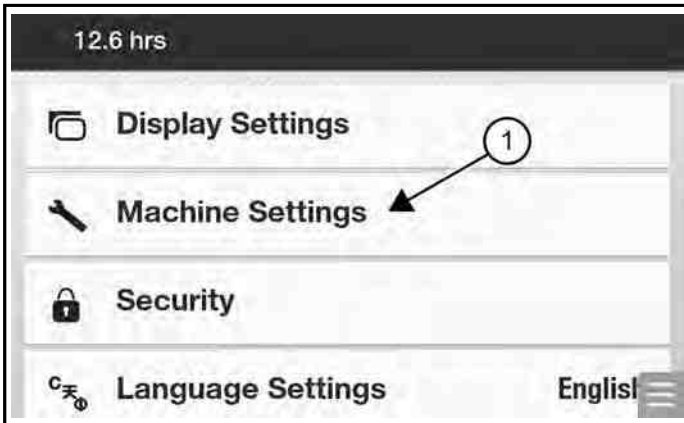
NOTE: The regeneration process can last for 30 minutes or longer.

Figure 111



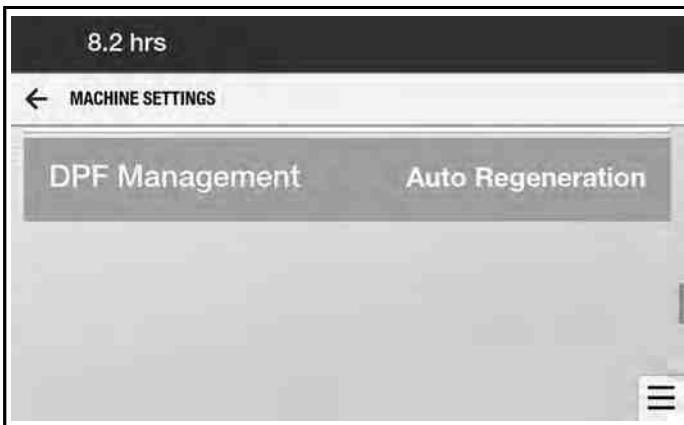
1. Select the **[NAVIGATION HANDLE]** icon (Item 1) [Figure 111].
2. Select **[SETTINGS]** (Item 2) [Figure 111].

Figure 112



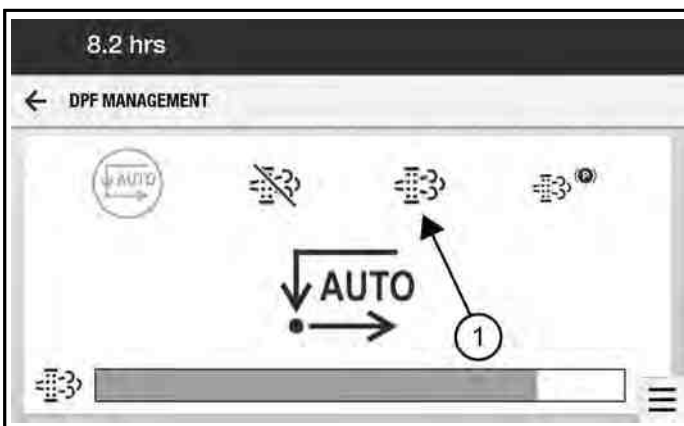
3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 112].

Figure 113



4. Scroll down and select **[DPF MANAGEMENT]** [Figure 113].

Figure 114



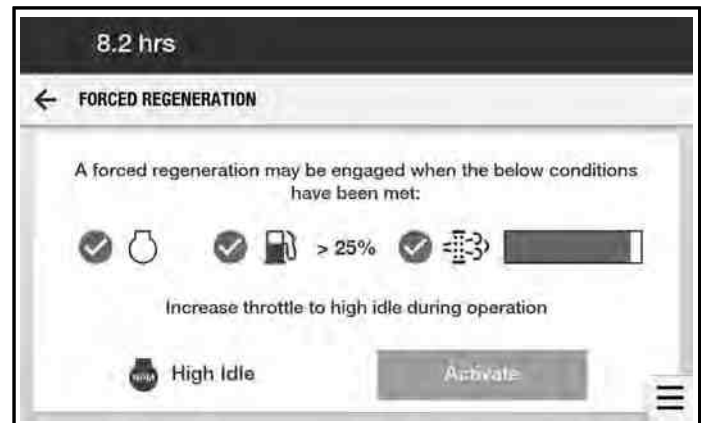
5. Select the forced regeneration icon (Item 1) [Figure 114].

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 115



7. Select **[ACTIVATE]** [Figure 115] to start regeneration.

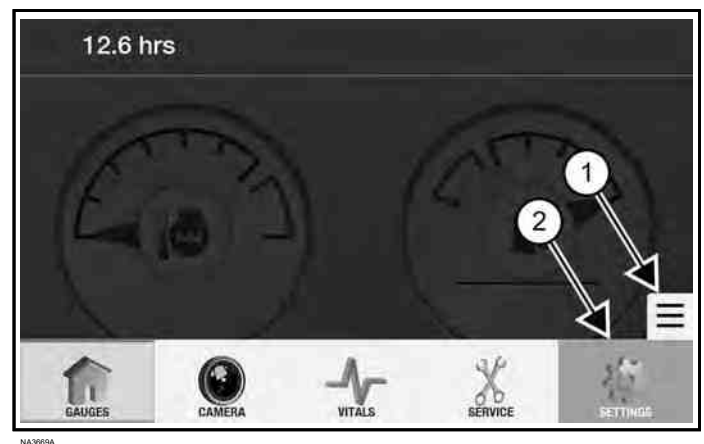
It is recommended to allow the regeneration cycle to finish before turning the machine off.

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.

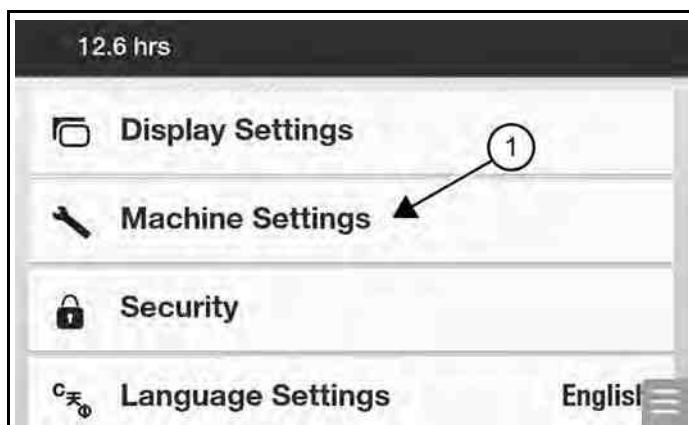
Figure 116



1. Select the **[NAVIGATION HANDLE]** icon (Item 1) [Figure 116].

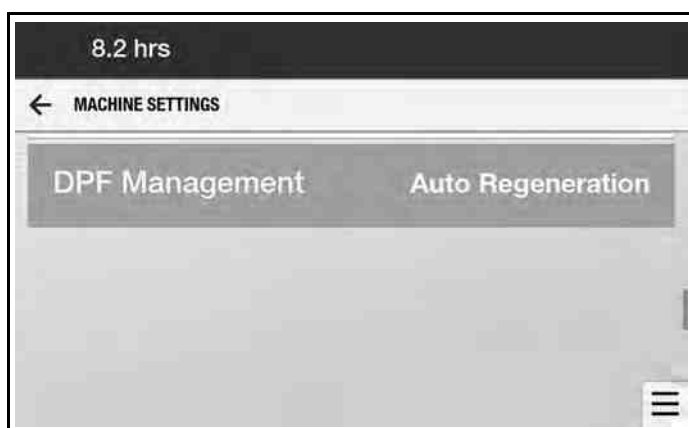
2. Select **[SETTINGS]** (Item 2) [Figure 116].

Figure 117



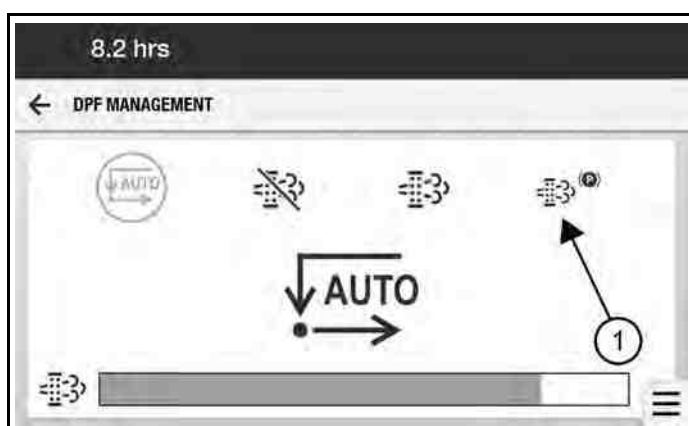
3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 117].

Figure 118



4. Scroll down and select **[DPF MANAGEMENT]** [Figure 118].

Figure 119



5. Select the forced parked regeneration icon (Item 1) [Figure 119].

⚠ IMPORTANT

MACHINE DAMAGE HAZARD

Failure to follow directions may cause damage to the DPF.

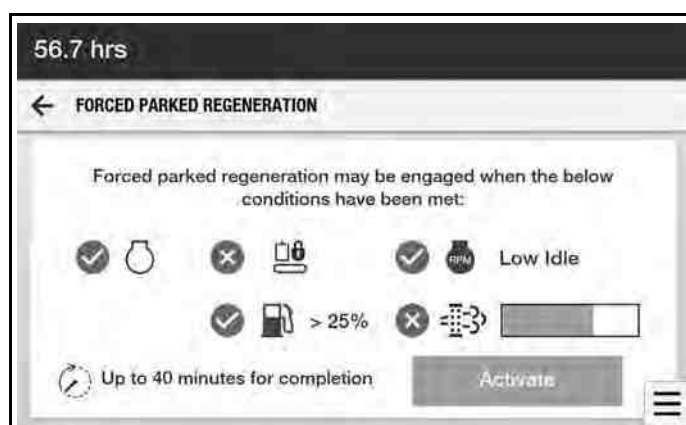
Never stop the engine during the regeneration cycle. This will by-pass the programmed cool down cycle required after a high temperature regen. ◀

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 120



7. Select **[ACTIVATE]** [Figure 120] 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.

NOTE: Understand the work environment. The inhibit function is intended to temporarily delay the exhaust emissions system regeneration process when operating in heat sensitive areas where regeneration is not advisable.

⚠ IMPORTANT

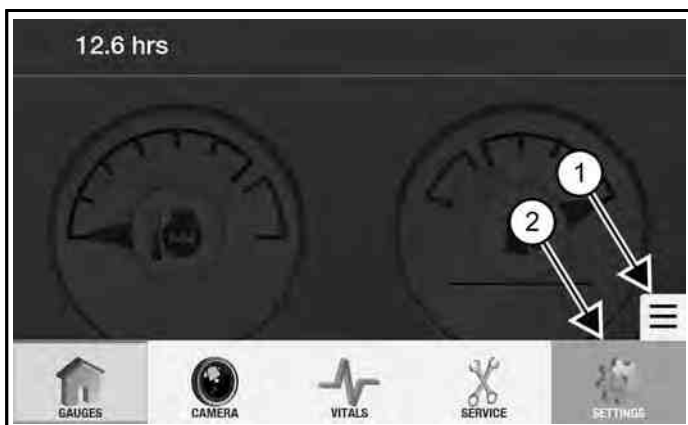
MACHINE DAMAGE HAZARD

Operating the machine in inhibit mode for extended periods may cause severe damage to the DPF. ◀

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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.

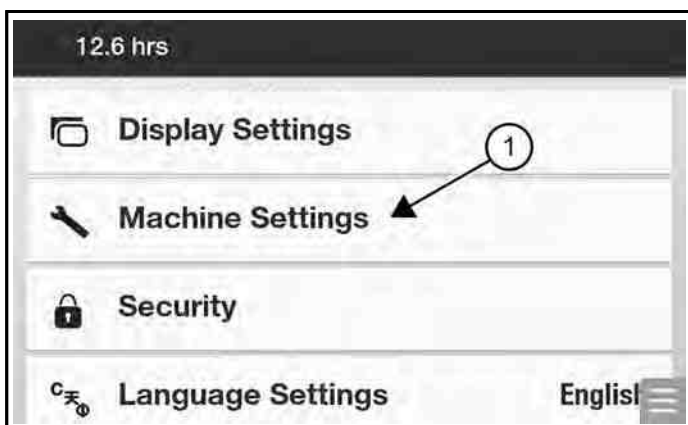
Figure 121



NA3865A

1. Select the **[NAVIGATION HANDLE]** icon (Item 1) [Figure 121].
2. Select **[SETTINGS]** (Item 2) [Figure 121].

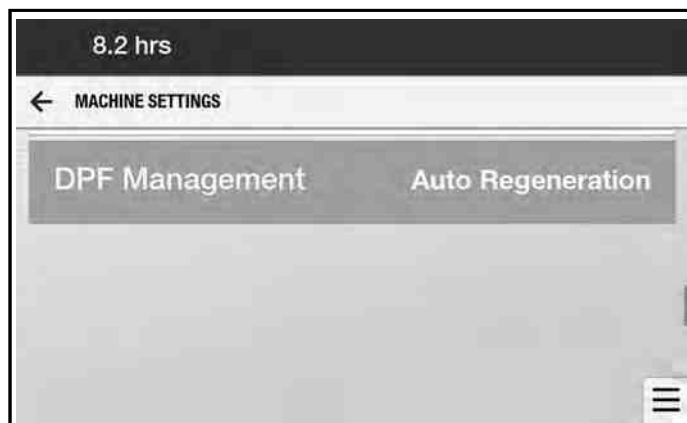
Figure 122



NA3865A

3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 122].

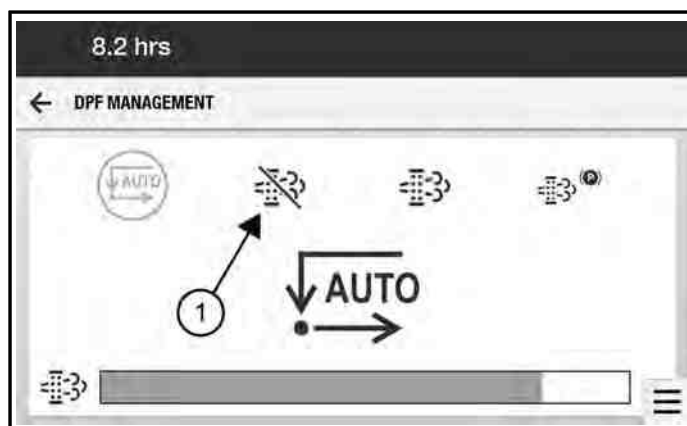
Figure 123



NA3865

4. Scroll down and select **[DPF MANAGEMENT]** [Figure 123].

Figure 124



NA3862D

5. Select the inhibit mode icon (Item 1) [Figure 124].

Figure 125



NA3863

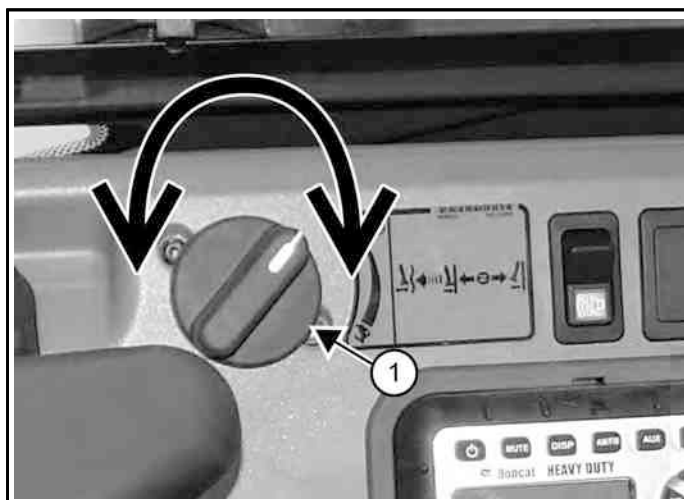
6. Select **[ACTIVATE]** [Figure 125] to inhibit regeneration.
7. After running the machine in inhibit mode, take one of the below actions as soon as possible:

- 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 126



P200090a

The engine speed control dial (Item 1) [Figure 126] 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 (DELUXE PANEL)

Activating Eco Mode

Figure 127



1. Press a scroll button (Item 1) [Figure 127] until the Machine Settings icon (Inset) is highlighted.
2. Press button 3 to open the **MACHINE PERFORMANCE** screen.
3. Press button 2 to enable Eco Mode.

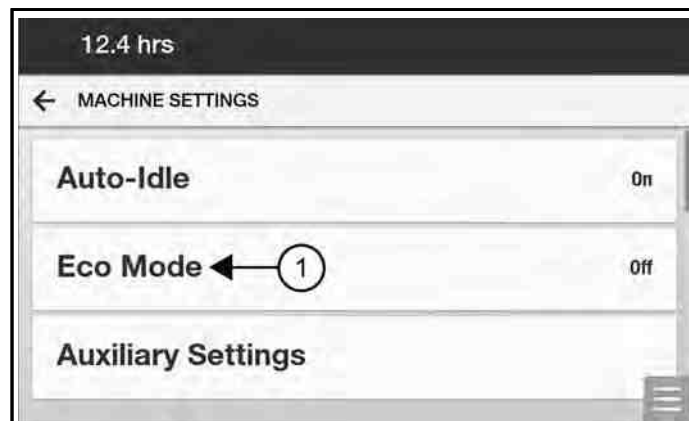
If the machine maximum engine speed is 2450 rpm when Eco Mode is activated, the maximum engine speed will be approximately 2080 rpm.

ECO MODE (DISPLAY)

Activating Eco Mode

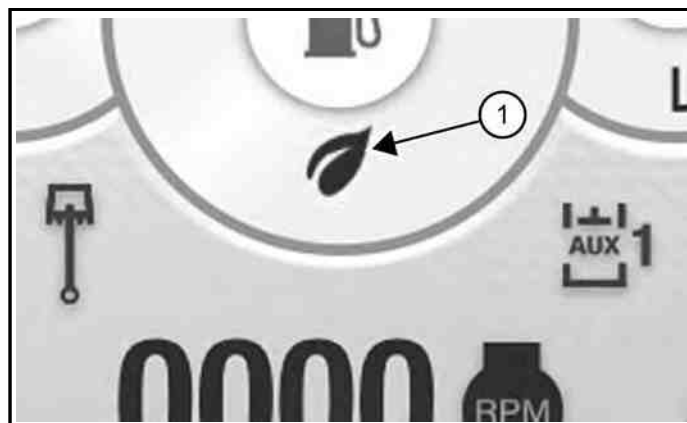
1. Select [SETTINGS]→ [MACHINE SETTINGS].

Figure 128



2. Select [**ECO MODE**] (Item 1) [Figure 128] to turn Eco mode on / off.

Figure 129



The Eco mode icon (Item 1) [Figure 129] will be displayed on the **GAUGES** screen when Eco mode is on.

BOOM SWING

Enabling Boom Swing

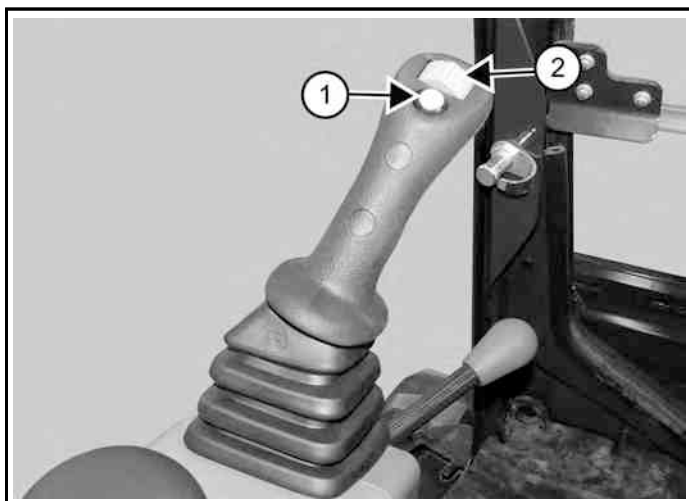
Figure 130



NA20361a

The purpose of the boom swing is to offset the boom with respect to the upperstructure for digging close to a structure [Figure 130]. Adjust the mirrors if necessary before beginning.

Figure 131



P200104a

1. If no auxiliary hydraulics are enabled, control the boom swing with the left joystick switch (Item 2) [Figure 131].

OR

If auxiliary hydraulics are enabled, press and hold the button (Item 1) [Figure 131] 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 64)

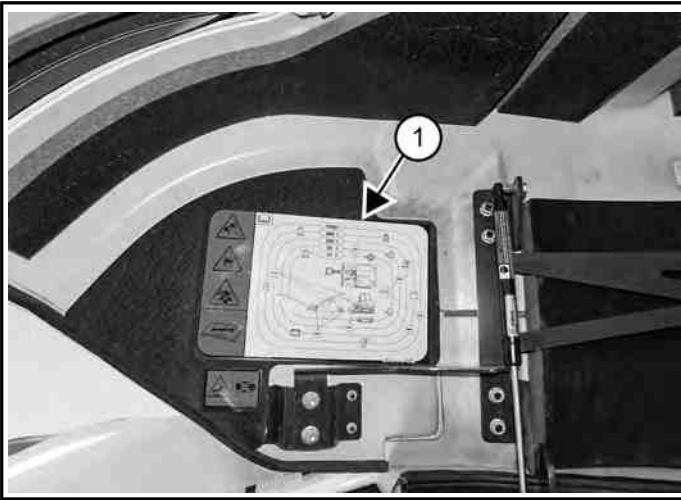
2. Use the switch (Item 2) [Figure 131] on the left joystick to control boom swing.

- 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 132



C206559a

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 132] is located inside the right cover. (See Service Schedule on Page 186)

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 133

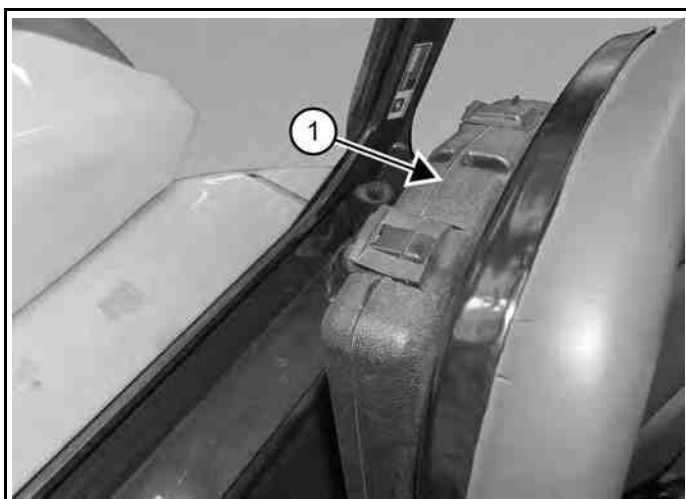


P132086

Use the grab handles and tracks to enter the canopy / cab [Figure 133].

Operation & Maintenance Manual And Operator's Handbook Locations

Figure 134



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 134].

Figure 135



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 135].

⚠ WARNING

INSUFFICIENT INSTRUCTIONS HAZARD
Untrained operators or failure to follow instructions can cause serious injury or death.

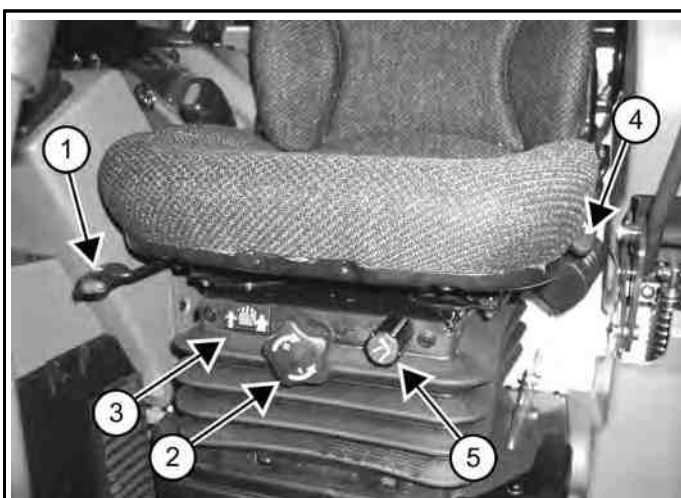
- Read and understand the Operation & Maintenance Manual, Operator's Handbook, and decals on machine.
- Follow warnings and instructions in the manuals when making repairs, adjustments or servicing.
- Check for correct function after adjustments, repairs or service.

W-2003

Seat Adjustment

Adjusting The Suspension Seat

Figure 136



C113009a

1. Release the seat lever (Item 1) [Figure 136] 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 136].
3. Release the lever (Item 4) [Figure 136] to change the incline of the seat back.
4. Turn the knob (Item 5) [Figure 136] to adjust the height of the seat.

Adjusting Mirrors

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

Figure 137

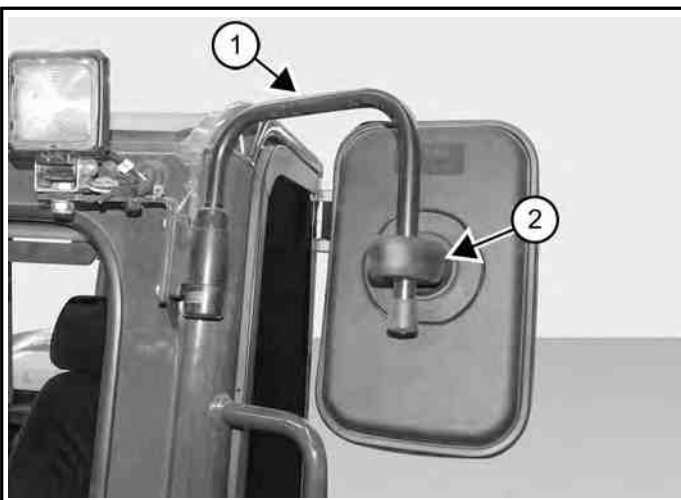
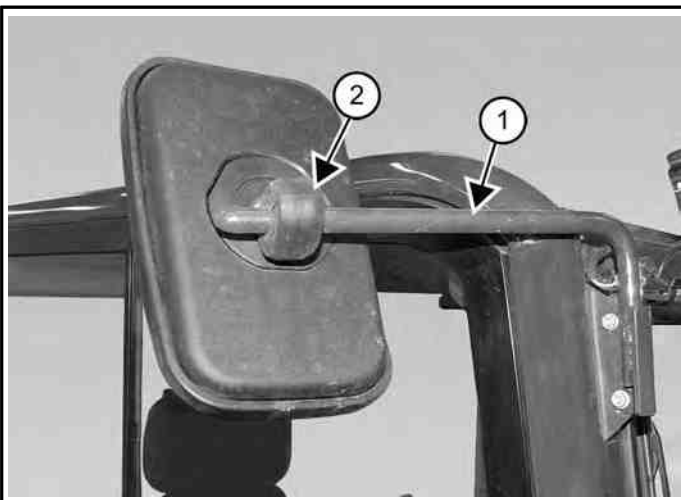


Figure 138



1. Before entering the cab, position the left and right mirror brackets (Item 1) [Figure 137] and [Figure 138] as shown.

Final mirror adjustment will be made from inside the cab.

2. Tighten the mount retention screws (Item 2) [Figure 137] and [Figure 138] 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 139

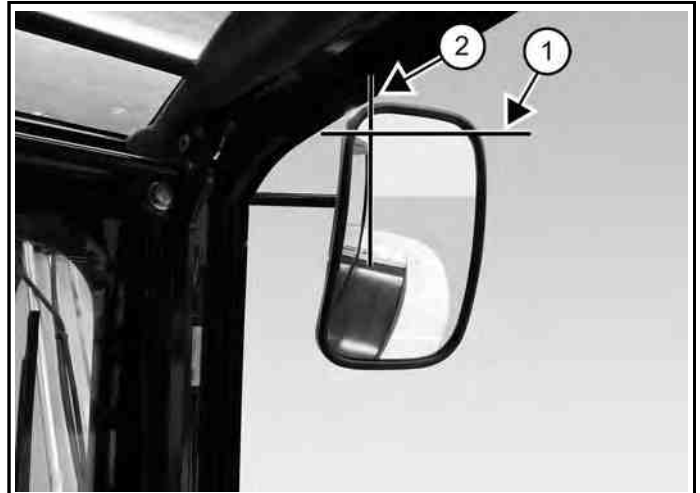
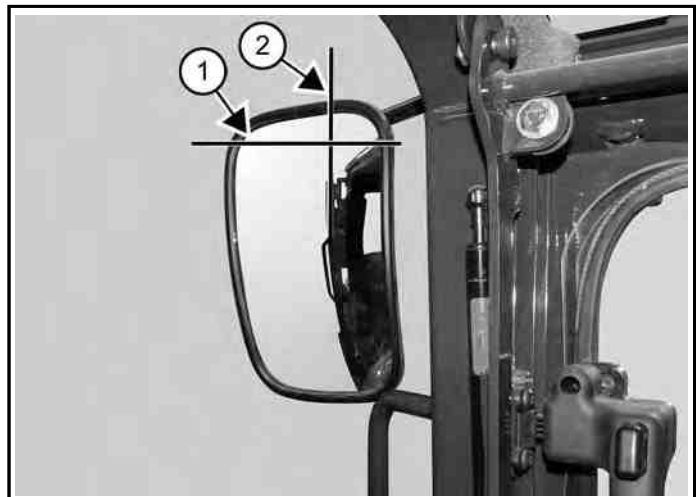


Figure 140



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 139] and [Figure 140].

Figure 141



The left mirror can be rotated into the transport position when trailering the excavator [Figure 141].

Fastening The Seat Belt

Figure 142



Fasten the seat belt [Figure 142].

STARTING THE ENGINE (DELUXE PANEL)

Starting Engine With Start Switch (Deluxe Panel)

Perform the pre-starting procedure.
(See Pre-Starting Procedure on Page 86)

⚠ WARNING

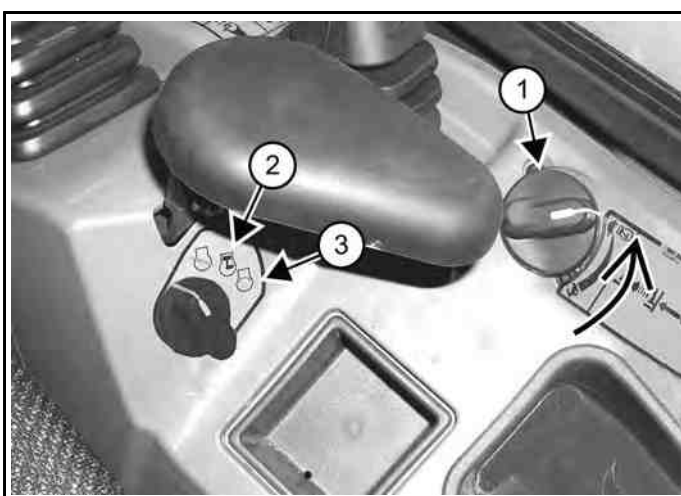
GENERAL HAZARD

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

Figure 143



C113013a

1. Set the engine speed control (Item 1) [Figure 143] to the low idle position.

NOTE: Machines with a Deluxe Panel have a permanent, randomly generated Master Password set at the factory. Your machine will also be assigned an Owner Password. Your dealer will provide you with this password. Change the owner password to one that you will easily remember to prevent unauthorised use of your machine. Keep your password in a safe location for future needs.
(See Changing The Owner Password on Page 234)

NOTE: The Password Lockout feature can be used to allow starting of the machine without a password. If unlocked, the start switch will start the machine without using a password.
(See Disabling And Enabling Password Lockout Feature on Page 236)

2. With the left console raised, turn the start switch to on (Item 2) [Figure 143].

Figure 144



p112014a

3. Enter the password if prompted with the buttons (Item 1) [Figure 144].

Figure 145



p113016a

If preheating is required, the glow plugs will automatically cycle and the engine preheat icon (Item 1) [Figure 145] will turn on.

4. When the engine preheat icon goes off, turn the start switch to start (Item 3) [Figure 143]. Release the switch when the engine starts.
5. Stop the engine if the warning lights and alarm do not go off.
Check for the cause before starting the engine again.
6. Turn the start switch off to stop the engine.

Lowering The Control Console

Figure 146



P134071a

- Lower the left control console [Figure 146].

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.
- 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.

STARTING THE ENGINE (DISPLAY)

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 261)

- 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 245)
(See Settings (Touch Display) on Page 255)

Starting The Engine

⚠ WARNING

GENERAL HAZARD

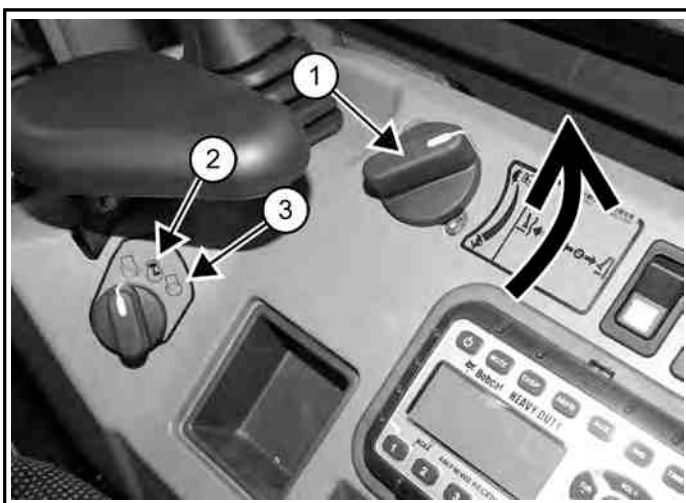
Failure to follow instructions can cause serious injury or death.

- 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 86)

Figure 147



P200582a

2. Set the engine speed control (Item 1) [Figure 147] to low idle.

⚠ IMPORTANT

MACHINE DAMAGE HAZARD

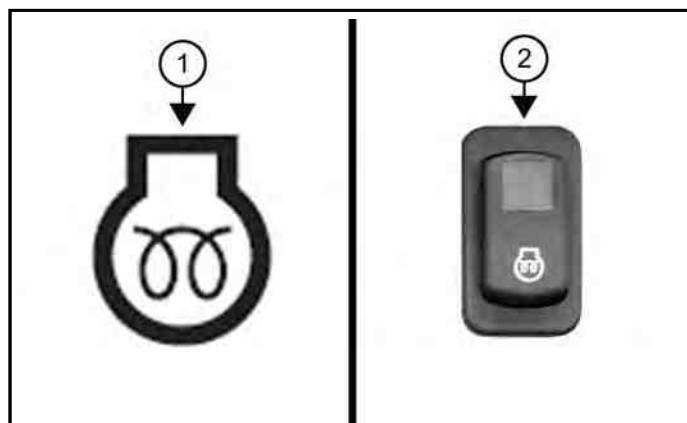
Damage to the starter motor can occur with prolonged use.

- 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 147].
4. Enter the password if prompted.

Figure 148



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 148] 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 147].

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 149



- Lower the left control console [Figure 149].

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.
- 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 Deluxe Panel During Operation

Figure 150



- Frequently monitor the temperature and fuel gauges. Left Console Lockout light must be off to operate the machine.
- After the engine is running, frequently monitor the deluxe panel [Figure 150] for machine condition. The associated icon will be on if there is an error condition.

EXAMPLE: Engine Coolant Temperature is High

- The Engine Over-Temperature icon (Item 1) [Figure 150] is on.
- Press a scroll button (Item 3) [Figure 150] until the service code screen is displayed. One of the following Service Codes will be displayed:

“M0810”:
Engine Coolant Temp Too High

“M0811”:
Engine Coolant Temp Extremely High

Find the cause of the service code and correct before operating the machine again.

NOTE: The last 40 codes stored in history can also be viewed.

Monitoring The Standard Display During Operation

Figure 151

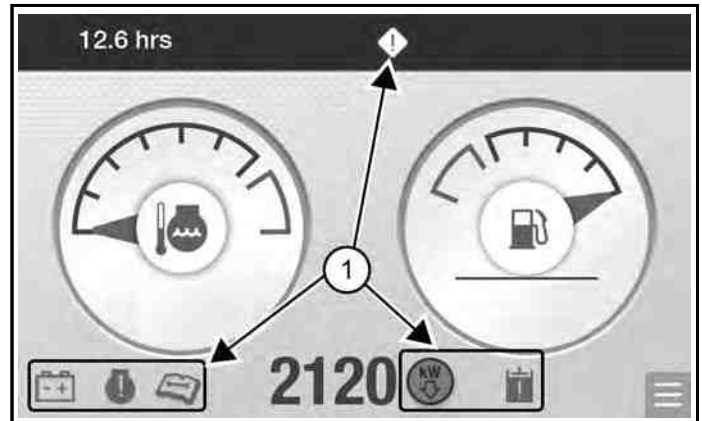
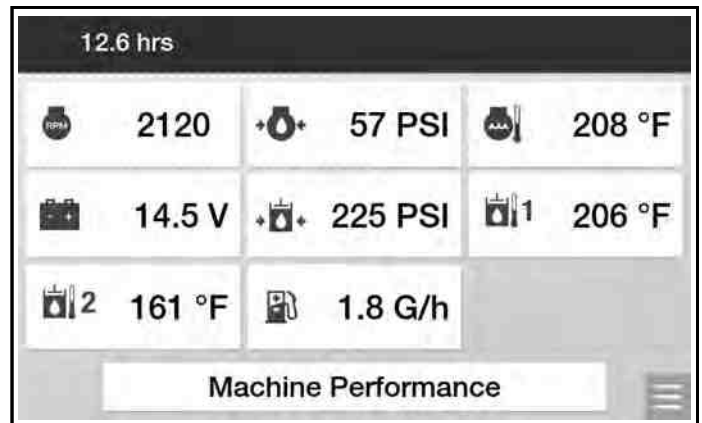


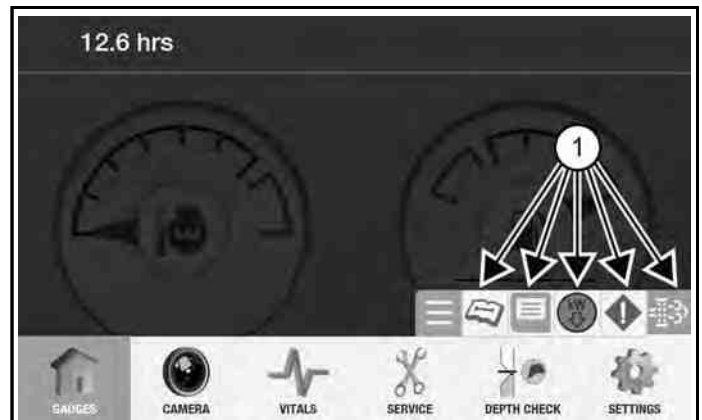
Figure 152



Frequently monitor the **GAUGES** [Figure 151] and **VITAL DETAIL** [Figure 152] screens for machine condition.

These icons (Item 1) [Figure 151] indicate machine conditions that may require service. (See Standard Display on Page 35)

Figure 153



Active shortcuts (Item 1) [Figure 153] that appear also indicate a need for service.
(See Active Shortcuts on Page 242)

A red dot next to the **[SERVICE]** icon indicates an active service code. (See Viewing Service Codes on Page 244)

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

Monitoring The Touch Display During Operation

Figure 154



C132908

Figure 155



NA3782

Frequently monitor the **GAUGES** [Figure 154] and **VITAL DETAIL** [Figure 155] screens for machine condition.

These icons (Item 1) [Figure 154] 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 251)

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 248)

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.

If either “U1201-00: Engine Disabled” or “M8899: Engine Disabled” service codes appear on the display, the engine has been remotely disabled. Your engine will continue to operate normally for a brief period, and then will begin to derate.
(See Stopping The Engine And Leaving The Machine on Page 100) Once the engine is turned off, it cannot be restarted. Contact the machine owner or your Bobcat dealer for more details.

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 156



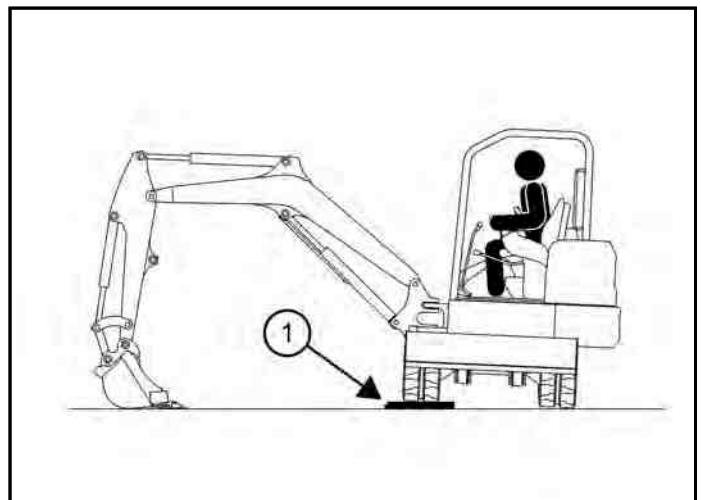
P134071a

1. Ensure the left console is down [Figure 156].
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 157

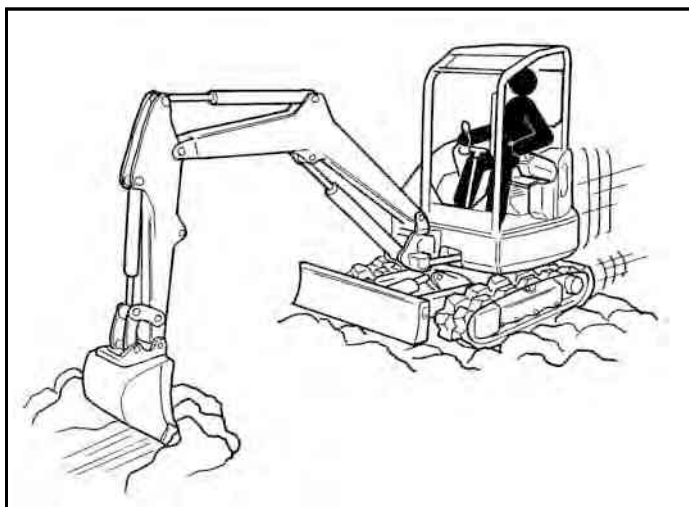


NA20364a

- When working on wet or soft ground, put planks (Item 1) [Figure 157] 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 158



NA20380

- The bucket may also be used to pull the excavator [Figure 158].
 - ▷ Raise the blade.
 - ▷ Extend the arm and lower the boom.
 - ▷ Operate the boom in a digging manner.

Operating On Slopes

WARNING

INSTABILITY HAZARD

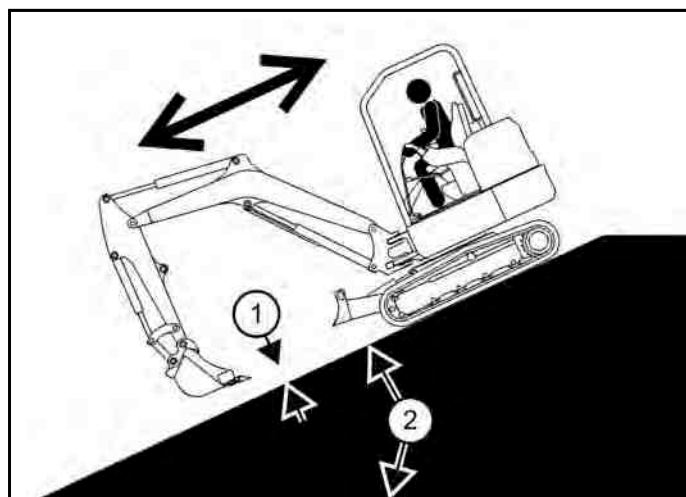
Machine tipping or rollover can cause serious injury or death.

- 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 159



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 159]. Run the engine slowly.
- Do not travel down or back up slopes that exceed 25 degrees (Item 2) [Figure 159].
- 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 160

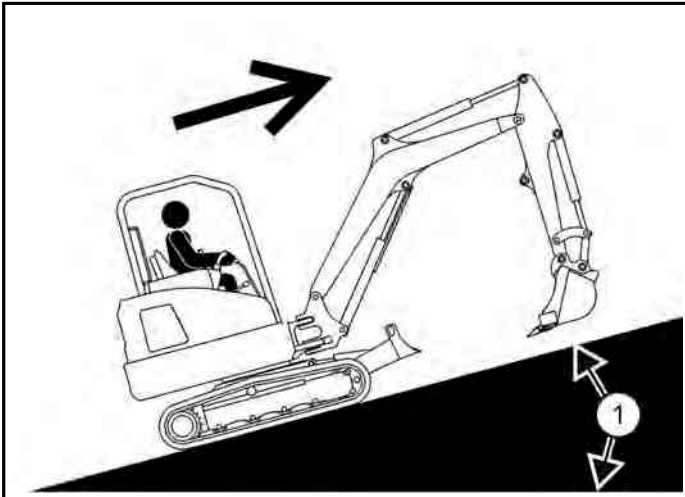
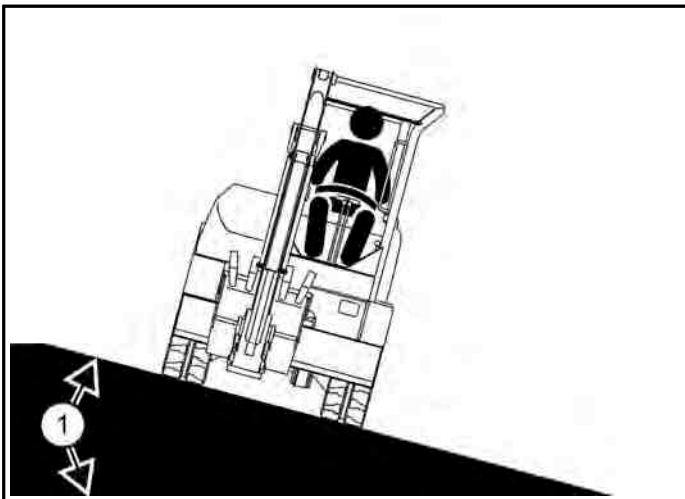
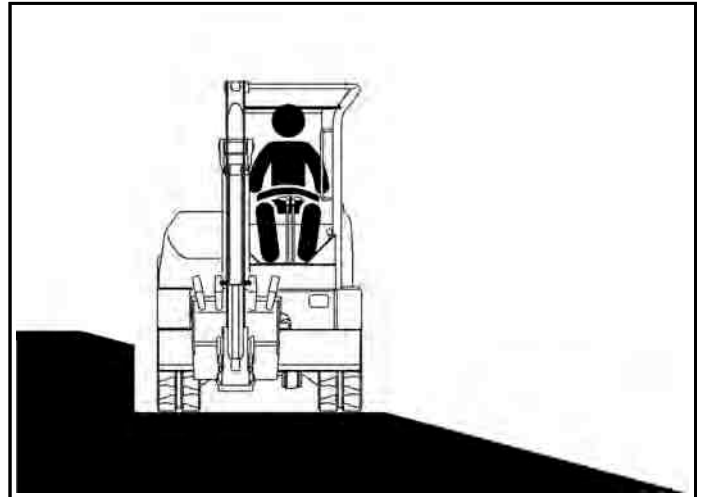


Figure 161



- When travelling up slopes (Item 1) [Figure 160], or on side slopes that are 15 degrees or less (Item 1) [Figure 161], position the machine as shown and run the engine slowly.

Figure 162



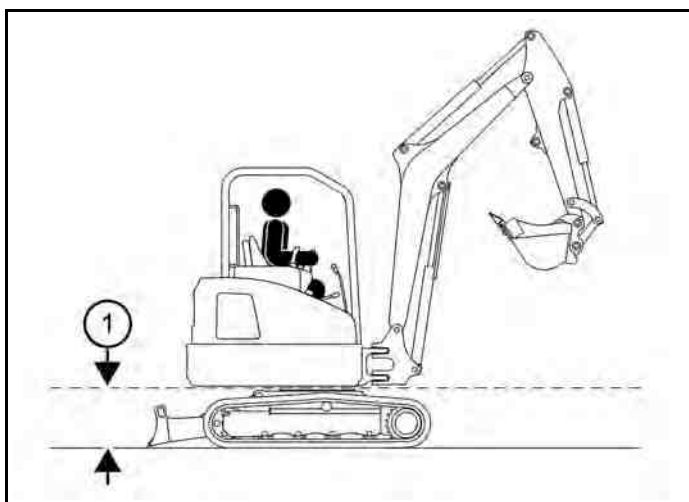
- When operating on a slope, level the work area before beginning [Figure 162].
- If this is not possible, the following procedure should be used:
- Do not work on slopes that are over 15 degrees (Item 1) [Figure 161].
 - Use a slow work cycle.
 - Avoid working with the tracks across the slope. This 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.
 - To brake the machine when going down a slope, move the travel controls to the neutral position.
- 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 163



- Do not operate or immerse the excavator in water higher than the bottom of the swing bearing (Item 1) [Figure 163].
- 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 164

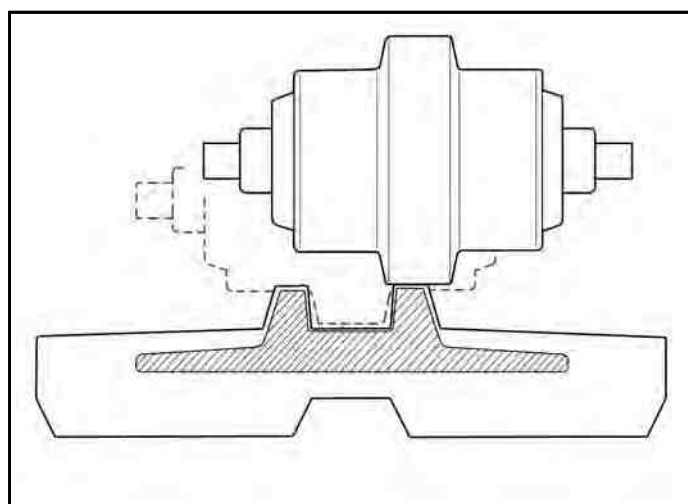
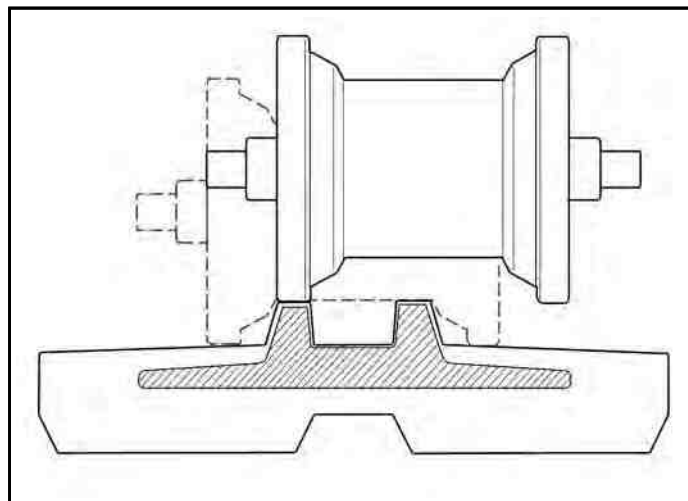


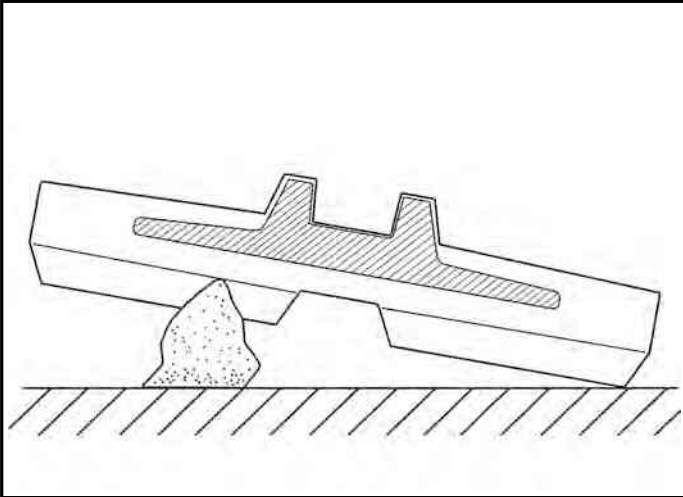
Figure 165



- Maintain proper track tension. (See Track Tension on Page 220)

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 164] or [Figure 165]).

Figure 166



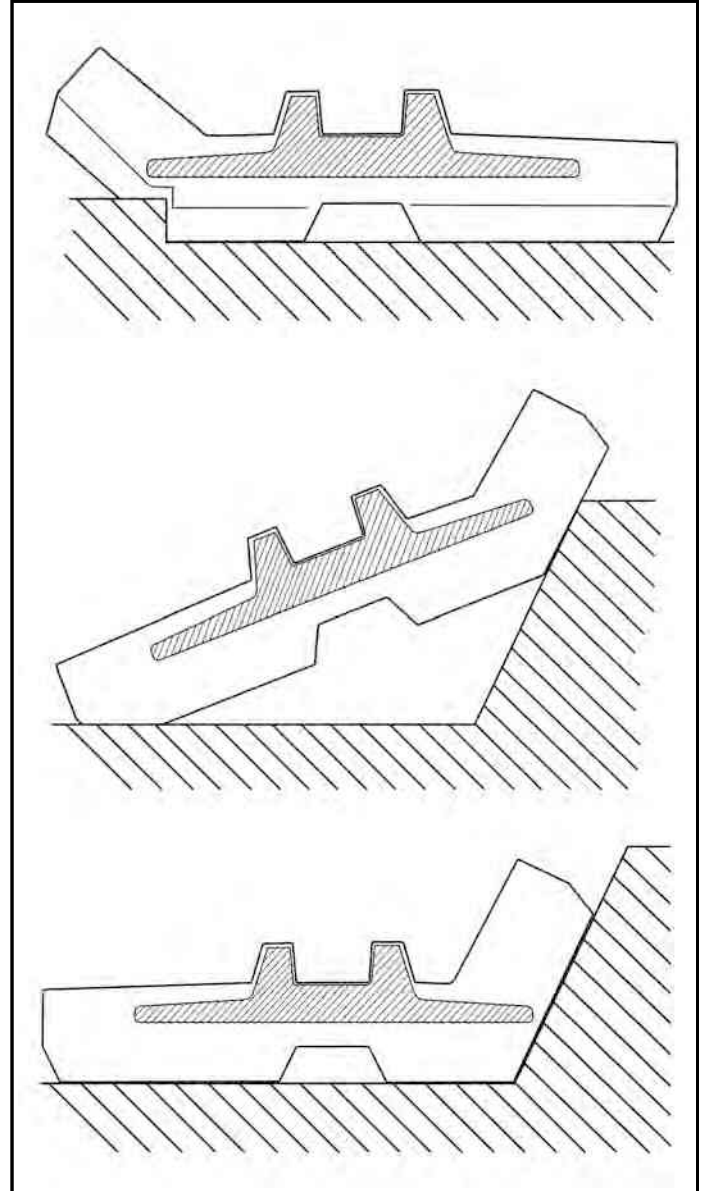
- Avoid driving over sharp objects.

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 166] 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 167



- Avoid driving over stumps and ridges.

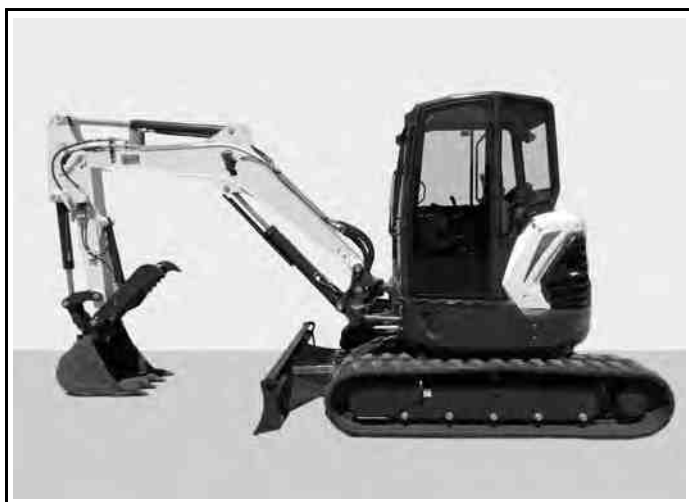
This may apply extensive stress to the lug root where metals are embedded [Figure 167].

- Avoid making quick turns on bumpy and rocky fields.

STOPPING THE ENGINE AND LEAVING THE MACHINE

Stopping The Engine And Leaving The Machine

Figure 168



C200402a

1. Stop the machine on level ground.
2. Lower the work equipment and the blade to the ground [Figure 168].

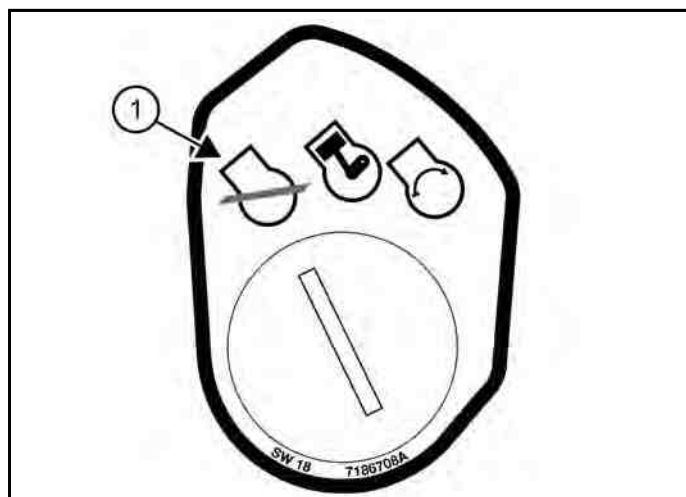
Figure 169



C208107a

3. Rotate the engine speed control dial counterclockwise to low idle [Figure 169].
4. Run the engine at idle speed for about 5 minutes to allow it to cool.

Figure 170



7186708c

5. Turn the switch to Stop (Item 1) [Figure 170].
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-2140

WARNING

GENERAL HAZARD

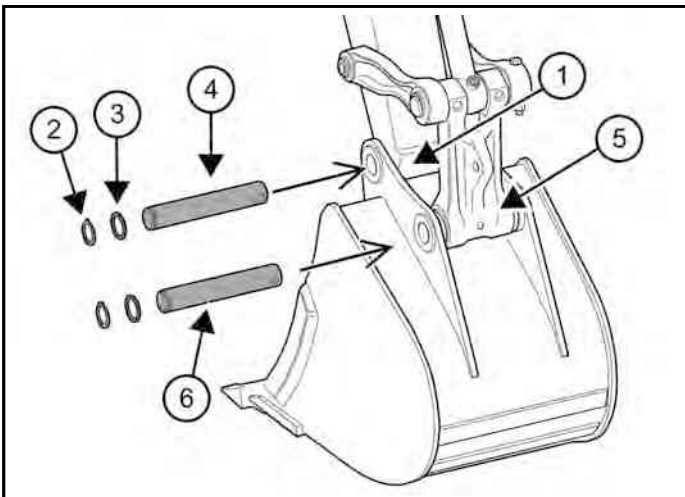
Failure to follow instructions can cause serious injury or death.

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.

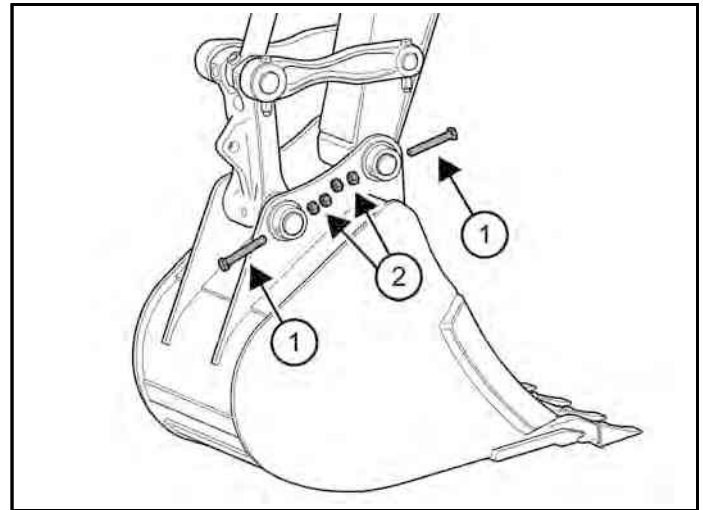
Figure 171



2. Move the arm toward the bucket and align the mounting hole (Item 1) [Figure 171].
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 171].
6. Push the pin (Item 4) through the bucket bushings and pivot [Figure 171].
7. Align link with bucket bushing (Item 5) [Figure 171] and washers.

8. With washer and snap ring installed, push the second pin (Item 6) through bucket bushing and link [Figure 171].

Figure 172



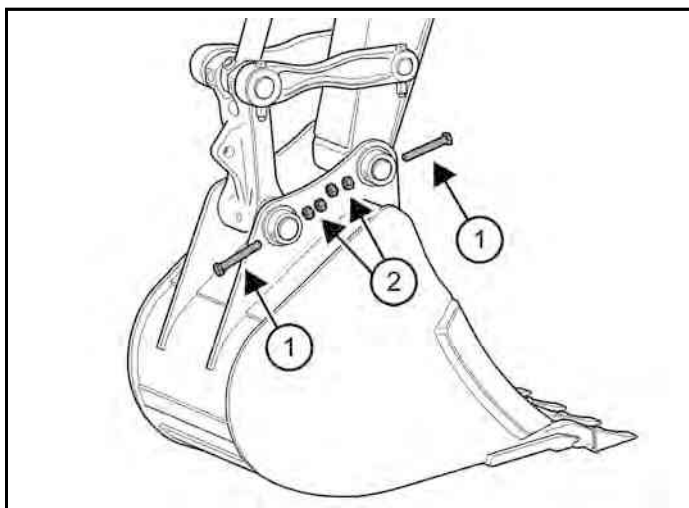
NA20307b

9. Install screws (Item 1) and double nuts (Item 2), ensuring that the screws rotate freely [Figure 172].
10. Add grease to the grease fittings.

REMOVING ATTACHMENTS (PIN-ON ATTACHMENT)

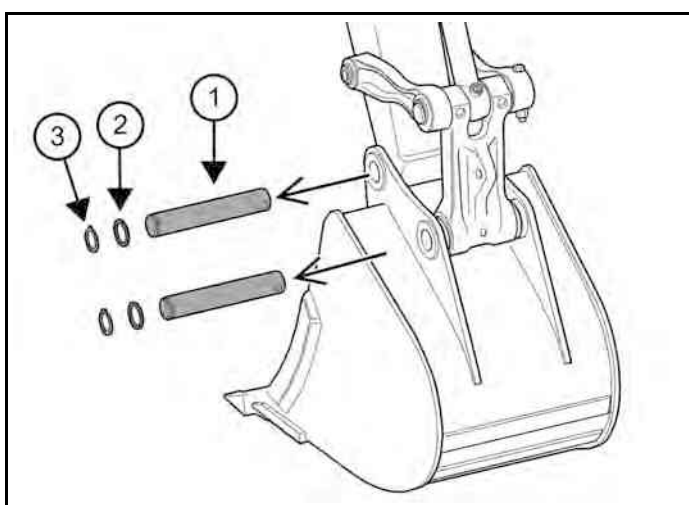
1. Park the excavator on a flat surface and lower the bucket fully.
2. Stop the engine and exit the excavator.

Figure 173



3. Remove the screws (Item 1) and double nuts (Item 2) [Figure 173].

Figure 174



4. Remove the pins, washers, and snap rings (Items 1, 2, and 3) [Figure 174].
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.

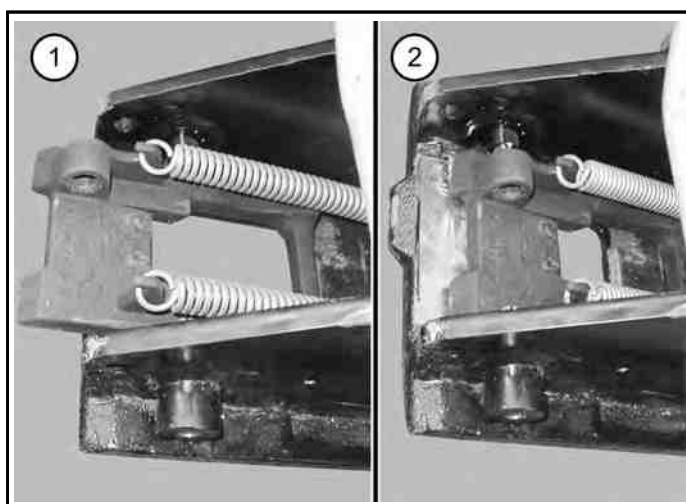
Keep all bystanders 6 m (20 ft) away from equipment when operating. ◀

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.

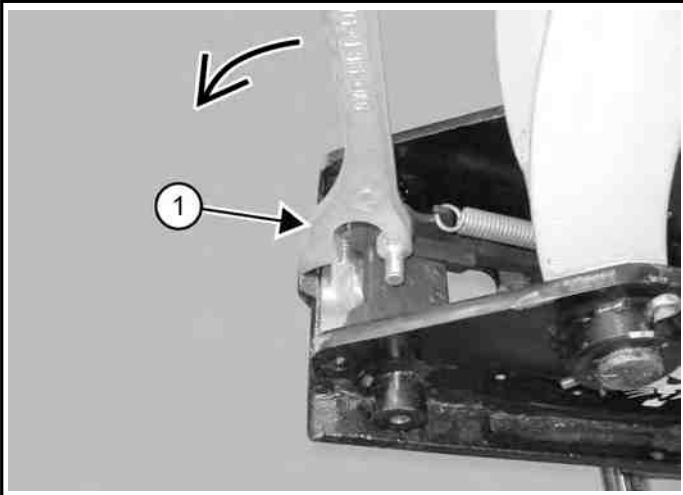
Figure 175



p72272b

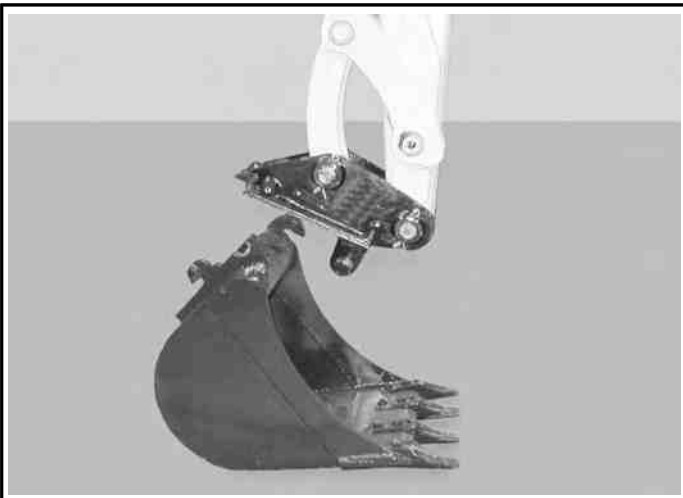
3. Inspect the quick coupler [Figure 175].

Figure 176



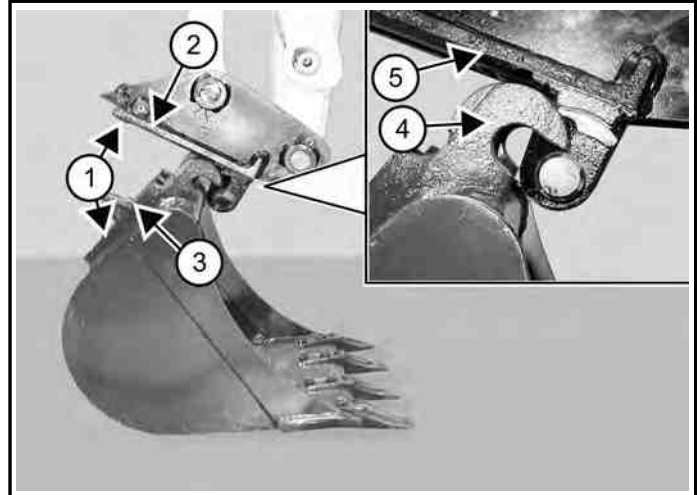
4. If the coupler is in the unlatched position (Item 1) [Figure 175], proceed to Step 5.
OR
If the coupler is in the latched position (Item 2) [Figure 175], install the tool (Item 1) [Figure 176] and pull the handle. The latch will move completely forward and lock in the unlatched position.
5. Enter the excavator, fasten the seat belt, and start the engine.

Figure 177



6. Position the quick coupler near the attachment [Figure 177].

Figure 178

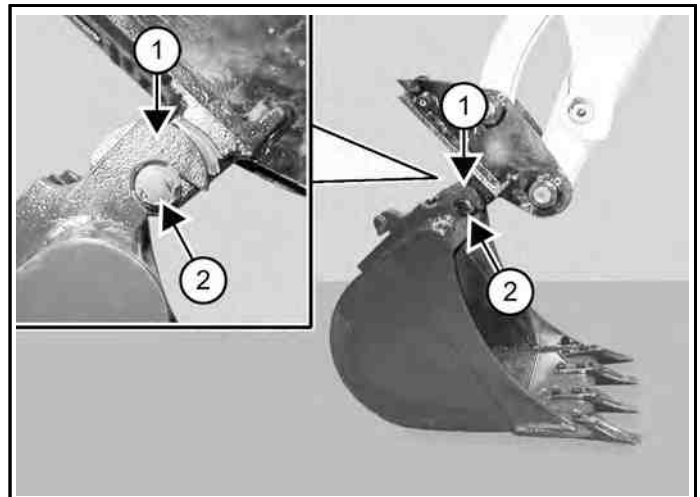


7. Extend the arm out until there is at least 100° (Item 1) between the quick coupler surface (Item 2) and the attachment mounting surface (Item 3) [Figure 178].

There must be proper clearance (Item 1) between the hook (Item 4) and the quick coupler (Item 5) [Figure 178].

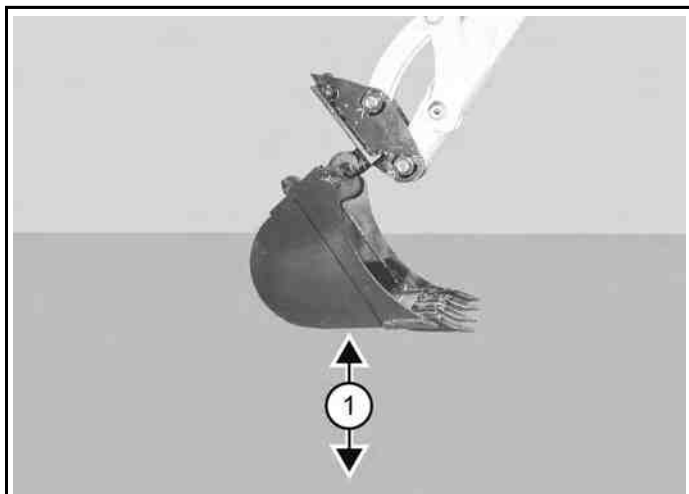
Extend the arm out to get the required angle (Item 1) [Figure 178]. Damage could occur to the attachment hooks or the quick coupler without proper clearance.

Figure 179



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 179].

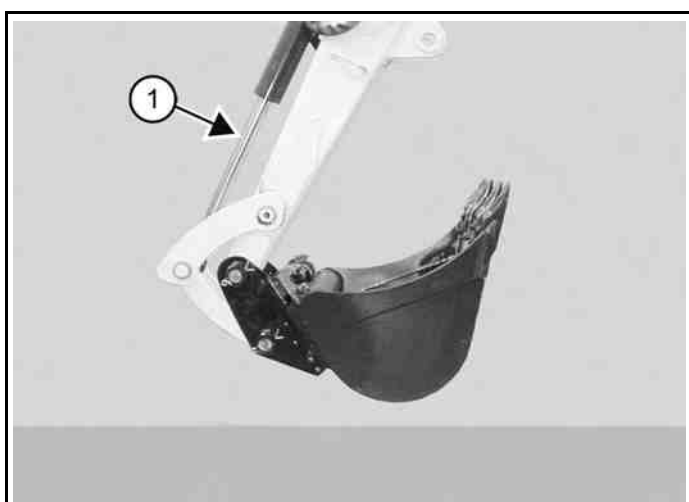
Figure 180



p-72277a

9. Raise the boom until there is approximately 500 mm (20.0 in) (Item 1) [Figure 180] of clearance between the bottom of the attachment and the ground.

Figure 181



p-72278a

10. Extend the bucket cylinder (Item 1) [Figure 181] 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 105)

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

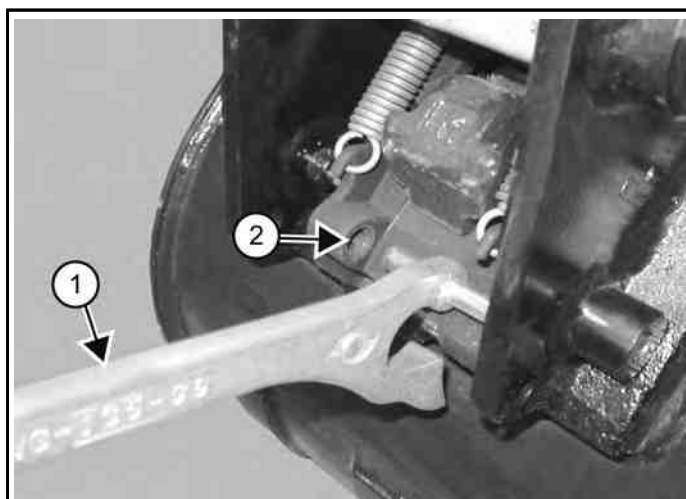
Failure to follow instructions can cause serious injury.

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.

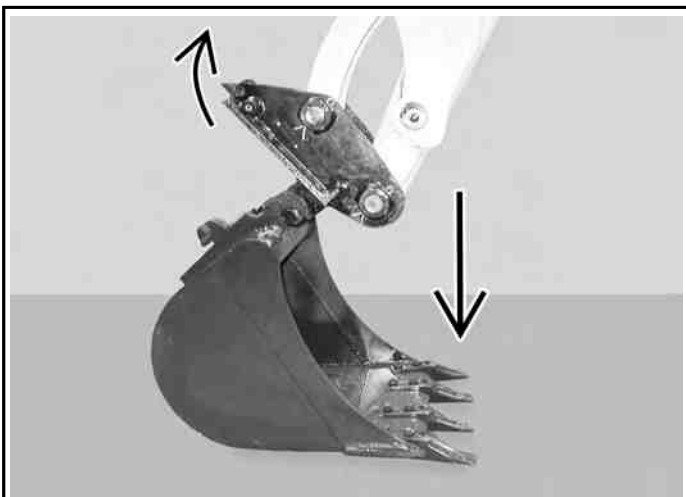
Figure 182



p-72288

2. Install the quick coupler tool (Item 1) into the hole (Item 2) in the quick coupler [Figure 182].
3. Push down on the tool (Item 1) [Figure 182] to unlock the latch.
4. Remove the tool.
5. Enter the excavator, fasten the seat belt, and start the engine.

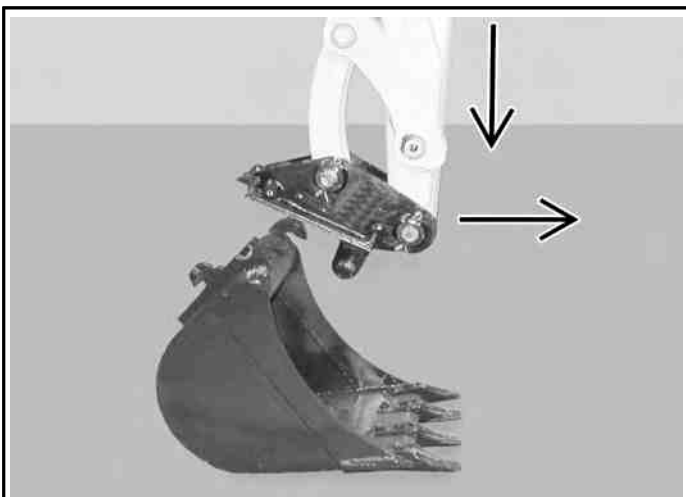
Figure 183



p-72282a

6. Retract the bucket cylinder fully and lower the boom until the attachment is on the ground [Figure 183].

Figure 184



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 184].

INSPECTING AND ADJUSTING THE QUICK COUPLER LATCH

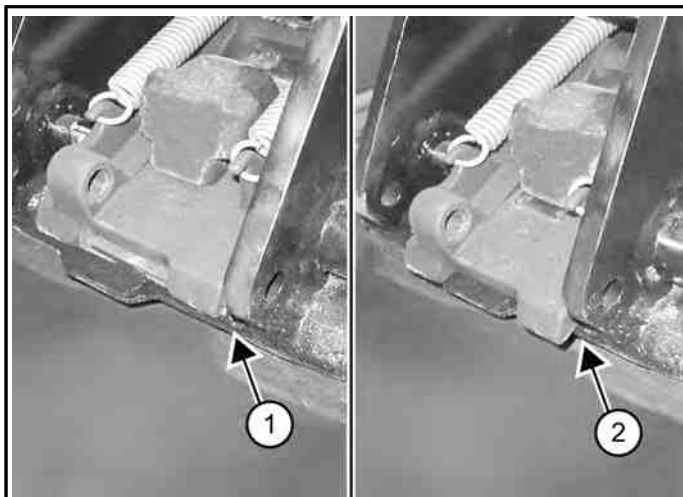
⚠ WARNING

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 185

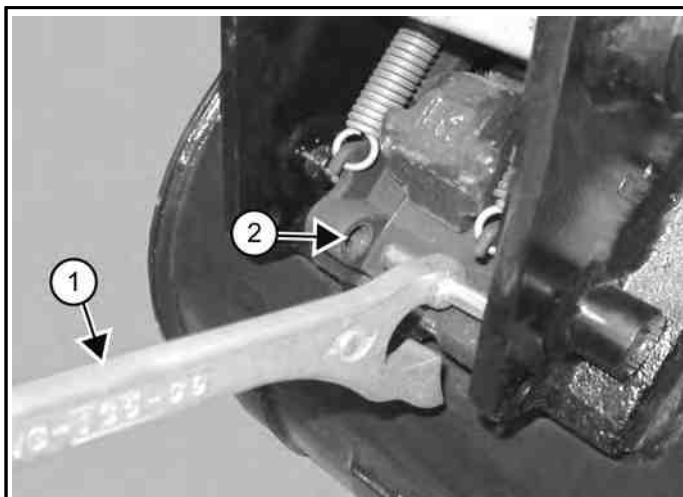


p-72279a

Visually inspect the quick coupler latch to the bucket mount [Figure 185]. The latch must be fully engaged (Item 1) [Figure 185].

If the latch is not fully engaged (Item 2) [Figure 185], proceed with the following instructions:

Figure 186



p-72286

1. Install the tool (Item 1) in the hole (Item 2) of the quick coupler [Figure 186].

2. Push the tool (Item 1) [Figure 186] down to unlatch the quick coupler.
3. Remove the tool (Item 1) [Figure 186].
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 181].
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 185].
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.

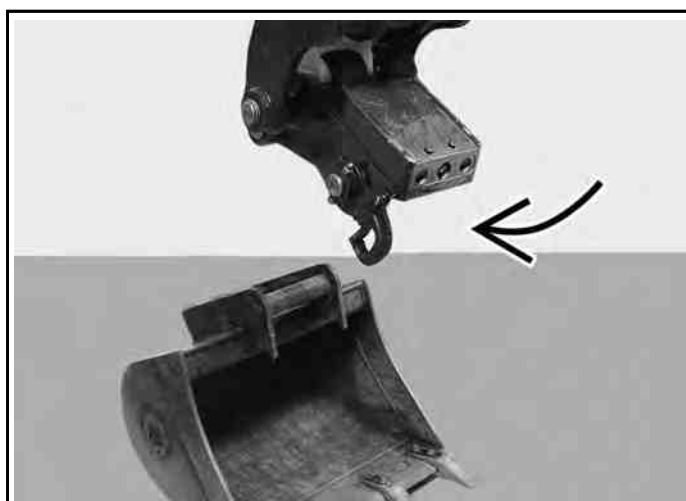
Keep all bystanders 6 m (20 ft) away from equipment when operating. ◀

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 187



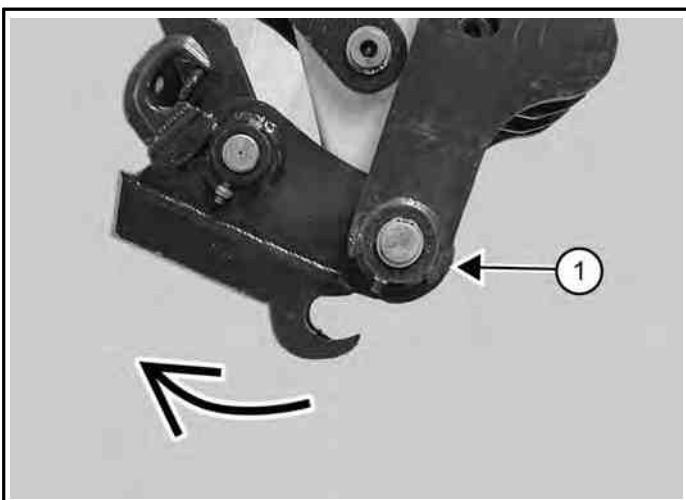
CT13895a

3. Position the arm and quick coupler to the attachment [Figure 187].

Figure 188

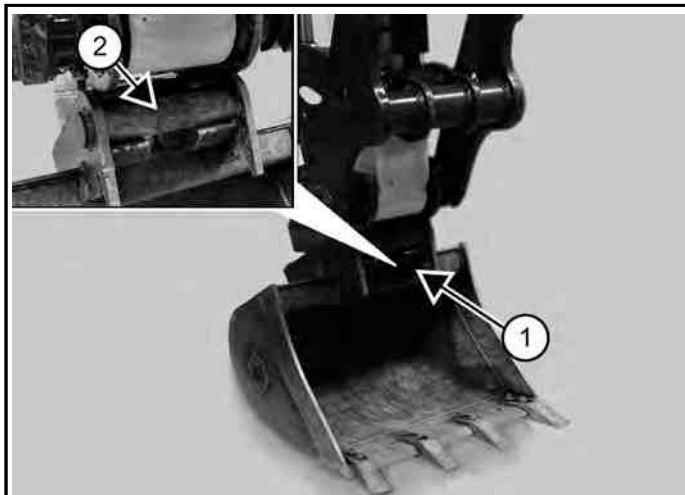


Figure 189



4. Move the right joystick (Item 1) [Figure 188] to the right (OUT) to curl the coupler (Item 1) [Figure 189] back, fully away from the cab.
5. Lower the coupler onto the attachment.

Figure 190



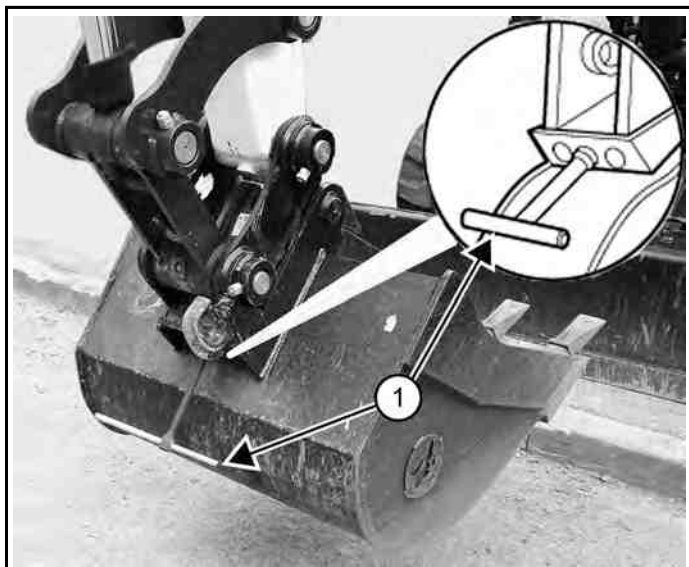
6. Engage the coupler hooks (Item 1) onto the attachment shaft (Item 2) [Figure 190].

Figure 191



7. Move the right joystick to the left (IN) and curl the coupler (Item 1) [Figure 191] in toward the cab fully.
8. Stop the engine and exit the machine.

Figure 192



9. Use the supplied wrench (Item 1) [Figure 192] and turn the wrench clockwise until the locking pins fully engage.

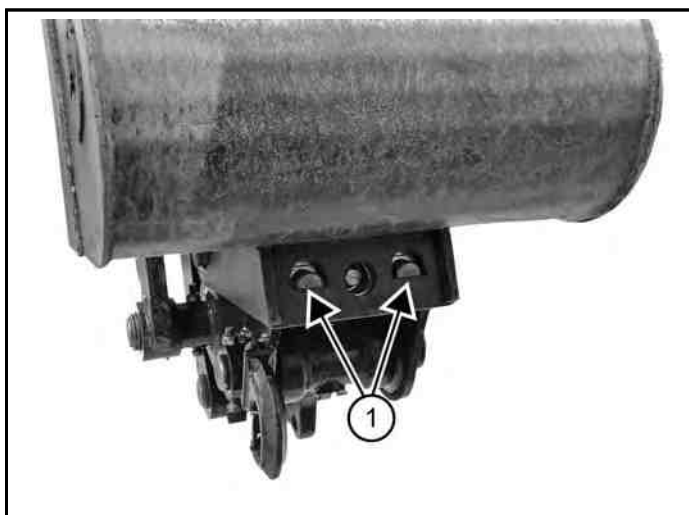
⚠ WARNING

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 193



10. Visually check that the locking pins (Item 1) [Figure 193] 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 86)
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 121)

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. ◀

W2119

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

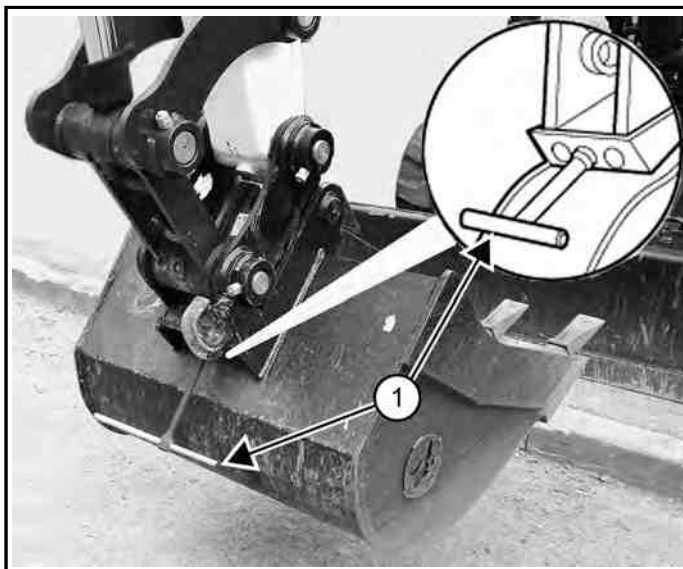
Figure 194



C113899

3. Move the right joystick to the left (IN) and curl the coupler in toward the cab fully [Figure 194].
4. Stop the engine and exit the excavator.

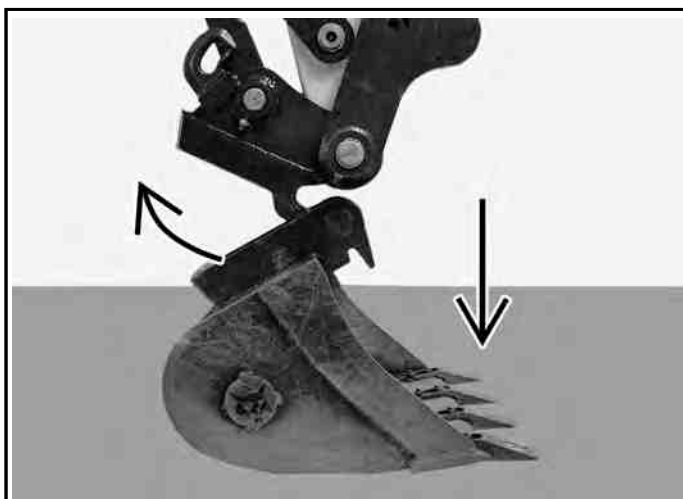
Figure 195



p113903b

5. Use the supplied wrench (Item 1) [Figure 195] 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 196



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 196].
9. Move the arm away from the attachment.

INSTALLING ATTACHMENTS (MECHANICAL PIN GRABBER COUPLER)

Figure 197



You have been supplied with the release tool [Figure 197] 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.

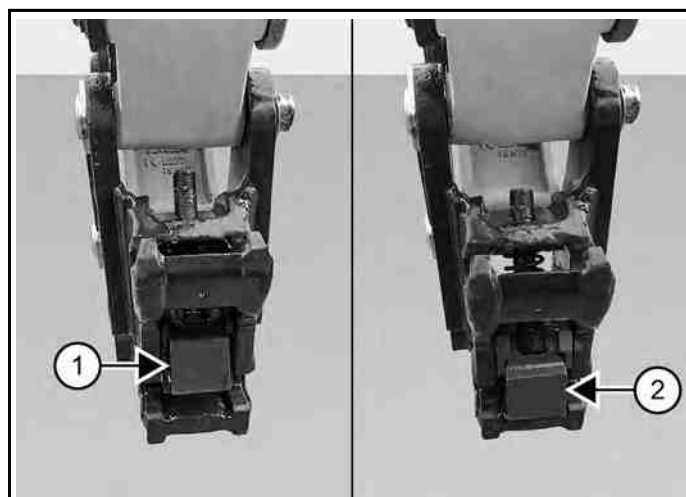
Keep all bystanders 6 m (20 ft) away from equipment when operating. ◀

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 198



C207448b

2. Inspect the quick coupler. If the wedge and the trigger are in the primed position (Item 1) [Figure 198], proceed to Step 4.

OR

If the wedge is in the engaged position (Item 2) [Figure 198], see Step 3.

⚠ WARNING

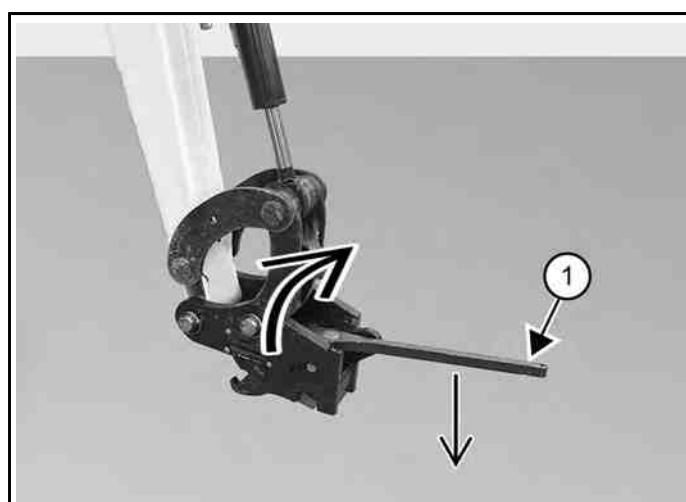
PINCHING HAZARD

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 199

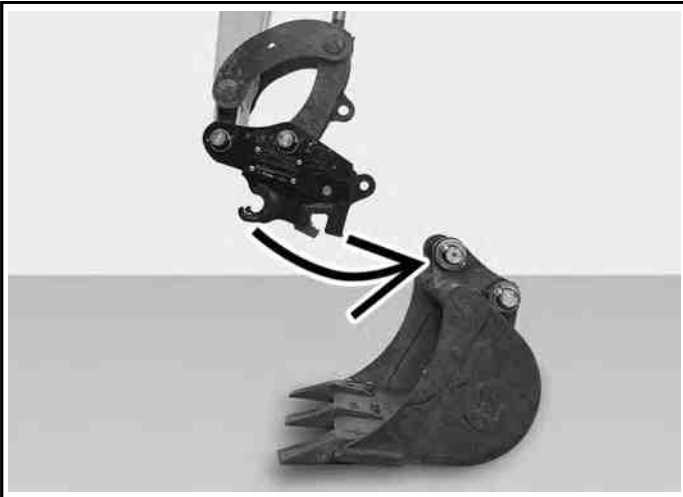


C207448b

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 199].

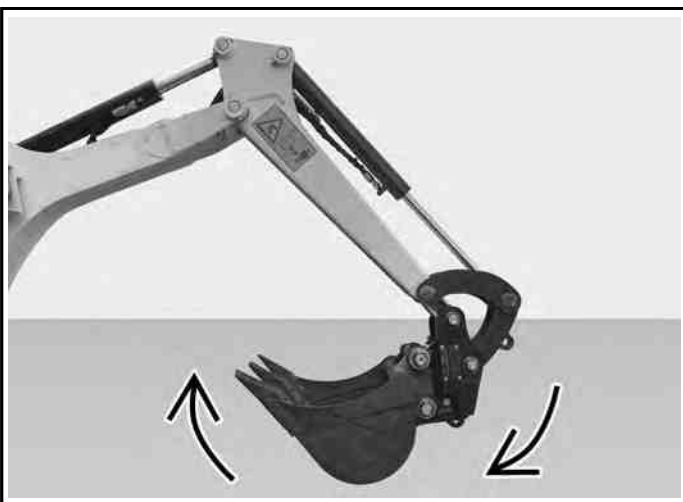
- c. Rotate the release tool clockwise and hold [Figure 199].
- d. Push the release tool down [Figure 199].
- e. The bottom part of the wedge will withdraw from the rear pin slot and the trigger will drop down.
- f. Remove the release tool and return it to a secure position.
- g. Enter the excavator, fasten the seat belt, and start the engine.

Figure 200



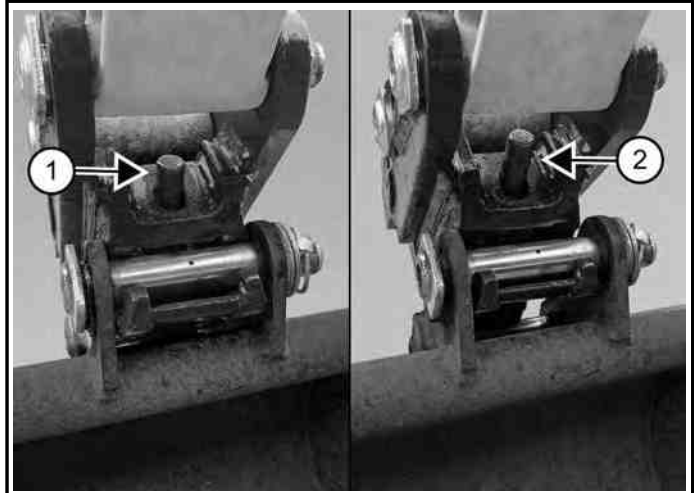
4. Guide the coupler front hooks onto the attachment front pin [Figure 200].
5. Raise the boom until there is approximately 500 mm (20 in) of clearance between the bottom of the attachment and the ground.

Figure 201



6. Extend the bucket cylinder and curl in the bucket [Figure 201] until you hear the wedge engage on the attachment back pin.

Figure 202



7. Visually inspect the indication bar to see if the coupler is fully engaged (Item 1) [Figure 202].

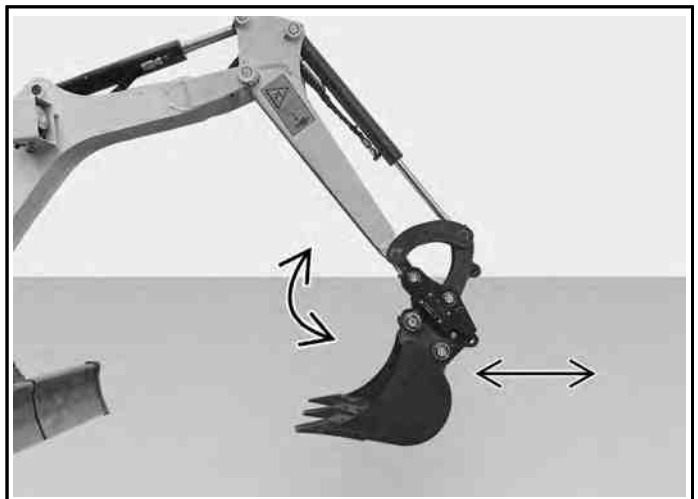
If the visual indicator bar is not fully engaged (Item 2) [Figure 202], the attachment must not be operated. Turn off the excavator and examine the coupler for dirt build up or damage. Refer to the service manual for further information.

⚠ 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. ◀

Figure 203



8. Shake the attachment vigorously and / or carry out a bump test to ensure the attachment is secured to the coupler [Figure 203].

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 204

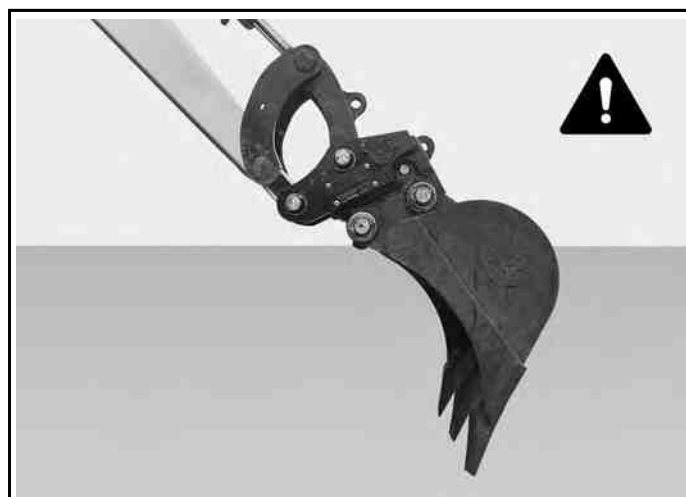


C207452a

1. Position the attachment close to ground level at the angle shown [Figure 204].

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

Figure 205



C207453a

DO NOT RELEASE AN ATTACHMENT WITH THE COUPLER CURLED OPEN. [Figure 205]

2. Stop the engine and exit the excavator.

WARNING

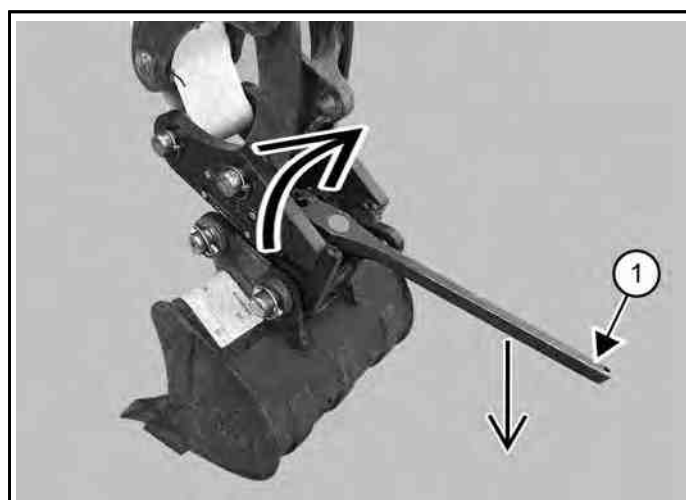
PINCHING HAZARD

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 206



C207454b

3. Firmly insert the release tool (Item 1) [Figure 206].

⚠ 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 206].
5. Press the release tool down against the wedge to disengage the attachment back pin [Figure 206].
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 207



C207447b

10. Move the arm away from the attachment [Figure 207].

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.

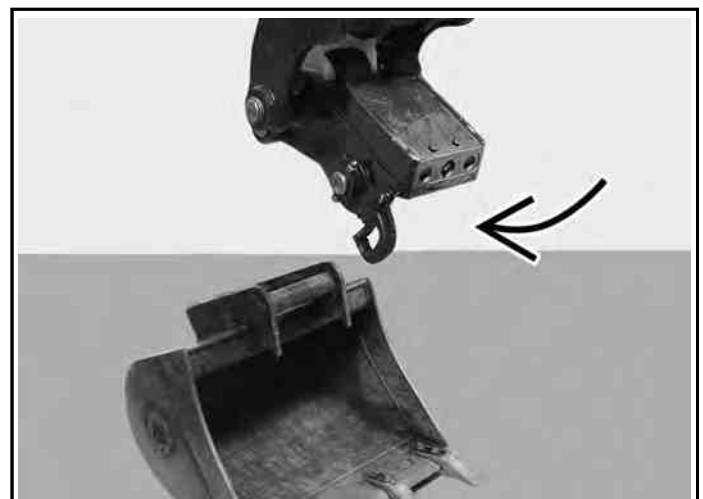
Keep all bystanders 6 m (20 ft) away from equipment when operating. ◀

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 208



C113895a

3. Position the arm and quick coupler to the attachment [Figure 208].

Figure 209

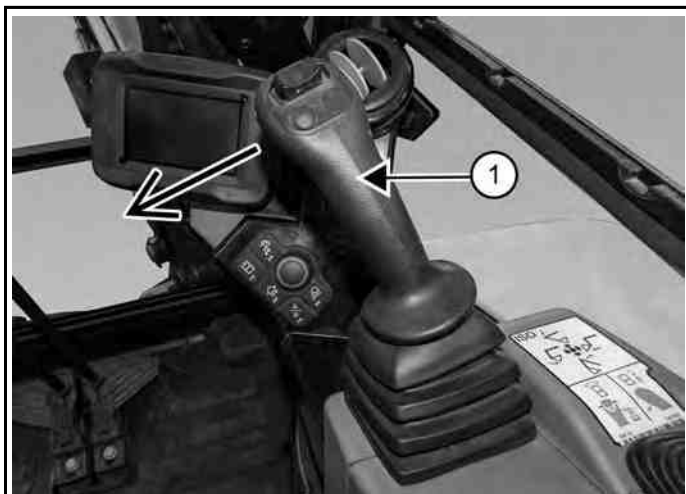
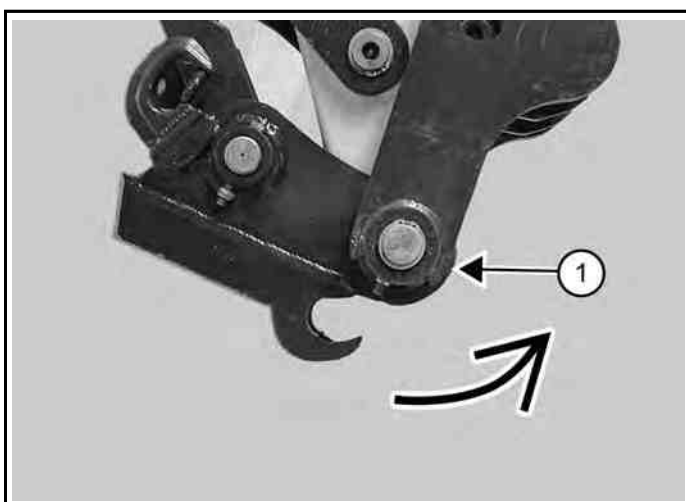


Figure 210



4. Move the right joystick (Item 1) [Figure 209] to the left (in) to curl the coupler (Item 1) [Figure 210] fully in toward the cab.

Figure 211

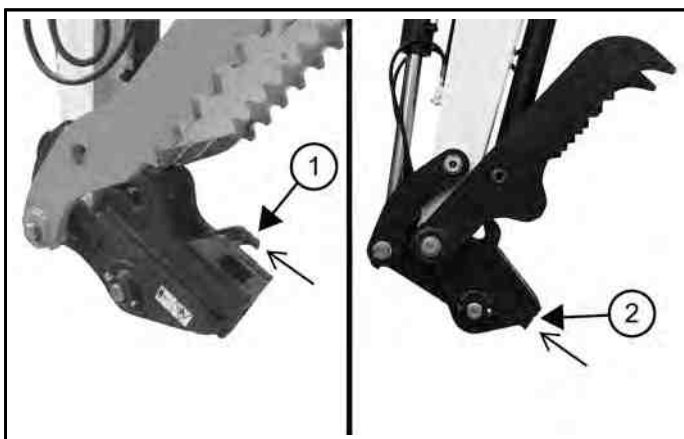


5. Press the Coupler On / Off switch (Item 1) [Figure 211] to the left (on) position to enable the quick coupler feature.

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 211] while continuing to hold the right joystick to the left (in).

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

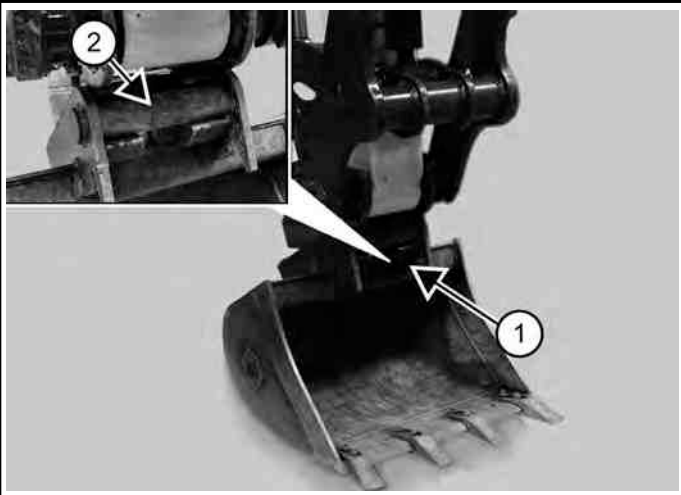
Figure 212



7. For the Pin Grabber Coupler – Continue holding the right joystick to the left (in) until the locking clasp (Item 1) [Figure 212] is fully retracted.

OR
For the Hydraulic Quick Coupler – Continue holding the right joystick to the left (in) until the pins (Item 2) [Figure 212] are fully retracted.

Figure 213



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 213].
9. Raise the attachment up slightly.

Figure 214



10. Curl the quick coupler in fully [Figure 214].
11. Press the Coupler On / Off switch (Item 1) [Figure 211] 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 215

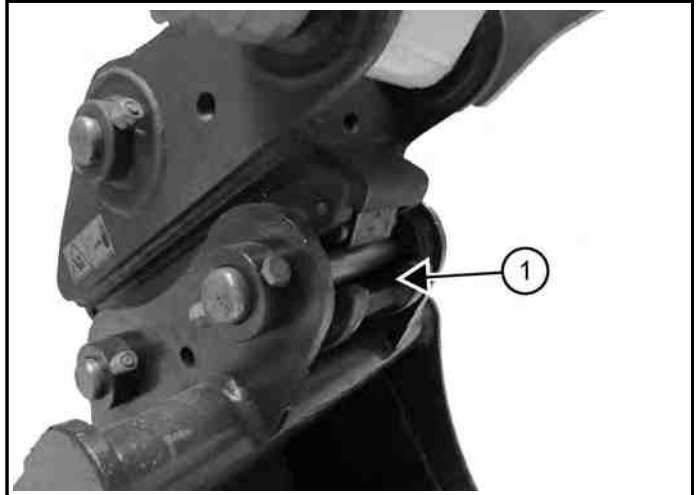
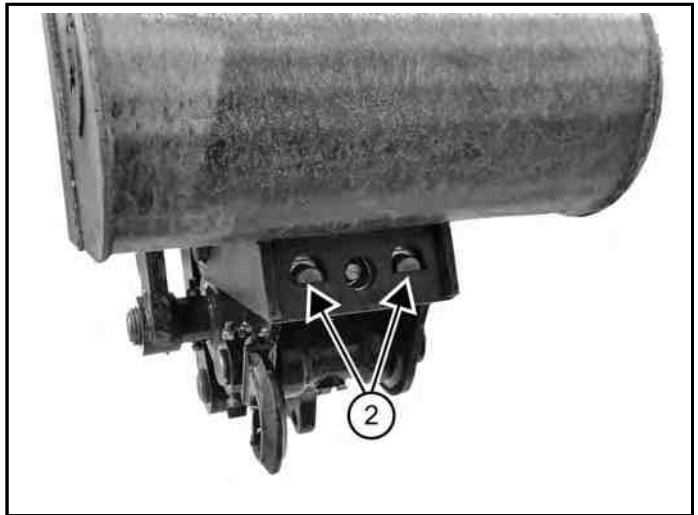


Figure 216



13. For the Pin Grabber Coupler – Visually check that the locking clasp (Item 1) [Figure 215] 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 216] 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 121)

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

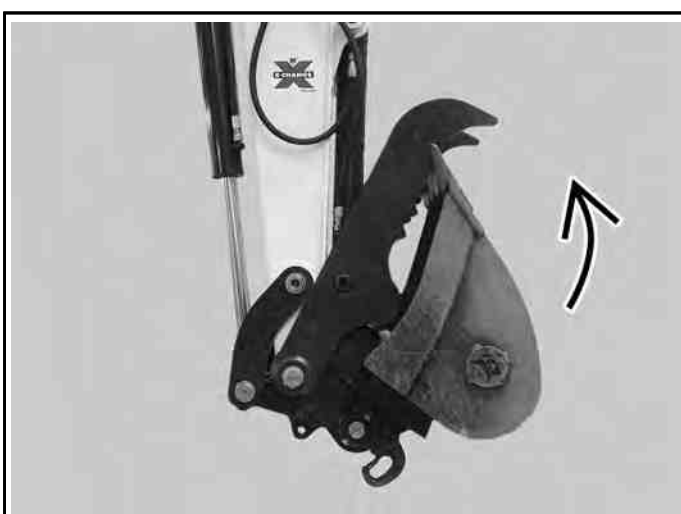
1. Enter the excavator and start the engine.
2. Raise the attachment slightly off the ground.

Figure 217



C206172e

Figure 218



C113899

3. Move the right joystick (Item 1) [Figure 217] to the left (in) to curl the coupler fully in toward the cab [Figure 218].

Figure 219



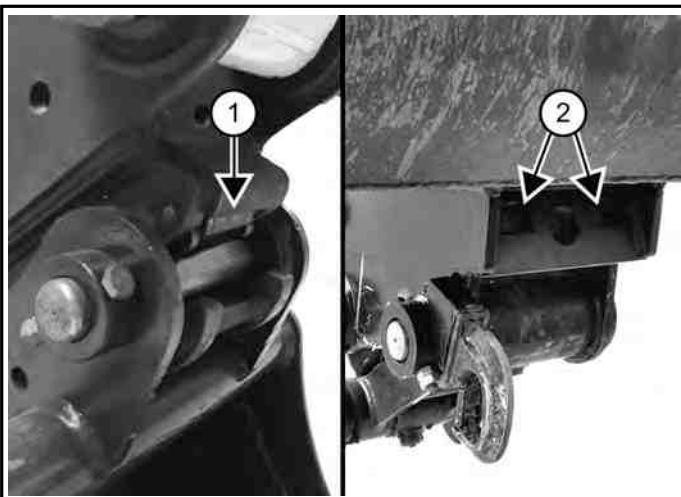
4. Press the Coupler On / Off switch (Item 1) [Figure 219] to the left (on) position to enable the quick coupler feature.

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 219], press and release the Coupler Intent switch (Item 2) [Figure 219] while continuing to hold the right joystick to the left (in).

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

Figure 220



6. For the Pin Grabber Quick Coupler – Continue holding the right joystick to the left (in) until the locking clasp (Item 1) [Figure 220] 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 220] 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 221

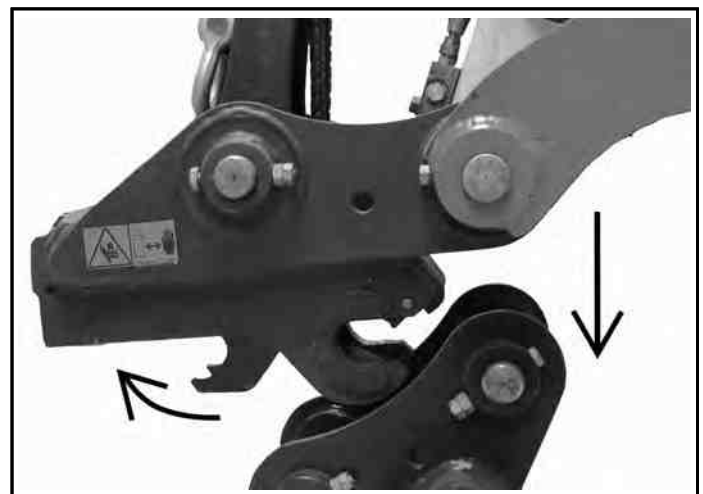
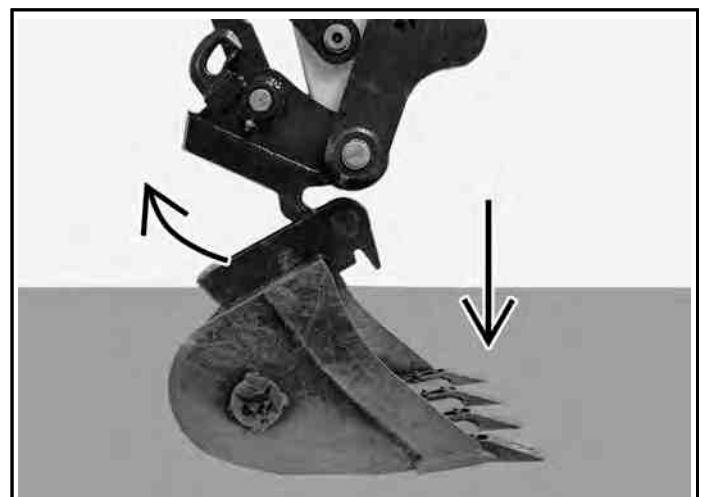


Figure 222



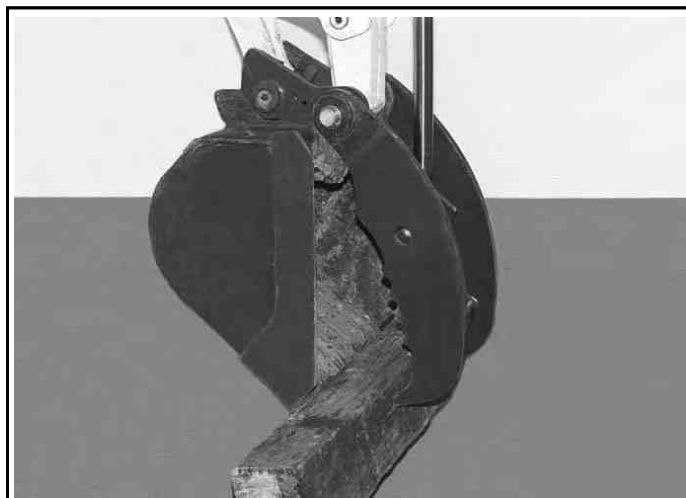
10. Move the arm away from the excavator until the quick coupler is clear of the attachment [Figure 221] or [Figure 222].
11. Press the Coupler On / Off switch (Item 1) [Figure 219] to the right, (off) position.

The switch light and buzzer will turn off.

HYDRAULIC CLAMP

Hydraulic Clamp Operation

Figure 223



N15513a

The optional lifting clamp attachment (if equipped) gives the excavator a wider range of use and mobility for debris removal [Figure 223].

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 121)

IMPORTANT

MACHINE DAMAGE

Improper use of the clamp, such as prying, will result in clamp damage.

Clamp is for lifting purposes only. ◀

I-2421

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 61) Adjust auxiliary flow as needed for optimal job performance.

Figure 224



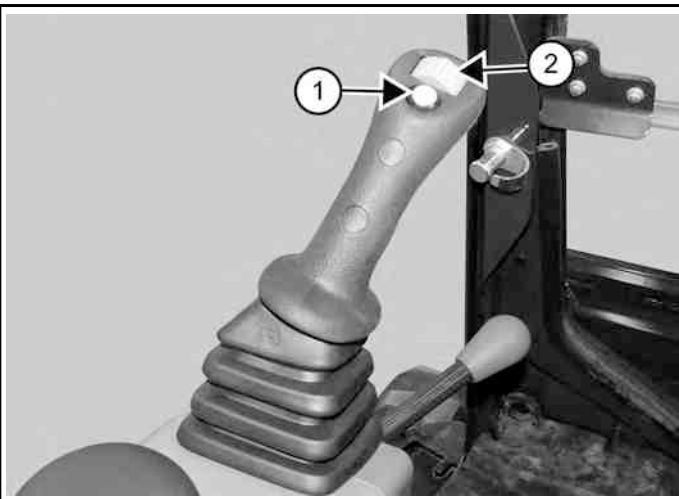
P200728d

2. Move the switch (Item 1) [Figure 224] on the right joystick to the right to open the clamp.
3. Move the switch (Item 1) [Figure 224] 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 225



P200104a

2. Press and hold the button (Item 1) [Figure 225] 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 225] on the left joystick to the left to open the clamp.
4. Move the switch (Item 2) [Figure 225] 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 121)

WARNING

INSTABILITY HAZARD

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

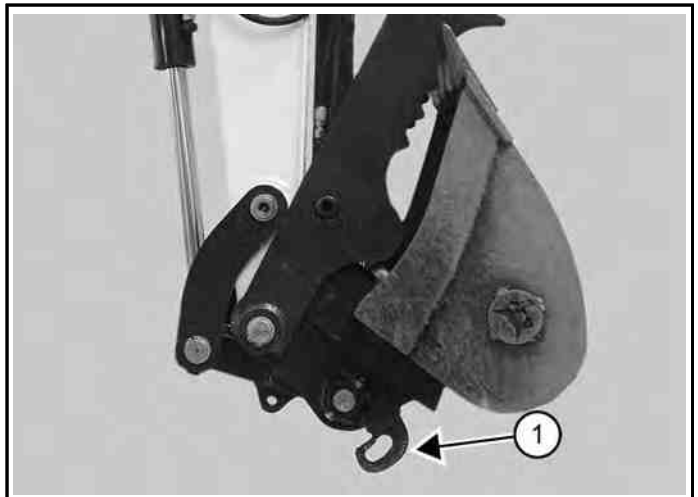
W-2374

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.

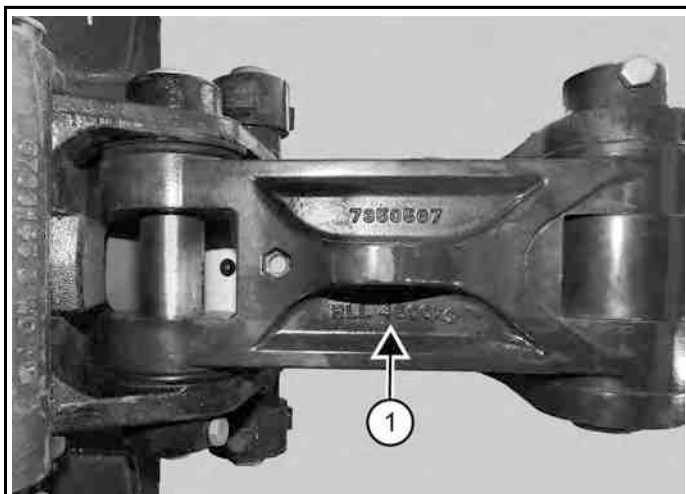
Do not exceed the machine's Rated Lift Capacity or the Rated Lift Load (RLL) of the lifting device (lift eye).

Figure 226



C135343a

Figure 227



P200410a

The maximum Rated Lift Capacity is shown on the lifting device (Item 1) [Figure 226] or [Figure 227].

⚠ WARNING

INSTABILITY AND CRUSHING HAZARD

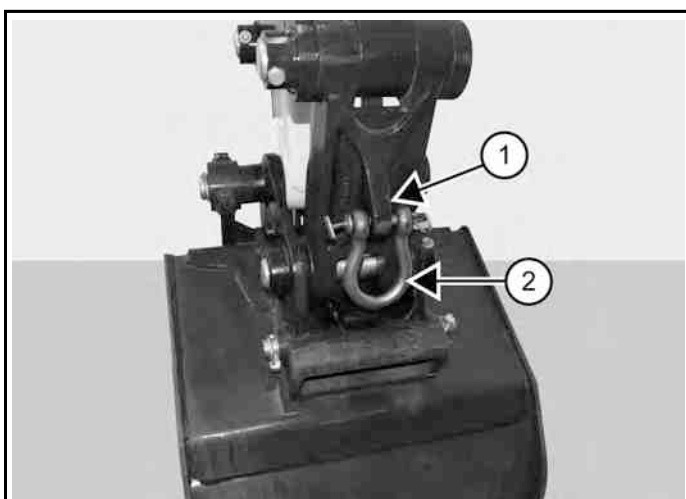
Excessive load can cause tipping, loss of control or failure of the lift eye resulting in serious injury or death.

Do not exceed rated lift capacity. ◀

W-2891

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

Figure 228

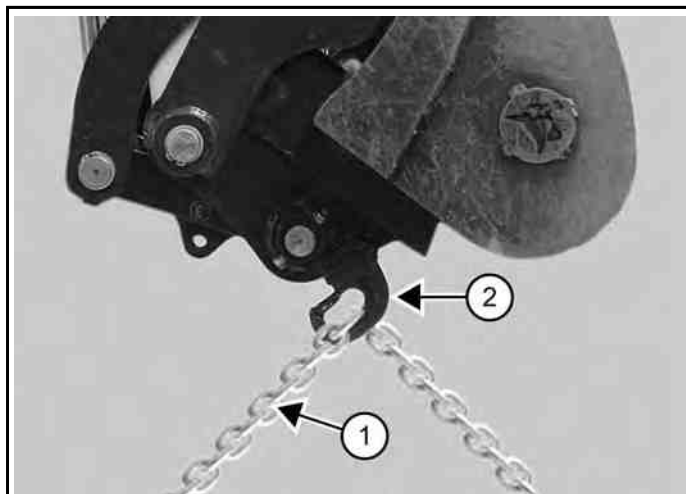


P200408a

3. For clevis lift eyes only, install the clevis (Item 2) through the lift eye (Item 1) [Figure 228].

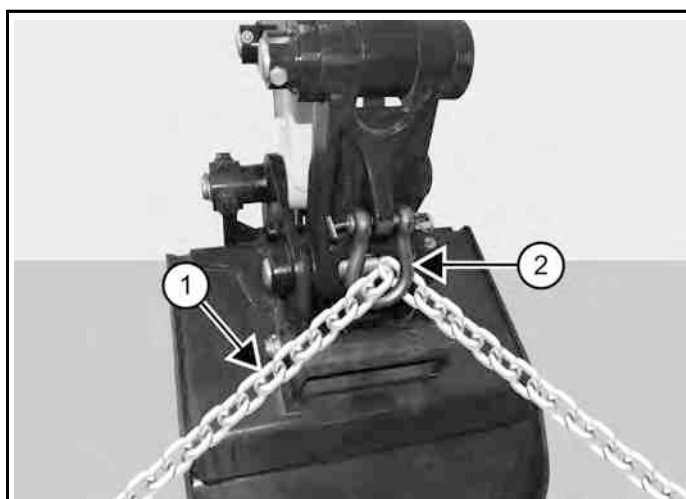
Visually check the lift eye and secondary lifting system (chain and clevis) for any damage. Replace any damaged components before lifting. See your Bobcat dealer for replacement lift eye and clevis.

Figure 229



C135344a

Figure 230



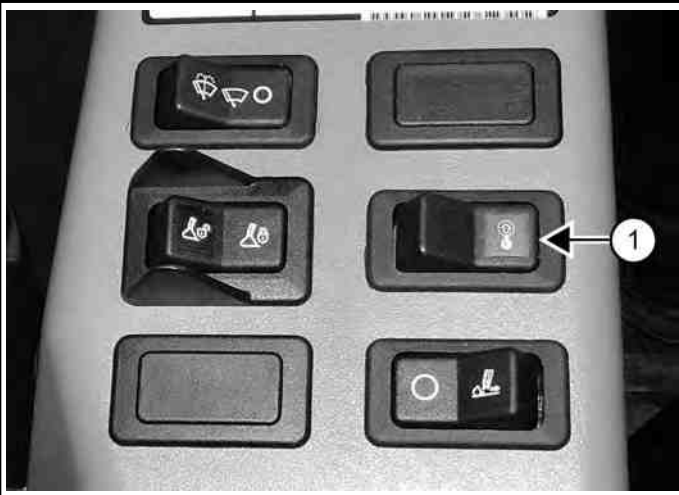
P200407a

4. Install a lift chain (Item 1) (or other type of lifting device) through the lift eye (Item 2) [Figure 229] or clevis (Item 2) [Figure 230] 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 86)

Figure 231



6. Press the overload warning device switch (Item 1) [Figure 231] on the left console to the left to activate the overload warning device.

Figure 232



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 232].
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

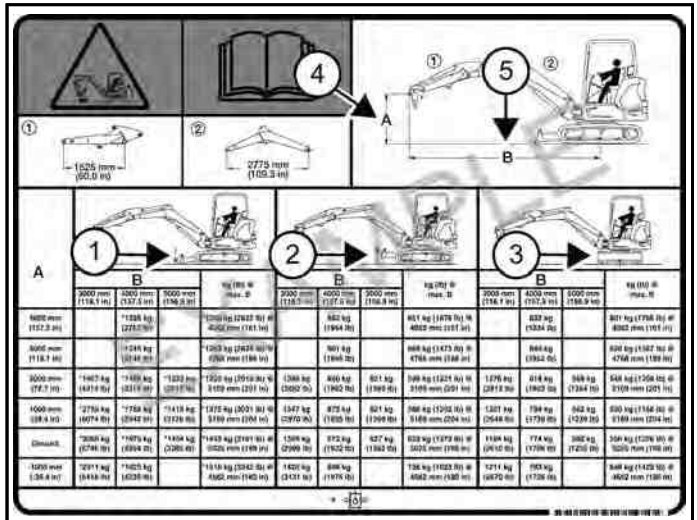
The standard lift capacities listed on the lift capacity decal are calculated for a machine equipped with no attachment mounting system and no attachment.

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 121)

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 122)

Calculating Lift Capacity

Figure 233

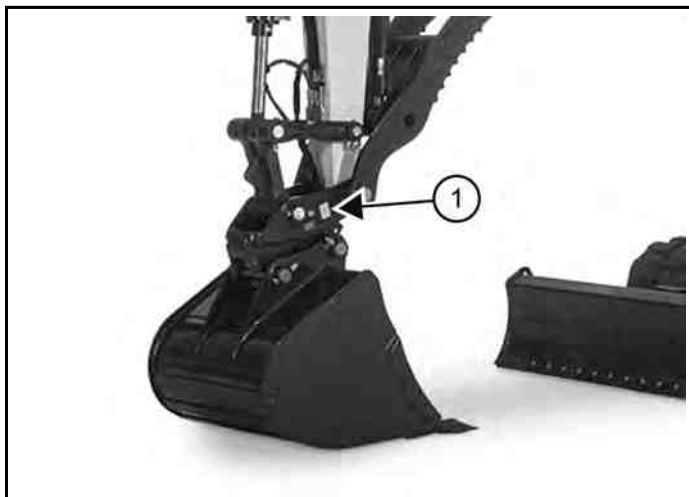


1. Find the standard lift capacity for your working conditions on your machine's lift capacity decal [Figure 233].

Working conditions include:

- Blade down (Item 1) [Figure 233]
- Blade Up (Item 2) [Figure 233]
- Boom Over Tracks (Item 3) [Figure 233]
- Lift Point Height (A) (Item 4) [Figure 233]
- Lift Radius (B) (Item 5) [Figure 233]
- Tracks Expanded / Retracted (not shown here)

Figure 234



C205365b

2. Find the weight of your attachment mounting system, which is printed on the plate as shown here (Item 1) [Figure 233].
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 122)

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, E17z-C4	39 kg (85 lb)
DX19, E19, E20, E20z, E20z-C4 (Pin-On)	29 kg (64 lb)
E19, E20, E20z, E20z-C4 (Klacc™ System)	81 kg (179 lb)
E26, E27, E27z	49 kg (98 lb)
E32, E32e, E35, E38, E40	52 kg (114 lb)
E42, E48, E50, E55, E60	97 kg (214 lb)
E50z, E55z, E60 (Europe)	95 kg (210 lb)
E88	166 kg (366 lb)

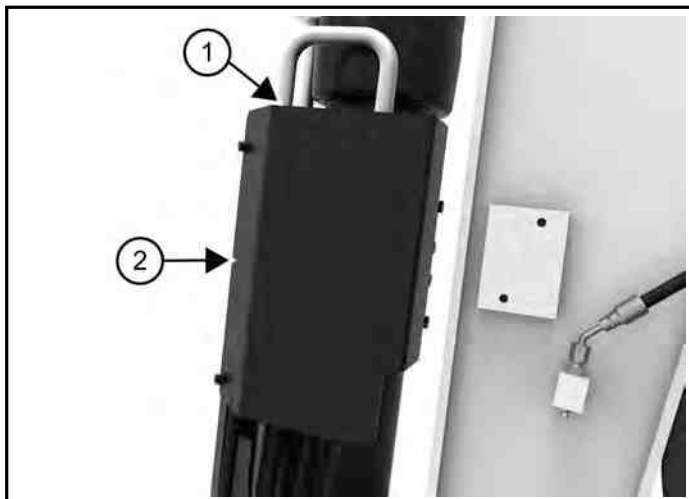
Description	Weight
Pin-On X-Change	
E32, E32e, E35, E38, E40	42 kg (92 lb)
E42, E48, E50, E55, E60	58 kg (128 lb)

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.

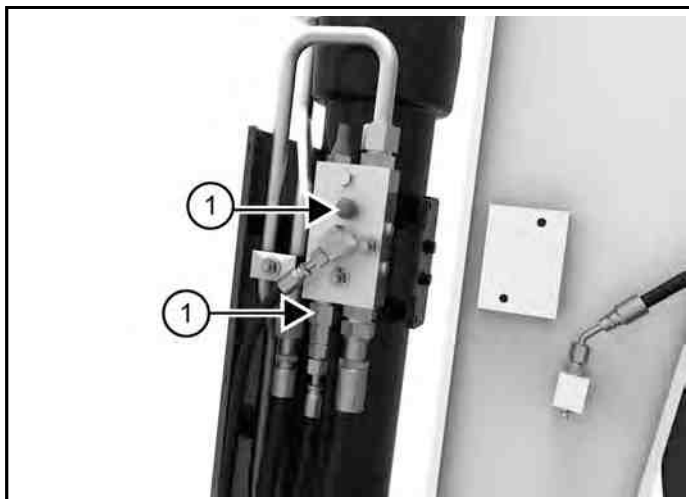
Figure 235



P132112a

If the excavator is equipped with a boom load holding valve (Item 1) [Figure 235], it will be attached to the boom cylinder at the base end.

Figure 236



P132113a

NOTE: The cover (Item 2) [Figure 235] is removed for photo clarity in [Figure 236].

Do not remove or adjust the two valves (Item 1) [Figure 236]. 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. ◀

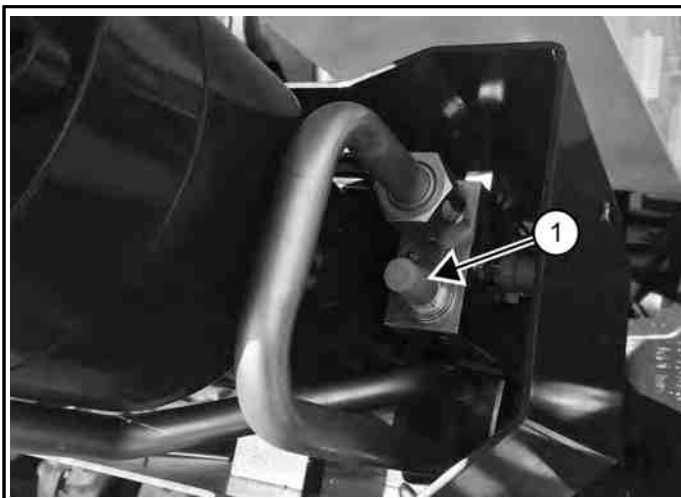
W-2793

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 237



P132108a

2. Remove the plastic cap (Item 1) [Figure 237] from the valve.

⚠ WARNING

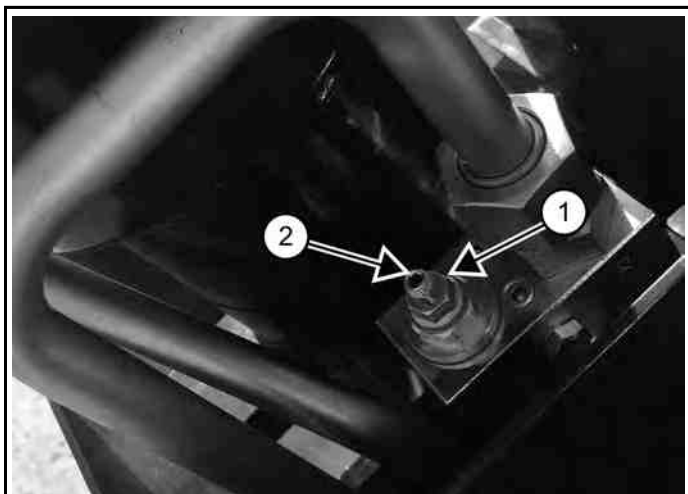
BURN HAZARD

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 238



3. Loosen the locknut (Item 1) [Figure 238].
4. Install a hex wrench into the valve screw (Item 2) [Figure 238] 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 238].

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.

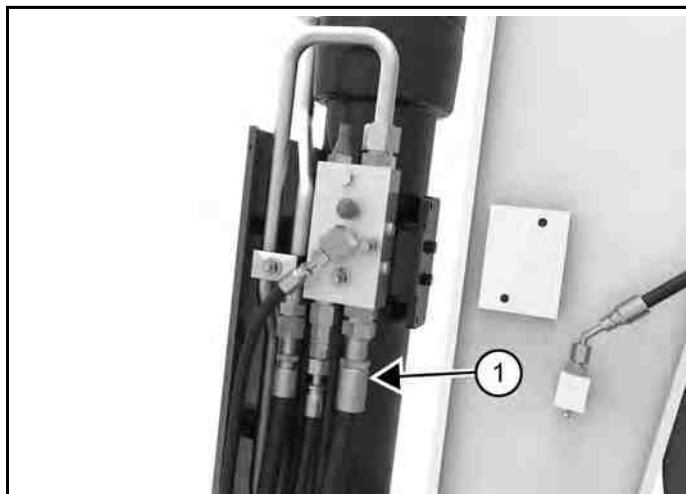
1. Place a container under the valve and hose end to catch any hydraulic fluid that is leaking.
2. Enter the excavator and turn the key on.
Do not start the engine.
3. Lower the left console.
4. Slowly move the joystick boom lower function to lower the boom to the ground.

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 239



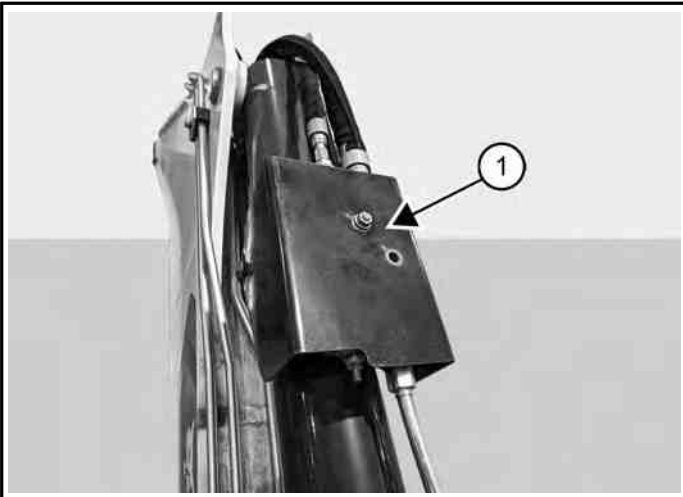
2. Remove the boom base end hose (Item 1) [Figure 239] from the boom load holding valve.
3. Loosen the locknut (Item 1) [Figure 238].
4. Install a hex wrench into the valve screw (Item 2) [Figure 238].
5. Slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the boom to lower to the ground.
6. After the boom is fully lowered, rotate the screw (Item 2) [Figure 238] counterclockwise 1/8 to 1/4 turn and tighten the locknut (Item 1) [Figure 238].
7. Reinstall the base end hose.

ARM LOAD HOLDING VALVE

Location Of Arm Load Holding Valve

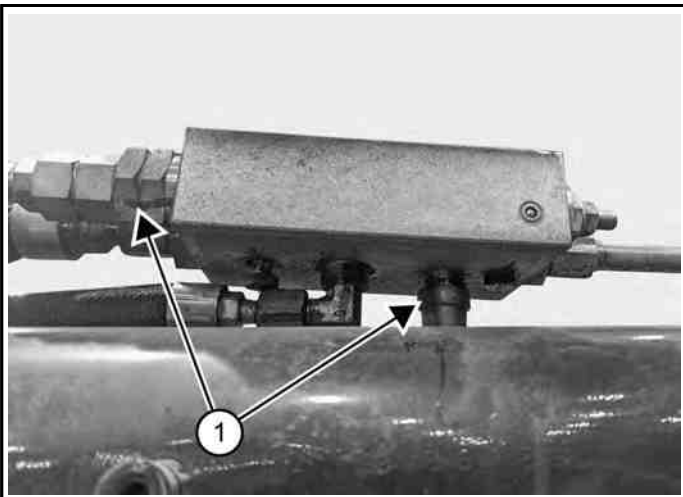
The arm load holding valve (if equipped) will hold the arm in its current position in the event of hydraulic pressure loss.

Figure 240



If the excavator is equipped with an arm load holding valve (Item 1) [Figure 240], it will be attached to the arm cylinder base end as shown.

Figure 241



Do not remove or adjust the two port relief valves (Item 1) [Figure 241]. 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. ◀

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

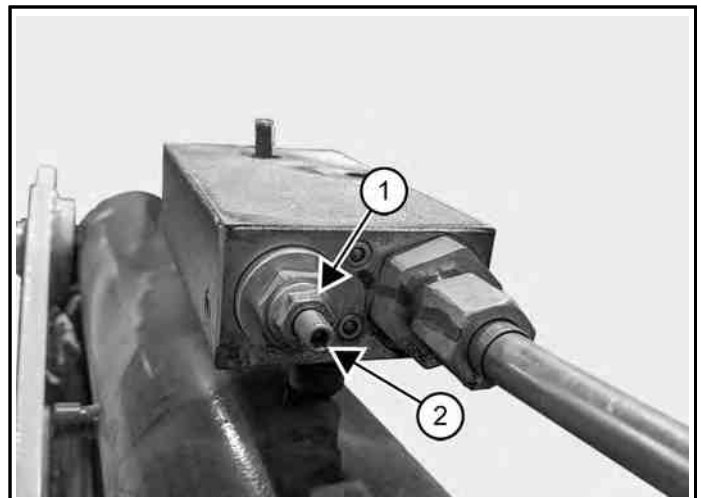
BURN HAZARD

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 242



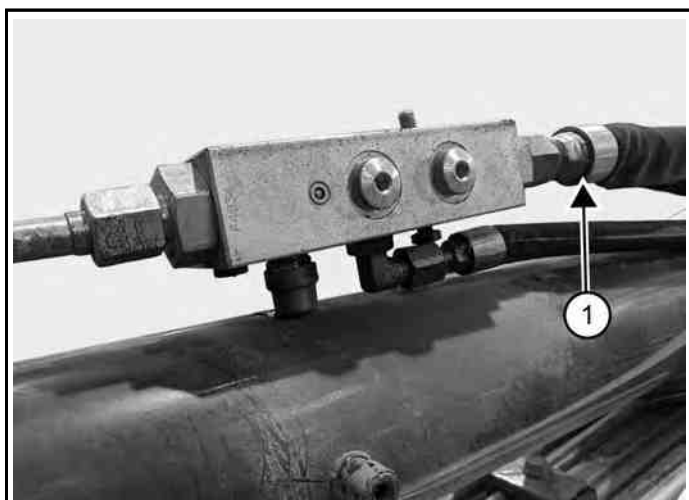
2. Loosen the locknut (Item 1) [Figure 242].
3. Install a hex wrench into the valve screw (Item 2) [Figure 242].
4. Slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the arm to lower.
5. After the arm is lowered, rotate the screw (Item 2) [Figure 242] counterclockwise the same 1/8 to 1/4 turn.
6. Tighten the locknut (Item 1) [Figure 242].

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

Figure 243



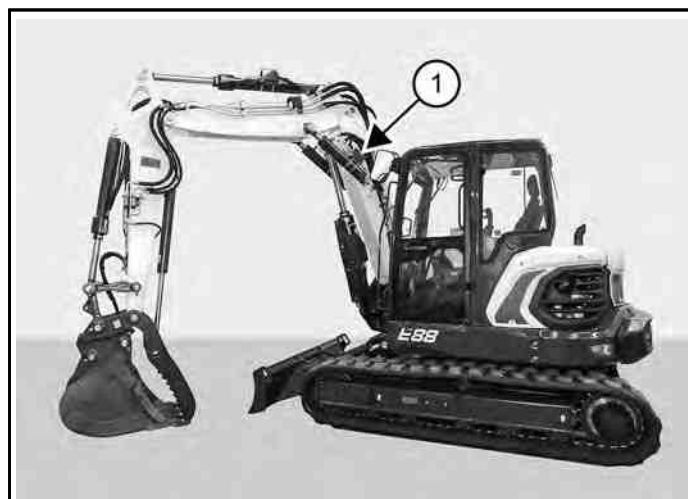
1. Remove the arm end hose (Item 1) [Figure 243] from the arm load holding valve.
2. Place a container under the valve and base end hose to catch any hydraulic fluid that is leaking.
3. Loosen the locknut (Item 1) [Figure 242].
4. Install a hex wrench into the valve screw (Item 2) [Figure 242].
5. Slowly 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 242] counterclockwise 1/8 to 1/4 turn.
7. Tighten the locknut (Item 1) [Figure 242].
8. Reinstall the base end hose.

ARTICULATED BOOM LOAD HOLDING VALVE

Location Of Articulated Boom Load Holding Valve

The articulated boom load holding valves will hold the articulated boom in its current position in the event of hydraulic pressure loss.

Figure 244



If the excavator is equipped with articulated boom load holding valves (Item 1) [Figure 244], they will be attached to the articulated boom cylinders as shown (on both sides).

WARNING

CRUSHING HAZARD

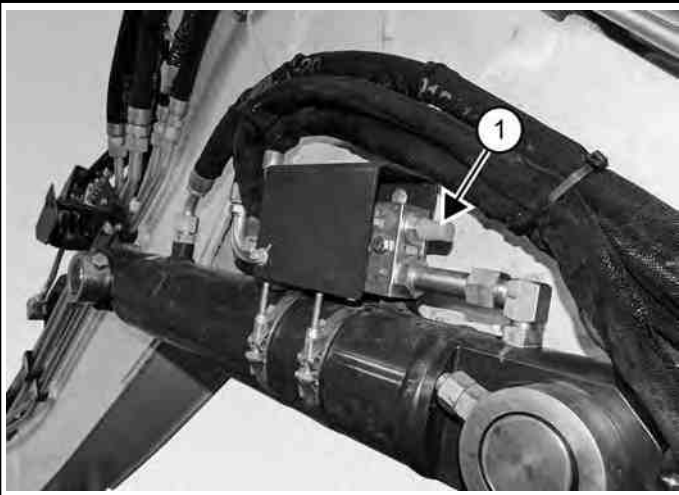
Falling equipment can cause serious injury or death. DO NOT work or stand under raised work equipment or attachment. ◀

Lowering Articulated 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 245



2. Remove the plastic cap (Item 1) [Figure 245] from the valve.

⚠ WARNING

BURN HAZARD

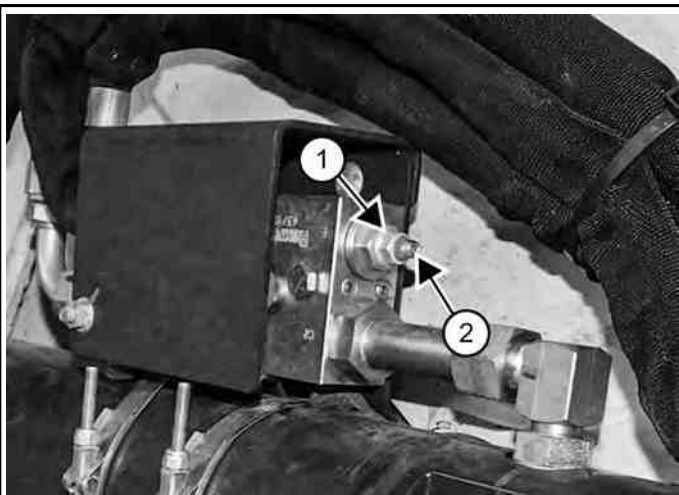
Hydraulic fluid, tubes, fittings and quick couplers can get hot when running machine and attachments.

Be careful when connecting and disconnecting quick couplers. ◀

W-2220

3. Mark the position of the set screw so that it can be returned to the original location after the articulated boom has been lowered.

Figure 246



4. Loosen the locknut (Item 1) [Figure 246].
5. Install a hex wrench into the valve screw (Item 2) [Figure 246] and slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the articulated boom to lower to the ground.

The more the screw is rotated, the faster the articulated boom will lower.

6. After the articulated boom is fully lowered, rotate the screw (Item 2) anticlockwise 1/8 to 1/4 turn and tighten the locknut (Item 1) [Figure 246].

Lowering Articulated 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 articulated boom before proceeding.

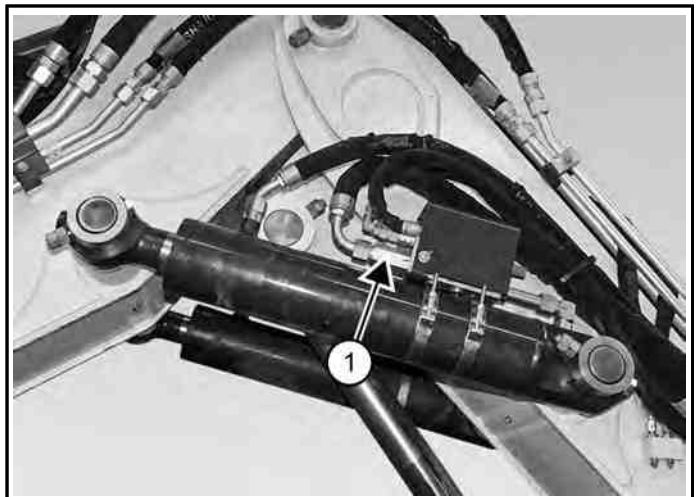
1. Place a container under the valve and hose end to catch any hydraulic fluid that is leaking.
2. Enter the excavator and turn the key on.
 - a. Do not start the engine.
3. Slowly push the toe of the pedal to lower the articulated boom to the ground.

Lowering Articulated 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 247



2. Remove the boom base end hose (Item 1) [Figure 247] from the boom load holding valve.
3. Loosen the locknut (Item 1) [Figure 246].
4. Install a hex wrench into the valve screw (Item 2) [Figure 246].

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) anticlockwise 1/8 to 1/4 turn and tighten the locknut (Item 1) [Figure 246].
7. Reinstall the boom base end hose.

DEPTH CHECK (DELUXE PANEL)

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 (Deluxe Panel) on Page 128)
(See Depth Check (Standard Display) on Page 146)
(See Depth Check (Touch Display) on Page 161)

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

Accessing The Depth Check Screen

Figure 248



C113639a

1. Scroll through screens with one of the arrow buttons until you reach the **ATTACHMENTS** screen [Figure 248].
2. Press the Enter button (Item 1) [Figure 248].

Figure 249

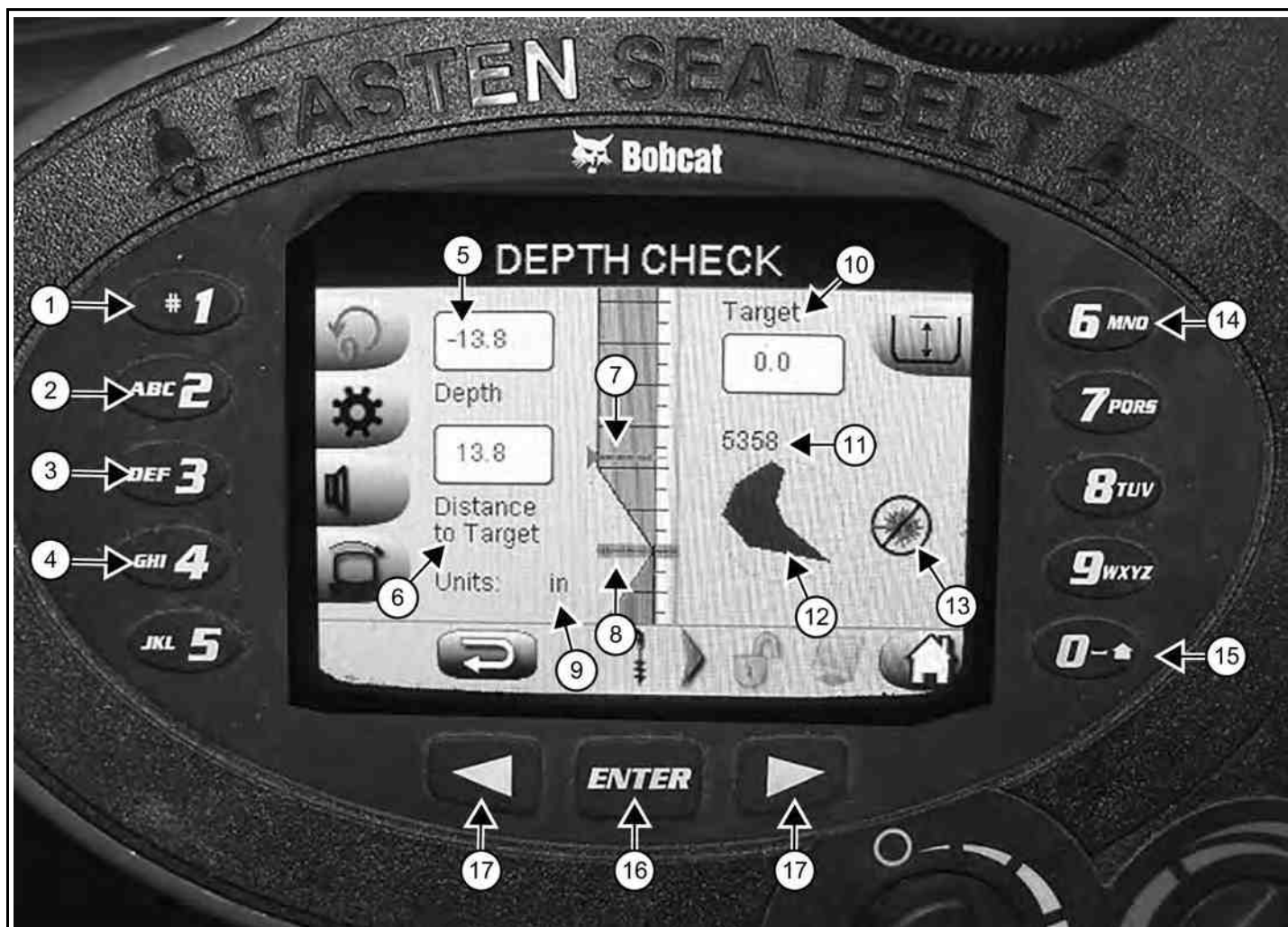


C113653a

3. Scroll through to the **ATTACHMENTS DEPTH CHECK** screen [Figure 249].
4. Press button 8 (Item 1) [Figure 249] to open the **DEPTH CHECK** screen.
(See Depth Check Screen on Page 130)

Depth Check Screen

Figure 250



See the following to access the **DEPTH CHECK** screen. (See Accessing The Depth Check Screen on Page 129)

REF.	DESCRIPTION	FUNCTION
1	Rebench	Press to Rebench. (See Digging To A Target Depth on Page 140)
2	Settings	Accesses SET DEPTH TARGETS , SELECT ATTACHMENT , SETUP AND CALIBRATION , and PREFERENCES screens.
3	Alarm	Turns target depth alarm on / off. (See Setting The Warning Zone on Page 139)
4	Change Screens	Toggles through DEPTH CHECK , DISTANCE TO TARGET , and GRADE CHECK screens.
5	Depth (Dimension)	Shows the current depth of the attachment cutting edge.
6	Distance to Target	Shows the difference between the current depth and the target depth.
7	Depth (Bar Graph)	Moves up and down to show the position of the attachment to the target.
8	Target (Bar Graph)	Shows where the target is in relationship to the attachment position.

REF.	DESCRIPTION	FUNCTION
9	Units	Shows current unit of measure. (See Switching Between English / Metric Units on Page 241)
10	Target (Dimension)	Shows depth to dig from an established starting point set by the operator. (Example: Desired dig depth from a surveyor's elevation pin.)
11	Attachment	Displays currently selected attachment.
12	Attachment Rotation	Shows a bucket 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.
13	Laser	Shows if the laser is on or off. (See Benching With A Laser System on Page 144)
14	Depth Target	Shows the five saved depth settings.
15	Home Screen	Returns to HOME screen.
16	Enter button	Press to enter a command or save a value.
17	Arrow buttons	Toggles through icons or returns to previous screen.

Calibrating The Boom

The following items are needed to complete this task:

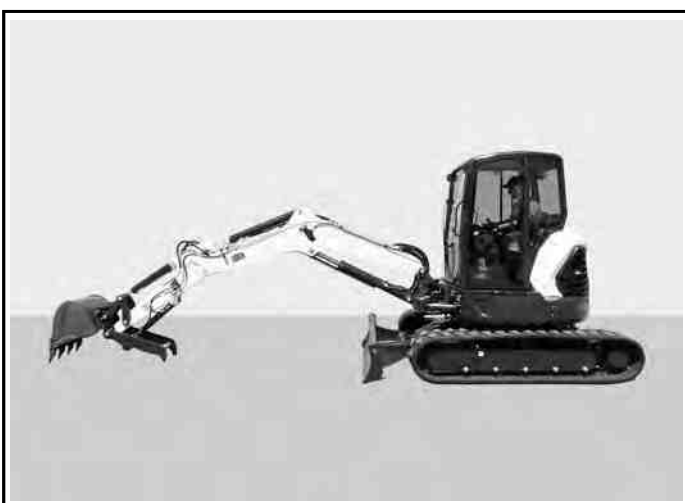
- Tape measure.
- Two magnetic tools that are included with the kit.

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 machine during this procedure.
2. Park the machine on a flat, level surface.

Figure 251



C200402a

3. Position the excavator with the bucket fully rolled out and the arm fully extended [Figure 251].
4. See the following to access the **DEPTH CHECK** screen.
(See Accessing The Depth Check Screen on Page 129)

Figure 252



C113654a

5. On the **DEPTH CHECK** screen, press button 2 (Item 1) [Figure 252] to access the **DEPTH CHECK SETTINGS** screen.

Figure 253



C113641a

6. Press button 3 (Item 1) [Figure 253] to access Setup And Calibration.
7. Read the message on the **DEPTH CHECK SETUP** screen and press the Enter button to continue.

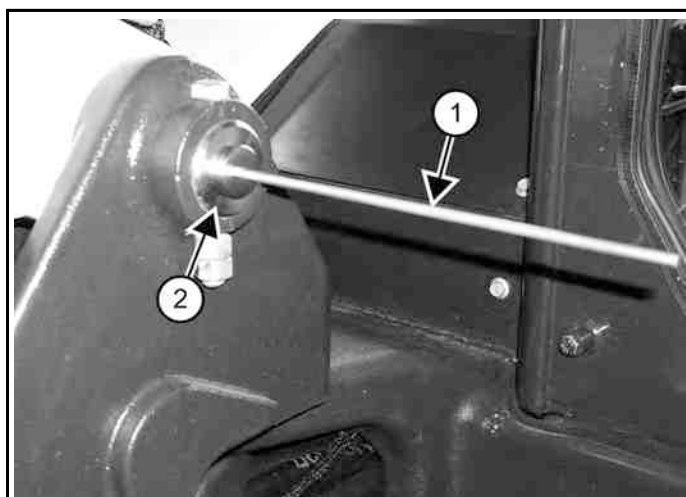
Figure 254



C113642a

8. Press button 1 (Item 1) [Figure 254] to set up the boom.

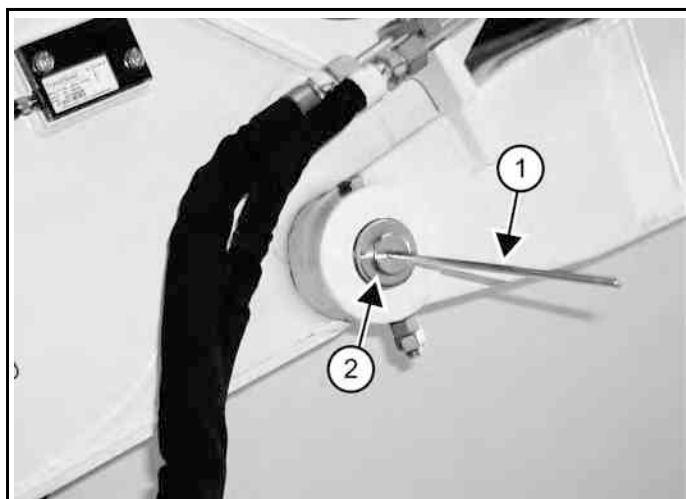
Figure 255



P131855a

9. Install one of the magnetic tools (Item 1) on the boom pivot pin (Item 2) [Figure 255]. Position the magnetic tool as close as possible to the centre of the boom pivot pin.

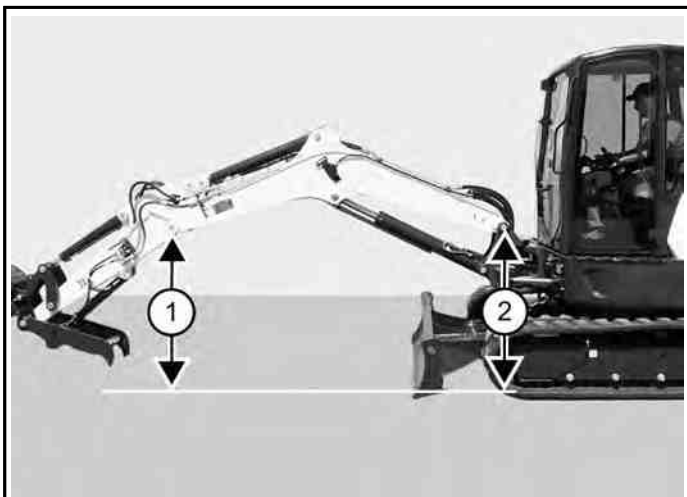
Figure 256



P131856a

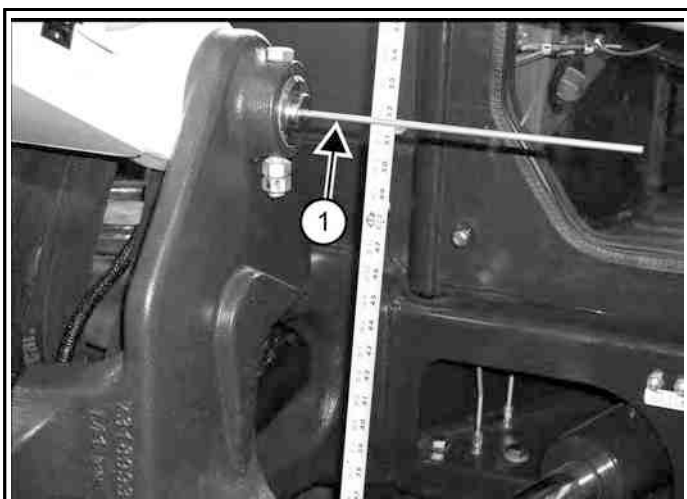
10. Install the second magnetic tool (Item 1) on the arm pivot pin (Item 2) [Figure 256]. Position the magnetic tool as close as possible to the centre of the arm pin.

Figure 257



11. Position the work group so the distance from the ground to the two magnetic tools (Items 1 and 2) [Figure 257] is identical.

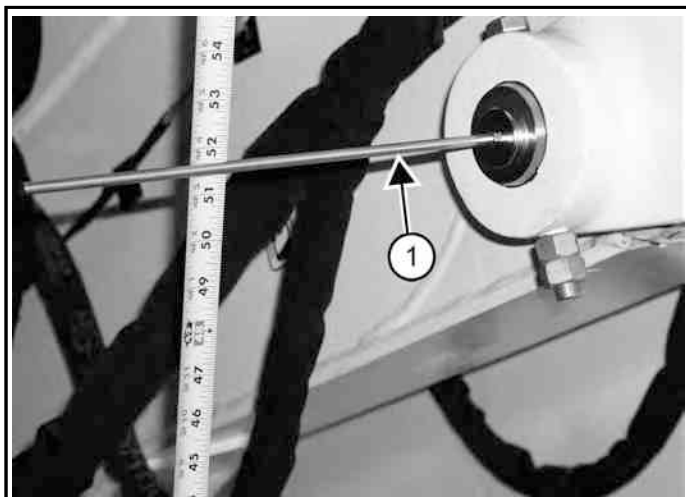
Figure 258



12. Measure the distance from the centre of the boom magnetic tool (Item 1) [Figure 258] 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 centrelines of the magnetic tools as this will eliminate any possible variation in the measurements to the ground.

Figure 259



13. Measure the distance from the centre of the arm magnetic tool (Item 1) [Figure 259] 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 260



15. With the boom leveled, press the Enter button (Item 1) [Figure 260] to store the information.
16. Proceed to calibrating the arm. (See Calibrating The Arm on Page 133)

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. See the following to access the **DEPTH CHECK** screen.
(See Accessing The Depth Check Screen on Page 129)

Figure 261



C113654a

2. On the **DEPTH CHECK** screen, press button 2 (Item 1) [Figure 261] to access the **DEPTH CHECK SETTINGS** screen.

Figure 262



C113641a

3. Press button 3 (Item 1) [Figure 262] to access Setup And Calibration.

Figure 263



C113642b

4. Press button 2 (Item 1) [Figure 263] to set up the arm.

Figure 264



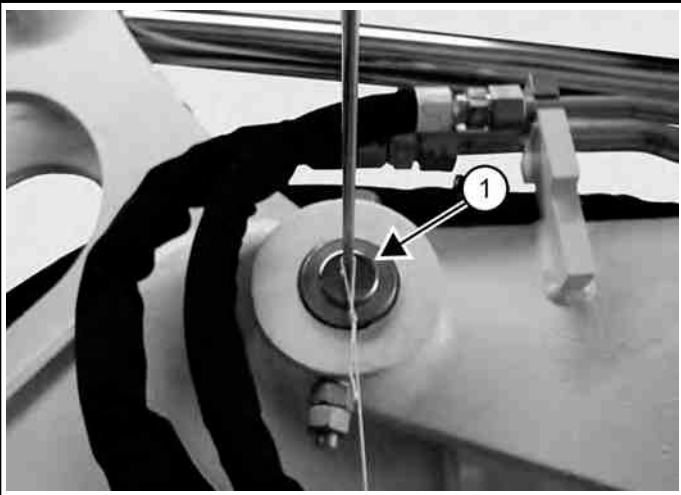
C113647a

5. Select the arm that your machine is equipped with [Figure 264].

NOTE: Some models only have one arm option available.

6. Press the Enter button.

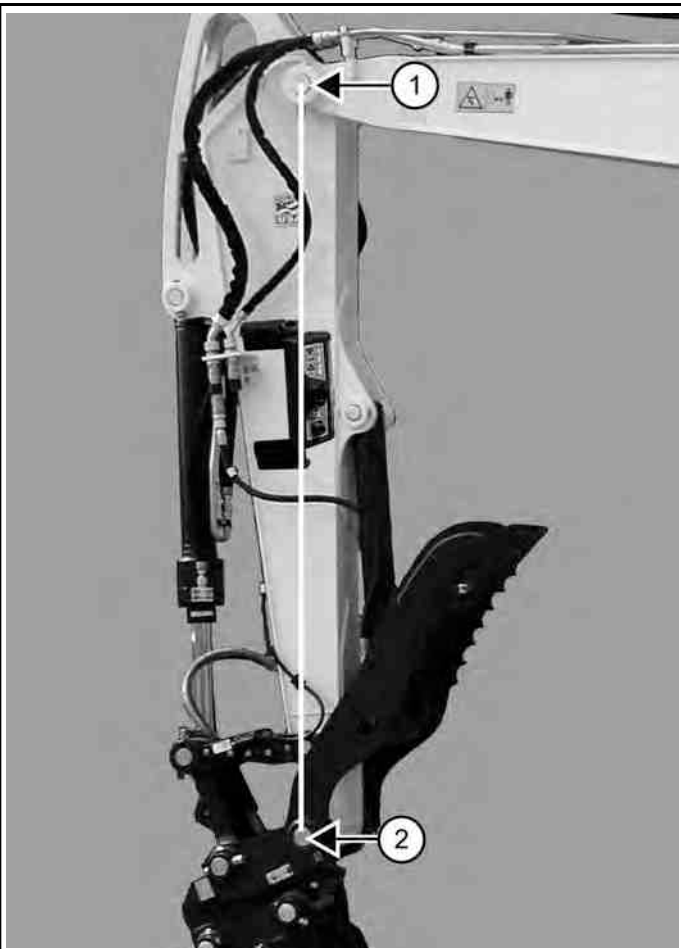
Figure 265



p132078b

7. Install the magnetic tool on the arm pin (Item 1) [Figure 265].
8. Place the plumb bob on the magnetic tool that is installed on the arm pin (Item 1) [Figure 265].

Figure 266



p132078c

9. Move the arm until the plumb bob line (Item 1) is centred on the pivoting bucket pin (Item 2) [Figure 266].

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

Figure 267



C119652a

10. With the arm vertical, press the Enter button (Item 1) [Figure 267] to store this information.
11. Proceed to calibrating the attachment. (See Calibrating The Attachment on Page 135)

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. See the following to access the **DEPTH CHECK** screen. (See Accessing The Depth Check Screen on Page 129)

Figure 268



2. On the **DEPTH CHECK** screen, press button 2 (Item 1) [Figure 268] to access the **DEPTH CHECK SETTINGS** screen.

Figure 269



3. Press button 3 (Item 1) [Figure 269] to access Setup And Calibration.

Figure 270



4. Press button 3 (Item 1) [Figure 270] to set up the attachment.

Figure 271



5. Select one of the attachments [Figure 271].

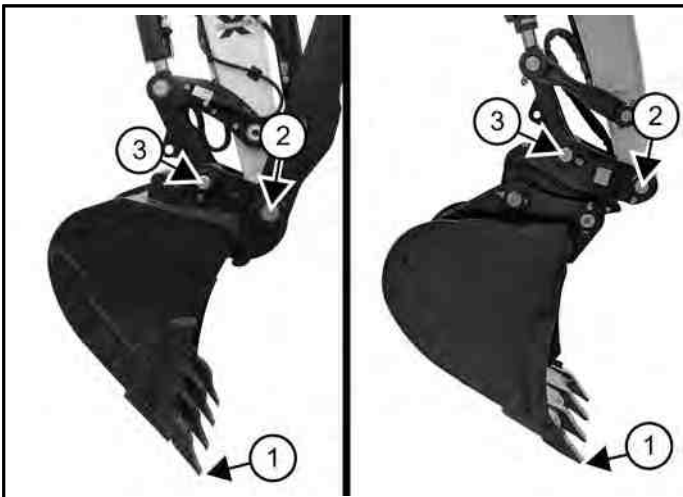
Up to five different attachments can be named, calibrated, and stored for future use.

Figure 272



6. On the **ATTACHMENT SETUP** screen, press button 1 (Item 1) [Figure 272] to change the name.
7. Use the buttons to enter a name or number for the attachment.
8. Press the Enter button to save the name.
9. Press the arrow buttons to return to the **ATTACHMENT SETUP** screen.
10. Press button 2 to select Setup and Calibration.
11. Select **[INSIDE LENGTH]**.

Figure 273



12. Measure the distance from the tip of the attachment (Item 1) to the centre of the inner pin (Item 2) [Figure 273] and enter this value.

Choose the correct pin (Item 2) [Figure 273] based on the type of attachment mounting system on your machine.

13. Select **[OUTSIDE 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.

14. Measure the distance from the tip of the attachment (Item 1) to the centre of the outer pin (Item 3) [Figure 273] and enter this value.

Choose the correct pin (Item 3) [Figure 273] based on the type of attachment mounting system on your machine.

15. Press the Enter button.

Figure 274



16. On the **ATTACHMENT SETUP** screen, press the Enter button (Item 1) [Figure 274] to store the information.

Use the plumb bob and pin extender to vertically align the inner pin (Item 2) and the attachment tip (Item 1) [Figure 273].

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 142)

Setting Depth Target

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

- 1. See the following to access the **DEPTH CHECK** screen.
(See Accessing The Depth Check Screen on Page 129)

Figure 275



- 2. To select one of the exiting depths, press button 6 (Item 1) [Figure 275].

OR

To set a new depth, press button 2 (Item 2) [Figure 275] and then press button 1 to access **SELECT DEPTH TARGET** screen.

Figure 276



- 3. Select one of the stored depths [Figure 276].

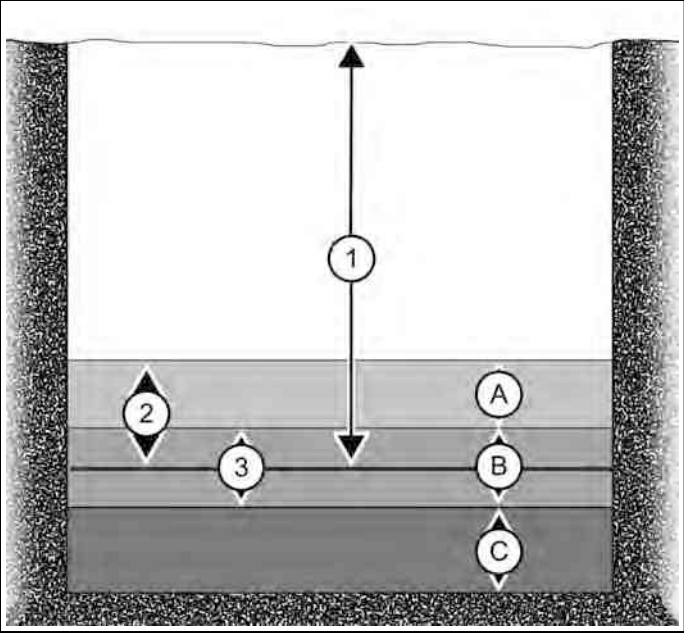
Figure 277



- 4. Enter the new depth target using the buttons [Figure 277].
- 5. Press the Enter button to save.

Description Of Grade And Warning Zones

Figure 278



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. See the following to access the **DEPTH CHECK** screen.
(See Accessing The Depth Check Screen on Page 129)

Figure 279



2. On the **DEPTH CHECK** screen, press button 2 (Item 1) [Figure 279].

Figure 280



3. Press button 1 (Item 1) [Figure 280] to select SET DEPTH TARGETS.

Figure 281



4. Press button 3 (Item 1) [Figure 281] to select WARNING ZONE.
5. Use the buttons to enter the new warning zone.
6. Press the Enter button to save.

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. See the following to access the **DEPTH CHECK** screen.
(See Accessing The Depth Check Screen on Page 129)

Figure 282



2. On the **DEPTH CHECK** screen, press button 2 (Item 1) [Figure 282].

Figure 283



3. Press button 1 (Item 1) [Figure 283] to select SET DEPTH TARGETS.

Figure 284



4. Press button 2 (Item 1) [Figure 284] to select GRADE ZONE.
5. Use the buttons to enter the new grade zone.
6. Press the Enter button to save.

Digging To A Target Depth

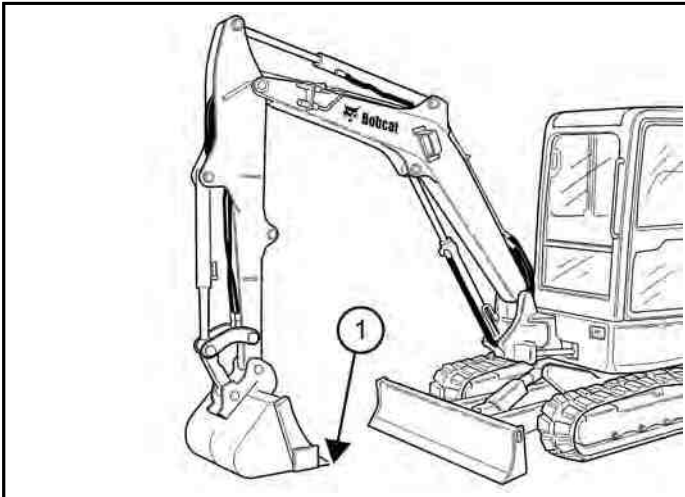
⚠ DANGER

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. ◀

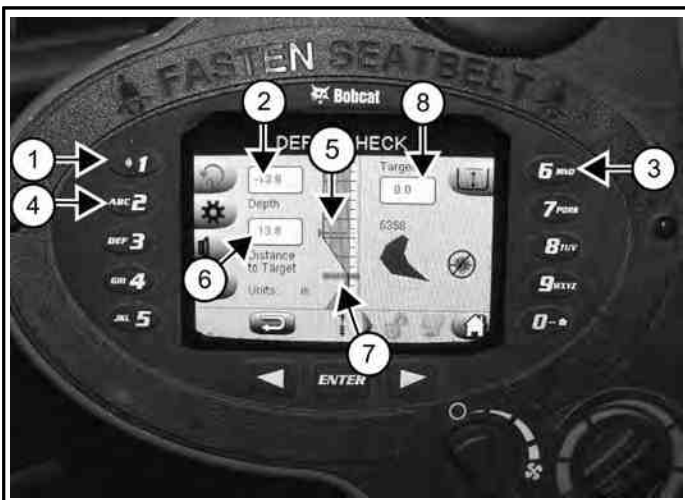
NOTE: If you are not digging with a laser, make sure the laser icon is not illuminated on the **DEPTH CHECK** screen.

Figure 285



1. Set the bucket (Item 1) [Figure 285] on the ground surface where you are going to start the dig or on the surveyor mark to establish the starting ground position.
2. See the following to access the **DEPTH CHECK** screen.
(See Accessing The Depth Check Screen on Page 129)

Figure 286



3. On the **DEPTH CHECK** screen, press button 1 (Item 1) [Figure 286] to rebench.

OR

Press the right joystick button to rebench.

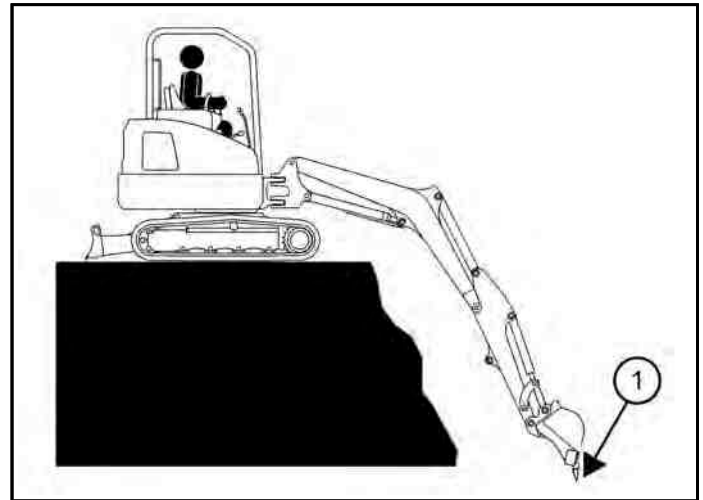
At rebench, the depth dimension (Item 2) [Figure 286] will set to 0.0. As the bucket is raised or lowered, the depth dimension (Item 2) [Figure 286] will change.

4. Press button 6 (Item 3) [Figure 286] to select one of the preset depths.

OR

Press button 2 (Item 4) [Figure 286] to set a new depth. (See Setting Depth Target on Page 138)

Figure 287



- As the hole is being dug, the position of the bucket (Item 1) [Figure 287] is dimensionally shown (Item 2) [Figure 286] and shown on the bar graph at (Item 5) [Figure 286].
- The distance to target depth is shown dimensionally (Item 6) and on the bar graph (Item 7) [Figure 286].
- When the bucket is getting close to the target depth (Item 8) [Figure 286], 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 Grade Zone on Page 139)
(See Setting The Warning Zone on Page 139)

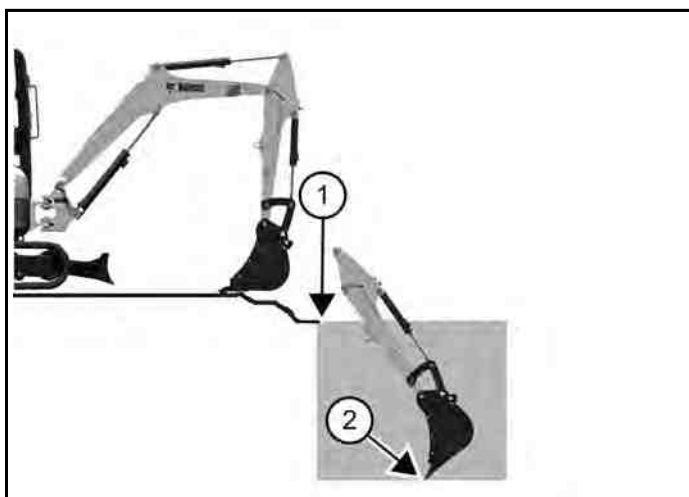
EXAMPLE: The Target is 2 m (6.5 ft) and the Depth is 1,5 m (4.9 ft), the Difference will be 0,5 m (1.6 ft).

$$2 \text{ m} - 1,5 \text{ m} = 0,5 \text{ m} \quad (6.5 \text{ ft} - 4.9 \text{ ft} = 1.6 \text{ ft}).$$

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 288



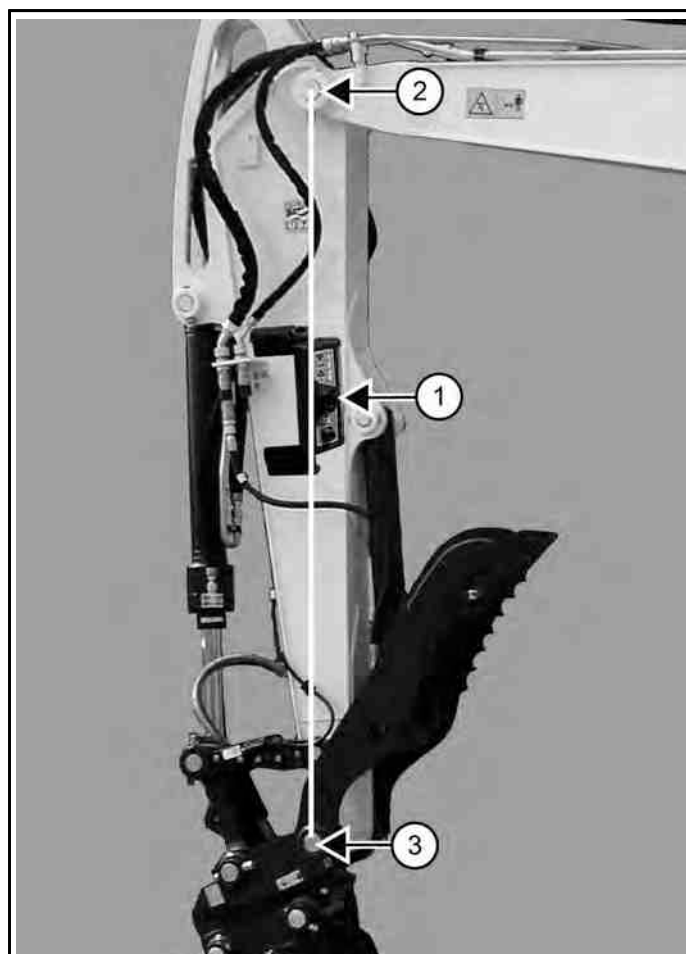
P200242b

- Reposition the excavator so the bucket can be rebenched off the original bench point (Item 1) [Figure 288].
- Position the excavator so the bucket will reach to the bottom of the hole (Item 2) [Figure 288] 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

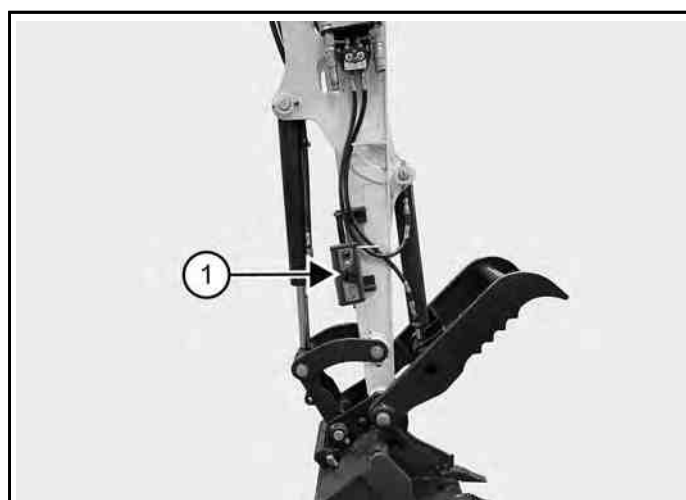
Figure 289



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 289].

Figure 290



C204985b

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 290].
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. See the following to access the **DEPTH CHECK** screen.
(See Accessing The Depth Check Screen on Page 129)

Figure 291



C113654a

5. On the **DEPTH CHECK** screen, press button 2 (Item 1) [Figure 291].

Figure 292



C113647b

6. Press button 1 (Item 1) [Figure 292] to select SET DEPTH TARGETS.

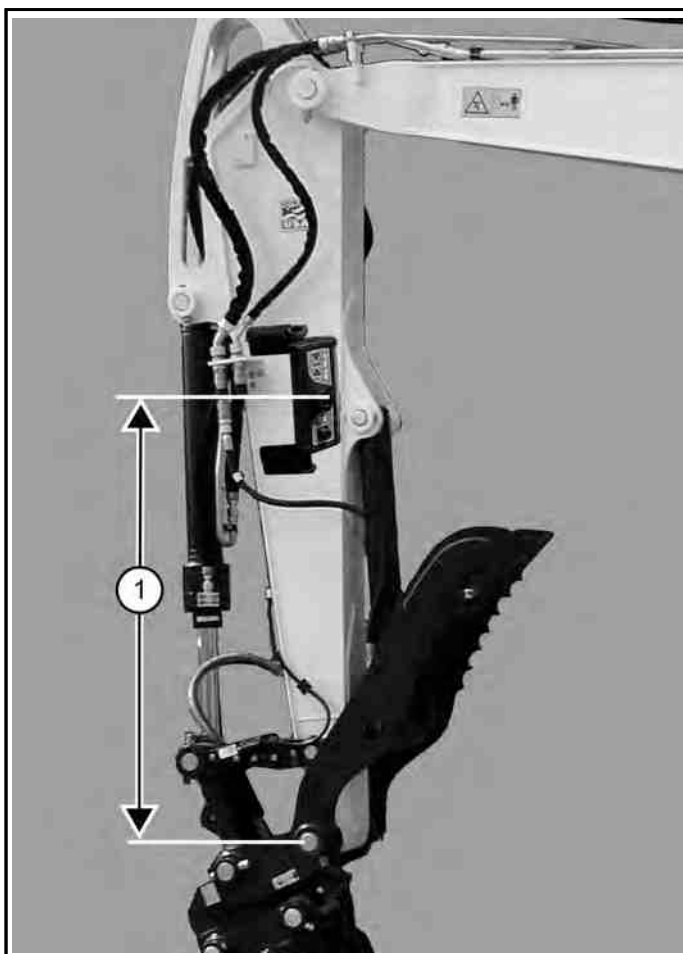
Figure 293



C113642e

7. Press button 4 (Item 1) [Figure 293] to select LASER RECEIVER.

Figure 294



p132078d

8. Measure from the centre of the laser receiver to the bucket pivot pin (Item 1) [Figure 294].
9. Enter this distance as the New Laser Receiver Position.

To dig a hole using the laser, see the following:
(See Benching With A Laser System on Page 144)

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 298].

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 142)
2. See the following to access the **DEPTH CHECK** screen.
(See Accessing The Depth Check Screen on Page 129)

Figure 295



3. On the **DEPTH CHECK** screen, press button 2 (Item 1) [Figure 295].

Figure 296



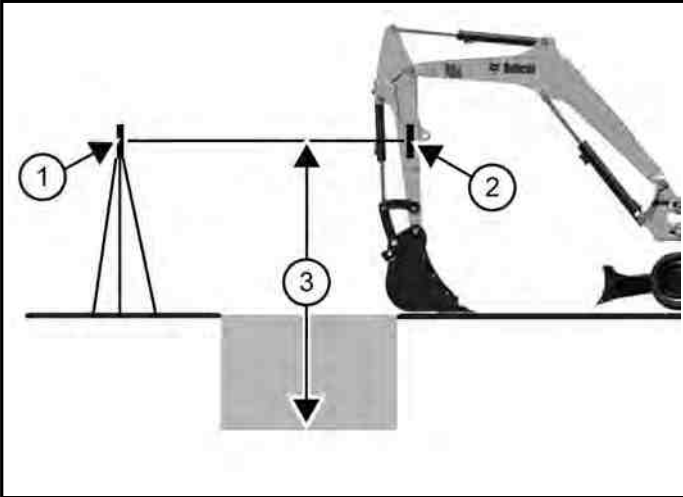
4. Press button 1 (Item 1) [Figure 296] to select SET DEPTH TARGETS.

Figure 297



5. Press button 6 (Item 1) [Figure 297] to turn the laser receiver on.

Figure 298



11. Proceed to dig, referencing the display and listening for audible alerts to maintain the correct depth.

6. 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 298].

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.

Figure 299



7. When the laser strikes the receiver and the receiver light turns green, press button 1 (Item 1) [Figure 299] to rebench.
OR
Rebench by pressing the right joystick button.
8. Press button 6 (Item 2) [Figure 299].
9. Enter the distance from the laser to the target depth (Item 3) [Figure 298].
10. Adjust the Warning Zone and Grade Zone as needed. (See Setting The Grade Zone on Page 139) (See Setting The Warning Zone on Page 139)

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 (Deluxe Panel) on Page 128)

(See Depth Check (Standard Display) on Page 146)

(See Depth Check (Touch Display) on Page 161)

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.

Depth Check Screen

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

WARNING

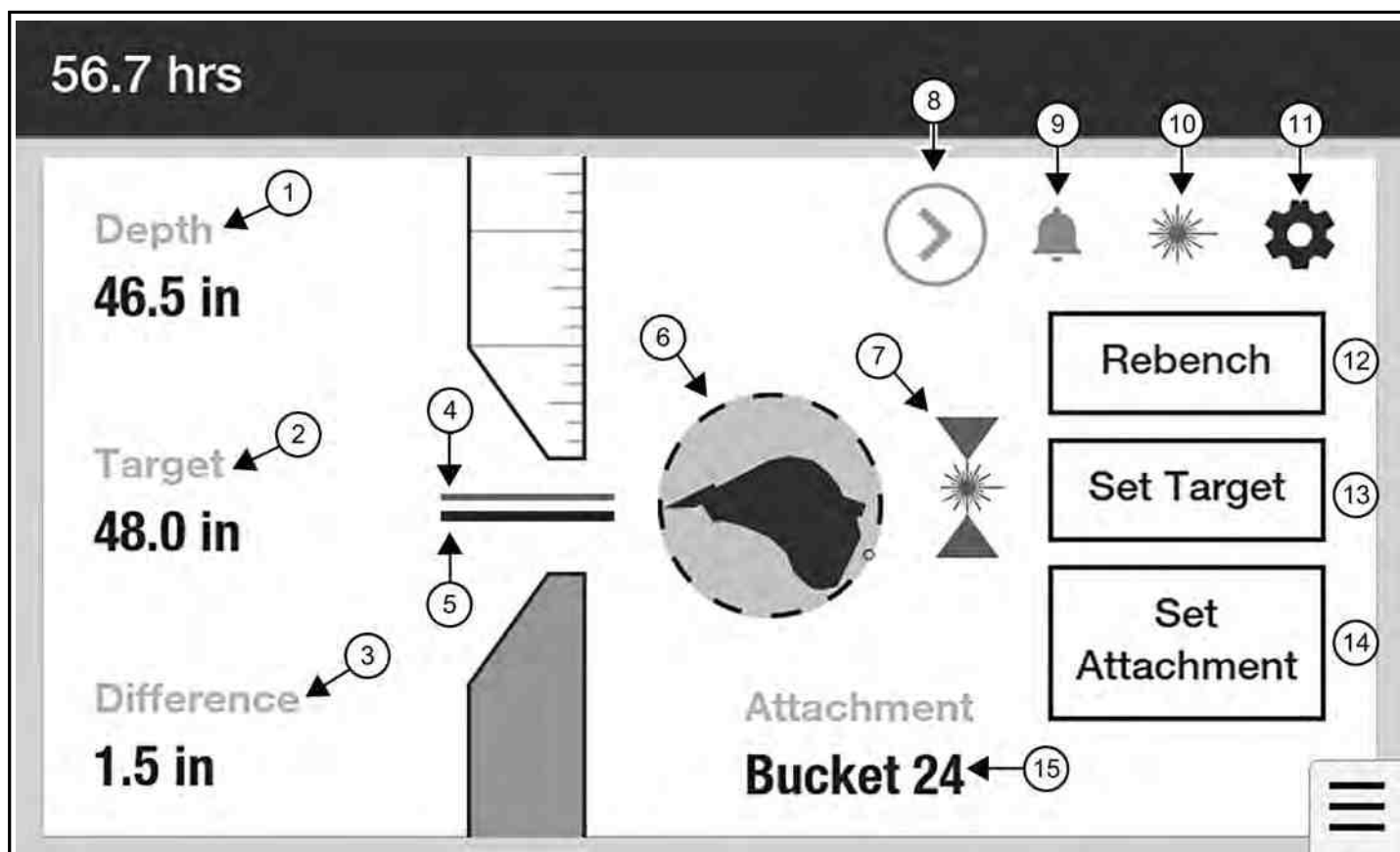
GENERAL HAZARD

Contact with equipment can cause serious injury or death.

Keep all bystanders 6 m (20 ft) away from equipment when operating. ◀

W-2268

Figure 300



C223889a

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	Laser Indicator Arrows	Solid green icon indicates laser beam is striking receiver. Red arrow indicates the direction the workgroup should be moved to receive the laser beam. (See Benching With A Laser System on Page 159)
8	Arrow	Used to move between depth check screens. (See Changing The Depth Check Screen on Page 148)
9	Alarm	Turns target depth alarm on / off. (See Setting The Warning Zone on Page 155)
10	Laser Setup	Accesses LASER SETUP screen where the laser position dimension can be added or laser turned on / off. When laser is on, the icon is illuminated. (See Setting Up A Laser With Depth Check on Page 158)

REF.	DESC.	FUNCTION
11	Depth Check Settings	Accesses DEPTH CHECK SETTINGS screen.
12	Rebench	Press to Rebench. (See Digging To A Target Depth on Page 156)
13	Set Target	Accesses SET TARGET DEPTH screen. (See Setting Target Depth on Page 154)
14	Set Attachment	Accesses SET ATTACHMENT screen.
15	Attachment	Displays currently selected attachment.

Changing The Depth Check Screen

There are two **DEPTH CHECK** screens:

- Dig Depth [Figure 301]
- Distance to Target [Figure 302]

Figure 301

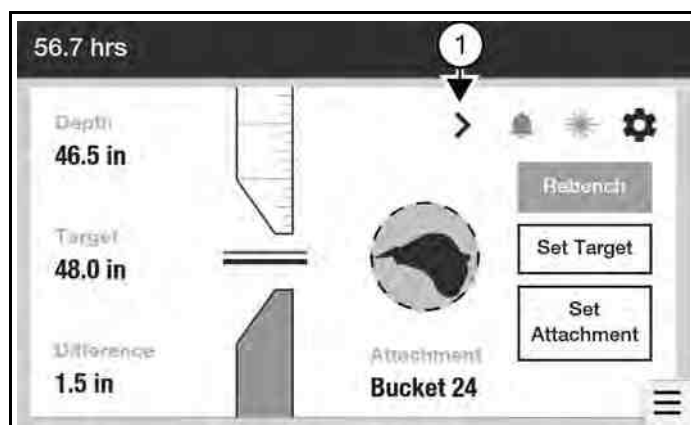
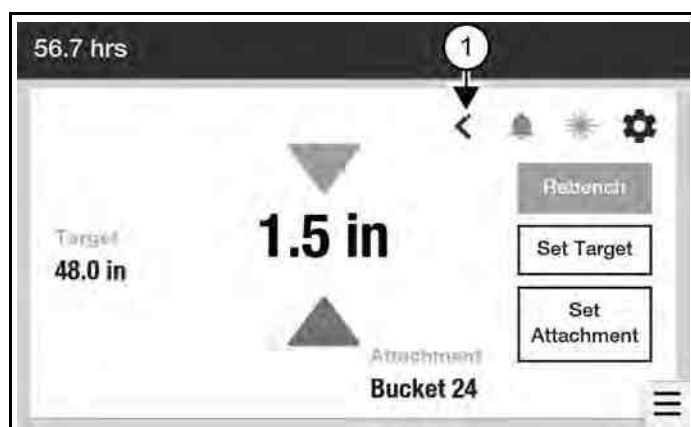


Figure 302



Press the arrow (Item 1) [Figure 301] [Figure 302] to toggle between these two screens at any time.

Calibrating The Boom

The following items are needed to complete this task:

- Tape measure.

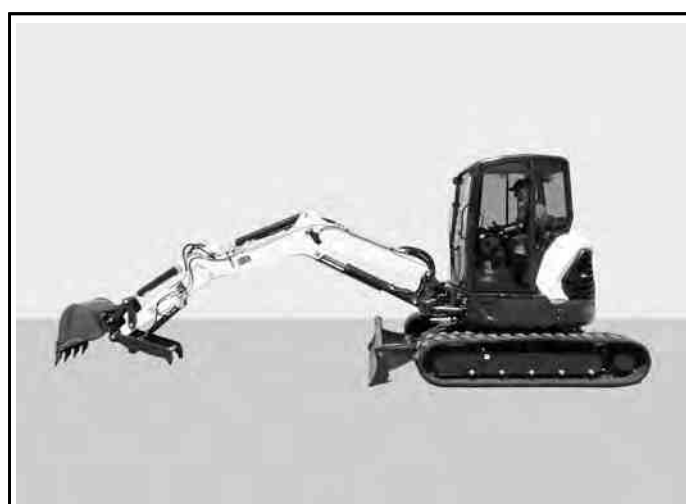
- Two magnetic tools that are included with the kit.

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.

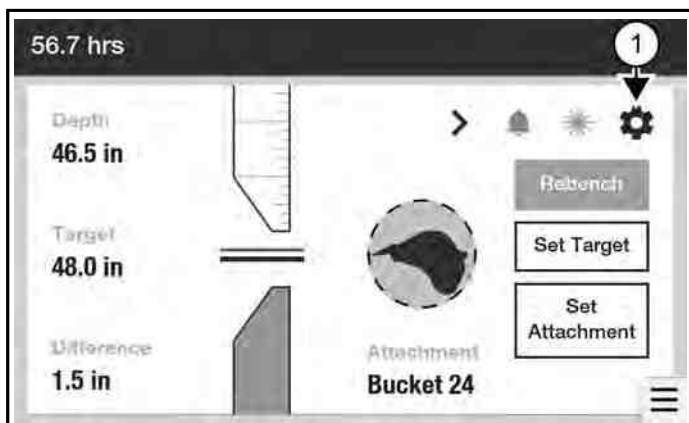
1. Move the machine to an open area where the boom and arm can be repositioned and there is fresh air, as you will need to operate the machine during this procedure.
2. Park the machine on a flat, level surface.

Figure 303



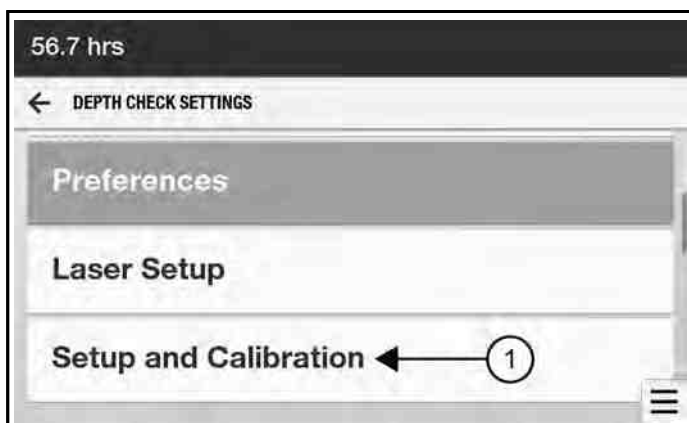
3. Position the excavator with the bucket fully rolled out and the arm fully extended [Figure 303].
4. On the standard display select **[NAVIGATION HANDLE] → [DEPTH CHECK]**.

Figure 304



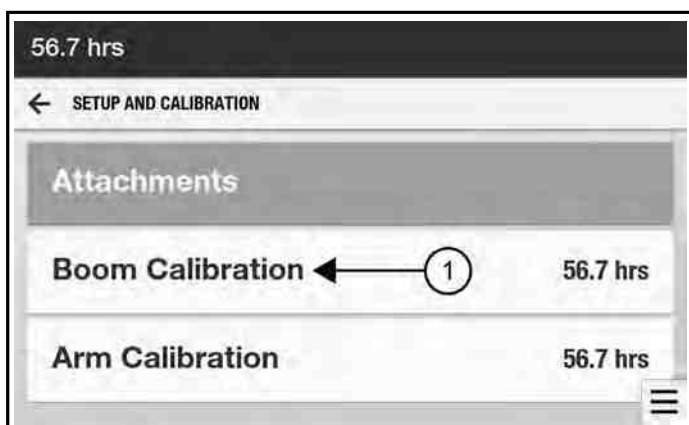
5. Select the Settings icon (Item 1) [Figure 304].

Figure 305



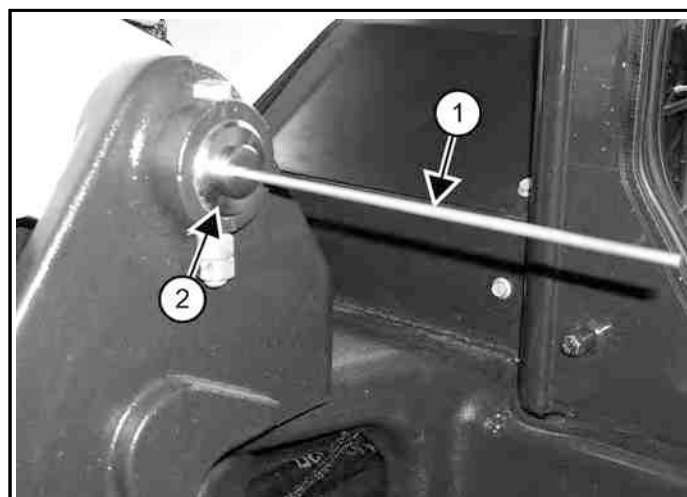
6. Select **[SETUP AND CALIBRATION]** (Item 1) [Figure 305].

Figure 306



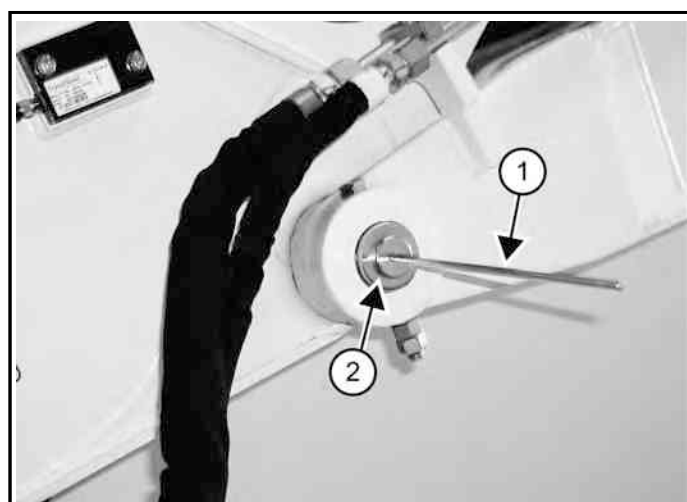
7. Select **[BOOM CALIBRATION]** (Item 1) [Figure 306].

Figure 307



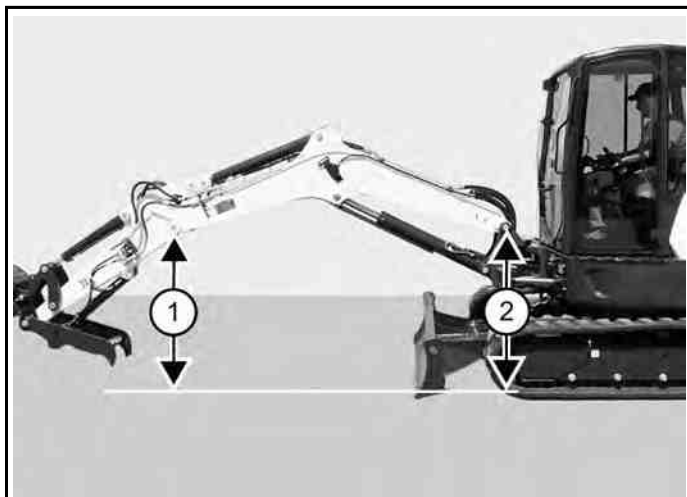
8. Install one of the magnetic tools (Item 1) on the boom pivot pin (Item 2) [Figure 307]. Position the magnetic tool as close as possible to the centre of the boom pivot pin.

Figure 308



9. Install the second magnetic tool (Item 1) on the arm pivot pin (Item 2) [Figure 308]. Position the magnetic tool as close as possible to the centre of the arm pin.

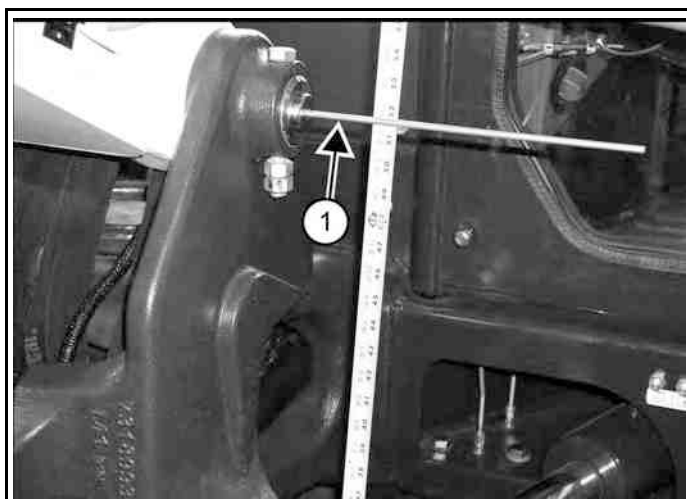
Figure 309



C200403b

10. Position the work group so the distance from the ground to the two magnetic tools (Items 1 and 2) [Figure 309] is identical.

Figure 310

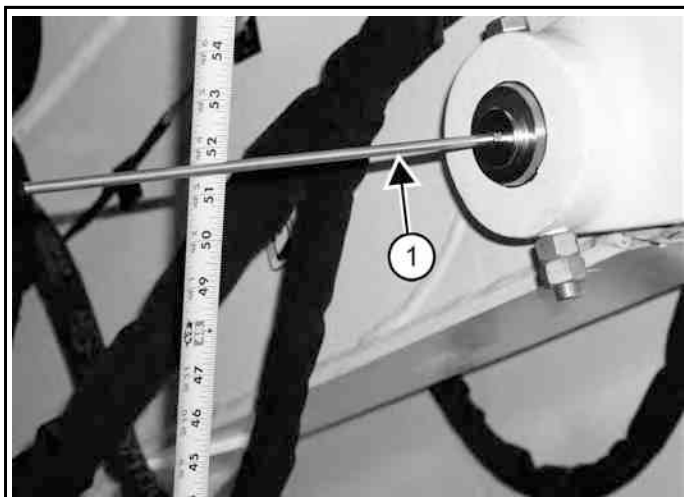


P131857a

11. Measure the distance from the centre of the boom magnetic tool (Item 1) [Figure 310] 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 centrelines of the magnetic tools as this will eliminate any possible variation in the measurements to the ground.

Figure 311



P131858a

12. Measure the distance from the centre of the arm magnetic tool (Item 1) [Figure 311] 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 312



NA3910

14. Follow the instructions on the screen and select **[DONE]** [Figure 312].
15. Proceed to calibrating the arm. (See Calibrating The Arm on Page 150)

Calibrating The Arm

The following items are needed to complete this task:

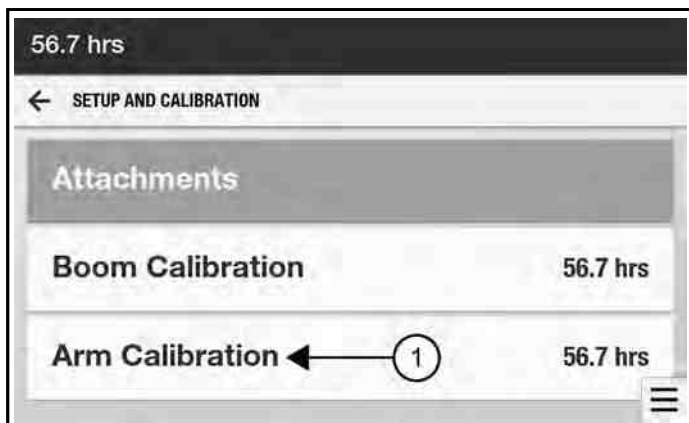
- Plumb bob.
- Magnetic tool that is included with the kit.

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.

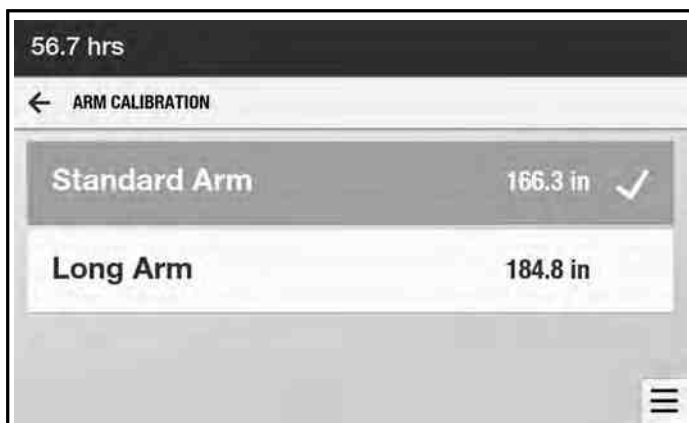
1. Select **[NAVIGATION HANDLE] → [DEPTH CHECK] → [SETTINGS] → [SETUP AND CALIBRATION]**.

Figure 313



2. Select **[ARM CALIBRATION]** (Item 1) [Figure 313].

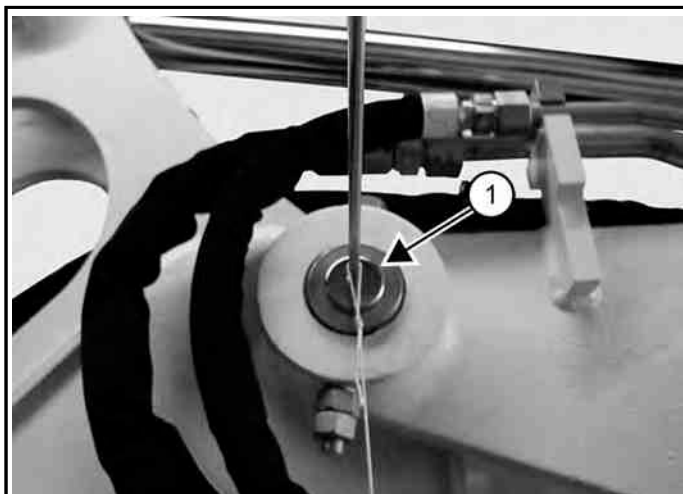
Figure 314



3. Select the arm that your machine is equipped with [Figure 314].

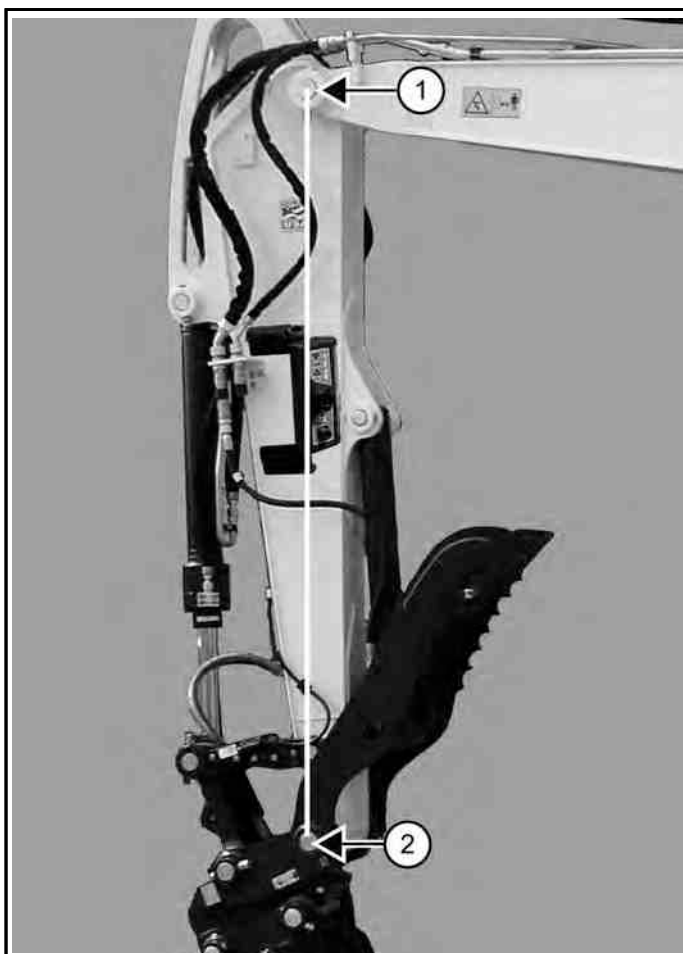
NOTE: Some models only have one arm option available.

Figure 315



4. Install the magnetic tool on the arm pin (Item 1) [Figure 315].
5. Place the plumb bob on the magnetic tool that is installed on the arm pin (Item 1) [Figure 315].

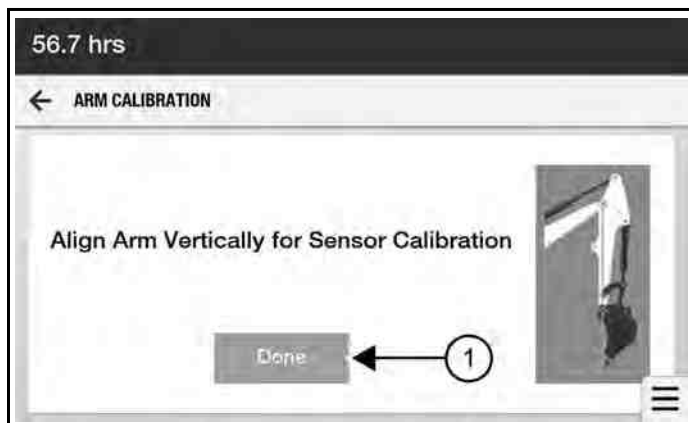
Figure 316



- Move the arm until the plumb bob line (Item 1) is centred on the pivoting bucket pin (Item 2) [Figure 316].

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

Figure 317



- With the arm vertical, select **[DONE]** (Item 1) [Figure 317] to store this information.
- Proceed to calibrating the attachment. (See Calibrating The Attachment on Page 152)

Calibrating The Attachment

The following items are needed to complete this task:

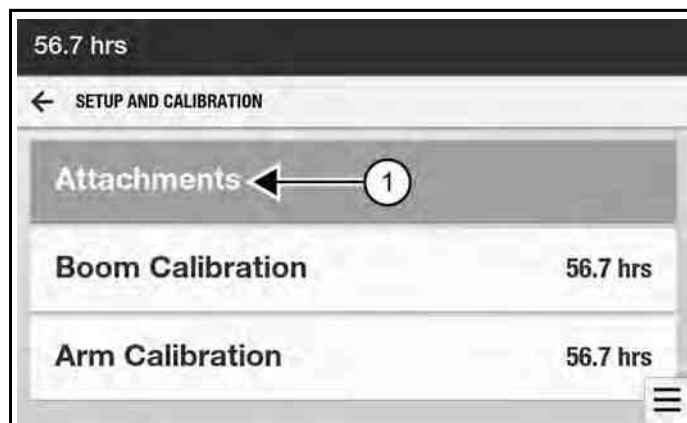
- Tape measure.
- Magnetic tool that is included with the kit.

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.

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

Figure 318



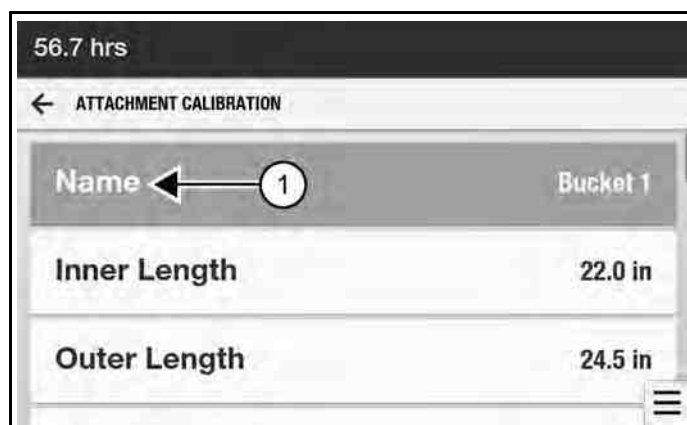
- Select **[ATTACHMENTS]** (Item 1) [Figure 318].

Figure 319



- Select one of the attachments [Figure 319].

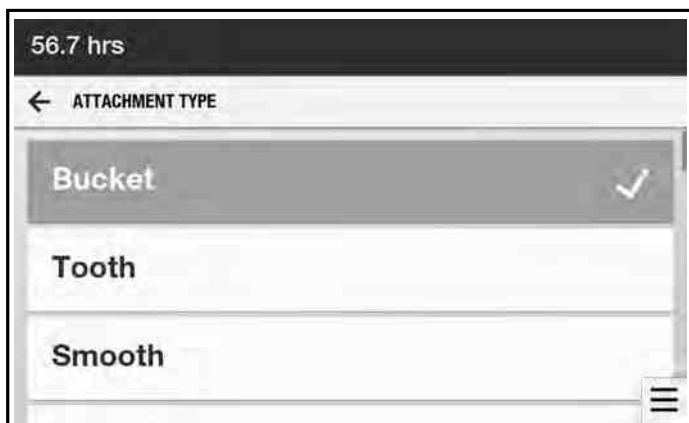
Figure 320



- On the **ATTACHMENT CALIBRATION** screen, select **[NAME]** (Item 1) [Figure 320].

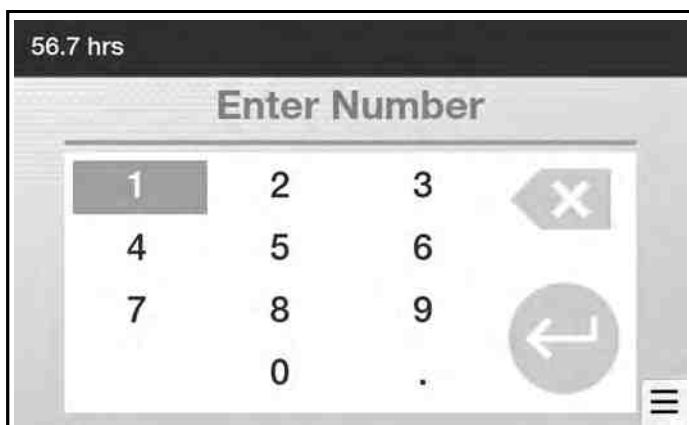
NOTE: A bucket is used as an example here, but this setup is similar for all attachments. The accuracy of these dimensions affects the accuracy of the Depth Check.

Figure 321



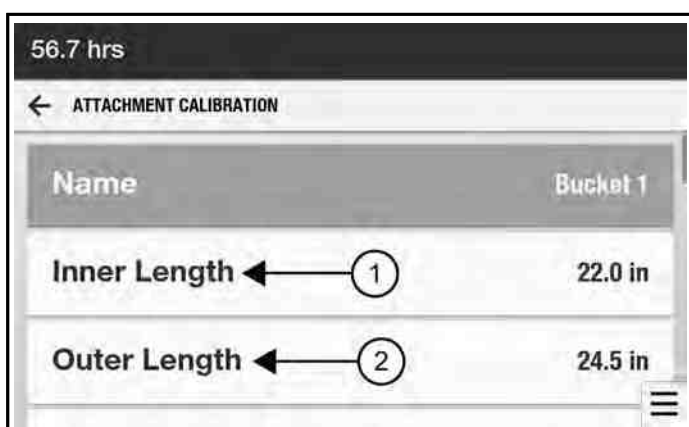
5. Select type of attachment [Figure 321].

Figure 322



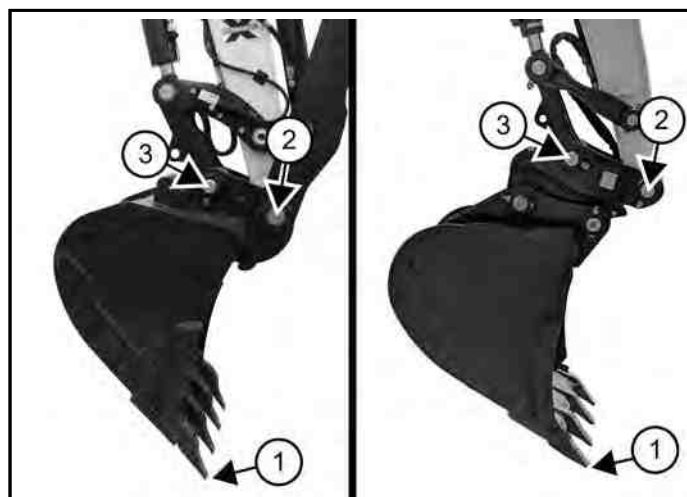
6. Enter a number to identify your attachment and select the enter icon [Figure 322].

Figure 323



7. Select **[INNER LENGTH]** (Item 1) [Figure 323].

Figure 324



8. Measure the distance from the tip of the attachment (Item 1) to the centre of the inner pin (Item 2) [Figure 324] and enter this value.

Choose the correct pin (Item 2) [Figure 324] based on the type of attachment mounting system on your machine.

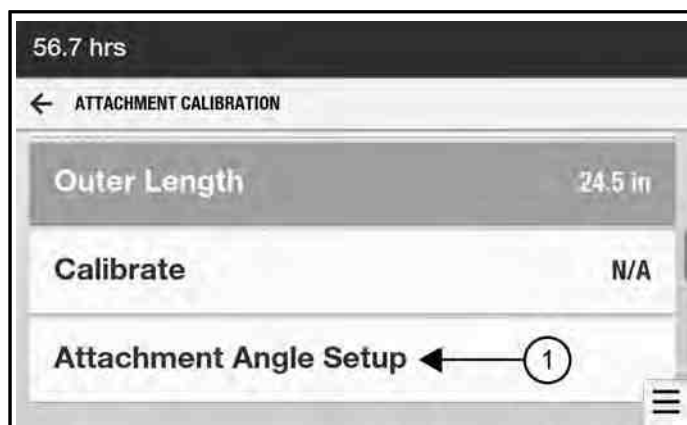
9. Select **[OUTER LENGTH]** (Item 2) [Figure 323].

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 324] and enter this value.

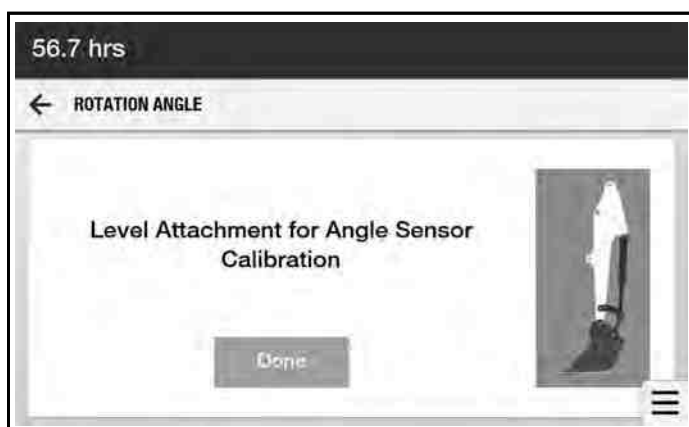
Choose the correct pin (Item 3) [Figure 324] based on the type of attachment mounting system on your machine.

Figure 325



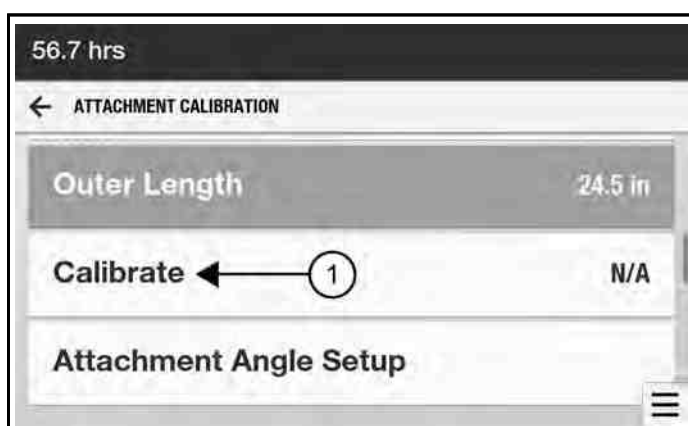
11. If you are using a non-standard bucket or attachment and want the display to more accurately reflect its rotation, select **[ATTACHMENT ANGLE SETUP]** (Item 1) [Figure 325].

Figure 326



12. Follow the instructions on the screen [Figure 326] and select **[DONE]**.

Figure 327



13. Select **[CALIBRATE]** (Item 1) [Figure 327].

Figure 328



14. Follow the instructions on the screen [Figure 328] 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 324].

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.

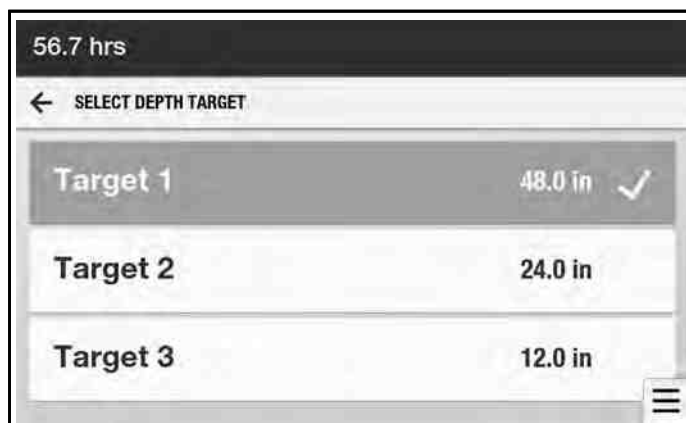
If more than one attachment is being set up, the attachments can be changed on the arm and the additional attachment dimensions can also be entered. Always measure to the cutting / work tip on the attachment when measuring the dimensions to add to the inside and outside length screens for each new attachment. 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 158)

Setting Target Depth

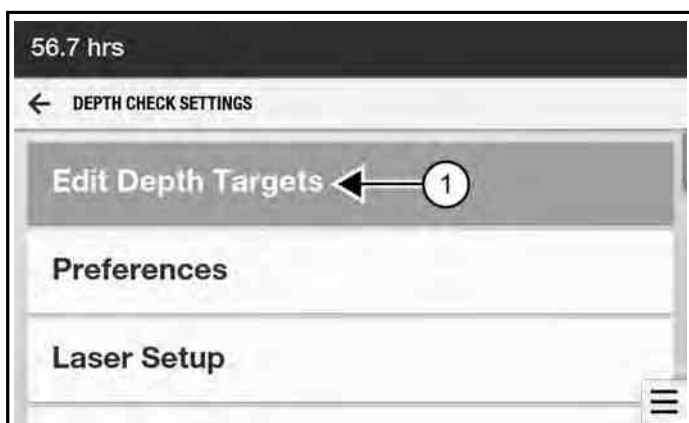
Several different target depths can be pre-set and stored in the system.

Figure 329



1. To select one of the preset target depths, select **[NAVIGATION HANDLE]** → **[DEPTH CHECK]** → **[SET TARGET]** and select a Target [Figure 329].
2. To change a preset target depth, select **[NAVIGATION HANDLE]** → **[DEPTH CHECK]** → **[SETTINGS]**.

Figure 330



3. Select **[EDIT DEPTH TARGETS]** (Item 1) [Figure 330].

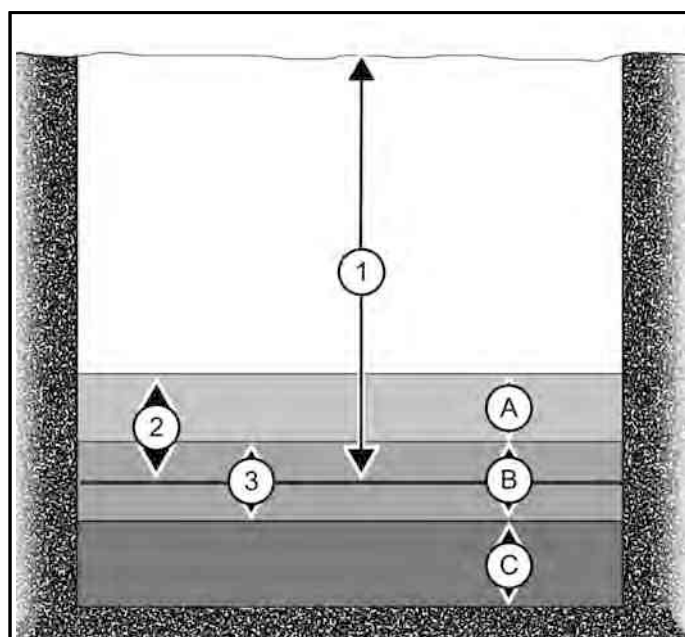
Figure 331



4. Select one of the Targets [Figure 331] and enter the new target depth on the keypad.

Description Of Grade And Warning Zones

Figure 332



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.

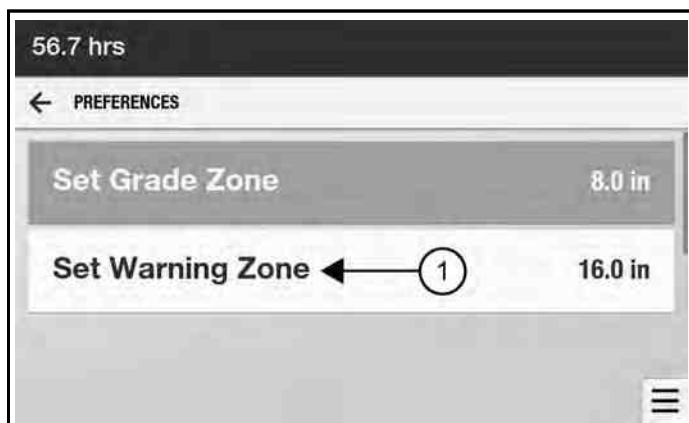
EXAMPLE: Operator sets Target Depth to 610 mm (24 in), Warning Zone to 100 mm (4 in), and Grade Zone to 50 mm (2 in). Operator will hear slow beeps from 508 – 584 mm (20 – 23 in), a solid beep from 584 – 635 mm (23 – 25 in), and fast beeps below 635 mm (25 in).

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 333



2. Select **[SET WARNING ZONE]** (Item 1) [Figure 333] and enter the dimension.
3. Select the **[ENTER]** icon to save your changes.

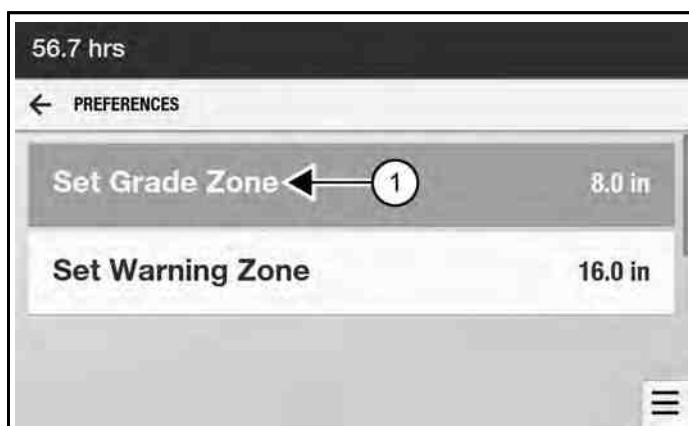
Setting The Grade Zone

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 334



2. Select **[SET GRADE ZONE]** (Item 1) [Figure 334] and enter the dimension.
3. Select the **[ENTER]** icon to save your changes.

Digging To A Target Depth

⚠ DANGER

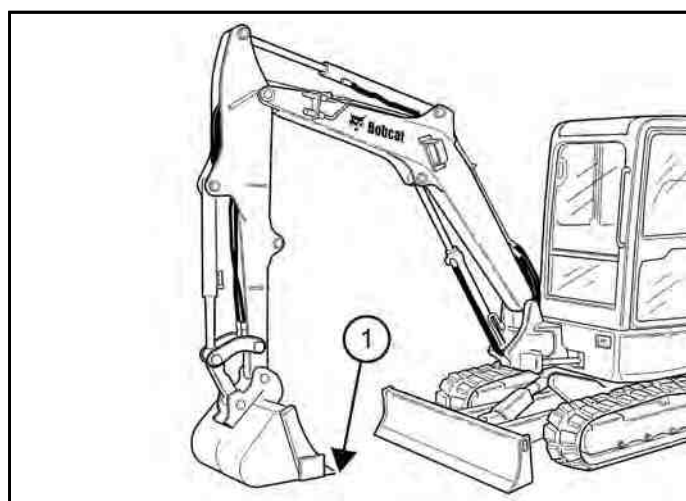
EXPLOSION AND ELECTROCUTION HAZARDS

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.

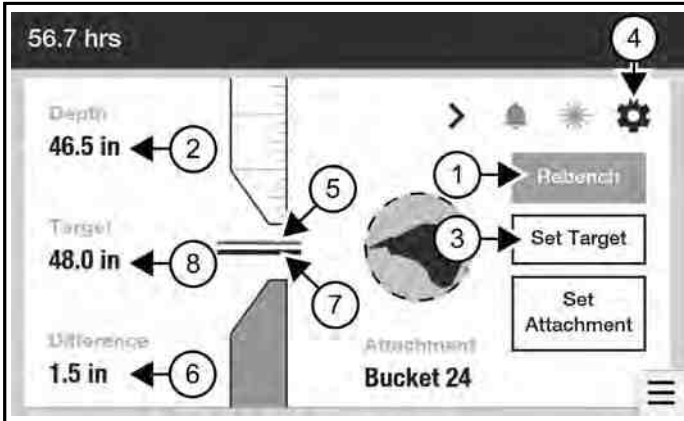
NOTE: If you are not digging with a laser, make sure the laser icon is not illuminated on the **DEPTH CHECK** screen.

Figure 335



1. Set the bucket (Item 1) [Figure 335] 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]**.

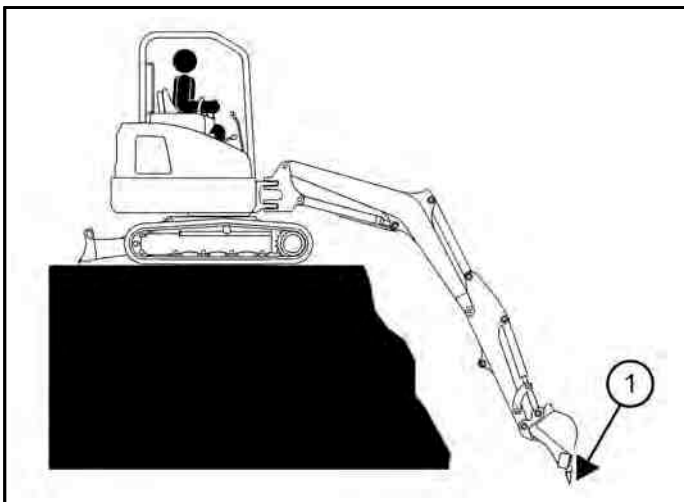
Figure 336



3. Select **[REBENCH]** (Item 1) [Figure 336] 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 336].
4. Select **[SET TARGET]** (Item 3) [Figure 336] to select one of the preset depth targets.
OR
Select the **[SETTINGS]** icon (Item 4) [Figure 336] to change one of the preset depth targets.
(See Setting Target Depth on Page 154)

Figure 337



- As the hole is being dug, the position of the bucket (Item 1) [Figure 337] is dimensionally shown (Item 2) [Figure 336] and shown on the bar graph at (Item 5) [Figure 336].
- The distance to target depth is shown dimensionally (Item 6) and on the bar graph (Item 7) [Figure 336].

- When the bucket is getting close to the target depth (Item 8) [Figure 336], 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 155) (See Setting The Grade Zone on Page 156)

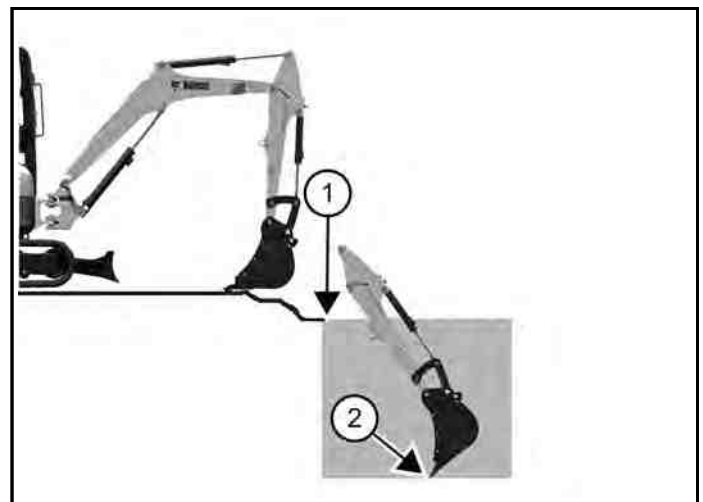
EXAMPLE: The Target is 2 m (6.5 ft) and the Depth is 1,5 m (4.9 ft), the Difference will be 0,5 m (1.6 ft).

$$2 \text{ m} - 1,5 \text{ m} = 0,5 \text{ m} \quad (6.5 \text{ ft} - 4.9 \text{ ft} = 1.6 \text{ ft}).$$

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 338

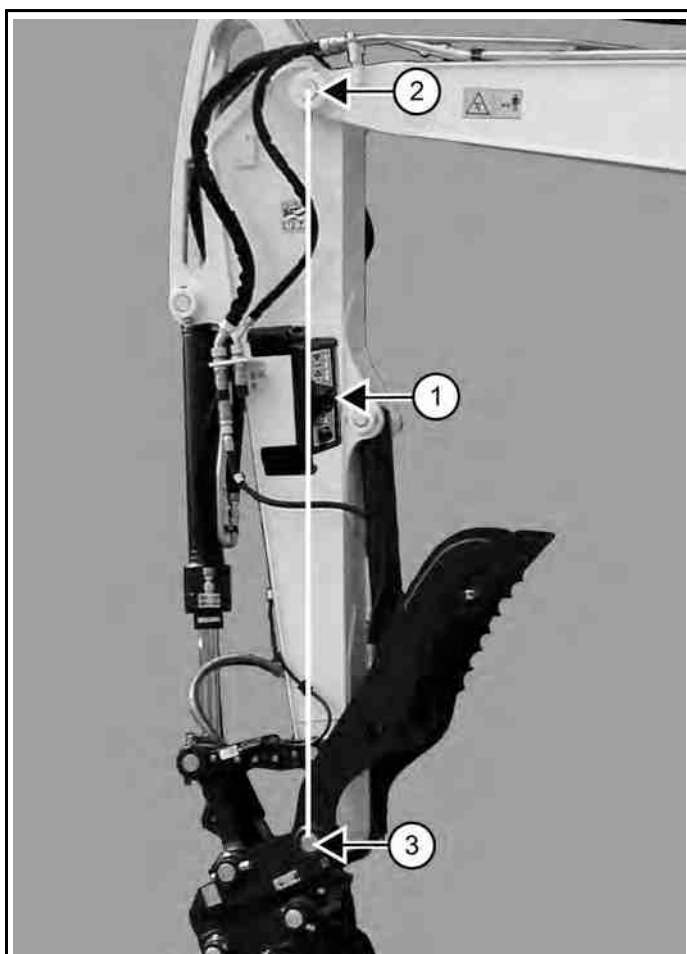


- Reposition the excavator so the bucket can be rebench off the original bench point (Item 1) [Figure 338].
- Position the excavator so the bucket will reach to the bottom of the hole (Item 2) [Figure 338] at an area that is known to be the correct depth. When rebenching at the bottom of the trench, 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

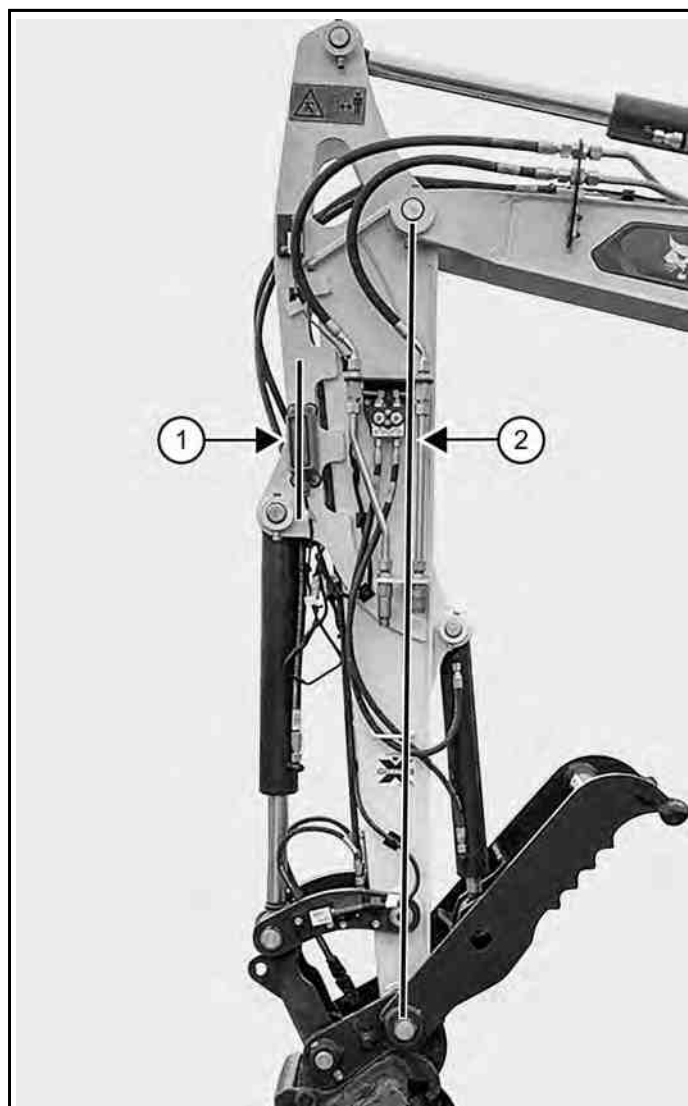
Figure 339



P132078b

1. Install the laser receiver (Item 1) in line with the arm pin (Item 2) and the bucket pivot pin (Item 3) [Figure 339] when possible.

Figure 340



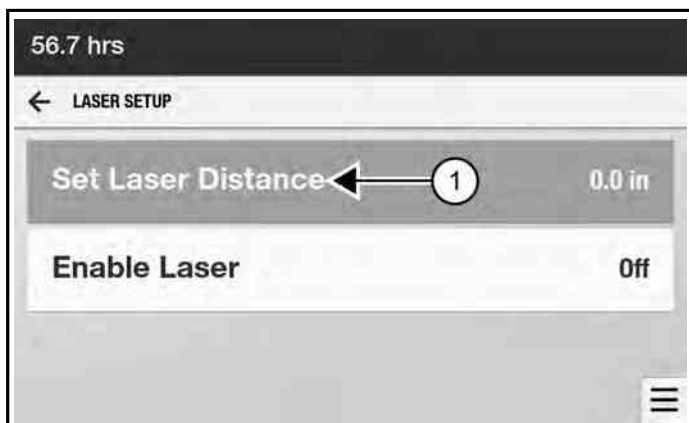
C223822c

2. If your machine is equipped with options that make it difficult to install the laser receiver in line with the pins, install it in an alternative location (Item 1) [Figure 340].

The receiver (Item 1) must be mounted parallel to the bucket and arm pins (Item 2) [Figure 340].

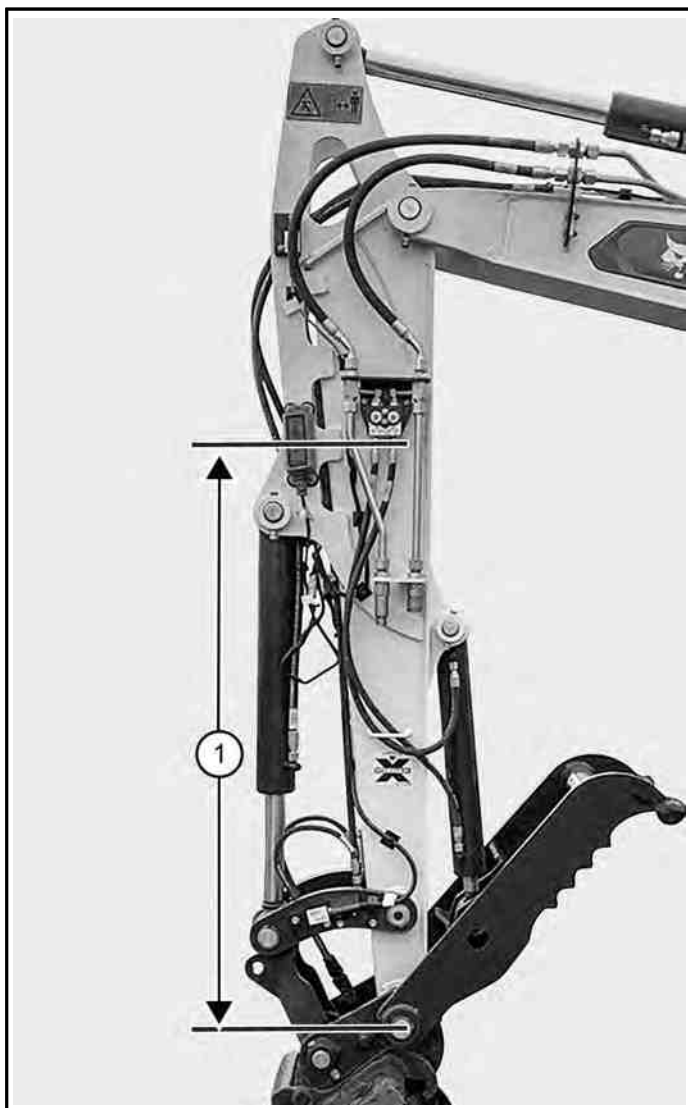
3. If your excavator is equipped with a clamp or arm that may interfere with the laser, make sure there is no hose-to-laser interference.
 - a. Fully curl the arm and bucket and make sure the hoses do not interfere with the laser receiver during any arm or bucket movement.
 - b. Adjust the position of the laser receiver if necessary to avoid any contact with the hoses.
4. Select **[NAVIGATION HANDLE] → [DEPTH CHECK] → [SETTINGS] → [LASER SETUP]**.

Figure 341



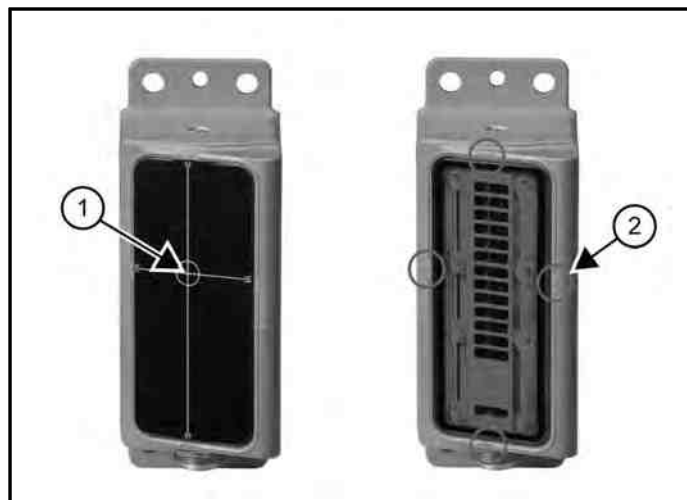
5. Select **[SET LASER DISTANCE]** (Item 1) [Figure 341].

Figure 342



6. Measure from the laser receiver zero point to the bucket pivot pin (Item 1) [Figure 342].

Figure 343



The LC511 receiver is shipped with a black cover that indicates the zero point from which to measure (Item 1) [Figure 343]. After this cover is removed, the zero point is found with the four arrows (Item 2) [Figure 343] on the receiver frame.

7. Enter this distance (Item 1) [Figure 342] as the Laser Distance.

To dig a hole using the laser, see the following:
(See Benching With A Laser System on Page 159)

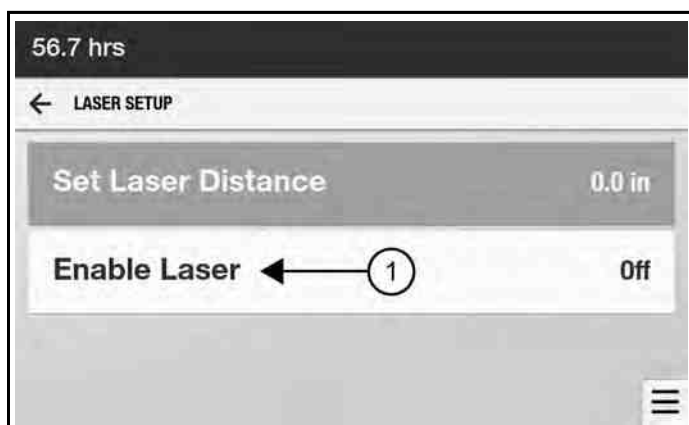
Benching With A Laser System

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 345].

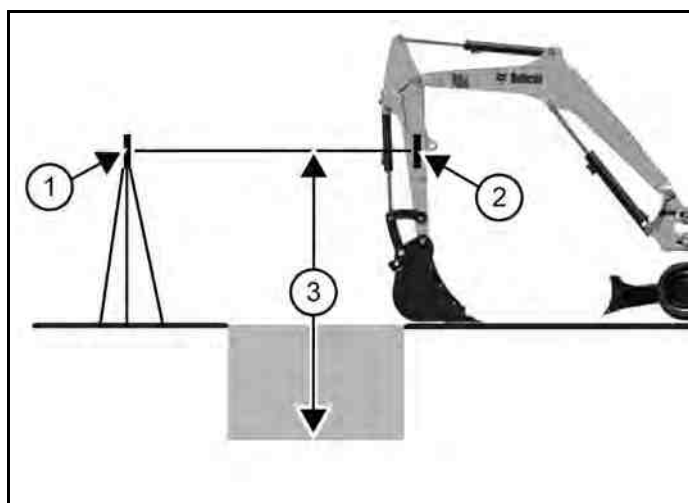
1. Make sure the laser receiver location on the arm has been entered into the Depth Check system.
(See Setting Up A Laser With Depth Check on Page 158)
2. Select **[NAVIGATION HANDLE] → [DEPTH CHECK] → [SETTINGS] → [LASER SETUP]**.

Figure 344



3. Select **[ENABLE LASER]** (Item 1) [Figure 344].

Figure 345



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 345].

Refer to the Laser Indicator Arrows on the display (See Depth Check Screen on Page 146) . A solid green icon indicates on grade with the laser beam, signaling to re-bench. A red indicator arrow shows the direction to move the workgroup to receive the laser beam.

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.

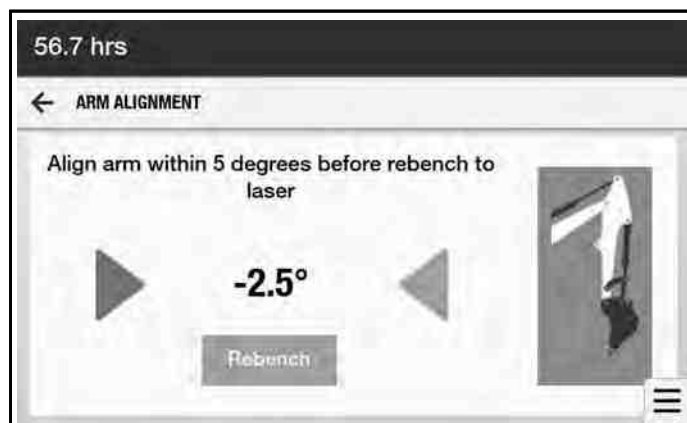
NOTE: The Laser Indicator Arrows show the last known strike point of the laser beam. If contact between laser beam and receiver is blocked, the Laser Indicator Arrows may not accurately show the direction of laser grade point.

5. When the laser strikes the receiver and the Laser Indicator Arrow turns green, select **[REBENCH]** (See Depth Check Screen on Page 146) .

OR

Rebench by pressing the right joystick button.

Figure 346



If the arm is not vertical when you try to rebench, the **ARM ALIGNMENT** screen [Figure 346] 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 345].
8. Adjust the Warning Zone and Grade Zone as needed. (See Setting The Grade Zone on Page 156) (See Setting The Warning Zone on Page 155)
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 (Deluxe Panel) on Page 128)
(See Depth Check (Standard Display) on Page 146)
(See Depth Check (Touch Display) on Page 161)

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.

Depth Check Screen

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

WARNING

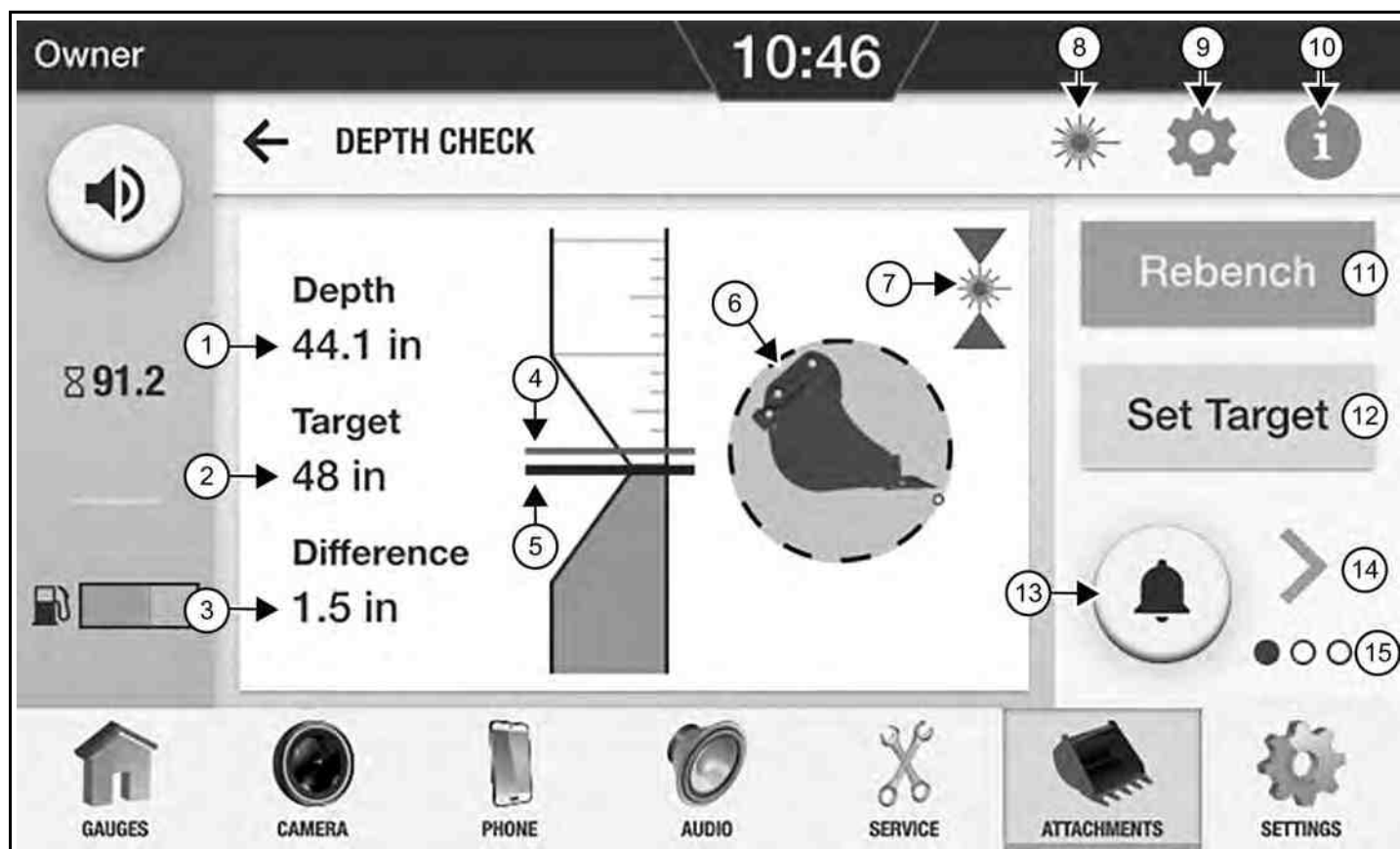
GENERAL HAZARD

Contact with equipment can cause serious injury or death.

Keep all bystanders 6 m (20 ft) away from equipment when operating. ◀

W-2288

Figure 347



C223438b

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	Laser Indicator Arrows	Solid green icon indicates laser beam is striking receiver. Red arrow indicates the direction the workgroup should be moved to receive the laser beam. (See Benching With A Laser System on Page 175)
8	Laser Setup	Accesses LASER SETUP screen where the laser position dimension can be added or laser turned on / off. When laser is on, the icon is illuminated. (See Setting Up A Laser With Depth Check on Page 174)
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 171)

REF.	DESC.	FUNCTION
12	Set Target	Accesses SET TARGET DEPTH screen. (See Setting Target Depth on Page 170)
13	Alarm	Turns target depth alarm on / off. (See Setting The Warning Zone on Page 171)
14	Arrow	Used to move between screens. You can also swipe between screens with your finger. (See Setting The Default Depth Check Screen on Page 163)
15	Screen Indicator	Dots indicate which of the three screens is being displayed.

Setting The Default Depth Check Screen

The **DEPTH CHECK** screen can be set to default to one of the following screens:

- Dig Depth [Figure 348]
- Distance to Target [Figure 349]
- Grade Check [Figure 350]

Figure 348

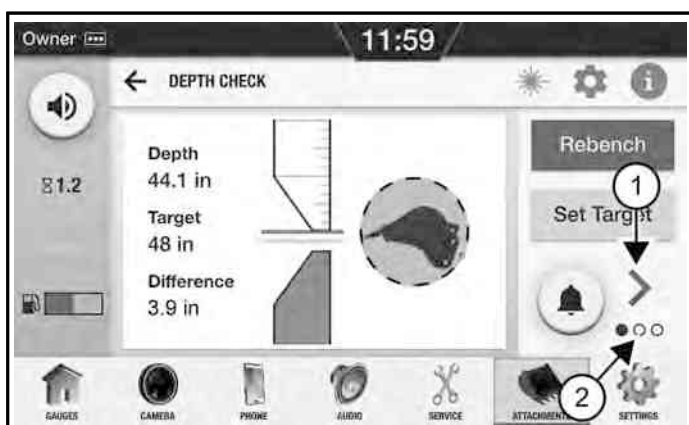
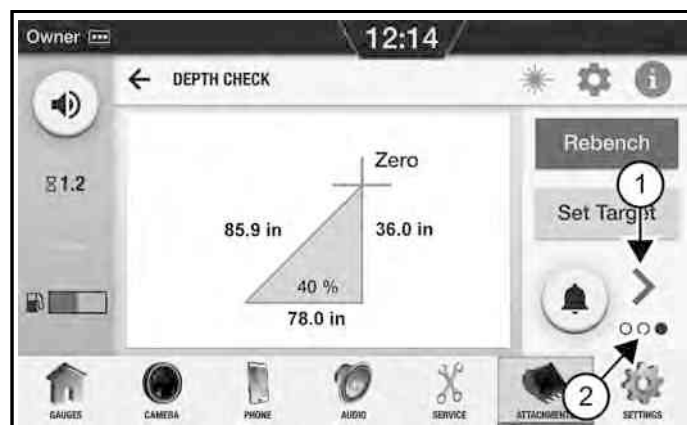


Figure 349



Figure 350



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 348], [Figure 349], or [Figure 350].

Switching Unit Scale

1. Select **[ATTACHMENTS] → [DEPTH CHECK] → [SETTINGS] → [PREFERENCES]**.

Figure 351



2. Select **[UNITS]** (Item 1) to switch between meters / millimeters or feet / inches (Item 2) [Figure 351].

You can also switch between metric and English units. (See Switching Between English / Metric Units on Page 263)

Calibrating The Boom

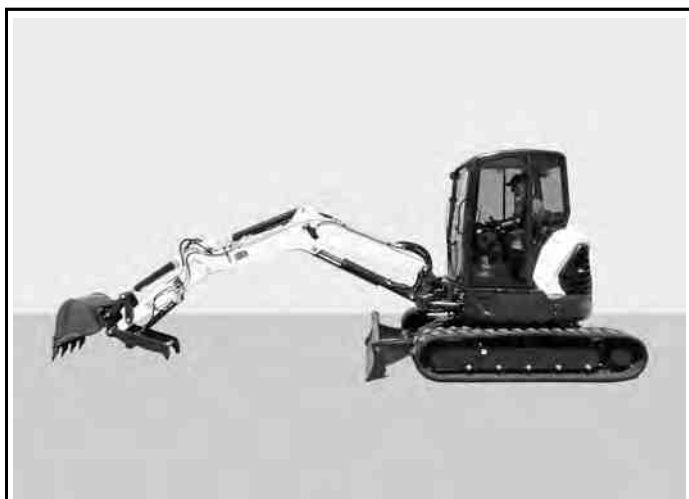
The following items are needed to complete this task:

- 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.

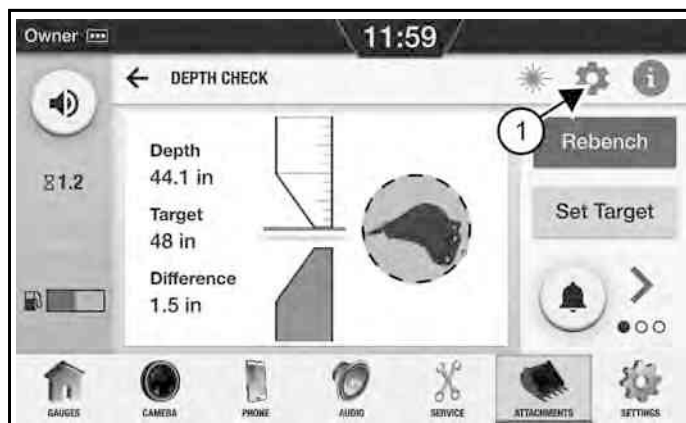
1. Move the machine to an open area where the boom and arm can be repositioned and there is fresh air, as you will need to operate the engine during this procedure.
2. Park the machine on a flat, level surface.

Figure 352



3. Position the excavator with the bucket fully rolled out and the arm fully extended [Figure 352].
4. On the touch display select **[ATTACHMENTS]** → **[DEPTH CHECK]**.

Figure 353



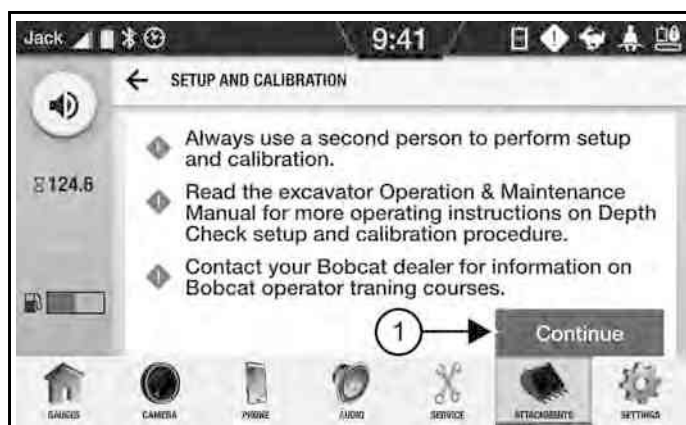
5. Select the **[SETTINGS]** icon (Item 1) [Figure 353].

Figure 354



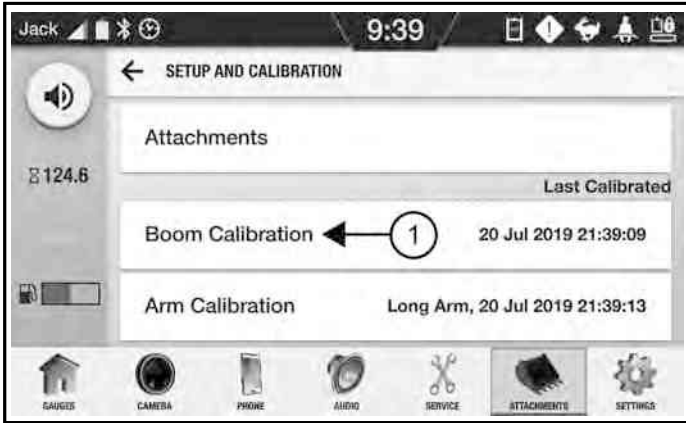
6. Select **[SETUP AND CALIBRATION]** (Item 1) [Figure 354].

Figure 355



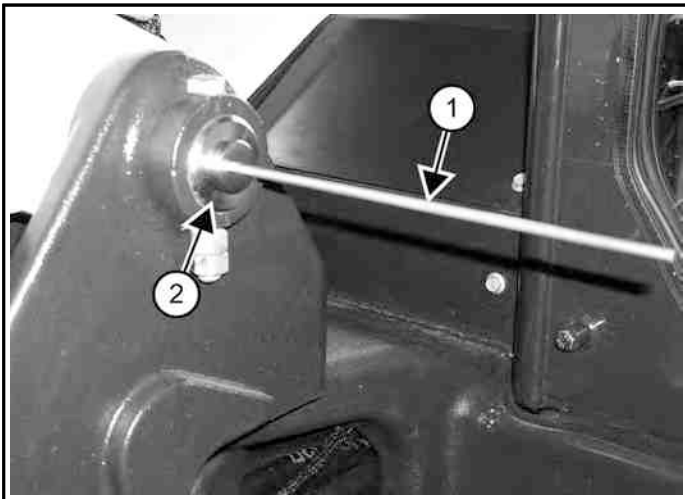
7. Read the message on the screen and press **[CONTINUE]** (Item 1) [Figure 355] to proceed.

Figure 356



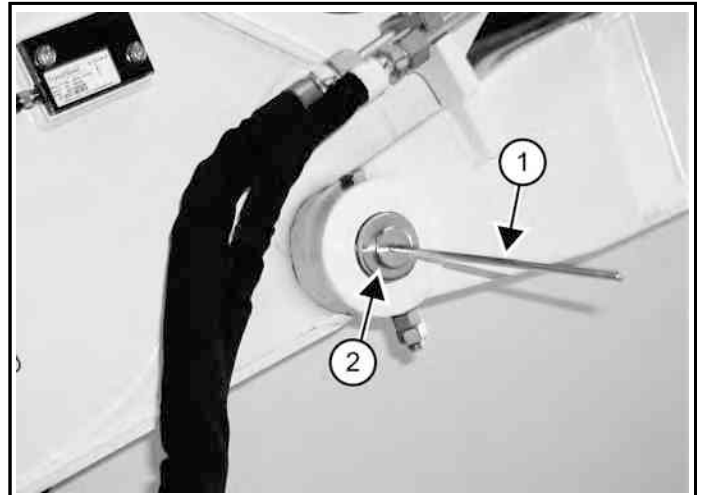
8. Select **[BOOM CALIBRATION]** (Item 1) [Figure 356].

Figure 357



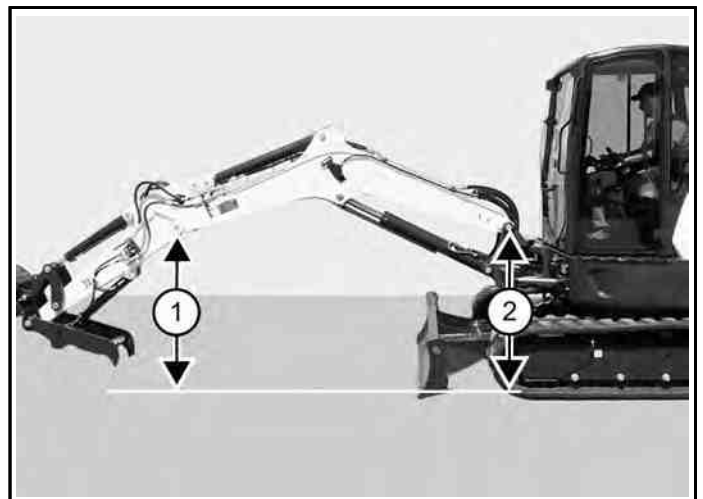
9. Install one of the magnetic tools (Item 1) on the boom pivot pin (Item 2) [Figure 357]. Position the magnetic tool as close as possible to the centre of the boom pivot pin.

Figure 358



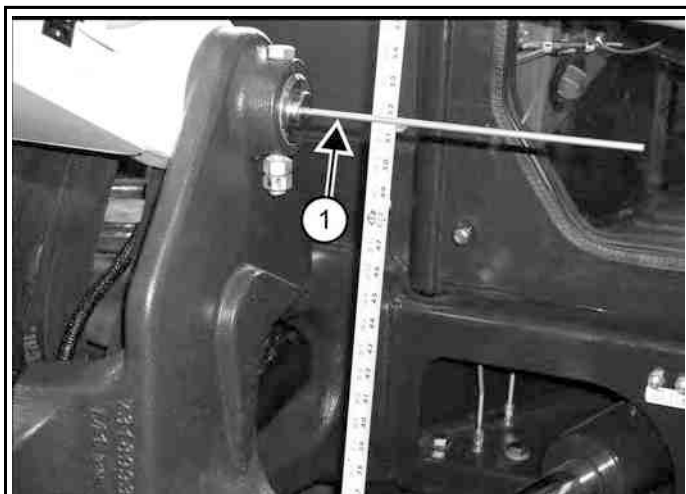
10. Install the second magnetic tool (Item 1) on the arm pivot pin (Item 2) [Figure 358]. Position the magnetic tool as close as possible to the centre of the arm pin.

Figure 359



11. Position the work group so the distance from the ground to the two magnetic tools (Items 1 and 2) [Figure 359] is identical.

Figure 360

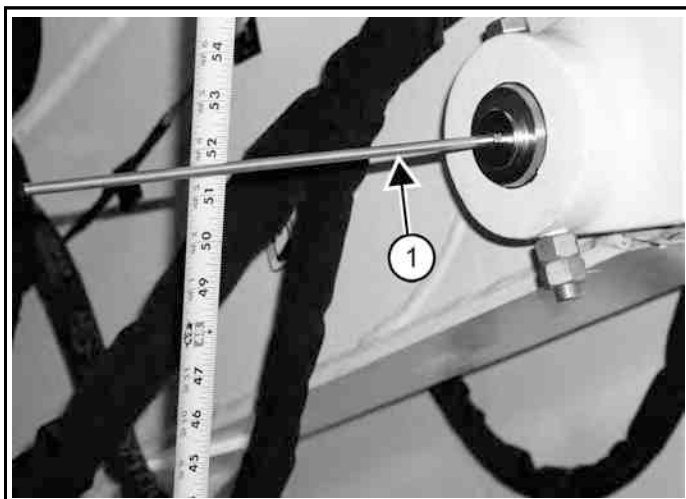


P131857a

12. Measure the distance from the centre of the boom magnetic tool (Item 1) [Figure 360] 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 centrelines of the magnetic tools as this will eliminate any possible variation in the measurements to the ground.

Figure 361



P131858a

13. Measure the distance from the centre of the arm magnetic tool (Item 1) [Figure 361] 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 362



P132913a

15. Follow the instructions on the screen and select **[DONE]** (Item 1) [Figure 362].
16. Proceed to calibrating the arm.
(See Calibrating The Arm on Page 166)

Calibrating The Arm

The following items are needed to complete this task:

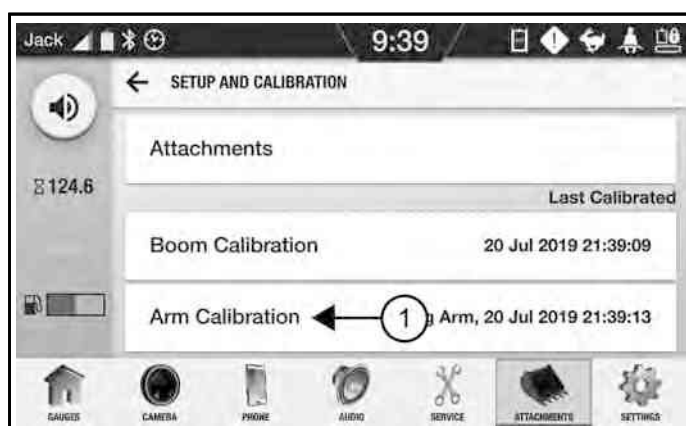
- Plumb bob.
- Magnetic tool that is included with the kit.

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 363



P132909c

2. Select **[ARM CALIBRATION]** (Item 1) [Figure 363].

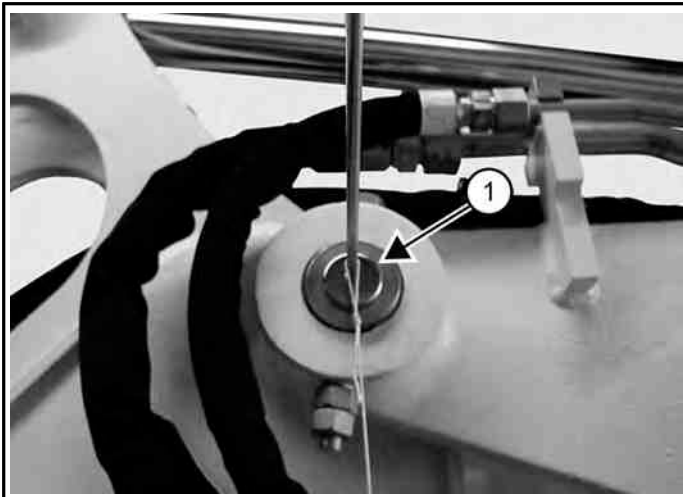
Figure 364



3. Select the arm that your machine is equipped with (Item 1 or 2) [Figure 364].

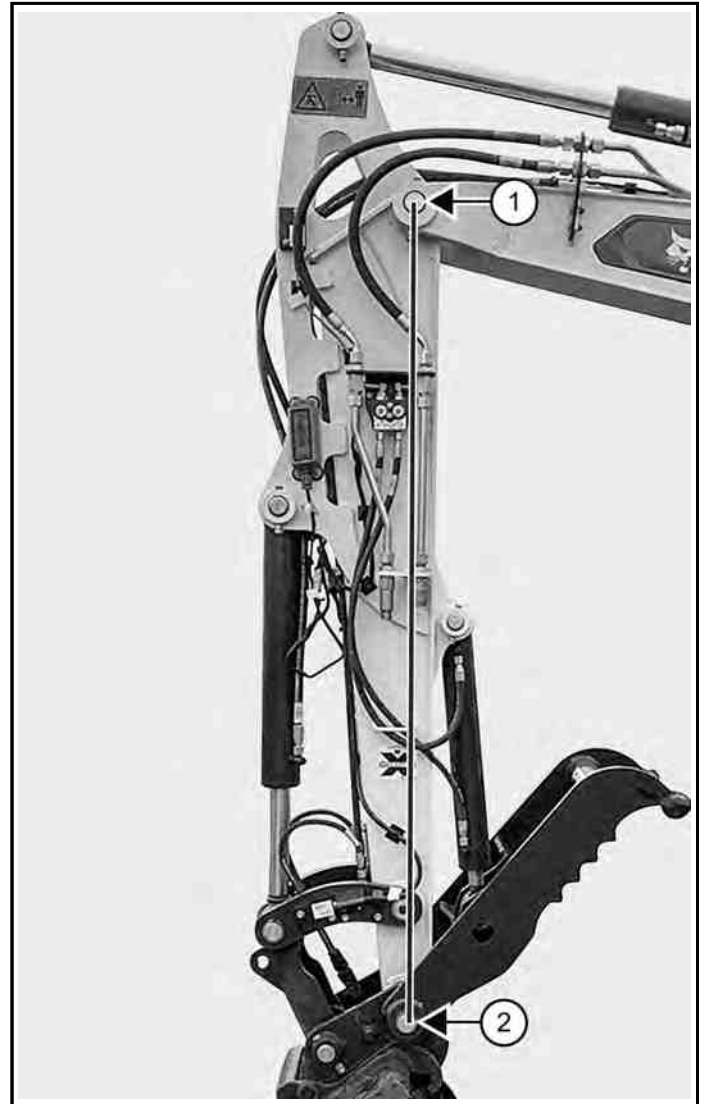
NOTE: Some models only have one arm option available.

Figure 365



4. Install the magnetic tool on the arm pin (Item 1) [Figure 365].
5. Place the plumb bob on the magnetic tool that is installed on the arm pin (Item 1) [Figure 365].

Figure 366



6. Position the arm so the plumb bob line (Item 1) is centered on the pivoting bucket pin (Item 2) [Figure 366].

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

Figure 367



7. With the arm vertical, select **[DONE]** (Item 1) [Figure 367] to store this information.
8. Proceed to calibrating the attachment.
(See Calibrating The Attachment on Page 168)

Calibrating The Attachment

The following items are needed to complete this task:

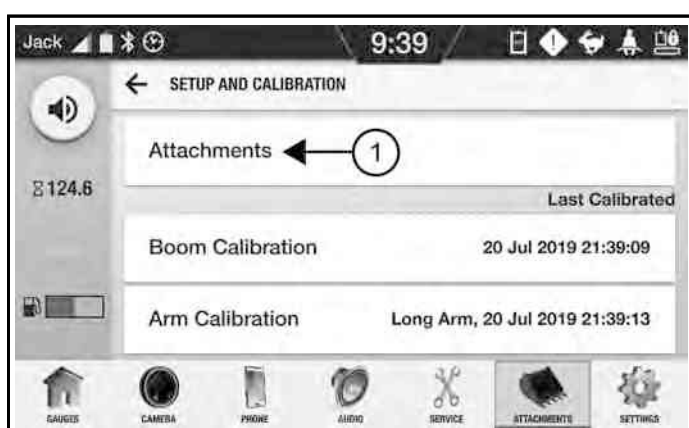
- Tape measure.
- Magnetic tool that is included with the kit.

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.

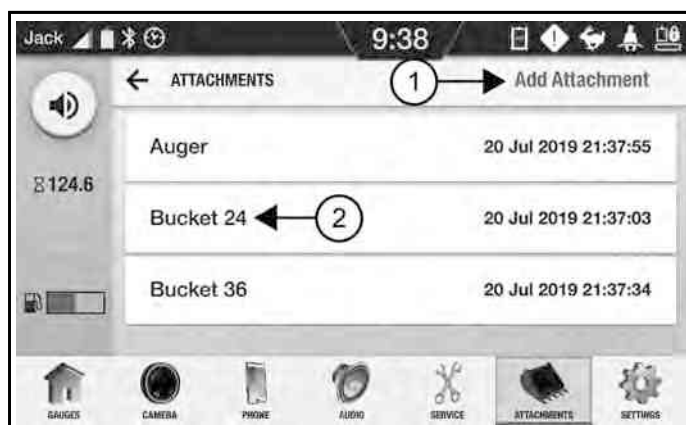
1. Select **[ATTACHMENTS]** → **[DEPTH CHECK]** → **[SETTINGS]** → **[SETUP AND CALIBRATION]**.

Figure 368



2. Select **[ATTACHMENTS]** (Item 1) [Figure 368].

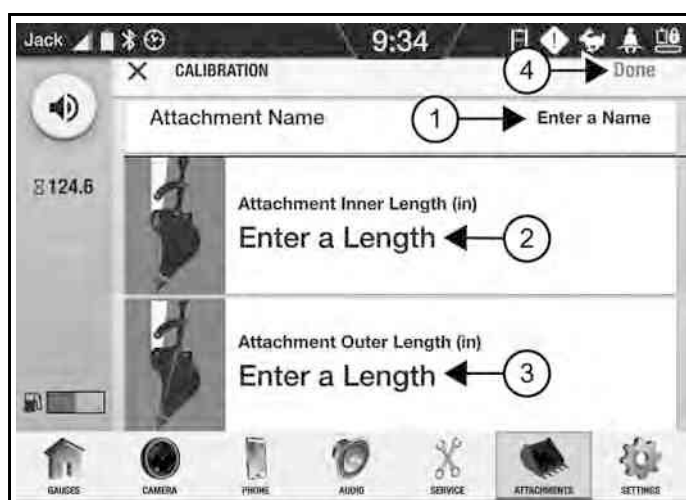
Figure 369



3. Select **[ADD ATTACHMENT]** (Item 1) [Figure 369].
OR
Select one of the existing attachments (Item 2) [Figure 369] 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 370



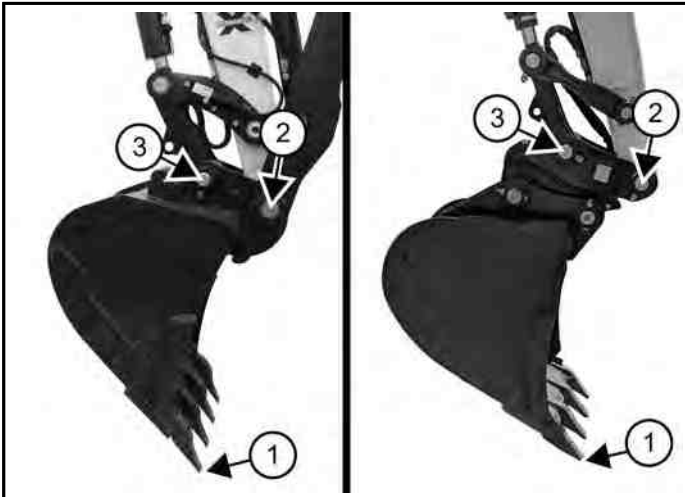
4. On the **CALIBRATION** screen, select **[ENTER A NAME]** (Item 1) [Figure 370].

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 370] for the Attachment Inner Length.

Figure 371



6. Measure the distance from the tip of the attachment (Item 1) to the center of the inner pin (Item 2) [Figure 371] and enter this value.

Choose the correct pin (Item 2) [Figure 371] based on the type of attachment mounting system on your machine.

7. Select **[ENTER A LENGTH]** (Item 3) [Figure 370] 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 371] and enter this value.

Choose the correct pin (Item 3) [Figure 371] based on the type of attachment mounting system on your machine.

Figure 372



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 372].

Figure 373



10. Follow the instructions on the screen [Figure 373] and select **[DONE]**.

Figure 374



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 371].

12. Select **[DONE]** (Item 1) [Figure 374] 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.

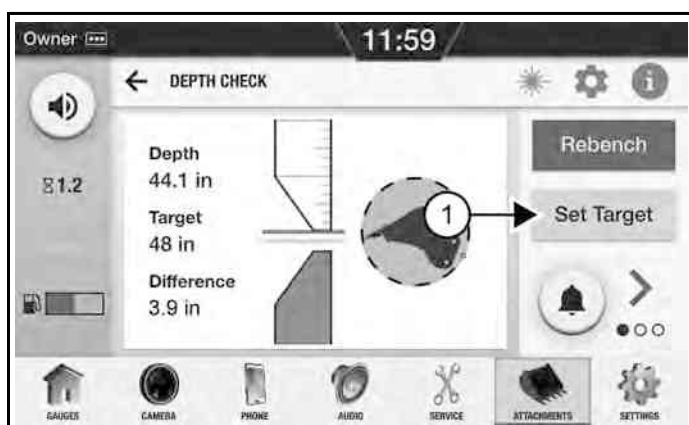
This finishes the calibration procedure, except if you are also installing a laser.
(See Setting Up A Laser With Depth Check on Page 174)

Setting Target Depth

NOTE: Twenty different target depths can be pre-set and stored in the system.

1. Select **[ATTACHMENTS]**→ **[DEPTH CHECK]**.

Figure 375



2. Select **[SET TARGET]** (Item 1) [Figure 375].

Figure 376



3. Select one of the existing target depths.
OR
Select **[ADD TARGET]** (Item 2) [Figure 376] to add a new target depth.

A check mark will appear (Item 1) [Figure 376] by the selected target depth.

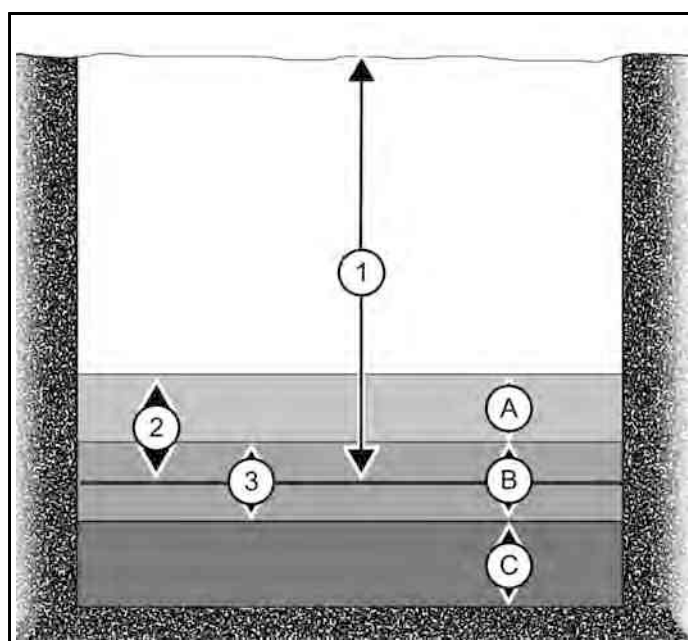
Figure 377



4. To remove an existing target depth, select **[EDIT]** (Item 3) [Figure 376].
 - a. Select the **[REMOVE]** icon (Item 1) [Figure 377] in front of a target depth to remove it.
The active target depth can not be removed.
 - b. Select **[SAVE]** (Item 2) [Figure 377] to confirm removal.

Description Of Grade And Warning Zones

Figure 378



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 379



2. Select **[SET WARNING ZONE]** (Item 1) [Figure 379] 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 380



2. Select **[SET GRADE ZONE]** (Item 1) [Figure 380] and enter the dimension.
3. Select **[ENTER]** to save your changes.

Digging To A Target Depth

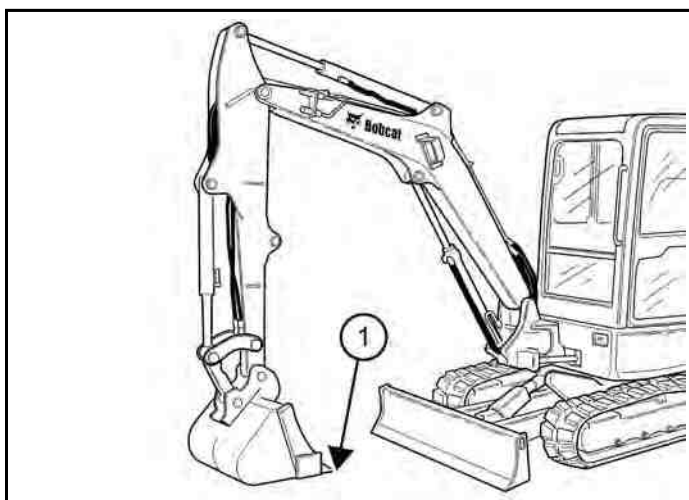
⚠ DANGER

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. ◀

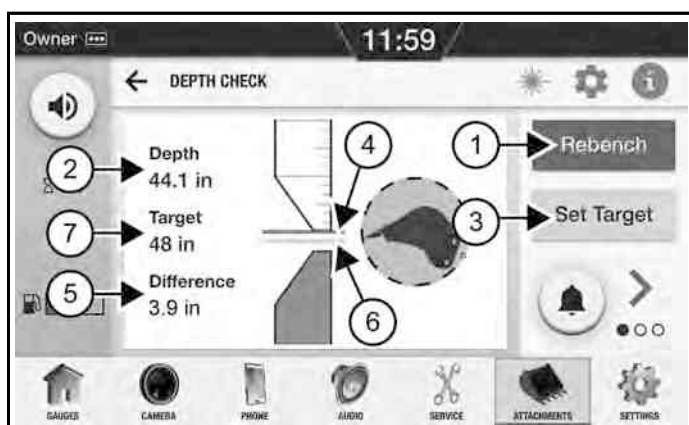
NOTE: If you are not digging with a laser, make sure the laser icon is not illuminated on the **DEPTH CHECK** screen.

Figure 381



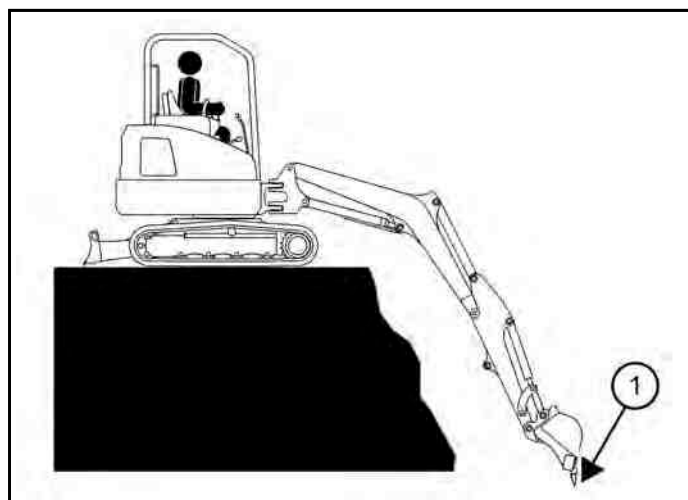
1. Set the bucket (Item 1) [Figure 381] on the ground surface where you are going to start the dig or on the surveyor mark to establish the starting ground position.
2. Select **[ATTACHMENTS]** → **[DEPTH CHECK]**.

Figure 382



3. Select **[REBENCH]** (Item 1) [Figure 382] 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 382].
4. Select **[SET TARGET]** (Item 3) [Figure 382] to set the new depth target.

Figure 383



- As the hole is being dug, the position of the bucket (Item 1) [Figure 383] is dimensionally shown (Item 2) [Figure 382] and shown on the bar graph (Item 4) [Figure 382].
- The distance to target depth is shown dimensionally (Item 5) and on the bar graph (Item 6) [Figure 382].
- When the bucket is getting close to the target depth (Item 7) [Figure 382], 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 171)

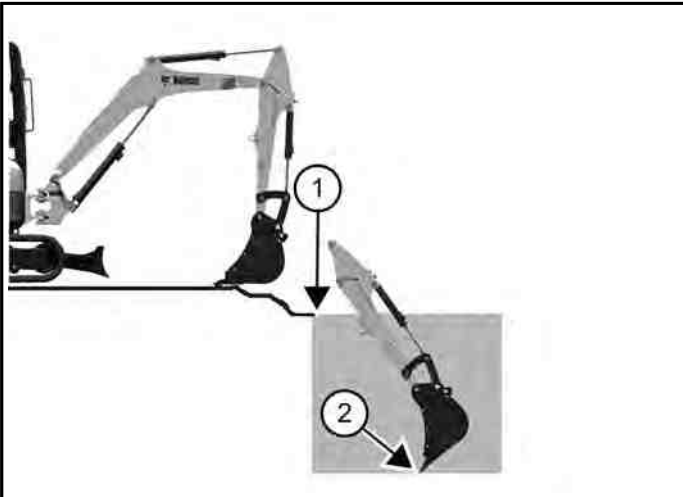
EXAMPLE: The Target is 2 m (6.5 ft) and the Depth is 1,5 m (4.9 ft), the Difference will be 0,5 m (1.6 ft).

$$2 \text{ m} - 1,5 \text{ m} = 0,5 \text{ m} \quad (6.5 \text{ ft} - 4.9 \text{ ft} = 1.6 \text{ ft}).$$

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 384



P200242b

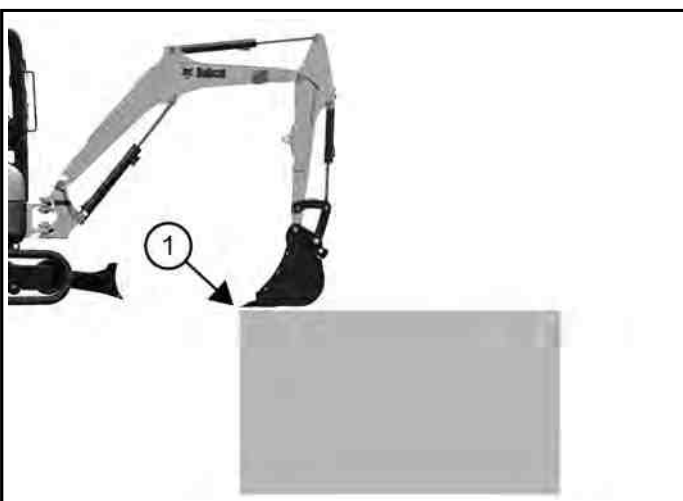
- Reposition the excavator so the bucket can be rebenched off the original bench point (Item 1) [Figure 384].
- Position the excavator so the bucket will reach to the bottom of the hole (Item 2) [Figure 384] at an area that is known to be the correct depth. When rebenching at the bottom of the trench, 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 171)

Figure 385

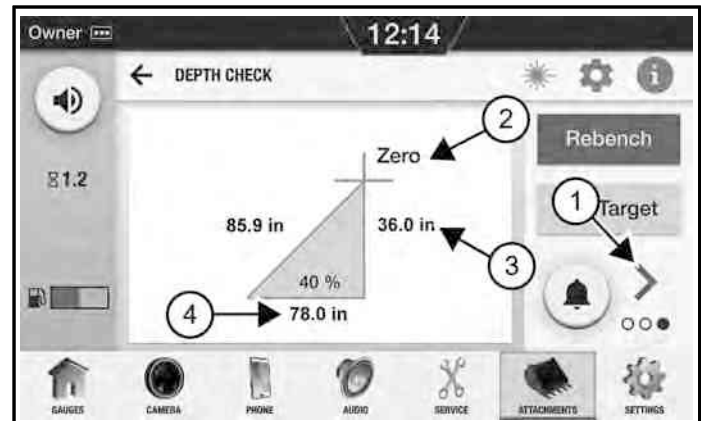


P200241a

1. When rebenching the bucket for setting to 0.0, position the bucket (Item 1) [Figure 385] at the starting point of the side of the hole.

This gives the Depth Check system the starting position of the hole.

Figure 386



NA3431c

2. Press the **[ARROW]** icon (Item 1) [Figure 386] to scroll to the **GRADE CHECK** screen [Figure 386].

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 386].

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 386].

⚠ DANGER

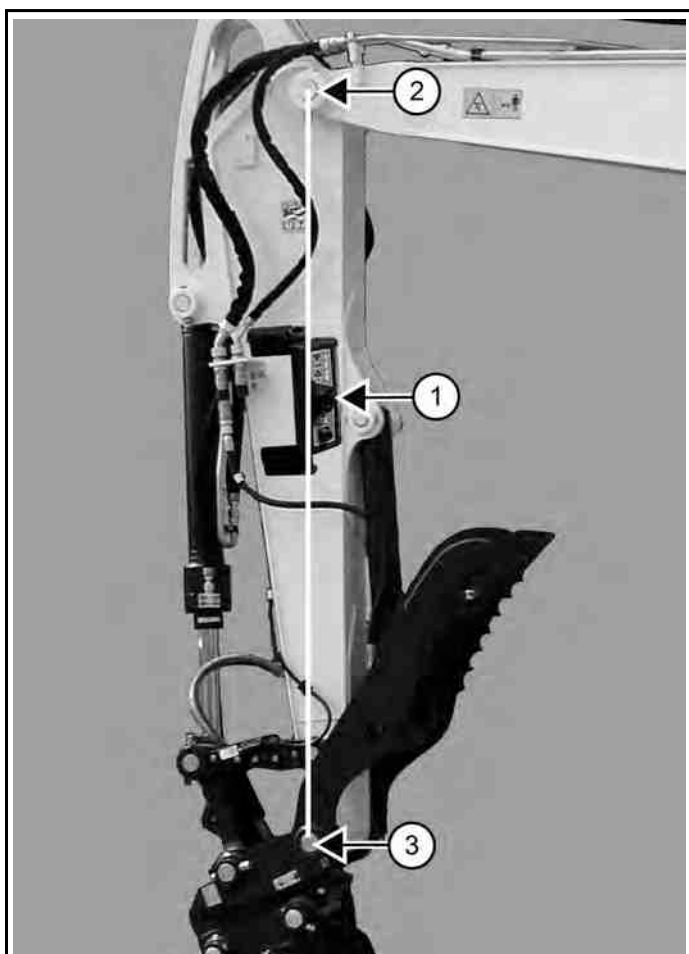
EXPLOSION AND ELECTROCUTION HAZARDS
Contact with underground utility lines will cause death, serious injury, or property damage.

- 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 to known depths. 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. ◀

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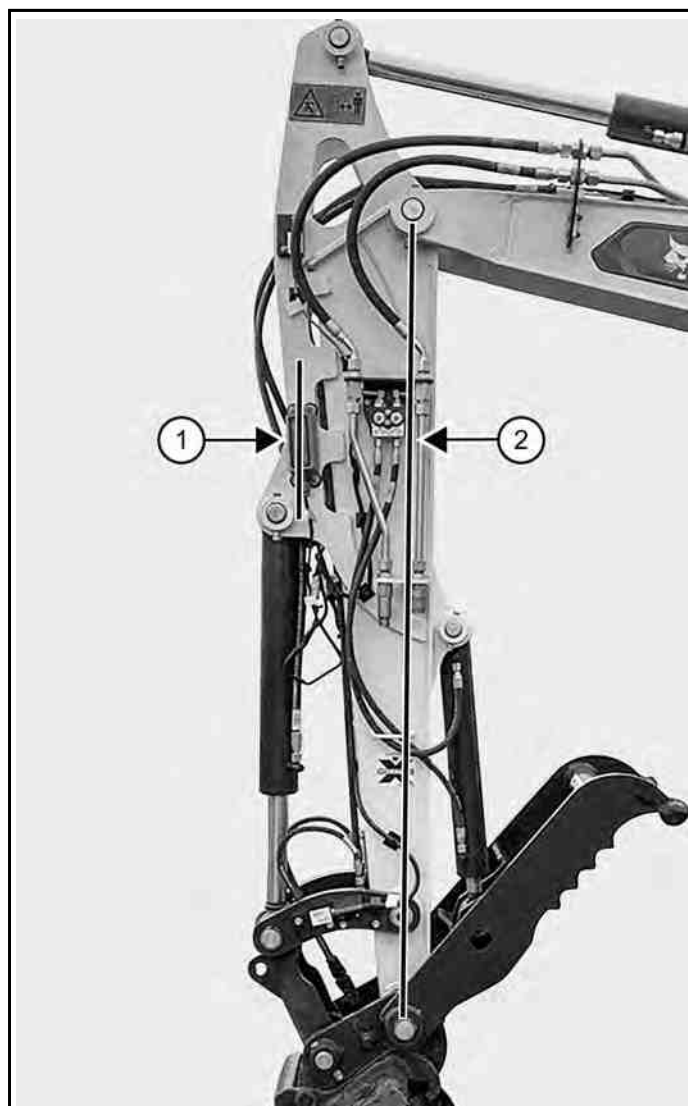
Setting Up A Laser With Depth Check

Figure 387



1. Install the laser receiver (Item 1) in line with the arm pin (Item 2) and the bucket pivot pin (Item 3) [Figure 387] when possible.

Figure 388

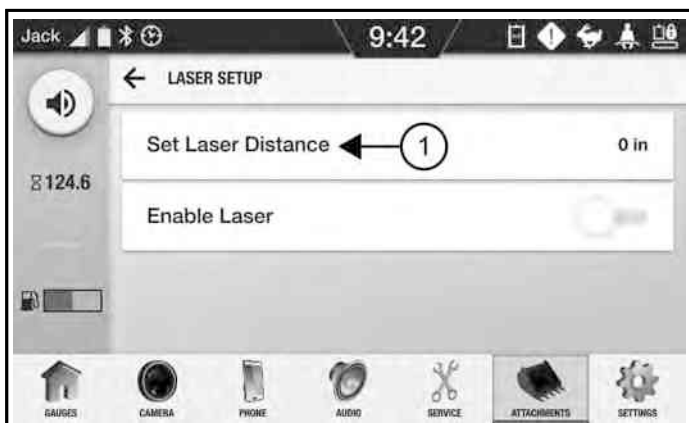


2. If your machine is equipped with options that make it difficult to install the laser receiver in line with the pins, install it in an alternative location (Item 1) [Figure 388].

The receiver (Item 1) must be mounted parallel to the bucket and arm pins (Item 2) [Figure 388].

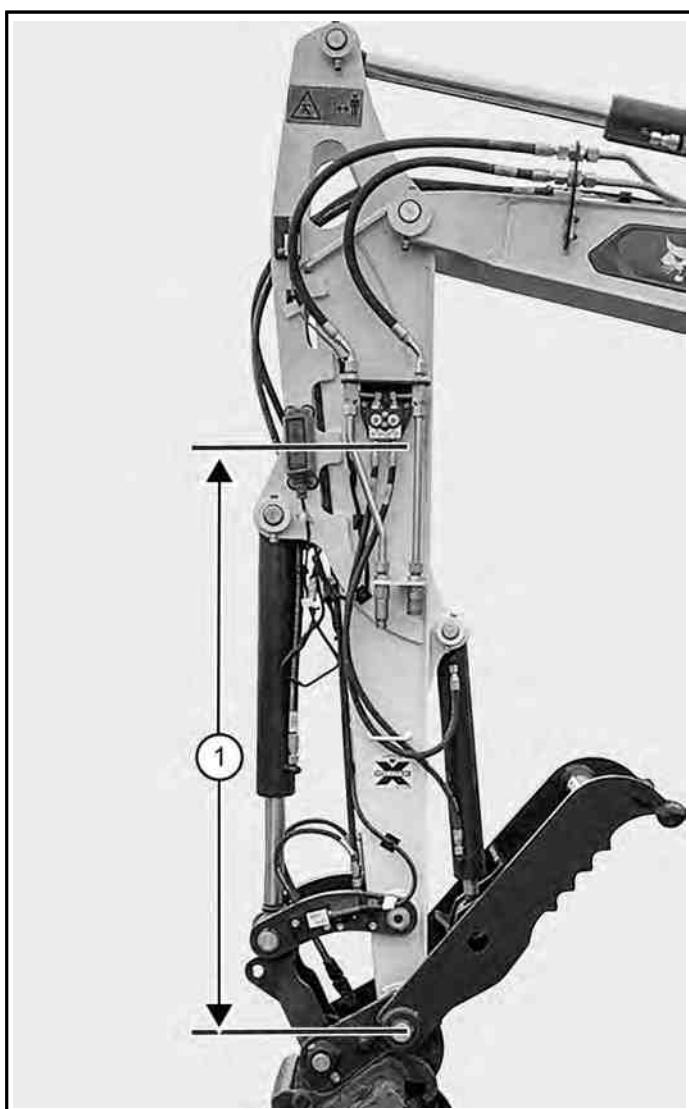
3. If your excavator is equipped with a clamp or arm that may interfere with the laser, make sure there is no hose-to-laser interference.
 - a. Fully curl the arm and bucket and make sure the hoses do not interfere with the laser receiver during any arm or bucket movement.
 - b. Adjust the position of the laser receiver if necessary to avoid any contact with the hoses.
4. Select **[ATTACHMENTS]** → **[DEPTH CHECK]** → **[SETTINGS]** → **[LASER SETUP]**.

Figure 389



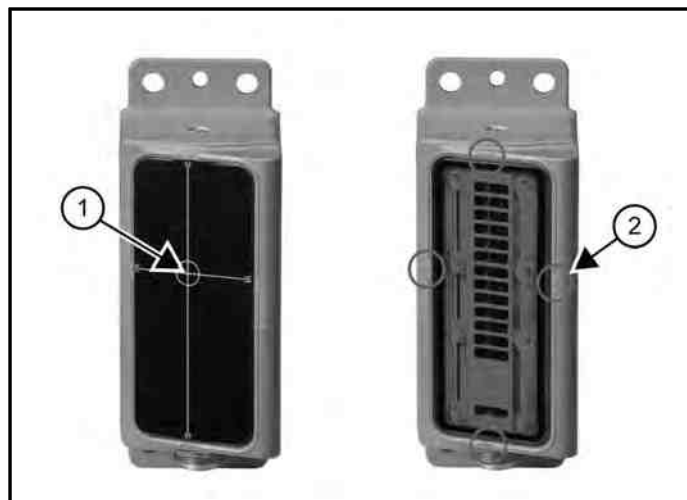
5. Select **[SET LASER DISTANCE]** (Item 1) [Figure 389].

Figure 390



6. Measure from the laser receiver zero point to the bucket pivot pin (Item 1) [Figure 390].

Figure 391



The LC511 receiver is shipped with a black cover that indicates the zero point from which to measure (Item 1) [Figure 391]. After this cover is removed, the zero point is found with the four arrows (Item 2) [Figure 391] on the receiver frame.

7. Enter this distance (Item 1) [Figure 390] as the Laser Distance.

To dig a hole using the laser, see the following:
(See Benching With A Laser System on Page 175)

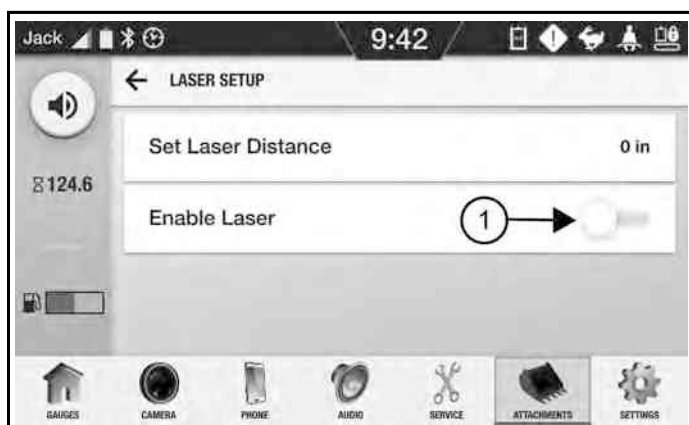
Benching With A Laser System

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 393].

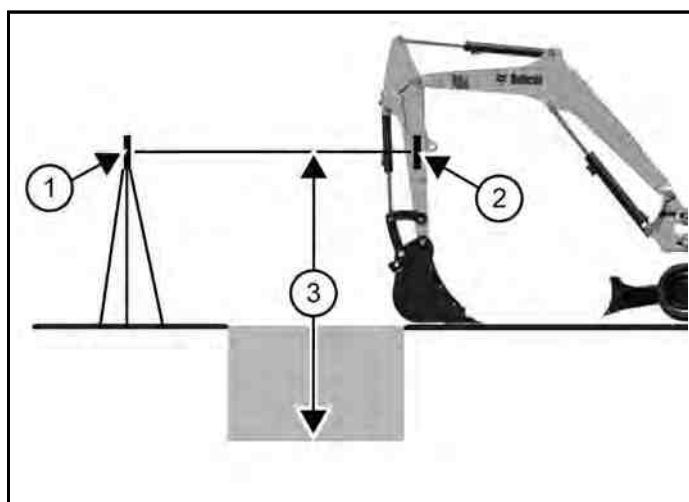
1. Make sure the laser receiver location on the arm has been entered into the Depth Check system.
(See Setting Up A Laser With Depth Check on Page 174)
2. Select **[ATTACHMENTS]→[DEPTH CHECK]→[SETTINGS]→[LASER SETUP]**.

Figure 392



3. Enable the laser by moving the slider (Item 1) [Figure 392].

Figure 393



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 393].

Refer to the Laser Indicator Arrows on the display (See Depth Check Screen on Page 161) . A solid green icon indicates on grade with the laser beam, signaling to re-bench. A red indicator arrow shows the direction to move the workgroup to receive the laser beam.

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.

NOTE: The Laser Indicator Arrows show the last known strike point of the laser beam. If contact between laser beam and receiver is blocked, the Laser Indicator Arrows may not accurately show the direction of laser grade point.

5. When the laser strikes the receiver and the Laser Indicator Arrow turns green, select **[REBENCH]** (See Depth Check Screen on Page 161) .

OR

Rebench by pressing the right joystick button.

Figure 394



If the arm is not vertical when you try to rebench, the **ARM ALIGNMENT** screen [Figure 394] 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 393].
8. Adjust the Warning Zone and Grade Zone as needed. (See Setting The Grade Zone on Page 171) (See Setting The Warning Zone on Page 171)
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.
One or more sensors are not working correctly.	Determine which sensor is not working correctly and replace. (See Checking The Bucket Sensor on Page 177) (See Checking The Arm Sensor on Page 177) (See Checking The Boom Sensor on Page 178)
Attachment was measured incorrectly.	Remeasure attachment and input new values.
Laser feature is activated but laser isn't being used.	Turn laser off.
Laser feature isn't activated, but a laser is being used to Rebench.	Turn laser feature on.
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.

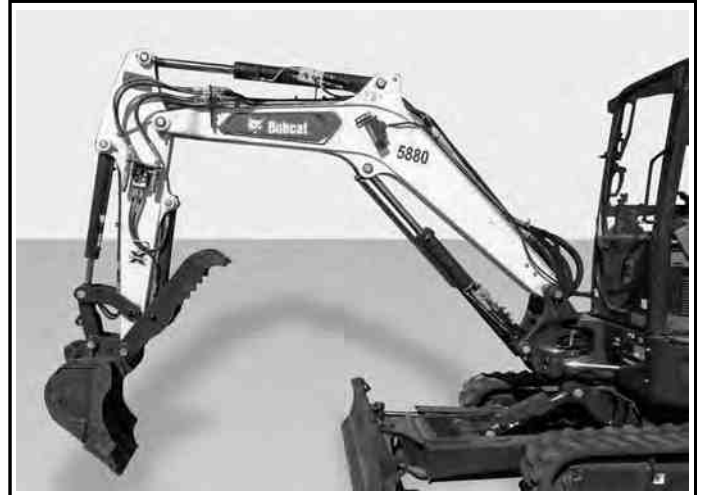
Checking The Bucket Sensor

The following item is required for this task:

- Tape measure.

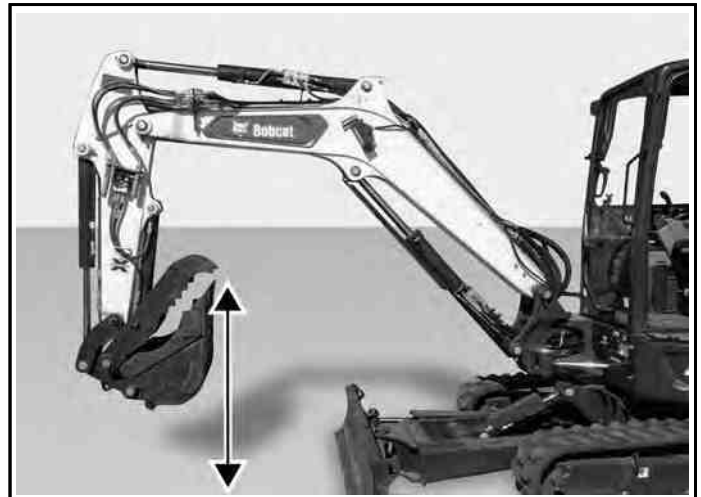
The task is a two-person job. One person must remain in the cab to enter data into the display while a second person takes measurements from outside the machine.

Figure 395



1. Place the bucket teeth on the ground with the teeth at the lowest point in the bucket movement arc [Figure 395].
2. Select **[REBENCH]**.

Figure 396



3. Move only the bucket up to nearly the fully curled position [Figure 396].
Do not move the boom or arm.
4. Measure how high the bucket teeth are off the ground [Figure 396].
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.

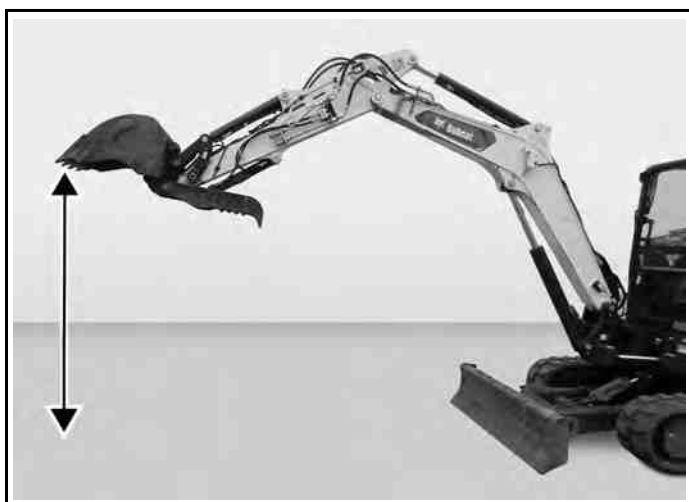
1. First verify that the bucket sensor is working correctly.
(See Checking The Bucket Sensor on Page 177)

Figure 397



2. Place the bucket teeth on the ground with the teeth at the lowest point in the bucket movement arc [Figure 397].
3. Select **[REBENCH]**.

Figure 398



4. Move only the arm out, extending it as much as possible [Figure 398].
Do not move the boom.
5. Measure how high the bucket teeth are off the ground [Figure 398].
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 177)
(See Checking The Arm Sensor on Page 177)

Figure 399



2. Set the bucket flat on the ground [Figure 399].
3. Select **[REBENCH]**.
4. Move the boom up.

Figure 400



5. Measure how high the bucket teeth are off the ground [Figure 400].

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 180)
- 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 401



- Secure the towing chain to the loop located at the rear of the excavator (Item 1) [Figure 401].

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

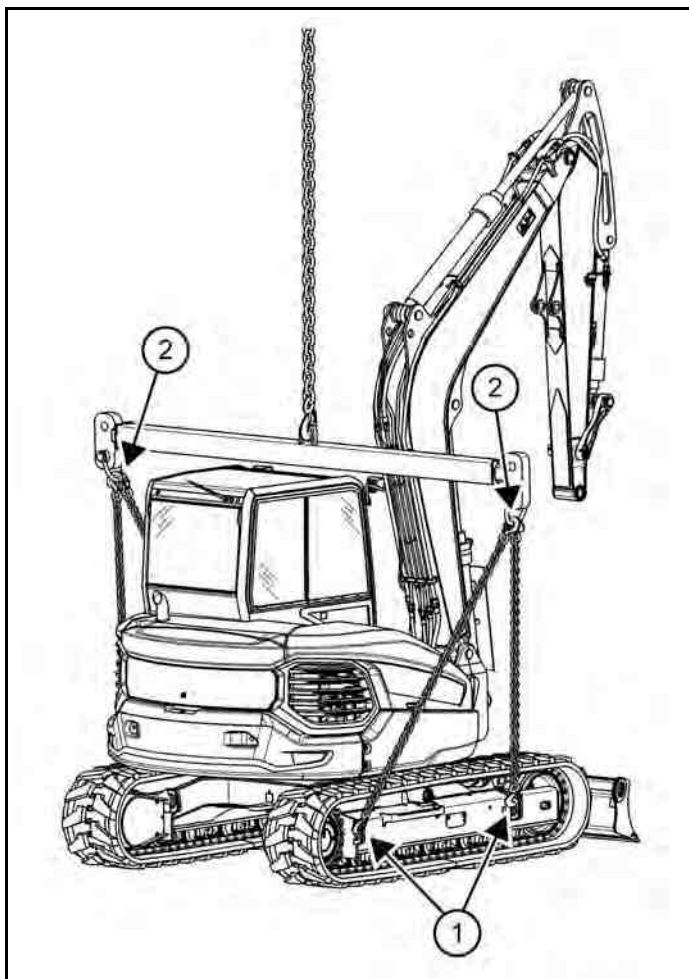
Falling machine can cause serious injury or death.

- 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).

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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 402



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 402].

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 center 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 403



C209967

7. Move the machine forward onto the transport vehicle [Figure 403].
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

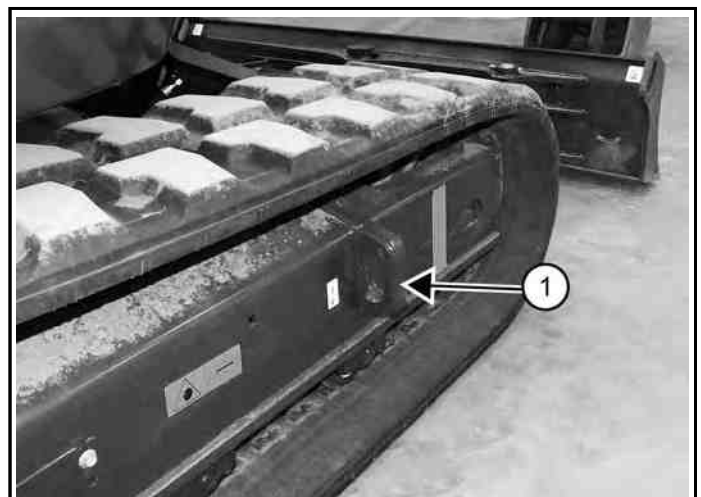
Tie down the excavator to prevent it from moving when going up or down slopes or during sudden stops. Use chain binders to tighten the chains and then safely tie the chain binder levers to prevent loosening.

Figure 404



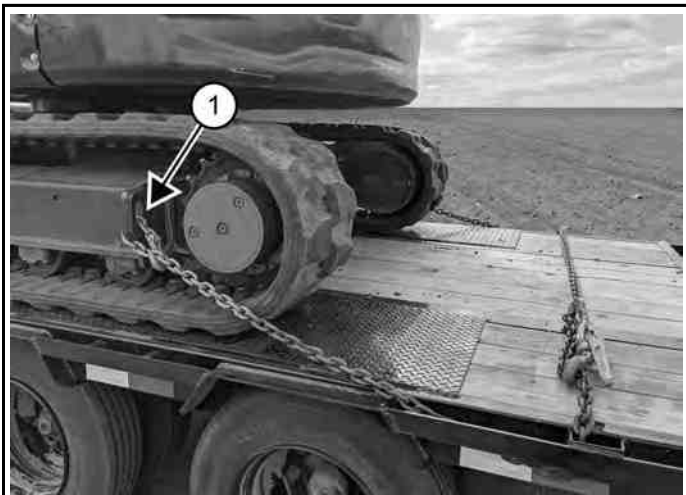
C209968a

Figure 405

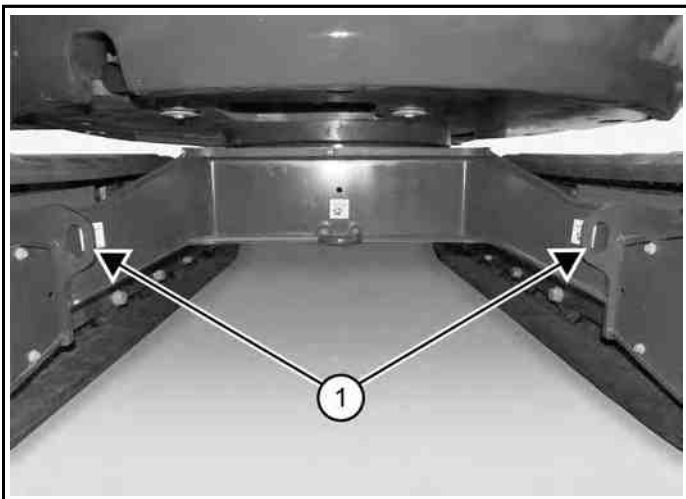


C209970a

1. At the front of the machine, fasten chains to the corners of the blade (Item 1) [Figure 404].
OR
Fasten chains to the tie-down loops on the outside of the tracks (Item 1) [Figure 405].

Figure 406

C200989a

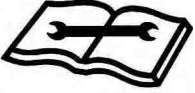
Figure 407

C200907a

2. At the rear of the machine, fasten chains to the tie-down loops on the exterior of the track (Item 1) [Figure 406].
OR
Fasten chains to the tie-down loops in the interior of the track (Item 1) [Figure 407].



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.

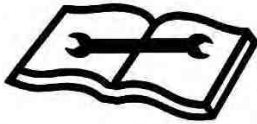
MAINTENANCE SAFETY WARNINGS



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.

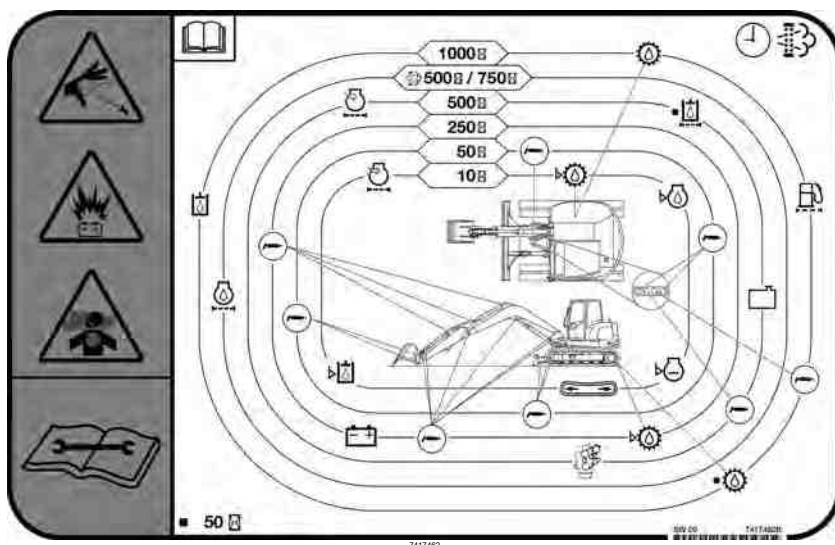
The service schedule decal is a guide for correct maintenance of the Bobcat excavator.

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.

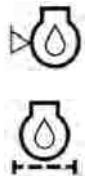
- Read and understand the Operation & Maintenance Manual, Operator's Handbook, and decals on machine.
- Follow warnings and instructions in the manuals when making repairs, adjustments or servicing.
- Check for correct function after adjustments, repairs or service.

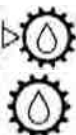
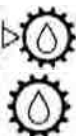
W-2003

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 202) • Fuel Filter (7336334)	D					
Tracks 	Tension (See Page 220)	O					
Operator Cab and HVAC	Filters (See Page 197) • 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 191)	C O					
Control Console Lockout	(See Page 190)	O					
Attachment Mounting System	(See Page 225)	O					
Travel Motion Alarm and Horn	(See Page 192)	O					
Operator Cab	Mounting hardware (See Page 49)	O					
Indicators and Lights		O					
Engine Air Filters and Air System 	(See Page 198) • Outer Air Filter (6666375) • Inner Air Filter (6666376)	D			C O		
Engine Oil and Filter 	(See Page 204) • 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 214) - 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 218) - 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 206) - Coolant (Packaging: A = 5 L can, B = 20 L container, C = 210 L drum, D = 1000 L tank): - Bobcat PG Coolant Premix (6987793) (purple) - Bobcat EG Coolant Premix (6987804) (red)	V					R
Lubrication 	Blade, boom swing, boom swing cylinder, bucket pivot points, and swing bearing (See Page 226)		G				
Travel Motors (Final Drive) 	Fluid (See Page 222) - Transmission Fluid (Packaging: A = 5 L, B = 20 L, C = 210 L) 80W-90 API GL-5 LS (6987805)		FR	V		R	
Alternator and Starter	Electrical connections		FO		O		
Hydraulic Filters 	Hydraulic filter and case drain filter (See Page 214) - Primary Hydraulic Filter (6670207) - Case Drain Filter (6686217)		FR		R		
Lubrication 	Boom, boom cylinder, arm, arm cylinder, bucket link, bucket cylinder, and articulated boom (if equipped) (See Page 226)			G			

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
Battery 	Cables and electrical connections (See Page 210) • Battery (7306047)			O			
Hydraulic Reservoir 	Breather cap (See Page 214) • Hydraulic Fill / Breather Cap (6692836)				R		
Engine Cooling System 	Radiator, fuel cooler, hydraulic fluid cooler, air conditioning condenser (if equipped) (See Page 206) • Radiator Cap (7337382)				C		
Alternator 	Belt (See Page 223)				O		
Air Conditioning (if equipped)	Belt (See Page 223)				O		
HVAC	Housing and coils (See Page 197)				C		
Lubrication 	Swing pinion (See Page 226)				G		
Fuel Pre-Filter 	Fuel pre-filter (See Page 203) • Fuel Pre-Filter (7348032)					R	
Fuel Tank	Vent filter (See Page 204) • Fuel Tank Vent Filter (7340277)					R	
Lubrication 	Swing reduction gear (See Page 226)					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 408



P200109a

When the left console is raised [Figure 408], 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 408].
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

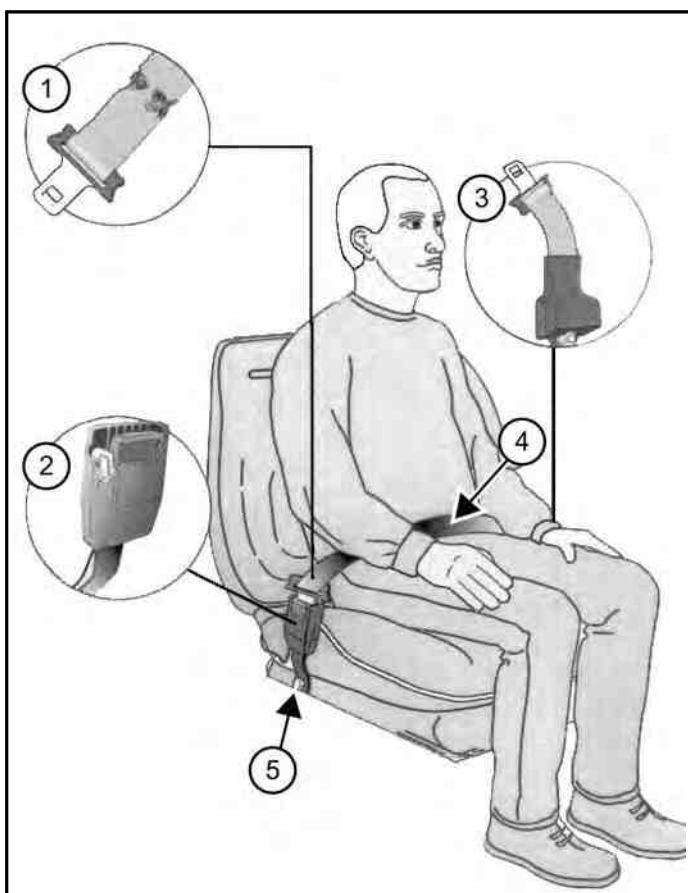
⚠ WARNING

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 409



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 409].

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. If equipped, check the retractor web storage device 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, 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 controls 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 192)

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

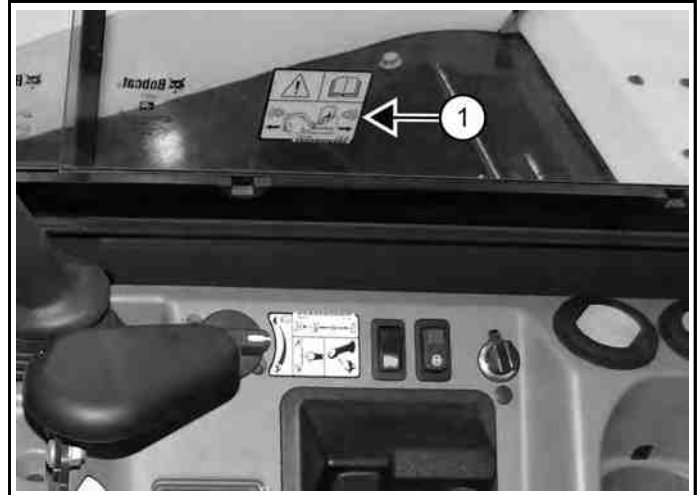
Failure to maintain a clear view in the direction of travel can cause serious injury or death.

- 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 86)

Figure 410



C208728a

2. Inspect for damaged or missing travel motion alarm decal (Item 1) [Figure 410].

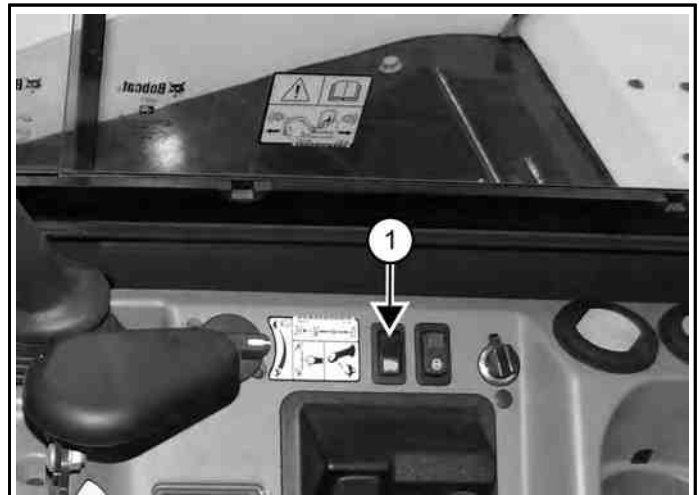
Replace if required.

3. Start the engine.
4. Move the travel control levers (one lever at a time) in the forward direction.
5. Move the travel control levers (one lever at a time) in the reverse direction.

The travel motion alarm must sound.

The travel motion alarm must sound.

Figure 411



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 411].

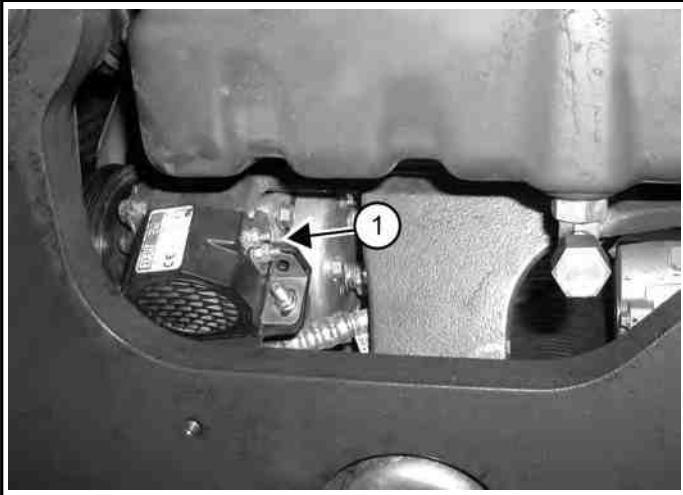
The travel motion alarm will shut off.

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 411].

The travel motion alarm will shut off.

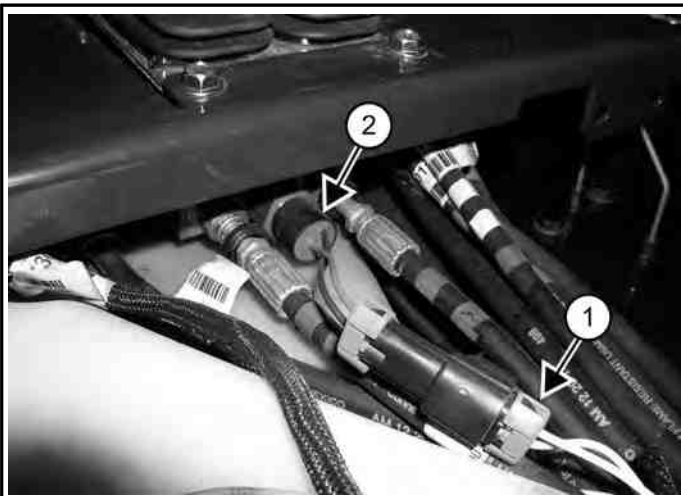
8. Return both levers to neutral and turn excavator key to the off position.
9. Exit the excavator.
(See Stopping The Engine And Leaving The Machine on Page 100)

Figure 412



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 412].
11. Inspect the travel motion alarm electrical connections and wire harness (Item 1) [Figure 412] for tightness and damage.
 - a. Repair or replace any damaged components.

Figure 413

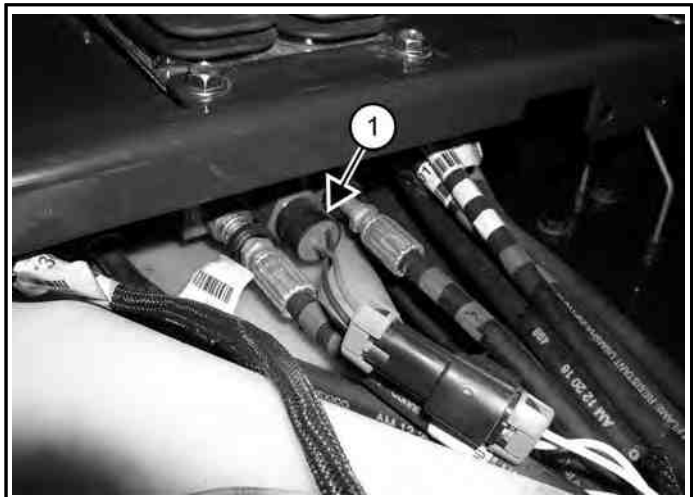


12. Locate the travel motion alarm switch, which is in the travel control valve under the floorplate [Figure 413].
 - a. Remove the floor mat and the floorplate to access the switch.
13. Inspect the wire harness (Item 1) and travel motion alarm switch (Item 2) for tightness and damage [Figure 413].

If the travel motion alarm switch requires service, see your Bobcat dealer.

Maintaining The Travel Motion Alarm Switch

Figure 414



The travel motion alarm switch (Item 1) [Figure 414] 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 floorplate.
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, contact your Bobcat dealer.

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

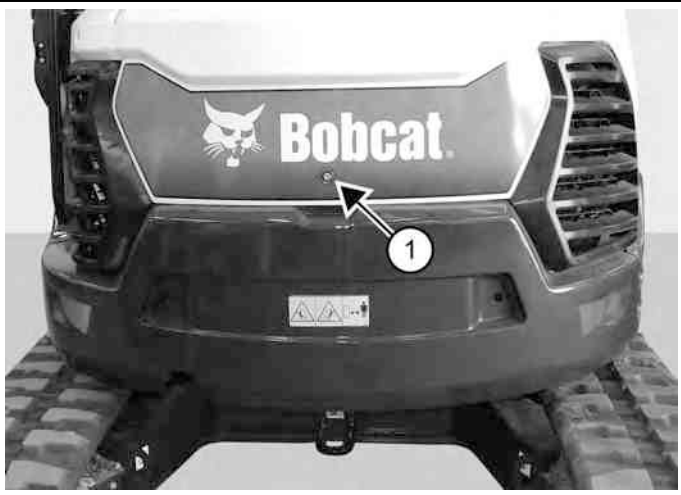
IMPACT HAZARD

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 415



P200085a

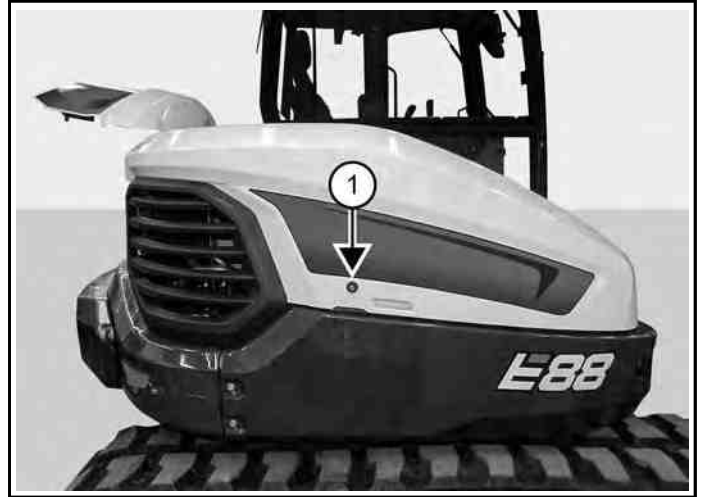
- Push the button (Item 1) [Figure 415] and pull the tailgate open.
- Push firmly to close the tailgate.

RIGHT SIDE COVER

Opening And Closing The Right Side Cover

1. Open the tailgate. (See Tailgate on Page 194)

Figure 416



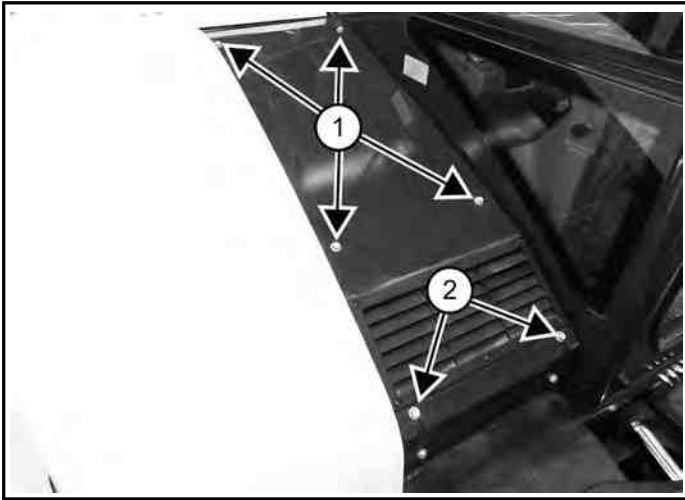
C209465a

2. Push the button (Item 1) [Figure 416] 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 417



C208729a

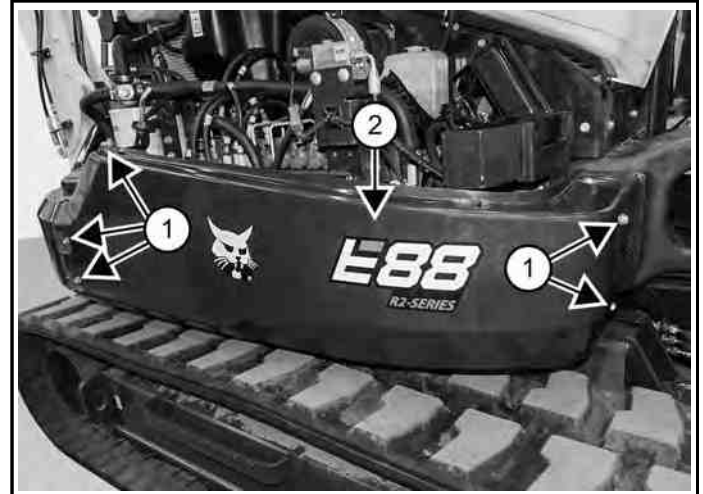
1. Remove the four top bolts (Item 1) [Figure 417].
2. Loosen the two bottom bolts (Item 2) [Figure 417].
3. Slide the centre cover off the two bottom bolts (Item 2) [Figure 417].
4. To install, slide the cover slots into the two bottom bolts (Item 2) [Figure 417].
5. Tighten the bottom two bolts (Item 2) [Figure 417].
6. Install the four bolts (Item 1) [Figure 417] and tighten.

RIGHT SIDE PANEL

Removing And Installing The Right Side Panel

1. Open the tailgate. (See Tailgate on Page 194)
2. Open the right side cover. (See Right Side Cover on Page 194)

Figure 418



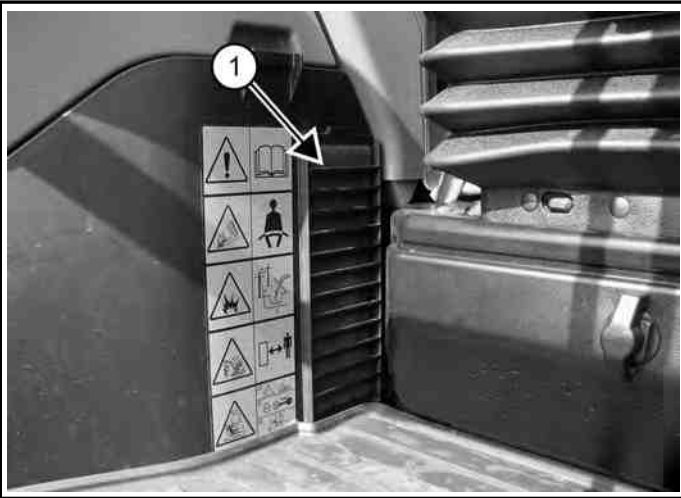
C208825a

3. Remove the five bolts (Item 1) on the right side panel (Item 2) and remove the panel [Figure 418].
4. To reinstall the panel, fit the panel back into place and tighten the bolts (Item 1) [Figure 418].

CAB FILTERS

Cleaning And Maintaining The Recirculation Filter

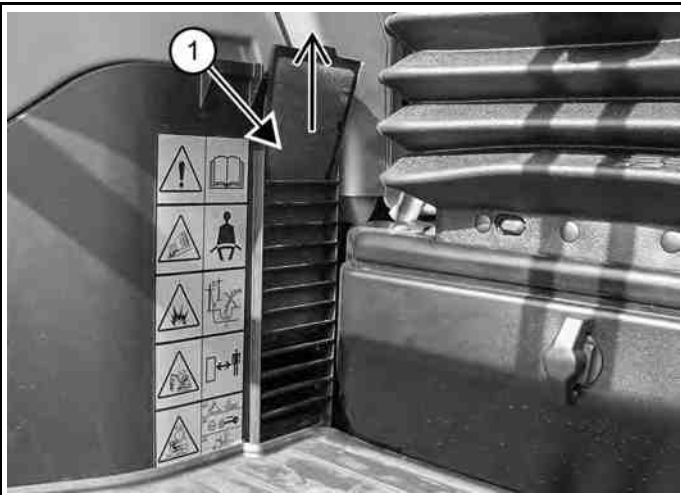
Figure 419



C206255a

The recirculation filter is located to the right of the operator seat (Item 1) [Figure 419]. It must be cleaned regularly.

Figure 420



C206255a

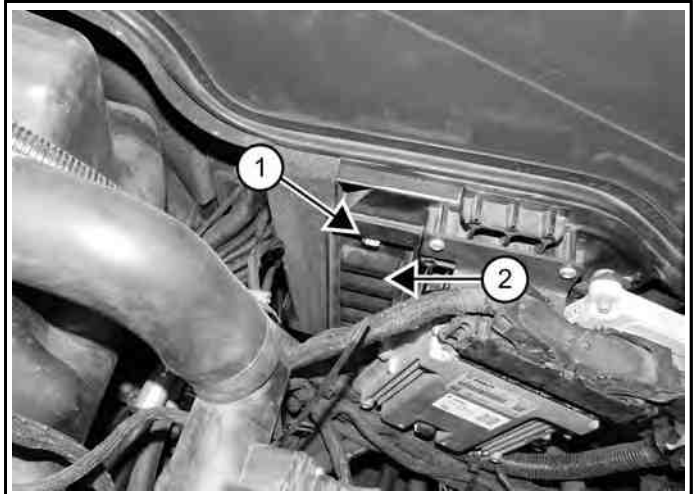
1. Pull up on the filter (Item 1) [Figure 420] until it is removed from the housing.
2. Shake the filter or use low pressure air to clean the filter.
Replace the filter if it is very dirty or damaged.
3. To reinstall the filter, position the bottom of the filter on the housing and slowly push the filter 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 195)

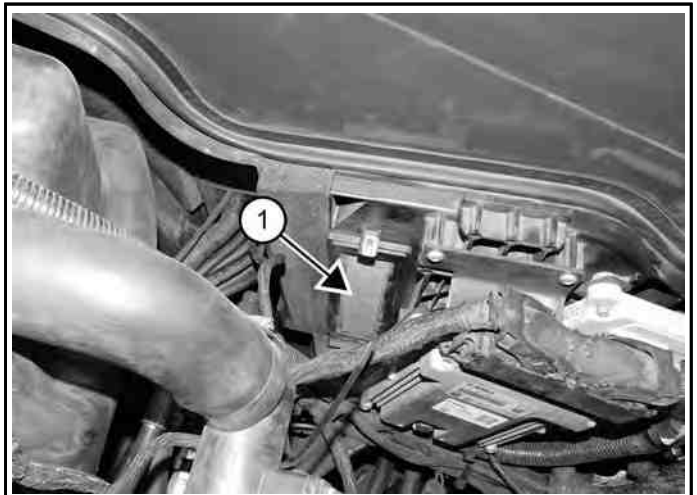
Figure 421



C208765a

2. Pull out on the tab (Item 1) [Figure 421] of the fresh air filter cover and remove the cover.

Figure 422



C208765a

3. Pull the filter (Item 1) [Figure 422] 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)

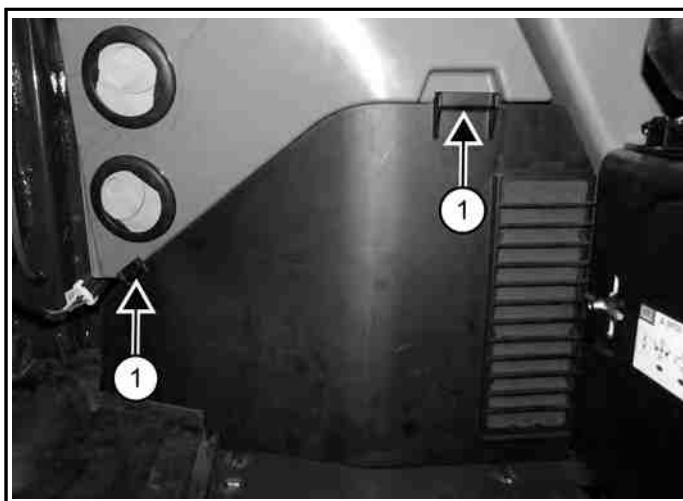
Cleaning HVAC Filters

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 186)

The HVAC housing is located to the right of the operator seat.

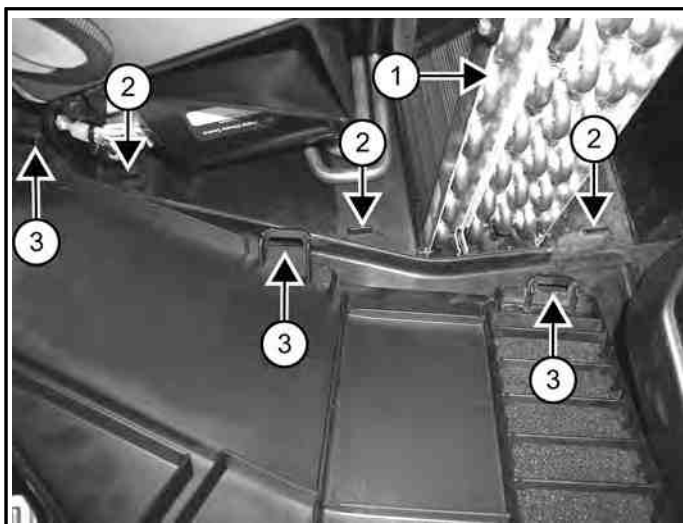
1. Remove the floor mat.

Figure 423



2. Pull back on the two latches (Item 1) [Figure 423] and remove the HVAC side cover.

Figure 424



3. Use low pressure air to remove debris and clean the coils (Item 1) [Figure 424].

A vacuum cleaner with a soft attachment or a soft bristle brush can also be used to remove surface debris. Do not scrape the coil with the vacuum nozzle, air nozzle, or any other tool.

4. 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.
5. 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.
6. Remove the centre floorplate to access the third rubber drain valve that is located below the left rear corner of the HVAC housing.
7. 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.

8. Reinstall the centre floorplate and close the right cover.
9. 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 424].
10. Press on the front of the cover to secure the front latch (Item 1) [Figure 423].
11. Press on the top edge of the side cover and work back to the rear of the cover and secure the rear latch.
12. Reinstall the floor mat.

ENGINE AIR CLEANER

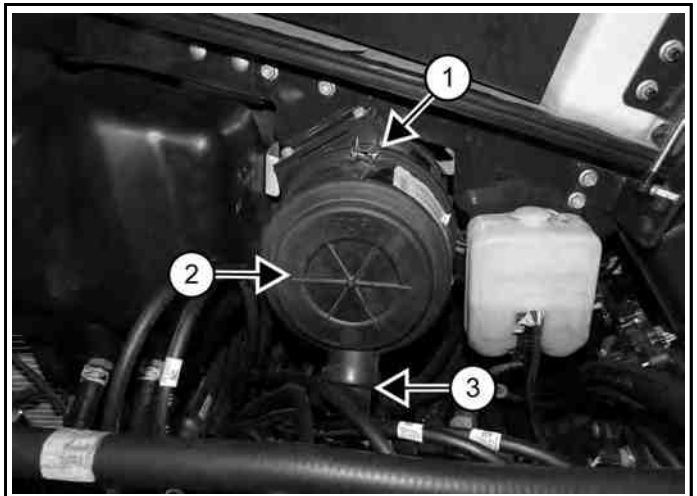
Replacing The Outer Filter Of The Air Cleaner

See the Service Schedule for the correct service interval. (See Service Schedule on Page 186)

The general warning icon and service code "M-0117 – Air Filter Plugged" will appear on the screen when air filter replacement is necessary.

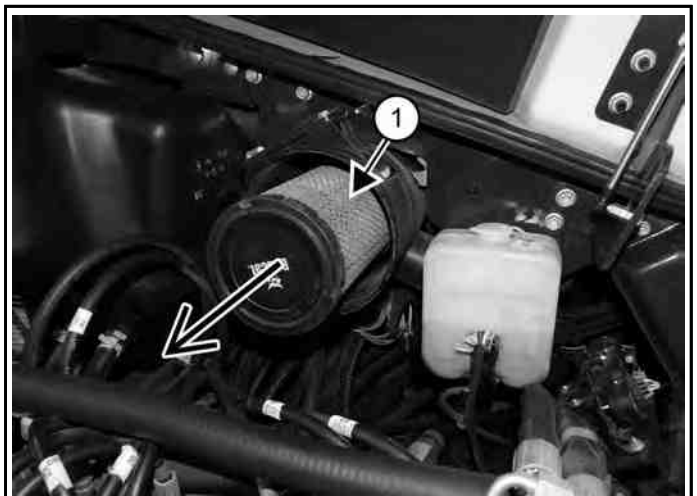
1. Open the tailgate. (See Tailgate on Page 194)
2. Open the right side cover. (See Right Side Cover on Page 194)

Figure 425



3. Release the three fasteners (Item 1) [Figure 425].
4. Remove and clean the dust cup (Item 2) [Figure 425].

Figure 426



5. Pull the outer filter (Item 1) [Figure 426] 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 425].
 10. Fasten the three fasteners (Item 1) [Figure 425] 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.
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.

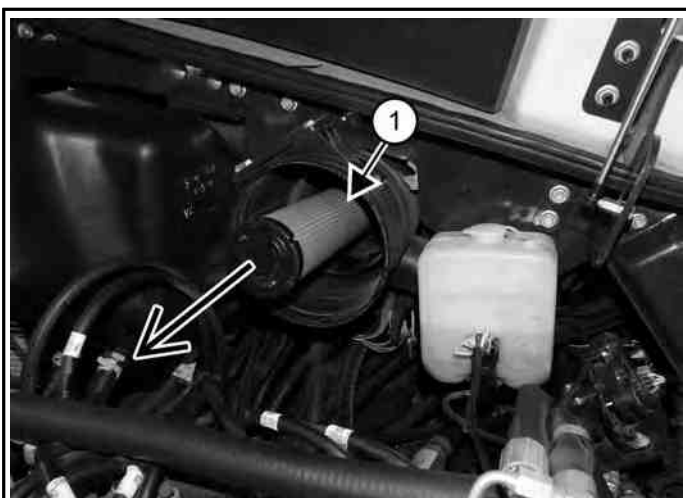
Replacing The Inner Filter Of The Air Cleaner

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 194)
2. Open the right side cover. (See Right Side Cover on Page 194)
3. Remove the dust cup and the outer filter. (See Replacing The Outer Filter Of The Air Cleaner on Page 198)

Figure 427



4. Remove the inner filter (Item 1) [Figure 427].

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 No. 1-D or 2-D, that meets ASTM D975 specifications.

Ultra-low sulfur diesel fuel must be used in this machine. Ultra-low sulfur is defined as 15 mg/kg (15 ppm) sulfur maximum.

Use only clean fuel that meets ISO4406 with a minimum cleanliness level of 18/16/13.

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%

Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than 5% 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.

Paraffinic fuels such as HVO (Hydrotreated Vegetable Oil) and GTL (Gas to Liquid) that comply with EN15490 are approved for this engine. Paraffinic fuels have lower density, which may cause a noticeable reduction in machine performance. Paraffinic fuels that don't comply with EN15490 can cause irreversible fuel system damage.

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.

Use only clean fuel that meets ISO4406 with a minimum cleanliness level of 18/16/13.

Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than 5% 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.

Paraffinic fuels such as HVO (Hydrotreated Vegetable Oil) and GTL (Gas to Liquid) that comply with EN15490 are approved for this engine. Paraffinic fuels have lower

density, which may cause a noticeable reduction in machine performance. Paraffinic fuels that don't comply with EN15490 can cause irreversible fuel system damage.

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 200)

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 HAZARD

Failure to follow instructions can cause serious injury or death.

Stop the engine and allow it to cool before adding fuel. NO SMOKING!

W-0003

⚠ WARNING

FIRE AND EXPLOSION HAZARD

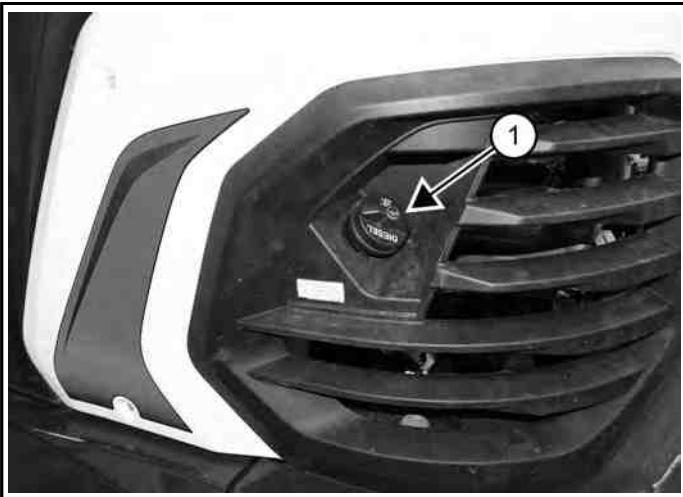
Failure to use care around combustibles can cause serious injury or death.

Always clean up spilled flammable fluids or oil. Keep heat, flames, sparks or lighted tobacco away from flammable fluids and oil. ◀

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 428



2. Remove the fuel fill cap (Item 1) [Figure 428].
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 186)

Using The Fuel Fill Pump

⚠ WARNING

FIRE AND EXPLOSION HAZARD

Failure to follow instructions can cause serious injury or death.
Stop the engine and allow it to cool before adding fuel. NO SMOKING! ◀

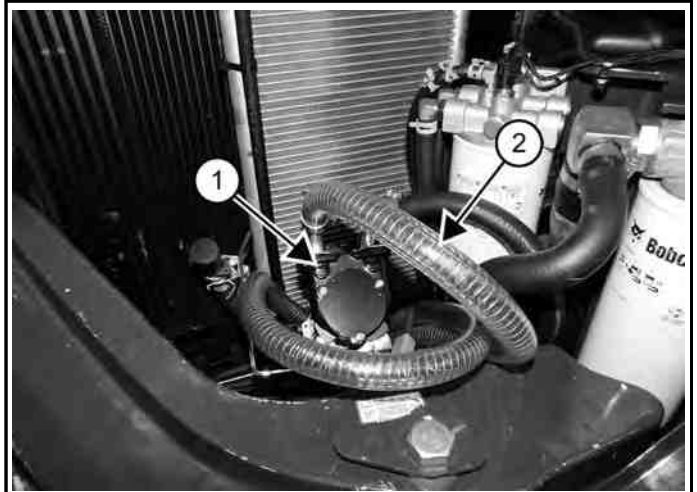
⚠ WARNING

FIRE AND EXPLOSION HAZARD

Failure to use care around combustibles can cause serious injury or death.

Always clean up spilled flammable fluids or oil. Keep heat, flames, sparks or lighted tobacco away from flammable fluids and oil. ◀

Figure 429



Your machine may be equipped with a battery-operated fuel fill pump (Item 1) [Figure 429] located under the right side cover.

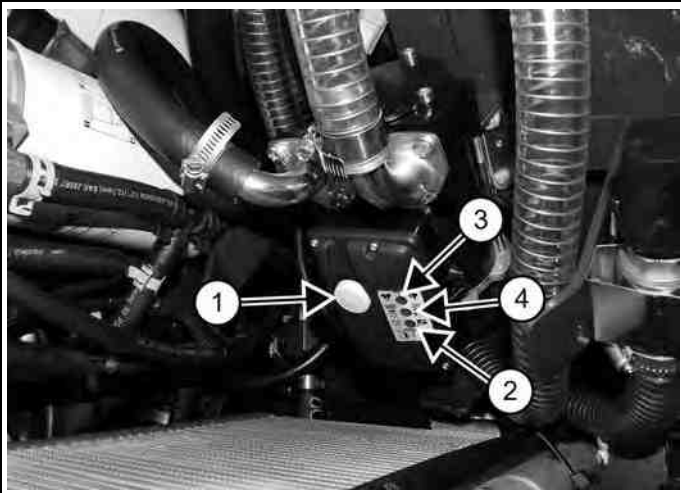
Figure 430



1. Loosen the fuel fill cap (Item 1) [Figure 430] using the start key.
2. Open the right side cover. (See Right Side Cover on Page 194)
3. Pull out the suction hose (Item 2) [Figure 429].
4. Ensure the suction hose (Item 2) [Figure 429] 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.
 6. Turn the start switch to on, but do not start the engine.

Figure 431



7. Briefly push the button (Item 1) [Figure 431] on the fuel pump to wake the system from stand-by mode.
The green light (Item 2) [Figure 431] will turn on.
8. Push the button (Item 1) [Figure 431] on the fuel pump to start fuel transfer.
The red light (Item 3) [Figure 431] will turn on.
9. The yellow light (Item 4) [Figure 431] will turn on when the fuel tank is full and fuel transfer will stop automatically.
OR
Push the button (Item 1) [Figure 431] for several seconds to stop fuel transfer at any time.
10. When fuel transfer is done, place the suction hose back into its holder.
11. Close the right side cover.
12. Tighten the fuel fill cap (Item 1) [Figure 430].

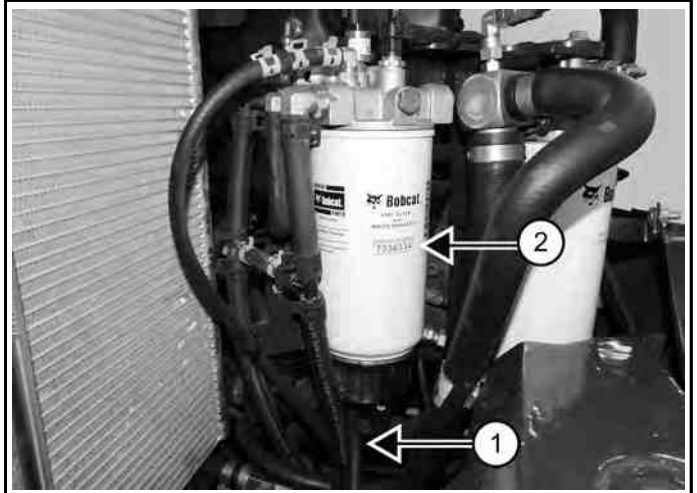
Removing Water From The Fuel Filter

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 194)
4. Open the right side cover.
(See Right Side Cover on Page 194)

Figure 432



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 432].
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

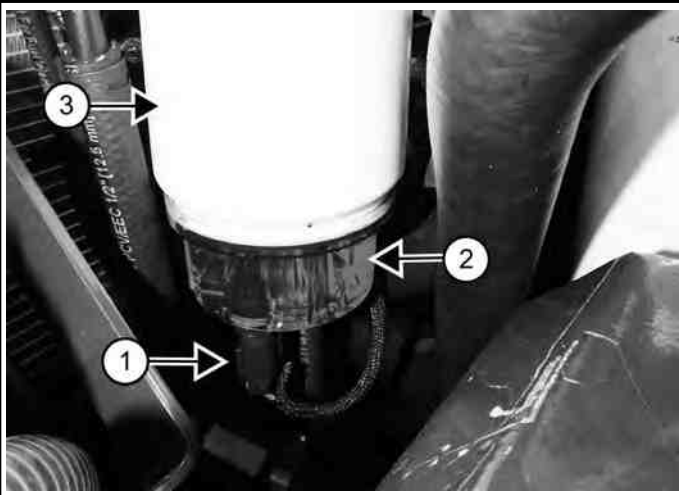
Failure to use care around combustibles can cause serious injury or death. Always clean up spilled flammable fluids or oil. Keep heat, flames, sparks or lighted tobacco away from flammable fluids and oil.

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 194)
3. Open the right side cover.
(See Right Side Cover on Page 194)

Figure 433



4. Disconnect the electric connector (Item 1) [Figure 433] from the bottom of the fuel filter.
 5. Unscrew and remove the water separator (Item 2) [Figure 433].
 6. Remove the fuel filter (Item 3) [Figure 433].
 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 433].
 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. ◀

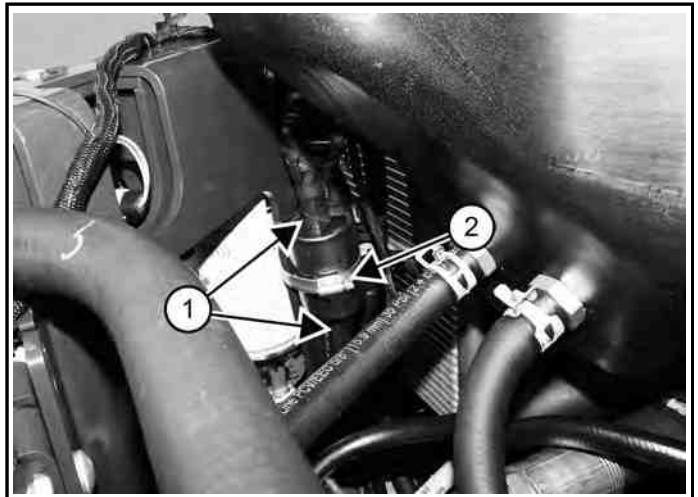
W-2072

Replacing The Fuel Pre-Filter

See the Service Schedule for the correct service interval. (See Service Schedule on Page 186)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 194)
3. Open the right side cover. (See Right Side Cover on Page 194)

Figure 434



4. Pinch off the upper and lower hoses (Item 1) [Figure 434] to prevent spilled fuel while the hoses are disconnected from the pre-filter.
5. Reposition the upper and lower hose clamps (Item 1) [Figure 434] and remove the hoses from the pre-filter.
6. Loosen the clamp (Item 2) [Figure 434].
7. Remove the pre-filter and discard.
8. Install the new pre-filter into the clamp (Item 2) [Figure 434] and tighten the clamp.
9. Install the upper and lower hoses.
10. Move the hose clamps (Item 1) [Figure 434] 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 flammable fluids or oil. Keep heat, flames, sparks or lighted tobacco away from flammable fluids 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

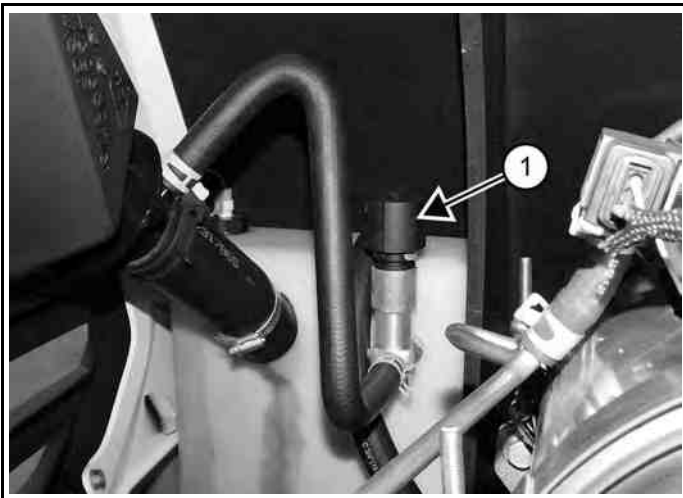
13. Turn the switch to off and check for leaks at the filter.
14. Close the right side cover.
15. Close the tailgate.

Replacing The Fuel Tank Vent Filter

See the Service Schedule for the correct service interval.
(See Service Schedule on Page 186)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 194)

Figure 435



C211705a

3. Locate the fuel tank vent filter (Item 1) [Figure 435], which is near the fuel fill.
4. Remove the fuel tank vent filter (Item 1) [Figure 435].
5. Install the new fuel tank vent filter and tighten.
6. Close the tailgate.

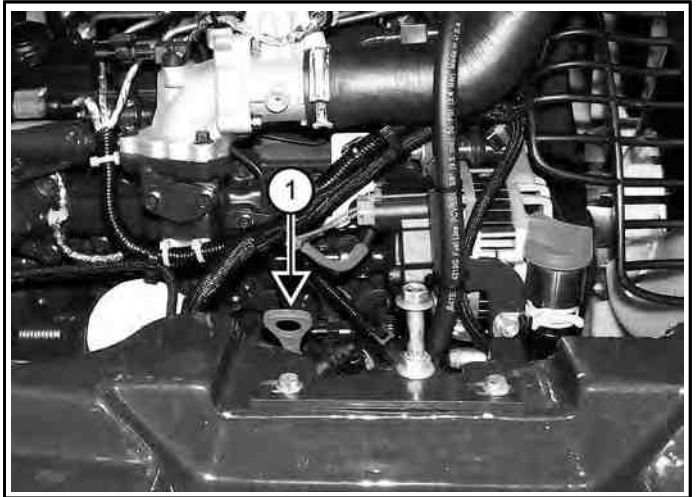
ENGINE LUBRICATION SYSTEM

Checking And Adding Engine Oil

See the Service Schedule for the correct service interval.
(See Service Schedule on Page 186)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 194)

Figure 436



C211706a

3. Remove the dipstick (Item 1) [Figure 436].
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	
[2] SAE 15W-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. ◀

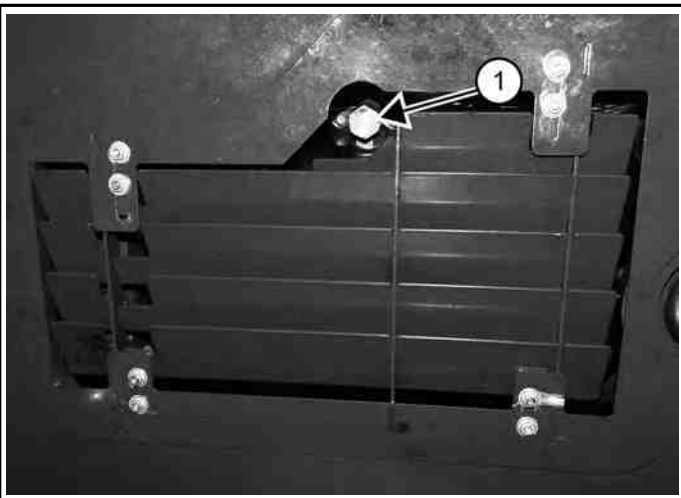
J-2384

Replacing Engine Oil And Filter

See the Service Schedule for the correct service interval.
(See Service Schedule on Page 186)

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 194)
5. Place a container under the oil pan.

Figure 437



C211707a

6. Remove the drain plug (Item 1) [Figure 437] from the engine oil pan and drain the oil.
7. Recycle or dispose of used oil in an environmentally safe manner.

⚠ WARNING

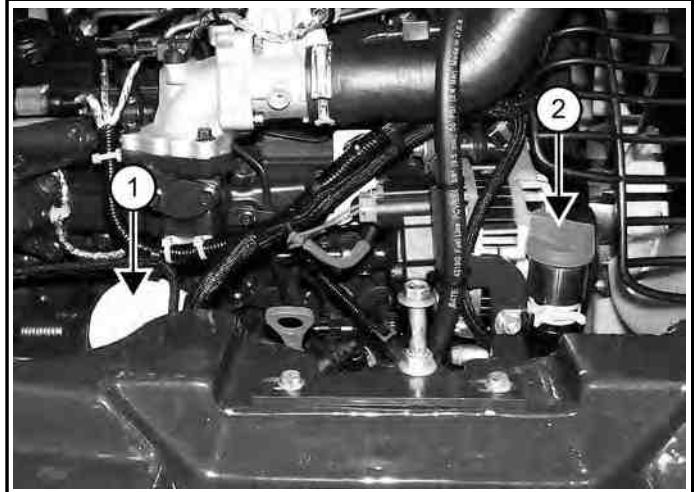
FIRE AND EXPLOSION HAZARD

Failure to use care around combustibles can cause serious injury or death.

Always clean up spilled flammable fluids or oil. Keep heat, flames, sparks or lighted tobacco away from flammable fluids and oil. ◀

W2103

Figure 438



C211706b

8. Remove the oil filter (Item 1) [Figure 438] 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 437].
12. Remove the fill cap (Item 2) [Figure 438].
13. Put oil in the engine.
Do not overfill.
14. Install the fill cap (Item 2) [Figure 438].
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

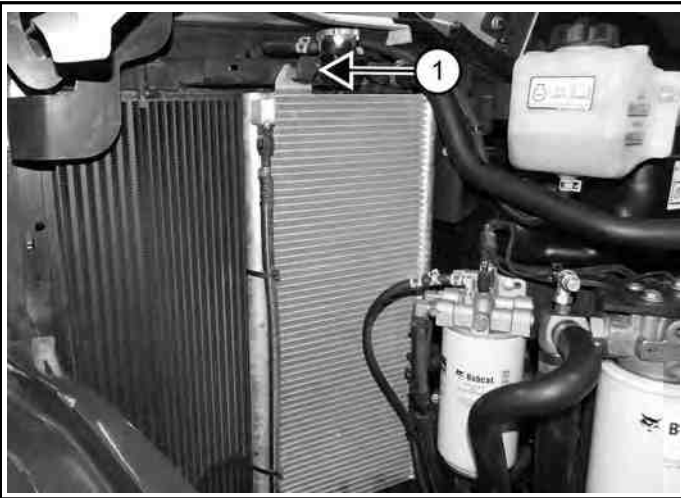
Cleaning The Engine Cooling System

Allow the cooling system and engine to cool before servicing or cleaning the cooling system.

Check the cooling system every day to prevent overheating, loss of performance, or engine damage. (See Service Schedule on Page 186)

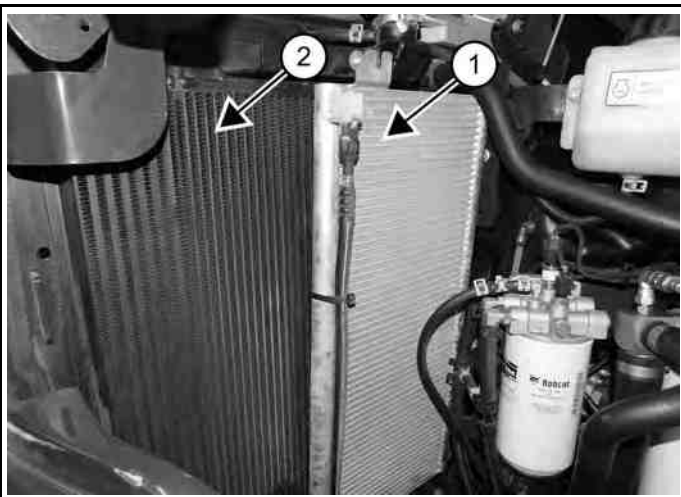
1. Stop the engine.
2. Open the right side cover.
(See Right Side Cover on Page 194)

Figure 439



3. Remove the knob (Item 1) [Figure 439] on the condenser (if equipped).

Figure 440



4. Separate the condenser (Item 1) (if equipped) from the radiator (Item 2) [Figure 440].

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 440].

Be careful not to damage fins when cleaning

6. Reposition the condenser (Item 1) [Figure 440] to the radiator.
7. Install and tighten the knob (Item 1) [Figure 439].

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.

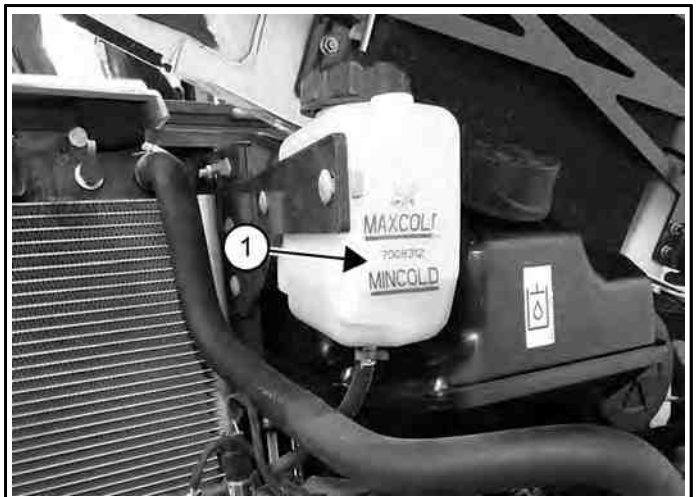
Wear safety glasses to prevent eye injury when any of the following conditions exist:

- 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 194)

Figure 441



3. Check the coolant level in the coolant recovery tank (Item 1) [Figure 441].

It should be between the MAX and MIN marks.

4. Before adding coolant, identify coolant type in machine.
5. Add premixed coolant as needed.
(See Coolant Concentration on Page 207)
(See Capacities Specifications on Page 276)

⚠ 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. ◀

Coolant Types

Your machine was factory filled with one of these two coolants. Before refilling or replacing coolant, identify the coolant by colour:

- Propylene Glycol (PG) is purple.
- Ethylene Glycol (EG) is red.

If coolant cannot be identified by colour, drain coolant completely and refill tank with Bobcat EG Coolant PreMix.

When adding coolant to the tank, add the same type of coolant. Do not mix different types of coolants.

To switch between different types of coolants, first completely drain existing coolant.

Coolant Concentration

Bobcat Company recommends using pre-mixed coolant. If you choose to mix it yourself, use the following concentrations.

Propylene Glycol (PG) Concentration

The correct mixing ratio of propylene glycol (PG) is 47% distilled water or deionized water and 53% PG. This will provide -37°C (-34°F) freeze protection. Mix 3,8 L (1 U.S. gal) PG concentrate with 3,3 L (3.5 qt) distilled water to obtain this ratio.

Ethylene Glycol (EG) Concentration

The correct mixing ratio of ethylene glycol (EG) is 50% distilled water or deionized water and 50% EG. This will provide -37°C (-34°F) freeze protection. Mix 3,8 L (1 U.S. gal) EG concentrate with 3,8 L (1 U.S. gal) distilled water to obtain this concentration.

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 186)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 194)
3. Open the right side cover.
(See Right Side Cover on Page 194)
4. Remove the right side panel.
(See Right Side Panel on Page 195)

⚠ WARNING

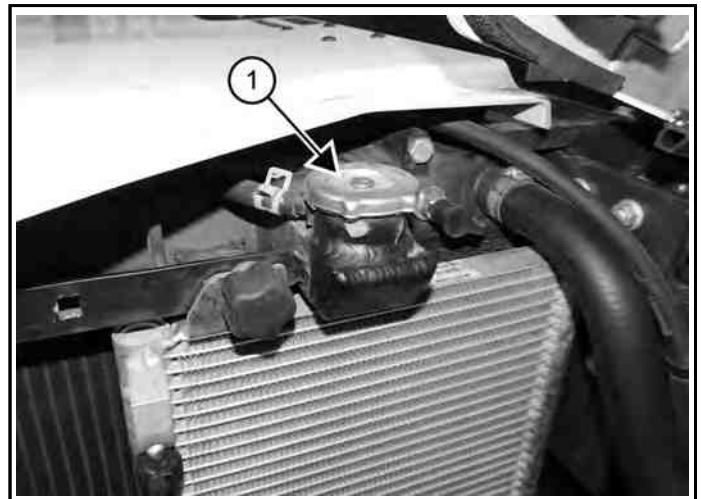
BURN HAZARD

Failure to follow instructions can cause serious burns.

Stop the engine and allow it to cool before removing the radiator cap or adding coolant. ◀

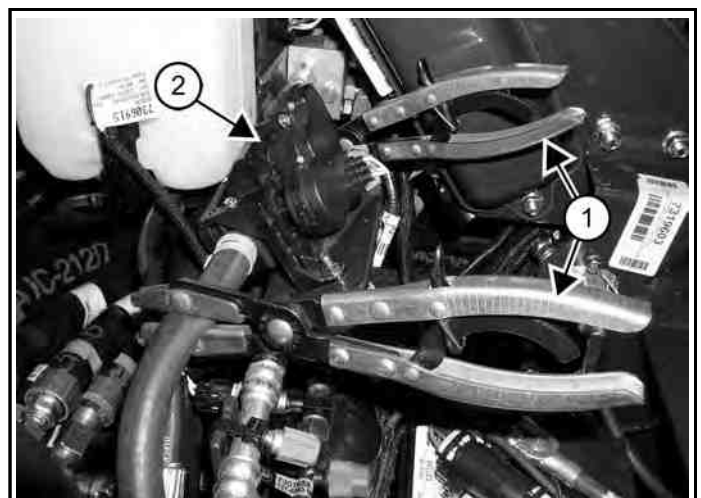
5. Identify the type of engine coolant in the machine.

Figure 442



6. When the engine is cool, loosen and remove the radiator cap (Item 1) [Figure 442].

Figure 443



7. Put locking hose pinching pliers (Item 1) on both sides of the heater valve (Item 2) [Figure 443].
8. Disconnect the hose clamps from the heater valve (Item 2) [Figure 443].
9. Route the hoses out of the upperstructure.
10. Remove the two locking hose pinching pliers (Item 1) [Figure 443] and drain the coolant into a container.
11. Install the two heater hoses onto the heater valve (Item 2) [Figure 443].
12. Install the two hose clamps on the heater hoses.
13. Recycle or dispose of used coolant in an environmentally safe manner.
14. Add premixed coolant to the radiator until the coolant level reaches the top of the radiator.
(See Coolant Concentration on Page 207)
20. Add coolant to the recovery tank (Item 1) [Figure 444] as needed.
21. Reinstall the right side panel.
22. Close the right side cover and tailgate.

IMPORTANT

MACHINE DAMAGE HAZARD

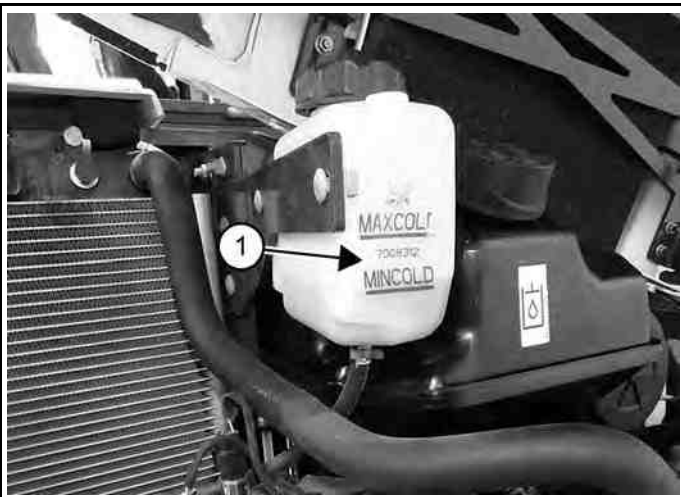
The incorrect ratio of water to coolant will reduce cooling system efficiency and may lead to premature engine failure.

- Always use the correct ratio of water to coolant.
- Always add a premixed solution. ◀

I-2124

15. Install the radiator cap (Item 1) [Figure 442].

Figure 444



16. Add premixed coolant to the recovery tank (Item 1) [Figure 444] until it is between the MAX and MIN marks. (See Coolant Concentration on Page 207)
17. Use a refractometer to check the condition of coolant in your cooling system.
18. Run the engine until it is at operating temperature.
19. Stop the engine.

ELECTRICAL SYSTEM

Electrical System Description

The machine has a 12 volt, 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 445

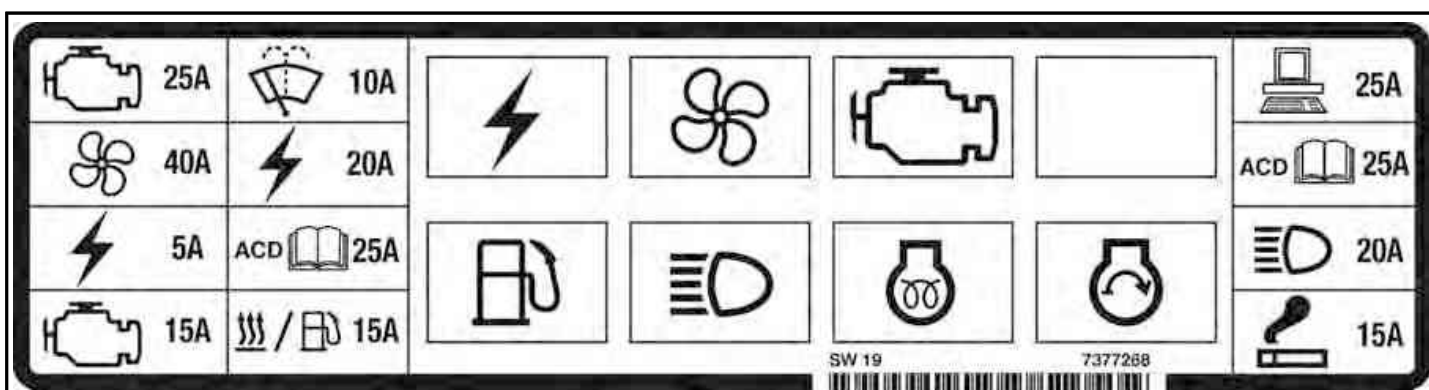


C132034a

The decal inside the fuse cover (Item 1) [Figure 446] shows the location and amp ratings of the fuses.

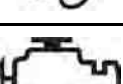
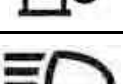
Remove the cover to check or replace the fuses and relays.

Figure 446



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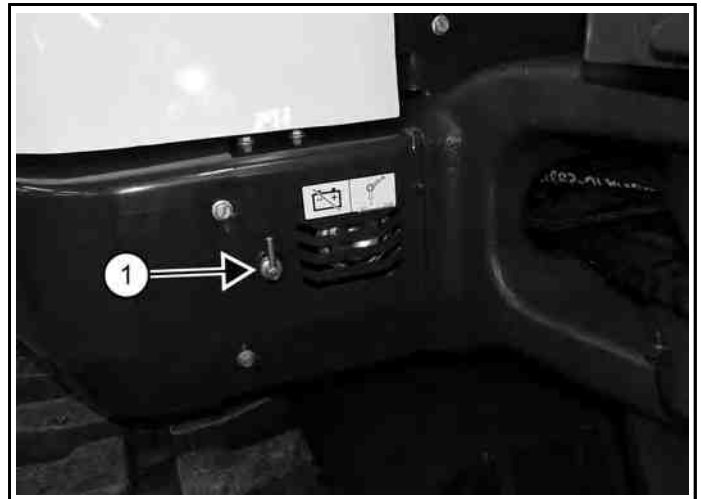
The location and sizes are shown in the table below and on the decal [Figure 446]. Always replace fuses using the same type and capacity. Relays are identified by the letter "R" in the Amp column.

ICON	DESCRIPTION	AMP
	Engine ECU	25
	Heat	40
	Ignition	5
	ECU Sensor	15
	Wiper / Washer	10
	Switched Power	20
	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
	Attachment Control Device (ACD)	25
	Lights	20
	ACC	15

Battery Disconnect Switch

Figure 447



Turn the battery disconnect switch to the off position before disconnecting or connecting the battery cables.

If equipped, the battery disconnect switch (Item 1) [Figure 447] is located on the right front of the excavator.

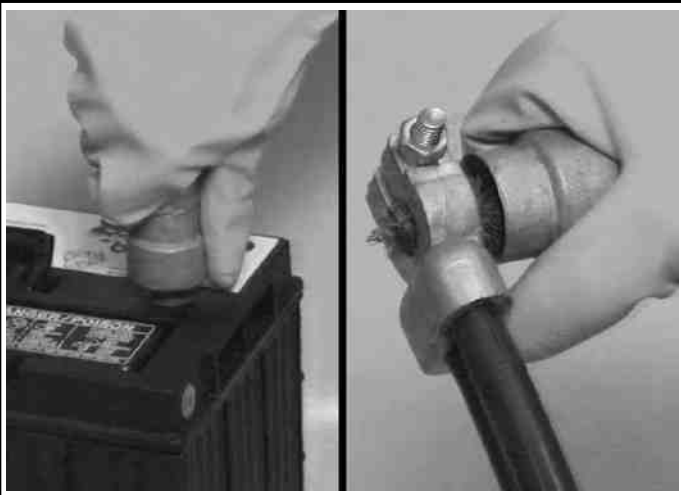
- Rotate the switch (Item 1) [Figure 447] anticlockwise to turn the switch to the off position.
- Rotate the switch (Item 1) [Figure 447] clockwise to turn to the on position (shown here in the on position).

Battery Maintenance

See the Service Schedule for the correct service interval. (See Service Schedule on Page 186)

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 448



Steps for reliability and long battery life:

- Keep battery posts and terminals clean [Figure 448].
- 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 212)
- Check the battery state of charge every 30 days on machines that are not frequently used. (See Testing The Battery on Page 211)

⚠ 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. ◀

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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

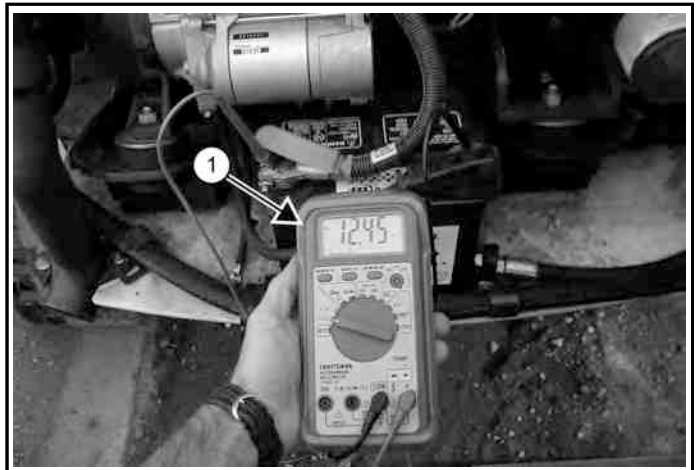
Use a good quality battery maintainer to keep the battery above 12.4 volts for machines that are not frequently used. Batteries below 12.4 volts must first be charged using a battery charger. Solar maintainers should have a minimum capacity of 10 watts to be effective.

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 449



P30836a

The simplest and most common check to determine battery state of charge is to use a digital multimeter or voltmeter (Item 1) [Figure 449].

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 hour	1.3 hours	2.5 hours
12.2 V	50%	1.9 hours	2.7 hours	5.1 hours
12.0 V	25%	2.9 hours	4.3 hours	7.8 hours
11.8 V	0%	4.0 hours	5.7 hours	10.7 hours

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. ◀

Using A Booster Battery (Jump Starting)

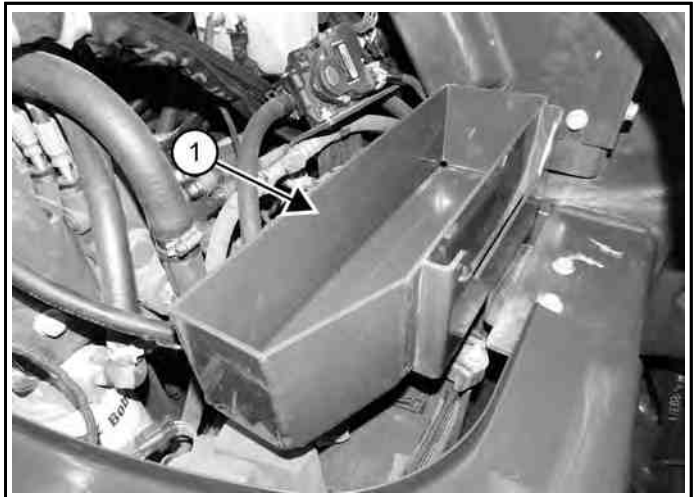
The following item is needed to complete this task:

- 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.

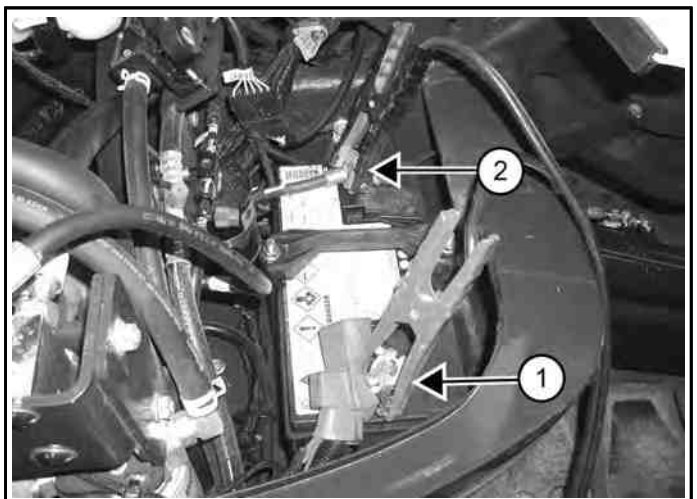
1. Be sure the key switch is OFF.
2. Open the tailgate. (See Tailgate on Page 194)
3. Open the right side cover. (See Right Side Cover on Page 194)

Figure 450



4. Remove the tool box (if equipped) (Item 1) [Figure 450] by pulling it upwards.

Figure 451



5. Connect the cable to the positive (+) terminal (Item 1) [Figure 451] of the excavator starter.
6. Connect the other cable to a good engine ground (Item 2) [Figure 451].
7. Start the engine.

8. After the engine has started, remove the negative (-) cable first (Item 2) [Figure 451].
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.

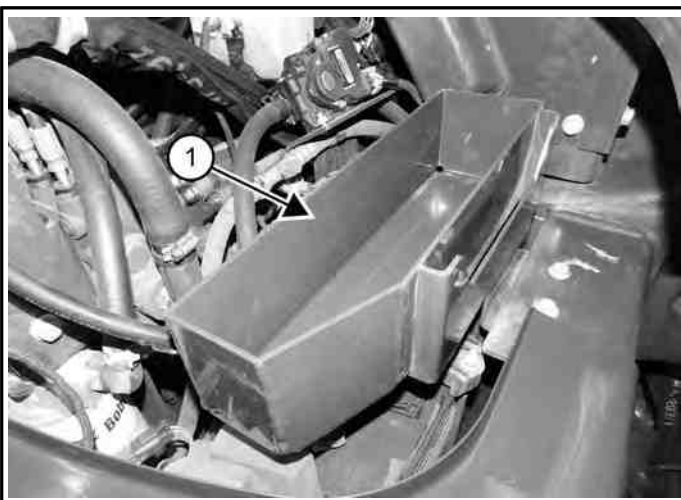
- Batteries contain acid that burns eyes and skin on contact. Wear safety goggles, protective clothing, and rubber gloves to keep acid off body.
- In case of acid contact, wash immediately with water. In case of eye contact, get prompt medical attention and wash eye with clean, cool water for at least 5 minutes.
- If electrolyte is ingested, drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention. ◀

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Removing And Installing The Battery

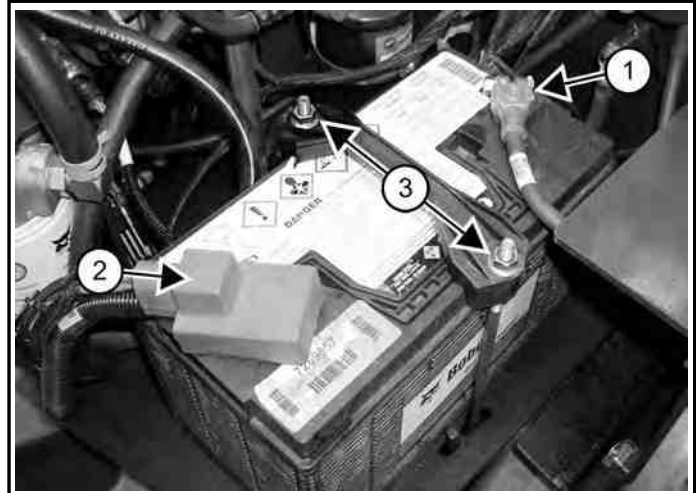
1. Open the tailgate. (See Tailgate on Page 194)
2. Open the right side cover. (See Right Side Cover on Page 194)

Figure 452



3. Remove the tool box (if equipped) (Item 1) [Figure 452] by pulling it upwards.

Figure 453



4. Disconnect the negative (-) cable (Item 1) [Figure 453].
 5. Disconnect the positive (+) cable (Item 2) [Figure 453].
 6. Remove the bolts (Item 3) [Figure 453] 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 453].
 11. Connect the negative (-) cable (Item 1) [Figure 453] 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. ◀

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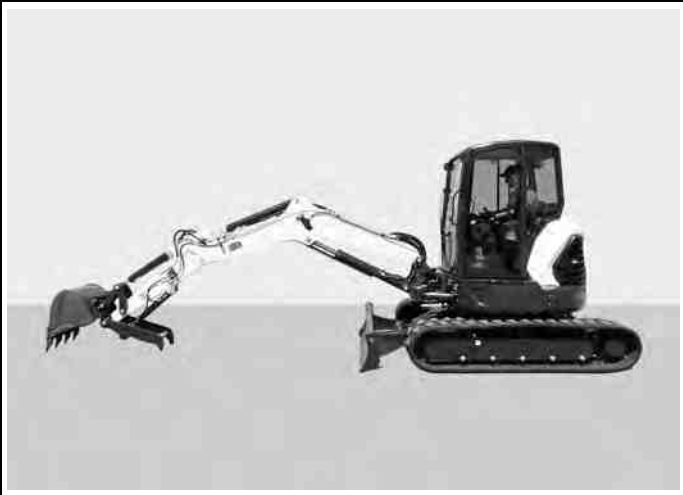
HYDRAULIC SYSTEM

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 186)

1. Park the machine on a flat surface.

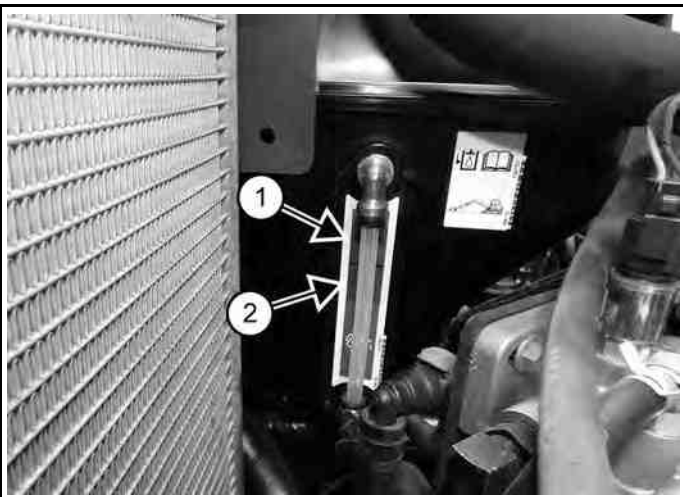
Figure 454



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 454].
3. Open the tailgate. (See Tailgate on Page 194)
4. Open the right side cover. (See Right Side Cover on Page 194)

Figure 455



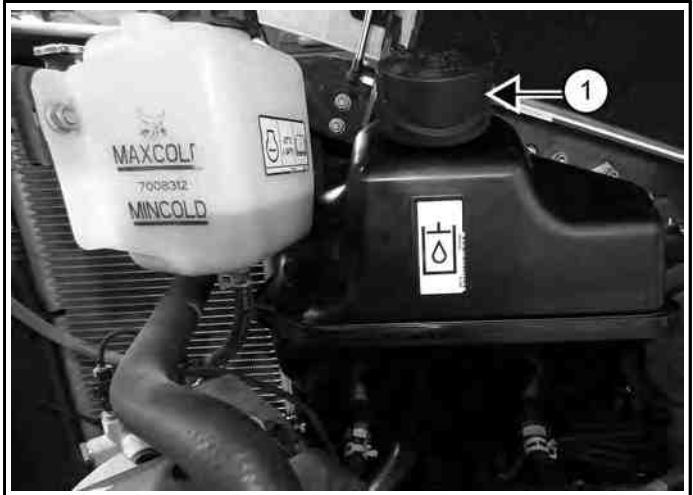
C228053a

5. Check the hydraulic fluid level. It must be visible in the sight gauge.

The decal on the hydraulic tank shows the correct fill level.

- Item 1 [Figure 455] is the correct fluid level when the machine is HOT (optional).
- Item 2 [Figure 455] is the correct fluid level when the machine is COLD (preferred).

Figure 456



C228054a

6. Clean the surface around the fill cap and remove the cap from the tank (Item 1) [Figure 456].

Figure 457



C209301a

7. Check the condition of the fill strainer screen (Item 1) [Figure 457].

⚠ WARNING

FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death. Always clean up spilled flammable fluids or oil. Keep heat, flames, sparks or lighted tobacco away from flammable fluids and oil. ◀

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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 276)

Be sure the screen is installed before adding fluid.

9. Check the fill cap (Item 1) [Figure 456].

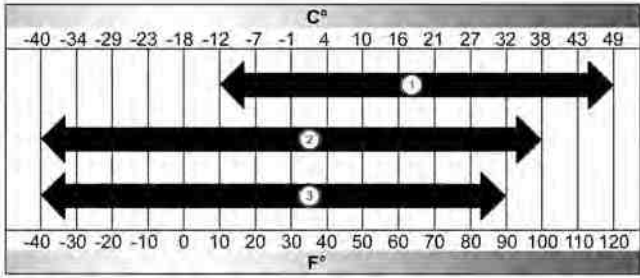
Clean or replace as necessary.

10. Install the fill cap (Item 1) [Figure 456].

11. Close the right side cover.

12. Close the tailgate.

Hydraulic Fluid Chart

HYDRAULIC FLUID	
Recommended Hydraulic Fluids	
	
Refer to the temperature range anticipated before next fluid change.	
[1] Bobcat Max Performance – Warm Climate or ISO VG 68 HVLP fluid with minimum VI 160	
[2] (Europe, Middle East, Africa Only) Bobcat Superior SH Hydraulic / Hydrostatic	
[3] Bobcat Max Performance – Cool Climate or ISO VG 46 HVLP fluid with minimum VI 155	

⚠ IMPORTANT

MACHINE DAMAGE HAZARD

Failure to follow directions can result in machine damage.

Starting the engine when the temperature of the hydraulic fluid is less than -29°C (-20°F) will result in significant damage to the hydraulic system and components.

Park the machine in a heated location or provide some means of warming the hydraulic fluid prior to starting the engine if the ambient temperature at startup is expected to be -29°C (-20°F) or below.

1-2403

Replacing The Hydraulic Filter

⚠ WARNING

FIRE AND EXPLOSION HAZARD

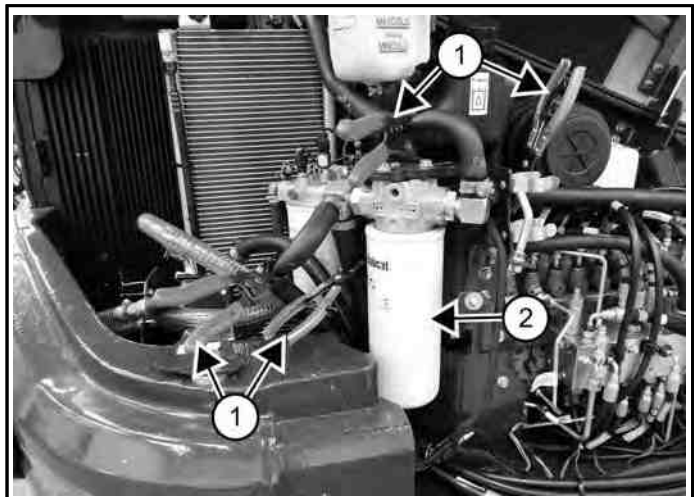
Failure to use care around combustibles can cause serious injury or death. Always clean up spilled flammable fluids or oil. Keep heat, flames, sparks or lighted tobacco away from flammable fluids and oil.

W2103

See the Service Schedule for the correct service interval.
(See Service Schedule on Page 186)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 194)
3. Open the right side cover.
(See Right Side Cover on Page 194)
4. Remove the right side panel.
(See Right Side Panel on Page 195)

Figure 458



C209382a

5. Install locking hose pliers (Item 1) [Figure 458] on the hoses running to the filter housing.
6. Remove the hydraulic filter (Item 2) [Figure 458].
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 458].
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

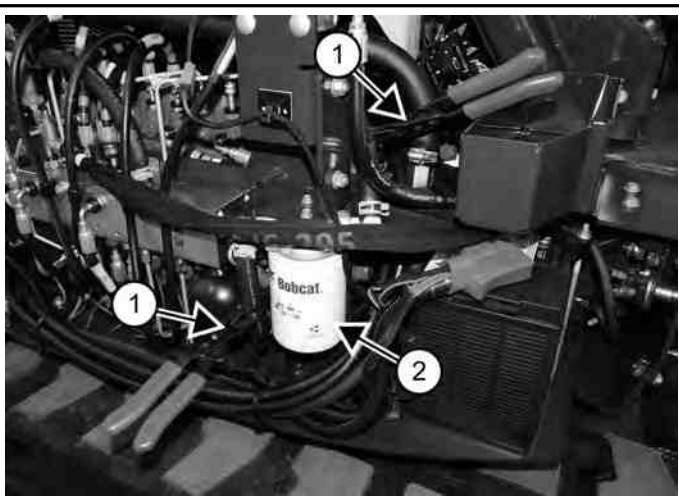
Failure to use care around combustibles can cause serious injury or death. Always clean up spilled flammable fluids or oil. Keep heat, flames, sparks or lighted tobacco away from flammable fluids and oil. ◀

See the Service Schedule for the correct service interval. (See Service Schedule on Page 186)

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 194)
3. Open the right side cover. (See Right Side Cover on Page 194)
4. Remove the right side panel. (See Right Side Panel on Page 195)

Figure 459



5. Install locking hose pliers (Item 1) [Figure 459] on the hoses running to the filter housing.
6. Remove the case drain filter (Item 2) [Figure 459].
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 459].
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

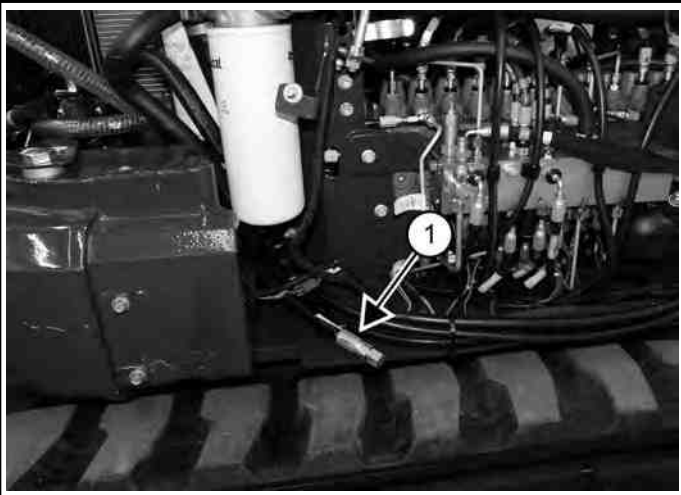
Pressurised diesel fuel or hydraulic fluid can penetrate skin and eyes, causing serious injury or death.

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. ◀

See the Service Schedule for the correct service interval. (See Service Schedule on Page 186)

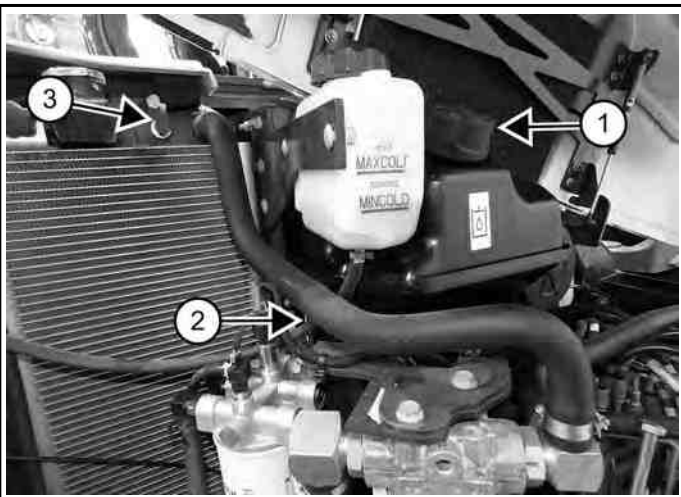
1. Extend the boom, arm, and bucket. Lower the bucket to the ground and lower the blade so the machine is in the position shown [Figure 454].
2. Stop the engine.
3. Open the tailgate. (See Tailgate on Page 194)
4. Open the right side cover. (See Right Side Cover on Page 194)
5. Remove the right side panel. (See Right Side Panel on Page 195)

Figure 460



6. Locate the drain hose (Item 1) [Figure 460], 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.

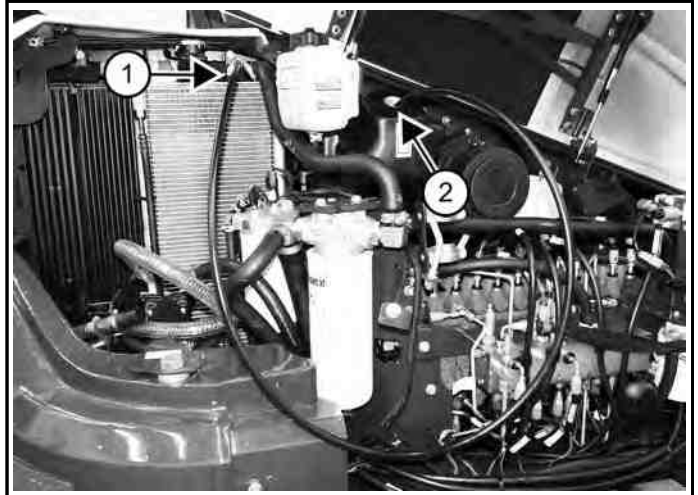
Figure 461



11. Remove the fill cap and add fluid to the hydraulic tank (Item 1) [Figure 461].
(See Capacities Specifications on Page 276)

The level should be between the hot fill and cold fill marks (Item 2) [Figure 461].
12. Locate the male coupler (Item 3) [Figure 461] that is to the left of the hydraulic tank and remove the cap.

Figure 462

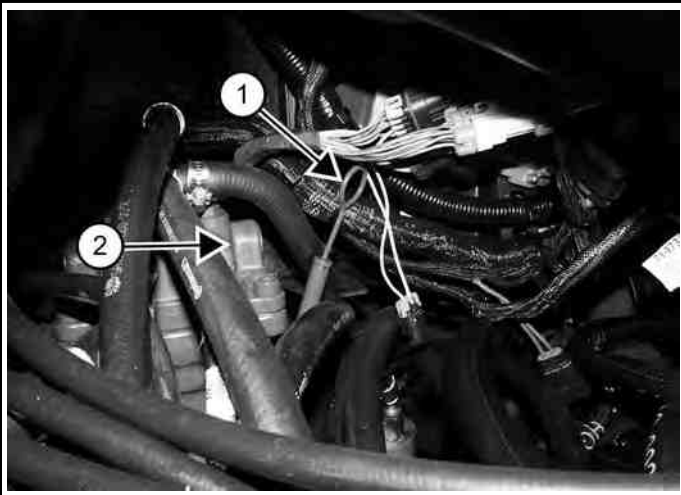


13. Install a female quick coupler and hose on the male quick coupler (Item 1) [Figure 462].
14. Route the hose (Item 1) from the male quick coupler into the hydraulic tank (Item 2) [Figure 462].
15. Start the machine.
16. Remove the female quick coupler (Item 1) [Figure 462] after a steady stream of hydraulic fluid, free of any air bubbles, drains from the hose.
17. Reinstall the fill cap (Item 1) [Figure 461] 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 194)
3. Open the right side cover.
(See Right Side Cover on Page 194)

Figure 463



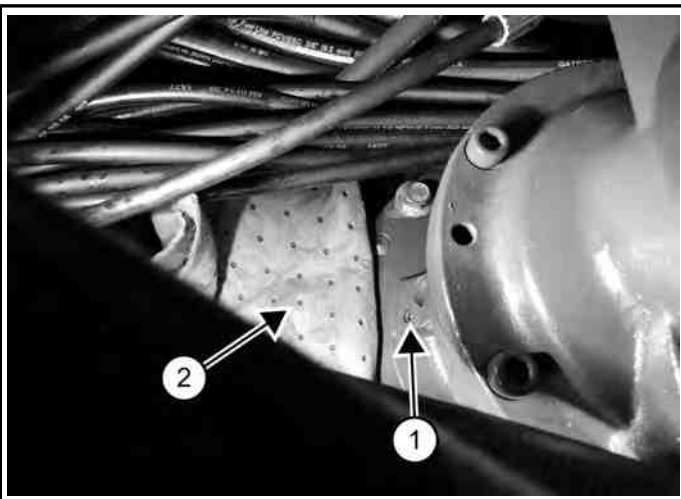
4. Pull out the dipstick (Item 1) of the swing motor gear box (Item 2) to check fluid level [Figure 463].
5. Keep the oil level between the marks on the dipstick.

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 195)

Figure 464



2. The swing motor carrier drain plug (Item 1) [Figure 464] is located on the side of the swing motor carrier.
3. Place a fluid containment mat (Item 2) [Figure 464] in the upperstructure by the drain plug to collect the fluid.

4. Remove the drain plug (Item 1) [Figure 464] and drain the swing motor carrier fluid onto the containment mat.
5. Reinstall the drain plug (Item 1) [Figure 464].
6. Recycle or dispose of the fluid in an environmentally safe manner.
7. Remove the dipstick (Item 1) [Figure 463] and add gear lube (80W-90) until the fluid is at the correct mark on the dipstick.
(See Capacities Specifications on Page 276)
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.

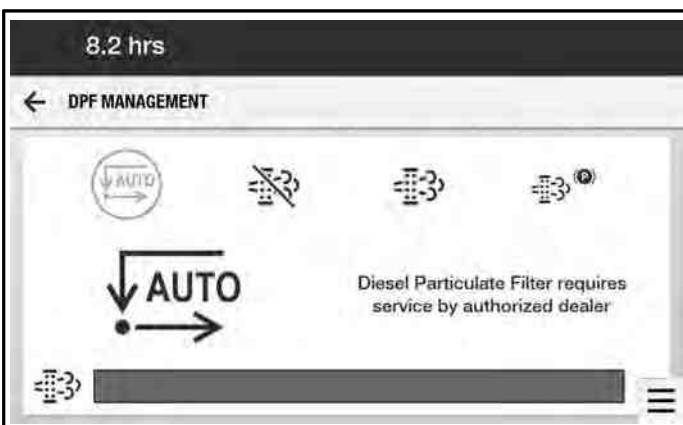
Ash residue will remain after the regeneration process is complete. The ash must be periodically removed from the DPF.

DPF Service Regeneration

Figure 465



Figure 466



The machine will alert the operator when DPF service is required [Figure 465] or [Figure 466].

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.

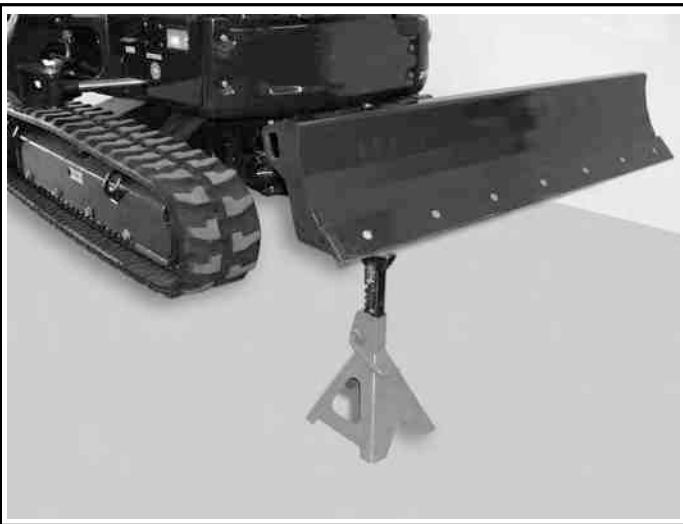
(See Service Schedule on Page 186)

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 467



P128543b

2. Raise the blade fully and install jackstands under the blade [Figure 467].

Figure 468



P91969a

3. Install jackstands under the track frame [Figure 468].
4. Raise the boom until all machine weight is on the jackstands.
5. Stop the engine.

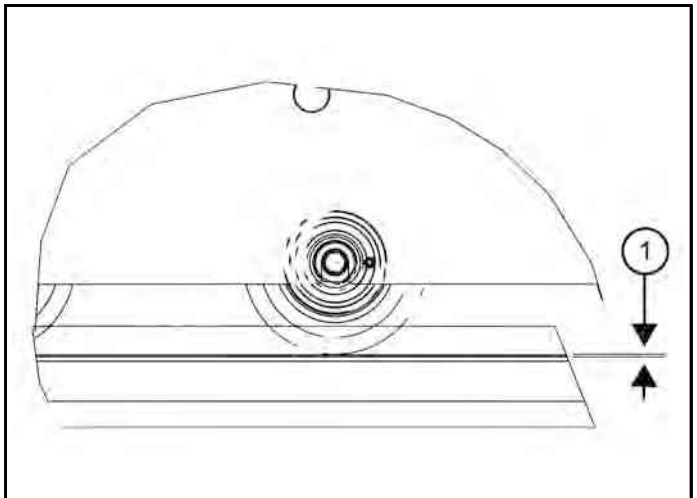
⚠ WARNING

PINCHING HAZARD

Keep finger and hands out of pinch points when checking the track tension. ◀

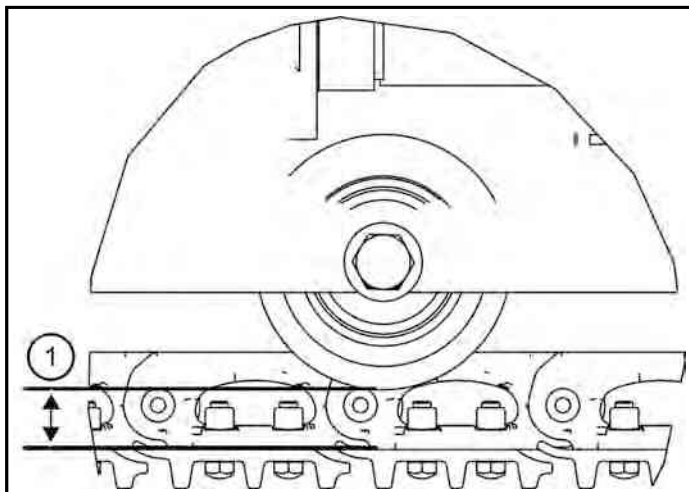
W-2142

Figure 469



NA15893a

Figure 470

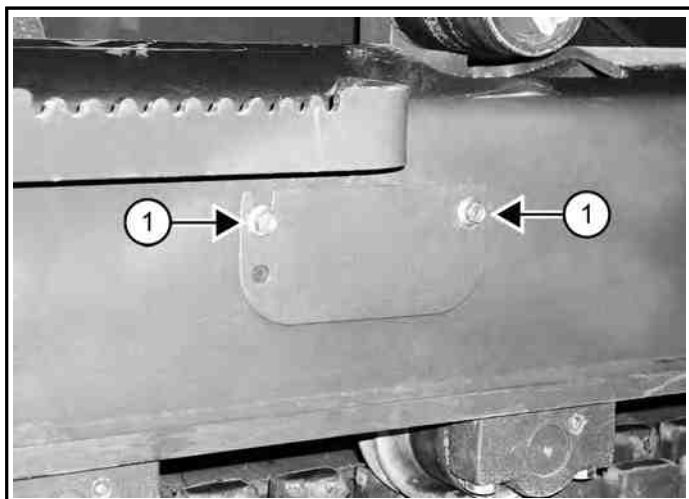


6. Measure the track clearance at the middle track roller.

Use a bolt or dowel of the appropriate size to check the gap.

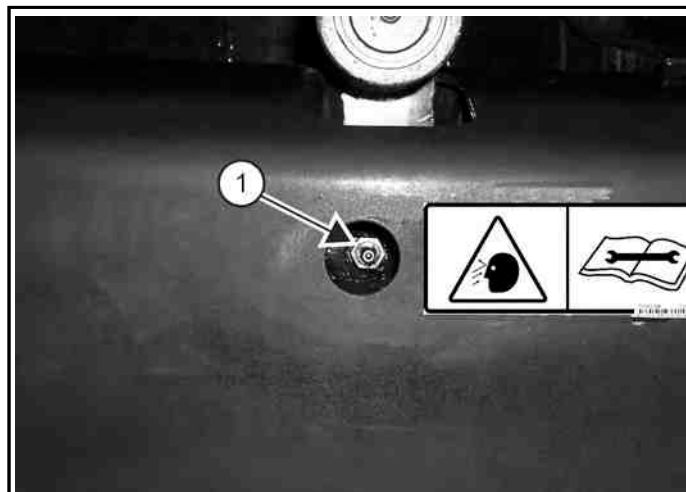
- a. For rubber tracks, measure the gap between the contact surface of the roller and the track. The clearance (Item 1) [Figure 469] should be 25 – 35 mm (1.0 – 1.4 in).
- b. For steel or segmented tracks, measure the gap between the external roller flange and the track grouser. The clearance (Item 1) [Figure 470] should be 86 – 106 mm (3.4 – 4.2 in).

Figure 471



7. Loosen the two bolts (Item 1) [Figure 471] and rotate the cover (if equipped) to access the bleed screw / grease fitting.

Figure 472



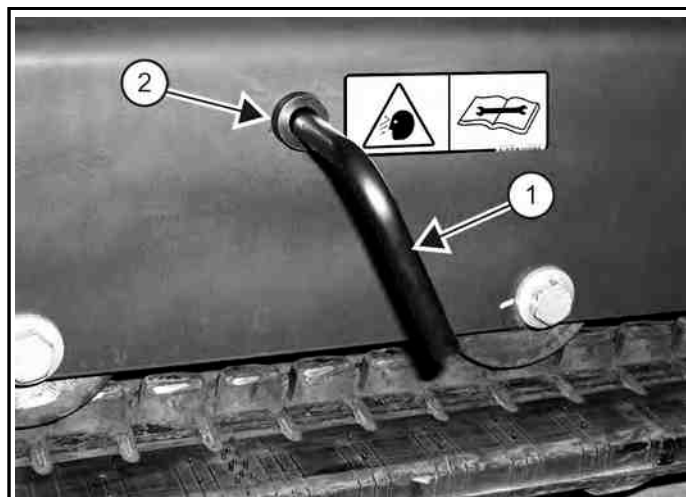
8. To **increase track tension**, add grease to the track tension fitting (Item 1) [Figure 472] until the track tension is correct.

⚠ 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.

Figure 473



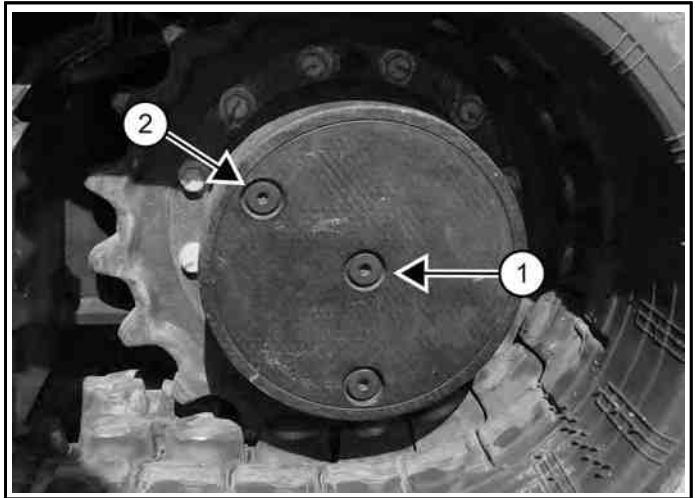
9. To **decrease track tension**, install the bleed tool (Item 1) [Figure 473] on the track tension fitting.
 - a. Turn the tool 90° anticlockwise and let the grease flow into a container.
 - b. Continue to release pressure until the track tension is correct.
 - c. Dispose of the grease in an environmentally 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 474



1. Park the excavator on a level surface with the plugs (Items 1 and 2) [Figure 474] positioned as shown.
2. Remove the plug (Item 1) [Figure 474].

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 474] 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 474].
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 186)

WARNING

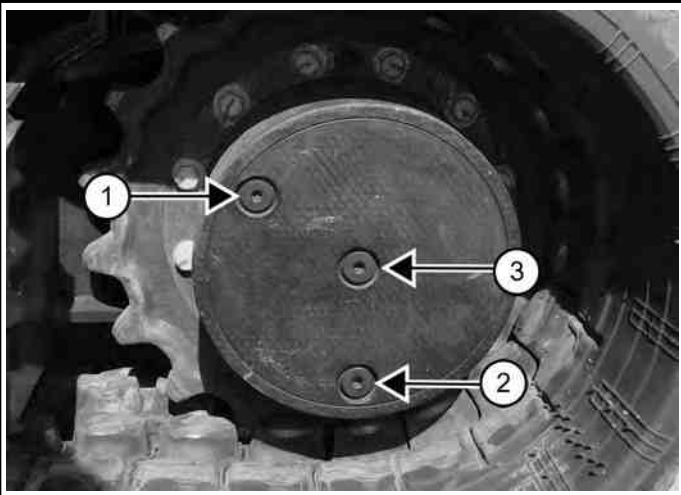
FIRE AND EXPLOSION HAZARD

Failure to use care around combustibles can cause serious injury or death.

Always clean up spilled flammable fluids or oil. Keep heat, flames, sparks or lighted tobacco away from flammable fluids and oil.

W-2103

Figure 475



1. Park the excavator on a level surface with plugs (Items 1, 2, and 3) [Figure 475] positioned as shown.
 2. Remove top and bottom plugs (Items 1 and 2) [Figure 475] and drain the lubricant into a container.
 3. Install the bottom plug (Item 2) [Figure 475].
 4. Remove the middle plug (Item 3) [Figure 475].
 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 475].
(See Capacities Specifications on Page 276)
- Lubricant should be API GL-4 or 5 containing extreme pressure additive (SAE 80W90).
6. Install the plugs (Items 1 and 3) [Figure 475].
 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

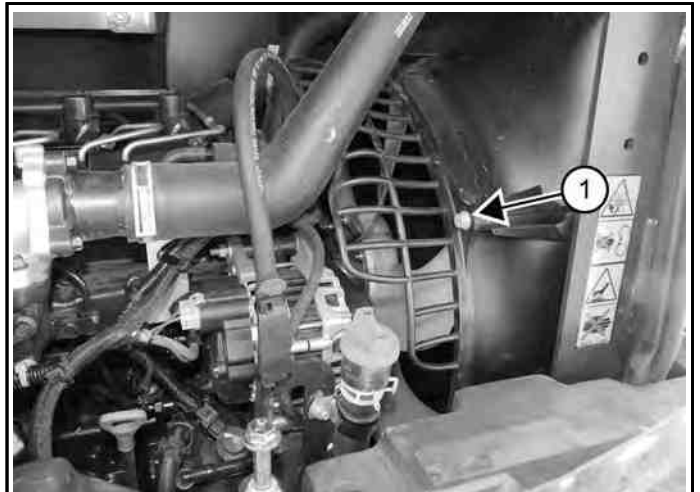
The following item is needed to complete this task:

- Alternator belt installation tool. See your local Bobcat dealer.

If your machine is equipped with air conditioning, see your Bobcat dealer for belt replacement.

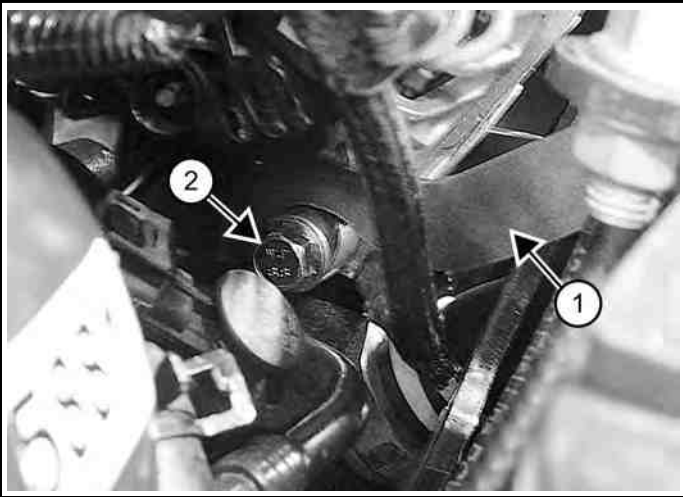
1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 194)

Figure 476



3. Remove the three bolts (Item 1) [Figure 476] on the fan guard and slide the fan guard off.

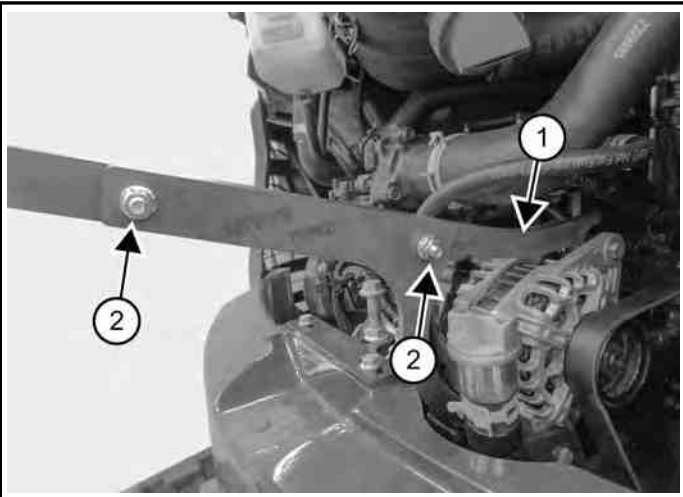
Figure 477



C143842b

4. Position the lower alternator tool (Item 1) around the spacer (Item 2) [Figure 477].

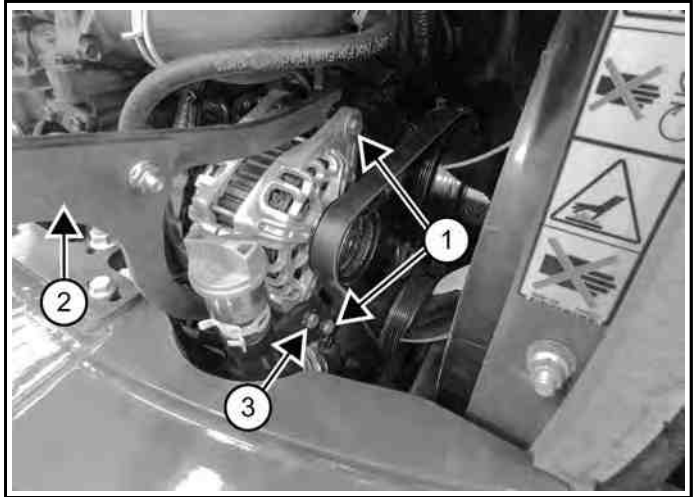
Figure 478



C143843b

5. Position the upper alternator tool (Item 1) and install the bolts and nuts on the tool (Item 2) [Figure 478].

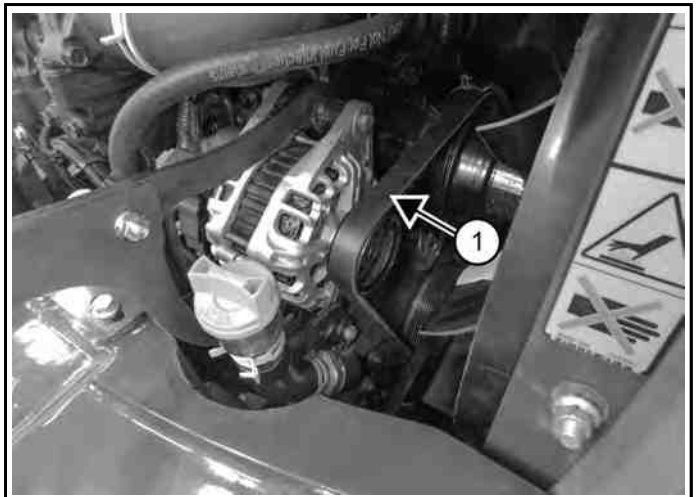
Figure 479



C143844b

6. Loosen the top and bottom bolts (Item 1) [Figure 479].
7. Lift up on the alternator tool (Item 2) and remove the bolt (Item 3) [Figure 479].

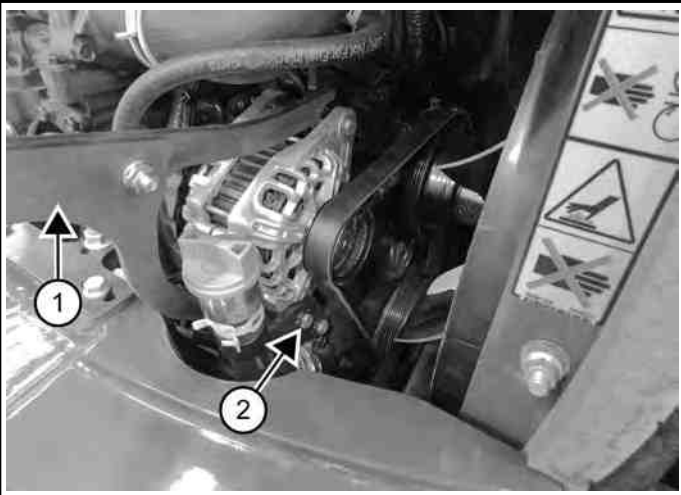
Figure 480



C143845b

8. Cut the old belt (Item 1) [Figure 480] and remove the belt from the pulleys.
9. Inspect the pulleys for wear.
10. Install the new belt.

Figure 481



C143844d

11. Use the alternator tool (Item 1) to align the alternator to the alternator mounting bolt (Item 2) [Figure 481].
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.

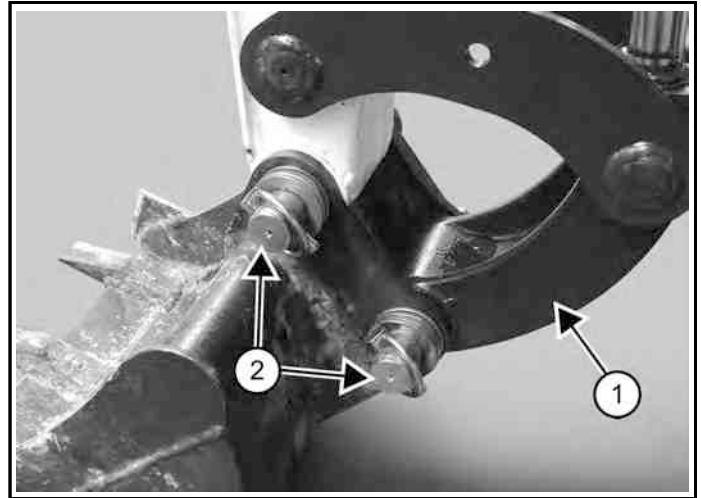
Replacing Air Conditioning Belt

See your Bobcat dealer for air conditioning belt replacement.

QUICK COUPLER

Inspecting And Maintaining The Bucket Link And Coupler

Figure 482

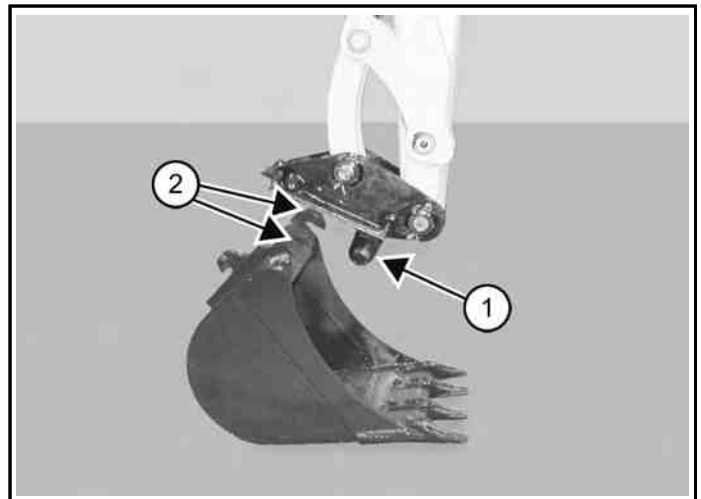


S35382a

- Inspect the bucket link (Item 1) [Figure 482] for wear or damage.
- Inspect the attachment pins (Item 2) [Figure 482] for wear or damage.

Repair or replace damaged parts.

Figure 483



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 483].

Repair or replace damaged parts.

BUCKET TEETH

Replacing Bucket Teeth

⚠ WARNING

IMPACT AND INJECTION HAZARDS

Flying debris and high pressure fluids can cause serious eye injury.

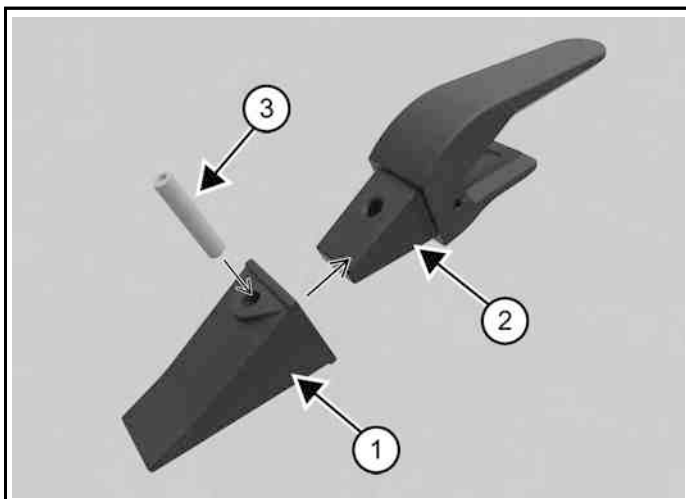
Wear safety glasses to prevent eye injury when any of the following conditions exist:

- 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 484



P131734a

5. To remove any damaged teeth, drive the retaining pin (Item 3) out of the tooth (Item 1) and remove the tooth [Figure 484].
6. Position the new tooth (Item 1) on the shank (Item 2) and install a new retaining pin (Item 3) [Figure 484].
7. Push the retaining pin in until it is flush with the top of the tooth.

MACHINE LUBRICATION

Grease Fitting Locations

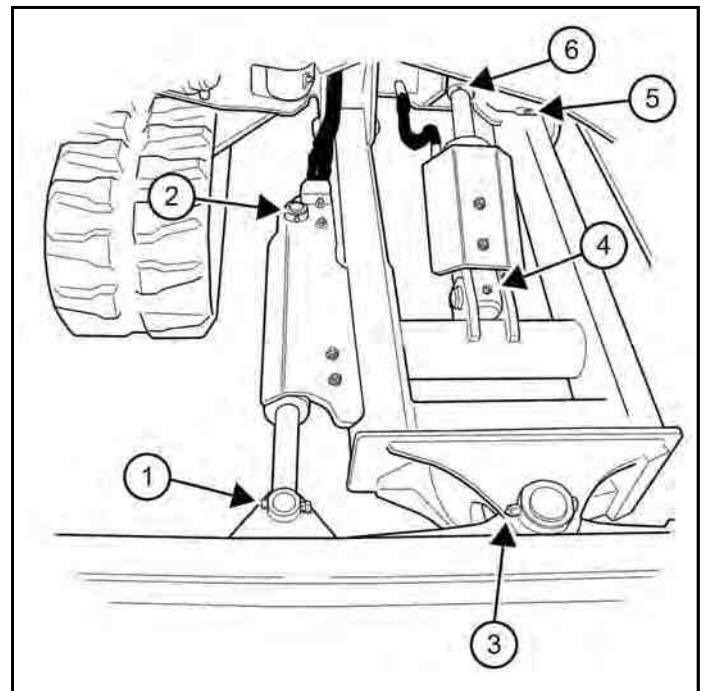
Always use a good quality lithium-based multipurpose grease when lubricating the machine. Apply the lubricant until extra grease shows.

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 186)

Blade Cylinder

Figure 485

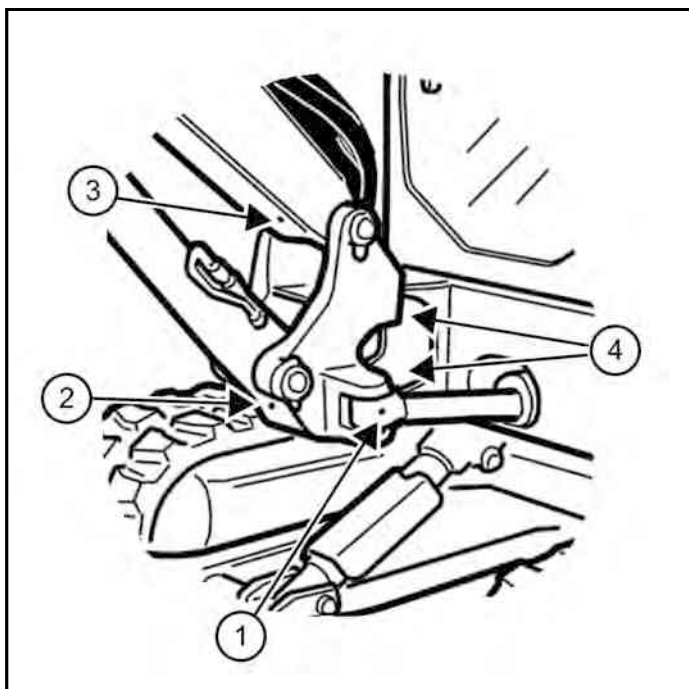


NA20141a

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 486

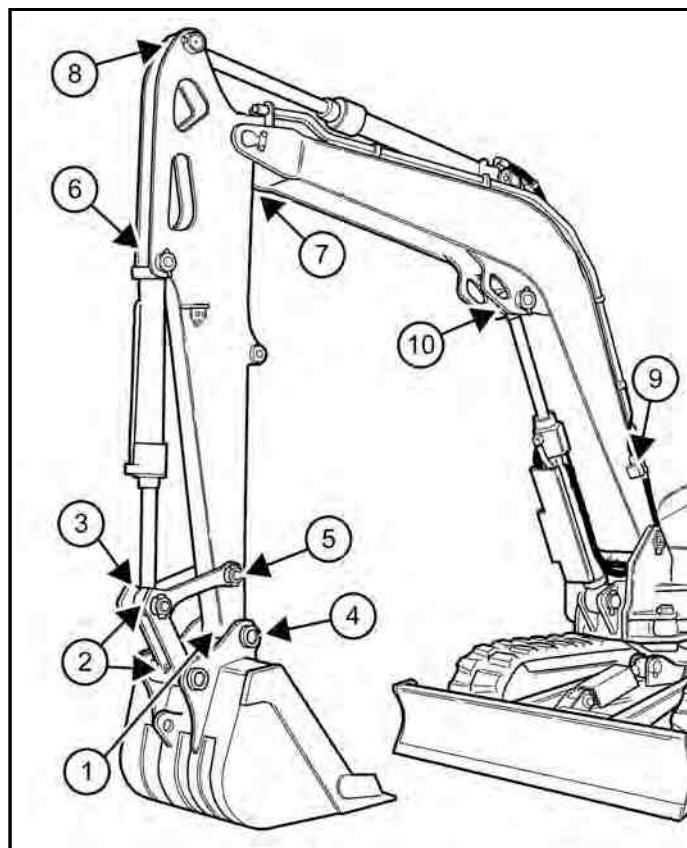


NA18172i

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 487



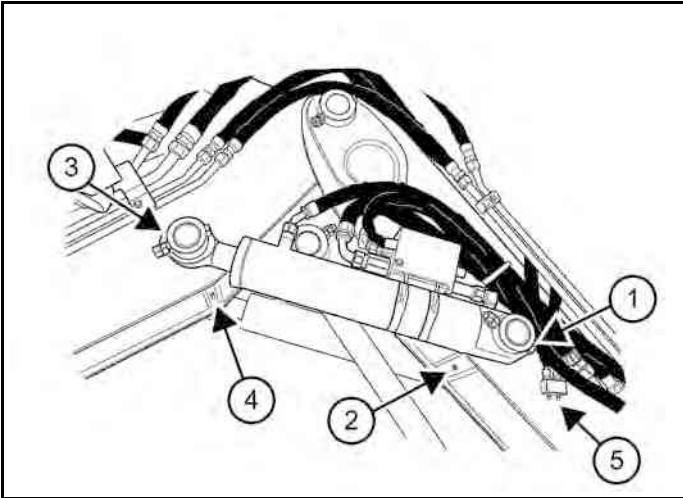
NA20187e

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.

Articulated Boom (If Equipped)

Figure 488

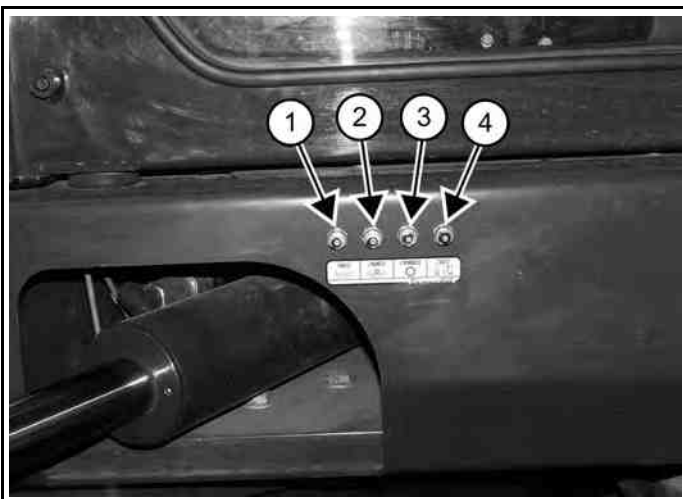


NA24003a

REF.	DESCRIPTION	QTY.
1	Articulated Boom Cylinder Base End	2
2	Articulated Boom Cylinder Base End Pivot	1
3	Articulated Boom Cylinder Rod End	2
4	Articulated Boom Cylinder Rod End Pivot	1
5	Articulated Boom Pivot	1

Remote Lubrication

Figure 489



C208507a

REF.	DESCRIPTION	QTY.	FREQUENCY
1	Swing Circle	1	Every 50 hours
2	Swing Pinion [A]	1	Every 500 hours

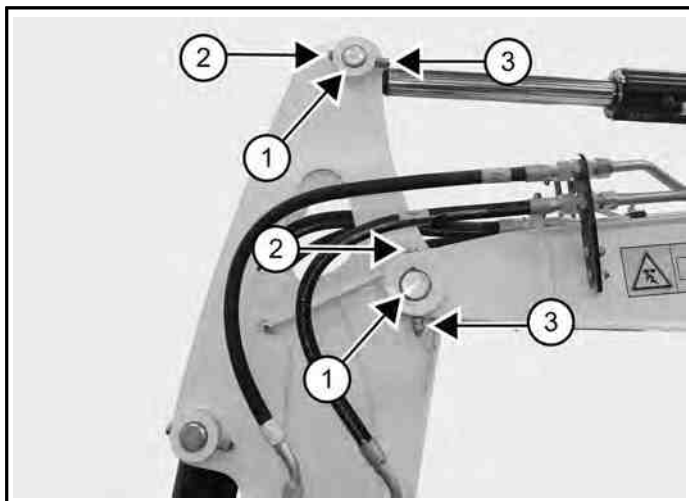
REF.	DESCRIPTION	QTY.	FREQUENCY
3	Swing Reduction Gear	1	Every 1000 hours
4	Swing Cylinder (base end)	1	Every 50 hours

[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 490



The pivots and cylinders (Item 1) have a large pin held in position with a bolt (Item 2) and double nuts (Item 3) [Figure 490] securing the pin.

After the nuts (Item 3) and bolt (Item 2) [Figure 490] 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.

ACTIVE WARNINGS (DELUXE PANEL)

Viewing Service Codes

The last 40 codes stored in history can be viewed on the Deluxe Panel. When more than 40 codes occur, the oldest code will disappear and the newest code will be in the number 1 position.

Figure 491



1. Press a scroll button (Item 1) [Figure 491] until the Active Warnings screen icon (Inset) is highlighted.

The **ACTIVE WARNINGS** screen displays active service codes.

Figure 492



2. Press button 9 [Figure 492] to view the next service code if more than one is present.

OR

Press button 4 [Figure 492] to display a history of service codes.

Figure 493



3. The **WARNINGS HISTORY** screen [Figure 493] will list the Service Code Number, Hourmeter reading when the error occurred, and the User who was logged in to operate the machine when the error occurred.
 - a. Press button 9 to view the next eight service codes.
 - b. Press the number next to the service code for more detail.
 - c. Press the left scroll button to back up one screen.

Maintenance Notification On Deluxe Panel

Figure 494



The Deluxe Panel will display a message (Item 1) [Figure 494] alerting the operator to service the machine.

This message will remain for 10 seconds and will appear for 10 seconds every time the machine is started until the maintenance clock is reset.

Figure 495



p113047

The Deluxe Panel will display a bar (Item 1) [Figure 495] showing the time remaining until next service. This bar will turn red when service is past due. "NEXT MAINTENANCE DUE" will change to "MAINTENANCE PAST DUE" and display the number of hours past due.

Buttons 4 and 9 can be used to adjust the service interval when the owner is logged in [Figure 495].

To reset the service clock after servicing the machine, press and hold button 1 (when the owner is logged in) until the bar graph resets to 0 [Figure 494].

VITALS (DELUXE PANEL)

Accessing Vital Detail

Figure 496



p113031c

1. Press a scroll button (Item 1) [Figure 496] until the Vitals screen icon (Inset) is highlighted.

Figure 497



p113031a

2. On the **VITALS** screen, view a digital readout of the gauges.
 - Engine Speed (RPM)
 - Engine Coolant Temperature
 - System Voltage
 - Hydraulic Fluid Temperature

ATTACHMENTS (DELUXE PANEL)

Accessing Attachment Information

Figure 498



1. Press a scroll button (Item 1) [Figure 498] until the Attachment screen icon (Inset) is highlighted.

Figure 499



2. Read the information on the **ATTACHMENTS** screen and press the Enter button [Figure 499].

Figure 500



3. Press buttons 4 or 9 until the desired Attachment is visible on the screen [Figure 500].

4. Press button 2 for more information about the attachment [Figure 500].

Figure 501



5. Information about the attachment, recommended auxiliary hydraulic flow, and tips about attachment operation will be displayed [Figure 501].

MACHINE SETTINGS (DELUXE PANEL)

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 Password

Figure 502



1. Press a scroll button (Item 1) [Figure 502] repeatedly until the Machine Settings screen icon (Inset) is highlighted [Figure 502].

Figure 503



2. Press button 1 to select PASSWORDS / LOCKOUTS [Figure 503].

Figure 504



3. Enter owner password and press the Enter button.

Figure 505



4. Press button 1 to select USER SETTINGS [Figure 505].

Figure 506



5. Select owner [Figure 506].

Figure 507



6. Press button 2 to select CHANGE PASSWORD [Figure 507].

Figure 510



2. Press button 1 to select PASSWORDS / LOCKOUTS [Figure 510].

Figure 508



7. Enter new owner password and press the Enter button [Figure 508].

Figure 511



3. Enter owner password and press the Enter button [Figure 511].

Changing The User Passwords

Figure 509



1. Press a scroll button (Item 1) [Figure 509] until the Machine Settings icon (Inset) is highlighted [Figure 509].

Figure 512



4. Press button 1 to select USER SETTINGS [Figure 512].

Figure 513



p113036

5. Select user [Figure 513].

Figure 514



p113043

6. Press button 2 to select CHANGE PASSWORD [Figure 514].

Figure 515



p113046

7. Enter new user password and press the Enter button [Figure 515].

Disabling And Enabling Password Lockout Feature

This feature allows the owner to unlock the password feature so that a password does not need to be used every time the engine is started.

Figure 516



p-079004

1. Press a scroll button (Item 1) [Figure 516] until the Machine Settings icon (Inset) is highlighted.

Figure 517



p113038

2. Press button 1 to select PASSWORDS / LOCKOUTS [Figure 517].

Figure 518



p113041

3. Enter owner password and press the Enter button [Figure 518].

Figure 519

p113042

4. Press button 2 to select MACHINE LOCK [Figure 519].

The procedure above can be followed to reset the machine lock so that the machine requires a password to start the engine. When the password is unlocked, no password is needed. The start switch is used to start the machine.

Viewing User Log In Information

Figure 520

p-97990d

1. Press a scroll button (Item 1) [Figure 520] until the Machine Settings icon (Inset) is highlighted.

Figure 521

p113038

2. Press button 2 to select MACHINE HISTORY [Figure 521].

Figure 522

p113064

3. Press button 1 to select USER LOG-IN INFO [Figure 522].

Individual user information can be viewed and reset back to zero.

4. View User Log hours and last time / dated used.
5. Use the buttons to access individual users.

Viewing User Job Statistics

Figure 523



p-97990d

1. Press a scroll button (Item 1) [Figure 523] until the Machine Settings icon (Inset) is highlighted.

Figure 524



p113038

2. Press button 2 to select MACHINE HISTORY [Figure 524].

Figure 525



p113064

3. Press button 2 to select USER JOB STATISTICS [Figure 525].

Figure 526



p113066

4. View Job Statistics (Job Hours / Idle Time) [Figure 526].

Information can be viewed and reset back to zero.

Viewing Overall Job Statistics

Figure 527



p-97990d

1. Press a scroll button (Item 1) [Figure 527] until the Machine Settings icon (Inset) is highlighted.

Figure 528



p113038

2. Press button 2 to select MACHINE HISTORY [Figure 528].

Figure 529



- Press button 3 to select OVERALL JOB STATISTICS [Figure 529].

Setting Auto Idle Time Delay

Figure 530



- Press a scroll button (Item 1) [Figure 530] until the Machine Settings icon (Inset) is highlighted.

Figure 531



- Press button 3 to select MACHINE PERFORMANCE [Figure 531].

Figure 532



- Press button 1 to select AUTO IDLE DELAY TIME [Figure 532].
- Use the buttons to enter a delay time between 4 and 250 seconds.

Resetting The Job Clock

Figure 533



- Press a scroll button (Item 1) [Figure 533] until the Machine Settings icon (Inset) is highlighted.

Figure 534



- Press button 1 to select PASSWORDS / LOCKOUTS [Figure 534].

- Enter owner password and press the Enter button.

Figure 535



- Press button 1 to select USER SETTINGS [Figure 535].

- Select user.

- Press button 9 to reset job statistics.

OR

Press left scroll button or button 0 to exit without saving.

Activating Eco Mode

Figure 536



- Press a scroll button (Item 1) [Figure 536] until the Machine Settings icon (Inset) is highlighted.
- Press button 3 to open the **MACHINE PERFORMANCE** screen.
- Press button 2 to enable Eco Mode.

If the machine maximum engine speed is 2450 rpm when Eco Mode is activated, the maximum engine speed will be approximately 2080 rpm.

DISPLAY (DELUXE PANEL)

Setting Date And Time

Figure 537



- Press a scroll button (Item 1) [Figure 537] until the Display screen icon (Inset) is highlighted.
- Press button 1 to select CLOCKS.

Figure 538



- Press button 1 to select TIME [Figure 538].
- Use the buttons to enter the time.
- Press the Enter button to continue.
- Press button 2 to select DATE.
- Use the buttons to enter the date.
- Press the Enter button to continue.

Setting The System Language

Figure 539



1. Press a scroll button (Item 1) [Figure 539] until the Display screen icon (Inset) is highlighted.
2. Press button 2 to select LANGUAGES.

Figure 540



3. Select a language [Figure 540].

Switching Between English / Metric Units

Figure 541



1. Press a scroll button (Item 1) [Figure 541] until the Display screen icon (Inset) is highlighted.

2. Press button 4 to select DISPLAY SETTINGS.
3. Press button 1 to cycle between ENGLISH and METRIC.

Setting The Alarm Clock

Figure 542



1. Press a scroll button (Item 1) [Figure 542] until the Display screen icon (Inset) is highlighted.
2. Press button 3 to select Alarm Clock.

Figure 543



3. Press button 1 to select OFF ONCE.
OR
Press button 2 to select ON DAILY.
OR
Press button 3 to select ON WEEKLY.

Figure 544



p113061

4. Select OFF / ON, select time, and select alarm frequency.

Figure 545



p113062

5. Use buttons to enter time.
6. Press the Enter button.

Figure 546



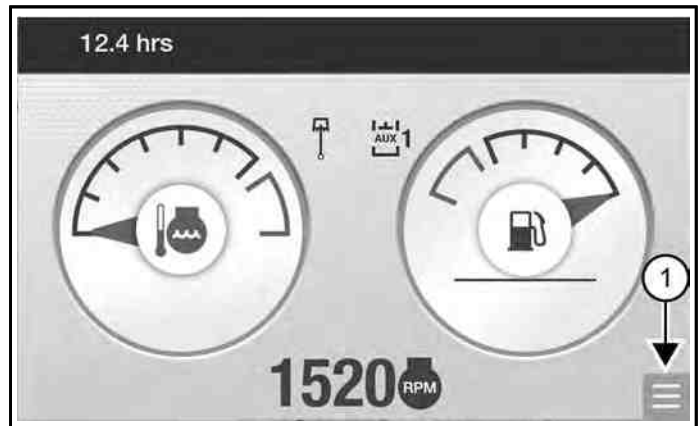
p113063

7. Press button 4 to set alarm to sleep.
OR
Press button 9 to shut off alarm. Alarm will still be active for the next day alarm setting.

NAVIGATION (STANDARD DISPLAY)

Opening Navigation Bar

Figure 547



NA3773a

1. Select the navigation handle (Item 1) [Figure 547] 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 41)
 3. **VITALS** screen
(See Vitals (Standard Display) on Page 243)
 4. **SERVICE** screen
(See Service (Standard Display) on Page 244)
 5. **DEPTH CHECK** screen (if equipped)
(See Depth Check (Standard Display) on Page 146)
 6. **SETTINGS** screen
(See Settings (Standard Display) on Page 245)

Active Shortcuts

Figure 548



NA3705

The following icons can appear in the navigation handle position [Figure 548]. Selecting an icon will take you directly to the indicated screen.

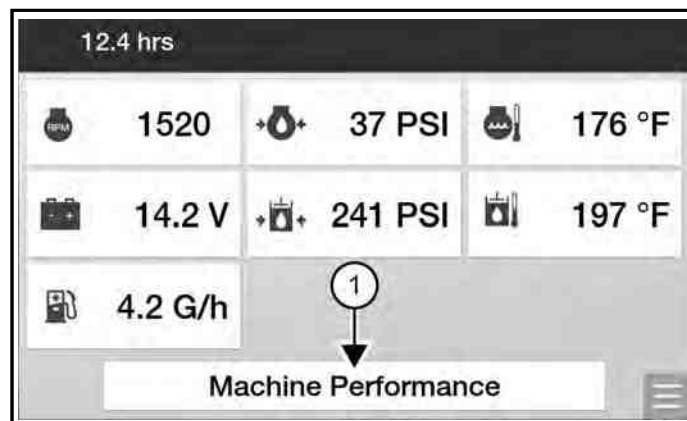
ICON	DESCRIPTION	FUNCTION
	Navigation Handle	Opens and closes the navigation bar.
	Service Due	Opens SERVICE screen.
	Software Update	Opens SOFTWARE screen.
	Machine Derate	Opens MACHINE PERFORMANCE screen.
	Warning	Opens SERVICE CODES screen.

VITALS (STANDARD DISPLAY)

Accessing Vital Detail And Machine Performance

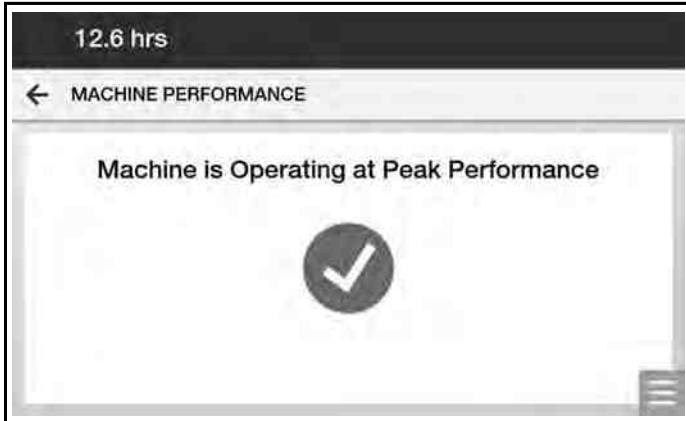
1. Select **[NAVIGATION HANDLE]**→ **[VITALS]**.

Figure 549



2. On the **VITAL DETAIL** screen [Figure 549], 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 549] to view any limitations or restrictions that prevent machine damage.

Figure 550



NA3702

Figure 551



NA3785

Examples of machine performance screens are shown in [Figure 550] and [Figure 551].

SERVICE (STANDARD DISPLAY)

Recording A Service

1. Select [NAVIGATION HANDLE]→ [SERVICE].

Figure 552



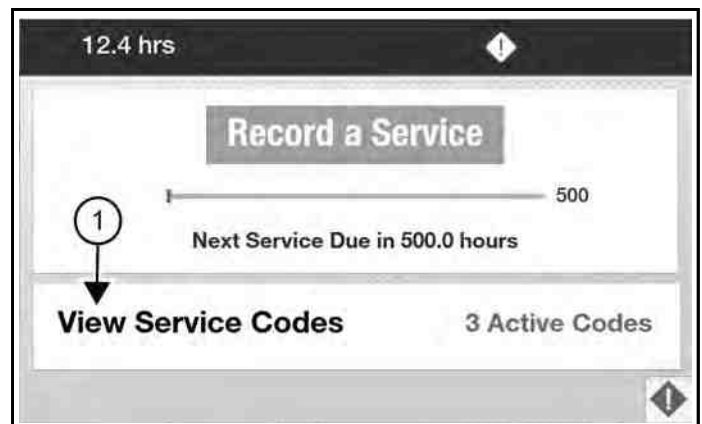
NA3748b

2. Select [RECORD A SERVICE] (Item 1) [Figure 552] to record the service as completed.

Viewing Service Codes

1. Select the [NAVIGATION HANDLE]→ [SERVICE].

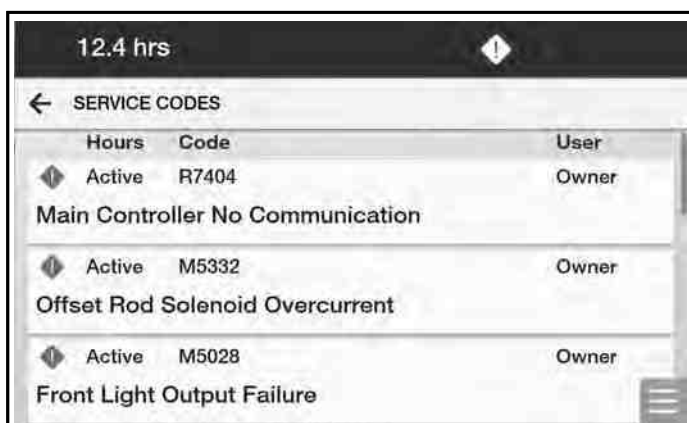
Figure 553



NA3748d

2. Select [VIEW SERVICE CODES] (Item 1) [Figure 553].

Figure 554



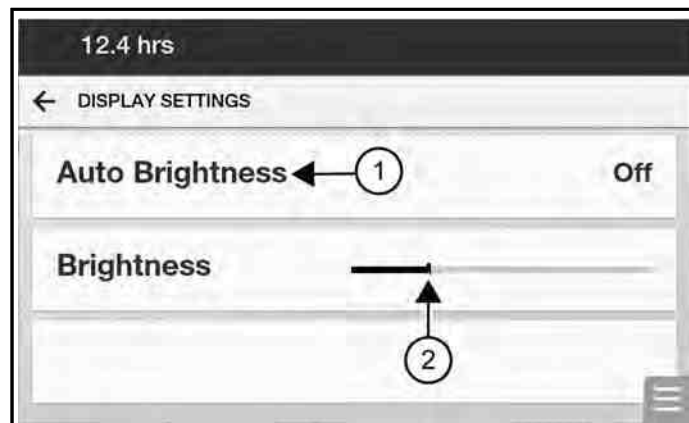
3. Scroll down if necessary to view service codes [Figure 554].

SETTINGS (STANDARD DISPLAY)

Adjusting Display Brightness

1. Select [NAVIGATION HANDLE] → [SETTINGS] → [DISPLAY SETTINGS].

Figure 555



2. Select [AUTO BRIGHTNESS] (Item 1) [Figure 555] 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 555] to the left to dim, to the right to brighten.

Managing Operators

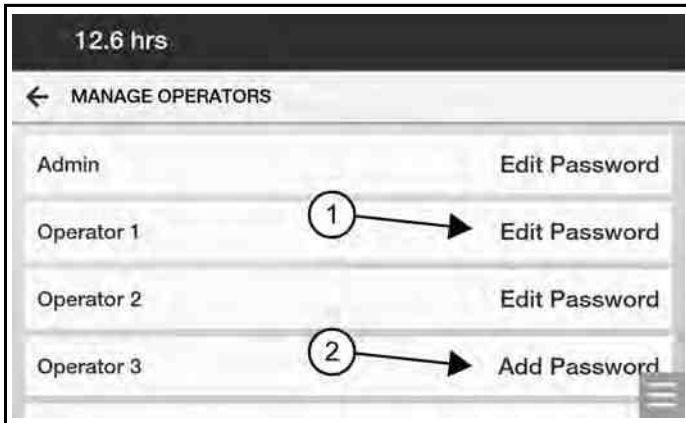
1. Select [NAVIGATION HANDLE] → [SETTINGS] → [SECURITY SETTINGS].
2. Enter the password and select the [ENTER] icon.

Figure 556



3. Select [MANAGE OPERATORS] (Item 1) [Figure 556].

Figure 557



4. Select **[EDIT PASSWORD]** (Item 1) [Figure 557] to change a password or remove an operator.

OR

Select **[ADD PASSWORD]** (Item 2) [Figure 557] 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 246)
- 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.

Password Description

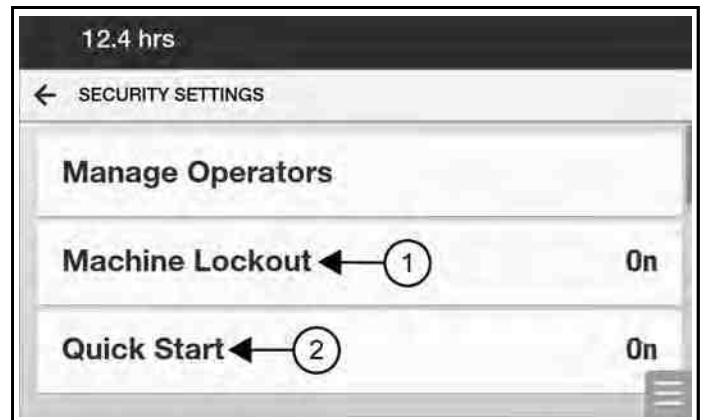
Owner Password: Allows for full use of the machine and to set up the display security settings. There is only one owner password. The owner password must be used to change the owner or operator passwords. If this password is lost, contact your Bobcat dealer to unlock the machine.

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 558



2. Select **[MACHINE LOCKOUT]** (Item 1) [Figure 558] to turn on / off.
3. Select **[QUICK START]** (Item 2) [Figure 558] 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.

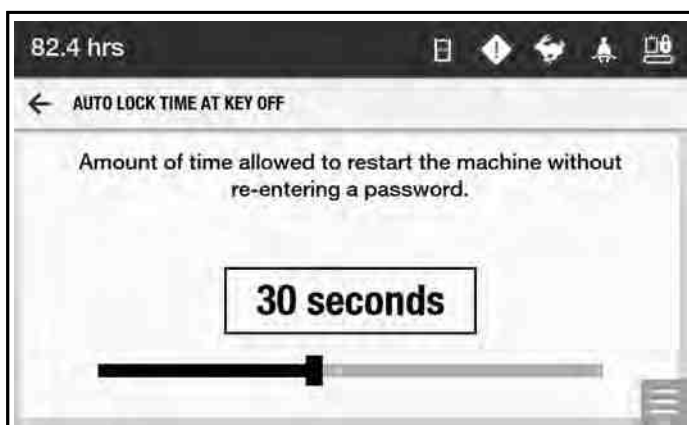
1. Select **[NAVIGATION HANDLE]**→ **[SETTINGS]**→ **[SECURITY SETTINGS]**.

Figure 559



2. Select **[AUTO LOCK TIME AT KEY OFF]** (Item 1) [Figure 559].

Figure 560



3. Use the slider to set the Auto Lock Time [Figure 560].

Setting The System Language

1. Select [NAVIGATION HANDLE] → [SETTINGS] → [LANGUAGE SETTINGS].

Figure 561



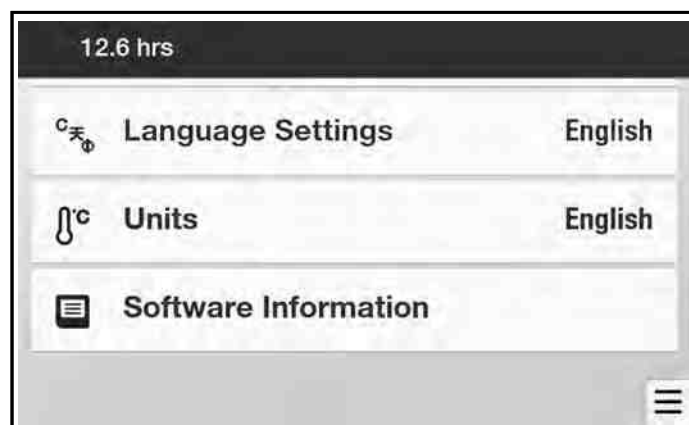
2. On the **SET LANGUAGE** screen, scroll through the languages and select the desired language.

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 562

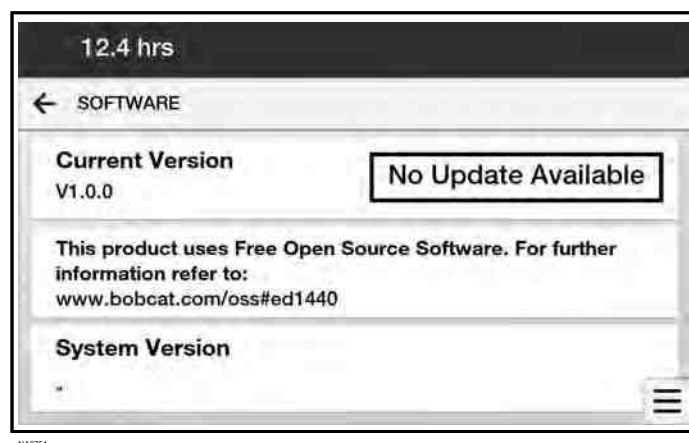


2. Scroll down and select [UNITS] (Item 1) [Figure 562] to toggle between English and metric units.

Software Version

1. Select [NAVIGATION HANDLE] → [SETTINGS] → [SOFTWARE INFORMATION].

Figure 563



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 564



1. Press the clock (Item 1) [Figure 564] to open the notification drawer.

Figure 565



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 565] to close the drawer.

Accessing Vital Detail And Machine Performance

Figure 566



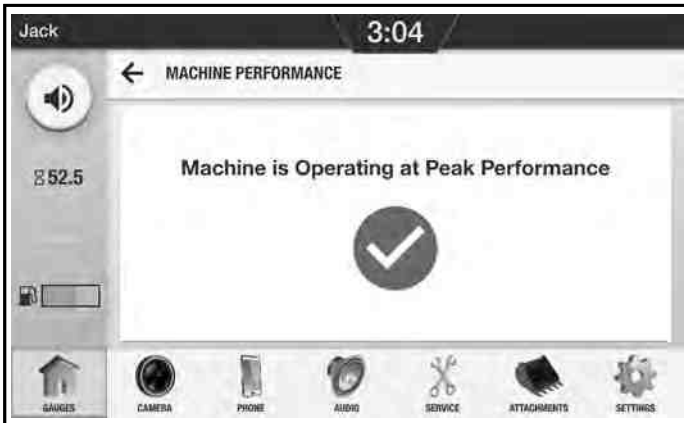
1. Select the vitals icon (Item 1) [Figure 566] to navigate to the **VITAL DETAIL** screen.

Figure 567



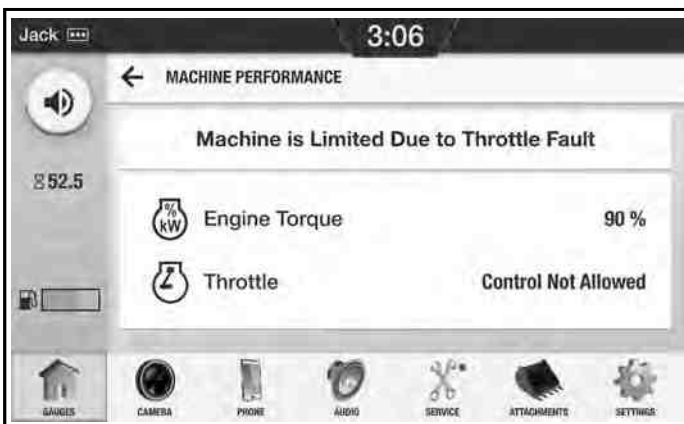
2. On the **VITAL DETAIL** screen, view a digital readout of the gauges. The screen provides real-time monitoring of:
 - Engine Speed (RPM)
 - Engine Oil Pressure
 - Engine Coolant Temperature
 - System Voltage
 - Hydraulic Fluid Pressure
 - Hydraulic Fluid Temperature
 - Fuel Usage (G/h or L/h)
3. Select **[MACHINE PERFORMANCE]** (Item 1) [Figure 567] to view any limitations or restrictions that prevent machine damage.

Figure 568



NA3780

Figure 569



NA3787

Examples of machine performance screens are shown in [Figure 568] and [Figure 569].

CAMERA (TOUCH DISPLAY)

Operating Rear View Camera

Figure 570



NA3384

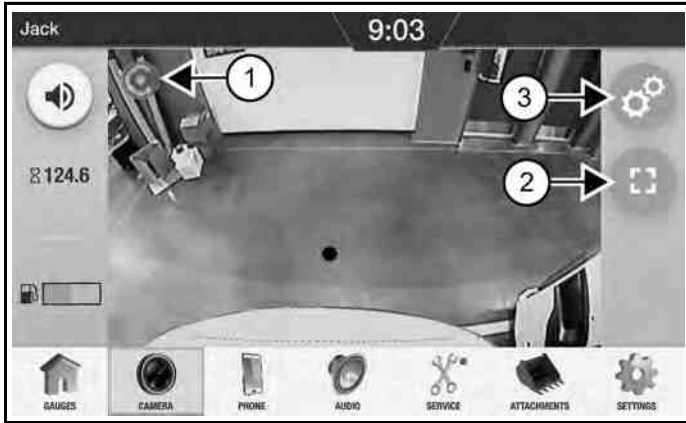
Figure 571



P200728a

- Select [**CAMERA**] (Item 1) [Figure 570] to access the **CAMERA** screen.
OR
Press the right joystick button (Item 1) [Figure 571] to toggle between the **CAMERA** screen and the current screen.

Figure 572



NA342B

The rotating spinner icon (Item 1) [Figure 572] indicates you are viewing a live broadcast from the camera.

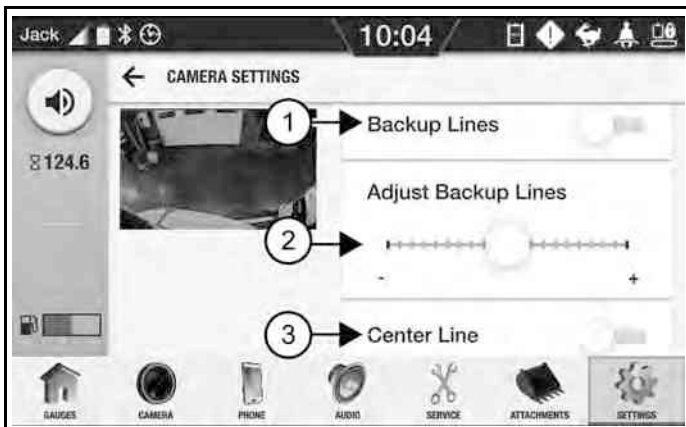
- Select the **[FULL SCREEN]** icon (Item 2) [Figure 572] to make the camera view full screen. Touch anywhere on the screen to go back to the view shown.
- Select the **[SETTINGS]** icon (Item 3) [Figure 572] to go to the **CAMERA SETTINGS** screen.

(See Adjusting Rear View Camera Settings on Page 250)

Adjusting Rear View Camera Settings

Select the **[SETTINGS]** icon on the **CAMERA** screen (Item 3) [Figure 572] to go to the **CAMERA SETTINGS** screen.

Figure 573



P132904a

- Select **[BACKUP LINES]** (Item 1) [Figure 573] to turn the lines on / off.
- Use the slider (Item 2) [Figure 573] to adjust the Backup Lines in or out.
- Select **[CENTER LINE]** (Item 3) [Figure 573] 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 574



1. Select **[SERVICE]** (Item 1) [Figure 574] and then navigate to **[VIEW SERVICE CODES]**.

Figure 575



2. Select a code (Item 1) [Figure 575] to go to the **SERVICE CODE DETAILS** screen.

Figure 576



3. On the **SERVICE CODE DETAIL** screen, you can select **[CALL DEALER]** (Item 1) [Figure 576] (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 577



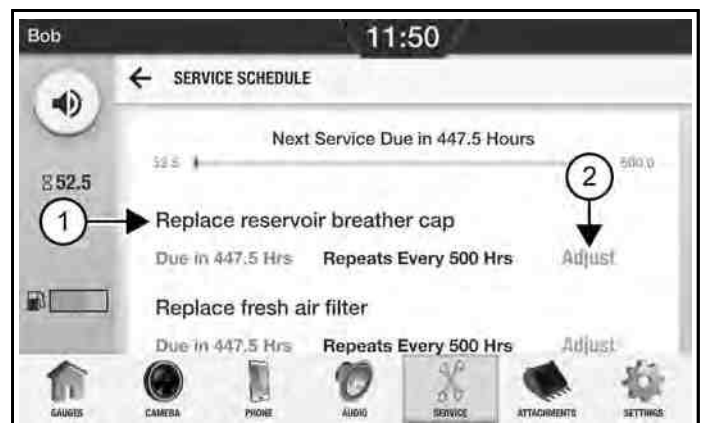
1. Select **[SERVICE]** (Item 1) [Figure 577].

Figure 578



2. View the hours remaining until next scheduled service is due (Item 1) [Figure 578] and any overdue service on the service screen.
3. Select **[VIEW SERVICE SCHEDULE]** (Item 2) [Figure 578].

Figure 579



4. On the **SERVICE SCHEDULE** screen, view the next scheduled maintenance (Item 1) [Figure 579].
5. To make the maintenance interval more frequent, select **[ADJUST]** (Item 2) [Figure 579].
 - 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 580



1. Select **[SERVICE]** (Item 1) [Figure 580].

Figure 581



2. Select **[RECORD A SERVICE]** (Item 1) [Figure 581].

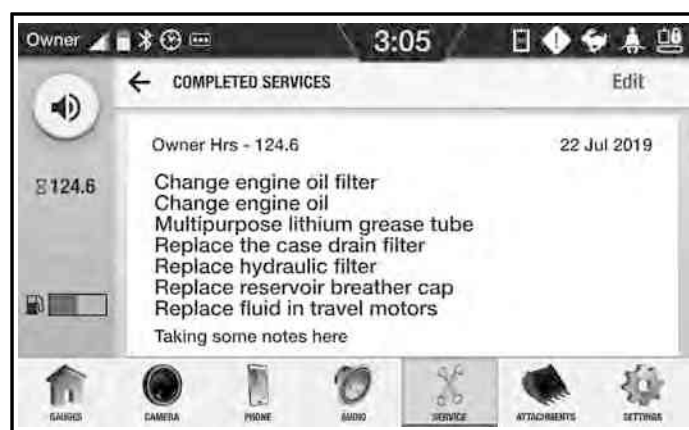
Figure 582



3. Select **[+ADD SERVICE ITEM]** (Item 1) [Figure 582] to add additional items that were performed.
4. Select **[ADD NOTES]** (Item 2) [Figure 582] to add notes to the record.

5. Select **[RECORD SERVICE]** (Item 3) [Figure 582] to save the service record.

Figure 583



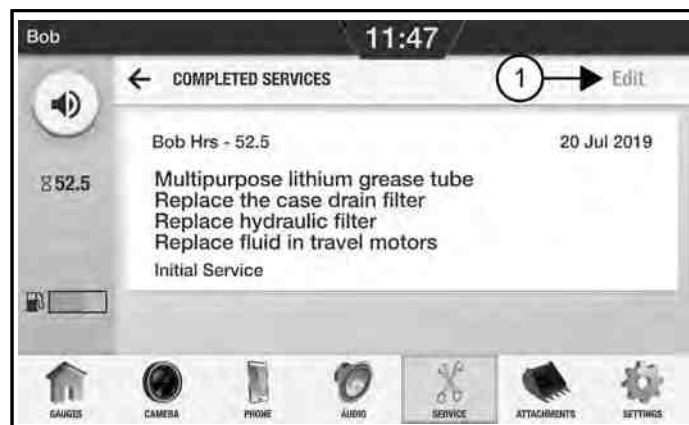
The Service Record will now list all the items that were marked as completed [Figure 583].

Removing Service Records

You must be logged in as the owner to complete this task.

1. Select **[SERVICE]**→ **[VIEW SERVICE RECORD]**.

Figure 584



2. Select **[EDIT]** (Item 1) [Figure 584] to remove a service record.
3. After entering the password, select the **[ENTER]** icon.

Figure 585



4. Select the **[DELETE]** icon (Item 1) [Figure 585] to remove a service record.
5. Select **[SAVE]** (Item 2) [Figure 585] to confirm.
OR
Select **[X]** (Item 3) [Figure 585] 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.

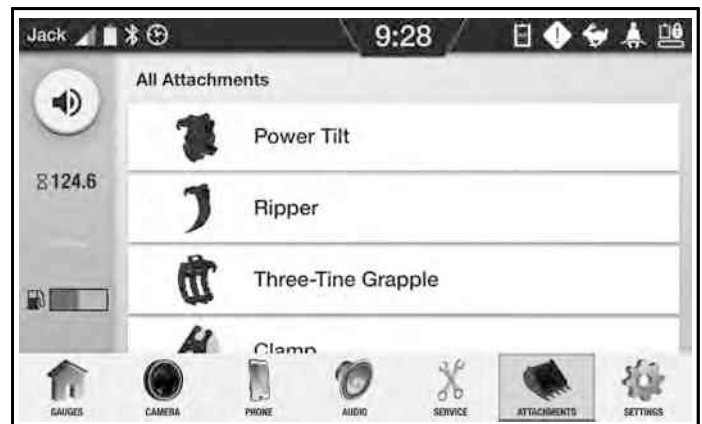
Always read and understand your Attachment Operator & Maintenance Manual before using attachments.

Figure 586



1. Select **[ATTACHMENTS]** (Item 1) [Figure 586].

Figure 587



2. Select one of the available attachments [Figure 587].

Figure 588



P132988a

The basic joystick information is shown on the tooltips screens [Figure 588].

- Select the arrows (Item 1) [Figure 588] to access additional information.
- Scroll down to find the tooltips.

SETTINGS (TOUCH DISPLAY)

Setting Date And Time

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

Figure 589



P132938a

2. Select **[SET DATE]** (Item 1) [Figure 589].
 - a. Scroll to set the day, month, and year (Item 2) [Figure 589].
 - b. Select **[ACCEPT]** (Item 3) [Figure 589] to save the change.

Figure 590



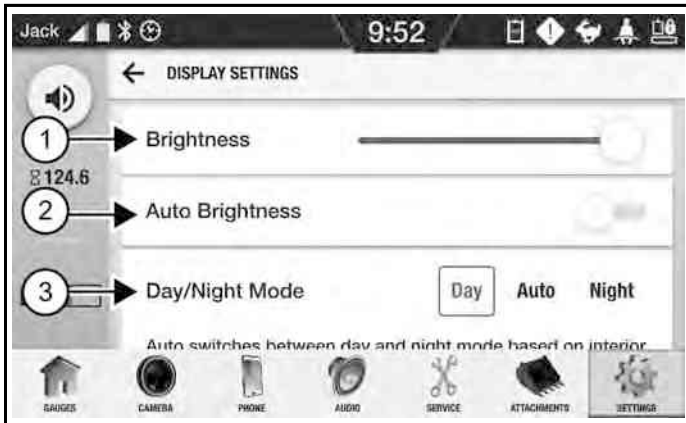
P132939a

3. Select **[SET TIME]** (Item 1) [Figure 590].
 - a. Scroll to choose between a 12 hr or 24 hr clock (Item 2) [Figure 590].
 - b. Scroll to set hour, minute, and AM / PM (Item 2) [Figure 590].
 - c. Select **[ACCEPT]** (Item 3) [Figure 590] to save the change.

Adjusting Display Brightness

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

Figure 591



2. To adjust the display brightness, move the slider (Item 1) [Figure 591] to the left to dim, to the right to brighten.

OR

Select **[AUTO BRIGHTNESS]** (Item 2) [Figure 591] to turn it on / off. When on, the brightness will automatically adjust according to the ambient light.

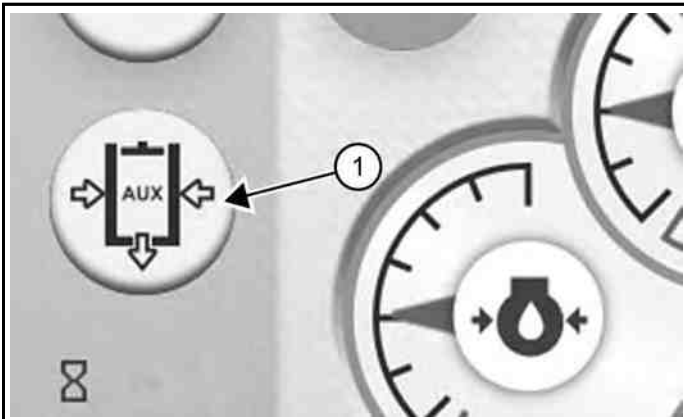
OR

Select **[DAY]**, **[AUTO]**, or **[NIGHT]** (Item 3) [Figure 591] 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 592



The Auxiliary Pressure Release icon (Item 1) [Figure 592] 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 592].

OR

Select **[SETTINGS]** → **[MACHINE SETTINGS]** → **[AUXILIARY PRESSURE RELEASE]**.

Either will bring you to the **AUXILIARY PRESSURE RELEASE** screen.

Figure 593



5. To release auxiliary pressure, press the AUX button on the jog shuttle as shown on the screen [Figure 593].

Figure 594



The spinner (Item 1) [Figure 594] 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.

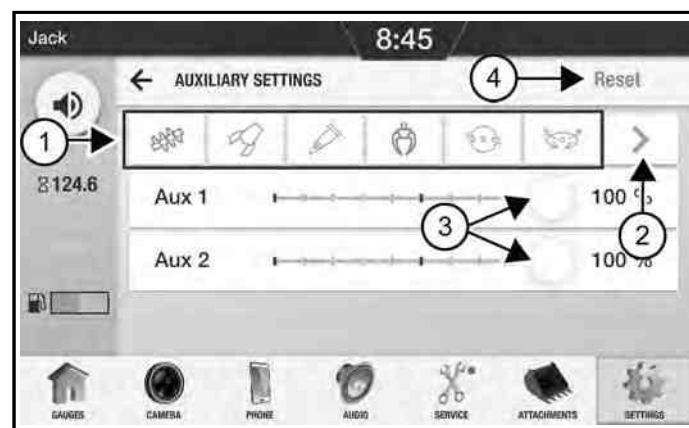
Possible reasons for a failure to release auxiliary pressure include:

- 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 596

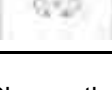


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The **AUXILIARY SETTINGS** screen shows six commonly used attachments (Item 1) [Figure 596].

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

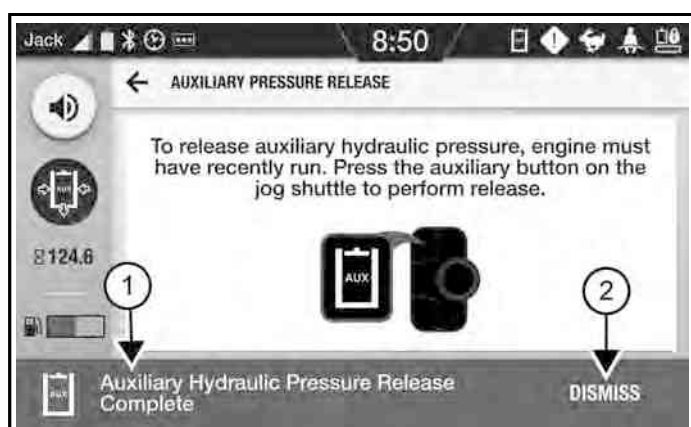
2. Choose the flow that best matches the attachment / operator requirements by selecting a pre-set hydraulic flow icon (Item 1) [Figure 596].

OR

Press the arrow (Item 2) [Figure 596] to select a custom-set hydraulic flow icon. Adjust the hydraulic flow by moving the slider (Item 3) [Figure 596] from 0% flow (off) to 100% flow in 10% increments.

3. If necessary, press **[RESET]** (Item 4) [Figure 596] to revert the selected flow setting back to the original factory setting.

Figure 595



When the process is completed, a notification (Item 1) [Figure 595] will appear indicating that the auxiliary pressure has been released. Press **[DISMISS]** (Item 2) [Figure 595].

Setting Auxiliary Hydraulics Flow Rate

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

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.

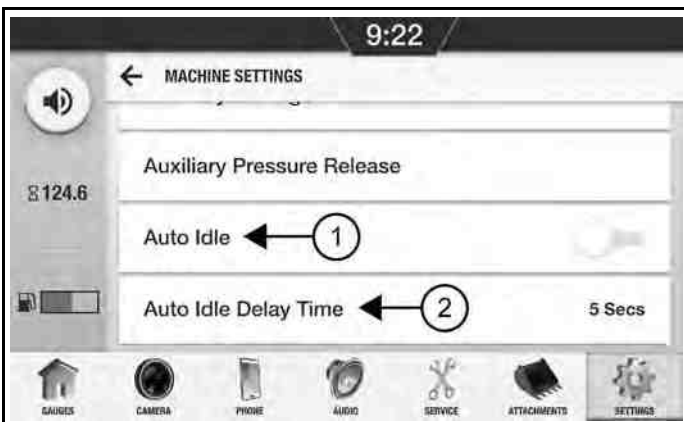
Activating Auto Idle

Figure 597



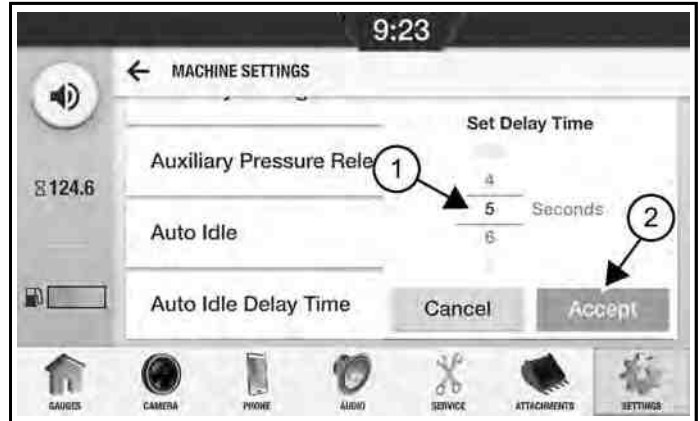
1. Select the Machine Settings button (Item 1) [Figure 597].

Figure 598



2. Select **[AUTO-IDLE]** (Item 1) [Figure 598] to turn it on / off.
3. Select **[AUTO-IDLE DELAY TIME]** (Item 2) [Figure 598] to set the delay time.

Figure 599



4. Swipe up or down (Item 1) [Figure 599] to select the auto-idle delay time to best suit the operating conditions.
5. Select **[ACCEPT]** (Item 2) [Figure 599] to set the new delay time.

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

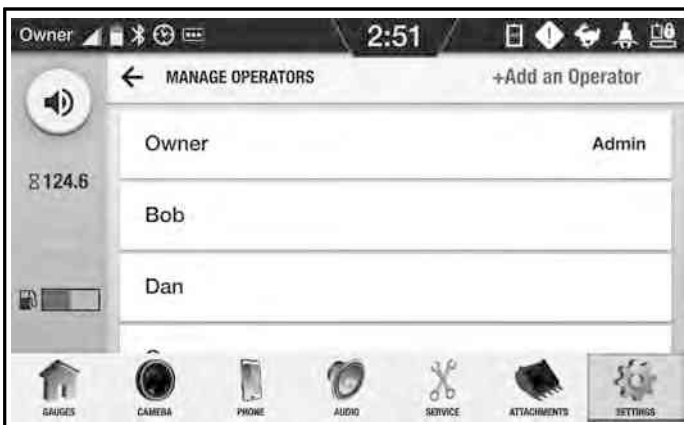
1. Select **[SETTINGS]** → **[SECURITY SETTINGS]**.
2. Enter the password if prompted.

Figure 600



3. Select **[MANAGE OPERATORS]** (Item 1) [Figure 600].

Figure 601



4. Select the owner or an operator [Figure 601].

Figure 602



5. Select **[OPERATOR PASSWORD]** (Item 1) [Figure 602].
6. Enter a new password and select **[ENTER]**.

Adding An Operator

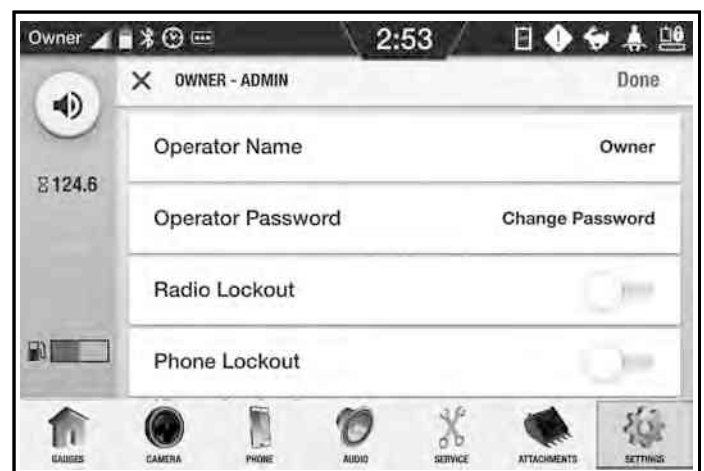
1. Select **[SETTINGS]** → **[SECURITY SETTINGS]** → **[MANAGE OPERATORS]**.

Figure 603



2. Select **[+ADD AN OPERATOR]** (Item 1) [Figure 603].

Figure 604



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 605



2. Select an operator [Figure 605].

Figure 606



3. Scroll down and select **[DELETE OPERATOR]** (Item 1) [Figure 606].

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 260)
- 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 91)

Enabling Machine Lockout and Quick Start

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

Figure 607



2. Select **[MACHINE LOCKOUT]** (Item 1) [Figure 607] to turn on / off.
3. Select **[QUICK START]** (Item 2) [Figure 607] 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 608



2. Select **[AUTO LOCK TIME AT KEY OFF]** (Item 1) [Figure 608].

Figure 609



3. Swipe up or down to set the Auto Lock Time (Item 1) [Figure 609].
4. Select **[ACCEPT]** (Item 2) [Figure 609].

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 610



2. Select **[SYSTEM SLEEP TIME AT KEY OFF]** (Item 1) [Figure 610].

Figure 611



3. Swipe up or down to set System Sleep Time (Item 1) [Figure 611].
4. Select **[ACCEPT]** (Item 2) [Figure 611].

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 612

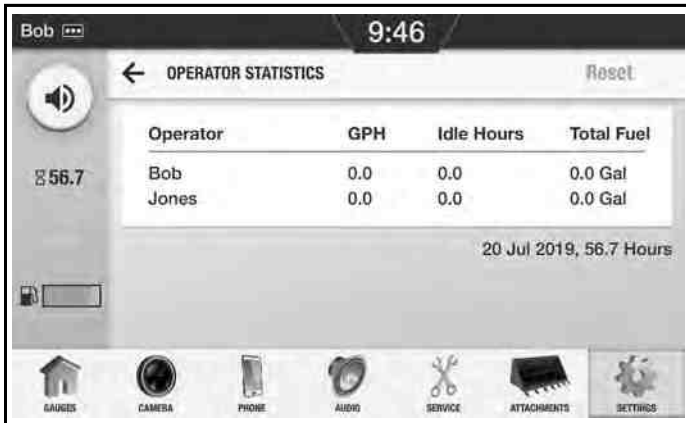


2. Select **[PASSWORD ERROR LOCKOUT]** (Item 1) [Figure 612] to turn on / off.

Accessing Operator Statistics

1. Select **[SETTINGS]**→ **[OPERATOR STATISTICS]**.

Figure 613



2. Use the **OPERATOR STATISTICS** screen [Figure 613] to view:

- Operator Name
- GPH (LPH) (Fuel Used Per Hour)
- Idle Hours
- Total Fuel

Using The Job Clock

Figure 614



1. To open the **JOB CLOCK** screen, select the clock icon (Item 1) [Figure 614] and then **[VIEW ALL]**.
OR
Select **[SETTINGS]** (Item 2) [Figure 614] and then **[JOB CLOCKS]**.

Figure 615



2. To start an existing job clock, select **[START]** (Item 1) [Figure 615].
3. Select **[STOP]** (Item 2) [Figure 615] 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 615].
 - a. Type in the new job clock name and select **[ENTER]**.
5. To delete an existing job clock, select **[EDIT]** (Item 4) [Figure 615].
 - a. Select the delete icon by the job clock you want to delete.
 - b. Select **[SAVE]**.
6. Select a job clock (Item 5) [Figure 615] to view the associated **JOB CLOCK DETAIL** screen [Figure 616].

Figure 616



The **JOB CLOCK DETAIL** [Figure 616] screen will show:

- Job Name
- Job Total Time
- Job Engine Hours
- Job Engine Idle Hours
- Total Fuel
- GPH (LPH) (Fuel Used Per Hour)
- History

Setting The System Language

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

Figure 617



2. On the **SET LANGUAGE** screen, scroll through the languages and select the desired language.

A check mark (Item 1) [Figure 617] will appear when accepted.

Switching Between English / Metric Units

1. Select **[SETTINGS]**.

Figure 618



2. Scroll down and select **[UNITS]** (Item 1) [Figure 618] 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 619



2. Use the **DEALER** screen to find your dealer information. You can call your dealer if a phone is paired (Item 1) [Figure 619].

Software Version

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

Figure 620

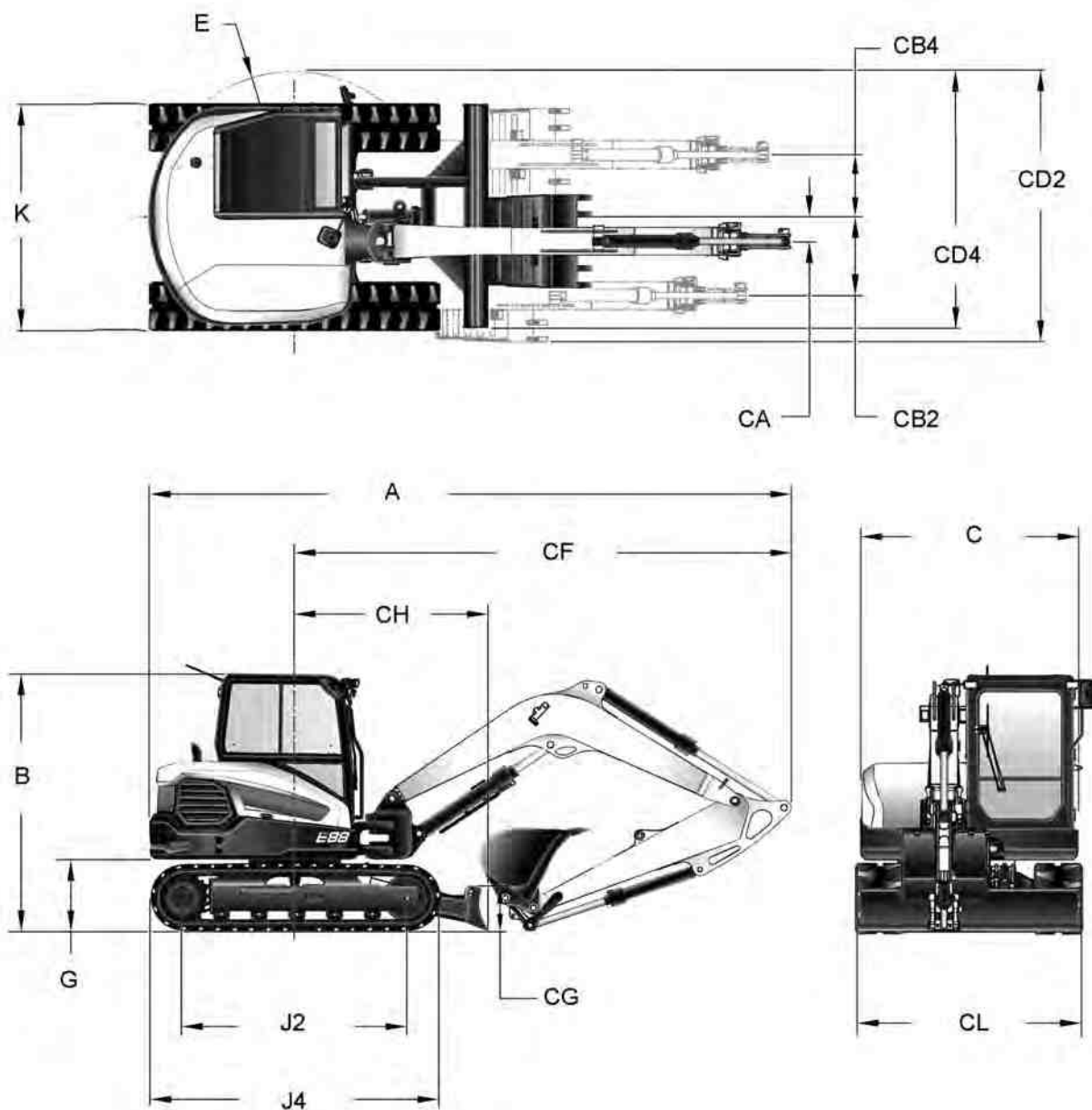


2. Use the **SOFTWARE** screen to find your software version and check for updates.

To update the software, see your Bobcat dealer.

MACHINE DIMENSIONS

Figure 621

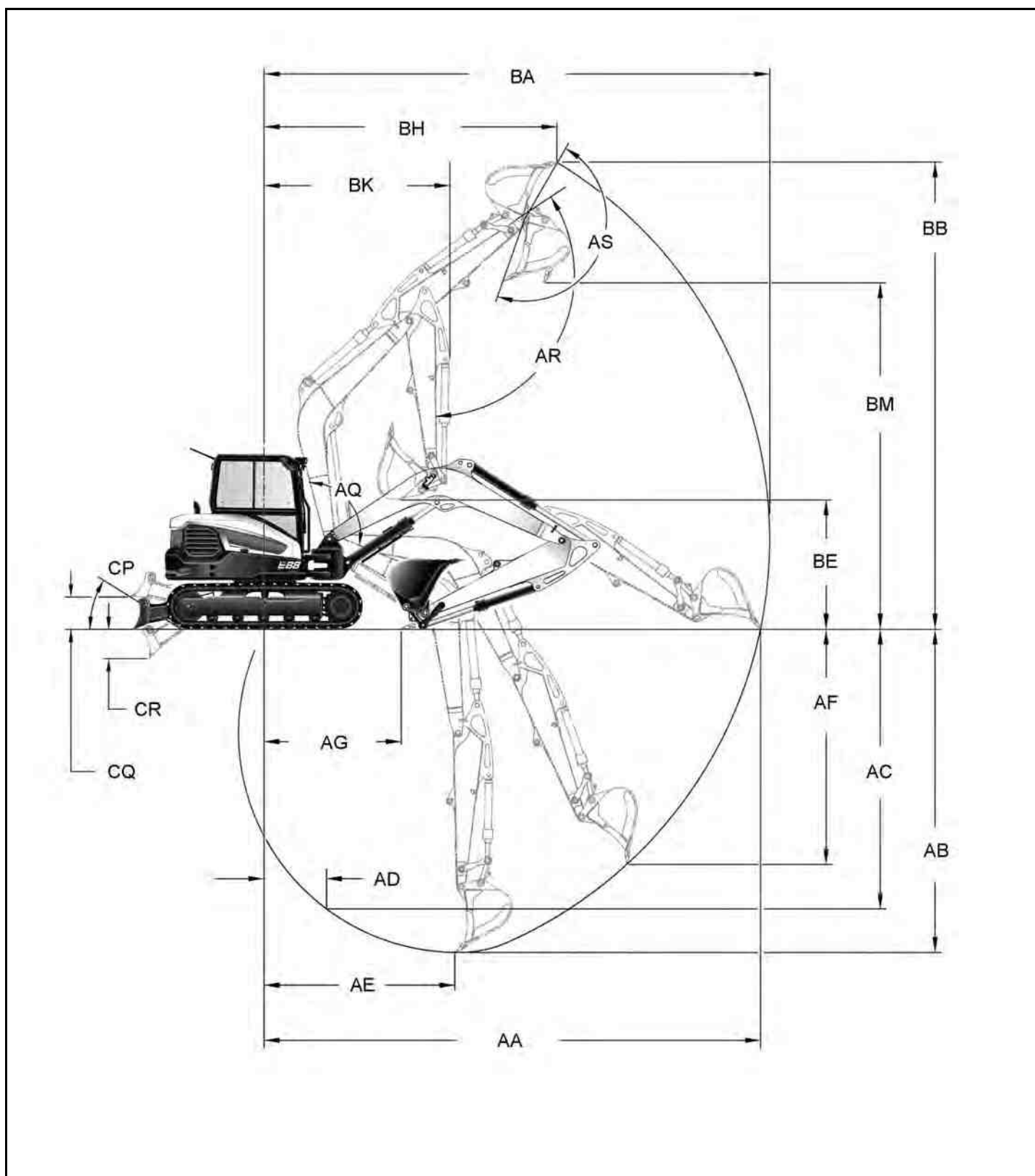


NA20185

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

REF.	DESCRIPTION	LONG ARM WITH FIXED BOOM	SHORT ARM WITH FIXED BOOM	SHORT ARM WITH ARTICULATED BOOM
A	OVERALL LENGTH	6341 mm (249.6 in)	6329 mm (249.2 in)	6255 mm (246.3 in)
B	OVERALL HEIGHT	2540 mm (100.0 in)	2540 mm (100.0 in)	2540 mm (100.0 in)
C	WIDTH OF UPPERSTRUCTURE	2200 mm (86.6 in)	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)	1568 mm (61.7 in)
G	CLEARANCE, UPPERSTRUCTURE TO GROUNDLINE	710 mm (28.0 in)	710 mm (28.0 in)	710 mm (28.0 in)
J2	NOMINAL DISTANCE BETWEEN CENTRELINES OF DRIVE SPROCKETS AND IDLERS	2311 mm (91.0 in)	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)	2896 mm (114.0 in)
K	OVERALL WIDTH OF CRAWLER	2200 mm (86.6 in)	2200 mm (86.6 in)	2200 mm (86.6 in)
CA	MACHINE CENTRELINE TO WORKING EQUIPMENT CENTRELINE, NORMAL OPERATION	250 mm (9.8 in)	250 mm (9.8 in)	250 mm (9.8 in)
CB2	MACHINE CENTRELINE TO WORKING EQUIPMENT CENTRELINE, WORK WIDTH AT MAX RH ROTATION	907 mm (35.7 in)	907 mm (35.7 in)	907 mm (35.7 in)
CB4	MACHINE CENTRELINE TO WORKING EQUIPMENT CENTRELINE, WORK WIDTH AT MAX LH ROTATION	622 mm (24.5 in)	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)	2707 mm (106.6 in)
CD4	WORKING WIDTH MAX LH ROTATION	2525 mm (99.4 in)	2525 mm (99.4 in)	2646 mm (104.2 in)
CF	MIN. RADIUS IN TRAVEL POSITION	4886 mm (192.4 in)	4872 mm (191.8 in)	4705 mm (185.2 in)
CG	BLADE HEIGHT	462 mm (18.2 in)	462 mm (18.2 in)	462 mm (18.2 in)
CH	MACHINE CENTRELINE TO BLADE	2009 mm (79.1 in)	2009 mm (79.1 in)	2009 mm (79.1 in)
CL	BLADE WIDTH	2200 mm (86.6 in)	2200 mm (86.6 in)	2200 mm (86.6 in)

Figure 622



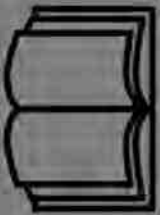
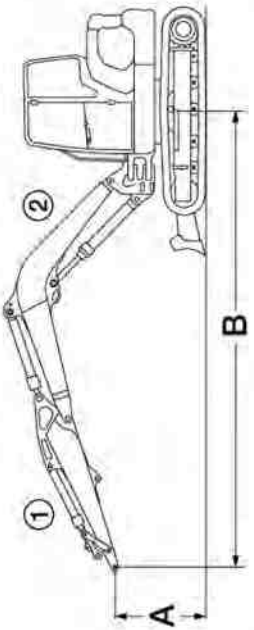
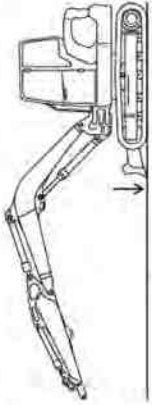
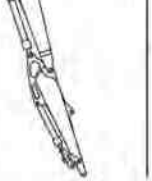
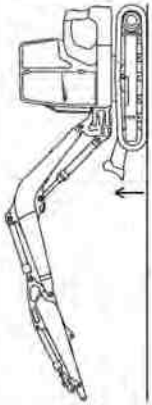
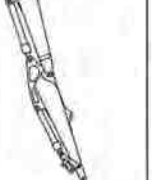
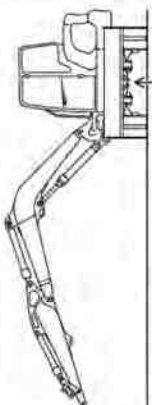
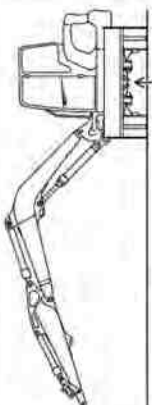
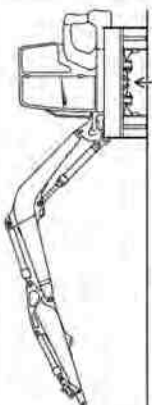
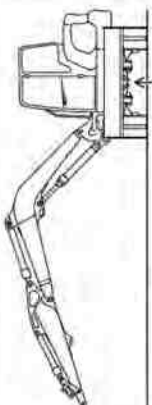
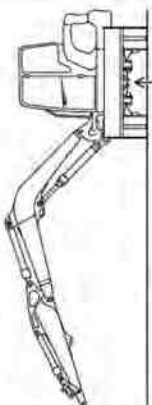
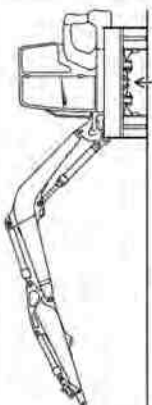
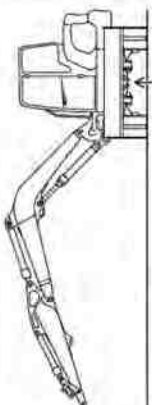
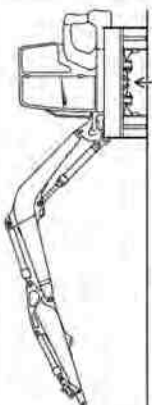
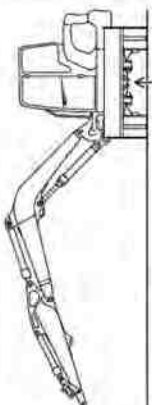
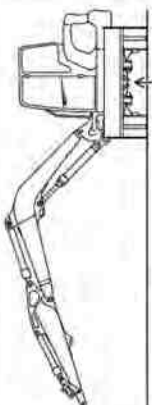
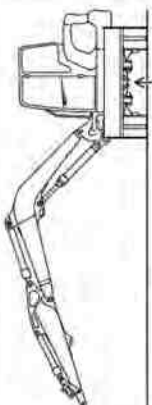
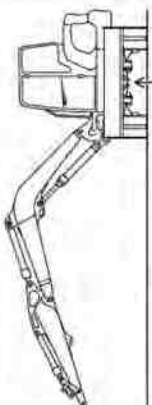
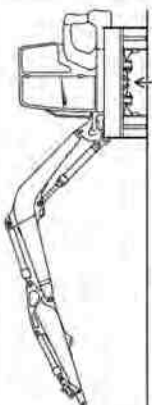
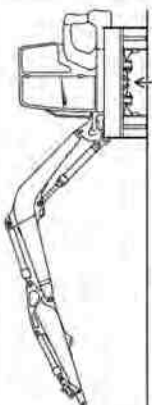
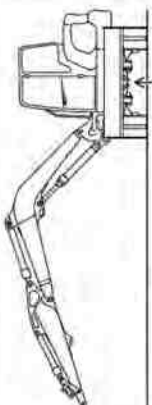
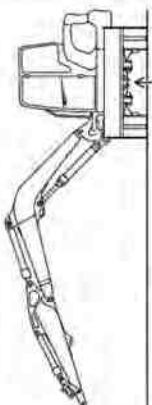
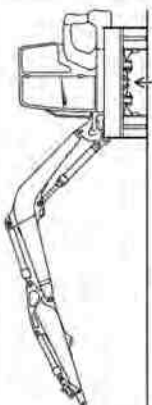
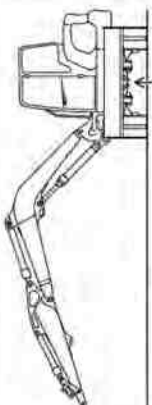
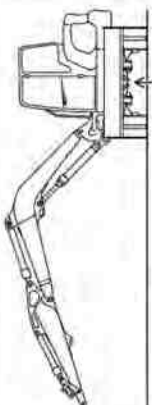
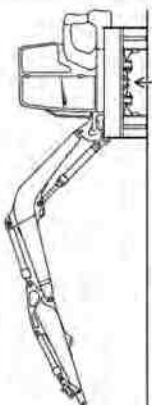
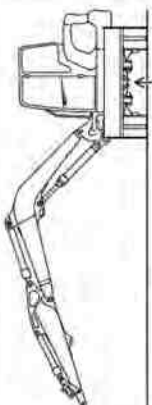
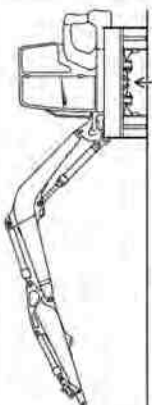
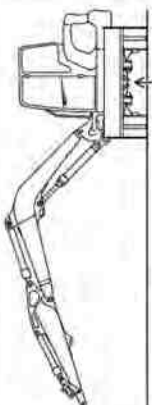
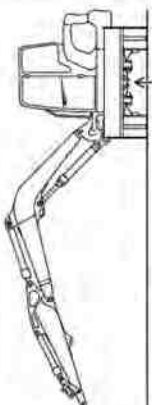
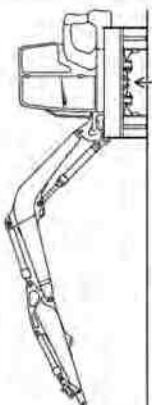
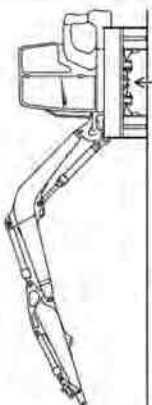
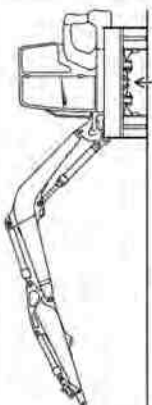
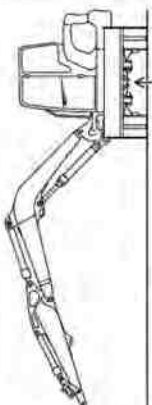
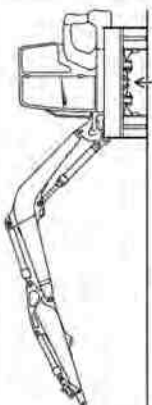
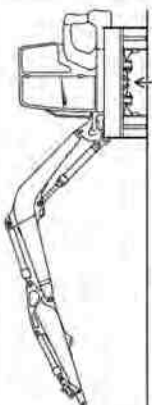
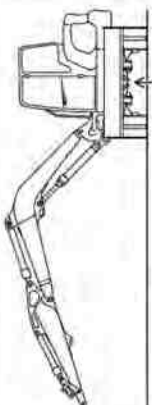
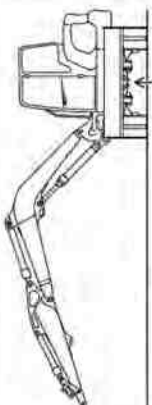
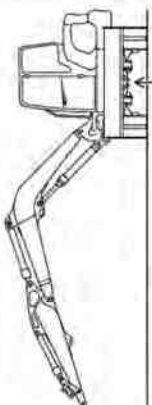
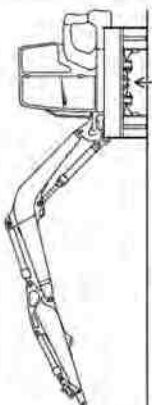
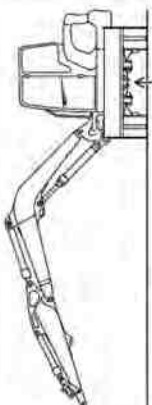
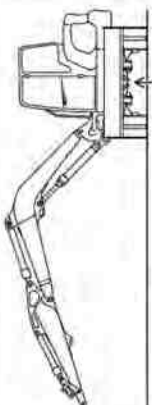
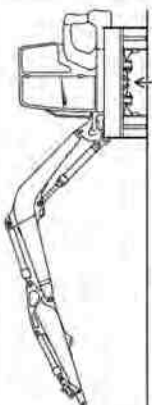
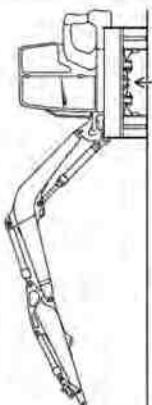
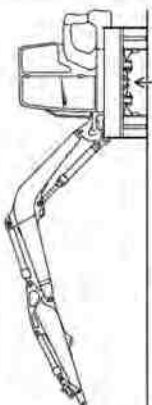
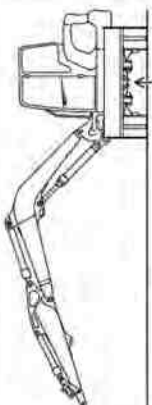
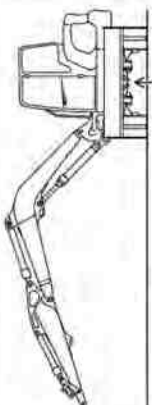
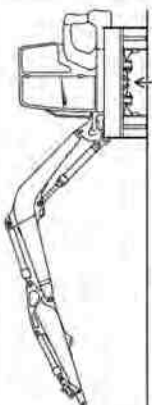
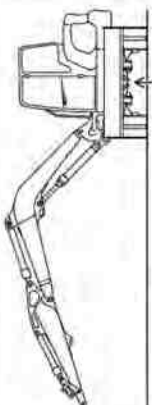
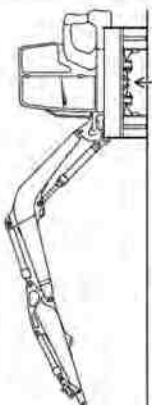
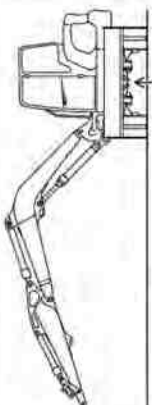
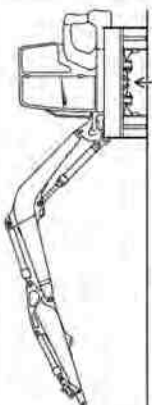
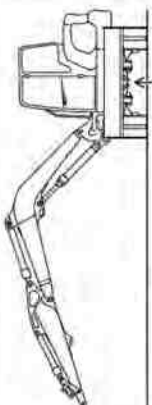
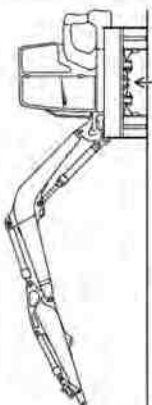
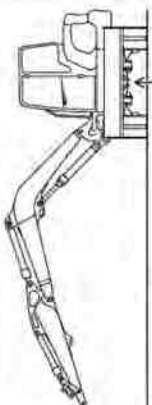
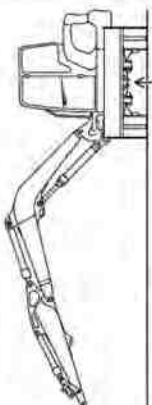
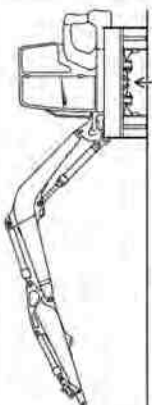
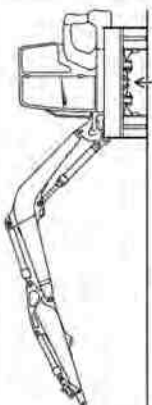
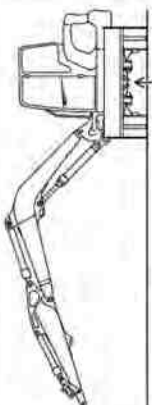
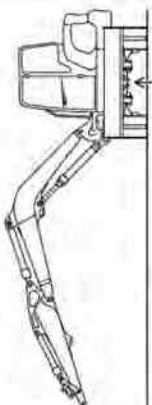
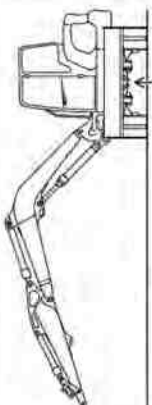
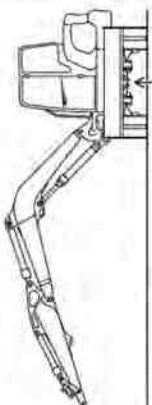
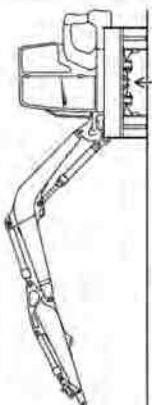
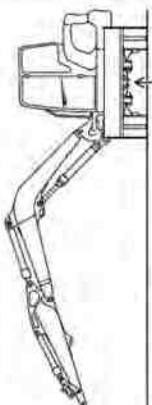
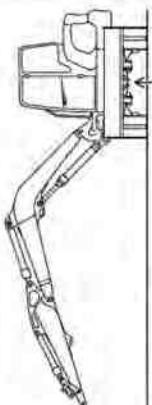
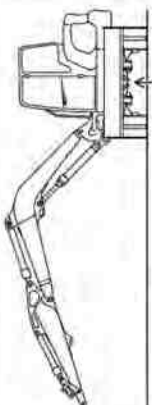
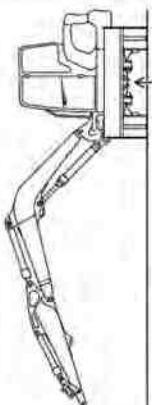
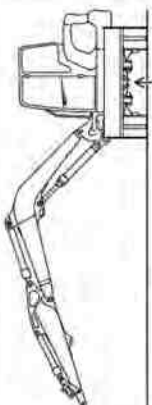
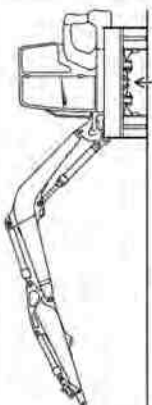
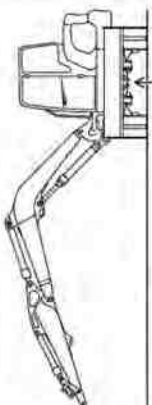
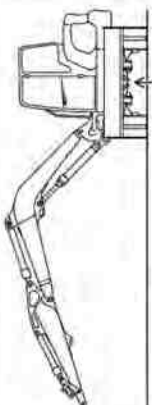
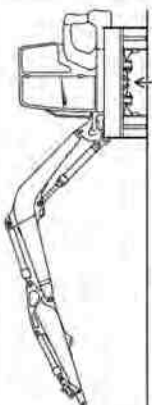
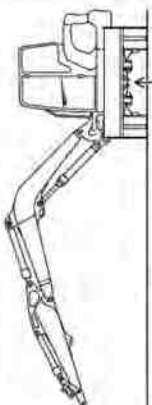
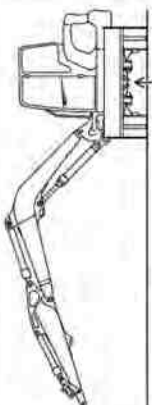
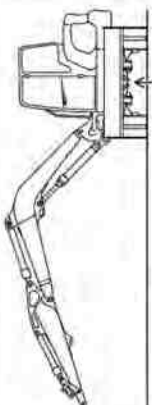
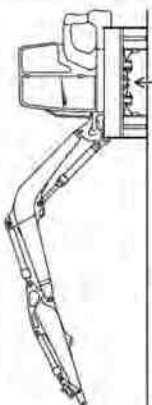
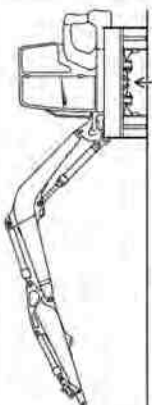
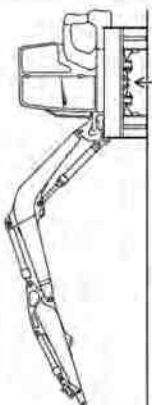
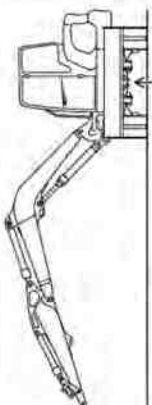
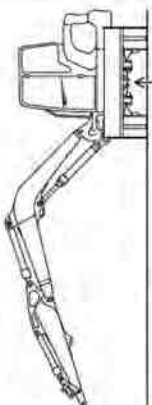
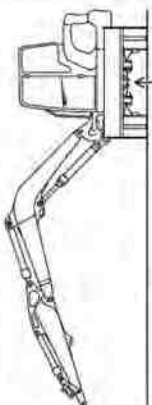
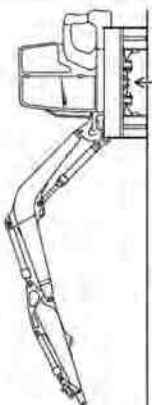
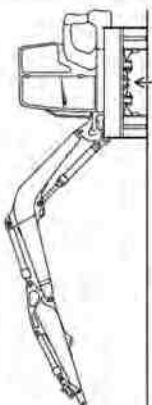
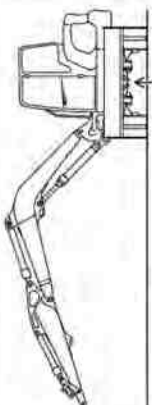
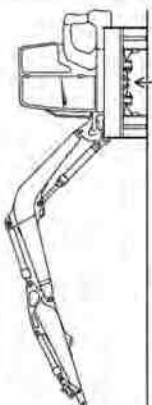
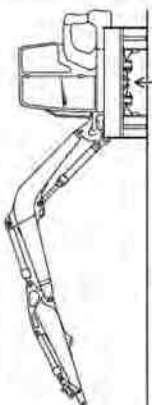
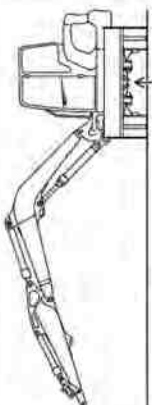
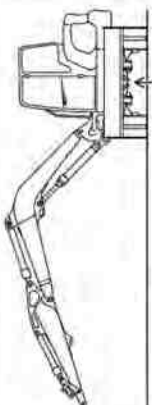
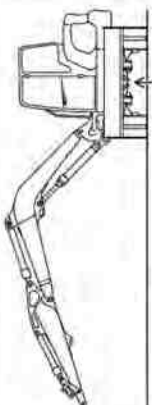
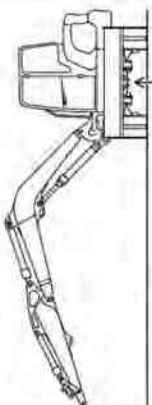
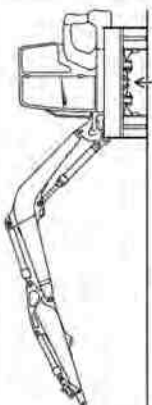
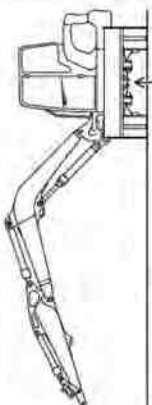
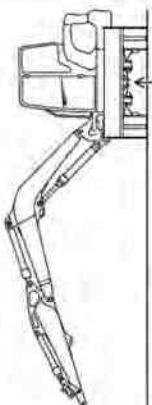
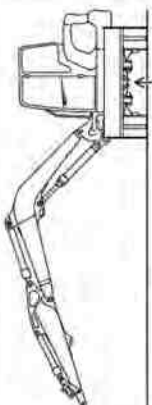
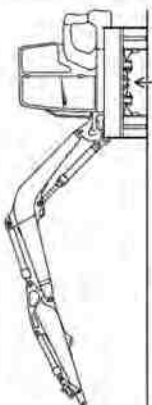
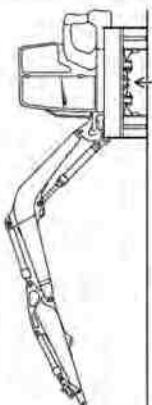
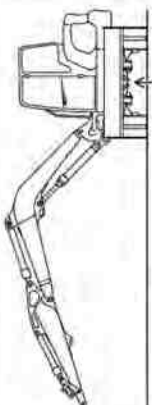
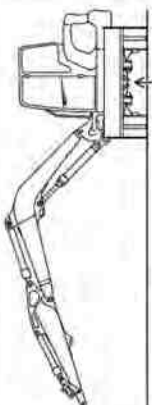
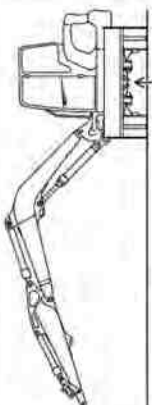
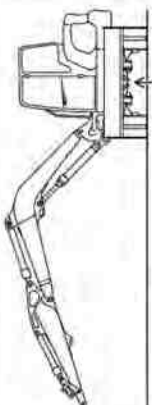
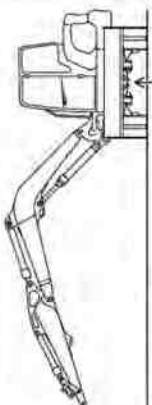
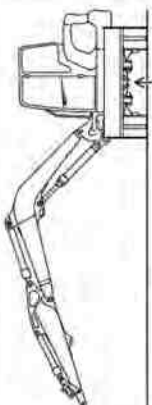
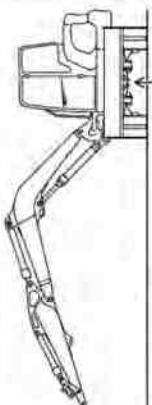
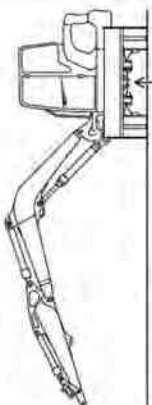
NA20186

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

REF.	DESCRIPTION	LONG ARM WITH FIXED BOOM	SHORT ARM WITH FIXED BOOM	SHORT ARM WITH ARTICULATED BOOM RETRACTED	SHORT ARM WITH ARTICULATED BOOM EXTENDED
AA	MAX. RADIUS AT GROUNDLINE	7418 mm (292.0 in)	7087 mm (279.0 in)	6259 mm (246.4 in)	7354 mm (289.5 in)
AB	MAX. DIGGING DEPTH	4859 mm (191.2 in)	4519 mm (177.9 in)	4145 mm (163.2 in)	4252 mm (167.4 in)
AC	MAX. DEPTH FOR 2500 MM (98.4 IN) LEVEL CUT	4559 mm (179.5 in)	4186 mm (164.8 in)	3828 mm (150.7 in)	3999 mm (157.4 in)
AD	MIN. RADIUS OF 2500 MM (98.4 IN) LEVEL CUT	1463 mm (57.6 in)	1474 mm (58.0 in)	310 mm (12.2 in)	2262 mm (89.1 in)
AE	RADIUS OF MAX. DIGGING DEPTH	2854 mm (112.4 in)	2854 mm (112.4 in)	1198 mm (47.2 in)	3474 mm (136.8 in)
AF	MAX. DEPTH OF VERTICAL WALL THAT CAN BE EXCAVATED	2883 mm (113.5 in)	2587 mm (101.9 in)	1562 mm (61.5 in)	3123 mm (123.0 in)
AG	BUCKET FLAT ON GROUNDLINE	2315 mm (91.1 in)	2478 mm (97.6 in)	1495 mm (58.9 in)	2859 mm (112.6 in)
AQ	BOOM PIVOT ANGLE	126°	126°	126°	126°
AR	ARM PIVOT ANGLE	122°	122°	123°	123°
AS	BUCKET PIVOT ANGLE	170°	170°	170°	170°
BA	MAX. RADIUS OF WORKING EQUIPMENT	7549 mm (297.2 in)	7225 mm (284.4 in)	6417 mm (252.6 in)	7486 mm (294.7 in)
BB	MAX. HEIGHT OF WORKING EQUIPMENT	7115 mm (280.1 in)	6887 mm (271.1 in)	4917 mm (193.6 in)	7622 mm (300.1 in)
BE	MIN. CLEARANCE OF FULLY CURLED BUCKET AT MAX. BOOM HEIGHT	1786 mm (70.3 in)	2147 mm (84.5 in)	1608 mm (63.3 in)	2461 mm (96.9 in)
BH	RADIUS OF BUCKET TEETH AT MAX. HEIGHT	3943 mm (155.2 in)	3692 mm (145.4 in)	5031 mm (198.1 in)	2219 mm (87.4 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)	2950 mm (116.1 in)	2604 mm (102.5 in)
BM	MIN. CLEARANCE OF FULLY CURLED BUCKET AT MAX. ARM HEIGHT	4765 mm (187.6 in)	4537 mm (178.6 in)	2989 mm (117.7 in)	5324 mm (209.6 in)
CP	MAX. APPROACH ANGLE	30°	30°	30°	30°
CQ	MAX. BLADE HEIGHT	479 mm (18.9 in)	479 mm (18.9 in)	479 mm (18.9 in)	479 mm (18.9 in)
CR	MAX. BLADE DEPTH	410 mm (16.1 in)	410 mm (16.1 in)	410 mm (16.1 in)	410 mm (16.1 in)

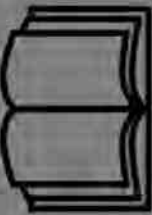
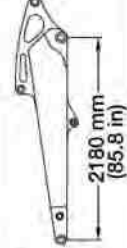
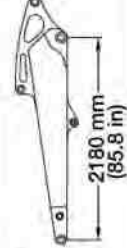
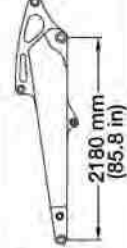
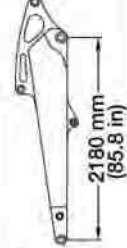
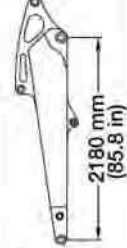
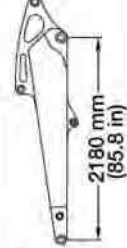
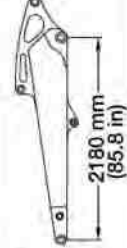
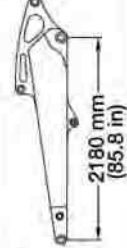
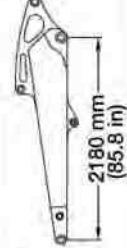
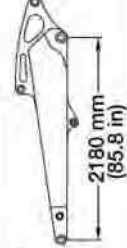
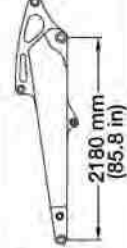
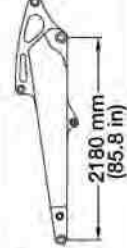
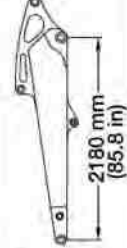
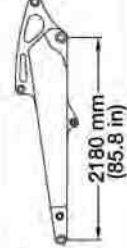
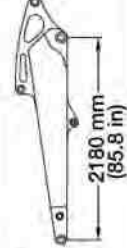
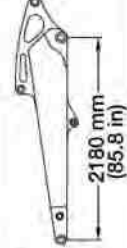
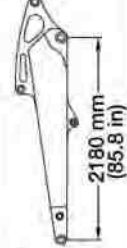
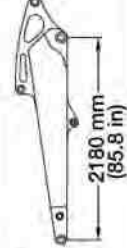
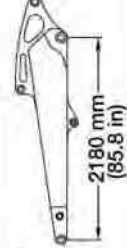
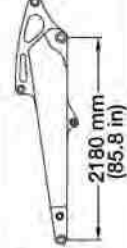
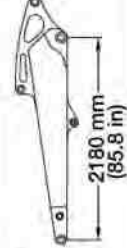
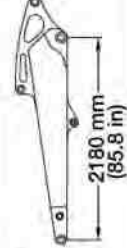
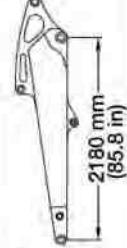
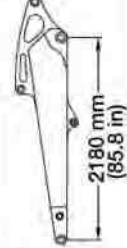
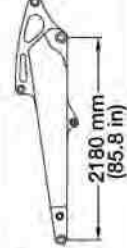
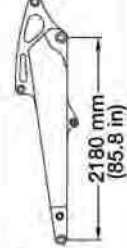
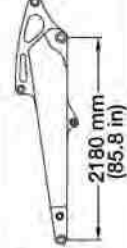
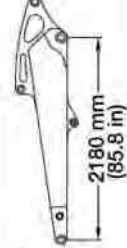
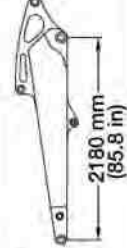
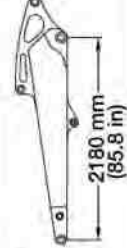
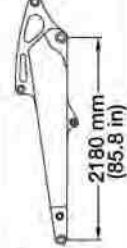
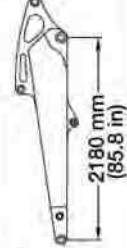
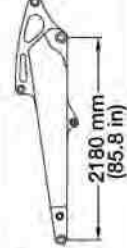
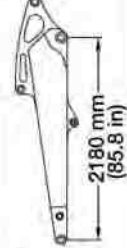
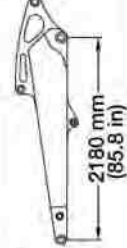
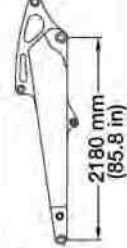
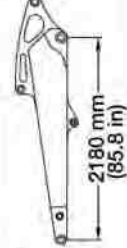
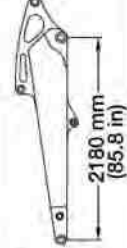
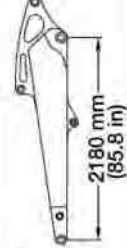
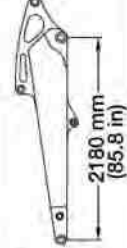
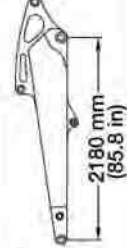
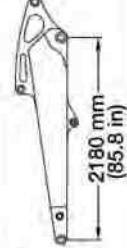
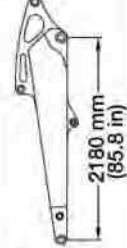
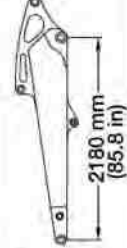
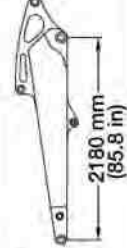
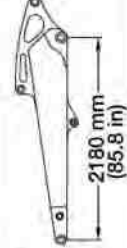
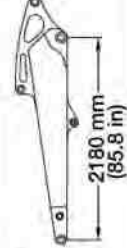
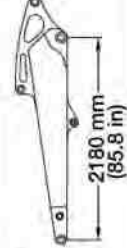
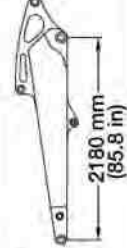
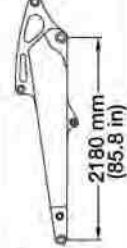
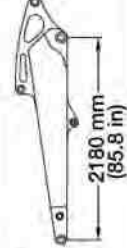
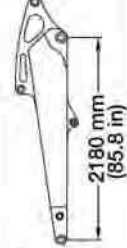
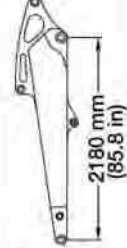
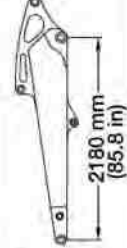
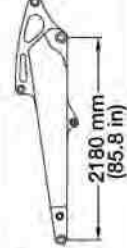
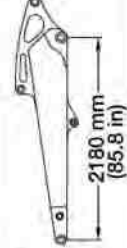
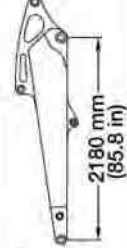
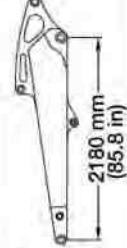
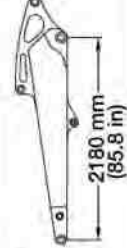
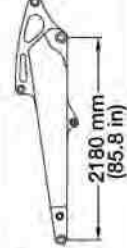
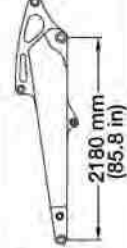
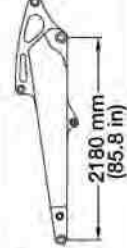
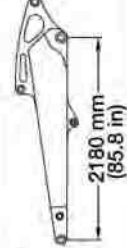
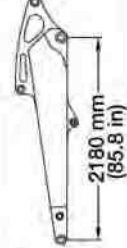
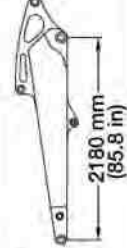
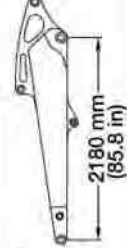
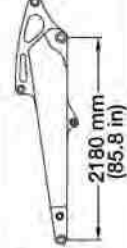
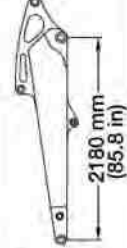
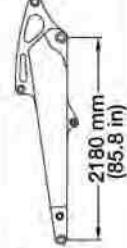
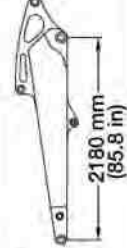
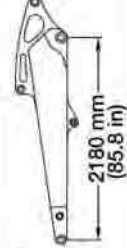
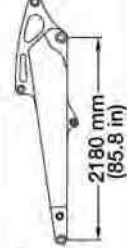
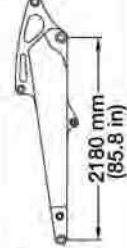
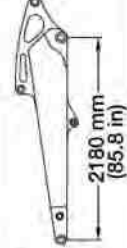
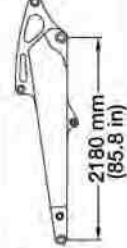
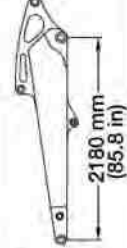
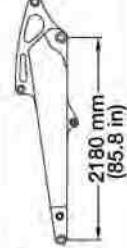
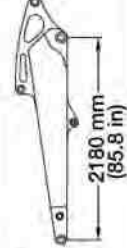
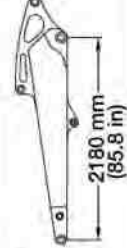
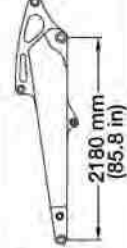
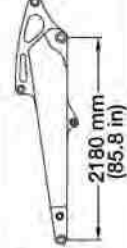
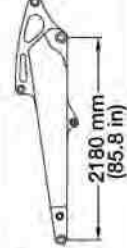
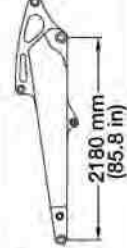
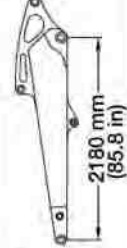
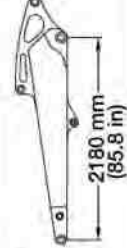
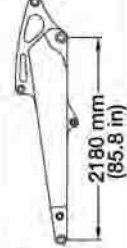
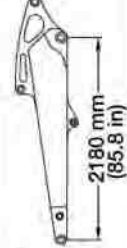
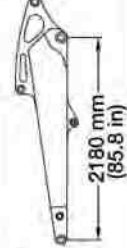
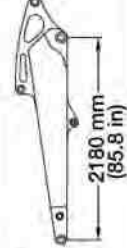
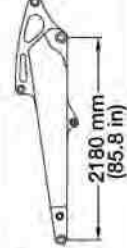
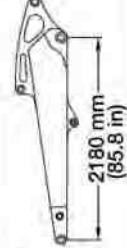
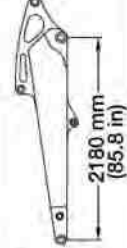
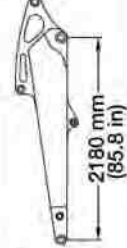
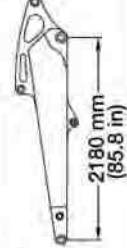
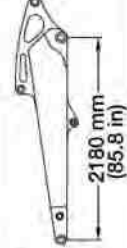
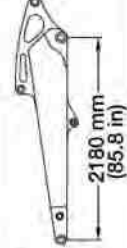
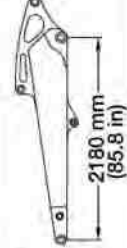
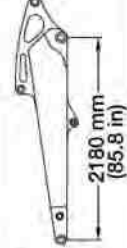
RATED LIFT CAPACITY – LONG ARM

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 
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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.

 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		 		
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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.

E88

A

B

B

B

B

kg @

max. B

kg @

max. B

kg @

max. B

4000 mm

3000 mm

3000 mm

3000 mm

3000 mm

3000 mm

4000 mm

4000 mm

4000 mm

4000 mm

4000 mm

4000 mm

3000 mm

3000 mm

3000 mm

3000 mm

3000 mm

3000 mm

2000 mm

2000 mm

2000 mm

2000 mm

2000 mm

2000 mm

1000 mm

1000 mm

1000 mm

1000 mm

1000 mm

1000 mm

Ground

Ground

Ground

Ground

Ground

Ground

-1000 mm

-1000 mm

-1000 mm

-1000 mm

-1000 mm

-1000 mm

1171 kg @

1171 kg @

1171 kg @

1171 kg @

1171 kg @

1171 kg @

5266 mm

5266 mm

5266 mm

5266 mm

5266 mm

5266 mm

1756 kg @

1756 kg @

1756 kg @

1756 kg @

1756 kg @

1756 kg @

5749 mm

5749 mm

5749 mm

5749 mm

5749 mm

5749 mm

1767 kg @

1767 kg @

1767 kg @

1767 kg @

1767 kg @

1767 kg @

5992 mm

5992 mm

5992 mm

5992 mm

5992 mm

5992 mm

1791 kg @

1791 kg @

1791 kg @

1791 kg @

1791 kg @

1791 kg @

6030 mm

6030 mm

6030 mm

6030 mm

6030 mm

6030 mm

1820 kg @

1820 kg @

1820 kg @

1820 kg @

1820 kg @

1820 kg @

5869 mm

5869 mm

5869 mm

5869 mm

5869 mm

5869 mm

1839 kg @

1839 kg @

1839 kg @

1839 kg @

1839 kg @

1839 kg @

5486 mm

5486 mm

5486 mm

5486 mm

5486 mm

5486 mm

SW 20

7365010

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.

E88

①

②

A

B

B

B

B

	3000 mm	4000 mm	5000 mm	6000 mm	kg @ max. B		3000 mm	4000 mm	5000 mm	6000 mm	kg @ max. B		3000 mm	4000 mm	5000 mm	6000 mm	kg @ max. B
4000 mm			*1735 kg	*1741 kg	*1771 kg @ 5255 mm									*1735 kg	1455 kg		1332 kg @ 5266 mm
3000 mm			*2002 kg	*1909 kg	*1766 kg @ 5749 mm									*2002 kg	1446 kg		1158 kg @ 5749 mm
2000 mm	*3553 kg	*2439 kg	*1899 kg		*1767 kg @ 5992 mm	3525 kg	2287 kg	1650 kg			1260 kg @ 5992 mm	2939 kg	1945 kg	1412 kg			1077 kg @ 5992 mm
1000 mm	*4052 kg	*2946 kg	*2173 kg	*1892 kg	*1791 kg @ 6030 mm	3406 kg	2231 kg	1626 kg	1255 kg		1245 kg @ 6030 mm	2763 kg	1955 kg	1374 kg	1064 kg		1056 kg @ 6030 mm
Ground	*4554 kg	*3035 kg	*2255 kg		*1820 kg @ 5869 mm	3440 kg	2214 kg	1616 kg			1299 kg @ 5989 mm	2739 kg	1923 kg	1350 kg			1092 kg @ 5989 mm
-1000 mm	*4237 kg	*2949 kg	*2174 kg		*1839 kg @ 5485 mm	3552 kg	2243 kg	1632 kg			1445 kg @ 5485 mm	2770 kg	1923 kg	1350 kg			1201 kg @ 5485 mm

SW 20

7429228

★ 

SW 20

7429286

7429286a

RATED LIFT CAPACITY – ARTICULATED BOOM

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

E88

A

B

B

B

	3000 mm	4000 mm	5000 mm	6000 mm	kg @ max. B
4000 mm		*1966 kg			1152 kg @ 5571 mm
3000 mm	*2909 kg	*2203 kg	*1846 kg	*1633 kg	1017 kg @ 6025 mm
2000 mm		*1786 kg	*1694 kg	*1644 kg	965 kg @ 6255 mm
1000 mm		*2285 kg	*1906 kg	*1638 kg	944 kg @ 6292 mm
Ground	*2499 kg	*2681 kg		*1527 kg	980 kg @ 6139 mm
-1000 mm	*3298 kg	*2463 kg			1078 kg @ 5777 mm

*

SW 20

7365513

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, short 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) Articulated Boom, add 572 kg (1261 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)
— Short Arm	39073 N (8784 lbf)
— Articulated Boom Retracted	37924 N (8526 lbf)
— Articulated Boom Extended	39848 N (8958 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
Articulated Boom (if equipped)	Foot pedal
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	Purple coolant is a mixture of 53% propylene glycol / 47% water OR Red coolant is a mixture of 50% ethylene glycol / 50% water (See Coolant Types on Page 207)

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)
Articulated Boom Port Relief, Base End And Rod End	270 bar (3916 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)
Articulated Boom (If Equipped)	100,0 mm (3.94 in)	60,0 mm (2.36 in)	370,0 mm (14.57 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

Articulated Boom Retract (If Equipped)	7.2 seconds
Articulated Boom Extend (If Equipped)	6.6 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 -18°C (0°F), 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)
Short Arm	39,2 kPa (5.68 psi)	39,8 kPa (5.78 psi)	39,8 kPa (5.77 psi)
Articulated Boom	40,0 kPa (5.81 psi)	40,7 kPa (5.90 psi)	40,6 kPa (5.89 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)
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MACHINE WARRANTY

A statement explaining the terms and conditions of the warranty coverage that applies to your machine was provided in the documentation kit shipped with the machine. If this warranty statement is lost or damaged, contact your dealer to obtain a new copy.

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 Company World Headquarters 250 East Beaton Drive West Fargo, ND 58078-6000 United States of America	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				
Technical Documentation Homologation Manager Doosan Bobcat EMEA s.r.o U Kodetky 1810 26312 Dobris Czech Republic	Conformity Assessment Procedure(s) 2000/14/EC, Annex VIII, Full Quality Assurance Sound Power Levels [Lw(A)] <table> <tr> <td>Measured Sound Power</td> <td>95,1 db(A)</td> </tr> <tr> <td>Guaranteed Sound Power</td> <td>96 db(A)</td> </tr> </table>	Measured Sound Power	95,1 db(A)	Guaranteed Sound Power	96 db(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					

UK DECLARATION OF CONFORMITY (MACHINE)

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

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

Technical Documentation

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

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 UK Regulation(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 November 2021

DECLARATION OF CONFORMITY (TOUCH DISPLAY)



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)

*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)

A handwritten signature in black ink, appearing to read 'Grüner', is positioned to the right of the text block.

DECLARATION OF CONFORMITY (HYDROFLUOROCARBON)

DOOSAN**DOOSAN BOBCAT EMEA**

U Kodetky 1810,
 Dobris, 263 12, Czech Republic
 +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, acting in its capacity as EU only representative for the import of goods from CLARK EQUIPMENT COMPANY doing business as BOBCAT COMPANY, a corporation organized under the law of the state of Delaware, USA with its registered address located at 250 East Beaton Drive, West Fargo, North Dakota, USA, 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.

Insu Jung

8th January, 2024


Doosan Bobcat EMEA s.r.o. | Identification No. 264 89 201 | Prague Commercial Register Section C, Entry 85459



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Reference Information

Product Serial Number:

Engine Serial Number:

Dealer Information: