EN

# Operation & Maintenance Manual

## Compact Excavator


E60 S/N: B4HV11001 & Above

7427957enGB (A)
May 2021

Printed in Belgium
Original Instructions


S5–B

# OPERATOR SAFETY WARNINGS

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

**SAFETY EQUIPMENT**

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

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

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

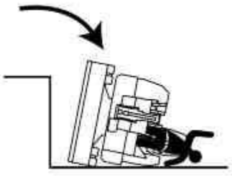
**• Fasten seat belt securely.**
**• Operate controls only from operator’s seat.**

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

# OPERATOR SAFETY WARNINGS

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

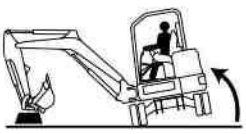
- **Do not grasp controls when entering cab / canopy.**
- **Be sure controls are in neutral before starting.**
- **Sound horn and check behind machine before starting.**



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

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

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



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

- **Never carry riders.**

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

Bobcat®

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## 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**<br>Bobcat<br><br>Bobcat Company<br>World Headquarters<br>250 East Beaton Drive<br>West Fargo, ND 58078–6000<br>United States of America | **Directive 2000/14/EC: Noise Emission in the Environment by Equipment For Use Outdoors**<br><br>**Notified Body**<br><br>Technical and Test Institute for Construction Prague<br>Czech Republic<br>Notified Body Number: 1020<br><br>**EC Certificate No.**<br><br>1020-090-022395 |
| **Technical Documentation**<br><br>Homologation Manager<br>Doosan Bobcat EMEA s.r.o<br>U Kodetky 1810<br>26312 Dobris<br>Czech Republic | **Conformity Assessment Procedure(s)**<br><br>2000/14/EC, Annex VIII, Full Quality Assurance<br><br>**Sound Power Levels [Lw(A)]**<br><br>Measured Sound Power **96.3 db(A)**<br><br>Guaranteed Sound Power **97 db(A)** |
| **Description of Equipment**<br><br>Type of Equipment: Excavator<br>Model Name: E60<br>Model Code: B4HV<br><br>Engine Manufacturer: Bobcat Company<br>Engine Model: DM02VB DM02-MFE01<br>Engine Power: 41.0 kW @ 2200 rpm | **Equipment conforms to CE Directive(s) Listed Below**<br><br>2006/42/EC: Machinery Directive<br>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:**

26 March 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)

Continental

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

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

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

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

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

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

   Additional relevant Union harmonisation legislation:
   **None.**

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

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

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

9. Additional information:
   **None.**

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

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

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

## DECLARATION OF CONFORMITY (HYDROFLUOROCARBON)

C201133

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

www.doosanbobcat.com

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

We Doosan Bobcat s.r.o. with VAT number CZ26489201, acting in its capacity as EU representative for the import of goods from CLARK EQUIPMENT COMPANY doing business as BOBCAT COMPANY, a corporation organized under the laws 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.

Miguel Mallo Marcos

27th March, 2019

## INTRODUCTION

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

### Bobcat Company Is ISO 9001 Certified

NA3495c

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

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

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

## MANUFACTURING LOCATIONS

### North America

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

### Czech Republic

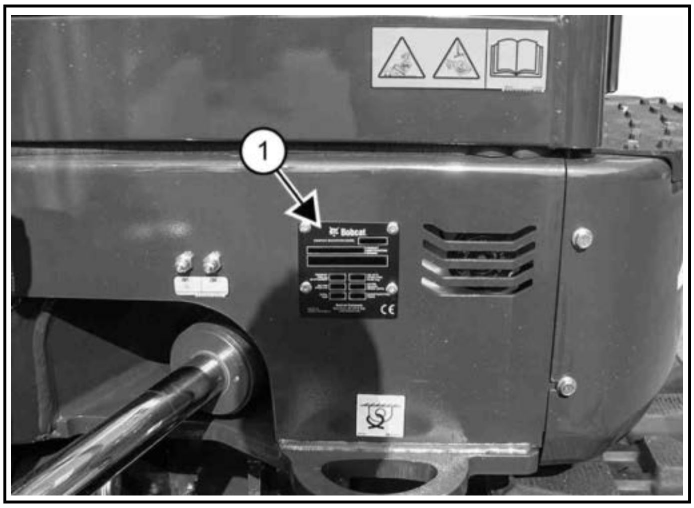
Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
263 12 Dobřiš
Czech Republic

## SERIAL NUMBER LOCATIONS

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

### Machine Serial Number Location

**Figure 1**

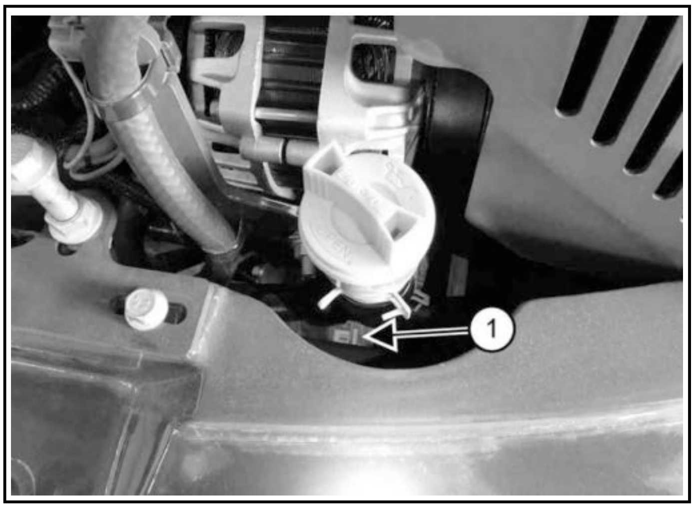



C206254a

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**




P200119

The engine serial number (Item 1) [Figure 2] is located on the side of the engine under the oil fill cap.

## DELIVERY REPORT

**Figure 3**


Bobcat
Delivery Report
SERIAL NUMBER | MODEL NUMBER | DELIVERY DATE
WARNING

NA15473

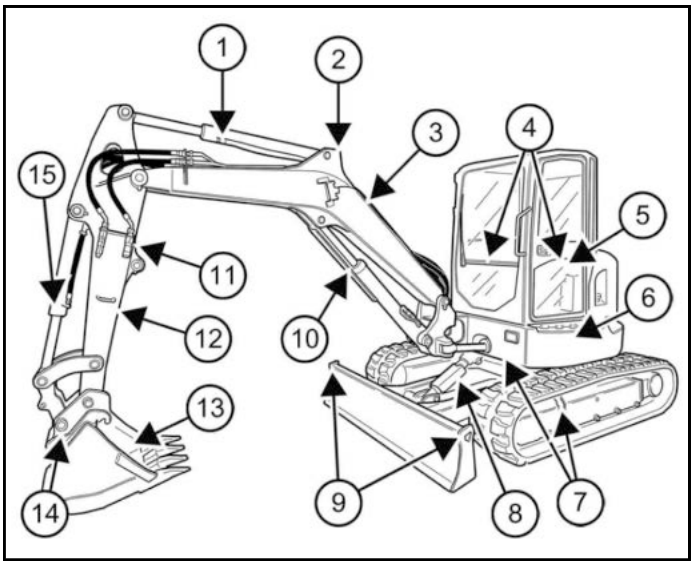
The delivery report contains a list of items that must be explained or shown to the owner or operator by the dealer when the machine is delivered.

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

## EXCAVATOR IDENTIFICATION

### Front View

**Figure 4**



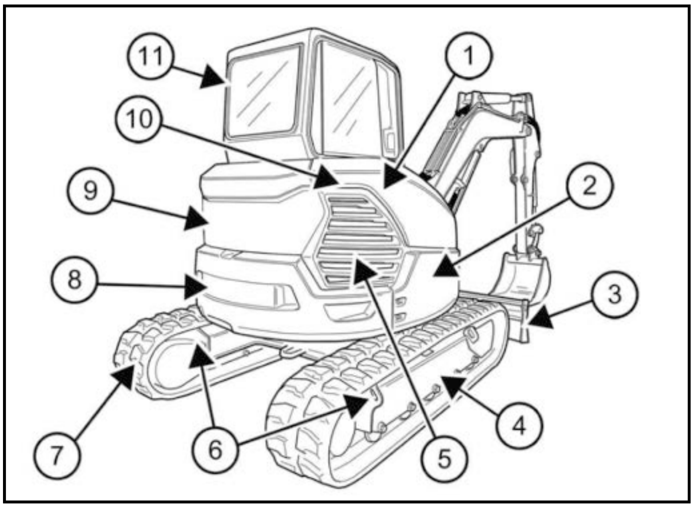

NA18172f

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

[A] Several different buckets and other attachments are available.
[B] Optional attachment couplers are available.

### Rear View

**Figure 5**




NA18173b

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

[A] Optional tracks are available.
[B] Canopy is not available in all areas. Contact your local Bobcat dealer for more information.
[C] Roll-Over Protective Structure (ROPS) per ISO 12117-2 / Tip-Over Protective Structure (TOPS) per ISO 12117. 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
- Arm-Mounted Auxiliary Hydraulics and Quick Couplers
- Auto-Shift Drive Motors
- Battery Disconnect Switch
- Cab with ROPS / TOPS / FOPS Approval
- Counterweight (Heavy)
- Deluxe Cloth Suspension Heated Seat With Headrest
- Dozer Blade (1960 mm (77.2 in))
- Engine and Hydraulic System Monitor with Shut Down
- Engine Speed Control Dial with Auto Idle Feature
- Fuel Filter with Water Bowl
- Horn
- Hydraulic and Travel Control Lockouts
- Hydraulic Joystick Controls
- Keyless Start
- Long Arm
- Pin-On X-Change
- Retractable Seat Belt
- Rubber Tracks (400 mm (15.7 in))
- Standard Display
- Two-Speed Travel
- Upperstructure 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.

- Angle Blade
- Attachment Quick Coupler – German Style
- Attachment Quick Coupler – Hydraulic Pin Grabber
- Attachment Quick Coupler – Hydraulic Quick Coupler
- Attachment Quick Coupler – Klac™ System
- Attachment Quick Coupler – Mechanical Pin Grabber
- Beacon Kit
- Cab With Heater and HVAC
- Case Drain Kit
- Counterweight (Add On)
- Depth Check Kit
- Direct to Tank Kit
- Engine Louvre
- Front Guard Kit
- Fuel Transfer Pump
- Hydraulic (Automatic) Track Tensioning
- Load Holding Valve - Arm
- Load Holding Valve - Boom
- Overload Warning Device
- Radio
- Rear Mounted Lights
- Rearview Camera
- Secondary, Third, and Fourth Auxiliary Hydraulics
- Segmented Tracks
- Side Mirror
- Standard Arm
- Steel Tracks
- Strobe Light
- Touch Screen Display
- Travel Motion Alarm

### Attachments

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

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

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

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

### Buckets Available

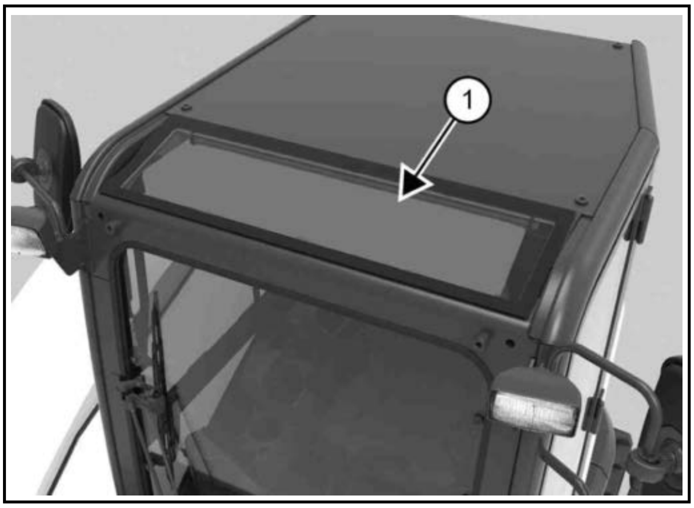
Increase the versatility of your excavator with a variety of bucket sizes.

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**




C133135c

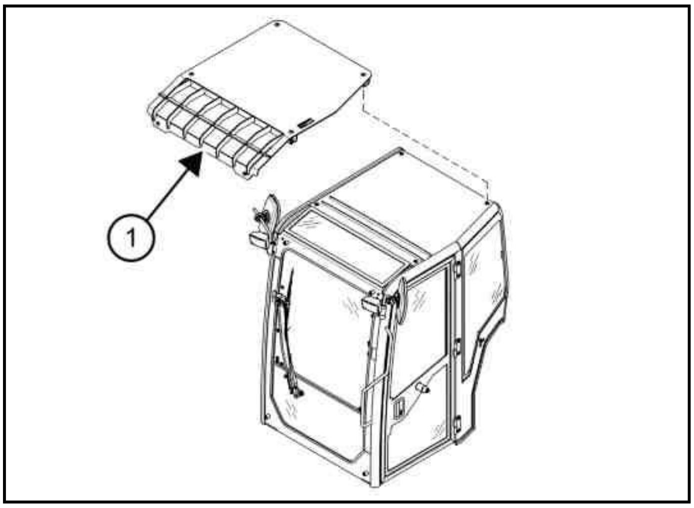
The top window (Item 1) [Figure 6] is a Falling-Object Protective Structure (FOPS) that meets the top guard requirements of FOPS Level 1 per ISO 10262.

There is a kit available that meets FOPS Level 2 per ISO 10262. (See Top Guard (FOPS II) Kit on Page 18)

See your Bobcat dealer for more information.

**Top Guard (FOPS II) Kit**

**Figure 7**



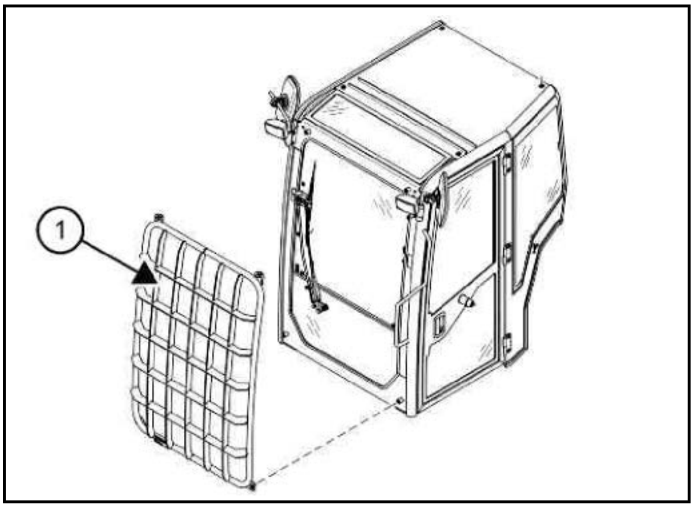

NA13738b

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

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

**Front Guard Kit**

**Figure 8**




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

Carefully follow the operating and maintenance instructions in this manual.

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

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

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

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

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

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

### Safe Operation Is The Operator's Responsibility

**⚠ Safety Alert Symbol**

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

**⚠ WARNING**

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

W-2001

**⚠ IMPORTANT**

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

I-2019

**⚠ WARNING**

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

W-2044

**⚠ DANGER**

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

D-1002

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

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

### Safe Operation Needs A Qualified Operator

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

### A Qualified Operator Must Do The Following

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

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

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

**Silica Dust Exposure**

NA3504

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

**FIRE PREVENTION**

NA3505

**Maintenance**

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

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

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

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

**Operation**

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

**Electrical**

P200082

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

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

**Hydraulic System**

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

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

**Fuelling**

P200084

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

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

**Starting**

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

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

**Exhaust System**

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

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

**Welding And Grinding**

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

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

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

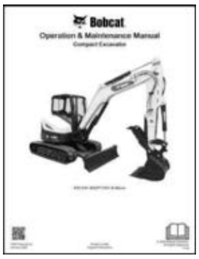
**Fire Extinguishers**

P200083

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

## PUBLICATIONS AND TRAINING RESOURCES

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




OPERATION & MAINTENANCE MANUAL

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

7427957enGB


SERVICE MANUAL

Complete maintenance instructions for your Bobcat excavator.

7427958enUS


OPERATOR'S HANDBOOK

Gives basic operation instructions and safety warnings.

7407666enUS


TOUCH DISPLAY USER GUIDE

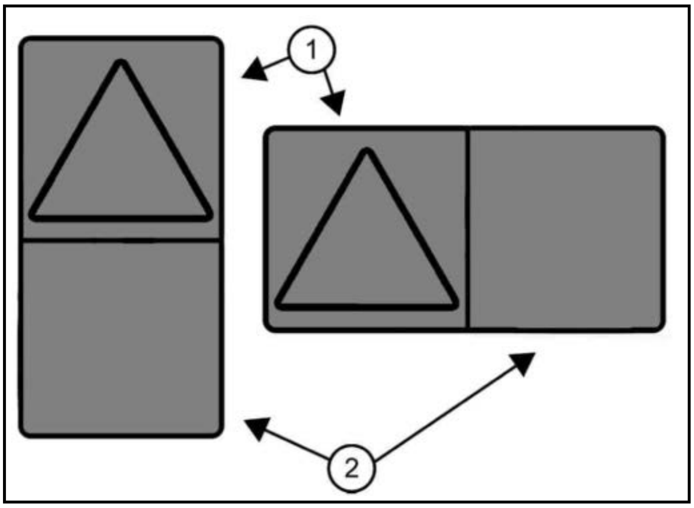
Gives instructions for pairing a cellular phone with the touch display and for operating the sound system on the touch display.

7326266enUS

## PICTORIAL ONLY SAFETY SIGNS

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

**Figure 9**




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.

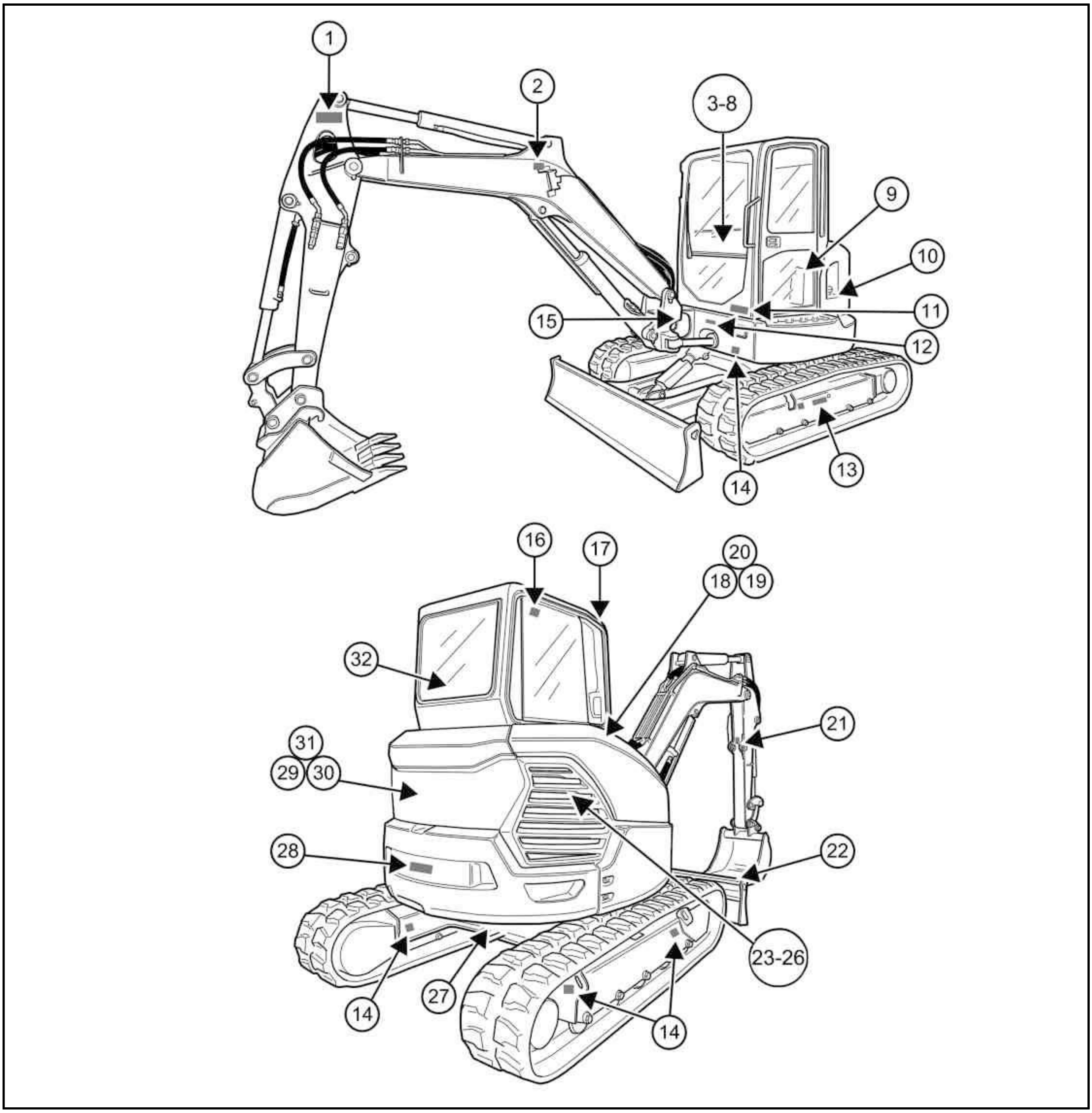
**Avoidance Panels:** Depict actions required to avoid the hazards.

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

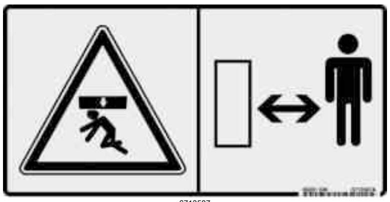
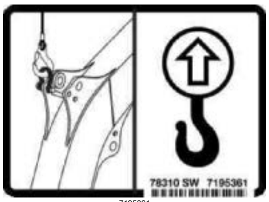
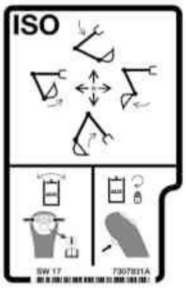
**MACHINE SIGNS (DECALS)**

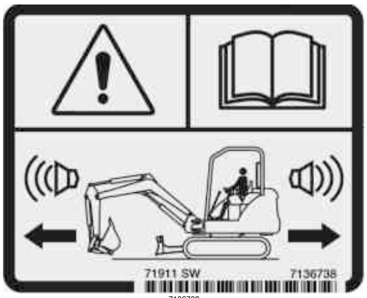
Follow the instructions on all Machine Signs (Decals) that are on the machine. Replace any damaged machine signs and be sure they are in the correct locations. Machine signs are available from your Bobcat dealer.

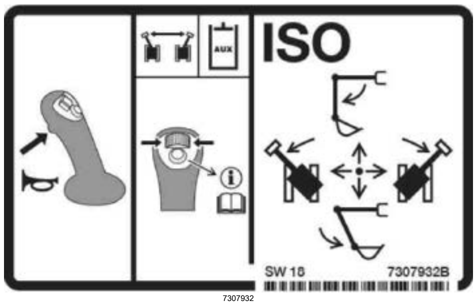
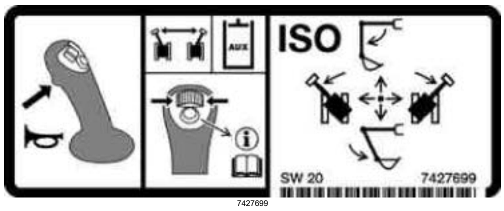
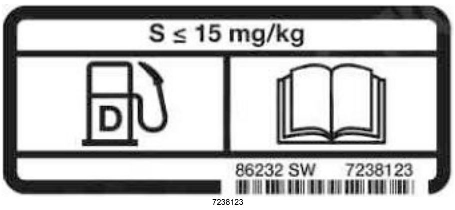
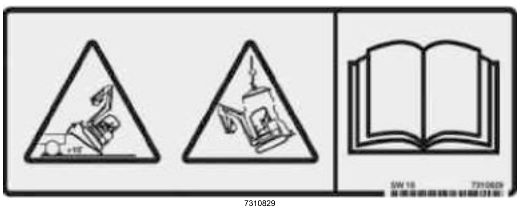
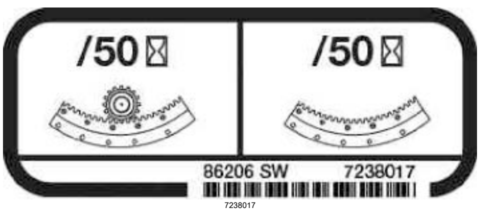
**Figure 10**

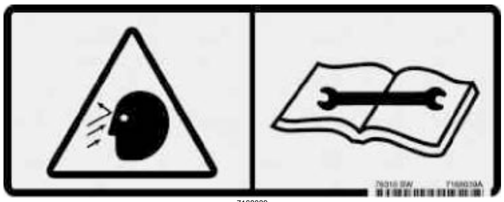



NA18172k

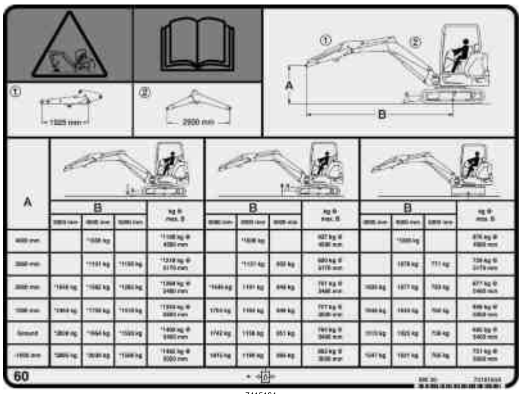
| REF | DECAL | WARNING<br>(IF APPLICABLE) |
|---|---|---|
| 1 | Stay Clear (6713507)<br><br>6713507 | **⚠ WARNING**<br>**GENERAL HAZARD**<br>**Failure to follow instruction can cause serious injury or death.**<br>**Keep away from the operating machine.** ◂<br>W-2520 |
| 2 | Lift Point (7195361) (2)<br><br>7195361 | |
| 3 | ISO Control Pattern for Right Joystick (7307931 or 7350091)<br><br>7307931 | **⚠ WARNING**<br>**UNINTENDED MOVEMENT HAZARD**<br>**Failure to follow instructions can cause serious injury or death. Know the control pattern before operating.**<br>**Read and understand the Operation & Maintenance manual before operating the machine.** ◂<br>W-3022 |
| 4 | Engine Speed Control Dial / Angle Blade Control Lever (7240698 or 7240699)<br><br>7240698<br><br>7240699 | |

| REF | DECAL | WARNING<br>(IF APPLICABLE) |
|---|---|---|
| 5 | Motion Alarm (7136738) (if equipped)<br><br>7136738 | **WARNING**<br>**CRUSHING HAZARD**<br>**Failure to maintain a clear view in the direction of travel can cause serious injury or death.**<br>• **This machine is equipped with a motion alarm. ALARM MUST SOUND! when operating forward or backward.**<br>• **The operator is responsible for the safe operation of this machine.◂**<br>W-2786 |
| 6 | General Warnings (7148158)<br><br>7148158 | **WARNING**<br>**GENERAL HAZARD**<br>**Failure to follow instructions can cause serious injury or death.**<br>**Read and understand the Operation & Maintenance Manual and Handbook before operating excavator.**<br>• **Keep away from drop-offs, steep areas or banks that could break away.**<br>• **Explosion or electrocution can occur if machine contacts utility lines or pipes. Check for overhead or underground lines before operating.**<br>• **Keep bystanders away. No riders. Check location of blade for direction of travel before moving steering controls.**<br>• **Operate machine from operators position only.**<br>**To Leave Excavator**<br>**1. Lower attachment and blade to ground.**<br>**2. Stop engine and remove the key (if equipped.)**<br>**3. Raise control console.◂**<br>W-2518 |
| 7 | Operator's Handbook (7236492)<br><br>7236492 | |
| 8 | Start Switch (7186708)<br><br>7186708 | |

| REF | DECAL | WARNING (IF APPLICABLE) |
|---|---|---|
| 9 | ISO Control Pattern for Left Joystick (7307932 for E50z and E55z) or (7427699 for E60)<br><br><br><br> | **⚠ WARNING**<br>**UNINTENDED MOVEMENT HAZARD**<br>**Failure to follow instructions can cause serious injury or death. Know the control pattern before operating.**<br>**Read and understand the Operation & Maintenance manual before operating the machine.◂**<br>W-3022 |
| 10 | Ultra Low Sulfur Diesel Fuel (7238123)<br><br> | |
| 11 | Transporting and Lifting (7178215)<br><br> | **⚠ WARNING**<br>**GENERAL HAZARD**<br>**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.◂**<br>W-2517 |
| 12 | Remote grease location (7238017)<br><br> | |

| REF | DECAL | WARNING (IF APPLICABLE) |
|---|---|---|
| 13 | High Pressure Grease (7168039) (2)<br><br>7168039 | **⚠ WARNING**<br>**INJECTION HAZARD**<br>**High pressure grease can penetrate skin and eyes, causing serious injury.**<br>**Do not loosen the track tension fitting more than 1 - 1/2 turns.**<br>W-2994 |
| 14 | Tie-Down (6595014) (9)<br><br>6595014 | |
| 15 | Battery Shut-Off Switch (7342035)<br><br>7342035 | |
| 16 | Emergency Exit (7169014) (cab models only)<br><br>7169014 | |
| 17 | Not a Lift Point (7359393) (cab models only)<br><br>7359393 | |

| REF | DECAL | WARNING (IF APPLICABLE) |
|---|---|---|
| 18 | Lift Capacity (7430993, 7415164, or 7415165) | |



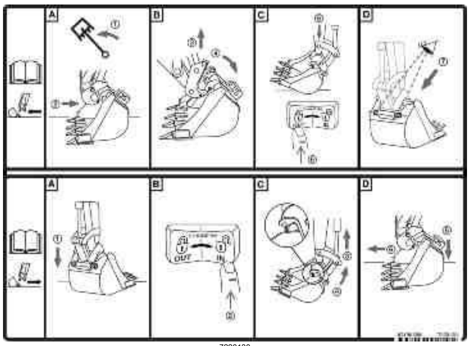
7415164

**WARNING**

**INSTABILITY HAZARD**
**Overload can cause tipping or rollover leading to serious injury or death.**
- **Do not lift or hold any load that exceeds these ratings at their specific load radii and height.**
- **Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.**
- **Read and understand the Operation & Maintenance Manual for more information.**

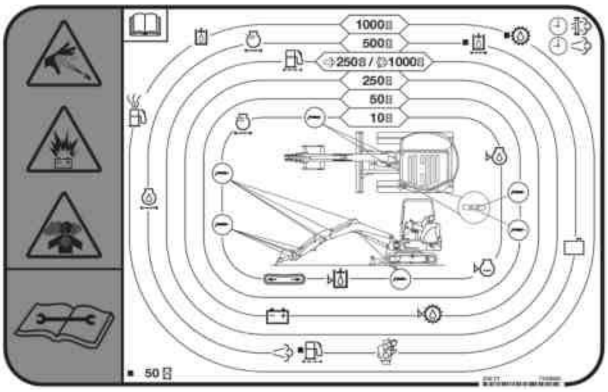
W-2519

| REF | DECAL | WARNING (IF APPLICABLE) |
|---|---|---|
| 19 | Installing and Removing Attachment (7240582, 7313768, 7174312, 7139000, or 7428649) | |



7220130

| REF | DECAL | WARNING (IF APPLICABLE) |
|---|---|---|
| 20 | Service Schedule (7438606) | |

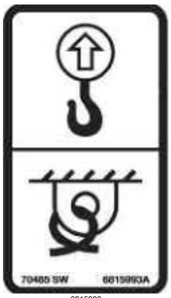
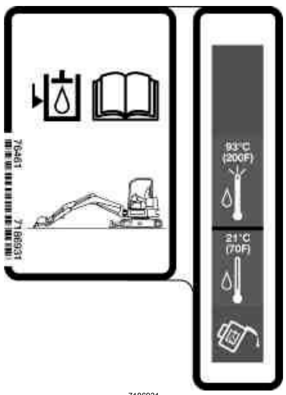


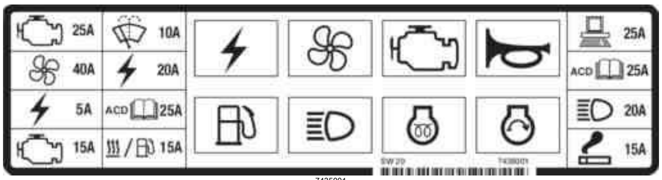
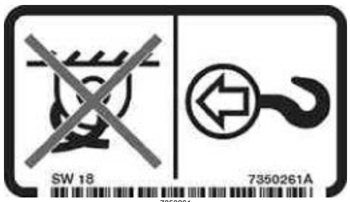
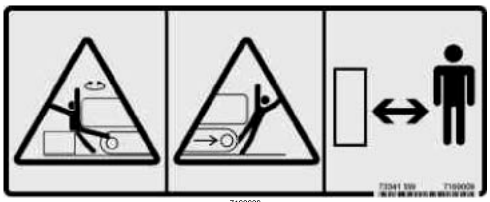

7438606

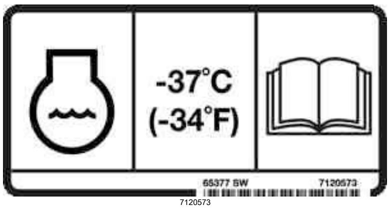
**WARNING**

**GENERAL HAZARD**
**Failure to follow instructions can cause serious injury or death.**
- **Leaking fluids under pressure can enter skin. Immediate medical attention is required. Wear goggles. Use cardboard to check for leaks.**
- **Battery makes flammable and explosive gas. Keep arcs, sparks, flames, and lighted tobacco away. Keep away from electrical contacts.**
- **Keep away from fan and moving parts. DO NOT operate with guard removed.**
- **All exhaust gases can kill. Always operate machine in a well ventilated area.**
- **Read and understand the Operation & Maintenance Manual for more information.**

W-2522

| REF | DECAL | WARNING (IF APPLICABLE) |
|---|---|---|
| 21 | Not a Lift Point (7282101)   7282101 | |
| 22 | Lift Point / Tie-Down (6815993) (2)   6815993 | |
| 23 | Hot Surface Warning (7185935)  7185935 | **WARNING** **BURN HAZARD** **Failure to follow instructions can cause serious burns.** **Stop the engine and allow it to cool before removing the radiator cap or adding coolant.◂** W-2070 |
| 24 | Check Hydraulic Level (7186931)   7186931 | |

<table>
<tr><th>REF</th><th>DECAL</th><th>WARNING<br>(IF APPLICABLE)</th></tr>
<tr><td>25</td><td>Hydraulic Oil (7120570)<br><br><br>7120570</td><td></td></tr>
<tr><td>26</td><td>Fuse / Relay (7435001 for E50z and E55z) or (7451008 for E60)<br><br><br>7435001</td><td></td></tr>
<tr><td>27</td><td>Tow Point Only (7350261)<br><br><br>7350261</td><td></td></tr>
<tr><td>28</td><td>Stay Clear (7169009)<br><br>7169009</td><td>WARNING<br>CRUSHING HAZARD<br>Contact with machine can cause property damage, serious injury or death.<br>• Keep out of swing area or travel path.<br>• Always look in the direction of travel.<br>• Make sure swing area is clear of bystanders and objects.<br>W-2775</td></tr>
<tr><td>29</td><td>High Pressure Gas (7169291) (3)<br><br><br>7169291</td><td>WARNING<br>IMPACT HAZARD<br>Opening cylinder can release rod and cause serious injury or death.<br>• Contents under high pressure.<br>• Do not open.<br>• See Service Manual for additional information.<br>W-2523</td></tr>
</table>

| REF | DECAL | WARNING (IF APPLICABLE) |
|---|---|---|
| 30 | Engine Coolant (7120573)<br> | |
| 31 | Rotating Parts and Hot Surfaces (7243563)<br> | **WARNING**<br>**CUTTING AND BURN HAZARD**<br>**Keep away from the operating machine.**<br>• **Keep away from fan and moving parts. Do not operate with guard removed.**<br>• **Do not touch hot surfaces. Allow to cool before servicing.◂**<br>W-2521 |
| 32 | Operator's Manual Location (6732148)<br> | **WARNING**<br>**INSUFFICIENT INSTRUCTIONS HAZARD**<br>**Untrained operators or failure to follow instructions can cause serious injury or death. Read and understand the Operation & Maintenance Manual before operating the machine.◂**<br>W-3021 |

## INTENDED USE

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

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

Some examples of intended use include:

| | |
|---|---|
| Excavating |  |
| Excavating |  |
| Boom Swing |  |
| Rotating the Upperstructure |  |

| | |
|---|---|
| Loading Material |  |
| Backfilling |  |

**⚠ WARNING**

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

W-2374

**⚠ DANGER**

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

- **Check the work area for buried electrical, gas, utility, or other service lines before excavating or operating ground engaging equipment.**
- **Follow all local rules and regulations regarding digging or working in areas around underground utilities. Have all underground utility lines clearly marked before operating.◂**

1221-7BFCF43B

**⚠ WARNING**

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

W-2119

**⚠ IMPORTANT**

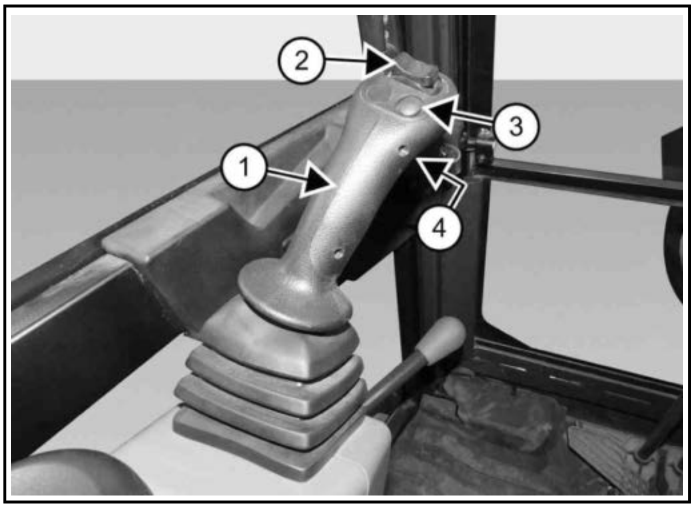
**MACHINE DAMAGE HAZARD**
**Failure to follow instructions could result in damage to the blade and undercarriage components.**
**Avoid impacting objects with the blade.◂**

I-2256

## INSTRUMENTS AND CONSOLES

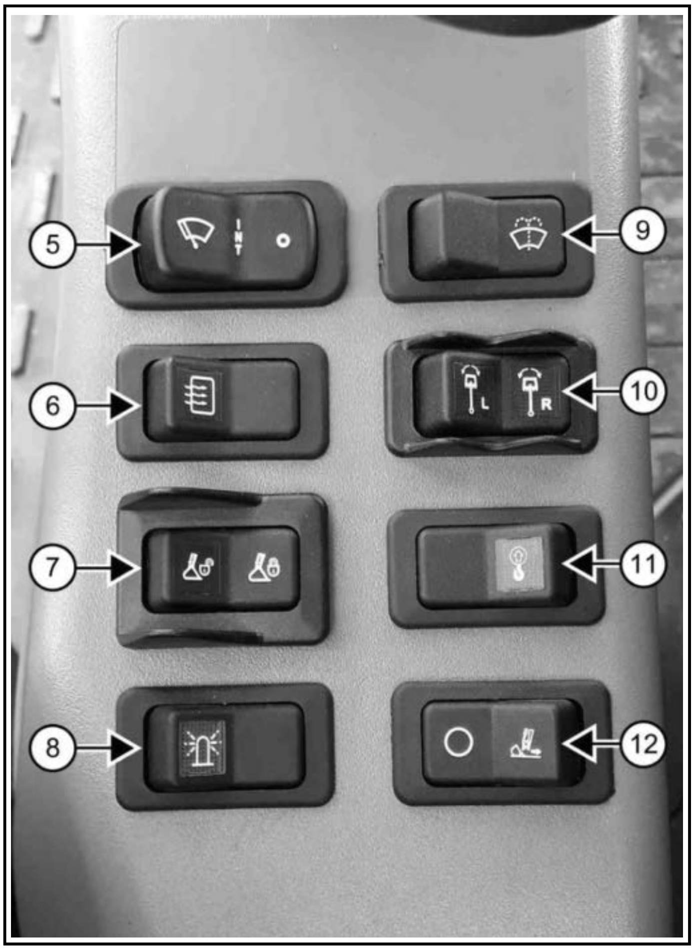
### Left Console

**Figure 11**




C206181b

**Figure 12**

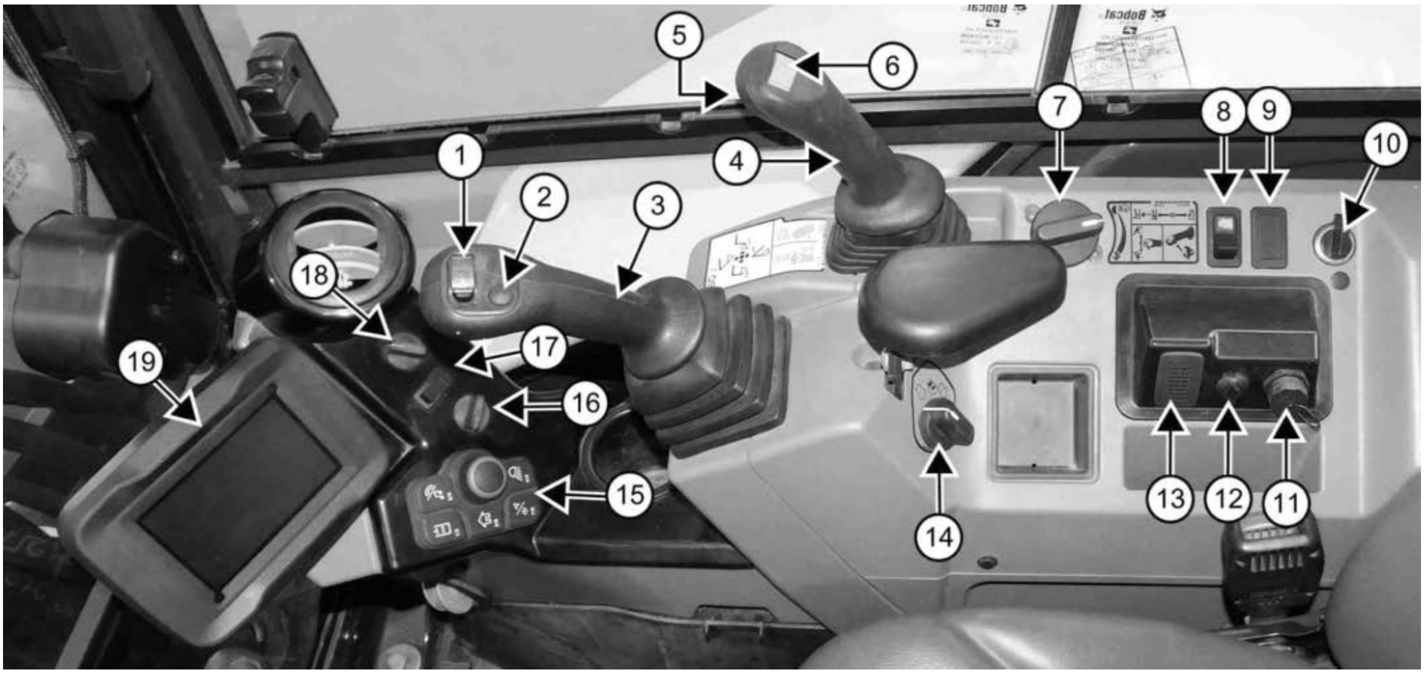



C208239a

| REF | DESCRIPTION | FUNCTION |
|---|---|---|
| 1 | Left Joystick | Operates the hydraulic controls. (See Hydraulic Controls on Page 54) |
| 2 | Left Joystick Switch | Controls boom swing and auxiliary hydraulics. (See Enabling Boom Swing on Page 73) (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59) |
| 3 | Left Joystick Button | Toggles between boom swing and auxiliary hydraulics (if equipped). (See Enabling Boom Swing on Page 73) (See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59) |
| 4 | Horn | Sounds the horn. |
| 5 | Windshield Wiper | Operates windshield wiper. |
| 6 | Rear Windshield Heat | Operates rear windshield heater. |
| 7 | Hydraulic Quick Coupler On / Off Switch (if equipped) | Retracts and extends hydraulic pins. (See Installing Attachments (Hydraulic Quick Coupler) on Page 99) |
| 8 | Beacon / Strobe Light (if equipped) | Turns beacon / strobe light on and off. |
| 9 | Windshield Washer | Operates windshield washer. |
| 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 60) |
| 11 | Overload Warning Device Switch (if equipped) | Operates the overload warning device. (See Overload Warning Device on Page 64) |
| 12 | Hydraulic Quick Coupler Intent Switch (if equipped) | Initiates quick coupler install or remove mode. (See Installing Attachments (Hydraulic Quick Coupler) on Page 99) |

**Right Console**

**Figure 13**




C206171a

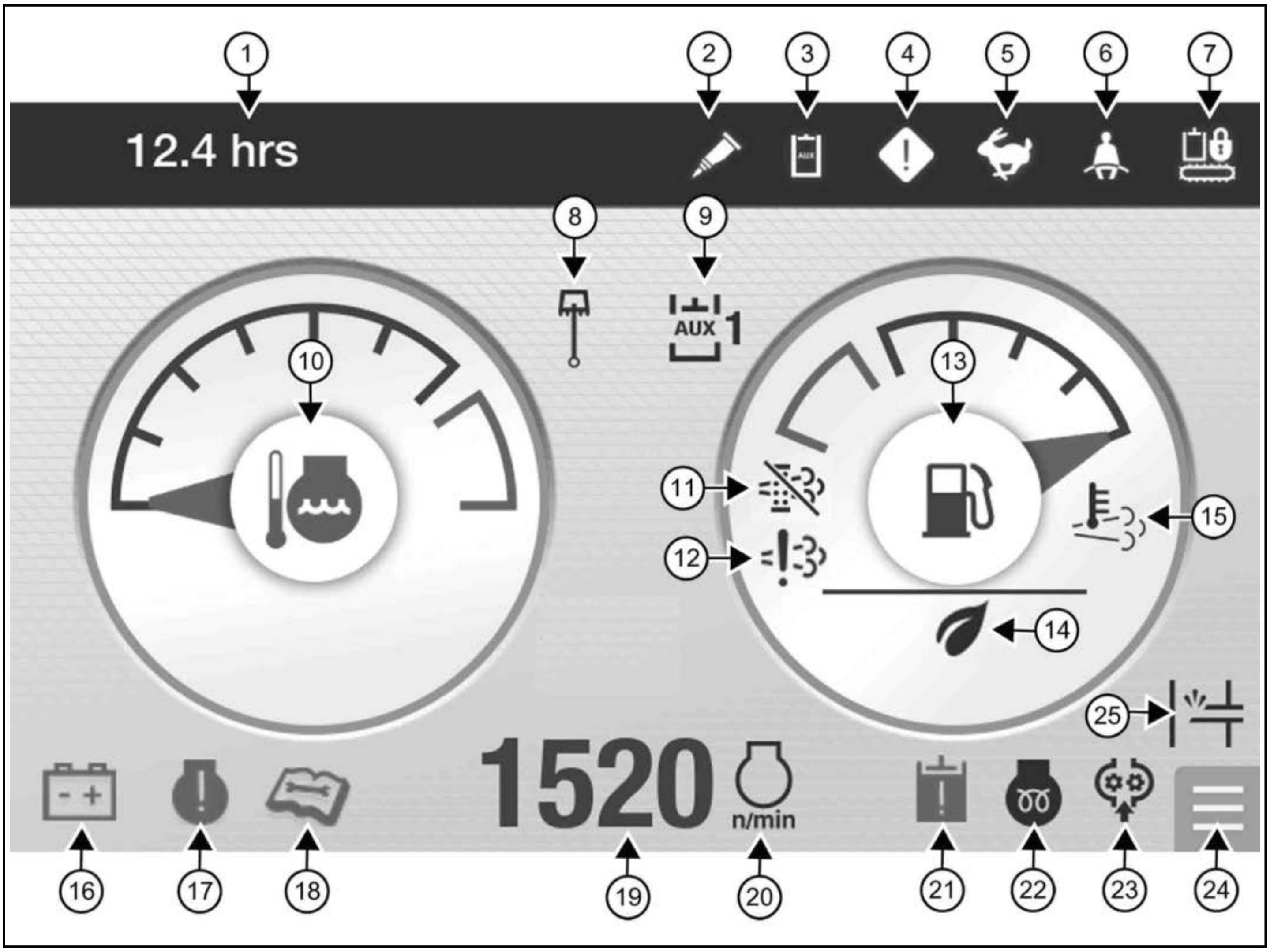
| REF. | DESCRIPTION | FUNCTION |
|---|---|---|
| 1 | Right Joystick Switch | Controls auxiliary hydraulics.<br>(See Operating Attachments With Primary Auxiliary Hydraulics on Page 56)<br>(See Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics on Page 60) |
| 2 | Right Joystick Button | Toggles between rear view camera (if equipped) and current screen on the display. (See Operating Rear View Camera on Page 200)<br>Used to bench the Depth Check system (if equipped).<br>(See Depth Check (Standard Display) on Page 112)<br>(See Depth Check (Touch Display) on Page 125) |
| 3 | Right Joystick | Operates the hydraulic controls. (See Hydraulic Controls on Page 54) |
| 4 | Blade Control Lever | Raises and lowers the blade. (See Blade Control Lever on Page 65) |
| 5 | Two-Speed Button (With Angle Blade Option) | Engages and disengages high range travel speed (if angle blade is equipped).<br>(See Engaging Two-Speed Travel (With Angle Blade Option) on Page 47) |
| 6 | Angle Blade Switch (With Angle Blade Option)<br>Two-Speed Button (Without Angle Blade Option) | Operates the angle blade (if angle blade is equipped).<br>(See Angle Blade on Page 65)<br>Engages and disengages high range travel speed (if angle blade is not equipped).<br>(See Engaging Two-Speed Travel (Without Angle Blade Option) on Page 46) |
| 7 | Engine Speed Control Dial | Controls engine rpm. (See Engine Speed Control on Page 72) |
| 8 | Travel Motion Alarm Cancel Switch | Temporarily disables the travel motion alarm.<br>(See Disabling The Travel Motion Alarm on Page 52) |
| 9 | Wait To Start Light | When light turns off, the engine can be started.<br>(See Starting The Engine on Page 77) |
| 10 | Auxiliary Power Outlet | 12 volt receptacle for accessories. |

| REF. | DESCRIPTION | FUNCTION |
|---|---|---|
| 11 | USB Port (if equipped) | See the Touch Display User Guide for more information about the sound system. |
| 12 | 3,5 mm (1/8 in) Auxiliary Input Jack (if equipped) | |
| 13 | Hands-Free Microphone (if equipped) | Used for hands-free talking with the touch display phone feature. |
| 14 | Key Switch or Keyless Start Switch | Used to start the engine. (See Starting The Engine on Page 77) |
| 15 | Jog Shuttle | Used to navigate the display.<br>(See Jog Shuttle (Standard Display) on Page 40)<br>(See Jog Shuttle (Touch Display) on Page 41) |
| 16 | Fan Motor Dial (if equipped) | Controls fan speed. |
| 17 | Air Conditioning Switch (if equipped) | Turns air conditioner on / off. |
| 18 | Temperature Control Dial (if equipped) | Controls temperature in cab. |
| 19 | Standard Display Screen | (See Standard Display on Page 36) |
| | Touch Display Screen | (See Touch Display on Page 38) |

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

**Standard Display**

**Figure 14**




NA3767e

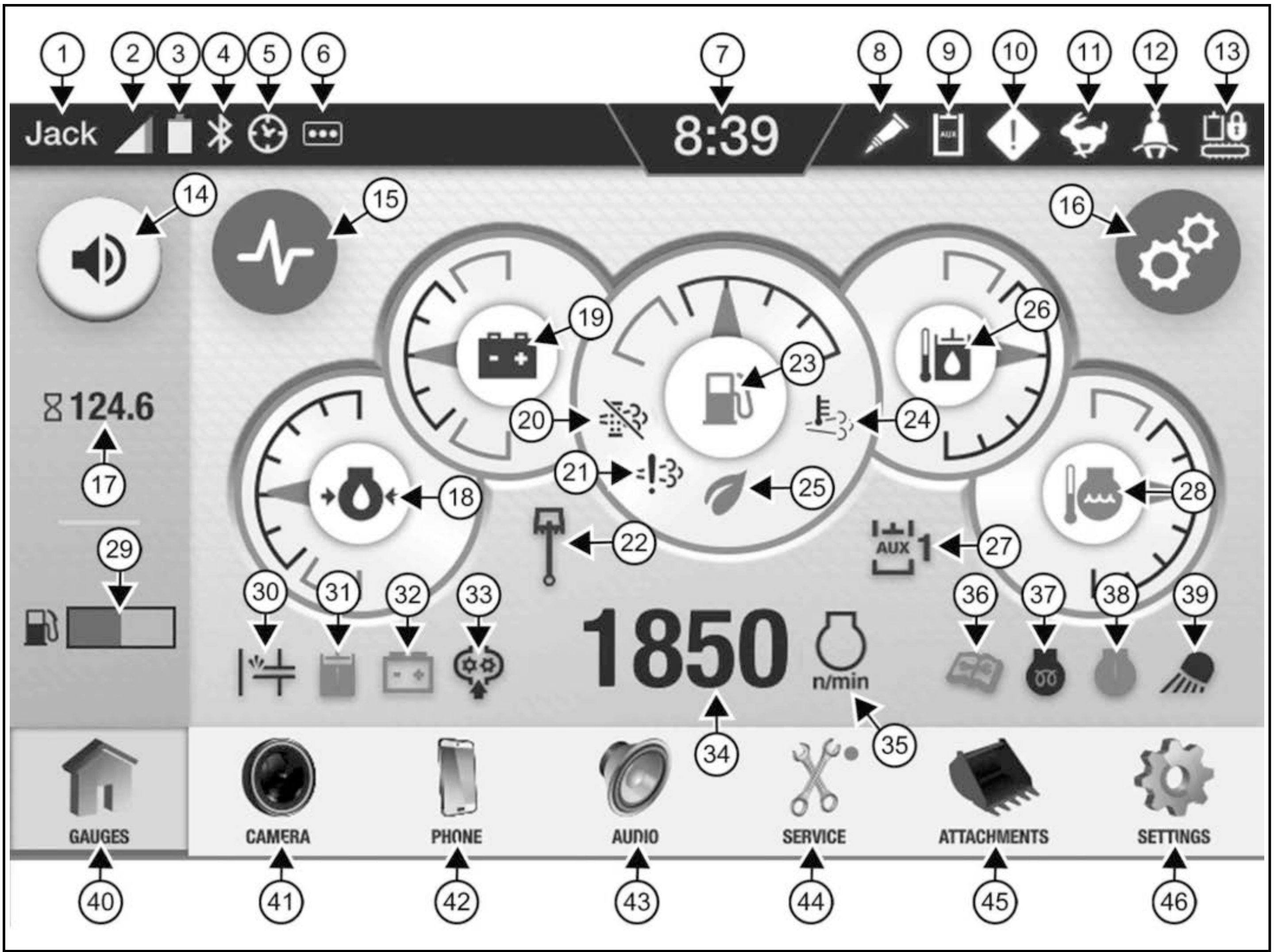
The standard display is a visual interface that provides control of certain machine settings and operating information through the use of a jog shuttle. The standard display is scratch resistant and weather resistant.

| REF | DESCRIPTION | FUNCTION |
|---|---|---|
| 1 | Machine Hours | Shows machine operating hours. |
| 2 | Direct To Tank | Indicates Direct To Tank feature has been activated. |
| 3 | Auxiliary Hydraulics | Indicates Auxiliary Hydraulics are activated. The icon changes when detent flow is activated.<br>(See Operating Attachments With Primary Auxiliary Hydraulics on Page 56) |
| 4 | General Warning | Indicates a malfunction of one or more machine functions. |
| 5 | High Range | Indicates high range is activated. (See Two-Speed Travel on Page 46) |
| 6 | Seat Belt Reminder | Illuminates as a reminder to fasten the seat belt. |
| 7 | Control Console Raised | Indicates the left console is raised and hydraulic controls are locked out.<br>(See Raising And Lowering The Console on Page 46) |

| REF | DESCRIPTION | FUNCTION |
|---|---|---|
| 8 | Boom Swing or Auxiliary Hydraulics (if equipped) | Indicates what control the left joystick switch is operating.<br>(See Boom Swing on Page 73)<br>(See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59)<br>(See Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics on Page 60) |
| 9 | Boom Swing or Auxiliary Hydraulics (if equipped) | Indicates what control the right joystick switch is operating.<br>(See Boom Swing on Page 73)<br>(See Operating Attachments With Primary Auxiliary Hydraulics on Page 56)<br>(See Operating Attachments With Primary, Secondary, And Fourth 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.<br>(See Diesel Particulate Filter (DPF) System on Page 66) |
| 12 | Emissions Error | Indicates emissions regulating system malfunction.<br>(See Diesel Particulate Filter (DPF) System on Page 66) |
| 13 | Fuel Gauge | Shows the amount of fuel in the tank. Icon illuminates to indicate a malfunction. |
| 14 | Eco Mode | Indicates Eco Mode is activated. (See Eco Mode on Page 72) |
| 15 | High Exhaust System Temperature (HEST) | Indicates the exhaust temperature is higher than normal operation temperature.<br>(See Diesel Particulate Filter (DPF) System on Page 66) |
| 16 | Battery Warning | Indicates battery voltage is low. |
| 17 | Engine Warning | Indicates the engine has malfunctioned. |
| 18 | Service Due | Indicates scheduled maintenance is due. |
| 19 | Engine RPM | Shows engine RPM. |
| 20 | Throttle Indicator | Manual throttle icon changes to Auto icon when Auto Idle is activated.<br>(See Auto Idle on Page 48) |
| 21 | Hydraulic Warning | Indicates hydraulic fluid temperature is high. |
| 22 | Glow Plugs | Indicates glow plugs are active. |
| 23 | Secondary Auxiliary Hydraulics | Indicates Secondary Auxiliary Hydraulics are activated.<br>(See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59) |
| 24 | Navigation Handle | Brings up the navigation bar. (See Opening Navigation Bar on Page 194) Any active shortcuts will be displayed. (See Active Shortcuts on Page 194) |
| 25 | Fuel Priming | Indicates fuel priming is in process. |

**Touch Display**

**Figure 15**




NA3384s

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

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

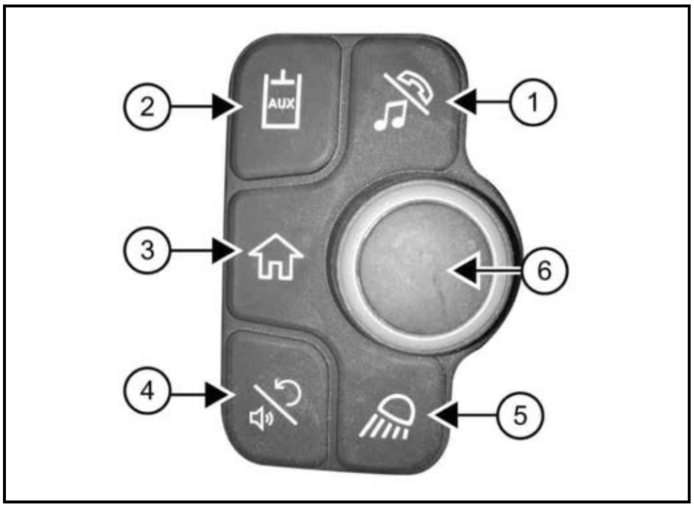
| REF | DESCRIPTION | FUNCTION |
|---|---|---|
| 1 | Operator Name | Shows the user that is currently logged into the system. |
| 2 | Connected Device Signal Strength | Indicates the signal strength of a connected device. |
| 3 | Connected Device Battery Strength | Indicates the battery strength of a connected device. |
| 4 | Bluetooth® Device | Indicates a Bluetooth Device has been connected. |
| 5 | Job Clock | Indicates one of the job clocks is running.<br>(See Using The Job Clock on Page 213) |
| 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.<br>Provides access to Notification Drawer.<br>(See Notification Drawer on Page 199) |
| 8 | Direct To Tank | Indicates Direct To Tank feature has been activated. |
| 9 | Auxiliary Hydraulics | Indicates Auxiliary Hydraulics are activated. The icon changes when detent flow is activated.<br>(See Operating Attachments With Primary Auxiliary Hydraulics on Page 56) |
| 10 | General Warning | Indicates a malfunction of one or more machine functions. |
| 11 | High Range | Indicates high range is activated. (See Two-Speed Travel on Page 46) |
| 12 | Seat Belt Reminder | Illuminates as a reminder to fasten the seat belt. |
| 13 | Control Console Raised | Indicates the left console is raised and hydraulic controls are locked out. (See Raising And Lowering The Console on Page 46) |
| 14 | Volume | Press to access volume slider bar. |
| 15 | Vitals (Digital Information) | Accesses the gauge information in digital format.<br>(See Accessing Vital Detail And Machine Performance on Page 199) |
| 16 | Machine Settings | Accesses various machine settings. |
| 17 | Machine Hours | Shows machine operating hours. |
| 18 | Engine Oil Pressure Gauge | Shows the engine oil pressure. |
| 19 | Battery Voltage Gauge | Shows the battery voltage. |
| 20 | Diesel Particulate Filter (DPF) | Indicates inhibit mode has been selected. DPF icon will blink when forced regeneration is required. DPF icon will be on during regeneration. (See Diesel Particulate Filter (DPF) System on Page 66) |
| 21 | Emissions Error | Indicates emissions regulating system malfunction.<br>(See Diesel Particulate Filter (DPF) System on Page 66) |
| 22 | Boom Swing or Auxiliary Hydraulics (if equipped) | Icon indicates what the left joystick switch is operating (boom swing, Aux 2, or Aux 4). (See Boom Swing on Page 73)<br>(See Operating Attachments With Secondary Auxiliary Hydraulics on Page 59)<br>(See Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics on Page 60) |
| 23 | Fuel Gauge | Shows the amount of fuel in the tank. |
| 24 | High Exhaust System Temperature (HEST) | Icon is on when the exhaust temperature is higher than normal operation. (See Diesel Particulate Filter (DPF) System on Page 66) |
| 25 | Eco Mode | Indicates Eco mode is activated. (See Eco Mode on Page 72) |
| 26 | Hydraulic Fluid Temperature Gauge | Shows the hydraulic fluid temperature. |
| 27 | Boom Swing or Auxiliary Hydraulics (if equipped) | Icon indicates what the right joystick switch is operating (boom swing, Aux 1, or Aux 4). (See Boom Swing on Page 73)<br>(See Operating Attachments With Primary Auxiliary Hydraulics on Page 56)<br>(See Operating Attachments With Primary, Secondary, And Fourth 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 59) |
| 34 | Engine RPM | Shows engine rpm. |
| 35 | Throttle Indicator | Manual throttle icon changes to Auto when Auto Idle is activated. (See Auto Idle on Page 48) |
| 36 | Service Due | Indicates scheduled maintenance is due. |
| 37 | Glow Plugs | Indicates glow plugs are active. |
| 38 | Engine Warning | Indicates the engine has malfunctioned. |
| 39 | Front Lights | Indicates front lights are on. |
| 40 | Gauges | Accesses **GAUGES** screen. |
| 41 | Camera (if equipped) | Accesses **CAMERA** screen. |
| 42 | Phone | Accesses **PHONE** screen. |
| 43 | Audio | Accesses **AUDIO** screen. |
| 44 | Service | Accesses **SERVICE** screen. |
| 45 | Attachment | Accesses **ATTACHMENT** screen. |
| 46 | Settings | Accesses **SETTINGS** screen. |

**Jog Shuttle (Standard Display)**

**Figure 16**




C206625a

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

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

| REF. | DESC. | FUNCTION |
|---|---|---|
| 1 | Not Used | |
| 2 | Auxiliary Hydraulics | Activates auxiliary hydraulics. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 56) |
| 3 | Gauges | Opens **GAUGES** screen. |
| 4 | Back | Returns to previous screen. |
| 5 | Lights | Turns front lights on and off. |
| 6 | Rotary Knob | Used to navigate between available icons on display. Press knob to select highlighted icon. |

**Using The Jog Shuttle With Standard Display**

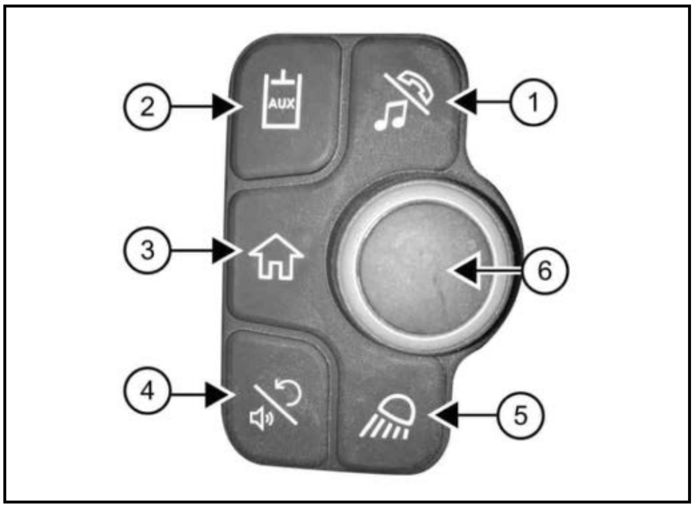
- Turn the rotary knob (Item 6) [Figure 16] to move between the icons on the screen.

  Only icons that highlight on the screen can be selected.

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

**Jog Shuttle (Touch Display)**

**Figure 17**




C206625a

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

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

| REF. | DESC. | FUNCTION |
|---|---|---|
| 1 | Audio / Phone | Toggles between **PHONE** screen and **AUDIO** screen. Also accepts and ends calls. |
| 2 | Auxiliary Hydraulics | Activates auxiliary hydraulics. (See Operating Attachments With Primary Auxiliary Hydraulics on Page 56) |
| 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.<br><br>In volume mode, used to adjust volume. Pressing the rotary knob will mute and unmute audio. |

**Using The Jog Shuttle With Touch Display**

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

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

## REAR VIEW CAMERA SYSTEM

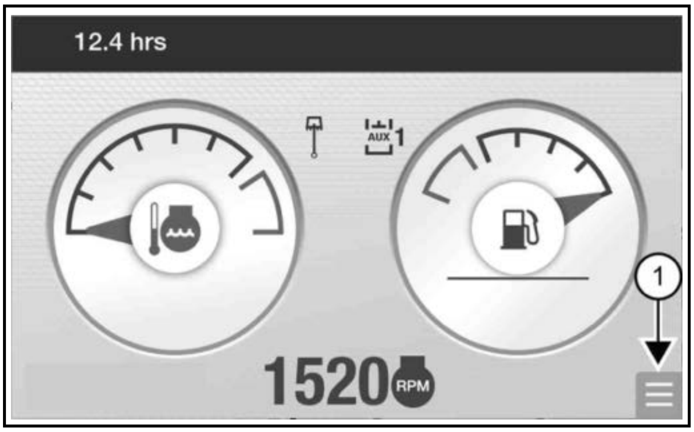
This machine may be equipped with a rear view camera system. The view from the camera is displayed on the display screen.

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

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

### Operating Rear View Camera

**Figure 18**




NA3773a

**Figure 19**


NA3384j

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

  OR

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

**Figure 20**


C206172a

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

**Figure 21**


NA3636c

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

See touch display section for additional features available on that display.
(See Camera (Touch Display) on Page 200)

### Cleaning And Maintaining Rear View Camera

Perform the following daily or as needed:

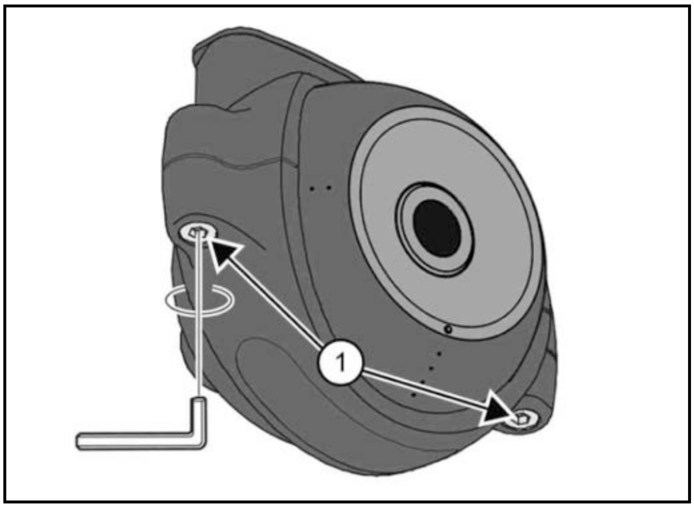
- Clean the lens of the camera using a soft cloth and clean water.
- Remove mud, snow, ice, or other debris that could affect the clear view provided by the camera system.
- Verify proper camera adjustment. Adjust camera if needed.
  (See Adjusting Rear View Camera Position on Page 43)

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

**Adjusting Rear View Camera Position**

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

**Figure 22**




NA3351a

2. Loosen the screws (Item 1) [Figure 22] of the clamp holding the camera.

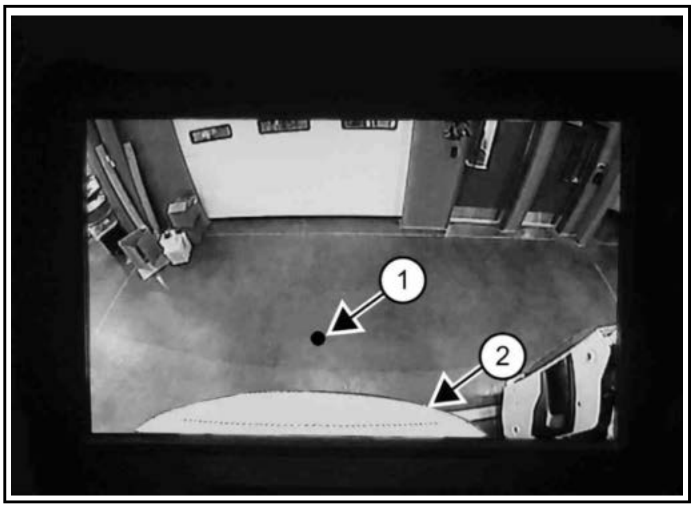
3. Turn the start switch to ON, but do not start the engine.

4. Turn the camera ON.
(See Operating Rear View Camera on Page 42)

5. Compare the camera display with the view through the rear window of the machine. The image should be as a mirror, with an object to the left of the machine appearing on the left of the display.

   See display menu to adjust if needed.

**Figure 23**




C137601a

6. Adjust the camera as follows.

   a. The mark on the ground (Item 1) [Figure 23] should be visible on the display.

   b. The tailgate (Item 2) [Figure 23] should be just visible on the display.

   c. The camera should be centred left and right.

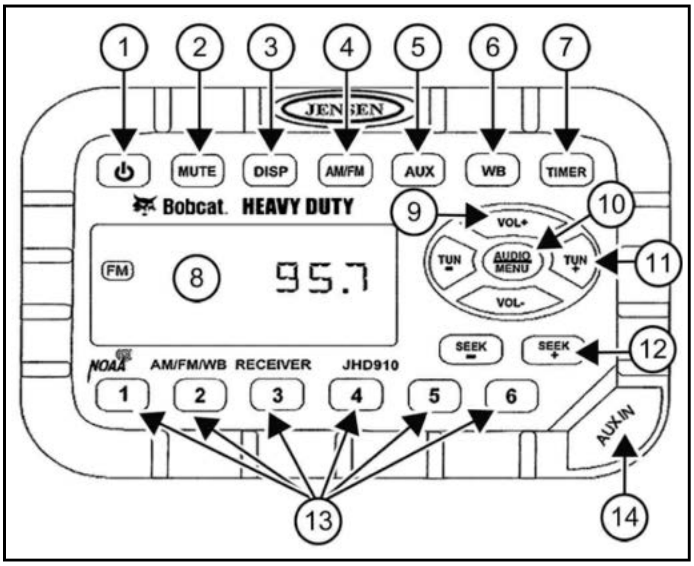
7. Tighten the screws to 0,8 – 1,0 N•m (7 – 8.8 in-lb) torque.

8. Turn the key switch to off.

## RADIO

### Radio Identification

**Figure 24**

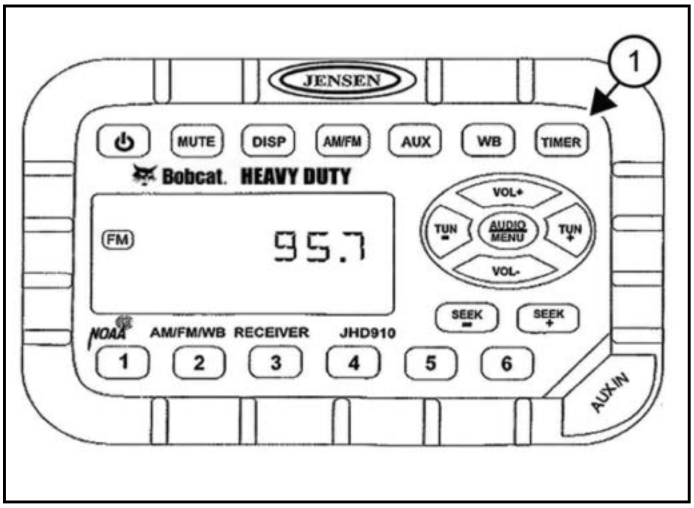



NA3090h

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

### Operating Radio Timer

**Figure 25**

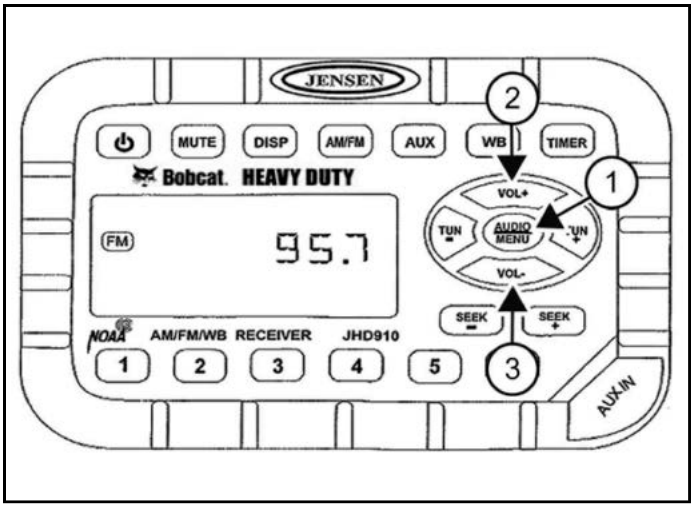



NA3090f

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

## Adjusting Radio Settings

**Figure 26**




NA3090g

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

  Normal operation will resume automatically.

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

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

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

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

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

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

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

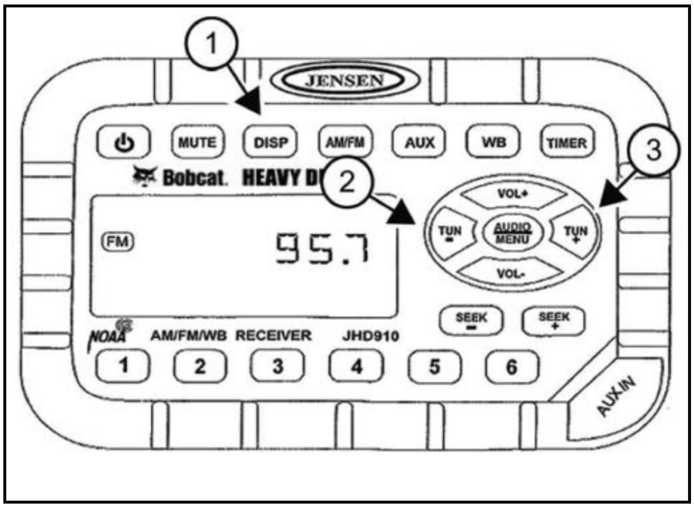
    **WB Alert:** Determines if weather band alert features is activated.

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

  Normal operation will resume automatically.

## Operating The Radio Clock

**Figure 27**




NA3090c

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

Normal operation will resume automatically.

## RAISING AND LOWERING THE CONSOLE

**Figure 28**

P134071a

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

  Push down on the handle until the latch is engaged.

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

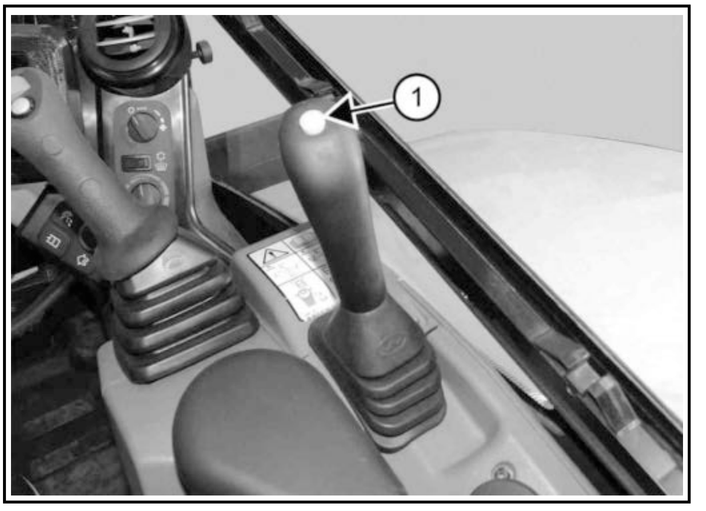
  The lift spring will assist in raising the console.

**NOTE:** When the console is raised, the hydraulic and traction system functions are locked and will not operate. If the engine stops, the boom / bucket (attachments) can be lowered to the ground using hydraulic pressure in the accumulator. The control console must be in the locked down position, and the key switch in the ON position.

## TWO-SPEED TRAVEL

### Engaging Two-Speed Travel (Without Angle Blade Option)

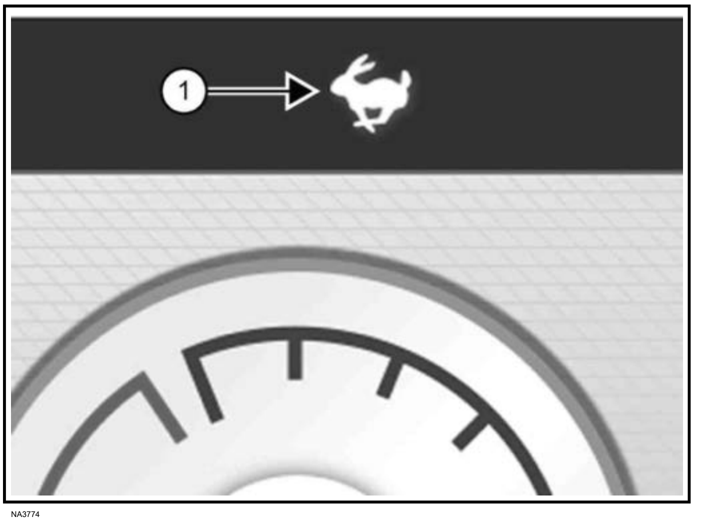
**Figure 29**




P200092b

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

**Figure 30**




NA3774

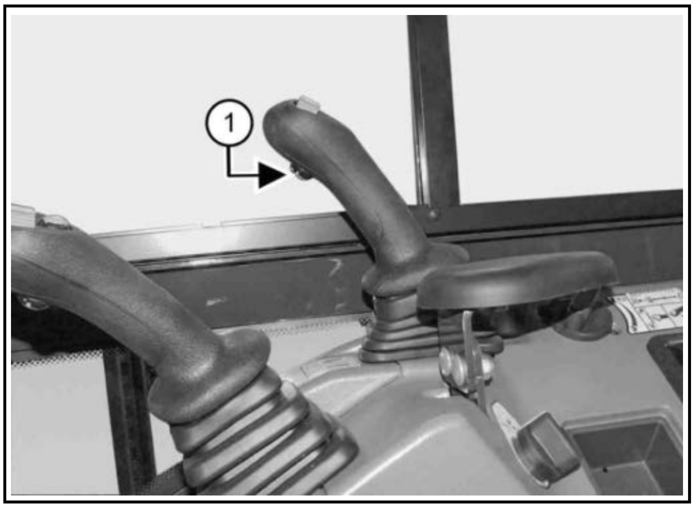
  Two beeps will be heard and the high range icon (Item 1) [Figure 30] will illuminate.

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

  One beep will be heard.

**Engaging Two-Speed Travel (With Angle Blade Option)**

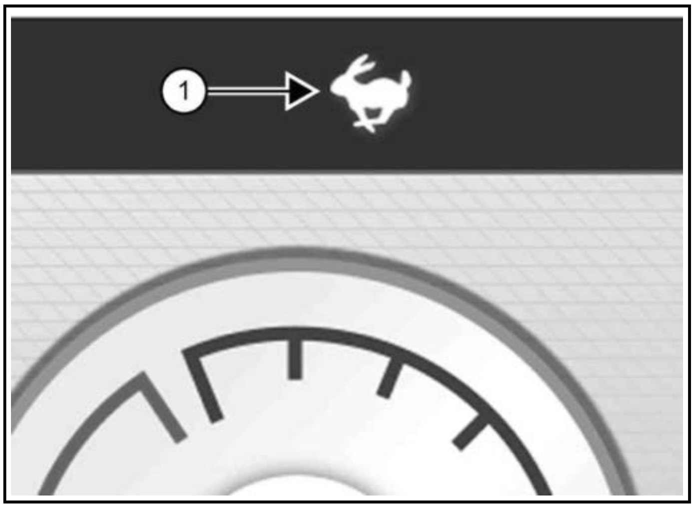
**Figure 31**




C201031a

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

**Figure 32**




NA3774

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

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

  One beep will be heard.

**Auto Shift Drive Motors**

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

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

## AUTO IDLE

### Auto Idle Description

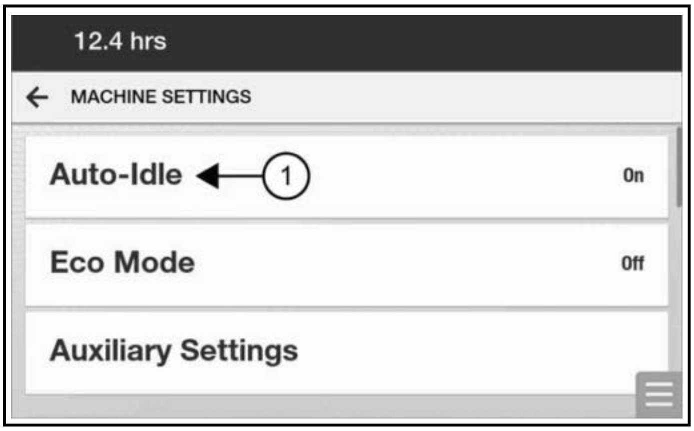
When auto idle is activated, engine speed will be reduced to low idle when the control levers (joystick, blade, travel, etc.) are in neutral and have not been used for the auto idle delay time. The engine rpm will return to the set position as soon as any control lever is activated.

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

### Activating Auto Idle

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

**Figure 33**




NA3742d

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

The Auto-Idle Delay Time can be changed on the touch display. (See Activating Auto Idle on Page 209)

## OPERATOR CAB (ROPS / TOPS / FOPS)

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

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

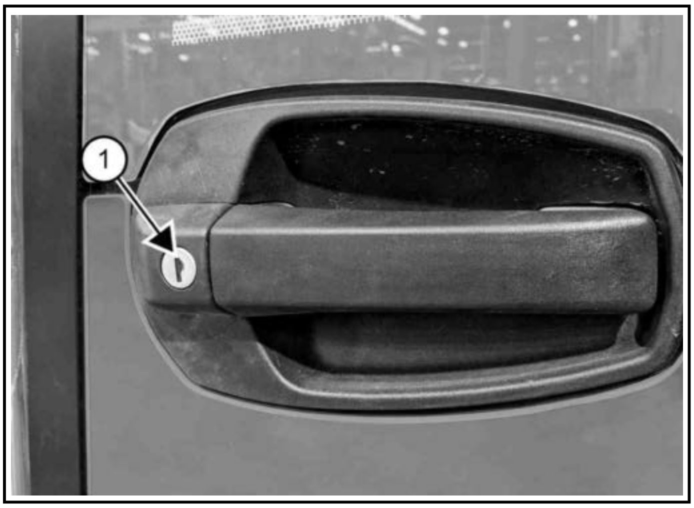
**WARNING**

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

W-2069

### Operating The Cab Door

**Figure 34**

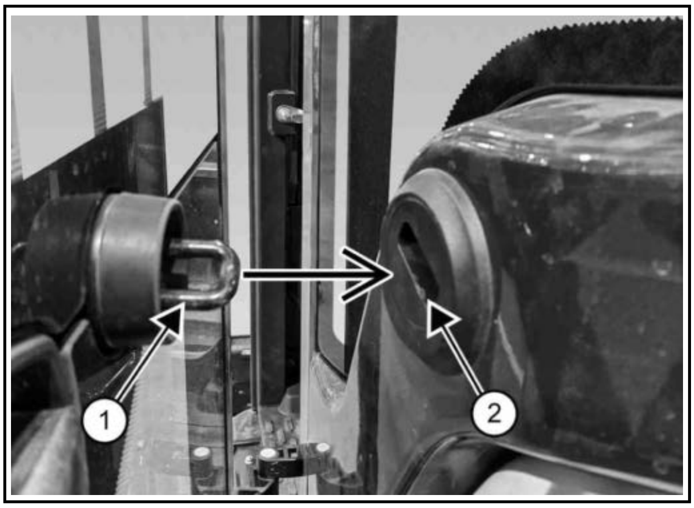



C206626a

- Pull on the latch to open the door.

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

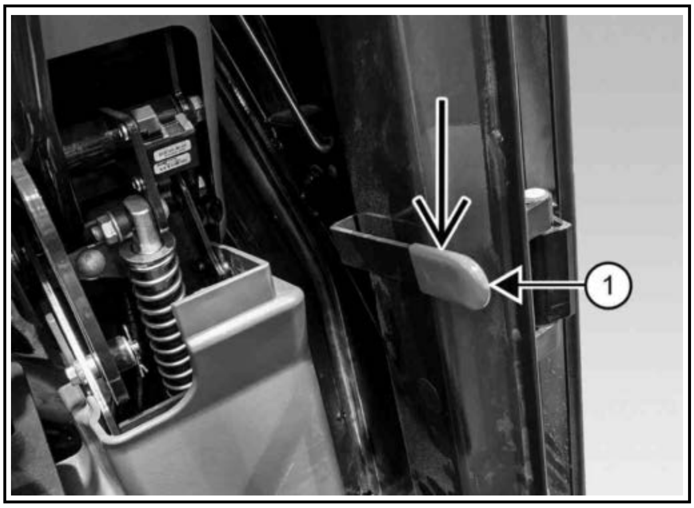
**Figure 35**



C206627a

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

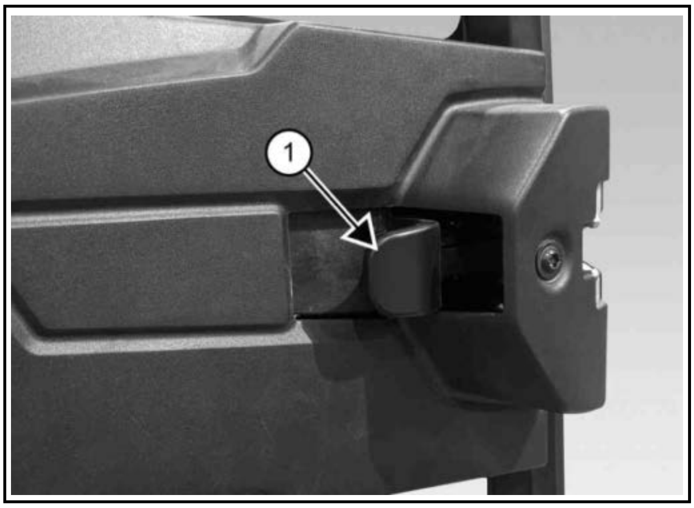
**Figure 36**



C206628a

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

**Figure 37**

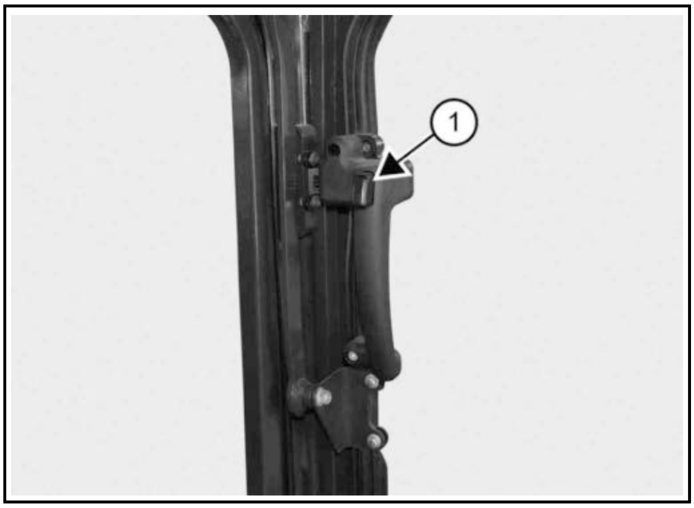


C206629a

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

**Operating The Front Window**

**Figure 38**



P20095a

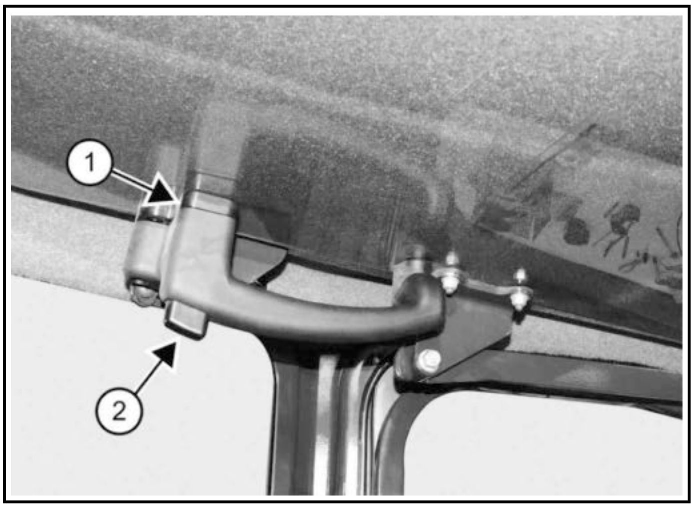
1. Push the window latch buttons (Item 1) [Figure 38] on both sides.

**Figure 39**


C206630a

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

**Figure 40**




P200096a

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

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

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

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

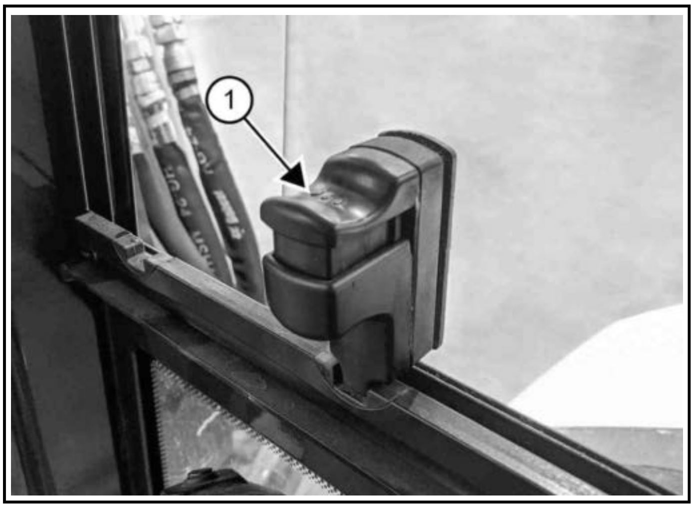
   Use both window grab handles (Item 1) [Figure 39] to pull the window down fully.

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

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

**Operating The Right Windows**

**Figure 41**




C206631a

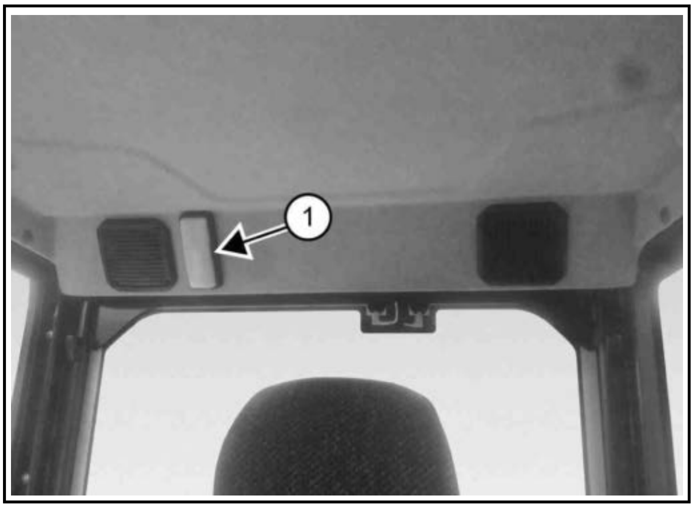
1. Pinch the latch together (Item 1) [Figure 41] and pull the window open.

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

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

**Operating The Cab Interior Light**

**Figure 42**

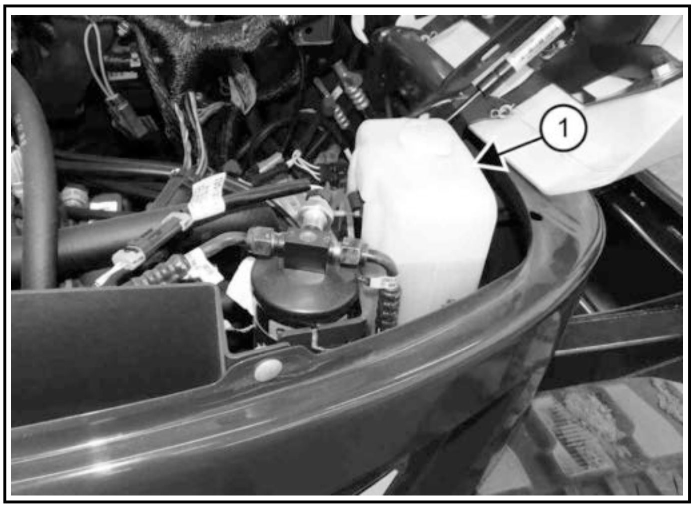



C208425b

- Use the switch (Item 1) [Figure 42] to the turn the light ON and OFF.

**Window Washer Reservoir**

**Figure 43**

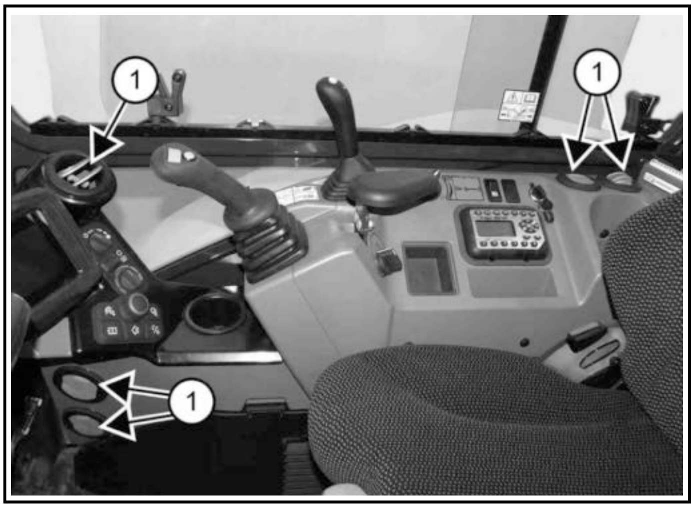



P200100a

The window washer reservoir (Item 1) [Figure 43] is located under the right side cover.

**Heating, Ventilation, And Air Conditioning Ducting**

**Figure 44**




P141329a

The HVAC louvers (Item 1) [Figure 44] 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 45**

C206630

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

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

**Making An Emergency Exit Through The Right Side Window**

**Figure 46**

C206632

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

## TRAVEL MOTION ALARM

### Travel Motion Alarm Description

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

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

If the alarm does not sound, see inspection instructions. (See Inspecting The Travel Motion Alarm System on Page 155)

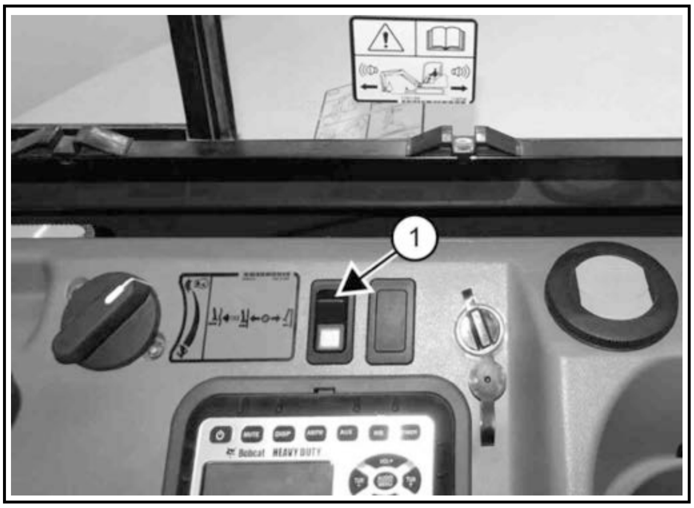
**⚠ WARNING**

**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 47**




C200665c

- Press the travel motion alarm switch (Item 1) [Figure 47] 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.

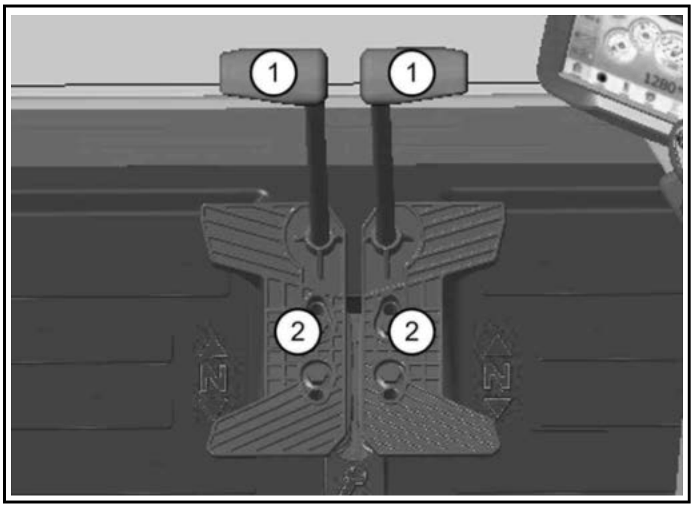
## TRAVEL CONTROLS

### 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 48**




C208449a

2. Slowly move both steering levers (Item 1) [Figure 48] forward for forward travel, backward for reverse travel.

   OR

   Control travel with the foot pedals (Item 2) [Figure 48].

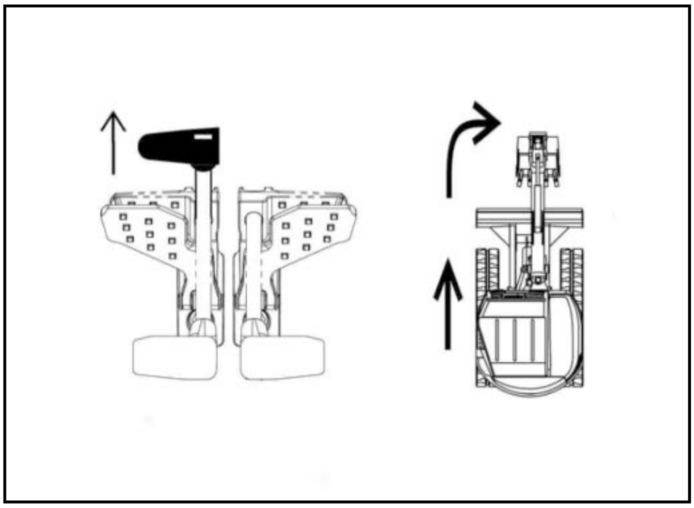
**⚠ WARNING**

**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*

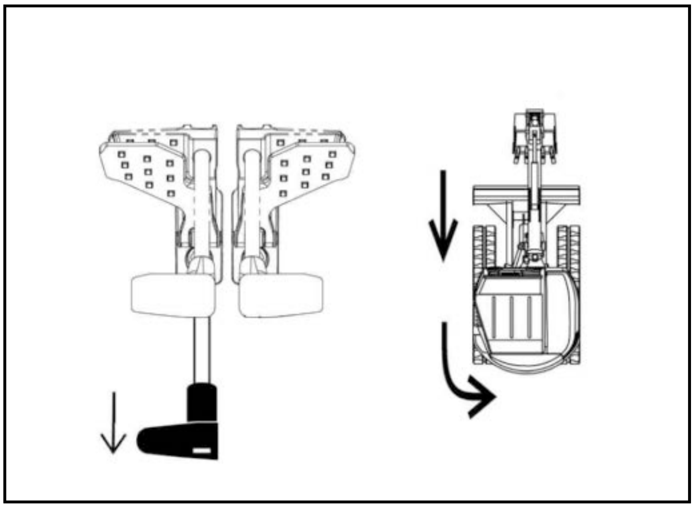
**Figure 49**



NA15007B

- Push the left steering lever forward to turn right while travelling forward [Figure 49].

**Figure 50**

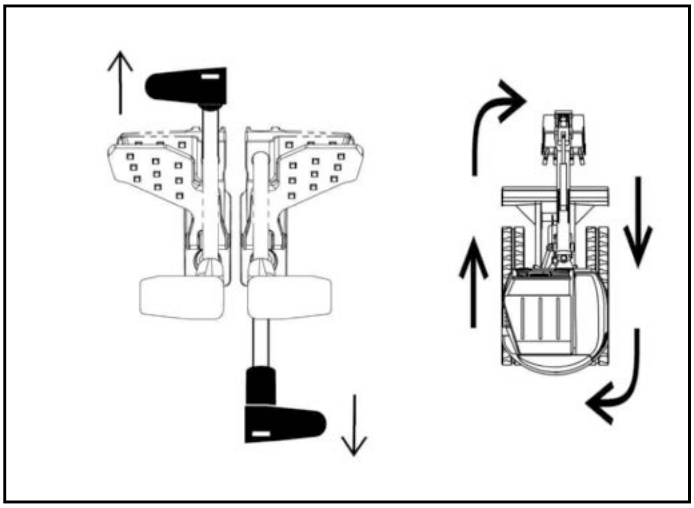


NA15010B

- Pull the left steering lever backward to turn right while travelling backward [Figure 50].

*Making A Counter-Rotation Right Turn*

**Figure 51**

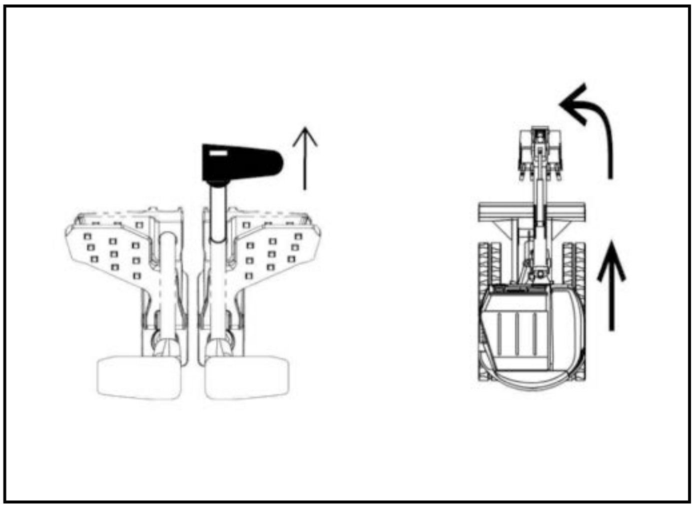


NA15007A

- Push the left steering lever forward and pull the right steering lever backward [Figure 51].

*Making A Left Turn*

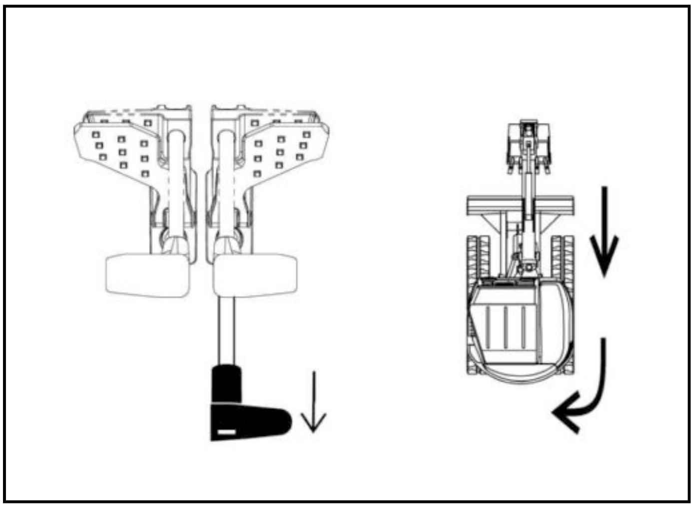
**Figure 52**



NA15008A

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

**Figure 53**

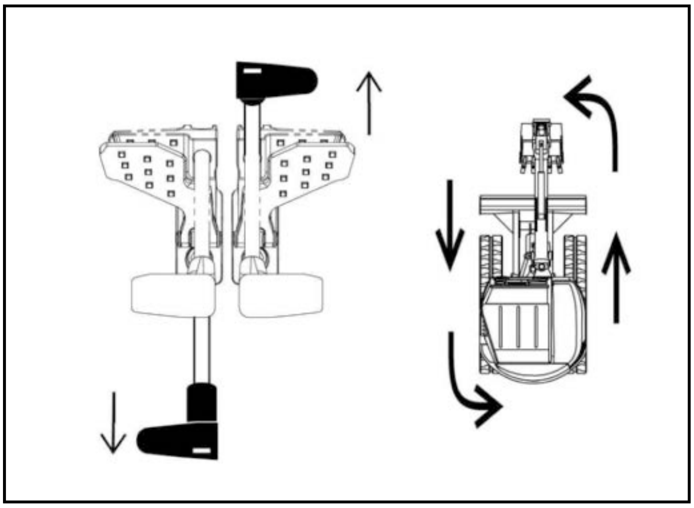


NA15009A

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

*Making A Counter-Rotation Left Turn*

**Figure 54**



NA15010A

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

## HYDRAULIC CONTROLS

### Hydraulic Controls Description

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

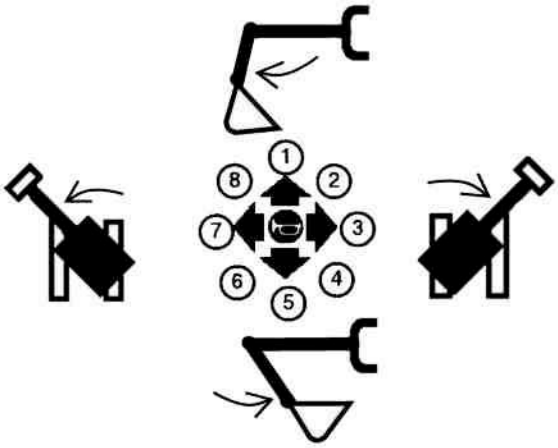
**⚠ WARNING**

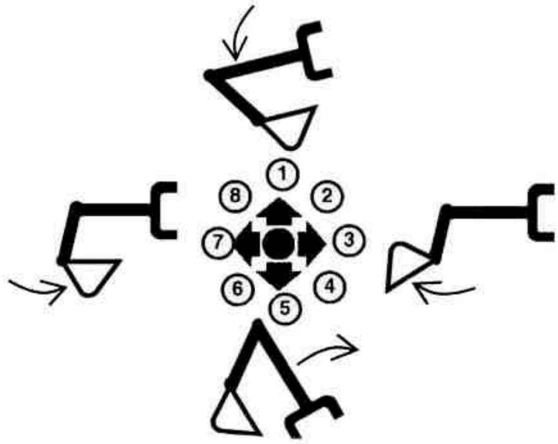
**GENERAL HAZARD**
**Failure to follow instructions can cause serious injury or death.**
**Before leaving the machine:**

- **Lower the work equipment to the ground.**
- **Lower the blade to the ground.**
- **Stop the engine and remove the key.**
- **Raise the control console.◂**

W-2780

**ISO Control Pattern**

| Left Joystick | |
|---|---|
|   P134139e | |
| Joystick Position | Function |
| 1 | Arm out |
| 2 | Arm out and slew right |
| 3 | Slew right |
| 4 | Arm in and slew right |
| 5 | Arm in |
| 6 | Arm in and slew left |
| 7 | Slew left |
| 8 | Arm out and slew left |

| Right Joystick | |
|---|---|
|   P134140e | |
| Joystick Position | Function |
| 1 | Boom lower |
| 2 | Boom lower and bucket dump |
| 3 | Bucket dump |
| 4 | Boom raise and bucket dump |
| 5 | Boom raise |
| 6 | Boom raise and bucket curl |
| 7 | Bucket curl |
| 8 | Boom lower and bucket curl |

## QUICK COUPLERS

**⚠ 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.◂**

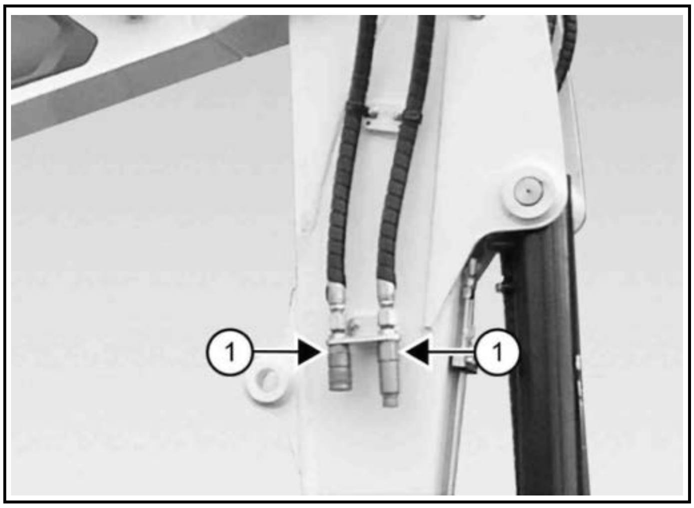
W-2220

**⚠ 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

**Figure 55**




C208415a

The excavator and attachments are supplied with flush faced couplers. The couplers are mounted on the arm of the excavator (Item 1) [Figure 55].

### 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.

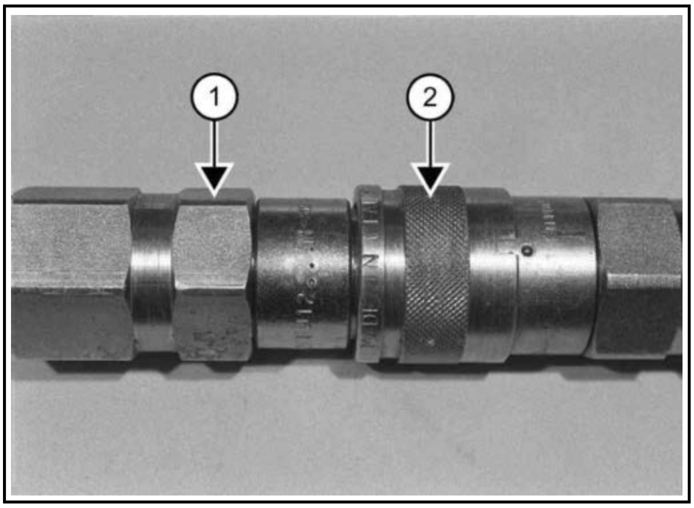
2. Visually check the couplers for corroding, cracking, damage, or excessive wear.

   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 56**




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 56].

## PRIMARY AUXILIARY HYDRAULICS

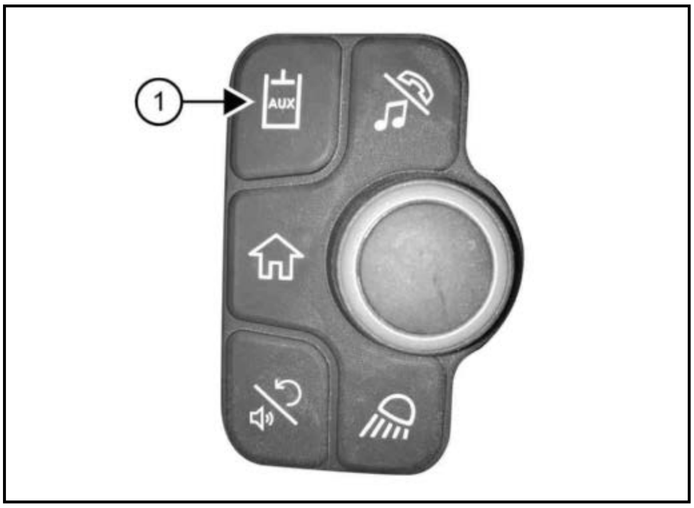
### Operating Attachments With Primary Auxiliary Hydraulics

**⚠ WARNING**

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

W-2052

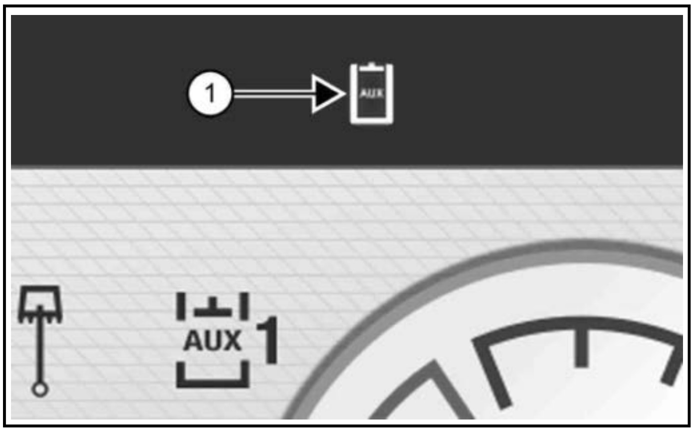
**Figure 57**




C206625b

1. Press the AUX button (Item 1) [Figure 57] on the jog shuttle.

**Figure 58**




NA3773b

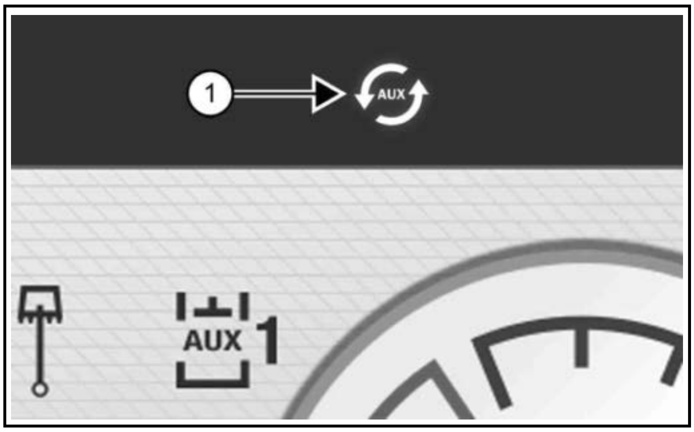
   The auxiliary hydraulics icon (Item 1) [Figure 58] will turn ON.

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

OR

To activate detent mode, press and hold the AUX button (Item 1) [Figure 57] on the jog shuttle again for at least one second.

**Figure 59**




NA3773c

A beep will be heard and the detent icon (Item 1) [Figure 59] 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 57)

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

**Figure 60**


C206172b

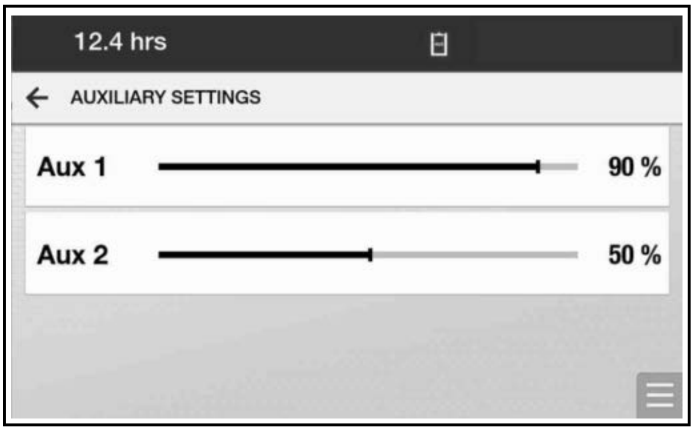
| ACTION | RESULT |
|---|---|
| Move right joystick switch (Item 1) to the right. | Supply hydraulic flow to female coupler. |
| Move right joystick switch (Item 1) to the left. | Supply hydraulic flow to male coupler. |
| Move right joystick switch (Item 1) halfway. | Auxiliary functions move at approximately 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 57] on the jog shuttle.

**Setting Auxiliary Hydraulics Flow Rate**

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

**Figure 61**




NA3766

2. Adjust the flow rate of the auxiliary hydraulics to best match the attachment / operator requirements [Figure 61].

| 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 The Auxiliary Hydraulics Flow on Page 208)

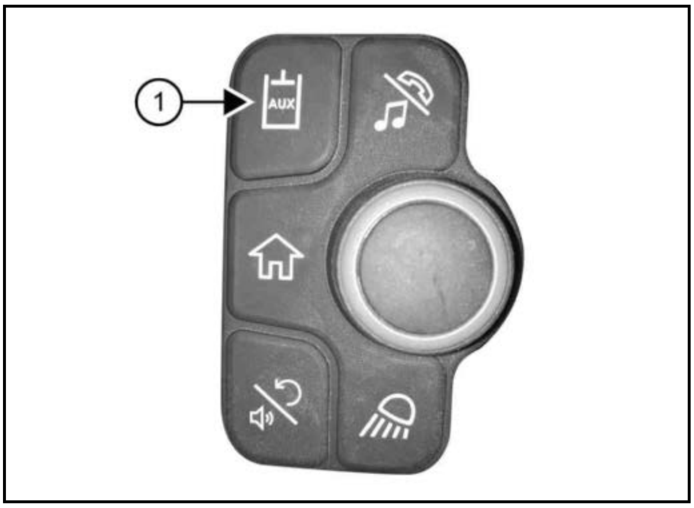
**NOTE:** If the auxiliary hydraulics are enabled when the engine is turned off, they will stay enabled at engine restart. If detent flow was enabled at engine off, it will be disabled at engine restart.

**Releasing Hydraulic Pressure in Excavator**

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

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

**Figure 62**




C206625b

4. Press the AUX button (Item 1) [Figure 62] on the jog shuttle to enable auxiliary hydraulics.
5. Move the right joystick switch (Item 1) [Figure 60] 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 207)

**Releasing Hydraulic Pressure In Attachments**

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

1. Release hydraulic pressure in the excavator.
2. Connect the male coupler from the attachment to the female coupler of the excavator, then repeat the procedure above.

   This will relieve pressure in the attachment.

3. Connect the female coupler from the attachment.

## SECONDARY AUXILIARY HYDRAULICS

### Operating Attachments With Secondary Auxiliary Hydraulics

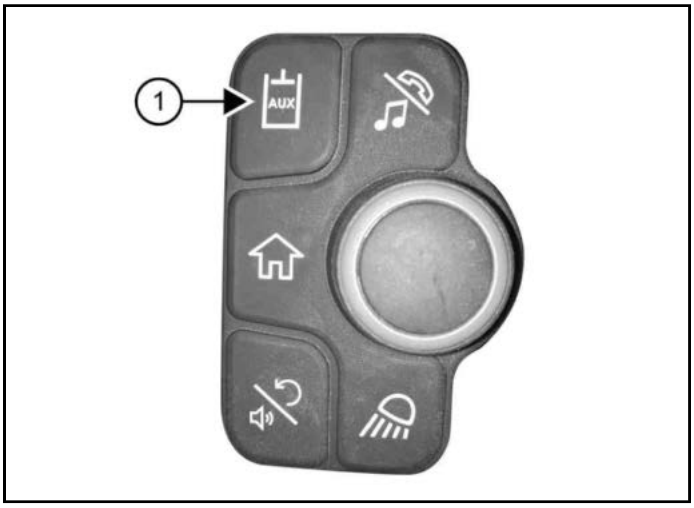
**WARNING**

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

W-2052

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

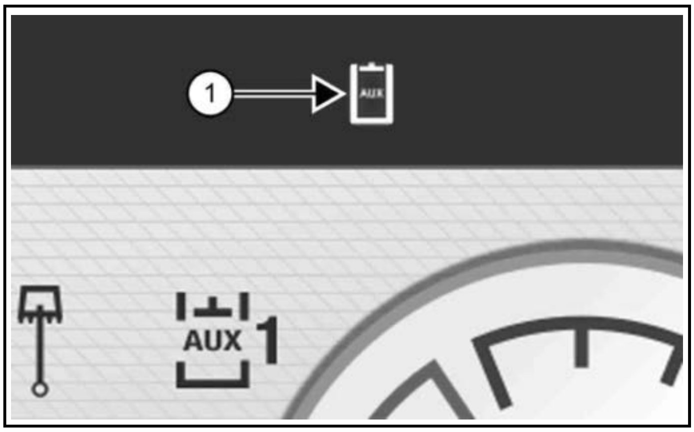
**Figure 63**




C206625b

1. Press the AUX button (Item 1) [Figure 63] on the jog shuttle to activate auxiliary hydraulics.

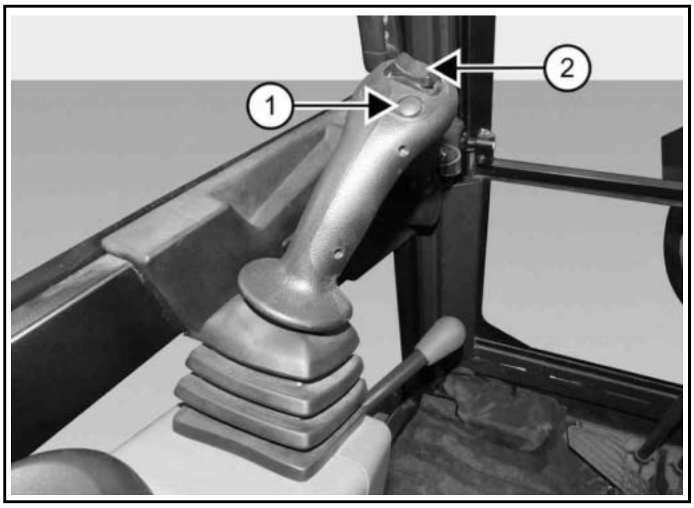
**Figure 64**




NA3773b

The auxiliary hydraulics icon (Item 1) [Figure 64] will turn ON.

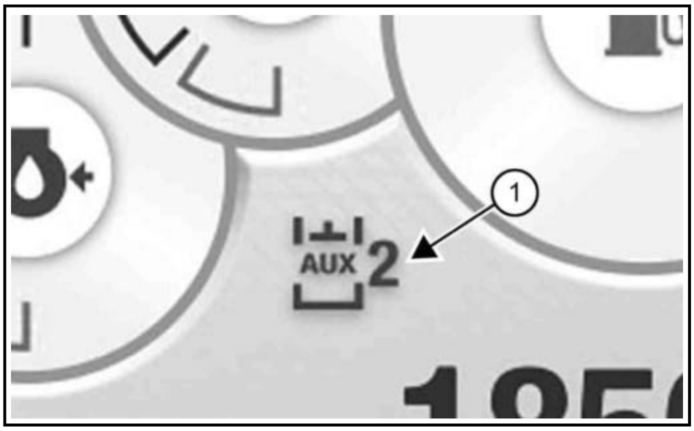
**Figure 65**




C206181a

2. Press and hold the button (Item 1) [Figure 65] on the left joystick until a beep is heard to switch from boom swing function to secondary auxiliary hydraulics.

**Figure 66**




C132982b

The second auxiliary hydraulics icon (Item 1) [Figure 66] 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 57)
4. Use the left joystick switch (Item 2) [Figure 65] 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 63] 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 65] until a beep is heard to switch to the secondary auxiliary hydraulics.

   The secondary auxiliary hydraulic icon (Item 1) [Figure 66] will be ON when activated.
5. Move the left joystick switch (Item 2) [Figure 65] to the right and left several times to release pressure.

### Releasing Secondary Auxiliary Hydraulic Pressure In Attachments

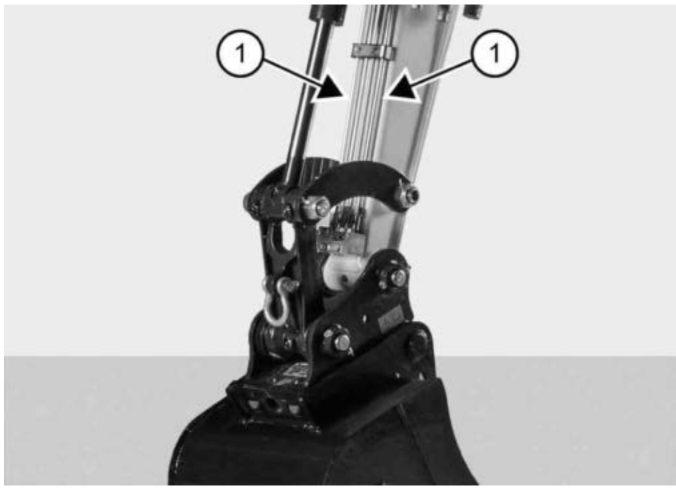
Hydraulic pressure in the auxiliary hydraulic system can make it difficult to engage quick couplers to an attachment.

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 67**




C133922a

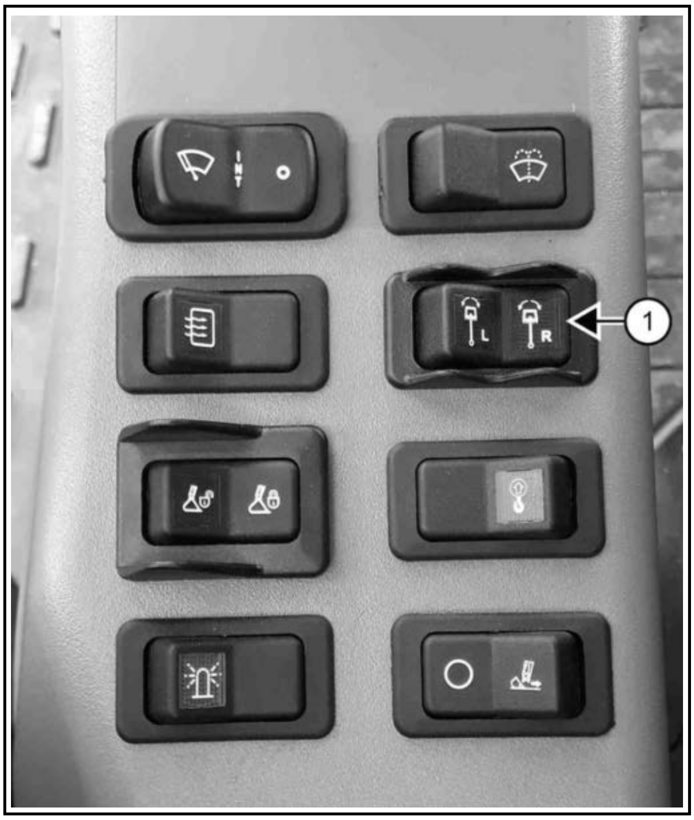
When the excavator is equipped with fourth auxiliary hydraulics, the fourth auxiliary hydraulics lines will be mounted on top of the arm in the outside position (Item 1) [Figure 67] and connect to the port block on the arm.

### Operating Attachments With Primary, Secondary, And Fourth Auxiliary Hydraulics

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.

**NOTE:** Use only approved attachments for your model excavator. Attachments are approved for each model based on various factors. Using unapproved attachments could cause damage to the attachment or to the excavator.

**Figure 68**

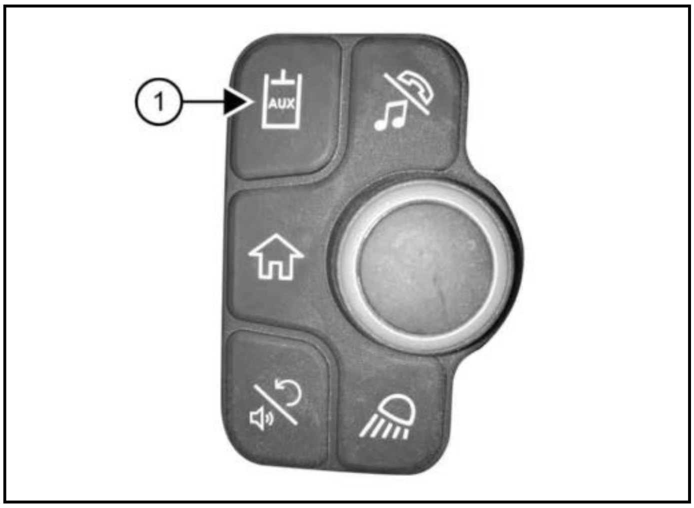



P133936b

1. Push the Boom Swing switch (Item 1) [Figure 68] on the left console to the left to operate boom swing with the left joystick.

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

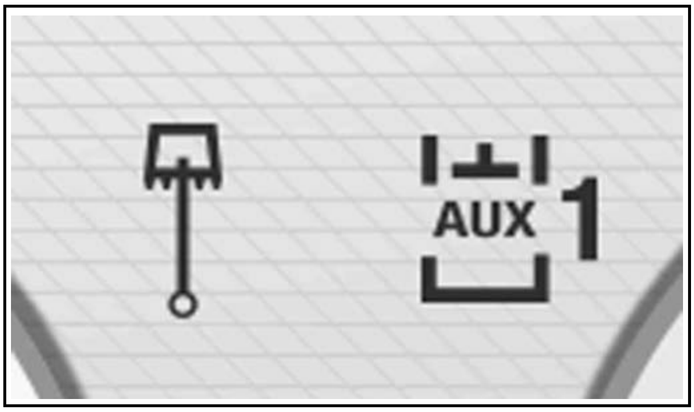
**Figure 69**




C206625b

2. Press the AUX button (Item 1) [Figure 69] on the jog shuttle to activate auxiliary hydraulics.

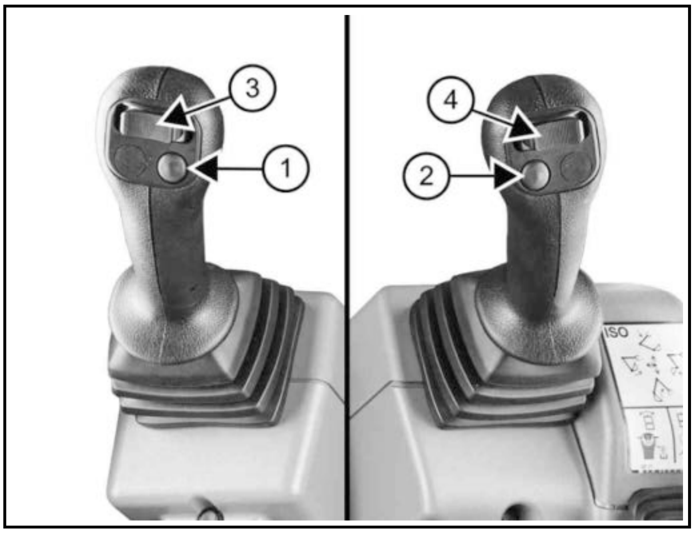
**Figure 70**




NA3773d

The display will indicate the left joystick controls boom swing and the right joystick controls primary auxiliary hydraulics [Figure 70].

**Figure 71**




P134072a

3. Press the joystick buttons to toggle to the desired joystick control configuration.

   - Press the left joystick button (Item 1) [Figure 71] until two beeps are heard to select Boom Swing, Aux 2, or Aux 4.

   - Press the right joystick button (Item 2) [Figure 71] 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 68]. 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 71] to control the hydraulics indicated on the left side of the display panel (Boom Swing, Aux 2, or Aux 4).

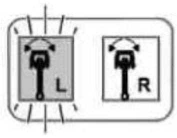
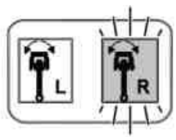
- Use the right joystick switch (Item 4) [Figure 71] to control the hydraulics indicated on the right side of the display panel (Boom Swing, Aux 1, or Aux 4).

5. When necessary, press the Boom Swing switch (Item 1) [Figure 68] to the right to transfer boom swing control to the right joystick.

   After you push the Boom Swing switch, auxiliary hydraulics will deactivate. Press the AUX button (Item 1) [Figure 69] again to reactivate auxiliary hydraulics.

To set auxiliary hydraulics flow rate, see the following for standard display:
(See Setting Auxiliary Hydraulics Flow Rate on Page 57)
See the following for touch display:
(See Setting The Auxiliary Hydraulics Flow on Page 208)

**Auxiliary Hydraulics Settings Sequence**

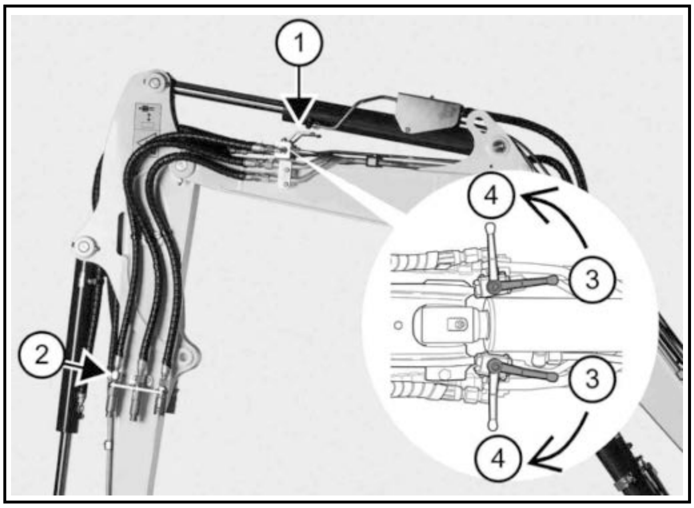
| Boom Swing Switch | Action | Display |
|---|---|---|
|   | 1. Initial setting with Boom Swing switch set to left joystick. |  |
| | 2. Activate auxiliary hydraulics. |   |
| | 3. Press right joystick button. |   |
| | 4. Press left joystick button. |   |
| | 5. Press right joystick button. |   |
|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

### THIRD AUXILIARY HYDRAULICS

**Operating Attachments With Third Auxiliary Hydraulics**

**Figure 72**




P133923b

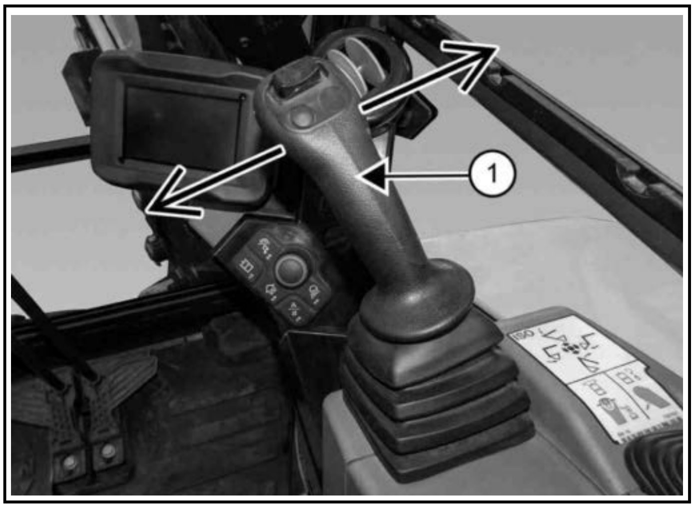
When the excavator is equipped with third auxiliary hydraulics, two manually operated diverter valves (Item 1) [Figure 72] will be installed into the bucket hydraulic circuit.

**NOTE:** Both levers (Item 1) must be fully rotated in either the bucket position (Item 4) or the third auxiliary position (Item 3) to operate correctly [Figure 72].

1. Move both levers inward (Item 3) [Figure 72] to select third auxiliary hydraulics.

2. Connect the attachment to the third auxiliary quick couplers (Item 2) [Figure 72].

**Figure 73**




C206172e

3. Move the right joystick (Item 1) [Figure 73] right and left to supply hydraulic flow to the third auxiliary ports (Item 2) [Figure 72].

**⚠ IMPORTANT**

**UNINTENDED MOVEMENT HAZARD**
**If attachments are left connected, hydraulic system pressure can cause unexpected attachment movement.**
**Disconnect attachments from the auxiliary hydraulic diverter valve quick couplers when the levers are in the bucket position.** ◂

I-2389

## OVERLOAD WARNING DEVICE

### Operating The Overload Warning Device

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

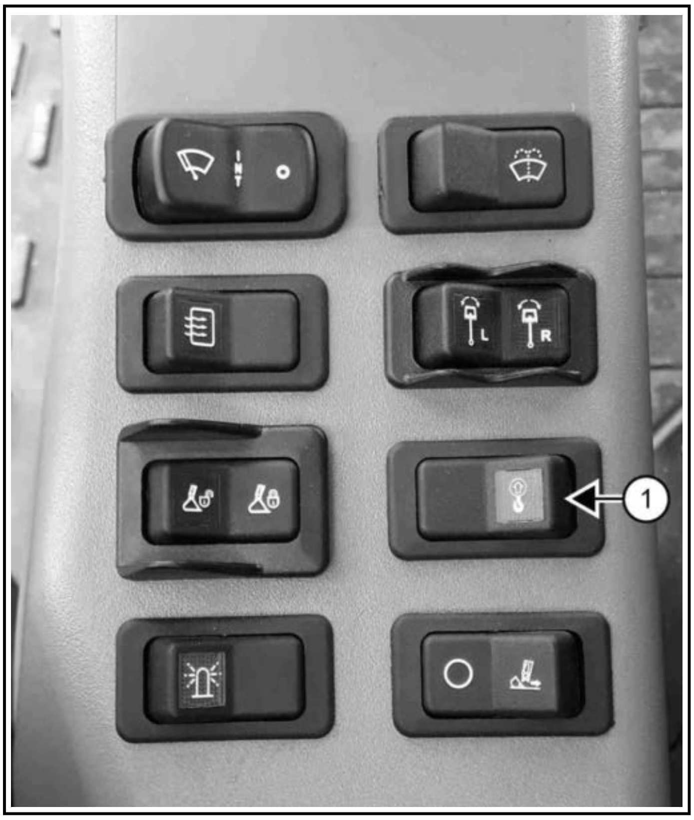
When the overload warning device (if equipped) is engaged, a warning buzzer will sound and the general warning icon will flash on the display if the work group is overloaded.

**⚠ WARNING**

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

W-2793

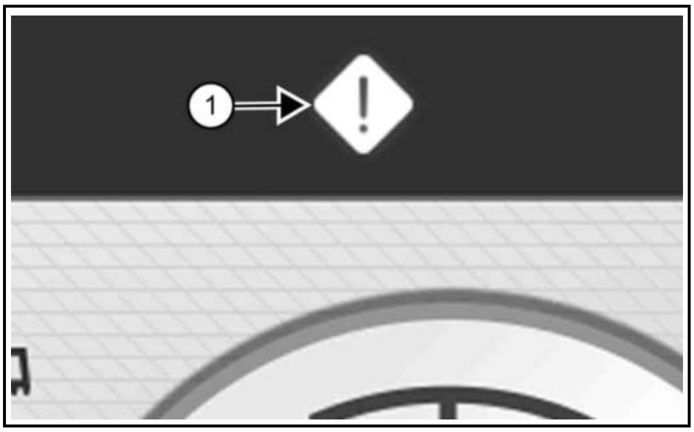
**Figure 74**




C208239c

1. Press the switch (Item 1) [Figure 74] to the right to enable the overload warning device.

**Figure 75**




NA3734f

2. If overload occurs, the general warning icon (Item 1) [Figure 75] will illuminate and a buzzer will sound.

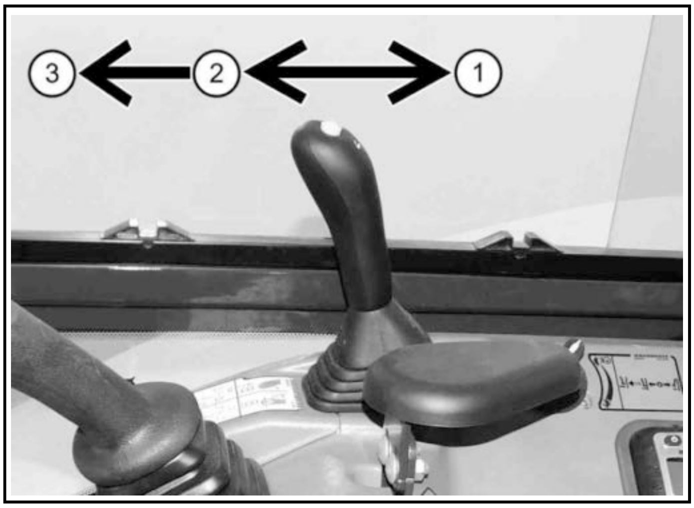
   a. Immediately bring the arm toward the machine, lower the boom, and reduce the load before continuing operation.

3. Disengage the overload warning device by pressing the switch (Item 1) [Figure 74] to the left.

## BLADE CONTROL LEVER

### Raising And Lowering The Blade

**Figure 76**




P200125a

The blade lever shown here [Figure 76] is for machines without an angle blade. For machines with an angle blade, the blade lever is shown in [Figure 77].

- Pull the lever backward (Item 1) [Figure 76] to raise the blade.
- Push the lever forward (Item 2) [Figure 76] to lower the blade.
- Push the lever forward until the lever is in the locked position (Item 3) [Figure 76] to put the blade in the float position.
  - ▹ Pull the lever backward to unlock from the float position.

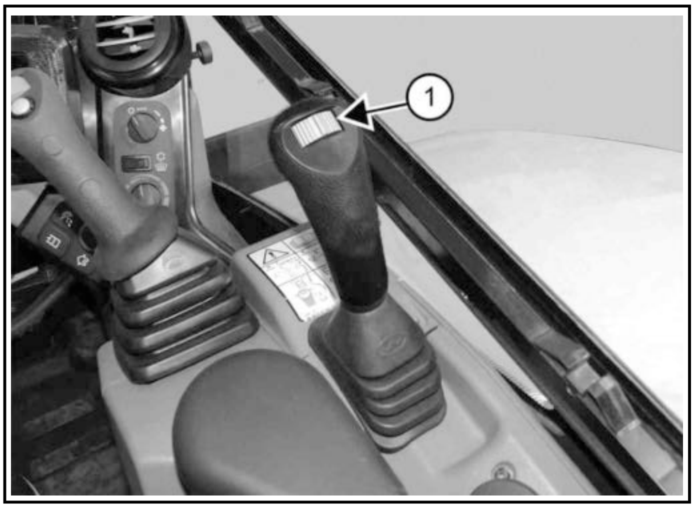
Keep blade lowered for increased digging performance.

## ANGLE BLADE

### Operating The Angle Blade

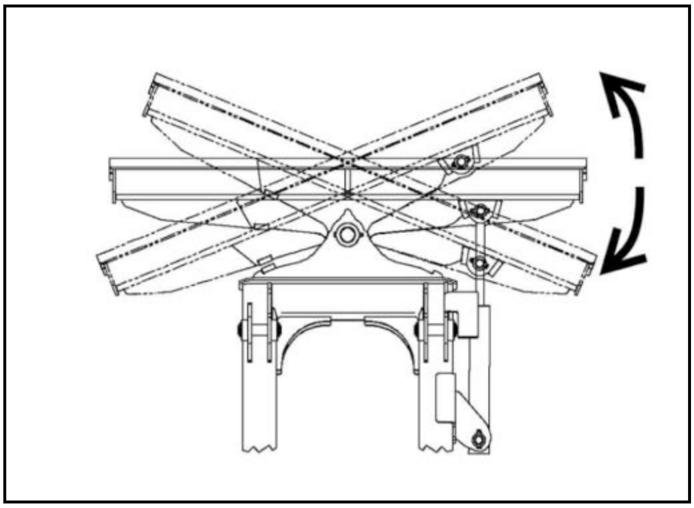
If your machine is equipped with an angle blade:

**Figure 77**




P2000092a

**Figure 78**



NA3529

- Move the switch (Item 1) [Figure 77] to the left to angle the blade to the left [Figure 78].
- Move the switch (Item 1) [Figure 77] to the right to angle the blade to the right [Figure 78].

Always have the blade straight for excavating or lifting the excavator.

## DIESEL PARTICULATE FILTER (DPF) SYSTEM

### DPF Description

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

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

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

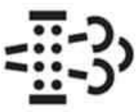
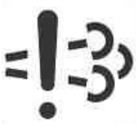
| Term | Description |
|---|---|
| Passive Regeneration | The engine provides adequate exhaust temperature during operation for regeneration. |
| Automatic Regeneration | The engine control unit (ECU) automatically controls active regeneration. Active regeneration can occur any time the engine is operating once the soot accumulated in the DPF reaches a certain level.<br>(See Automatic Regeneration Operation on Page 68) |
| Forced Regeneration | The operator activates a forced regeneration. This selection requires confirmation after certain machine conditions are met.<br>(See Forced Regeneration Operation on Page 69) |
| Forced Parked Regeneration | The operator activates a forced parked regeneration. This selection requires confirmation after certain machine conditions are met. |
| Service Regeneration | Your Bobcat dealer uses specialised equipment to perform a service regeneration.<br>(See DPF Service Regeneration on Page 181) |
| Inhibit Mode | Active regeneration will not occur. This selection requires confirmation.<br>(See Inhibit Mode Operation on Page 71) |

**DPF Regeneration Tables**

| Soot Level | 0 – 75% | 75 – 100% | 100 – 105% | 105 – 110% | 110 – 120% | 120 – 150% | > 150% |
|---|---|---|---|---|---|---|---|
| **Active Regeneration Status** | Not Required | Not Required | Regenerating | Regenerating | Regenerating | Not Regenerating | Not Regenerating |
| **Inhibit Allowed** | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Forced Allowed** | No | Yes | Yes | Yes | Yes | No | No |
| **Forced Parked Allowed** | No | Yes | Yes | Yes | Yes | No | No |
| **DPF Icon** | Off | Off | On | Flashing Slowly | Flashing Slowly | Flashing Quickly | Off |
| **HEST Icon** | Off | Off | On | On | On | Off | Off |
| **Check Engine Icon** | Off | Off | Off | Off | On | On | On |
| **Regeneration Type** | Passive | Passive | Automatic | Automatic | Automatic | Service | None |
| **Soot Load Bar Colour** | Grey | Blue | Blue | Red | Red | Red | Red |
| **Service Code** | None | None | None | None | P2463 | P24A3 | P24A3 |
| **Torque Derate** | None | None | None | None | Mild | Severe | Severe |
| **Operator Action** | None | None | None | Activate Forced or Forced Parked Regeneration when possible | Activate Forced or Forced Parked Regeneration when possible | Dealer Service Regeneration Required (See DPF Service Regeneration on Page 181) | Contact your Bobcat dealer to replace the DPF |

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

### DPF Regeneration Status Icons

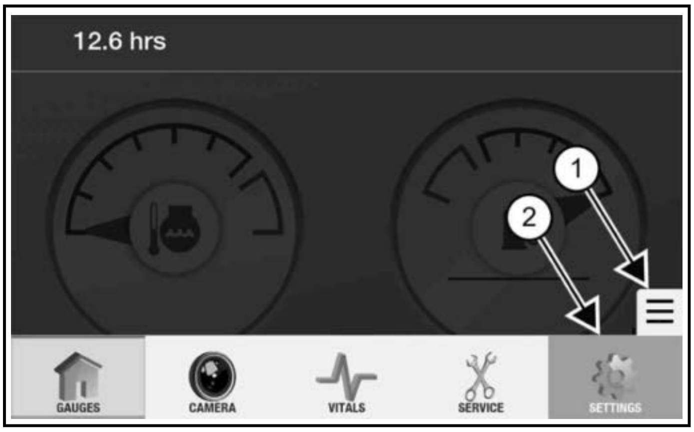
| Icon | Definition |
|---|---|
|  | DPF - Appears on the display during regeneration. Machine is requesting that operator activate a forced or forced parked regeneration when flashing. |
|  | Hot Exhaust System Temperature (HEST) - Appears on the display during regeneration to indicate that exhaust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

### Automatic Regeneration Operation

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

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

**Figure 79**

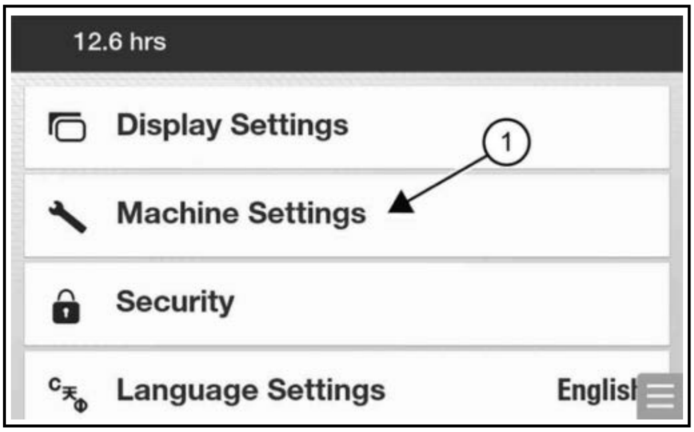



NA3669A

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

2. Select **[SETTINGS]** (Item 2) [Figure 79].

**Figure 80**




NA3668A

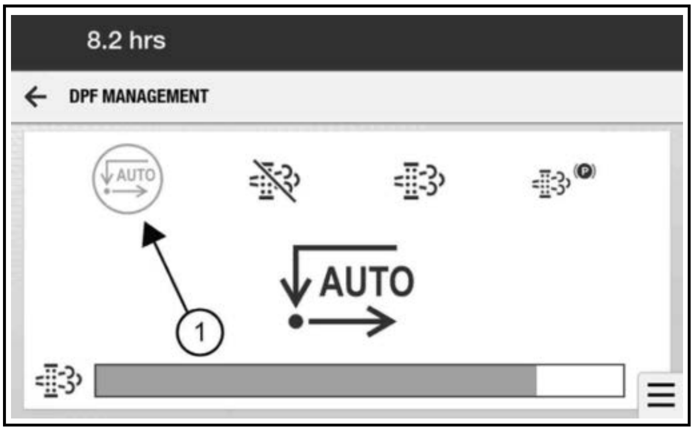
3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 80].

**Figure 81**


NA3856

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

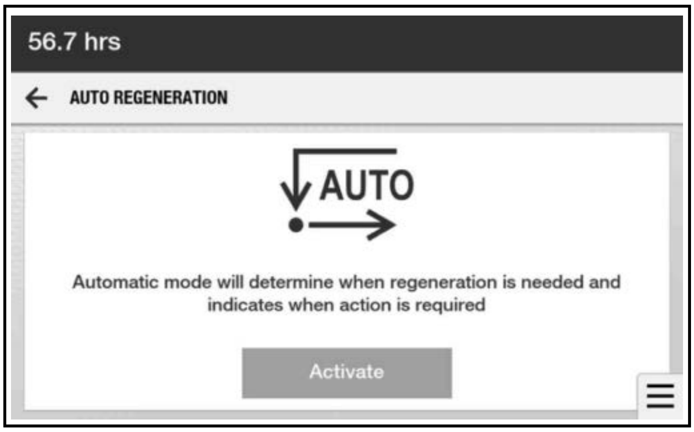
**Figure 82**




NA3862A

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

**Figure 83**




NA3865

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

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

   The machine should be operated during this regeneration.

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

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

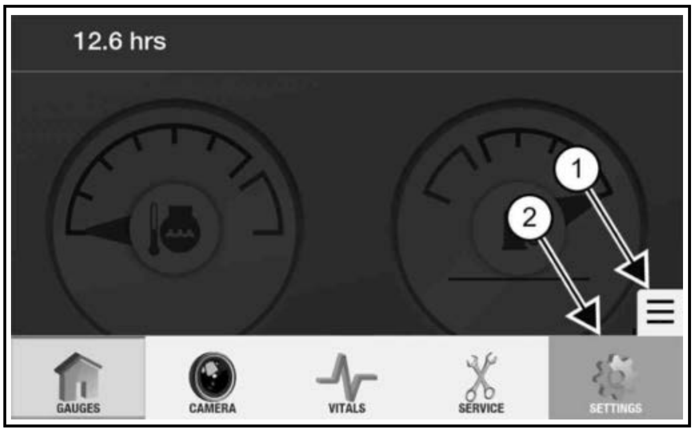
   It is recommended to allow the regeneration cycle to finish before turning the machine off.

### Forced Regeneration Operation

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

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

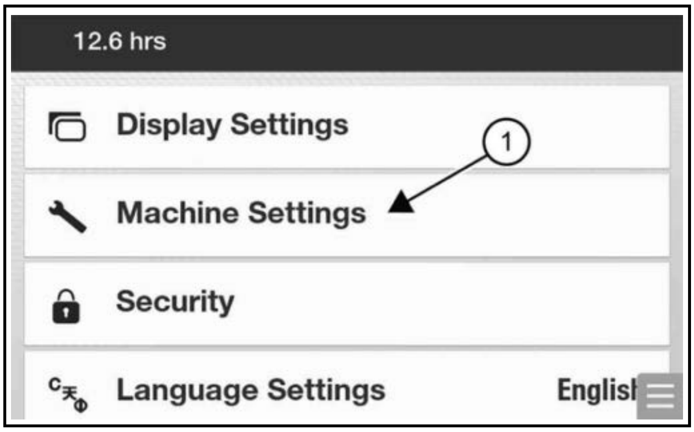
**Figure 84**




NA3669A

1. Select the **[NAVIGATION HANDLE]** icon (Item 1) [Figure 84].
2. Select **[SETTINGS]** (Item 2) [Figure 84].

**Figure 85**




NA3668A

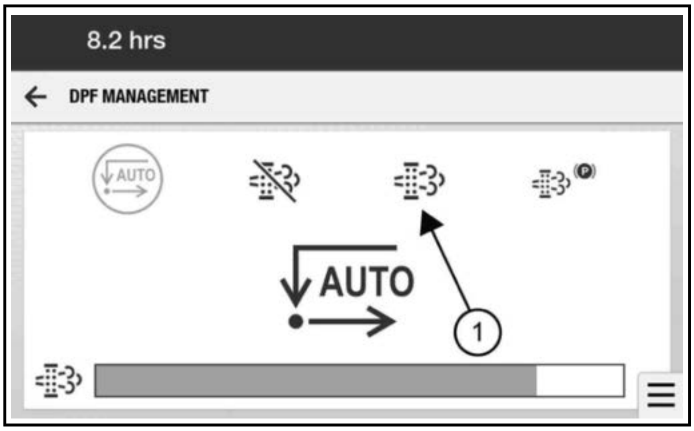
3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 85].

**Figure 86**


NA3856

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

**Figure 87**




NA3862B

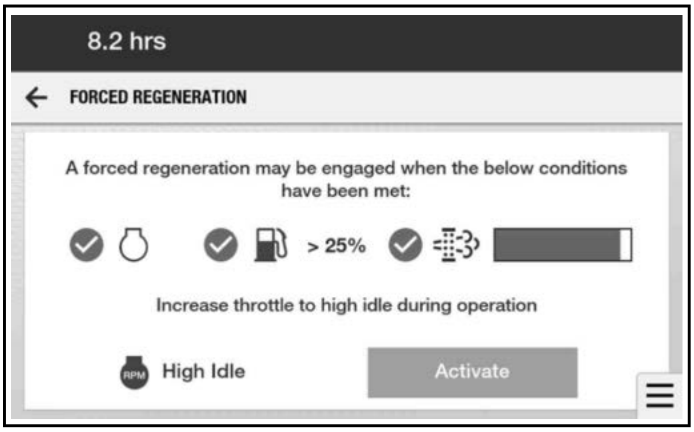
5. Select the forced regeneration icon (Item 1) [Figure 87].

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

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

6. Increase engine speed to high idle.

**Figure 88**




NA3864

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

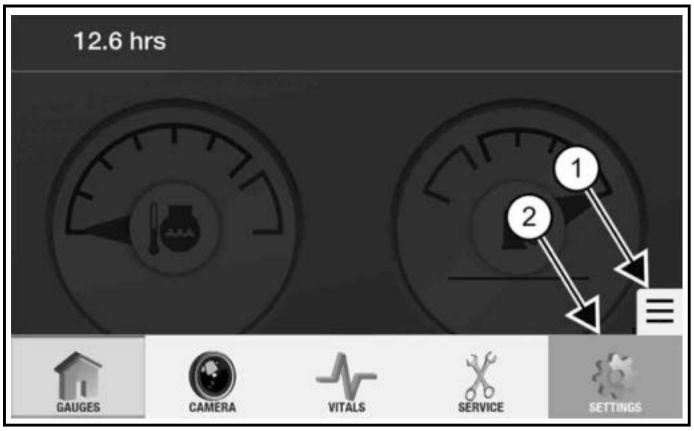
   It is recommended to allow the regeneration cycle to finish before turning the machine off.

**Forced Parked Regeneration Operation**

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

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

**Figure 89**

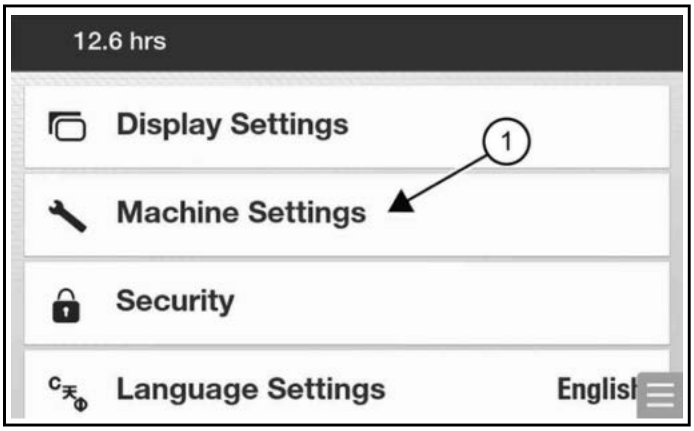



NA3669A

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

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

**Figure 90**




NA3668A

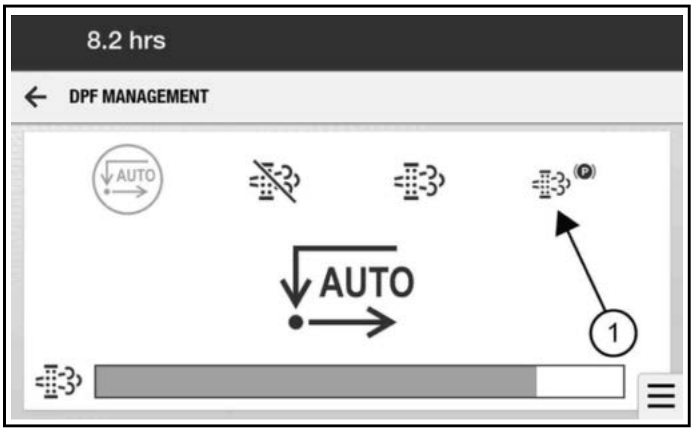
3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 90].

**Figure 91**


NA3856

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

**Figure 92**




NA3862C

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

**⚠ IMPORTANT**

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

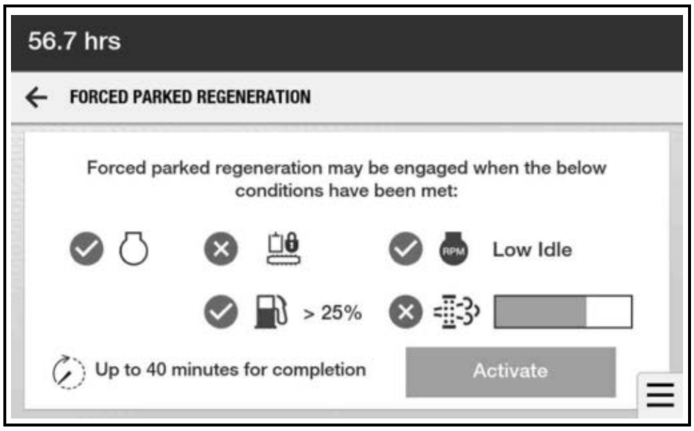
I-2352

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

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

6. Decrease engine speed to low idle.

**Figure 93**




NA3933

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

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

**Inhibit Mode Operation**

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

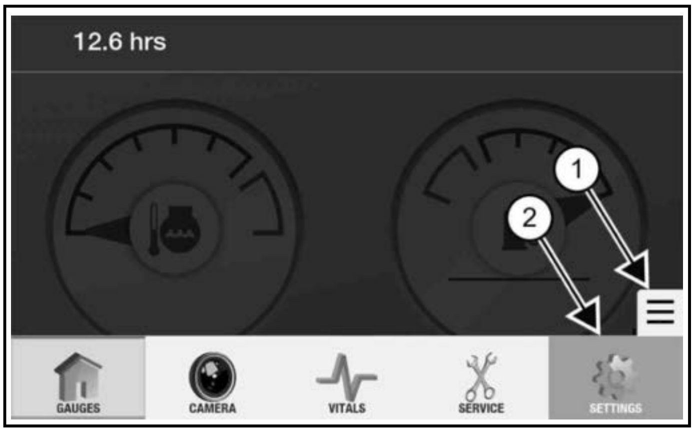
**⚠ IMPORTANT**

**MACHINE DAMAGE HAZARD**
**Operating the machine in inhibit mode for extended periods may cause severe damage to the DPF.◂**

I-2409

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

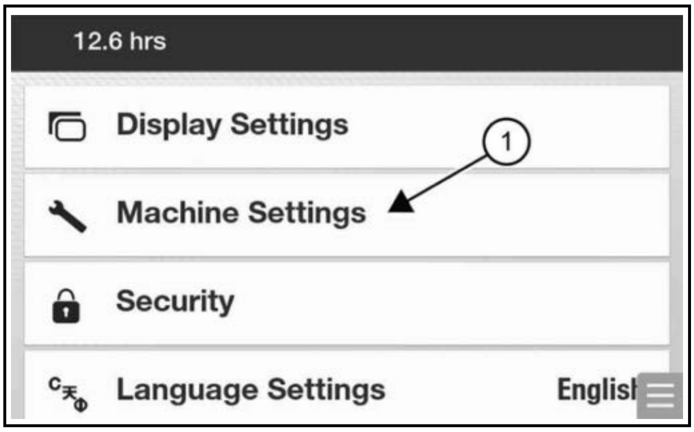
**Figure 94**




NA3669A

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

**Figure 95**




NA3668A

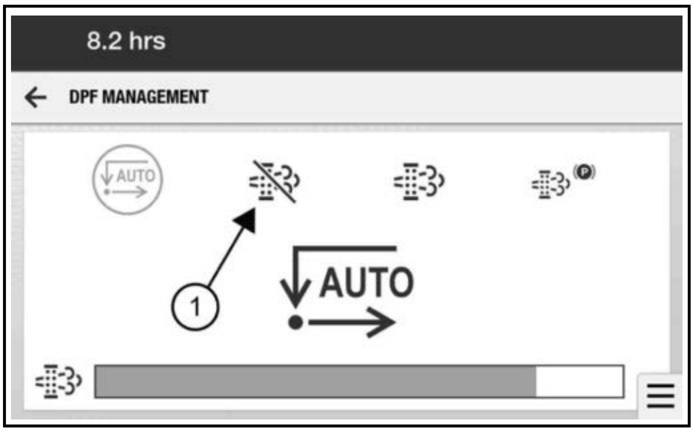
3. Select **[MACHINE SETTINGS]** (Item 1) [Figure 95].

**Figure 96**


NA3856

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

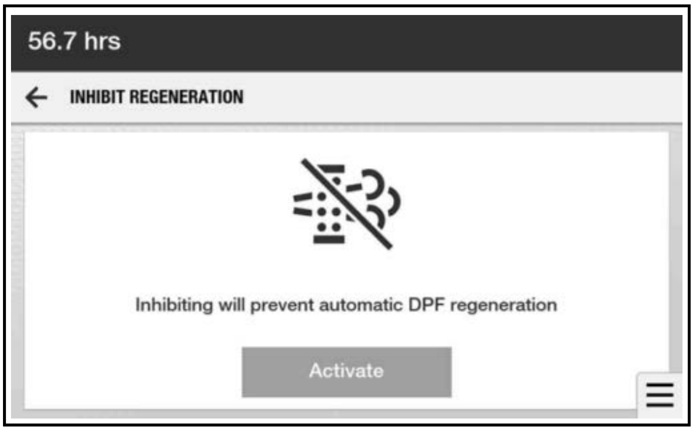
**Figure 97**




NA3862D

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

**Figure 98**




NA3863

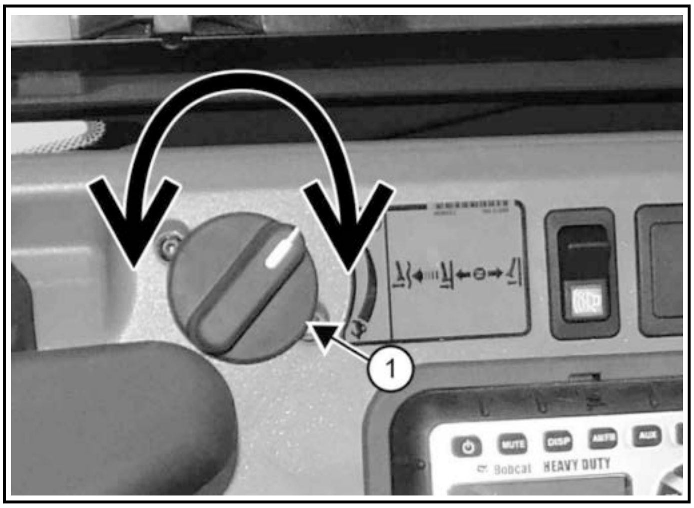
6. Select **[ACTIVATE]** [Figure 98] to inhibit regeneration.

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

## ENGINE SPEED CONTROL

### Setting Engine Speed (RPM)

**Figure 99**




P200090a

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

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

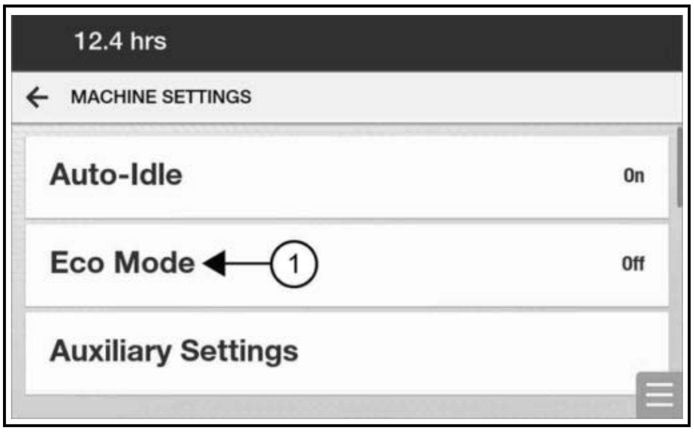
### Eco Mode

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

*Activating Eco Mode*

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

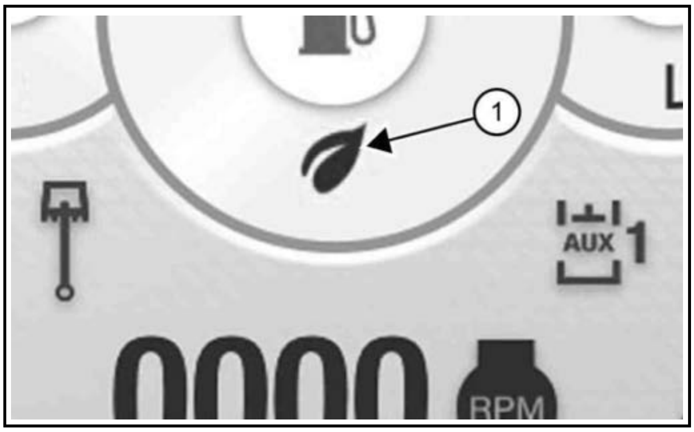
**Figure 100**




NA3742b

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

**Figure 101**



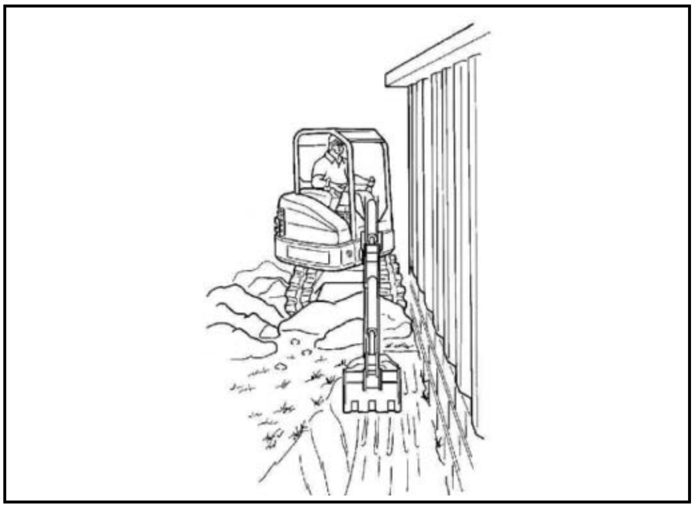

C132900g

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

## BOOM SWING

### Enabling Boom Swing

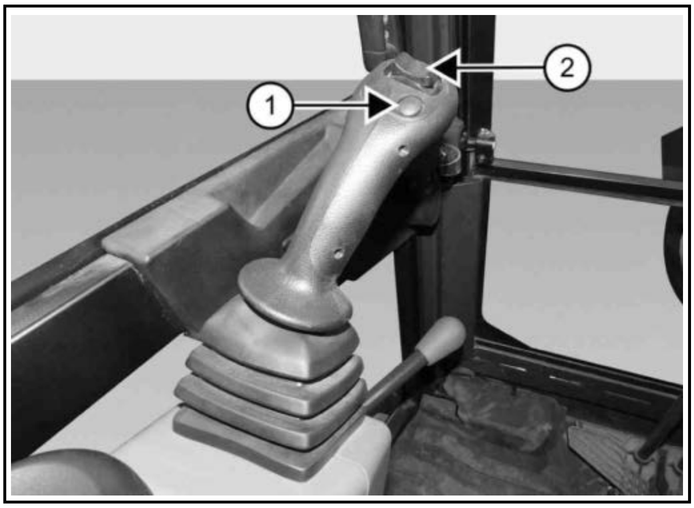
**Figure 102**



NA1432b

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

**Figure 103**




C206181a

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

   OR

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

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

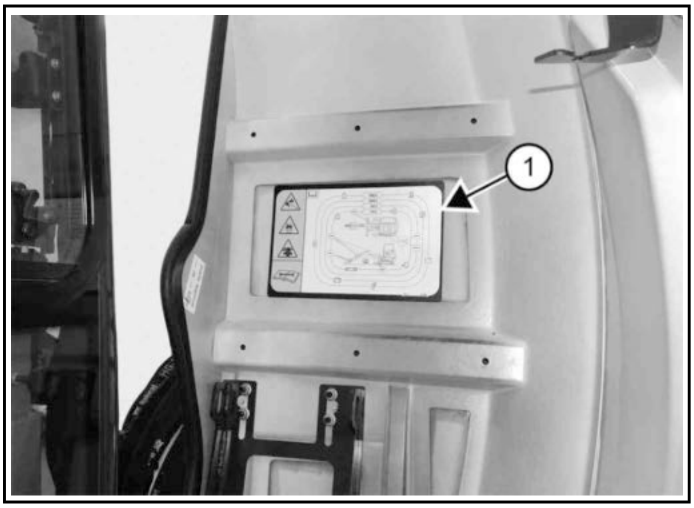
a. Move the switch to the left to swing the boom to the left.

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

## DAILY INSPECTION

### Daily Inspection And Maintenance List

**Figure 104**




P200106a

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The Service Schedule is a guide for correct maintenance of the Bobcat excavator. The decal (Item 1) [Figure 104] is located inside the right cover.
(See Service Schedule on Page 149)

Do the following before each day of operation:

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

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

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

**⚠ WARNING**

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

W-2001

**⚠ IMPORTANT**

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

I-2226

**⚠ WARNING**

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

W-2782

## PRE-STARTING PROCEDURE

### Entering The Excavator

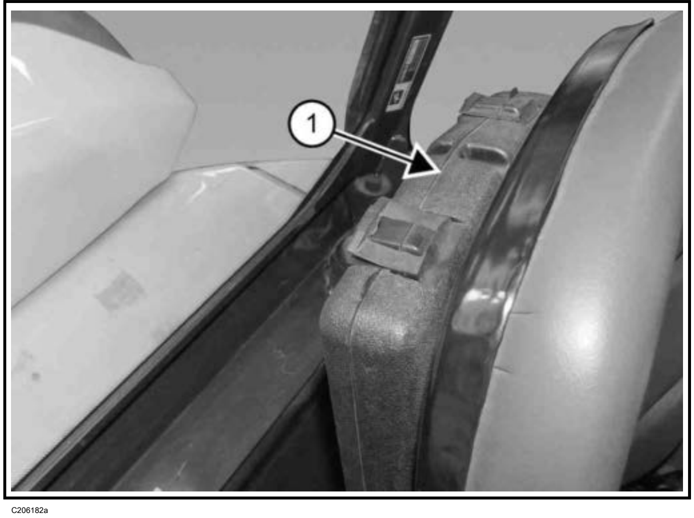
**Figure 105**

P132086

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

### Operation & Maintenance Manual And Operator's Handbook Locations

**Figure 106**

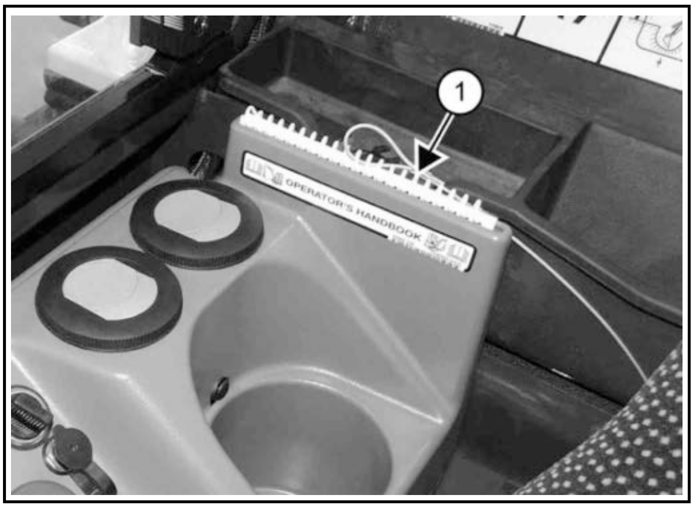



C206182a

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

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

**Figure 107**




P200107a

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

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

**⚠ WARNING**

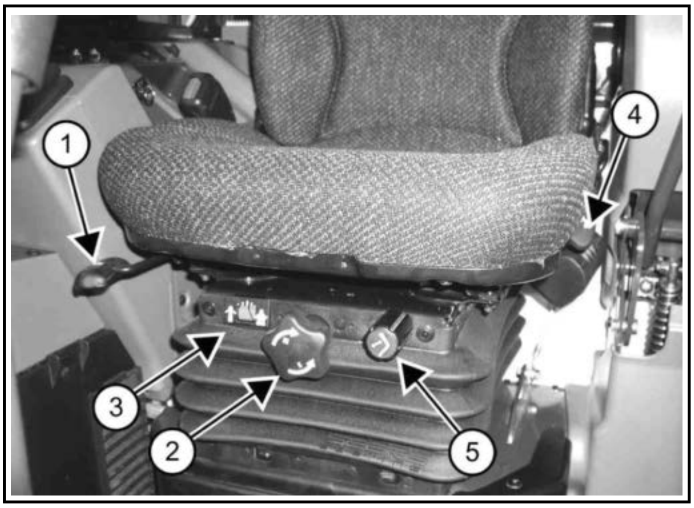
**INSUFFICIENT INSTRUCTIONS HAZARD**
**Untrained operators or failure to follow instructions can cause serious injury or death.**
- **Read and understand the Operation & Maintenance Manual, Operator's Handbook and decals on machine.**
- **Follow warnings and instructions in the manuals when making repairs,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

W-2003

## Seat Adjustment

*Adjusting The Suspension Seat*

**Figure 108**




C113009a

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

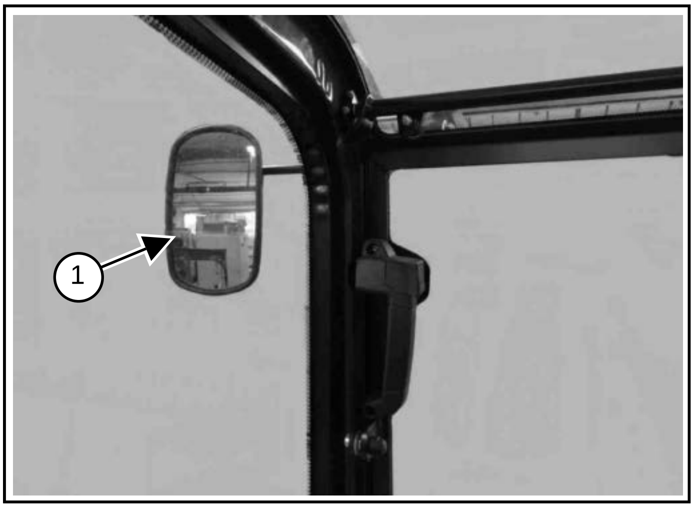
2. Turn the handle (Item 2) to change the adjustment for operator weight. Turn the handle until your weight is shown in the window (Item 3) [Figure 108].

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

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

## Adjusting Mirrors

**Figure 109**




P113541a

Adjust mirrors (Item 1) [Figure 109] (if equipped).

## Fastening The Seat Belt

**Figure 110**

P113010

Fasten the seat belt [Figure 110].

## STARTING THE ENGINE

### Quick Start Description

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

If your machine is equipped with a touch display, the Sleep Time can be adjusted.
(See System Sleep Time At Key OFF on Page 212)

- 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.<br>• Engine can be started after glow plugs have cycled and wait to start light is off.<br>• Machine functions are active immediately after engine is started. |
| Machine Lockout On / Quick Start On  NA3516 | • Password is required.<br>• Engine can be started after glow plugs have cycled and wait to start light is off.<br>• Machine functions are disabled until a password is entered.<br>• Machine will shut down if a valid password is not entered within 10 minutes. |
| Machine Lockout On / Quick Start Off  NA3517 | • Password is required.<br>• Engine cannot be started until a password is entered. |

### Starting The Engine

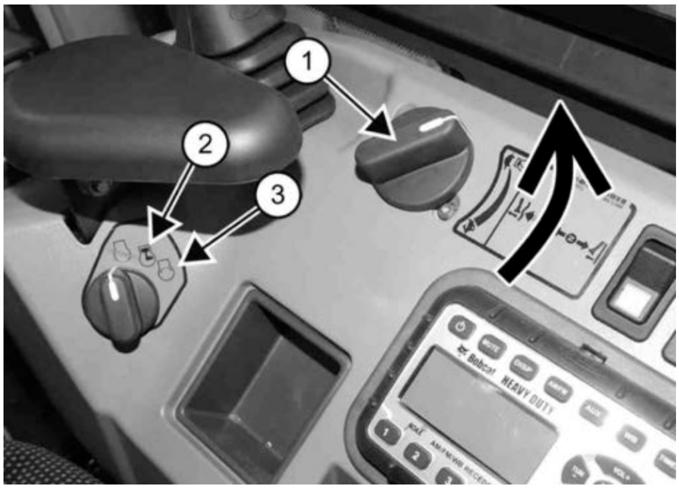
**⚠ WARNING**

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

W-2135

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

**Figure 111**




P200582a

2. Set the engine speed control (Item 1) [Figure 111] to low idle.

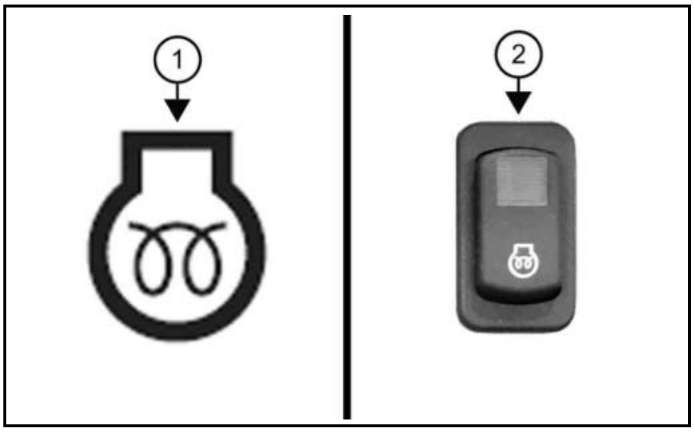
**⚠ IMPORTANT**

**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 111].
4. Enter the password if prompted.

**Figure 112**




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 112] 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 111].

   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 113**

P134071a

- Lower the left control console [Figure 113].

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

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

**Warming The Hydraulic System**

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

**Cold Temperature Starting Tips**

**⚠ WARNING**

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

W-2071

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

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

- Replace the engine oil with the correct type and viscosity for the anticipated starting temperature. (See Engine Oil Chart on Page 168)

- Make sure the battery is fully charged.

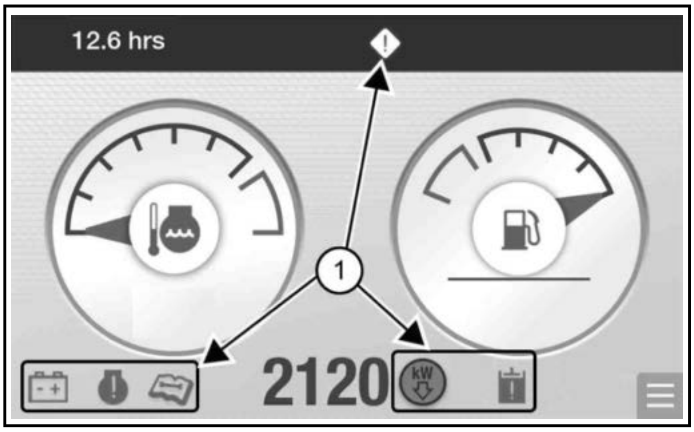
  If the battery is discharged (but not frozen), a booster battery can be used to jump start the excavator. (See Using A Booster Battery (Jump Starting) on Page 175)

- Install an engine heater.

## MONITORING THE DISPLAY

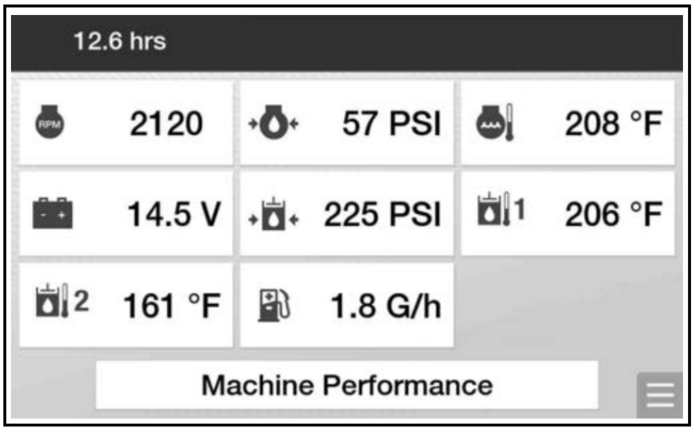
### Monitoring The Standard Display During Operation

**Figure 114**




NA3712A

**Figure 115**

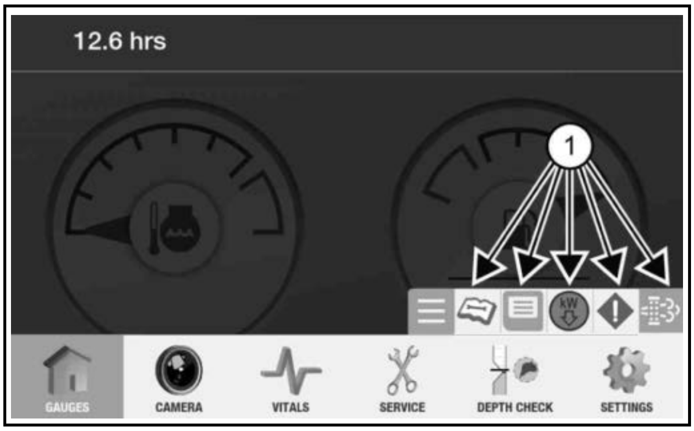



NA3701

Frequently monitor the **GAUGES** [Figure 114] and **VITAL DETAIL** [Figure 115] screens for machine condition.

These icons (Item 1) [Figure 114] indicate machine conditions that may require service.
(See Standard Display on Page 36)

**Figure 116**




NA3705E

Active shortcuts (Item 1) [Figure 116] that appear also indicate a need for service.
(See Active Shortcuts on Page 194)

A red dot next to the **[SERVICE]** icon indicates an active service code. (See Viewing Service Codes on Page 196)

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

### Monitoring The Touch Display During Operation

**Figure 117**


C132900i

**Figure 118**


NA3762

Frequently monitor the **GAUGES** [Figure 117] and **VITAL DETAIL** [Figure 118] screens for machine condition.

These icons (Item 1) [Figure 117] 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 202)

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 199)

### Derate And Shutdown Conditions

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

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

## OPERATING PROCEDURE

### Inspect The Work Area

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

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

### Basic Operating Instructions

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

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

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

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

### Operating Near An Edge Or Water

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

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

### Lowering The Work Group If The Engine Stops

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

**Figure 119**

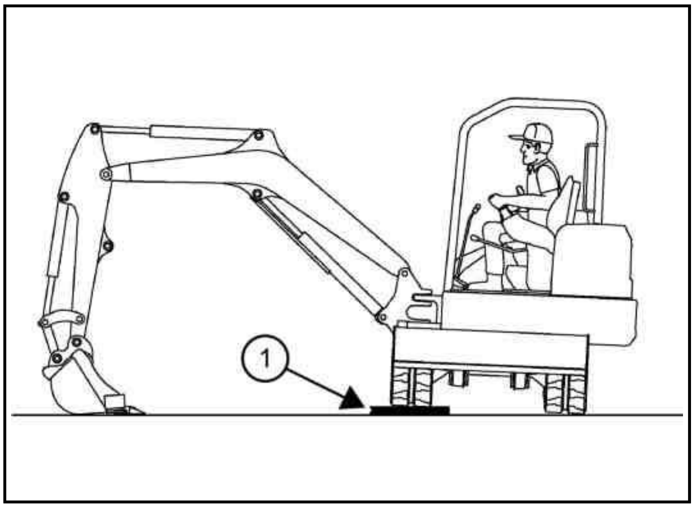
P134071a

1. Ensure the left console is down [Figure 119].
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.

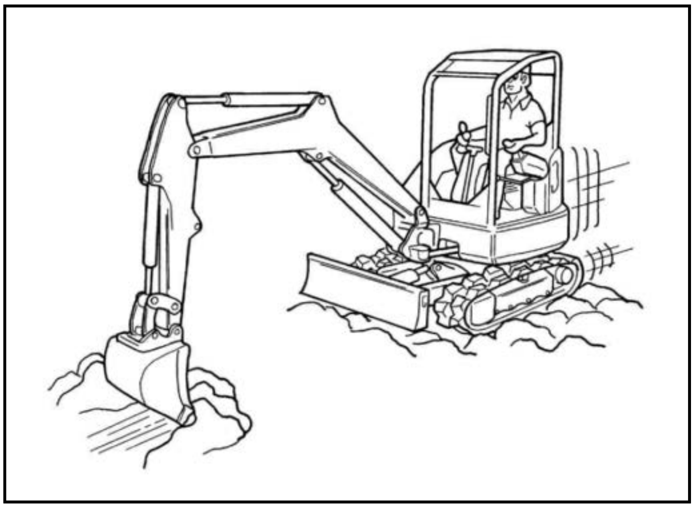
**Figure 120**




NA1440a

- When working on wet or soft ground, put planks (Item 1) [Figure 120] 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 121**



NA1422a

- The bucket may also be used to pull the excavator [Figure 121].
  - ▹ Raise the blade.
  - ▹ Extend the arm and lower the boom.
  - ▹ Operate the boom in a digging manner.

### Operating On Slopes

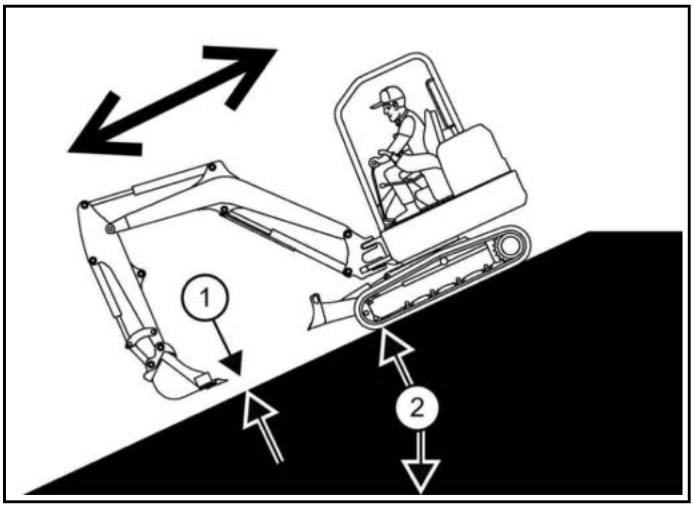
**⚠ WARNING**

**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 122**




NA1448e

- 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 122]. Run the engine slowly.

- Do not travel down or back up slopes that exceed 25 degrees (Item 2) [Figure 122].

- 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.

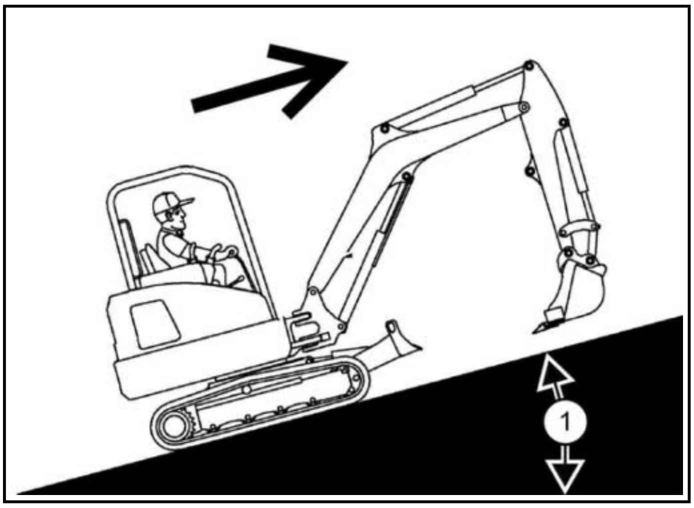
  Damage to the blade or hydraulic cylinder can result.

**⚠ 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.◂**

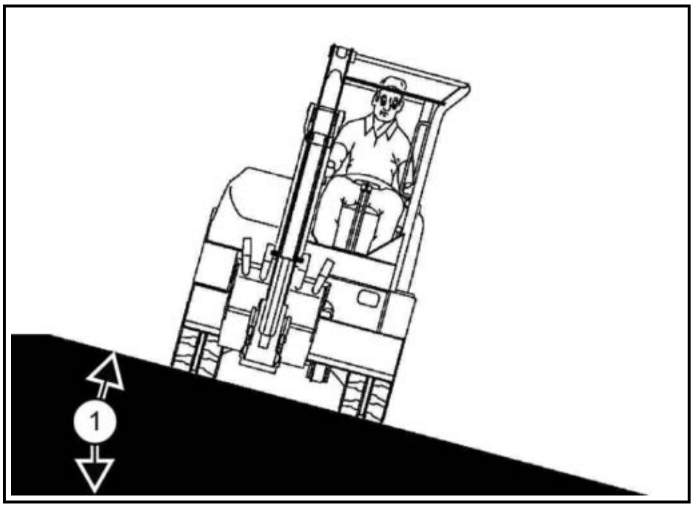
W-2498

**Figure 123**




NA1447e

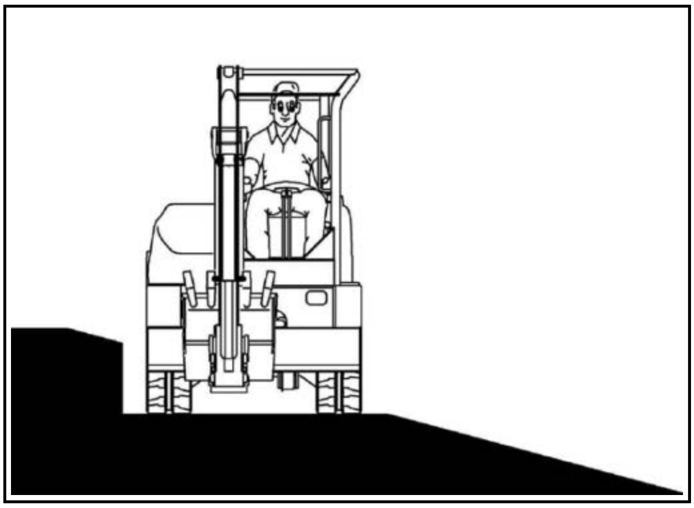
**Figure 124**




NA1449c

- When travelling up slopes (Item 1) [Figure 123], or on side slopes that are 15 degrees or less (Item 1) [Figure 124], position the machine as shown and run the engine slowly.

**Figure 125**



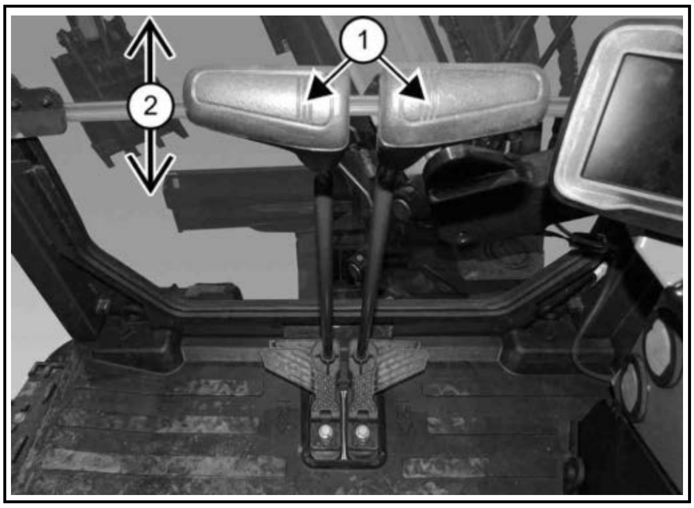
NA1450a

- When operating on a slope, level the work area before beginning [Figure 125].

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

  - Do not work on slopes that are over 15 degrees (Item 1) [Figure 124].
  - Use a slow work cycle.
  - Avoid working with the tracks across the slope. This will reduce stability and increase the tendency for the machine to slide.
  - Position the excavator with the blades downhill and lowered.
  - Avoid swinging or extending the bucket more than necessary in a downhill direction.
  - When you must swing the bucket downhill, keep the arm low and skid the bucket downhill.
  - When working with the bucket on the uphill side, keep the bucket as close to the ground as possible.
  - Dump the spoil far enough away from the trench or hole to prevent the possibility of a cave in.

**Figure 126**




P200102a

- To brake the machine when going down a slope, move the steering levers (Item 1) to the NEUTRAL position (Item 2) [Figure 126].

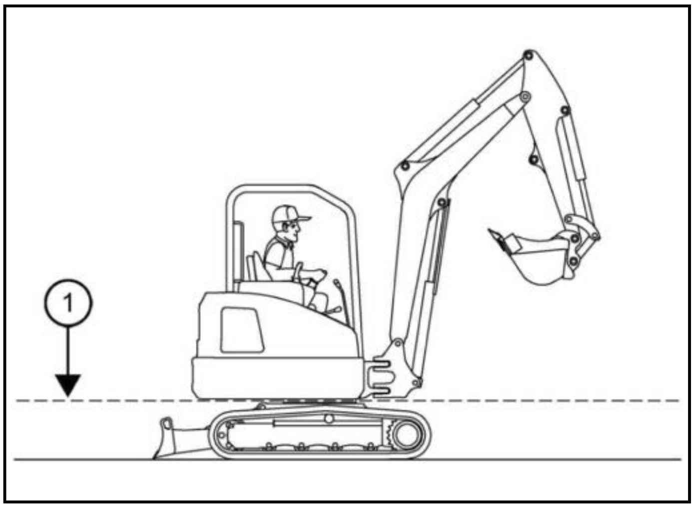
  This will engage the hydrostatic braking.

- 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 127**




NA1446a

- Do not operate or immerse the excavator in water higher than the bottom of the swing bearing (Item 1) [Figure 127].
- 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**

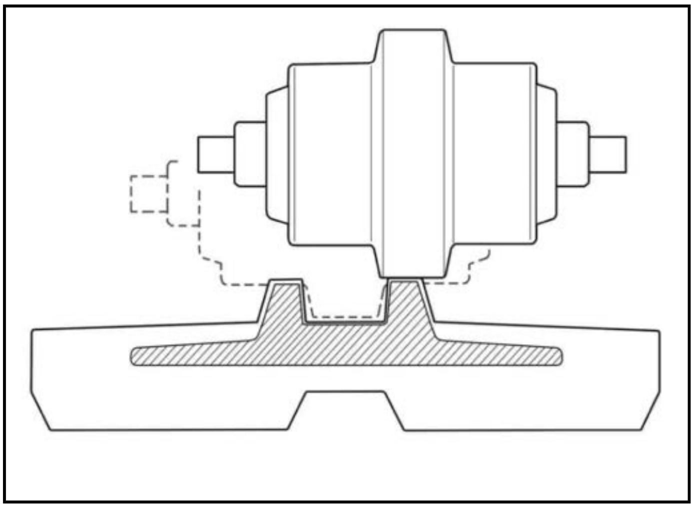
- In freezing temperatures, park the machine on boards or concrete.

  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 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.

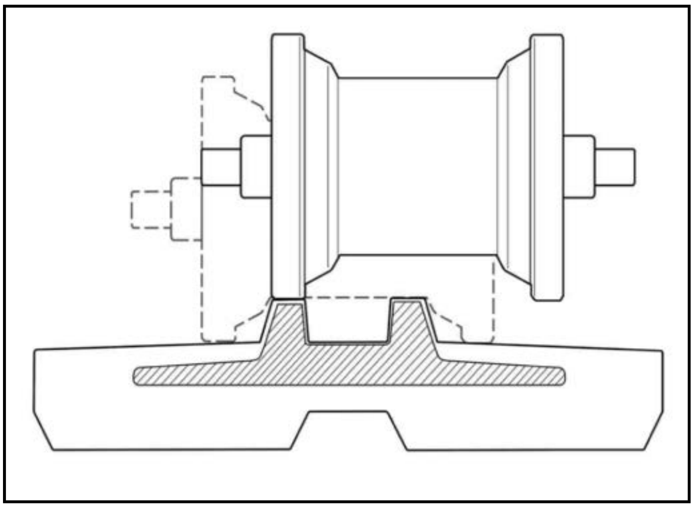
  Stones and foreign objects can become wedged between the sprocket / rollers and cause detracting and track stress.

**Figure 128**



NA20189

**Figure 129**

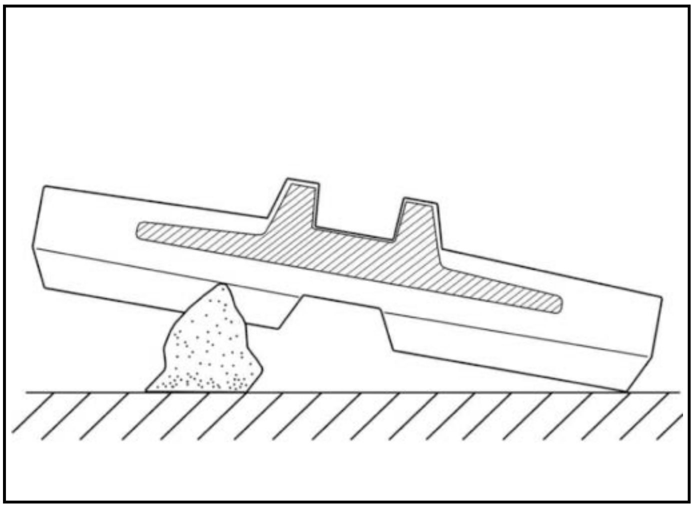


NA20190

- Maintain proper track tension.
  (See Track Tension on Page 182)

  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 128] or [Figure 129]).

**Figure 130**



NA20246

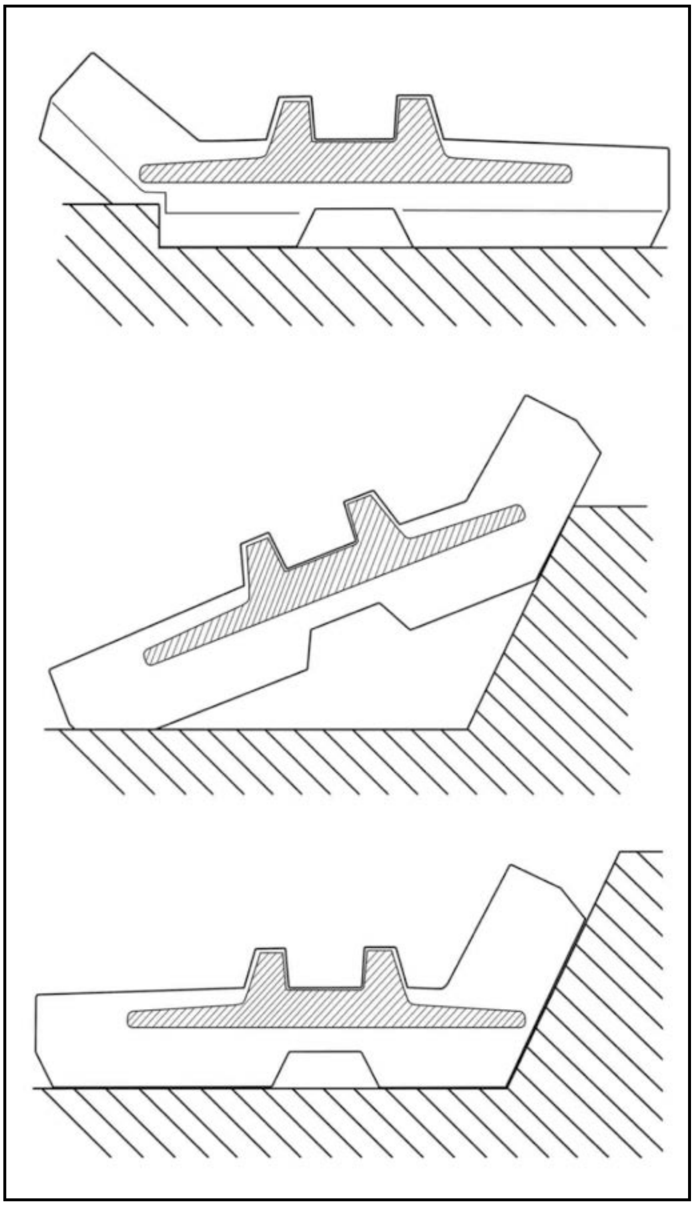
- Avoid driving over sharp objects.

  When rubber tracks drive over sharp projections:

  - Intensive stress is applied to the lug side of the rubber surface, especially at the edges of embedded metals, causing cracks and cuts in the area around the embedded metals.
  - Concentrated forces cause cuts [Figure 130] 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 131**



NA20247a

- Avoid driving over stumps and ridges.

  This may apply extensive stress to the lug root where metals are embedded [Figure 131].

- Avoid making quick turns on bumpy and rocky fields.

## STOPPING THE ENGINE AND LEAVING THE MACHINE

### Stopping The Engine And Leaving The Machine

**Figure 132**

C200402a

1. Stop the machine on level ground.

2. Lower the work equipment and the blade to the ground [Figure 132].

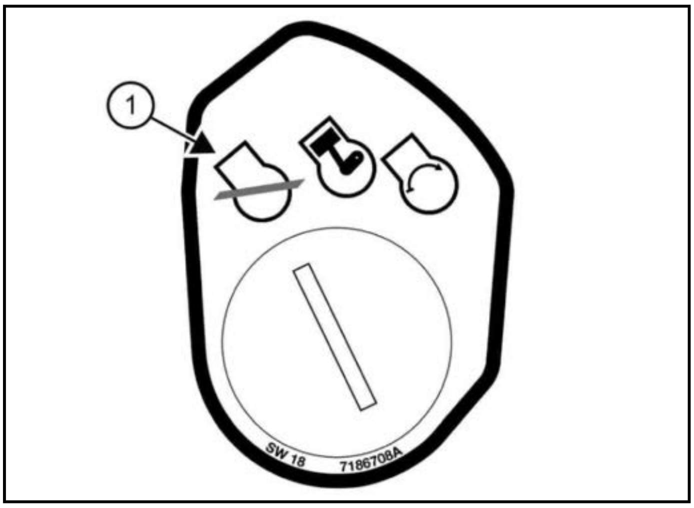
**Figure 133**

C208107a

3. Rotate the engine speed control dial counterclockwise to low idle [Figure 133].

4. Run the engine at idle speed for about 5 minutes to allow it to cool.

**Figure 134**




7186708c

5. Turn the switch to Stop (Item 1) [Figure 134].
6. Disconnect the seat belt.
7. Remove the key from the switch (if equipped) to prevent operation of machine by unauthorised personnel.
8. Raise the control console.
9. Exit the machine.

## INSTALLING ATTACHMENTS (PIN-ON ATTACHMENT)

**⚠ WARNING**

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

W-2052

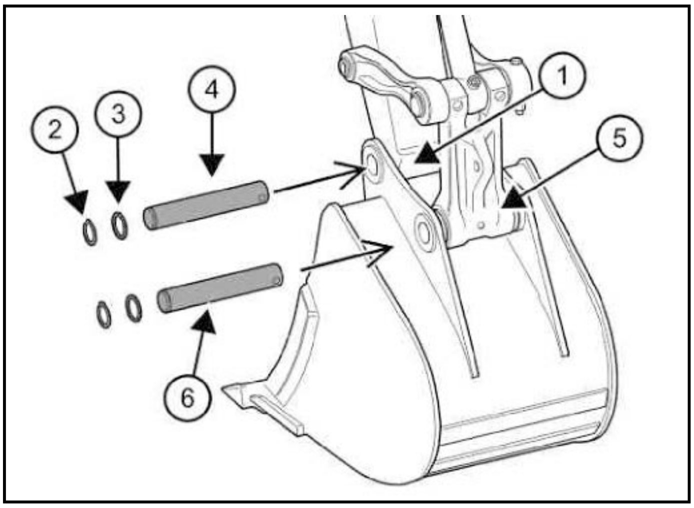
**⚠ WARNING**

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

W-2140

1. Start the engine.

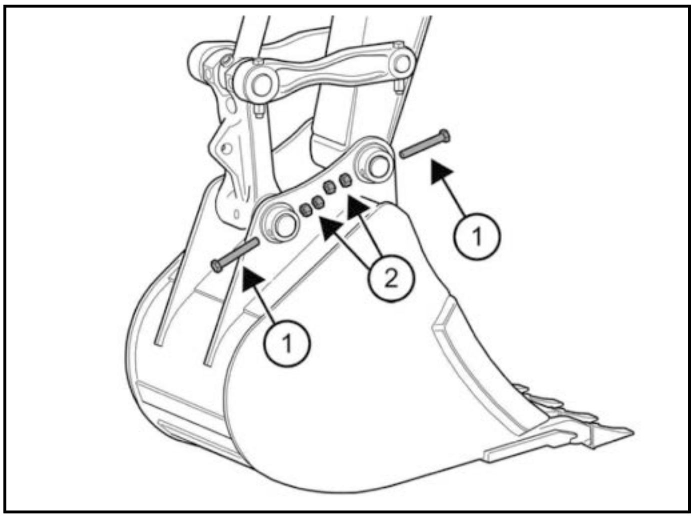
**Figure 135**




NA20306b

2. Move the arm toward the bucket and align the mounting hole (Item 1) [Figure 135].
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 135].
6. Push the pin (Item 4) through the bucket bushings and pivot [Figure 135].
7. Align link with bucket bushing (Item 5) [Figure 135] and washers.
8. With washer and snap ring installed, push the second pin (Item 6) through bucket bushing and link [Figure 135].

**Figure 136**




NA20307b

9. Install screws (Item 1) and double nuts (Item 2), ensuring that the screws rotate freely [Figure 136].

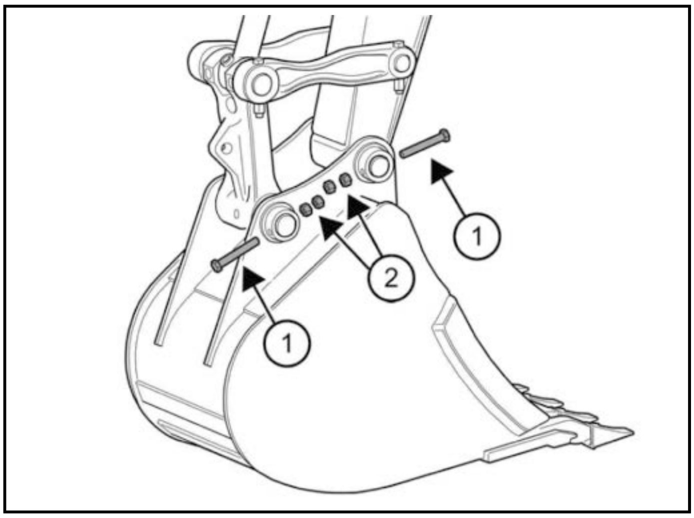
10. Add grease to the grease fittings.

## 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.

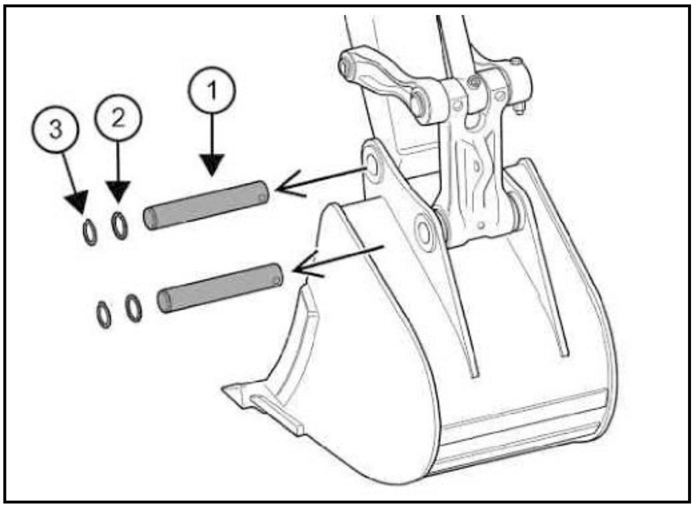
**Figure 137**




NA20307b

3. Remove the screws (Item 1) and double nuts (Item 2) [Figure 137].

**Figure 138**




NA20306c

4. Remove the pins, washers, and snap rings (Items 1, 2, and 3) [Figure 138].

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.◂**

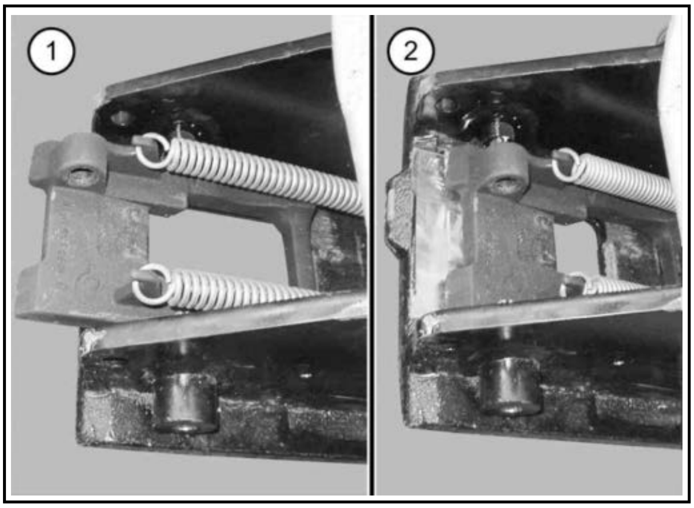
W-2119

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.

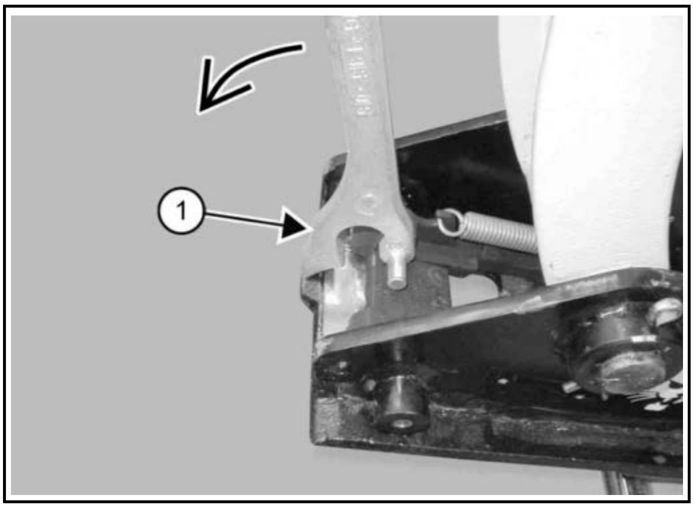
**Figure 139**




p72272b

3. Inspect the quick coupler [Figure 139].

**Figure 140**




p72273a

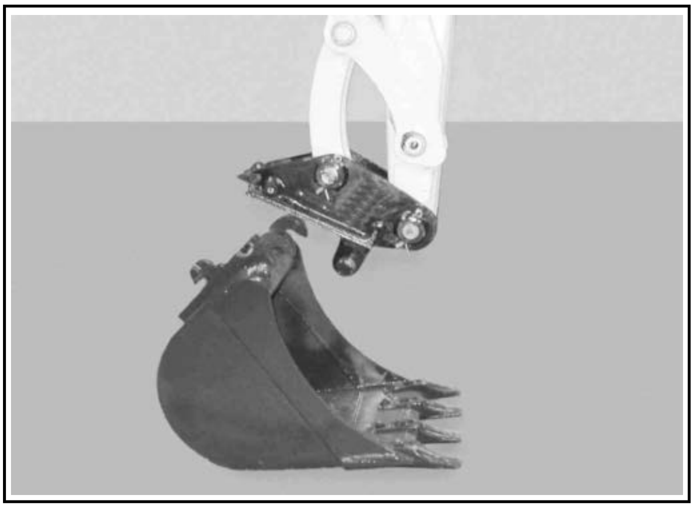
4. If the coupler is in the unlatched position (Item 1) [Figure 139], proceed to Step 5.

   OR

   If the coupler is in the latched position (Item 2) [Figure 139], install the tool (Item 1) [Figure 140] 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.

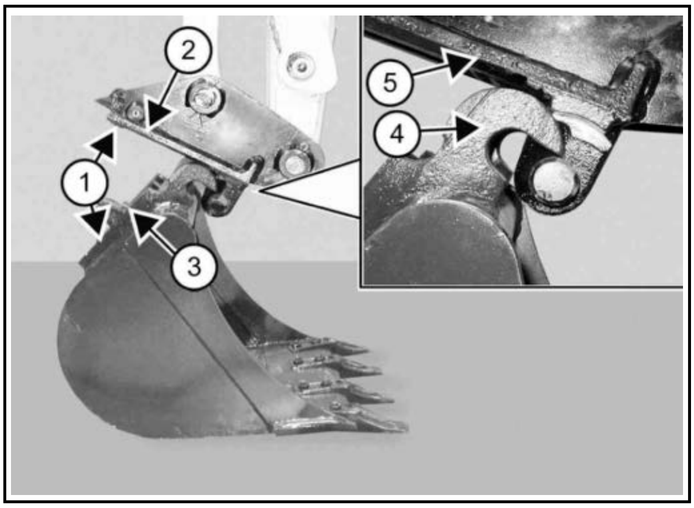
**Figure 141**



p-72274b

6. Position the quick coupler near the attachment [Figure 141].

**Figure 142**



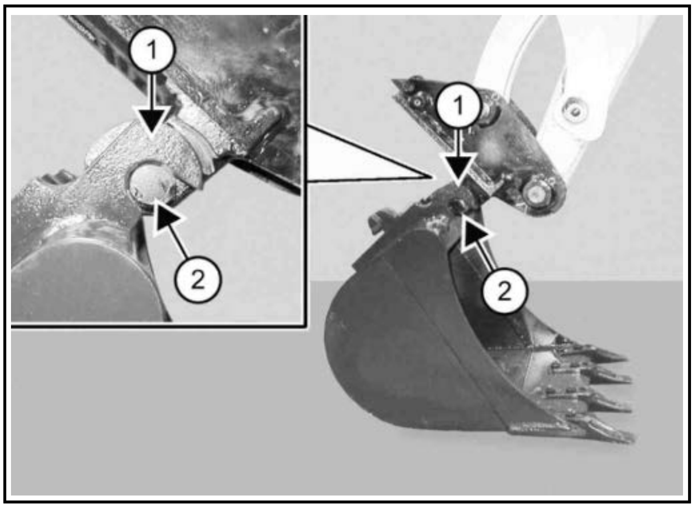

p-72275b

7. Extend the arm out until there is at least 100° (Item 1) between the quick coupler surface (Item 2) and the attachment mounting surface (Item 3) [Figure 142].

   There must be proper clearance (Item 1) between the hook (Item 4) and the quick coupler (Item 5) [Figure 142].

   Extend the arm out to get the required angle (Item 1) [Figure 142]. Damage could occur to the attachment hooks or the quick coupler without proper clearance.

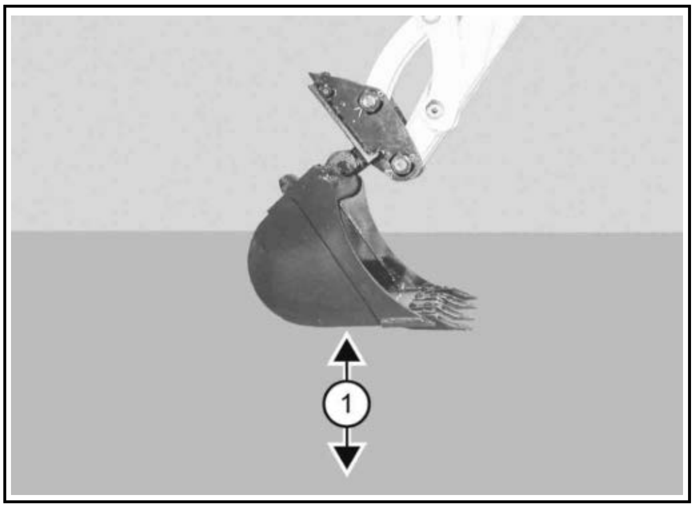
**Figure 143**




p-72276a

8. Raise the boom and extend the arm until the hooks of the attachment (Item 1) engage the pins (Item 2) of the quick coupler [Figure 143].

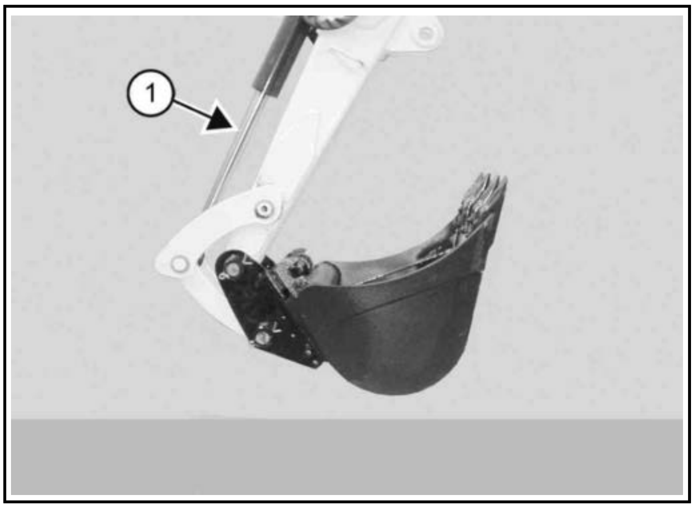
**Figure 144**




p-72277a

9. Raise the boom until there is approximately 500 mm (20.0 in) (Item 1) [Figure 144] of clearance between the bottom of the attachment and the ground.

**Figure 145**




p-72278a

10. Extend the bucket cylinder (Item 1) [Figure 145] 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 91)

## 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.).

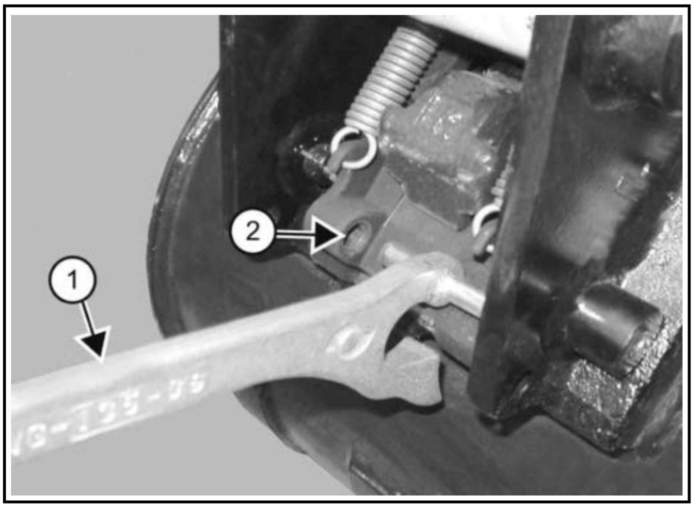
**⚠ WARNING**

**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 146**




p-72286

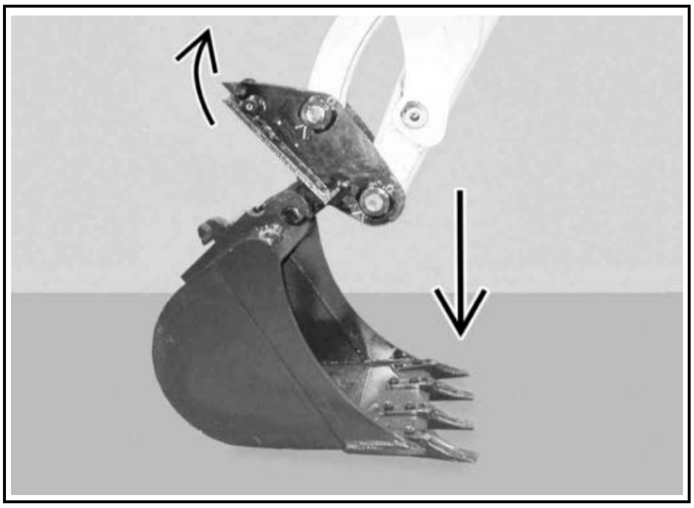
2. Install the quick coupler tool (Item 1) into the hole (Item 2) in the quick coupler [Figure 146].

3. Push down on the tool (Item 1) [Figure 146] to unlock the latch.

4. Remove the tool.

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

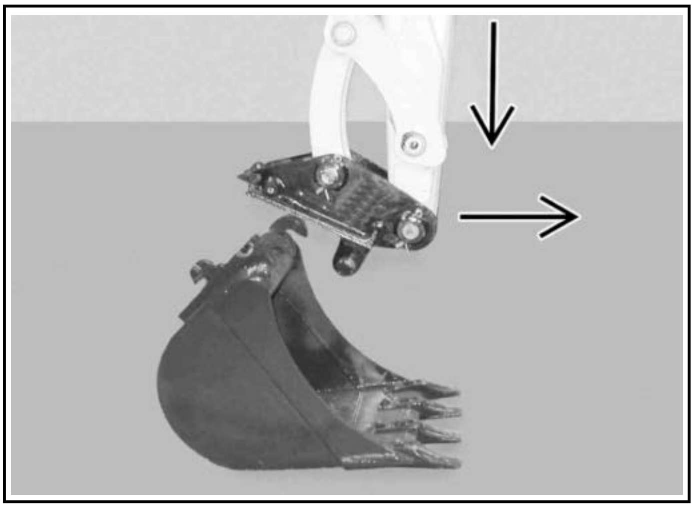
**Figure 147**



p-72282a

6. Retract the bucket cylinder fully and lower the boom until the attachment is on the ground [Figure 147].

**Figure 148**



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 148].

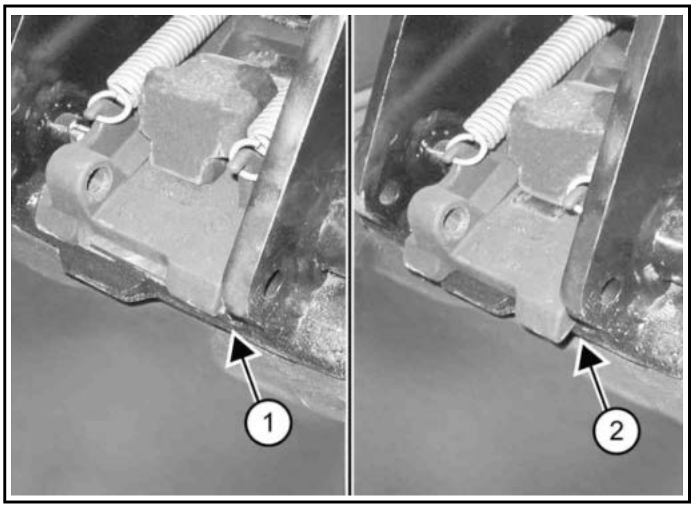
## INSPECTING AND ADJUSTING THE QUICK COUPLER LATCH

**⚠ 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 149**

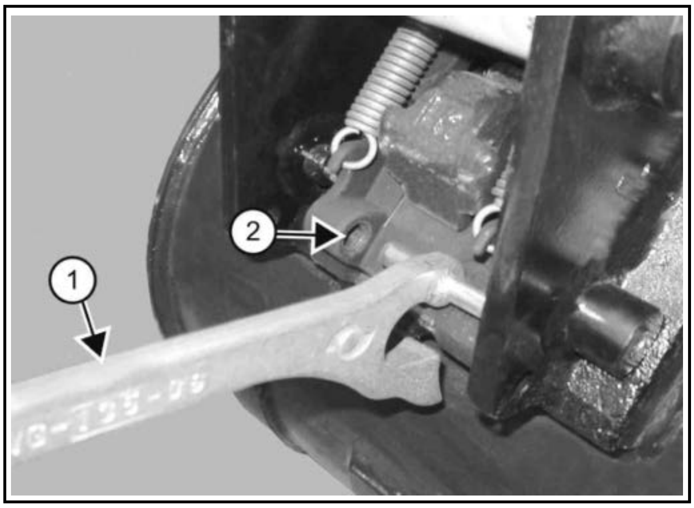



p-72279a

Visually inspect the quick coupler latch to the bucket mount [Figure 149]. The latch must be fully engaged (Item 1) [Figure 149].

If the latch is not fully engaged (Item 2) [Figure 149], proceed with the following instructions:

**Figure 150**




p-72286

1. Install the tool (Item 1) in the hole (Item 2) of the quick coupler [Figure 150].
2. Push the tool (Item 1) [Figure 150] down to unlatch the quick coupler.
3. Remove the tool (Item 1) [Figure 150].
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 145].
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 149].
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.◂**

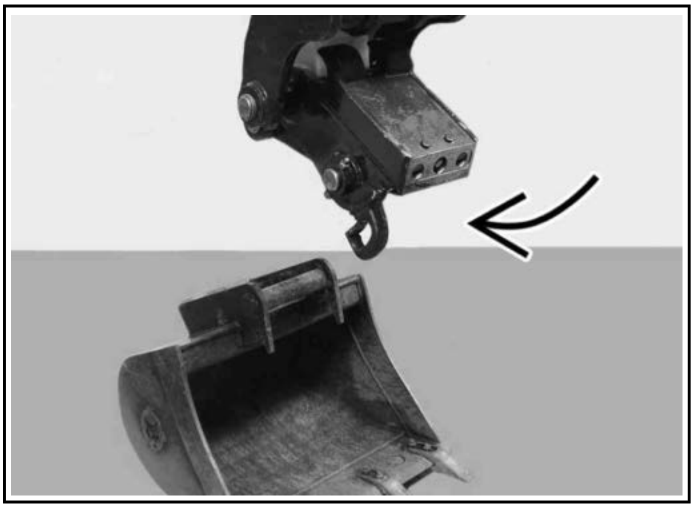
W-2119

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 151**



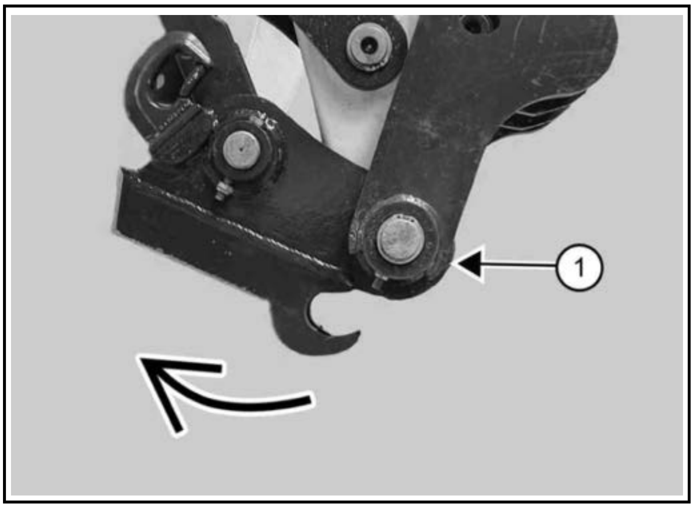
C113895a

3. Position the arm and quick coupler to the attachment [Figure 151].

**Figure 152**


C206172c

**Figure 153**

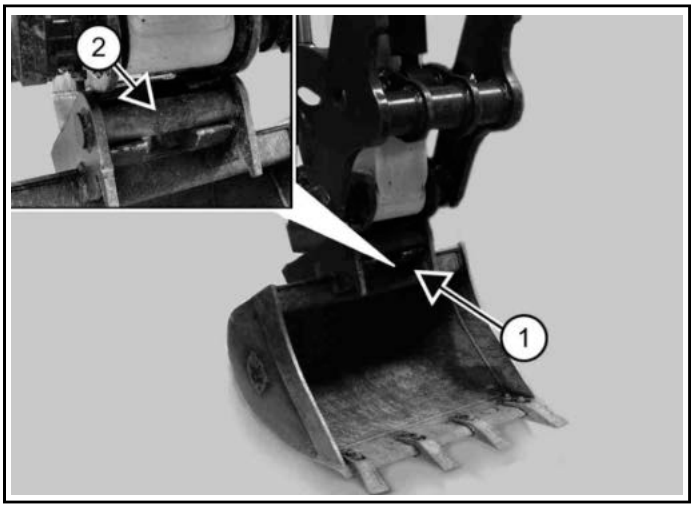



C113902c

4. Move the right joystick (Item 1) [Figure 152] to the right (OUT) to curl the coupler (Item 1) [Figure 153] back, fully away from the cab.

5. Lower the coupler onto the attachment.

Figure 154



p113898c

6. Engage the coupler hooks (Item 1) onto the attachment shaft (Item 2) [Figure 154].

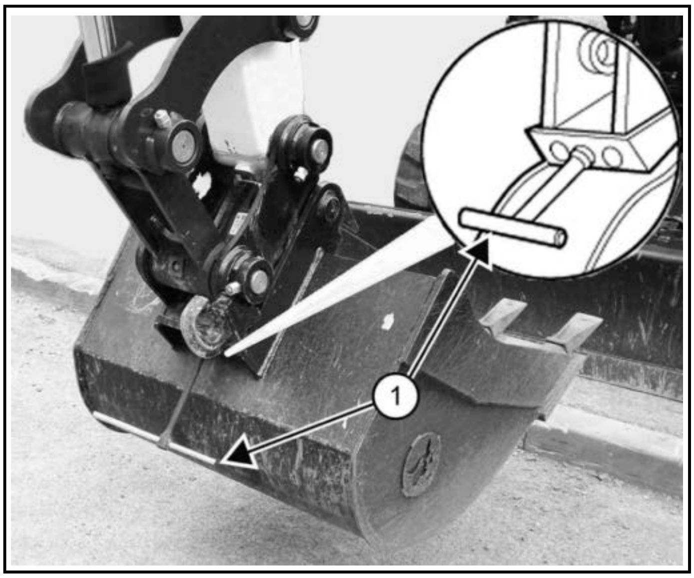
Figure 155

C113899

7. Move the right joystick to the left (IN) and curl the coupler (Item 1) [Figure 155] in toward the cab fully.

8. Stop the engine and exit the machine.

Figure 156



p113903b

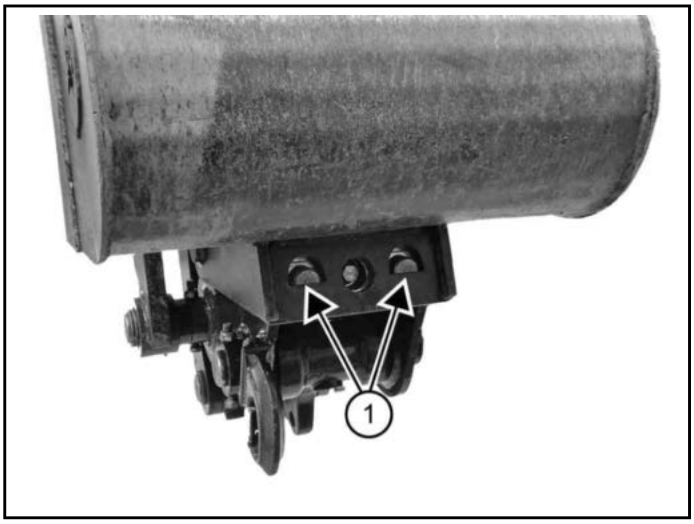
9. Use the supplied wrench (Item 1) [Figure 156] and turn the wrench clockwise until the locking pins fully engage.

**⚠ 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 157



C113900

10. Visually check that the locking pins (Item 1) [Figure 157] are extended through the holes in the attachment mounting frame, securely fastening the attachment to the coupler.

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

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

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

13. Lower the attachment flat to the ground.

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

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

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

**REMOVING ATTACHMENTS (GERMAN STYLE COUPLER)**

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

**⚠ WARNING**

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

W-2119

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

2. Raise the boom.

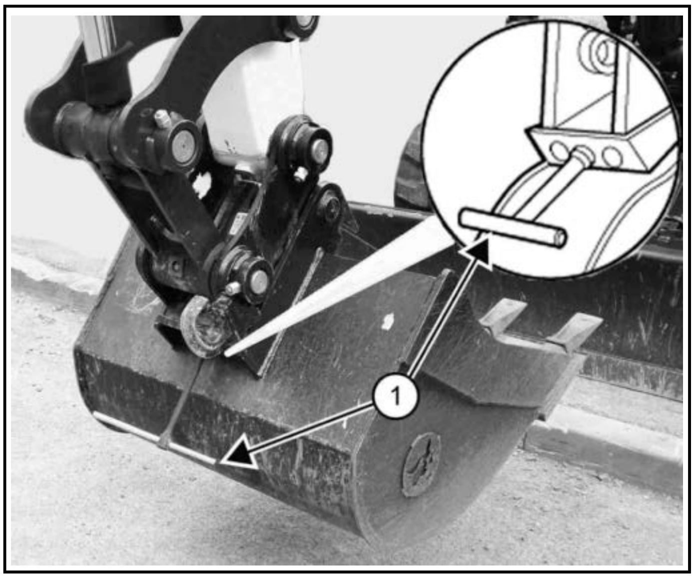
**Figure 158**

C113899

3. Move the right joystick to the left (IN) and curl the coupler in toward the cab fully [Figure 158].

4. Stop the engine and exit the excavator.

**Figure 159**



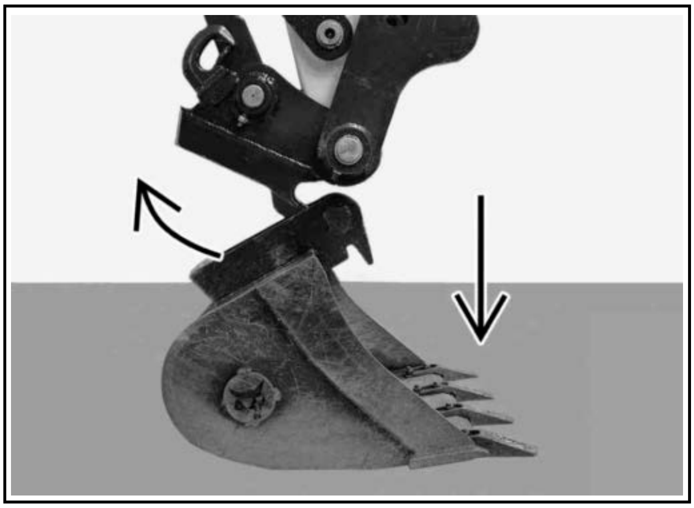

p113903b

5. Use the supplied wrench (Item 1) [Figure 159] 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 160**



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 160].

9. Move the arm away from the attachment.

## INSTALLING ATTACHMENTS (MECHANICAL PIN GRABBER COUPLER)

**Figure 161**

C207444

You have been supplied with the release tool [Figure 161] 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**

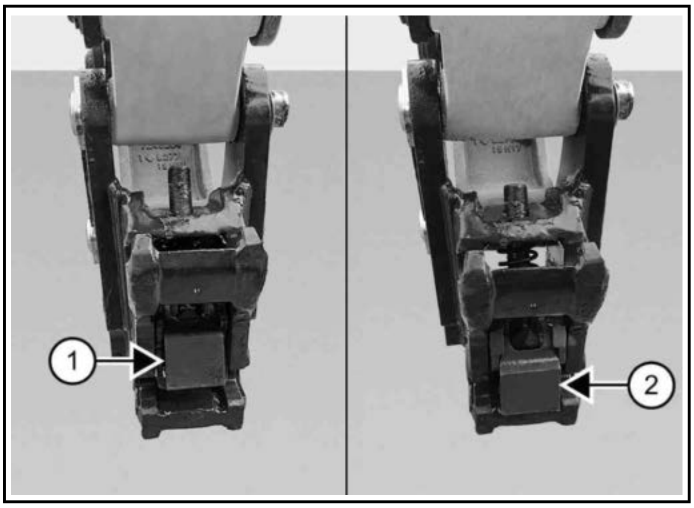
**ENTANGLEMENT AND IMPACT HAZARD**
**Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.**
**Keep all bystanders 6 m (20 ft) away from equipment when operating.◂**

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 162**




C207446b

2. Inspect the quick coupler. If the wedge and the trigger are in the primed position (Item 1) [Figure 162], proceed to Step 4.

   OR

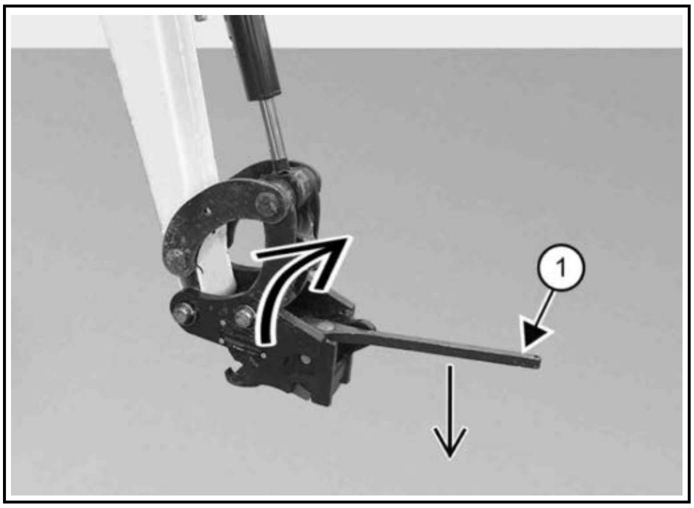
   If the wedge is in the engaged position (Item 2) [Figure 162], see Step 3.

   **⚠ 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 163**




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 163].

   c. Rotate the release tool clockwise and hold [Figure 163].

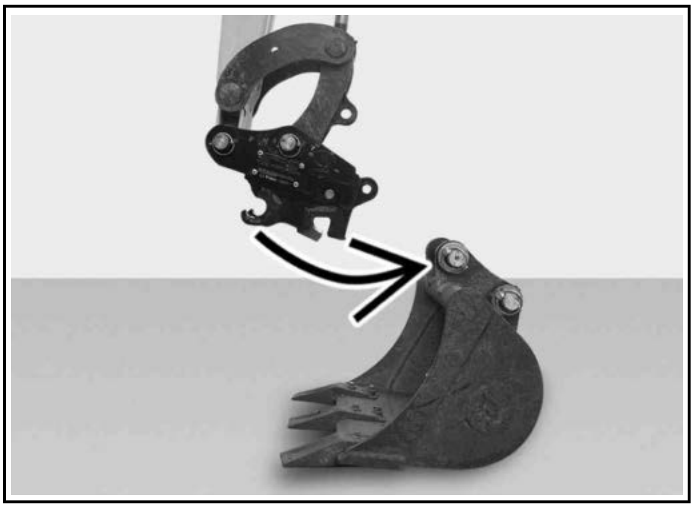
   d. Push the release tool down [Figure 163].

   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 164**

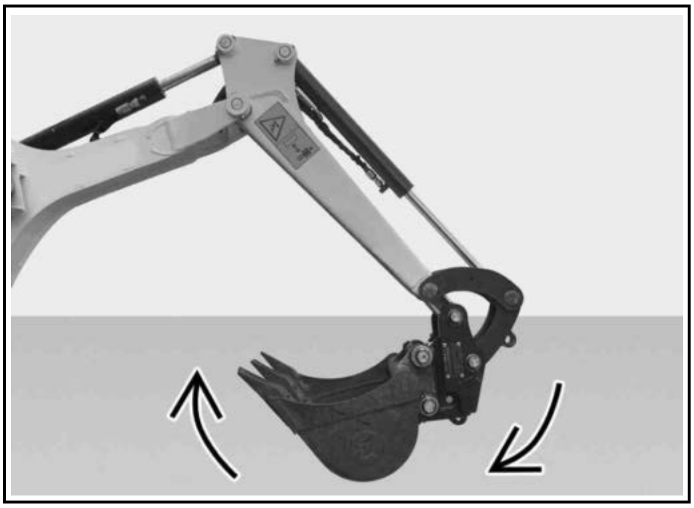


C207447a

4. Guide the coupler front hooks onto the attachment front pin [Figure 164].

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

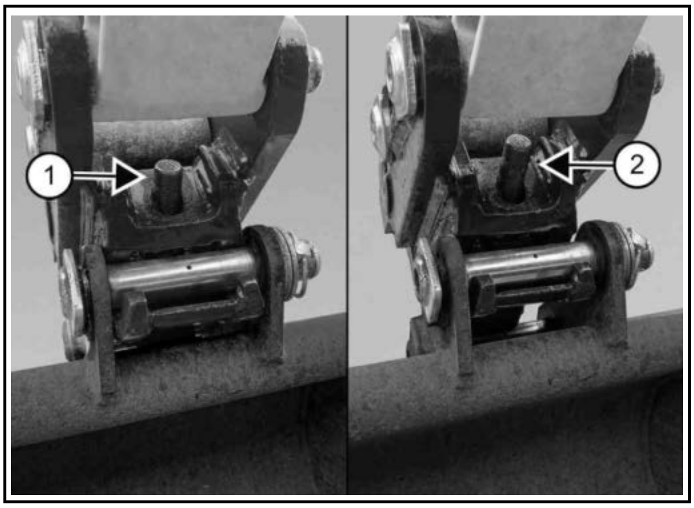
**Figure 165**



C207741a

6. Extend the bucket cylinder and curl in the bucket [Figure 165] until you hear the wedge engage on the attachment back pin.

**Figure 166**




C207449b

7. Visually inspect the indication bar to see if the coupler is fully engaged (Item 1) [Figure 166].

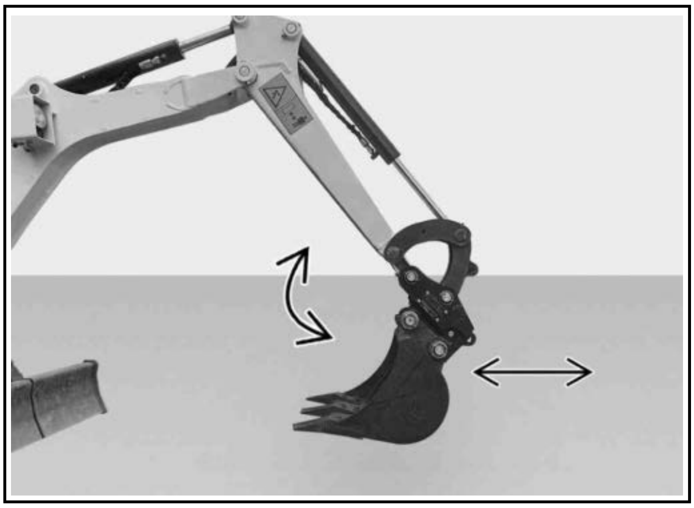
   If the visual indicator bar is not fully engaged (Item 2) [Figure 166], the attachment must not be operated. Turn off the excavator and examine the coupler for dirt build up or damage. Refer to the service manual for further information.

**⚠ WARNING**

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

W-3024

**Figure 167**



C207451a

8. Shake the attachment vigorously and / or carry out a bump test to ensure the attachment is secured to the coupler [Figure 167].

## 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.◂**

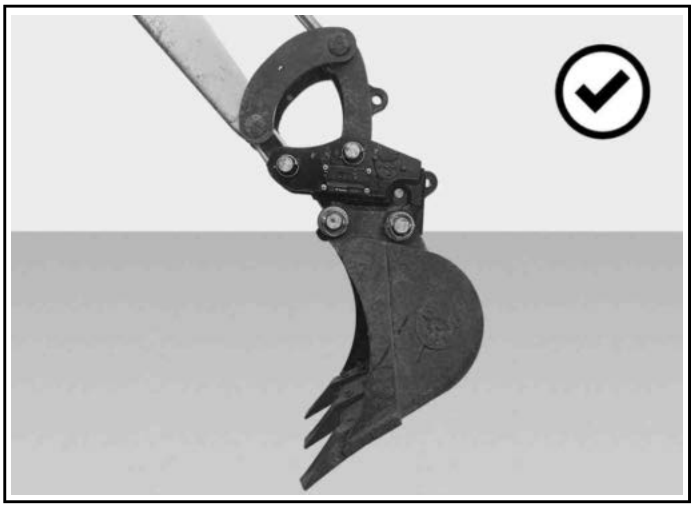
W-2052

**⚠ 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 168**

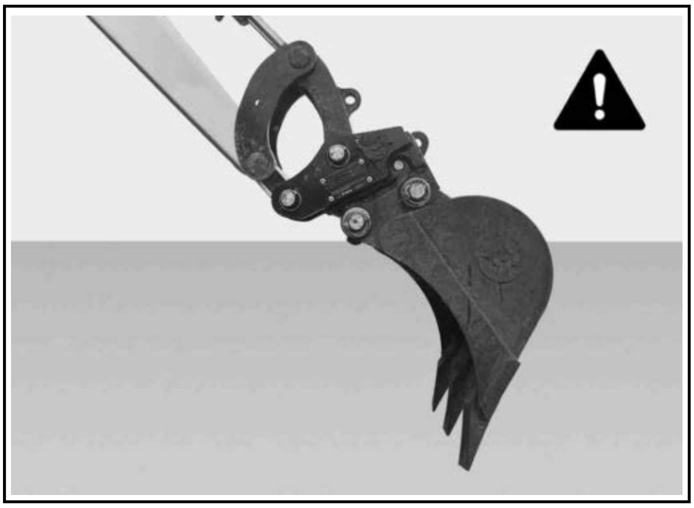


C207452a

1. Position the attachment close to ground level at the angle shown [Figure 168].

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

**Figure 169**



C207453a

**DO NOT RELEASE AN ATTACHMENT WITH THE COUPLER CURLED OPEN. [Figure 169]**

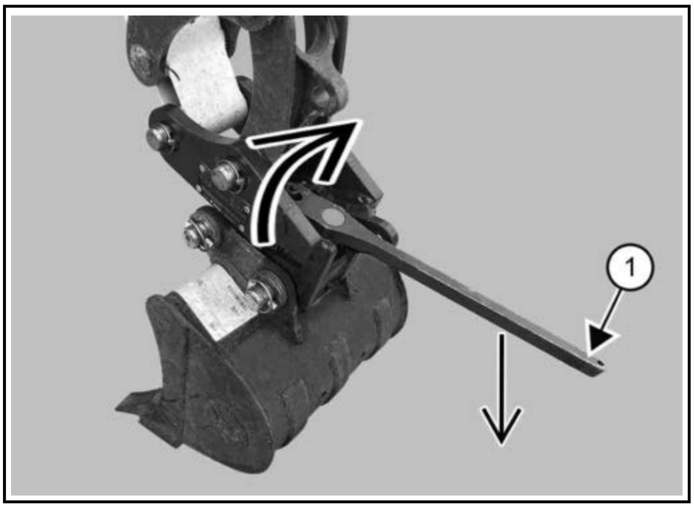
2. Stop the engine and exit the excavator.

**⚠ 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 170**




C207454b

3. Firmly insert the release tool (Item 1) [Figure 170].

**⚠ 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 170].

5. Press the release tool down against the wedge to disengage the attachment back pin [Figure 170].

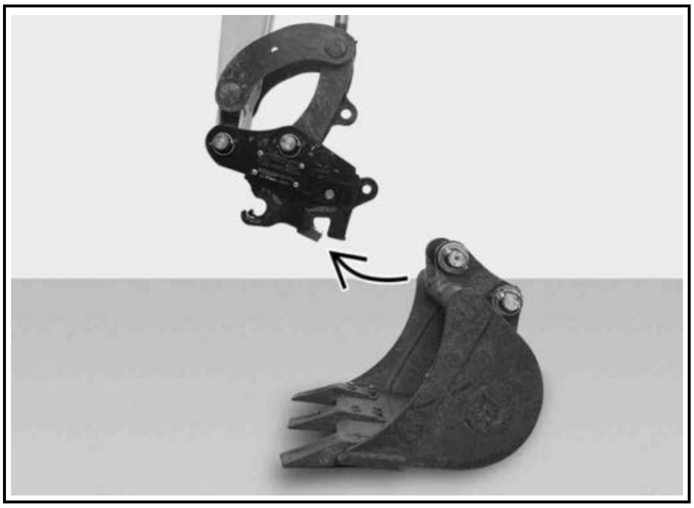
6. Remove the release tool and return it to a secure position.

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 171**



C207447b

10. Move the arm away from the attachment [Figure 171].

## 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.◂**

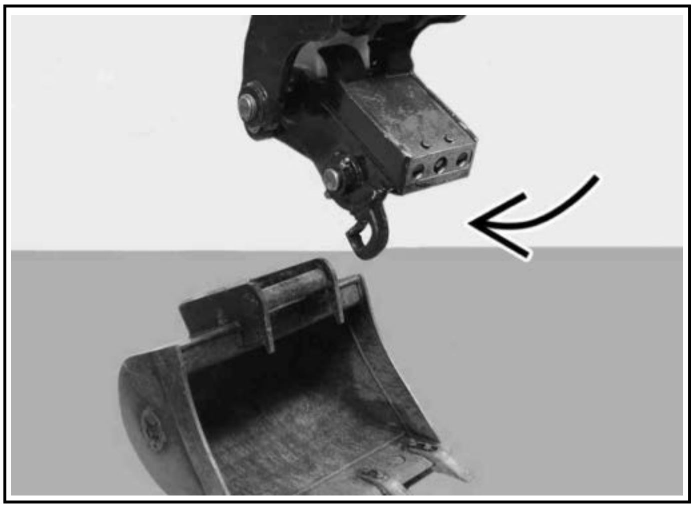
W-2119

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.

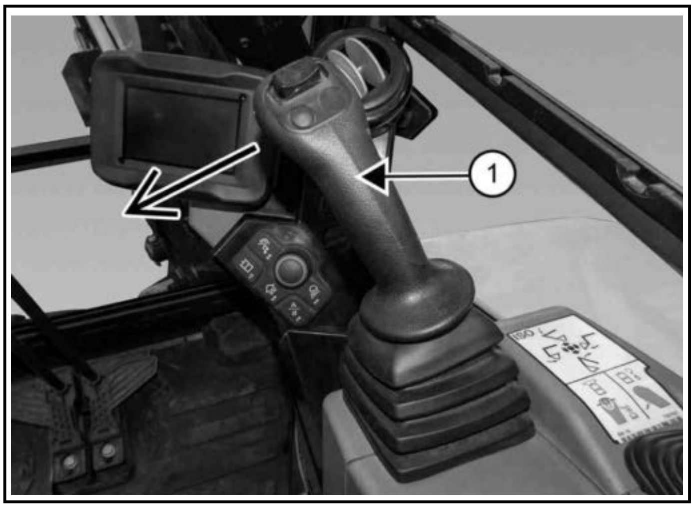
**Figure 172**



C113895a

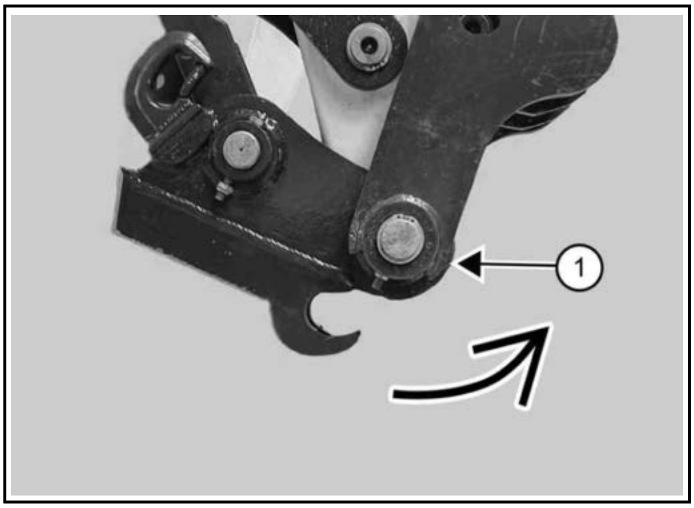
3. Position the arm and quick coupler to the attachment [Figure 172].

**Figure 173**




C206172e

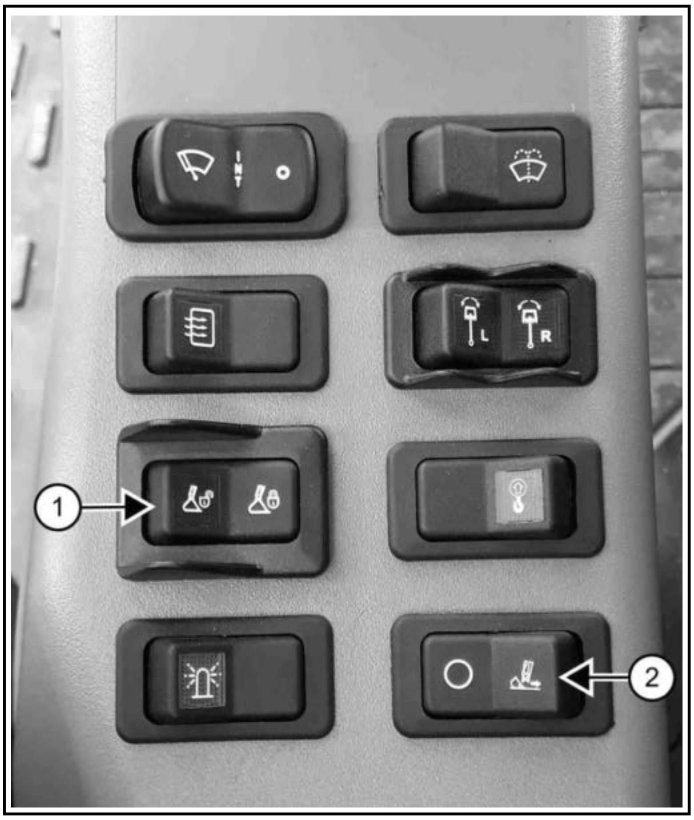
**Figure 174**




C113902b

4. Move the right joystick (Item 1) [Figure 173] to the left (IN) to curl the coupler (Item 1) [Figure 174] fully in toward the cab.

**Figure 175**




C208239d

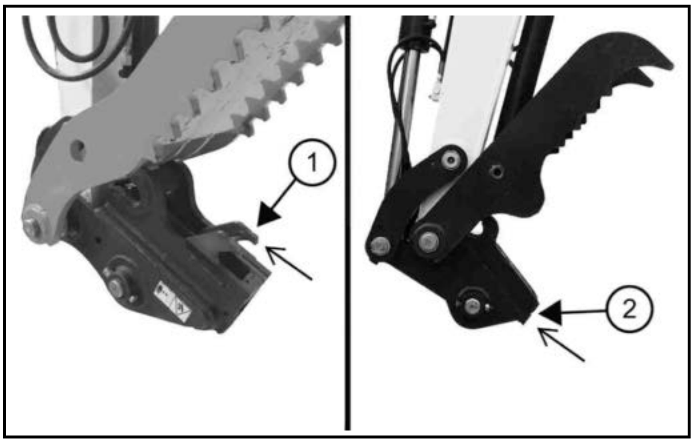
5. Press the coupler ON / OFF switch (Item 1) [Figure 175] to the left (ON) position to enable the quick coupler feature.

   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 INTENT switch (Item 2) [Figure 175] while continuing to hold the right joystick to the left (IN).

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

**Figure 176**



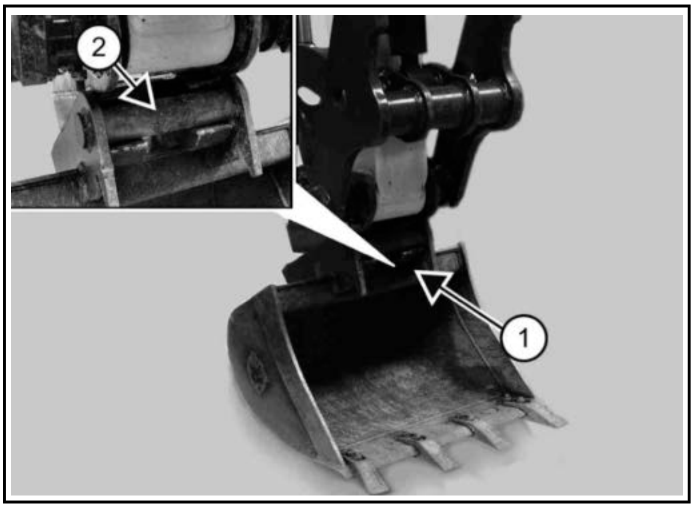

p113904b

7. For the Pin Grabber Coupler – Continue holding the right joystick to the left (IN) until the locking clasp (Item 1) [Figure 176] is fully retracted.

   OR

   For the Hydraulic Quick Coupler – Continue holding the right joystick to the left (IN) until the pins (Item 2) [Figure 176] are fully retracted.

**Figure 177**




p113898c

8. Roll the coupler out and move the arm toward the attachment. Position the boom, arm, and coupler so the coupler (Item 1) is positioned over the attachment pin (Item 2) [Figure 177].

9. Raise the attachment up slightly.

**Figure 178**

C113899

10. Curl the quick coupler in fully [Figure 178].

11. Press the coupler ON / OFF switch (Item 1) [Figure 175] to the right, (OFF) position.

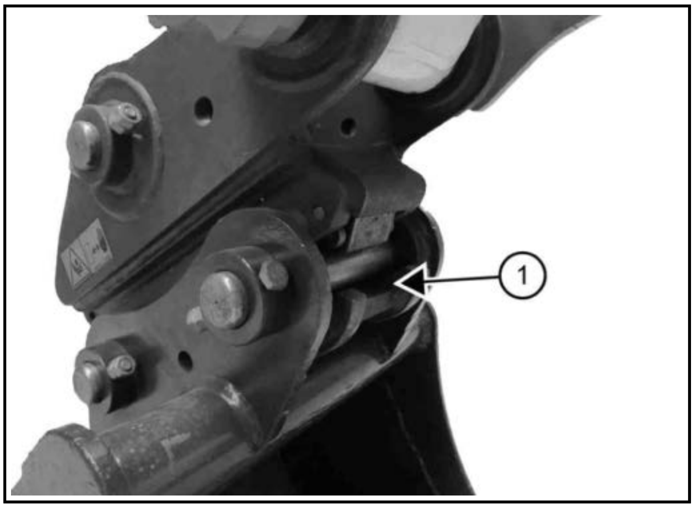
    The switch light and buzzer will turn OFF.

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

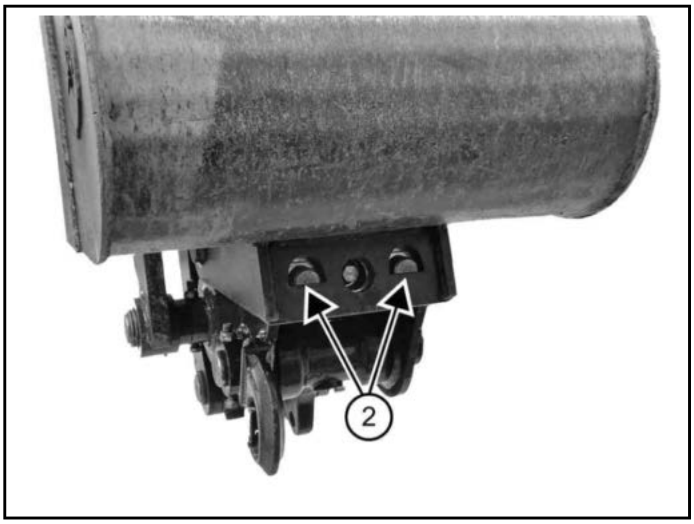
    For the Hydraulic Quick Coupler – The locking pins will extend and engage the attachment mount locking the attachment to the coupler.

**Figure 179**




C113664a

**Figure 180**




C113900a

13. For the Pin Grabber Coupler – Visually check that the locking clasp (Item 1) [Figure 179] 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 180] are extended through the holes in the attachment mounting frame, securely fastening the attachment to the coupler.

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

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

15. Lower the attachment flat to the ground.

**⚠ WARNING**

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

W-3024

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

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

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

## REMOVING ATTACHMENTS (HYDRAULIC QUICK COUPLER)

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

**⚠ WARNING**

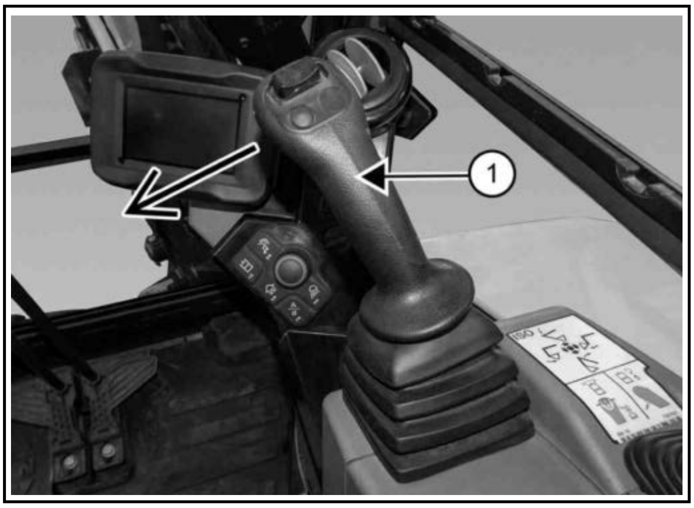
**ENTANGLEMENT AND IMPACT HAZARD**
**Contact with moving parts, a trench cave-in or flying objects can cause serious injury or death.**
**Keep all bystanders 6 m (20 ft) away from equipment when operating.◂**

W-2119

1. Enter the excavator and start the engine.

2. Raise the attachment slightly off the ground.

**Figure 181**



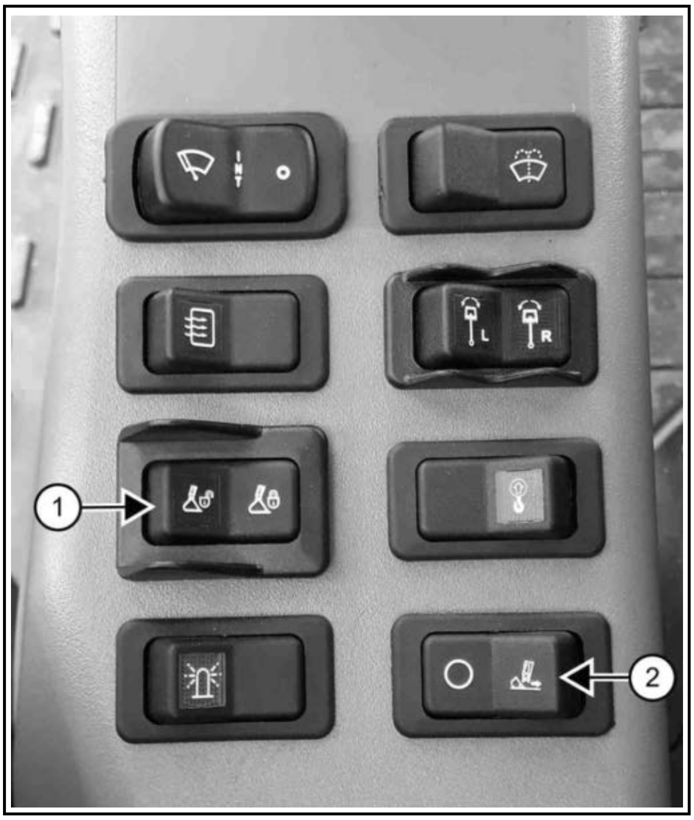

C206172e

**Figure 182**

C113899

3. Move the right joystick (Item 1) [Figure 181] to the left (IN) to curl the coupler fully in toward the cab [Figure 182].

**Figure 183**




C208239d

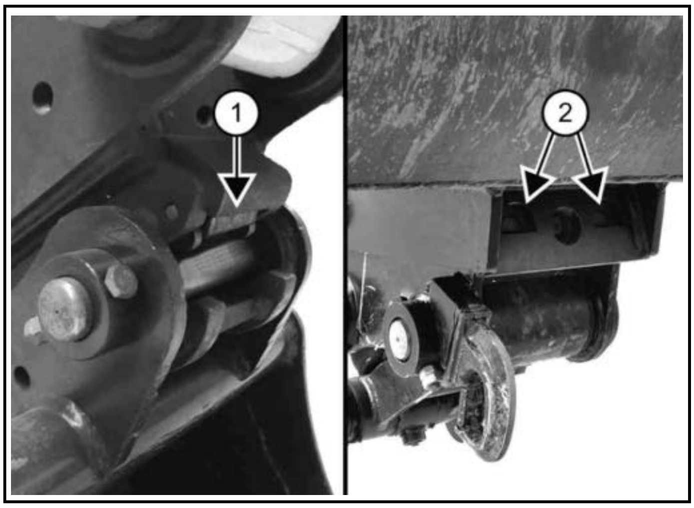
4. Press the coupler ON / OFF switch (Item 1) [Figure 183] to the left (ON) position to enable the quick coupler feature.

   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 183], press and release the INTENT switch (Item 2) [Figure 183] while continuing to hold the right joystick to the left (IN).

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

**Figure 184**




p113905d

6. For the Pin Grabber Quick Coupler – Continue holding the right joystick to the left (IN) until the locking clasp (Item 1) [Figure 184] 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 184] are fully retracted to unlock the attachment from the quick coupler.

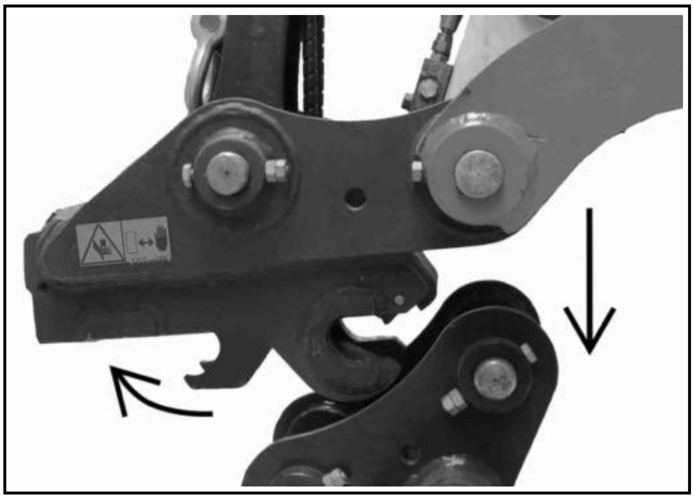
7. With the attachment slightly off the ground, roll the quick coupler back.

   The coupler will start to disengage from the attachment.

8. Roll the quick coupler back fully.

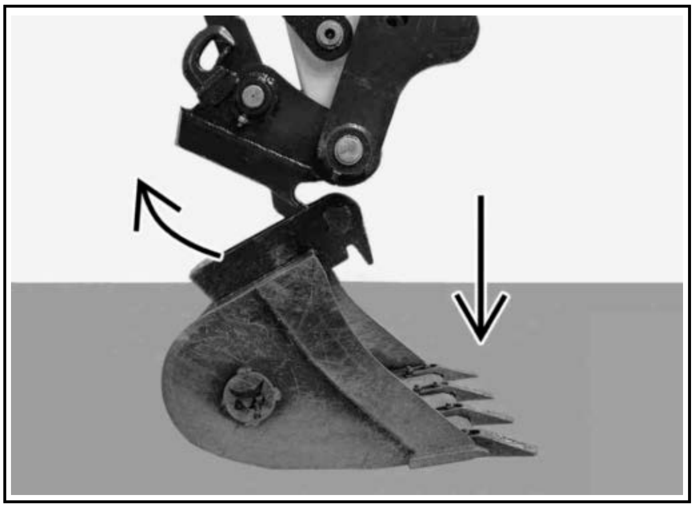
9. Lower the boom and arm until the attachment is on the ground and the quick coupler is disengaged from the attachment pins.

**Figure 185**



C113666a

**Figure 186**



p113896b

10. Move the arm away from the excavator until the quick coupler is clear of the attachment [Figure 185] or [Figure 186].

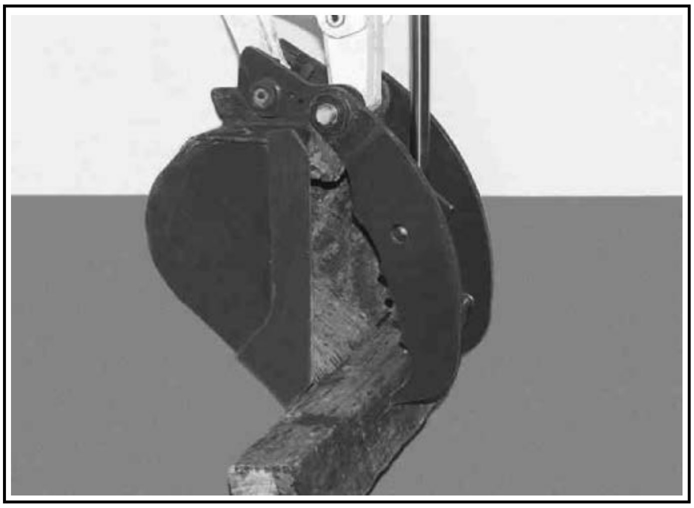
11. Press the coupler ON / OFF switch (Item 1) [Figure 183] to the right, (OFF) position.

    The switch light and buzzer will turn OFF.

## HYDRAULIC CLAMP

### Hydraulic Clamp Operation

**Figure 187**



N15513a

The optional lifting clamp attachment (if equipped) gives the excavator a wider range of use and mobility for debris removal [Figure 187].

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

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

**IMPORTANT**

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

1382-AF18701D

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

### Using Primary Auxiliary Hydraulics To Activate Clamp

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

   Set the hydraulics flow to 60 – 70%.
   (See Setting Auxiliary Hydraulics Flow Rate on Page 57) Adjust auxiliary flow as needed for optimal job performance.

**Figure 188**


C206172d

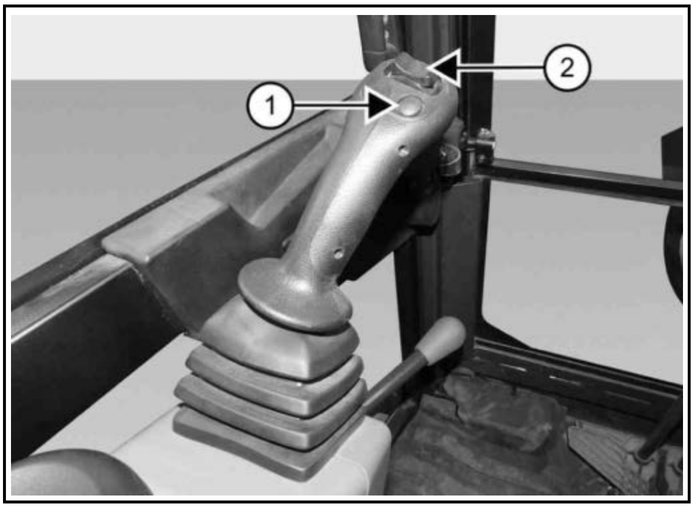
2. Move the switch (Item 1) [Figure 188] on the right joystick to the right to open the clamp.

3. Move the switch (Item 1) [Figure 188] 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 189**




C206181a

2. Press and hold the button (Item 1) [Figure 189] 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 189] on the left joystick to the left to open the clamp.

4. Move the switch (Item 2) [Figure 189] on the left joystick to the right to close the clamp.

## HANDLING OBJECTS

Do not exceed the Rated Lift Capacity when handling objects.

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

**⚠ WARNING**

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

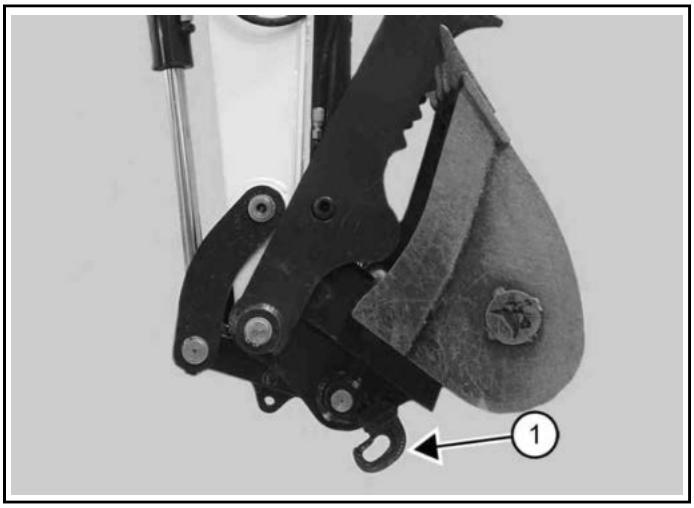
W-2374

### Handling Objects With The Lifting Device

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

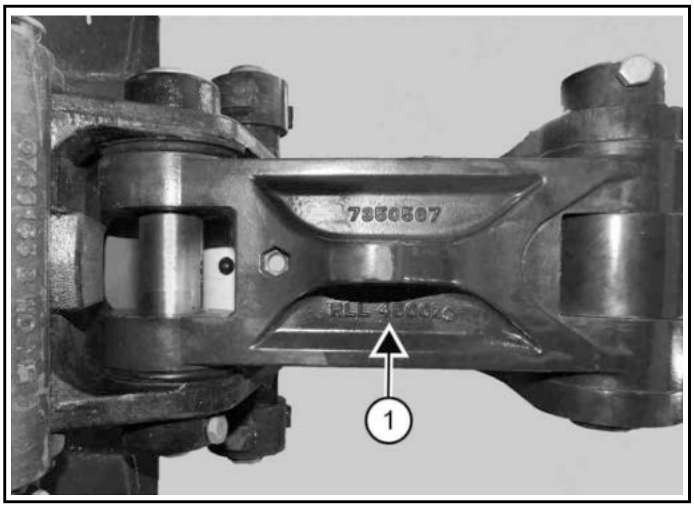
Do not exceed the machine's Rated Lift Capacity or the Rated Lift Load (RLL) of the lifting device (lift eye).

**Figure 190**




C135343a

**Figure 191**




P200410a

The maximum Rated Lift Capacity is shown on the lifting device (Item 1) [Figure 190] or [Figure 191].

**⚠ WARNING**

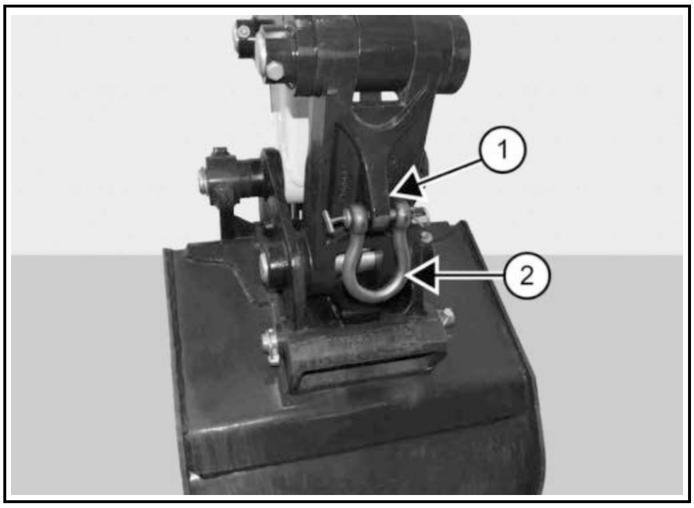
**INSTABILITY AND CRUSHING HAZARD**
**Excessive load can cause tipping, loss of control or failure of the lift eye resulting in serious injury or death.**
**Do not exceed rated lift capacity.◂**

W-2991

1. Extend the bucket cylinder completely and lower the boom to the ground.

2. Stop the engine and exit the excavator.

**Figure 192**

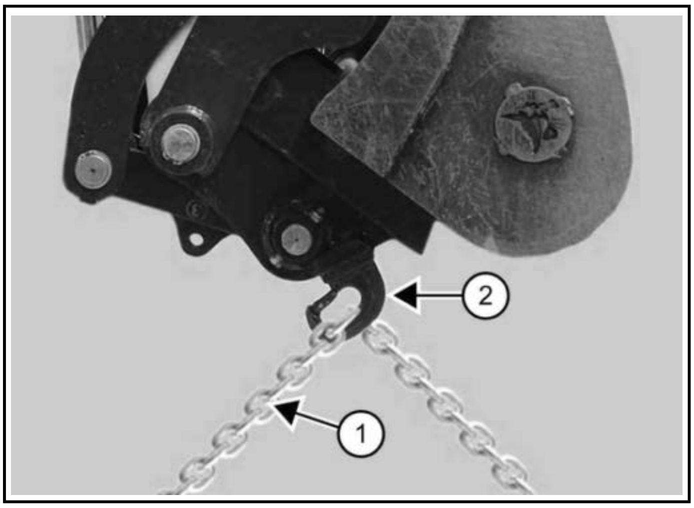



P200408a

3. For clevis lift eyes only, install the clevis (Item 2) through the lift eye (Item 1) [Figure 192].

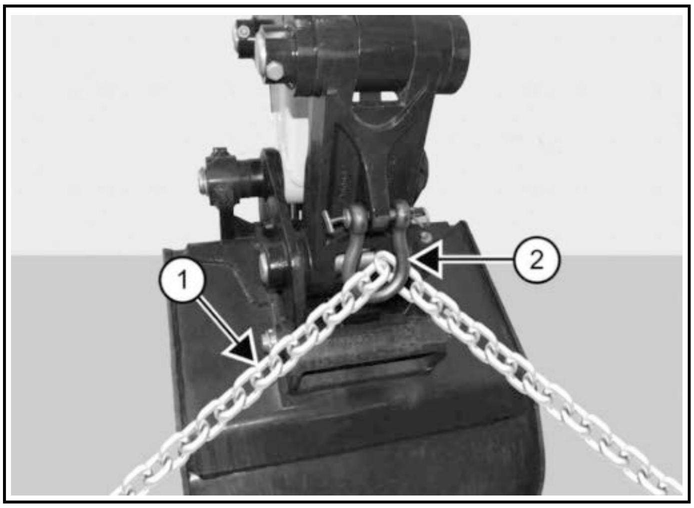
   Visually check the lift eye and secondary lifting system (chain and clevis) for any damage. Replace any damaged components before lifting. See your Bobcat dealer for replacement lift eye and clevis.

**Figure 193**




C135344a

**Figure 194**



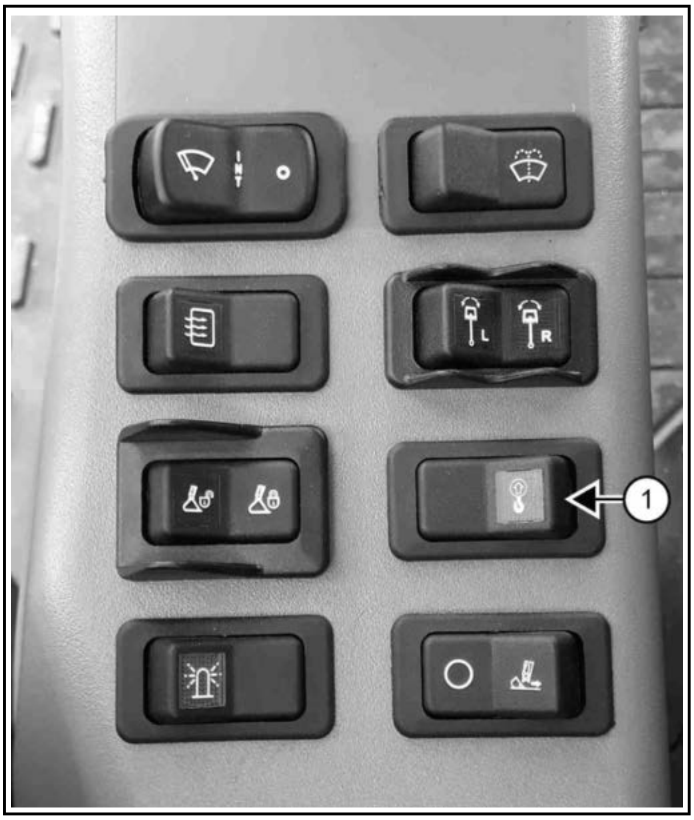

P200407a

4. Install a lift chain (Item 1) (or other type of lifting device) through the lift eye (Item 2) [Figure 193] or clevis (Item 2) [Figure 194] and connect to the object being lifted.

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

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

**Figure 195**




C208239c

6. Press the overload warning device switch (Item 1) [Figure 195] on the left console to the left to activate the overload warning device.

**Figure 196**

P113708

7. Make sure the load is evenly weighted and centred on the lifting chain (or other type of lifting device), and is secured to prevent the load from shifting [Figure 196].

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

9. Lift and position the load.

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

## LIFT CAPACITY

### Lift Capacity Description

**⚠ WARNING**

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

W-2991

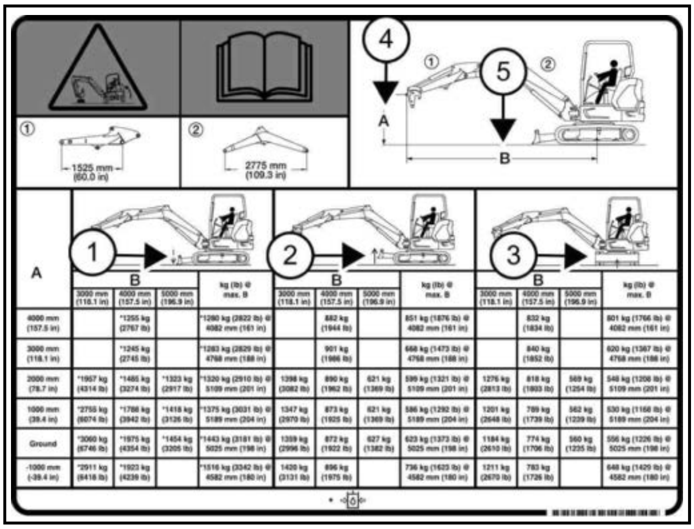
The standard lift capacities listed on the lift capacity decal are calculated for a machine equipped with no attachment mounting system and no attachment.

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

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

### Calculating Lift Capacity

**Figure 197**



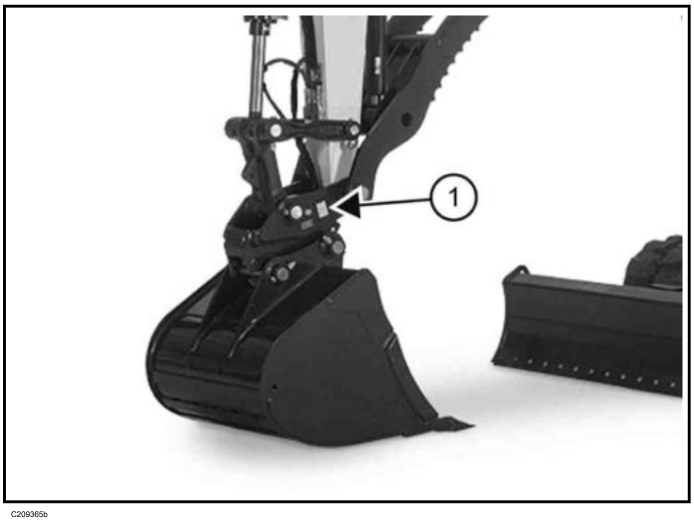

7342843c

1. Find the standard lift capacity for your working conditions on your machine’s lift capacity decal [Figure 197].

   Working conditions include:

   - Blade down (Item 1) [Figure 197]
   - Blade Up (Item 2) [Figure 197]
   - Boom Over Tracks (Item 3) [Figure 197]
   - Lift Point Height (A) (Item 4) [Figure 197]
   - Lift Radius (B) (Item 5) [Figure 197]
   - Tracks Expanded / Retracted (not shown here)

**Figure 198**




2. Find the weight of your attachment mounting system, which is printed on the plate as shown here (Item 1) [Figure 197].

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

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

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

**Attachment Mounting System And Clamp Weights**

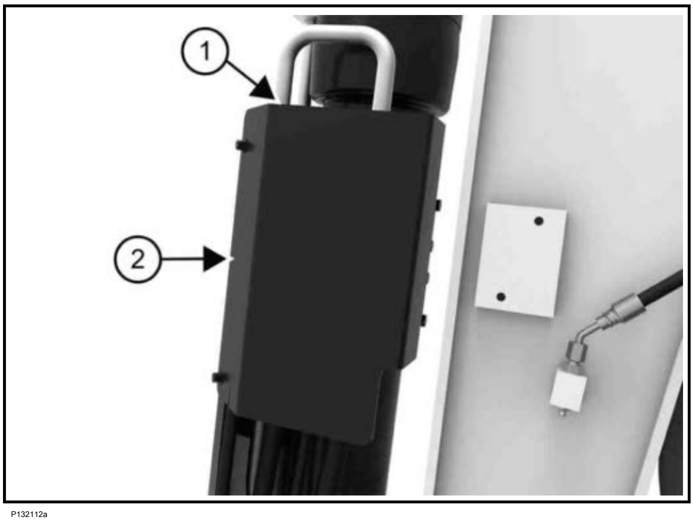
| Description | Weight |
|---|---|
| Hydraulic Clamp and Cylinder | |
| DX17z, E17, E17z | 39 kg (85 lb) |
| E19, E20, E20z (Pin-On) | 29 kg (64 lb) |
| E19, E20, E20z (Klac System) | 81 kg (179 lb) |
| E32, E35 | 52 kg (114 lb) |
| E42, E50, E55, E60 | 97 kg (214 lb) |
| E50z, E55z, E60 (Europe) | 95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

## BOOM LOAD HOLDING VALVE

### Location Of Boom Load Holding Valve

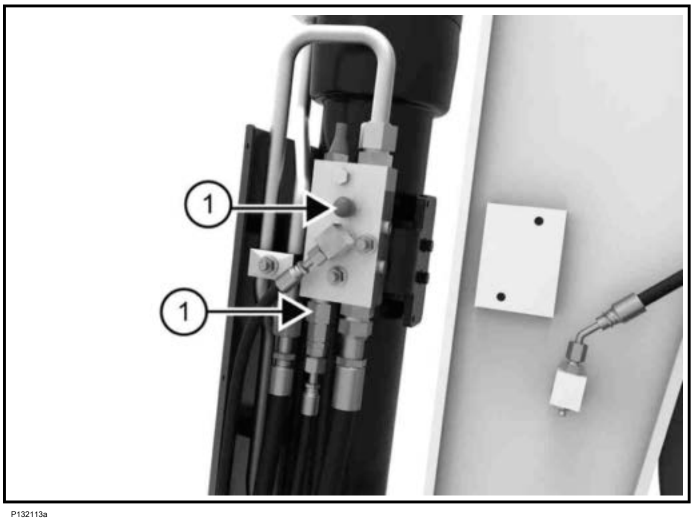
The boom load holding valve (if equipped) will hold the boom in its current position in the event of hydraulic pressure loss.

**Figure 199**




If the excavator is equipped with a boom load holding valve (Item 1) [Figure 199], it will be attached to the boom cylinder at the base end.

**Figure 200**




**NOTE:** The cover (Item 2) [Figure 199] is removed for photo clarity in [Figure 200].

Do not remove or adjust the two valves (Item 1) [Figure 200]. If these valves have been tampered with, see your Bobcat dealer for service.

**⚠ WARNING**

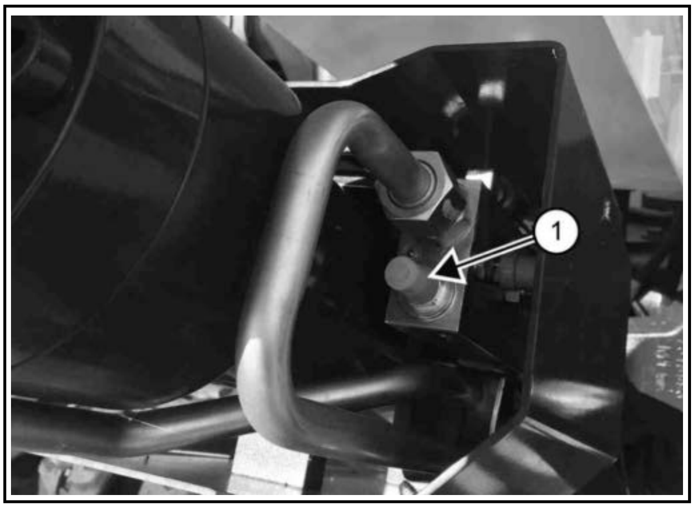
**CRUSHING HAZARD**
**Falling equipment can cause serious injury or death.**
**DO NOT work or stand under raised work equipment or attachment.**
W-2793

**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 201**



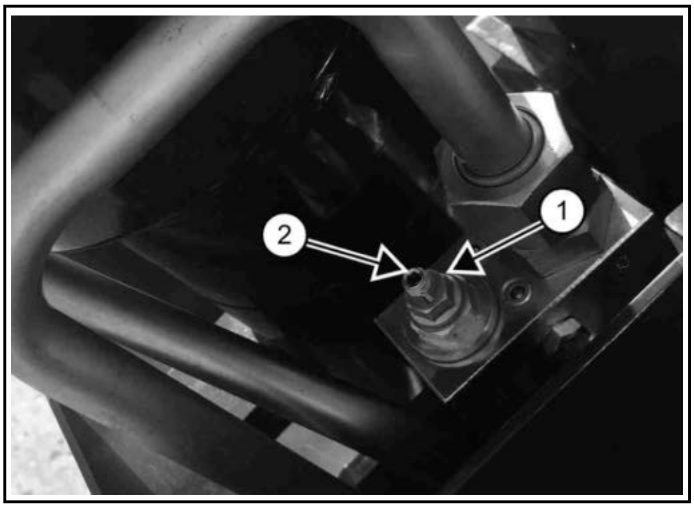

P132108a

2. Remove the plastic cap (Item 1) [Figure 201] 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 202**




P132109a

3. Loosen the locknut (Item 1) [Figure 202].
4. Install a hex wrench into the valve screw (Item 2) [Figure 202] 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 202].

**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.

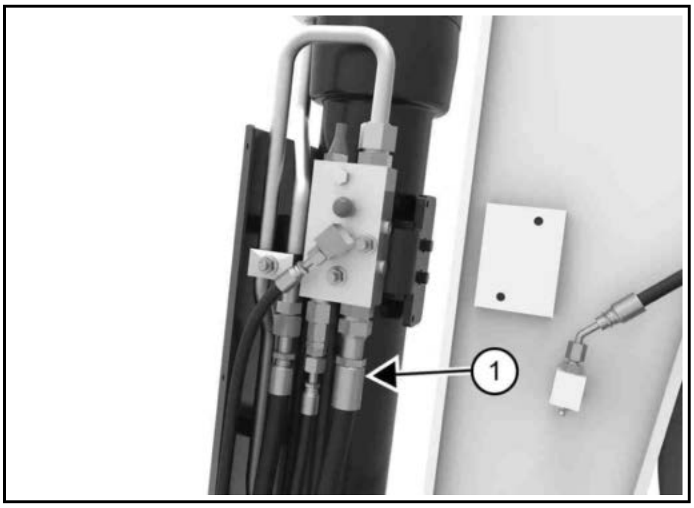
   Do not start the engine.
3. Lower the left console.
4. Slowly move the joystick boom lower function to lower the boom to the ground.

**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 203**




C132113b

2. Remove the boom base end hose (Item 1) [Figure 203] from the boom load holding valve.

3. Loosen the locknut (Item 1) [Figure 202].

4. Install a hex wrench into the valve screw (Item 2) [Figure 202].

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 202] counterclockwise 1/8 to 1/4 turn and tighten the locknut (Item 1) [Figure 202].

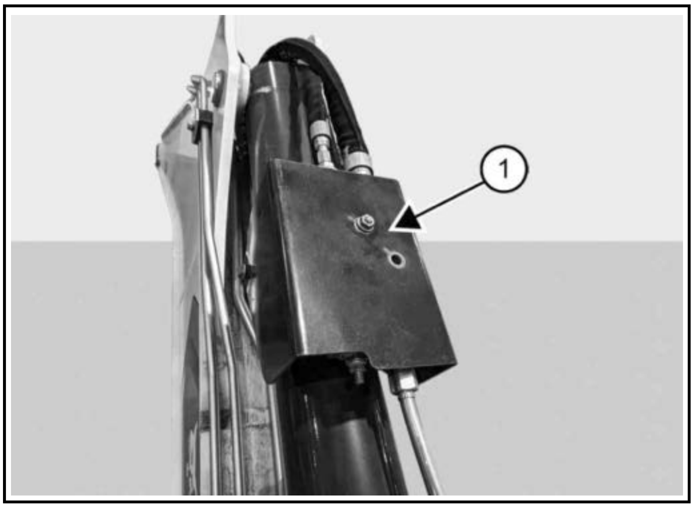
7. Reinstall the base end hose.

## 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.

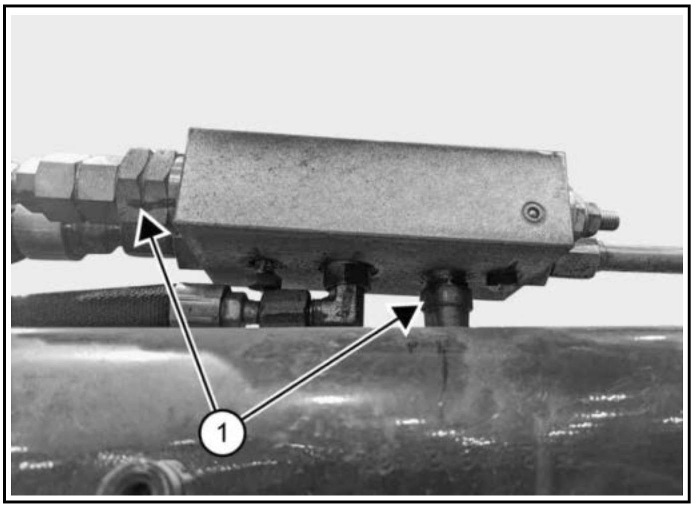
**Figure 204**




C206633a

If the excavator is equipped with an arm load holding valve (Item 1) [Figure 204], it will be attached to the arm cylinder base end as shown.

**Figure 205**




C206634a

Do not remove or adjust the two port relief valves (Item 1) [Figure 205]. If the port relief valves have been tampered with, see your Bobcat dealer for service.

**⚠ WARNING**

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

W-2793

### Lowering Arm with Load Holding Valve With Base End Hose Failure

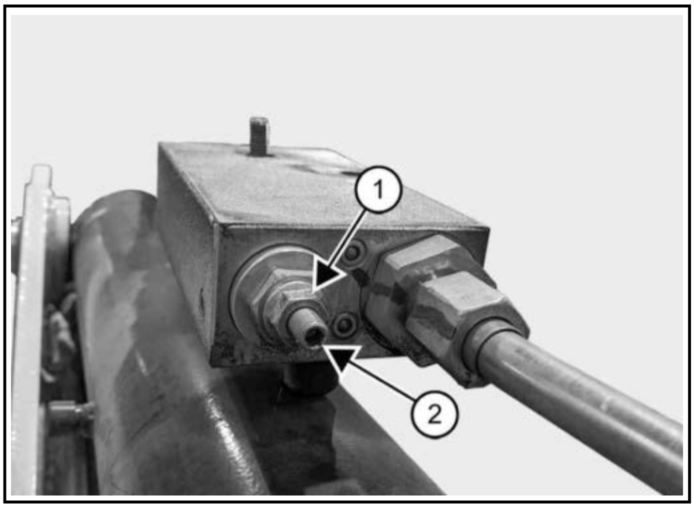
1. Place a container under the valve and hose end to catch any hydraulic fluid that is leaking.

**⚠ WARNING**

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

W-2220

**Figure 206**




C206635a

2. Loosen the locknut (Item 1) [Figure 206].
3. Install a hex wrench into the valve screw (Item 2) [Figure 206].
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 206] counterclockwise the same 1/8 to 1/4 turn.
6. Tighten the locknut (Item 1) [Figure 206].

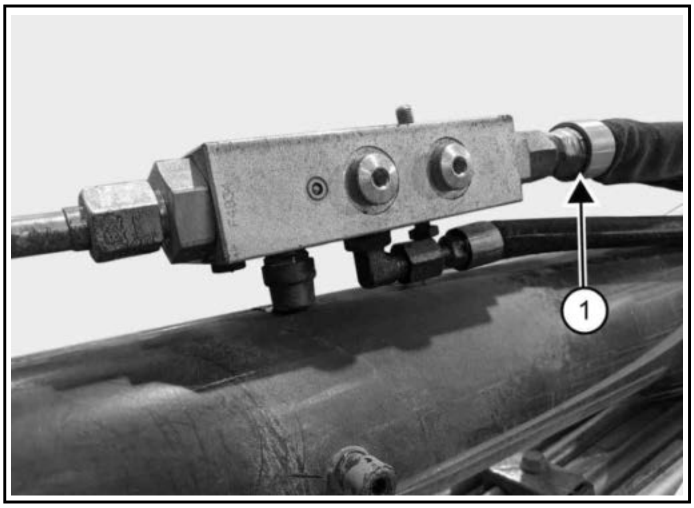
### Lowering Arm With Load Holding Valve With Rod End Hose Failure – With Accumulator Pressure

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

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

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

**Figure 207**




C206636

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

## DEPTH CHECK (STANDARD DISPLAY)

### Depth Check Description

**⚠ WARNING**

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

W-2050

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

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

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

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

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

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

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

**⚠ WARNING**

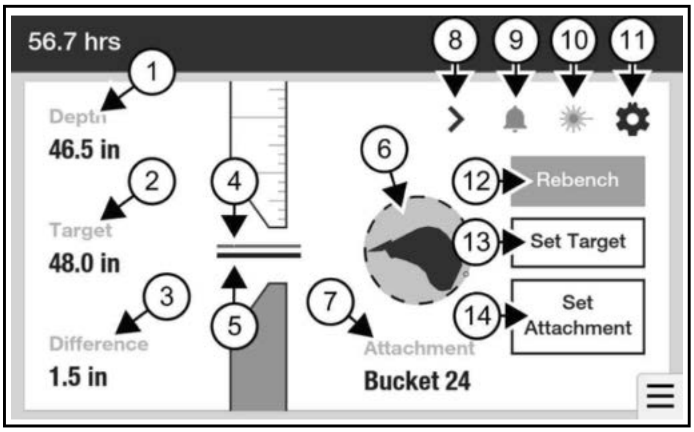
**GENERAL HAZARD**
**Contact with equipment can cause serious injury or death.**
**Keep all bystanders 6 m (20 ft) away from equipment when operating.◂**

W-2268

### Depth Check Screen

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

**Figure 208**




NA3915b

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

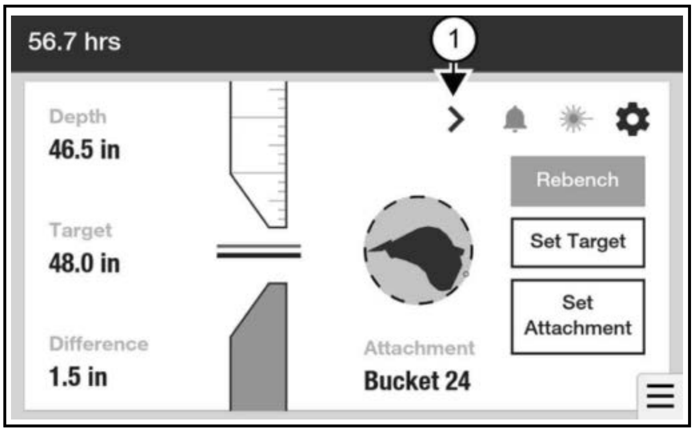
| REF. | DESC. | FUNCTION |
|---|---|---|
| 8 | Arrow | Used to move between depth check screens. (See Changing The Depth Check Screen on Page 113) |
| 9 | Alarm | Turns target depth alarm on / off. (See Setting The Warning Zone on Page 120) |
| 10 | Laser | Accesses **LASER SETUP** screen where you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

**Changing The Depth Check Screen**

There are two **DEPTH CHECK** screens:

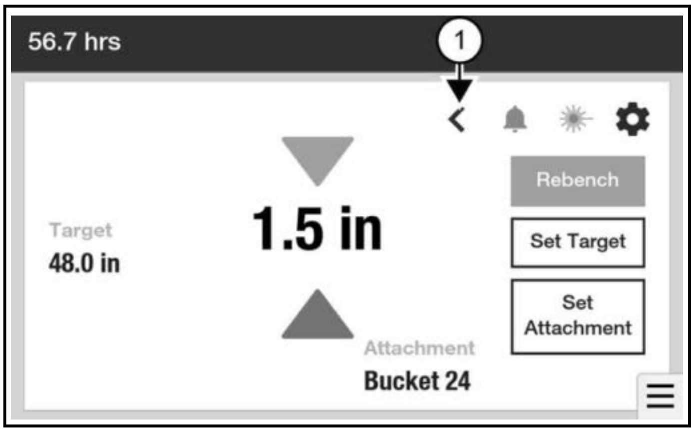
- Dig Depth [Figure 209]
- Distance to Target [Figure 210]

**Figure 209**




NA3915e

**Figure 210**




NA3914a

Press the arrow (Item 1) to toggle between these two screens at any time.

**Calibrating The Boom**

The following items are needed to complete this task:

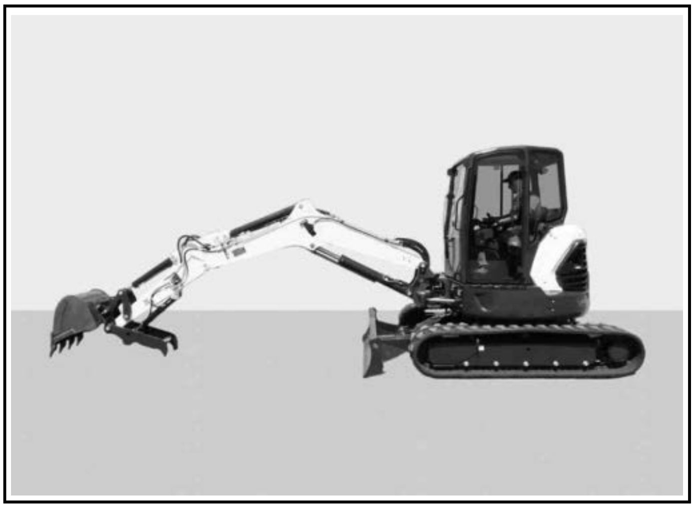
- Tape measure.
- Two magnetic tools that are included with the kit.

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

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

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

**Figure 211**

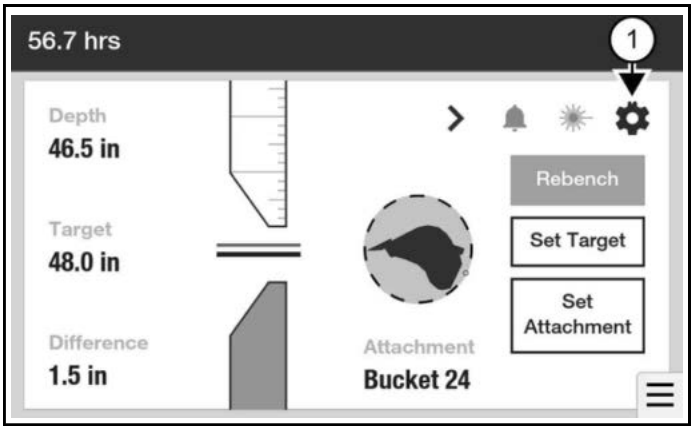


C200403a

3. Position the excavator with the bucket fully rolled out and the arm fully extended [Figure 211].

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

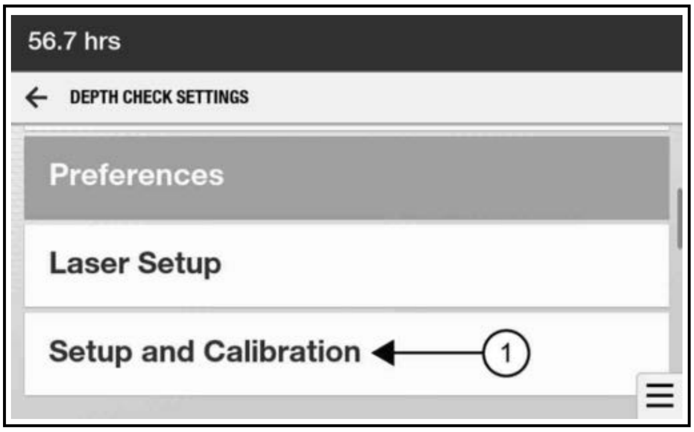
**Figure 212**




NA3915a

5. Select the Settings icon (Item 1) [Figure 212].

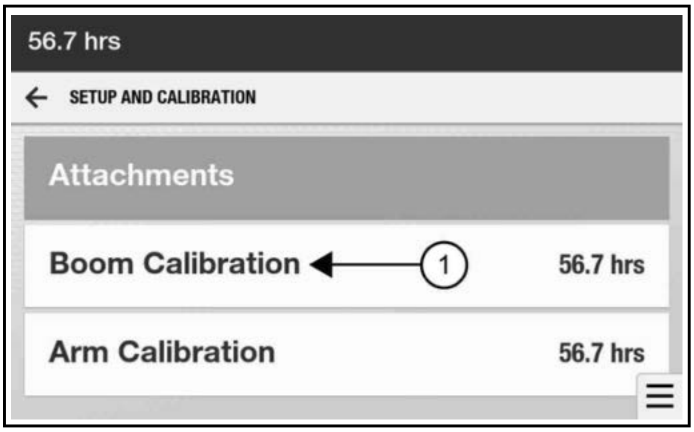
**Figure 213**




NA3921a

6. Select **[SETUP AND CALIBRATION]** (Item 1) [Figure 213].

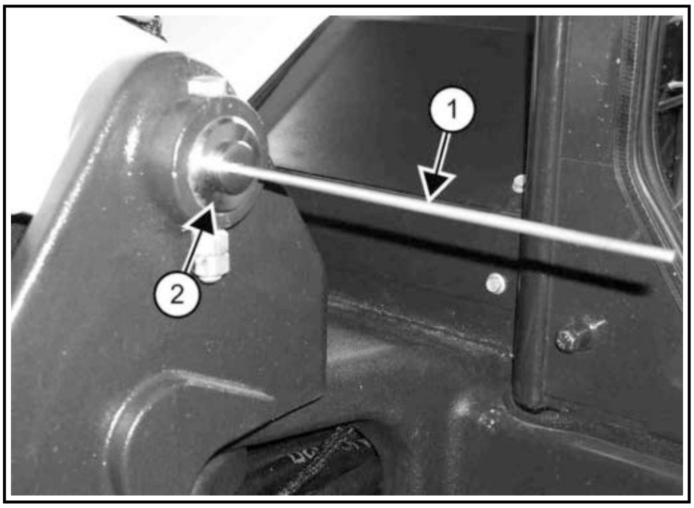
**Figure 214**




NA3923c

7. Select **[BOOM CALIBRATION]** (Item 1) [Figure 214].

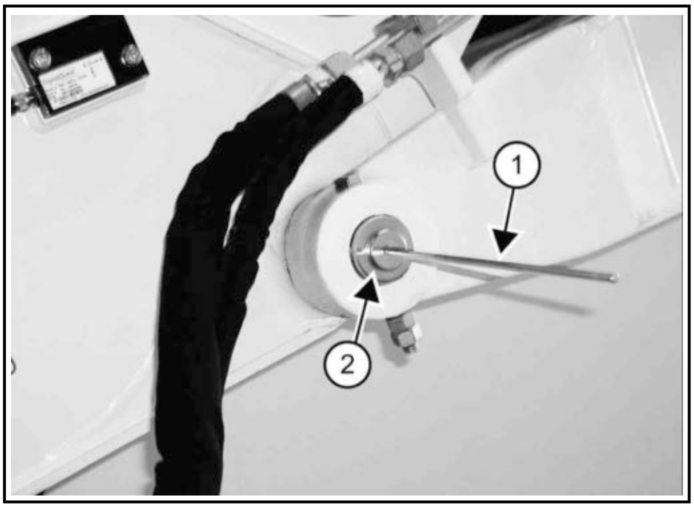
**Figure 215**




P131855a

8. Install one of the magnetic tools (Item 1) on the boom pivot pin (Item 2) [Figure 215]. Position the magnetic tool as close as possible to the centre of the boom pivot pin.

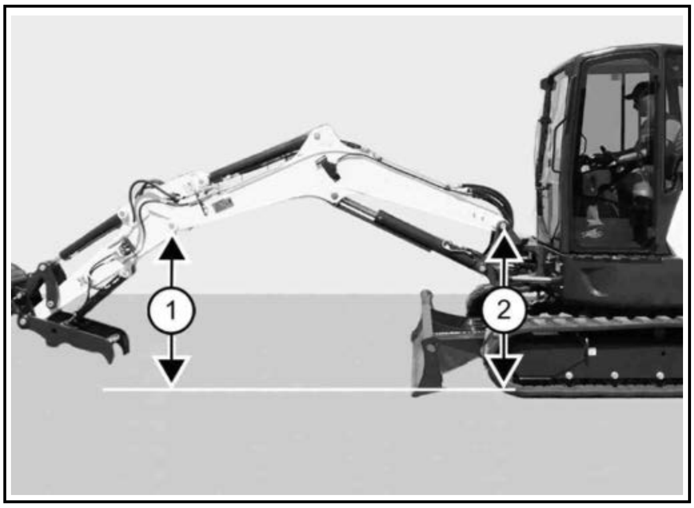
**Figure 216**




P131856a

9. Install the second magnetic tool (Item 1) on the arm pivot pin (Item 2) [Figure 216]. Position the magnetic tool as close as possible to the centre of the arm pin.

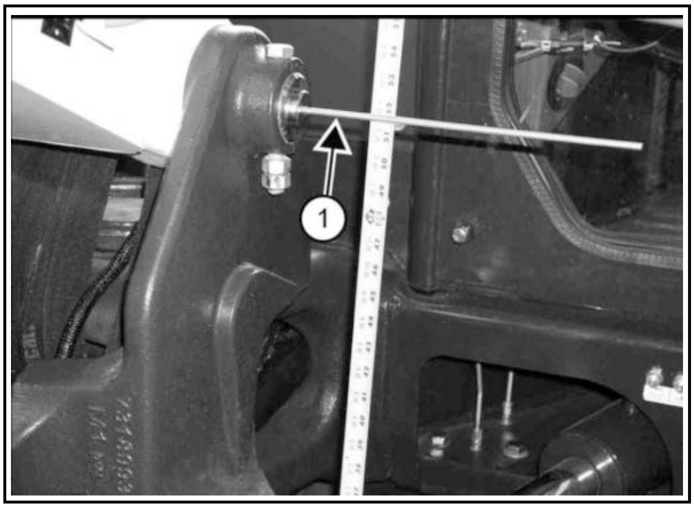
**Figure 217**




C200403b

10. Position the work group so the distance from the ground to the two magnetic sensors (Items 1 and 2) [Figure 217] is identical.

**Figure 218**

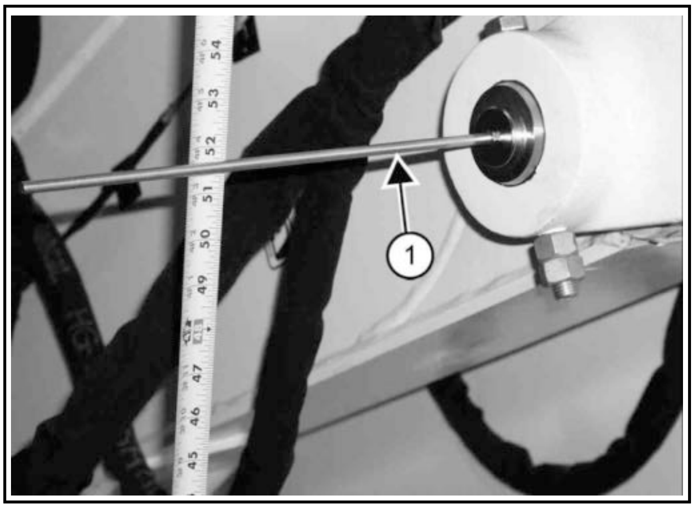



P131857a

11. Measure the distance from the centre of the boom magnetic tool (Item 1) [Figure 218] to the ground.

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

**Figure 219**




P131858a

12. Measure the distance from the centre of the arm magnetic tool (Item 1) [Figure 219] 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 220**


NA3910

14. Follow the instructions on the screen and select **[DONE]** [Figure 220].

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

### Calibrating The Arm

The following items are needed to complete this task:

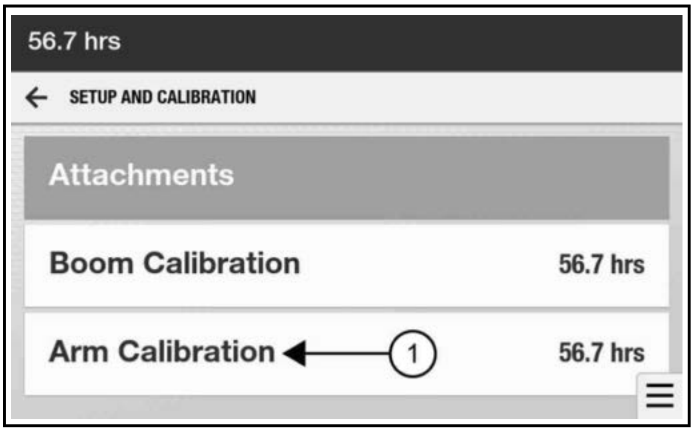
- Plumb bob.
- Magnetic tool that is included with the kit.

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

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

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

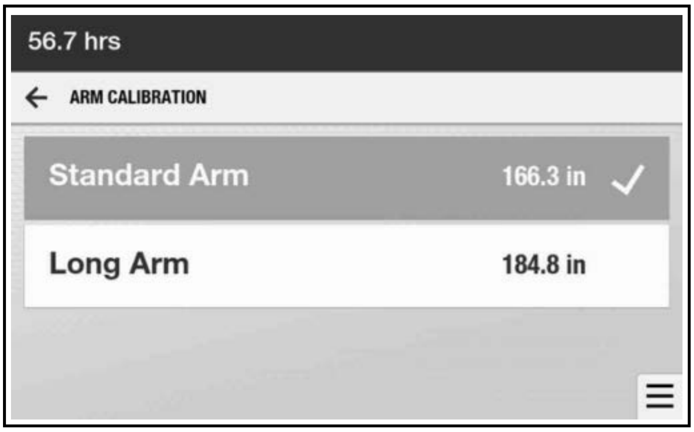
**Figure 221**




NA3923a

2. Select **[ARM CALIBRATION]** (Item 1) [Figure 221].

**Figure 222**

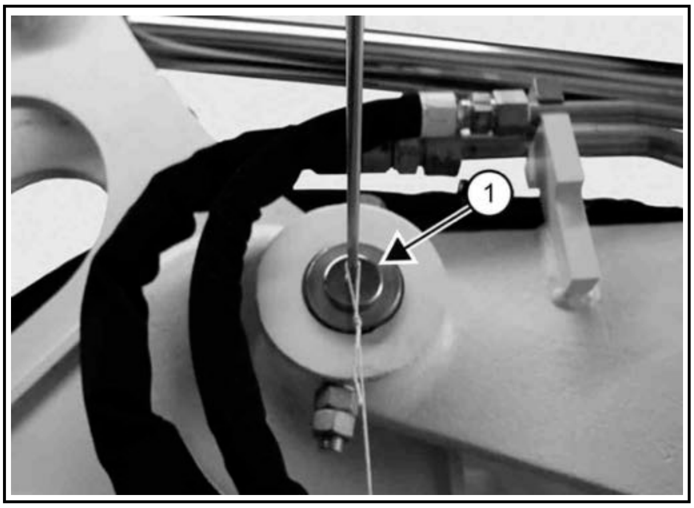



NA3895

3. Select the arm that your machine is equipped with [Figure 222].

   **NOTE:** Some models only have one arm option available.

**Figure 223**

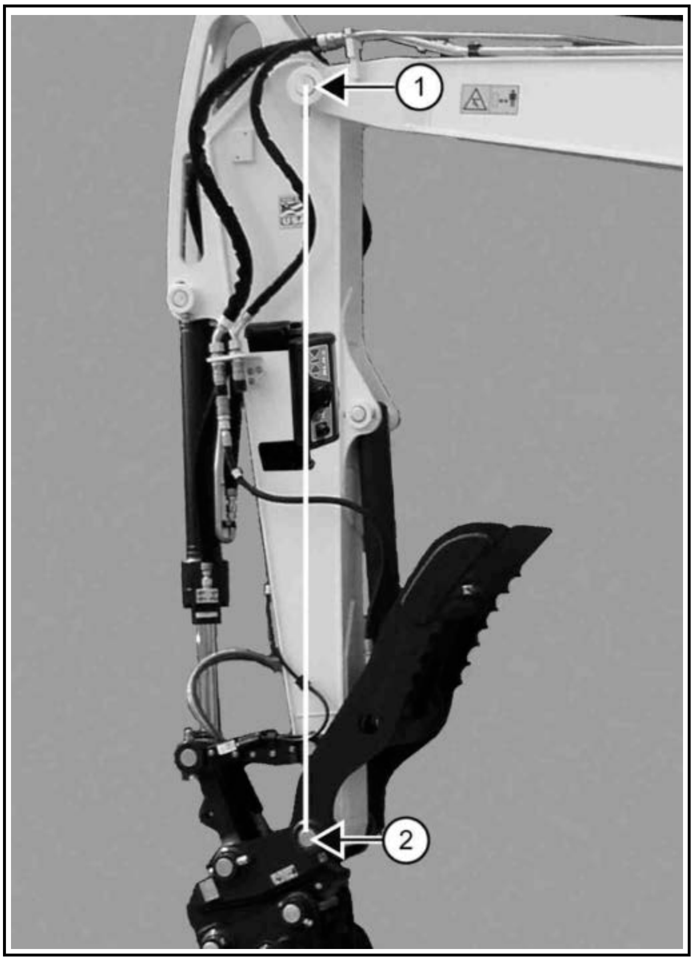



p132076b

4. Install the magnetic tool on the arm pin (Item 1) [Figure 223].

5. Place the plumb bob on the magnetic tool that is installed on the arm pin (Item 1) [Figure 223].

**Figure 224**

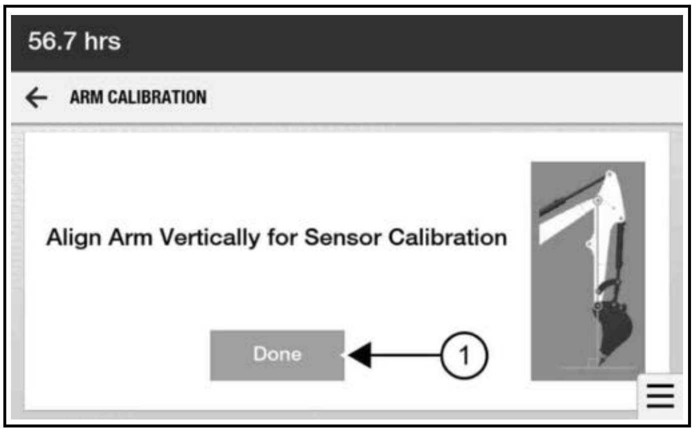



p132078c

6. Move the arm until the plumb bob line (Item 1) is centred on the pivoting bucket pin (Item 2) [Figure 224].

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

**Figure 225**




NA3896a

7. With the arm vertical, select **[DONE]** (Item 1) [Figure 225] to store this information.

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

**Calibrating The Attachment**

The following items are needed to complete this task:

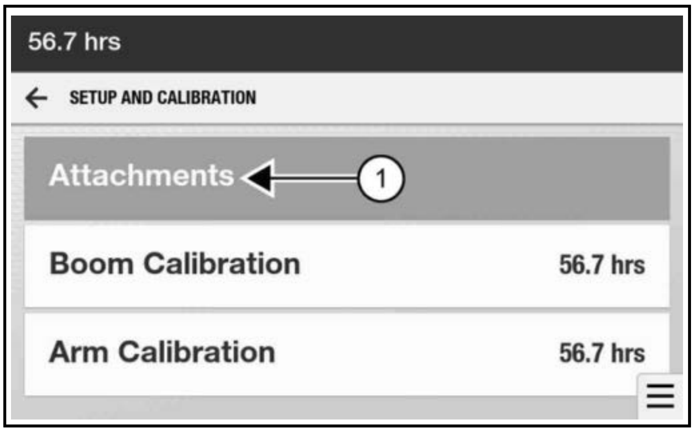
- Tape measure.
- Magnetic tool that is included with the kit.

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

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

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

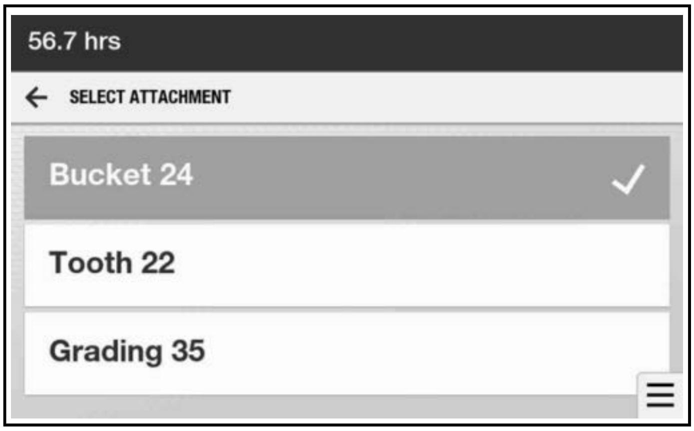
**Figure 226**




NA3923b

2. Select **[ATTACHMENTS]** (Item 1) [Figure 226].

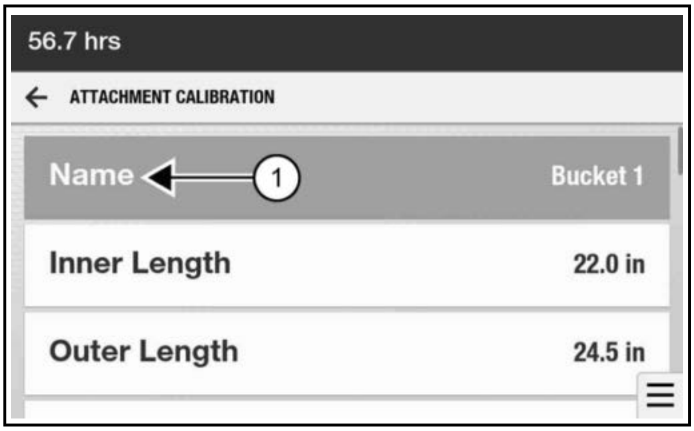
**Figure 227**




NA3916

3. Select one of the attachments [Figure 227].

**Figure 228**

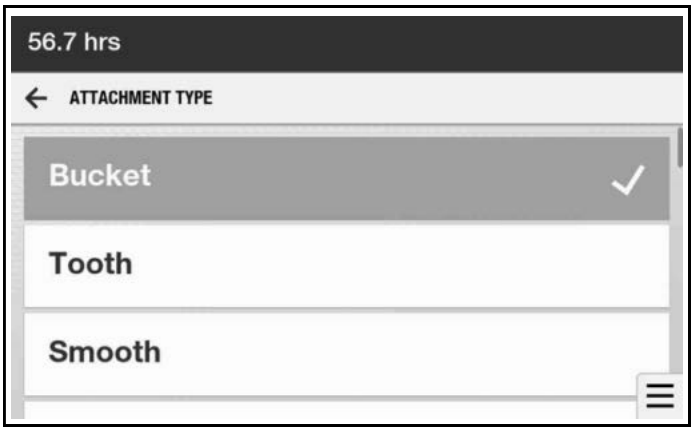



NA3899a

4. On the **ATTACHMENT CALIBRATION** screen, select **[NAME]** (Item 1) [Figure 228].

   **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.

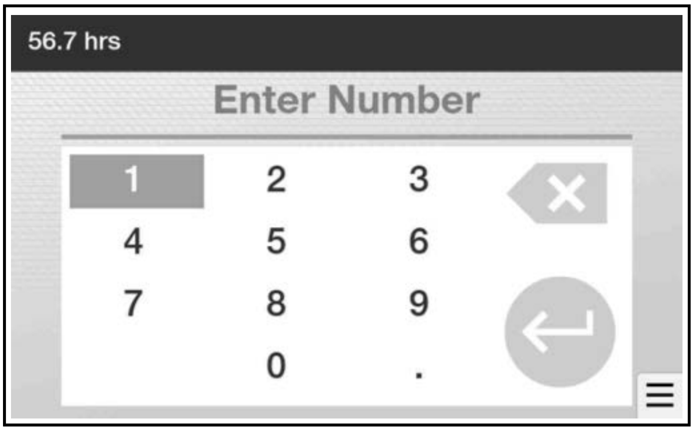
**Figure 229**




NA3904

5. Select type of attachment [Figure 229].

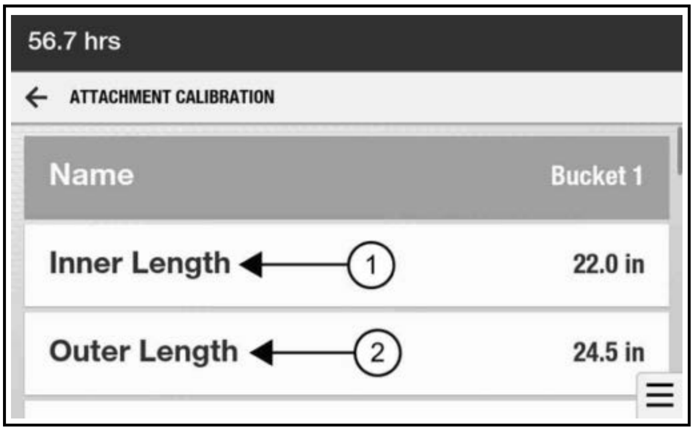
**Figure 230**




NA3903

6. Enter a number to identify your attachment and select the enter icon [Figure 230].

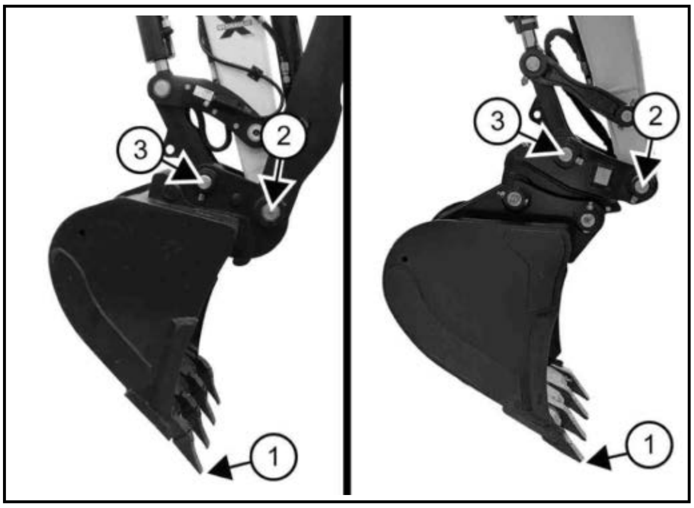
**Figure 231**




NA3899b

7. Select **[INNER LENGTH]** (Item 1) [Figure 231].

**Figure 232**




C205740a

8. Measure the distance from the tip of the attachment (Item 1) to the centre of the inner pin (Item 2) [Figure 232] and enter this value.

   Choose the correct pin (Item 2) [Figure 232] based on the type of attachment mounting system on your machine.

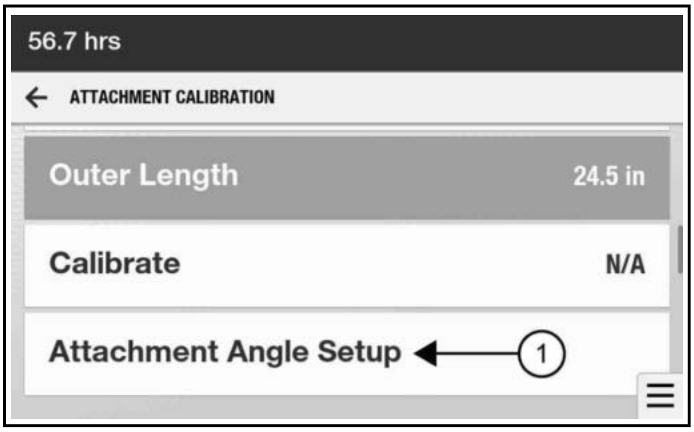
9. Select **[OUTER LENGTH]** (Item 2) [Figure 231].

   **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 232] and enter this value.

    Choose the correct pin (Item 3) [Figure 232] based on the type of attachment mounting system on your machine.

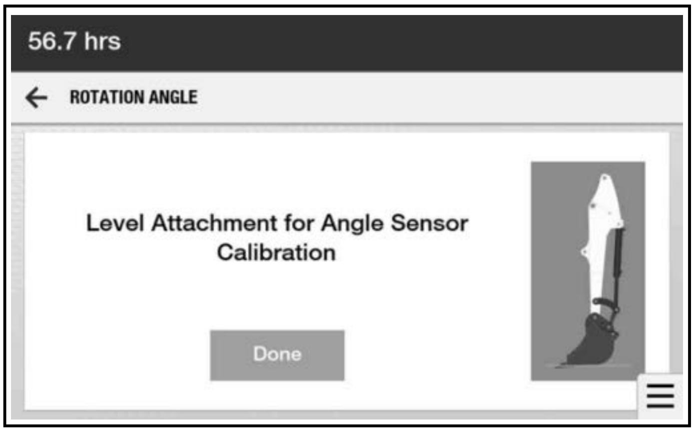
**Figure 233**




NA3898a

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 233].

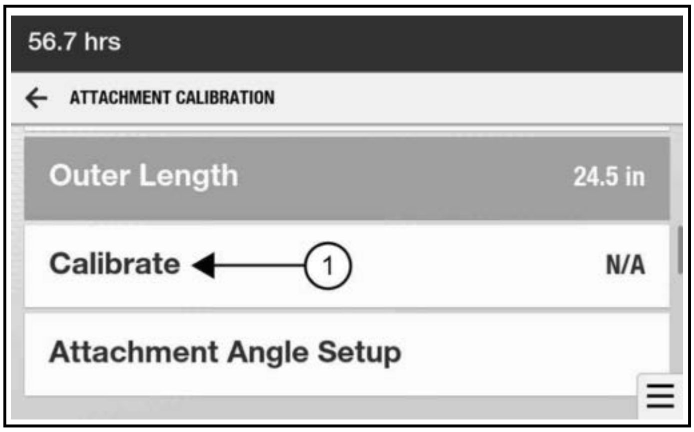
**Figure 234**




NA3897

12. Follow the instructions on the screen [Figure 234] and select **[DONE]**.

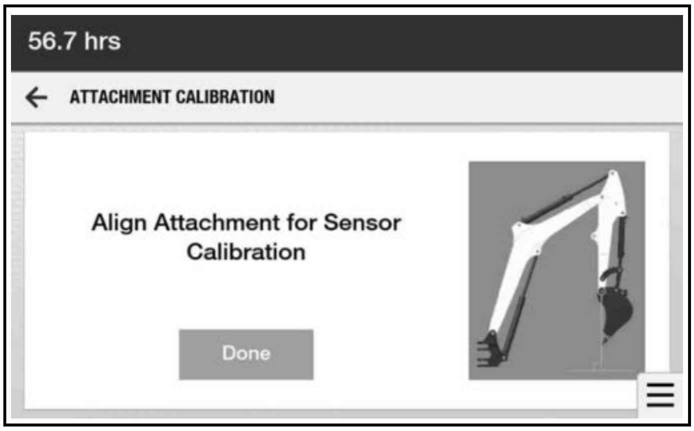
**Figure 235**




NA3898b

13. Select **[CALIBRATE]** (Item 1) [Figure 235].

**Figure 236**




NA3900

14. Follow the instructions on the screen [Figure 236] 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 232].

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

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

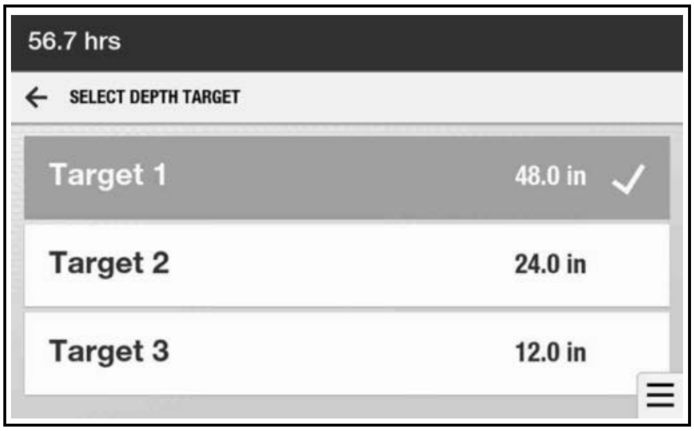
If more than one attachment is being set up, the attachments can be changed on the arm and the additional attachment dimensions can also be entered. Always measure to the cutting / work tip on the attachment when measuring the dimensions to add to the inside and outside length screens for each new attachment.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

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

**Setting Target Depth**

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

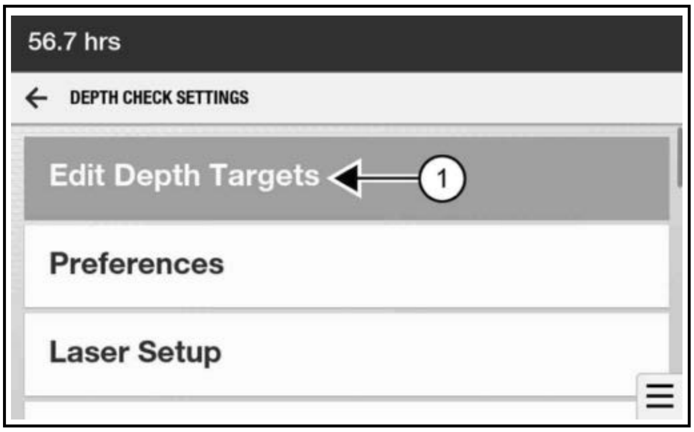
**Figure 237**




NA3917

1. To select one of the preset target depths, select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SET TARGET]** and select a Target [Figure 237].
2. To change a preset target depth, select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SETTINGS]**.

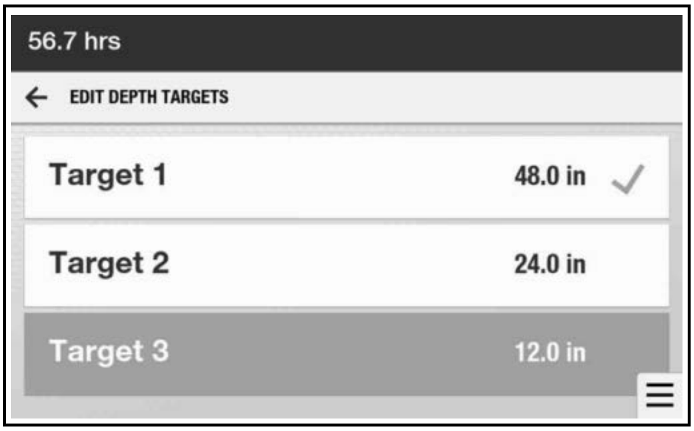
Figure 238




NA3922a

3. Select **[EDIT DEPTH TARGETS]** (Item 1) [Figure 238].

Figure 239

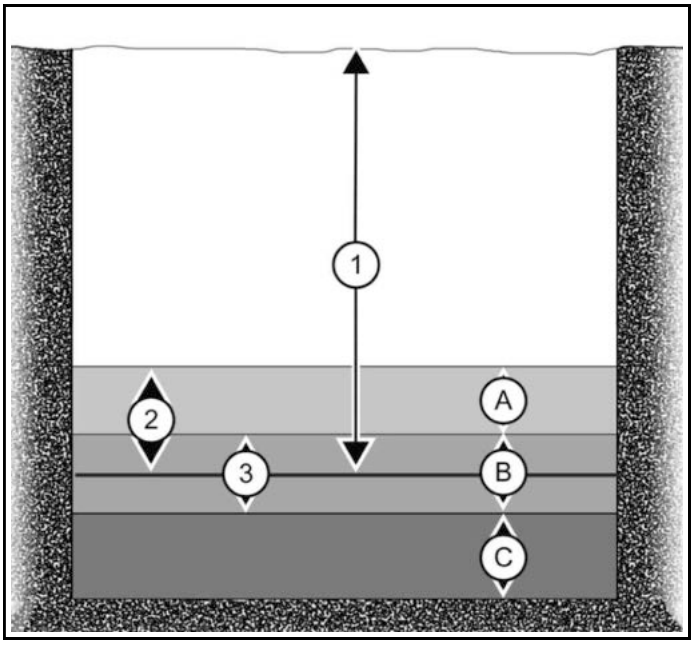



NA3911

4. Select one of the Targets [Figure 239] and enter the new target depth on the keypad.

### Description Of Grade And Warning Zones

Figure 240




NA20252a

The following three values can be set on the display:

| ITEM | DESCRIPTION |
|---|---|
| 1 | Target Depth |
| 2 | Warning Zone |
| 3 | Grade Zone |

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

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

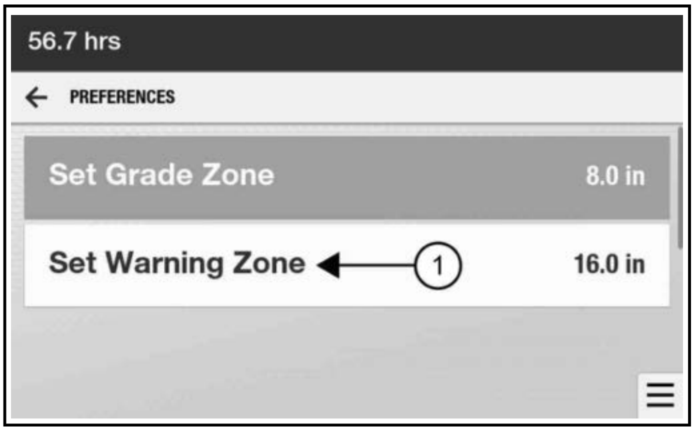
**EXAMPLE:** Operator sets Target Depth to 610 mm (24 in), Warning Zone to 100 mm (4 in), and Grade Zone to 50 mm (2 in). Operator will hear slow beeps from 508 – 584 mm (20 – 23 in), a solid beep from 584 – 635 mm (23 – 25 in), and fast beeps below 635 mm (25 in).

### Setting The Warning Zone

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

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

**Figure 241**




NA3913b

2. Select **[SET WARNING ZONE]** (Item 1) [Figure 241] and enter the dimension.

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

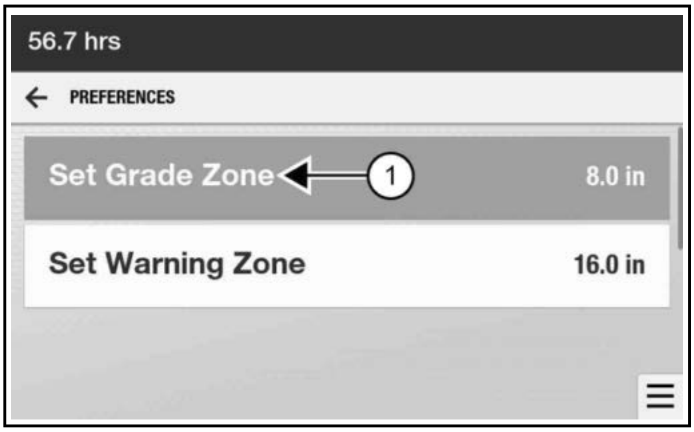
**Setting The Grade Zone**

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 242**




NA3913a

2. Select **[SET GRADE ZONE]** (Item 1) [Figure 242] and enter the dimension.

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

**Digging To A Target Depth**

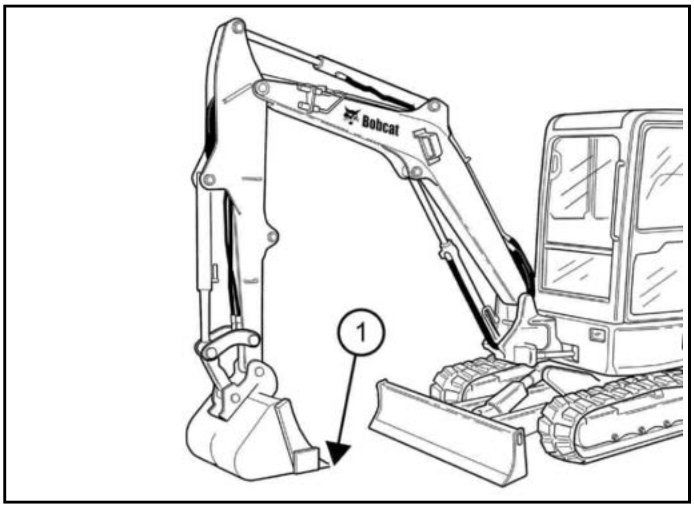
**⚠ DANGER**

**EXPLOSION AND ELECTROCUTION HAZARDS**
**Contact with underground utility lines will cause death, serious injury, or property damage.**
- **Check the work area for buried electrical, gas, utility, or other service lines before excavating or operating ground engaging equipment.**
- **Follow all local rules and regulations regarding digging or working in areas around underground utilities. Have all underground utility lines clearly marked before operating.**
- **DO NOT depend on the Depth Check system for digging close to known utilities. The system accuracy is dependent upon calibration, slope of the ground, and other variables.**
- **Reported utility locations, such as the depth of the line, can also vary due to soil erosion, grading, and other factors.◂**

1222-7BFD3B03

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

**Figure 243**

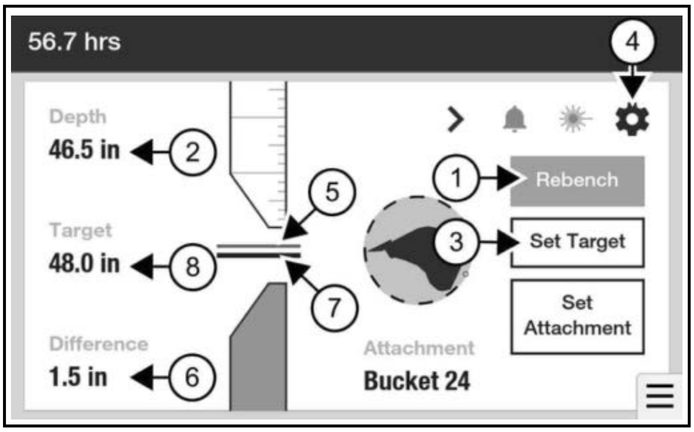



NA1400e

1. Set the bucket (Item 1) [Figure 243] 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 244**




NA3915c

3. Select **[REBENCH]** (Item 1) [Figure 244] on the display.

   OR

   Press the right joystick button to rebench.

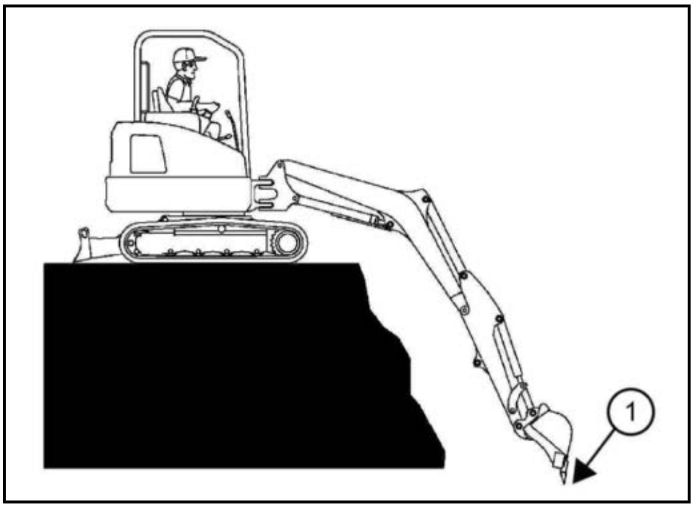
   At rebench, the depth dimension (Item 2) will set to 0.0. As the bucket is raised or lowered, the depth dimension (Item 2) will change [Figure 244].

4. Select **[SET TARGET]** (Item 3) [Figure 244] to select one of the preset depth targets.

   OR

   Select the **[SETTINGS]** icon (Item 4) [Figure 244] to change one of the preset depth targets.
   (See Setting Target Depth on Page 119)

**Figure 245**




NA1437d

- As the hole is being dug, the position of the bucket (Item 1) [Figure 245] is dimensionally shown (Item 2) [Figure 244] and shown on the bar graph at (Item 5) [Figure 244].

- The distance to target depth is shown dimensionally (Item 6) and on the bar graph (Item 7) [Figure 244].

- When the bucket is getting close to the target depth (Item 8) [Figure 244], a warning alarm (if activated) will start to slowly beep. The beeps will increase in frequency the closer the bucket gets to the target depth or grade zone. When the target depth or grade zone is reached, the alarm will sound continuously.
  (See Setting The Warning Zone on Page 120)
  (See Setting The Grade Zone on Page 121)

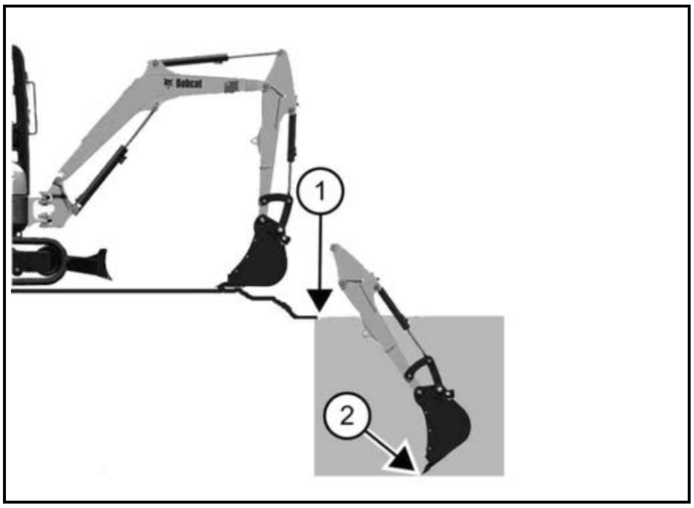
  **EXAMPLE:** The Target is 2 m (6.5 ft) and the Depth is 1,5 m (4.9 ft), the Difference will be 0,5 m (1.6 ft).

  2 m – 1,5 m = 0,5 m (6.5 ft – 4.9 ft = 1.6 ft).

**Repositioning The Excavator And Continuing To Dig To The Original Depth**

After repositioning the excavator, choose one of the following options to continue to dig to the original depth.

**Figure 246**




P200242b

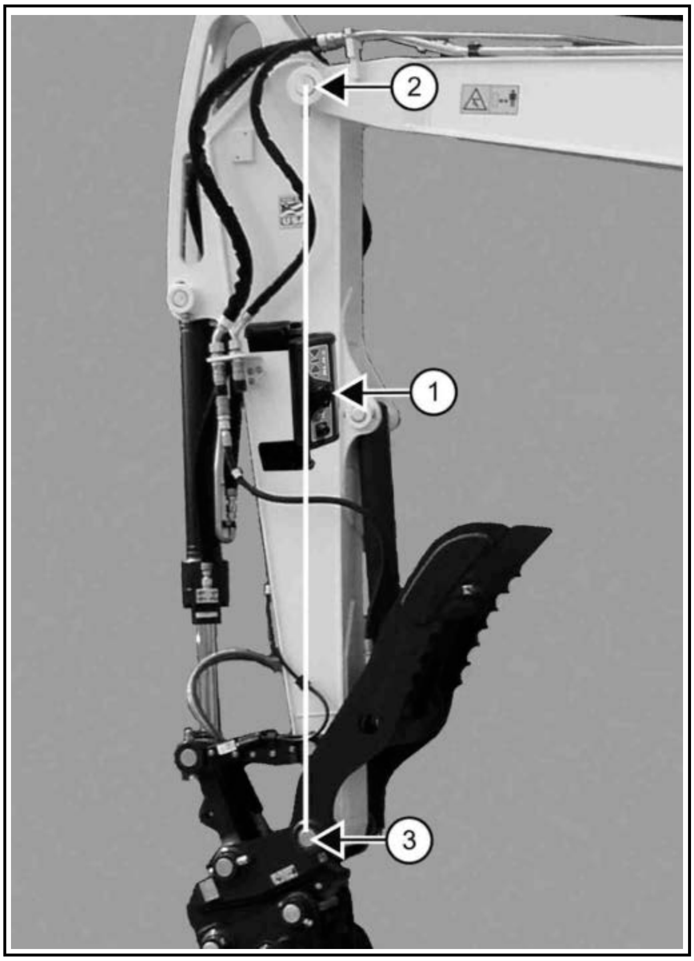
- Reposition the excavator so the bucket can be rebenched off the original bench point (Item 1) [Figure 246].

- Position the excavator so the bucket will reach to the bottom of the hole (Item 2) [Figure 246] 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

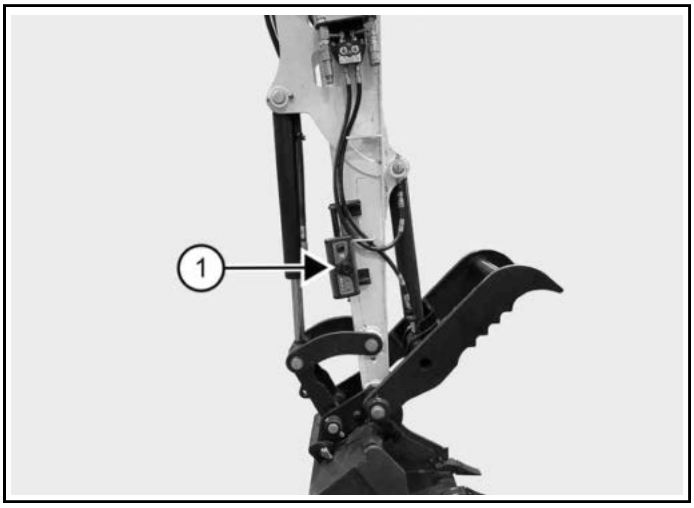
**Figure 247**




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 247].

**Figure 248**




C204995b

2. If your machine is equipped with options that make it difficult to install the laser receiver in the centre of the arm, install it in an alternative location such as shown here (Item 1) [Figure 248].

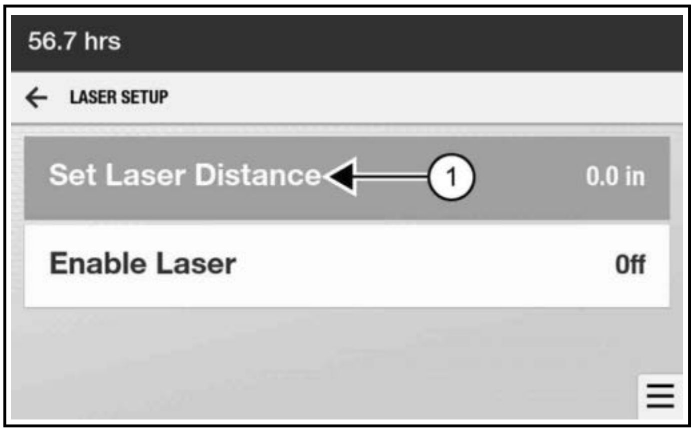
3. If your excavator is equipped with a clamp or arm that may interfere with the laser, make sure there is no hose-to-laser interference.

   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 249**

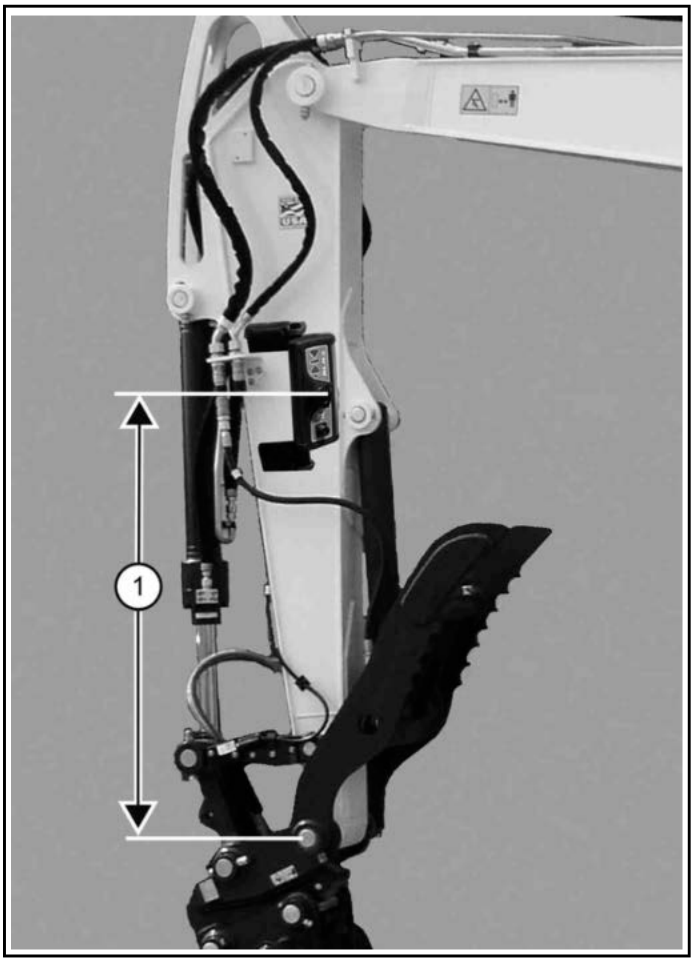



NA3912a

5. Select **[SET LASER DISTANCE]** (Item 1) [Figure 249].

6. Measure from the centre of the laser receiver to the bucket pivot pin (Item 1) [Figure 250]

**Figure 250**




p132078d

7. Enter this distance as the Laser Distance.

To dig a hole using the laser, see the following:
(See Benching With A Laser System on Page 124)

**Benching With A Laser System**

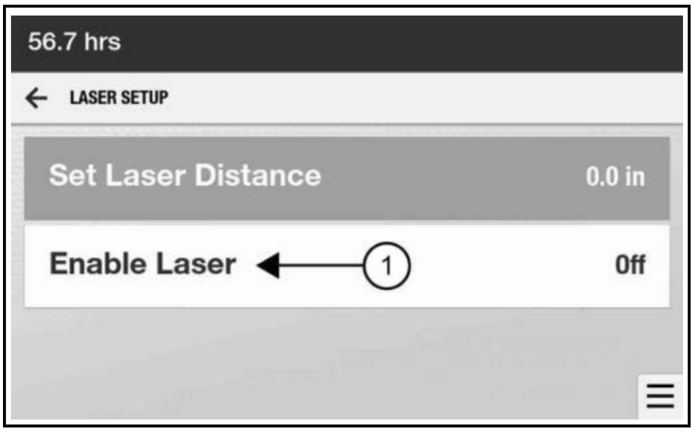
Read and understand the information supplied with the laser receiver for correctly setting up the laser system.

**When the laser feature is turned on, the target depth is the distance from the laser beam to grade point. Grade must be known prior to benching with a laser system. See (Item 3) [Figure 252].**

1. Make sure the laser receiver location on the arm has been entered into the Depth Check system. (See Setting Up A Laser With Depth Check on Page 123)

2. Select **[NAVIGATION HANDLE]→ [DEPTH CHECK]→ [SETTINGS]→ [LASER SETUP]**.

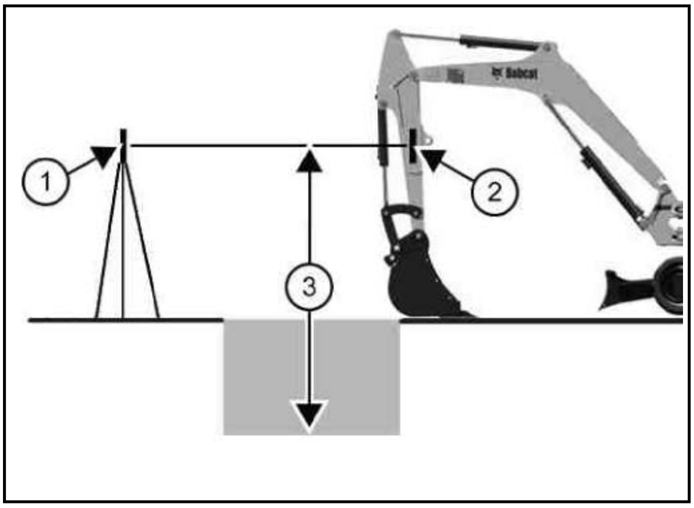
**Figure 251**




NA3912b

3. Select **[ENABLE LASER]** (Item 1) [Figure 251].

**Figure 252**




P200243a

4. With the excavator arm vertical, raise or lower the boom and arm as needed until the laser (Item 1) strikes the receiver (Item 2) [Figure 252].

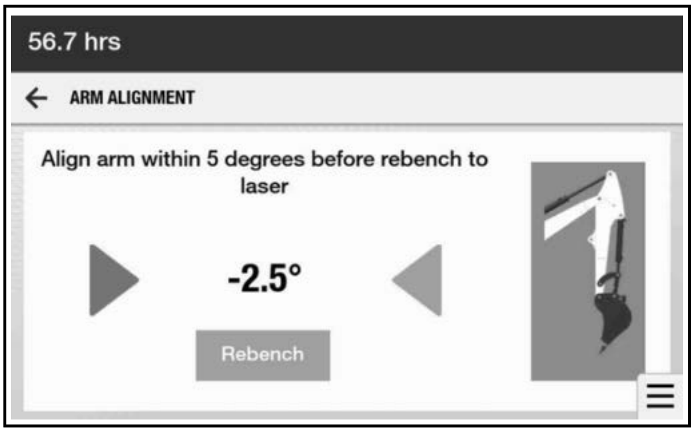
   If necessary, curl the bucket fully for increased bucket ground clearance, or dig a hole so that the bucket can be lowered to allow the laser to strike the receiver with the arm vertical.

5. When the laser strikes the receiver and the receiver light turns green, select **[REBENCH]**.

   OR

   Rebench by pressing the right joystick button.

**Figure 253**




NA3894

If the arm is not vertical when you try to rebench, the **ARM ALIGNMENT** screen [Figure 253] will remind you to make the arm vertical before rebenching is possible. Adjust the arm to the vertical position and select **[REBENCH]** [Figure 253].

6. Select **[SET TARGET]**.

7. Enter the distance from the laser to the target depth (Item 3) [Figure 252].

8. Adjust the Warning Zone and Grade Zone as needed. (See Setting The Grade Zone on Page 121) (See Setting The Warning Zone on Page 120)

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

## DEPTH CHECK (TOUCH DISPLAY)

### Depth Check Description

**⚠ WARNING**

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

W-2050

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

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

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

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

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

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

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

**⚠ WARNING**

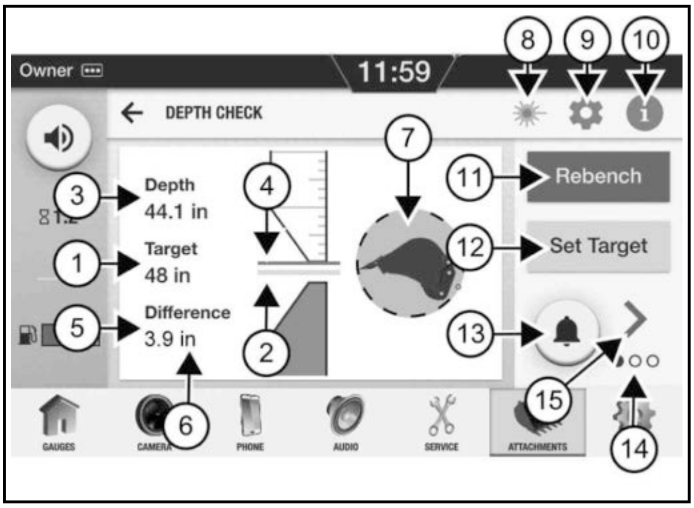
**GENERAL HAZARD**
**Contact with equipment can cause serious injury or death.**
**Keep all bystanders 6 m (20 ft) away from equipment when operating.**

W-2268

### Depth Check Screen

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

**Figure 254**




P132925e

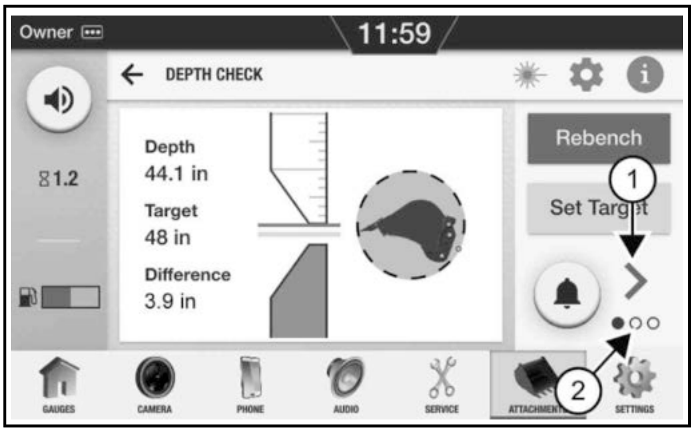
| REF. | DESC. | FUNCTION |
|---|---|---|
| 1 | Target (Dimension) | Depth to dig from an established starting point set by the operator. (Example: Desired dig depth from a surveyor's elevation pin.) |
| 2 | Target (Bar Graph) | Shows where the target is in relationship to the attachment position. |
| 3 | Depth (Dimension) | The current depth of the attachment cutting edge. |
| 4 | Depth (Bar Graph) | Moves up and down to show the position of the attachment to the target. |
| 5 | Difference (Dimension) | The difference between the current depth and the target depth. |
| 6 | Units | The current selected unit of measure (meters / millimeters or feet / inches). |
| 7 | Attachment Rotation | A bucket is used to represent the attachment. The bucket image will rotate to represent the position of the attachment as the attachment is curled out or curled in. |
| 8 | Laser | Accesses **LASER SETUP** screen where you can add the laser position dimension or turn the laser on / off. When laser is on, the icon is illuminated. (See Setting Up A Laser With Depth Check on Page 137) |
| 9 | Depth Check Settings | Accesses **DEPTH CHECK SETTINGS** screen. |
| 10 | Tips | Accesses **TOOL TIPS** screen. |
| 11 | Rebench | Press to Rebench. (See Digging To A Target Depth on Page 135) |
| 12 | Set Target | Accesses **SET TARGET DEPTH** screen. (See Setting Target Depth on Page 133) |
| 13 | Alarm | Turns target depth alarm on / off. (See Setting The Warning Zone on Page 134) |
| 14 | Screen Indicator | Dots indicate which of the three screens is being displayed. |
| 15 | Arrow | Used to move between screens. You can also swipe between screens with your finger. (See Setting The Default Depth Check Screen on Page 126) |

### Setting The Default Depth Check Screen

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

- Dig Depth [Figure 255]
- Distance to Target [Figure 256]
- Grade Check [Figure 257]

**Figure 255**

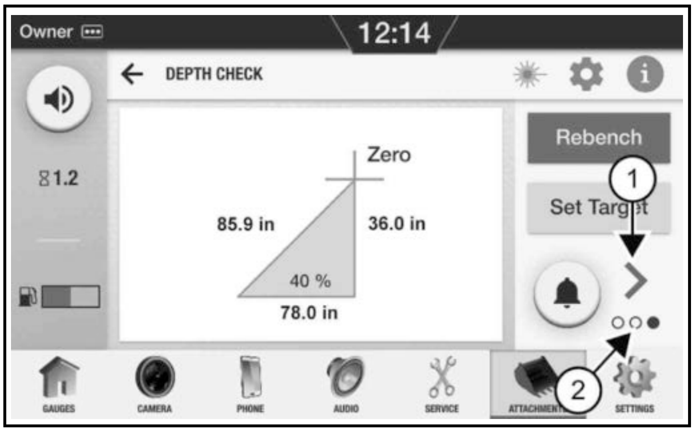



P132925b

**Figure 256**


NA3430b

**Figure 257**




NA3431b

1. To select one of the three depth check screens as the default screen, select **[ATTACHMENTS]→ [DEPTH CHECK]→ [SETTINGS]→ [PREFERENCES]→ [DEFAULT SCREEN]**.

Press the arrow (Item 1) to toggle between these three screens at any time. The three dots (Item 2) change to represent which **DEPTH CHECK** screen is active: [Figure 255], [Figure 256], or [Figure 257].

### Switching Unit Scale

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

**Figure 258**


P132911a

2. Select **[UNITS]** (Item 1) to switch between meters / millimeters or feet / inches (Item 2) [Figure 258].

You can also switch between metric and English units. (See Switching Between English / Metric Units on Page 214)

### Calibrating The Boom

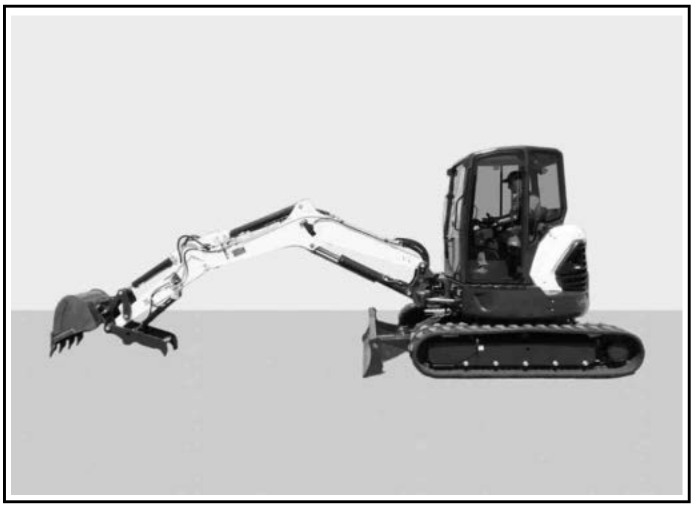
The following items are needed to complete this task:

- 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 259**

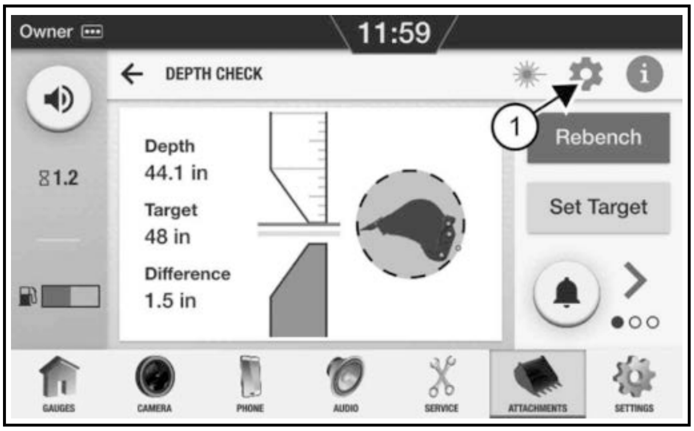


C200403a

3. Position the excavator with the bucket fully rolled out and the arm fully extended [Figure 259].

4. On the touch display select **[ATTACHMENTS]→ [DEPTH CHECK]**.

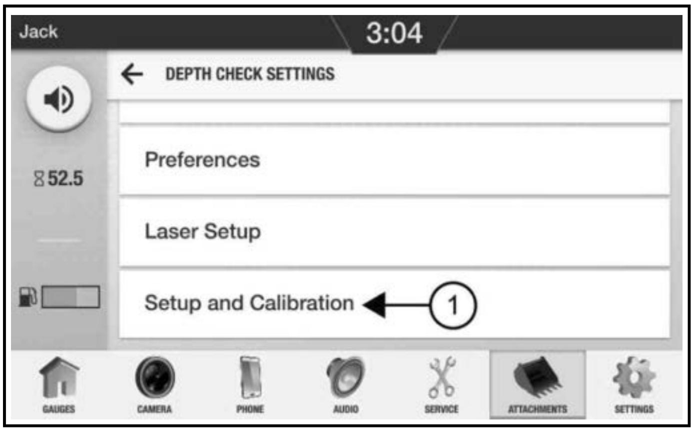
**Figure 260**




NA3429b

5. Select the **[SETTINGS ]** icon (Item 1) [Figure 260].

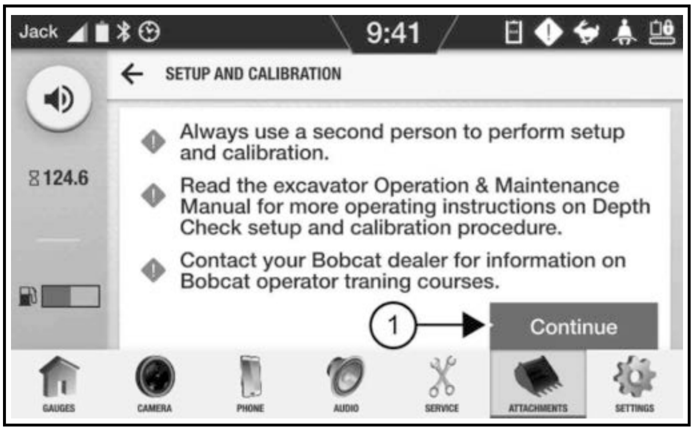
**Figure 261**




C132910d

6. Select **[SETUP AND CALIBRATION]** (Item 1) [Figure 261].

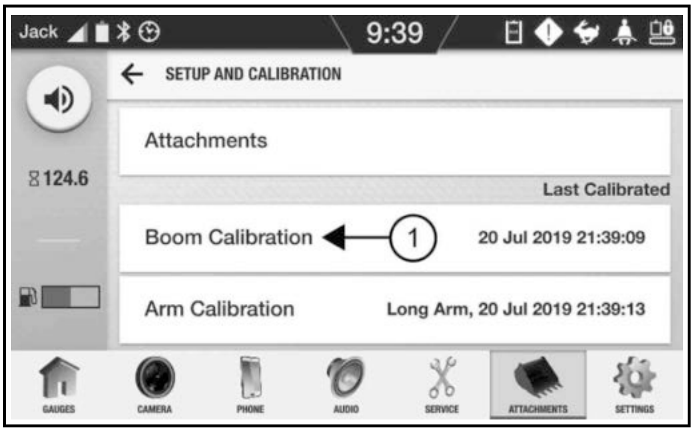
**Figure 262**




P132908a

7. Read the message on the screen and press **[CONTINUE]** (Item 1) [Figure 262] to proceed.

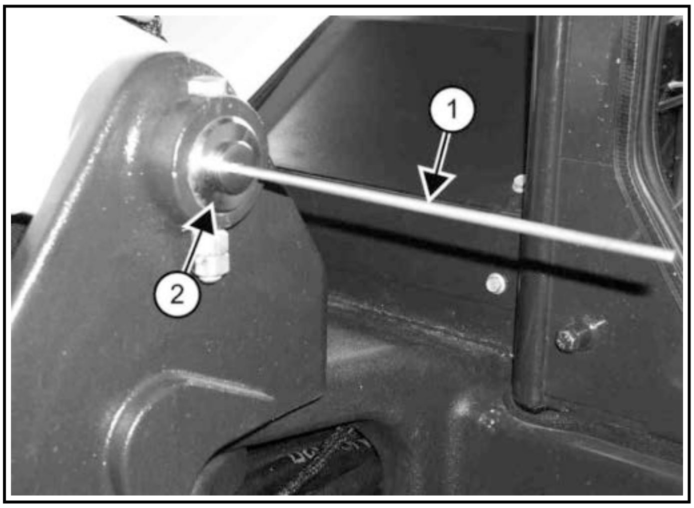
**Figure 263**




P132909b

8. Select **[BOOM CALIBRATION]** (Item 1) [Figure 263].

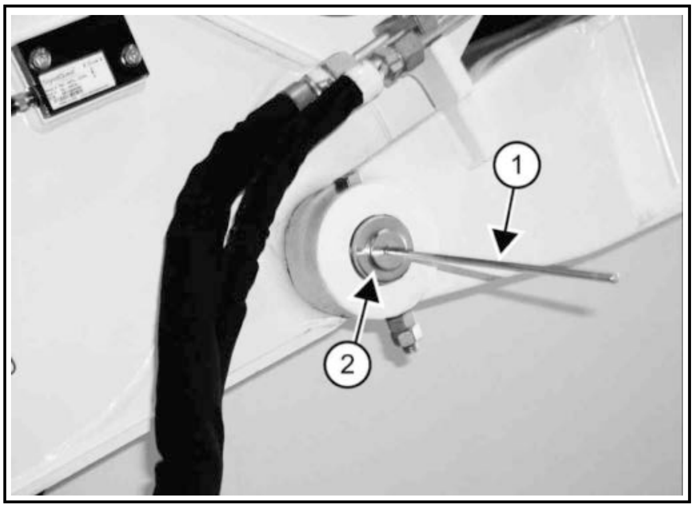
**Figure 264**




P131855a

9. Install one of the magnetic tools (Item 1) on the boom pivot pin (Item 2) [Figure 264]. Position the magnetic tool as close as possible to the center of the boom pivot pin.

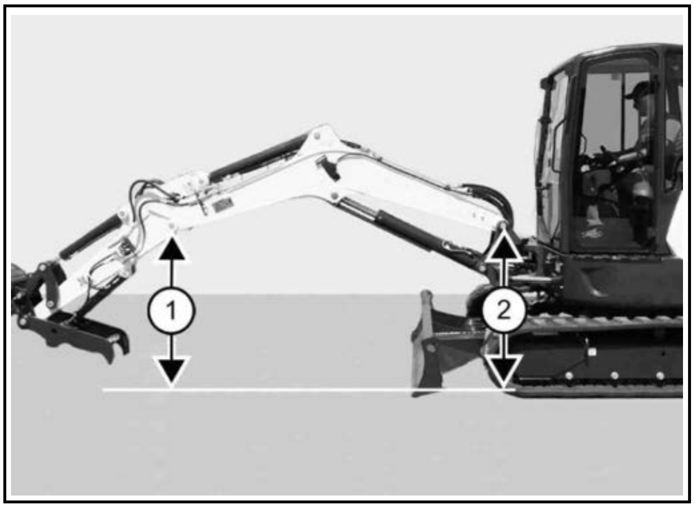
**Figure 265**




P131856a

10. Install the second magnetic tool (Item 1) on the arm pivot pin (Item 2) [Figure 265]. Position the magnetic tool as close as possible to the center of the arm pin.

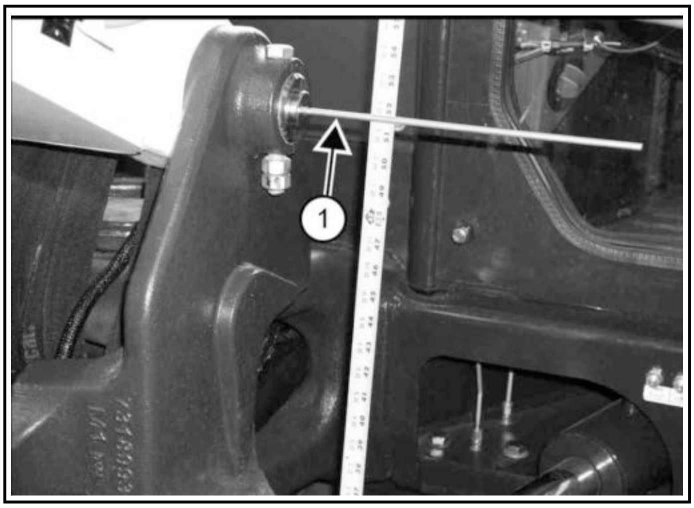
**Figure 266**




C200403b

11. Position the work group so the distance from the ground to the two magnetic tools (Items 1 and 2) [Figure 266] is identical.

**Figure 267**

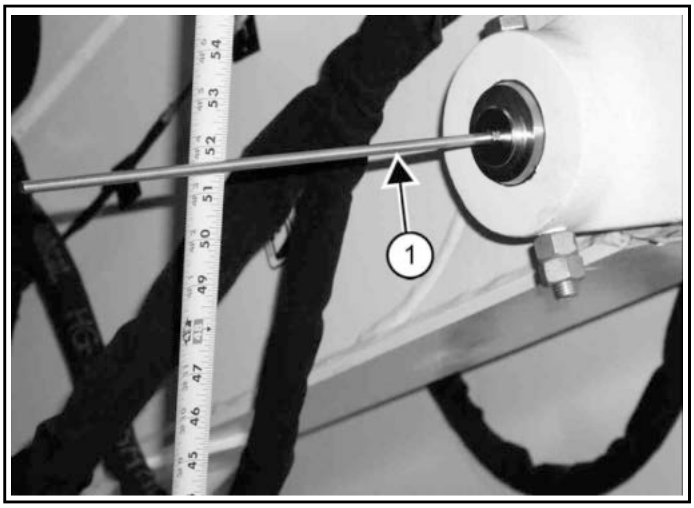



P131857a

12. Measure the distance from the center of the boom magnetic tool (Item 1) [Figure 267] to the ground.

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

**Figure 268**



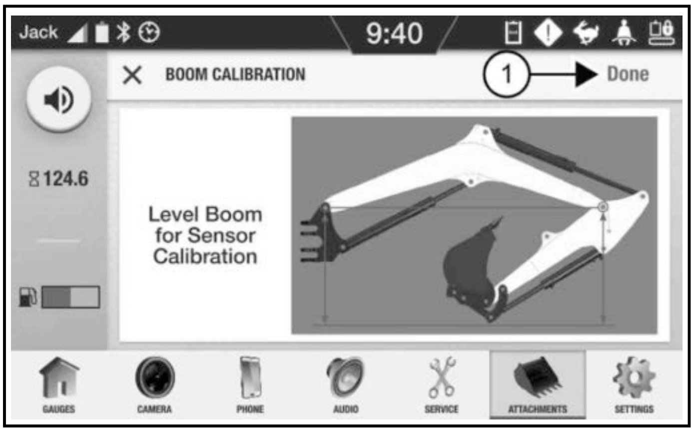

P131858a

13. Measure the distance from the center of the arm magnetic tool (Item 1) [Figure 268] 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 269**




P132913a

15. Follow the instructions on the screen and select **[DONE]** (Item 1) [Figure 269].

16. Proceed to calibrating the arm.
    (See Calibrating The Arm on Page 130)

**Calibrating The Arm**

The following items are needed to complete this task:

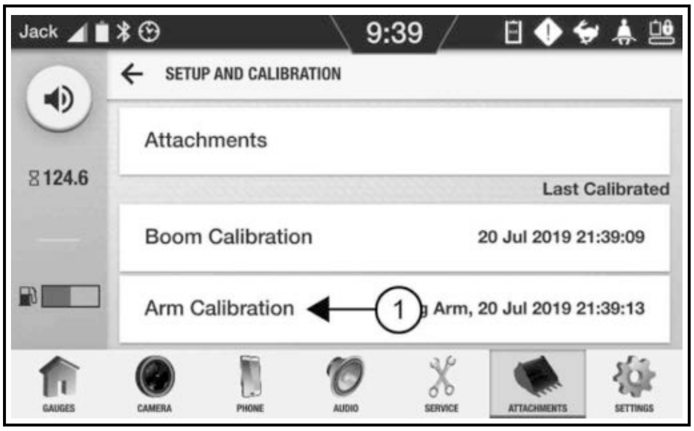
- Plumb bob.
- Magnetic tool that is included with the kit.

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

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

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

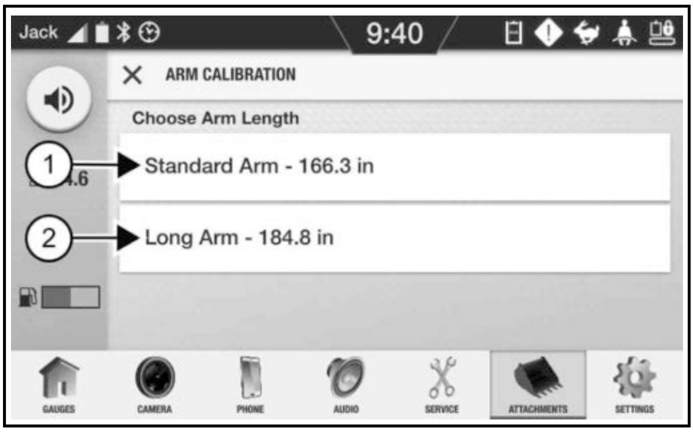
**Figure 270**




P132909c

2. Select **[ARM CALIBRATION]** (Item 1) [Figure 270].

**Figure 271**

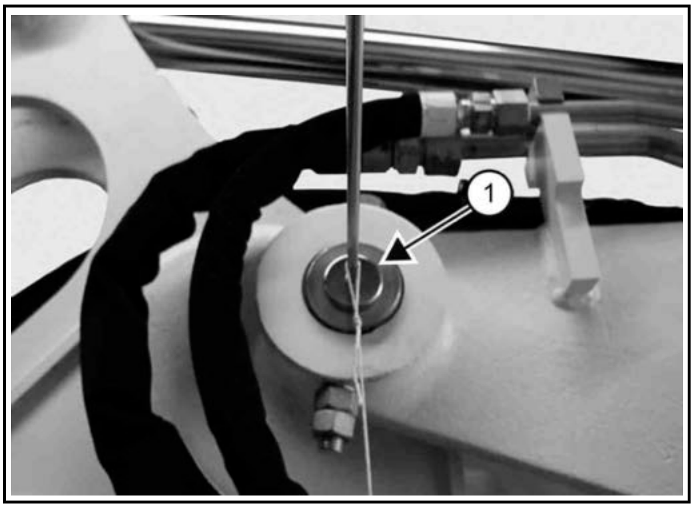



P132915a

3. Select the arm that your machine is equipped with (Item 1 or 2) [Figure 271].

   **NOTE:** Some models only have one arm option available.

**Figure 272**

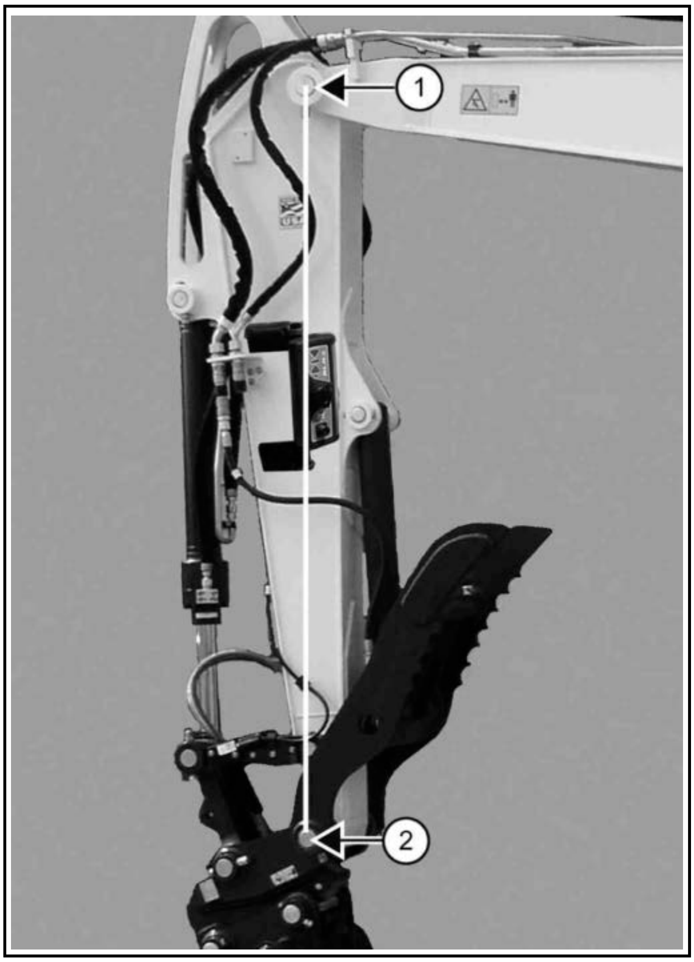



p132076b

4. Install the magnetic tool on the arm pin (Item 1) [Figure 272].

5. Place the plumb bob on the magnetic tool that is installed on the arm pin (Item 1) [Figure 272] .

**Figure 273**

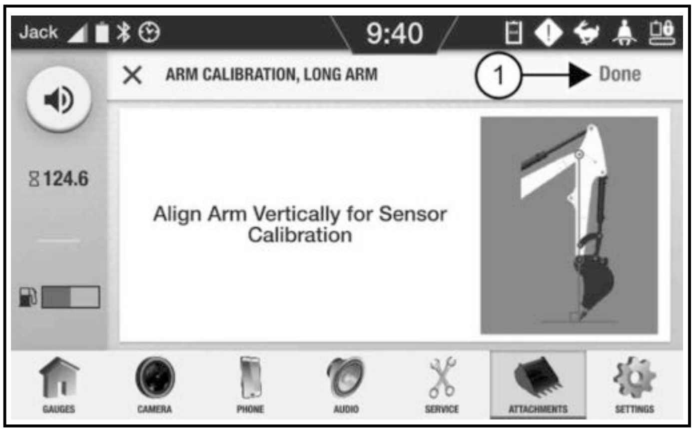



p132078c

6. Move the arm until the plumb bob line (Item 1) is centered on the pivoting bucket pin (Item 2) [Figure 273].

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

**Figure 274**




P132914a

7. With the arm vertical, select **[DONE]** (Item 1) [Figure 274] to store this information.

8. Proceed to calibrating the attachment. (See Calibrating The Attachment on Page 131)

**Calibrating The Attachment**

The following items are needed to complete this task:

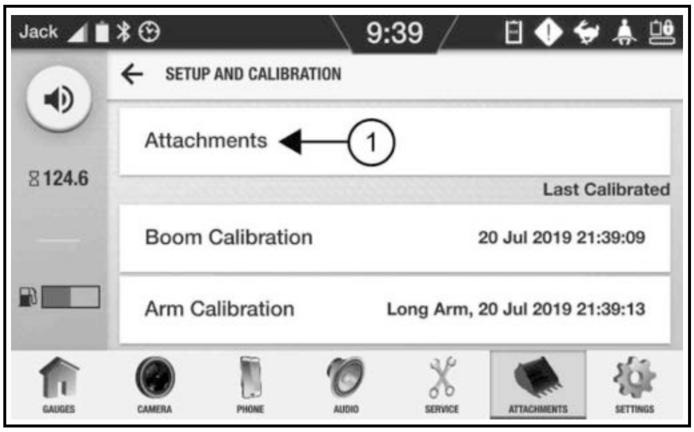
- Tape measure.
- Magnetic tool that is included with the kit.

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

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

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

**Figure 275**




P132909a

2. Select **[ATTACHMENTS]** (Item 1) [Figure 275].

**Figure 276**


P132919a

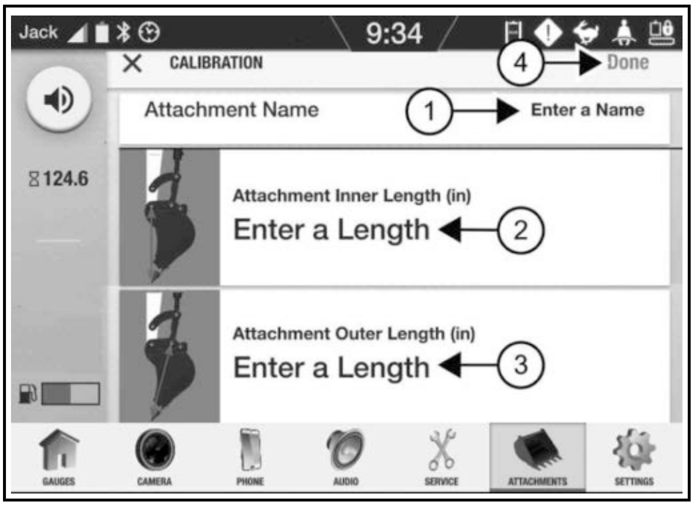
3. Select **[ADD ATTACHMENT]** (Item 1) [Figure 276].

   OR

   Select one of the existing attachments (Item 2) [Figure 276] 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 277**




P132974a

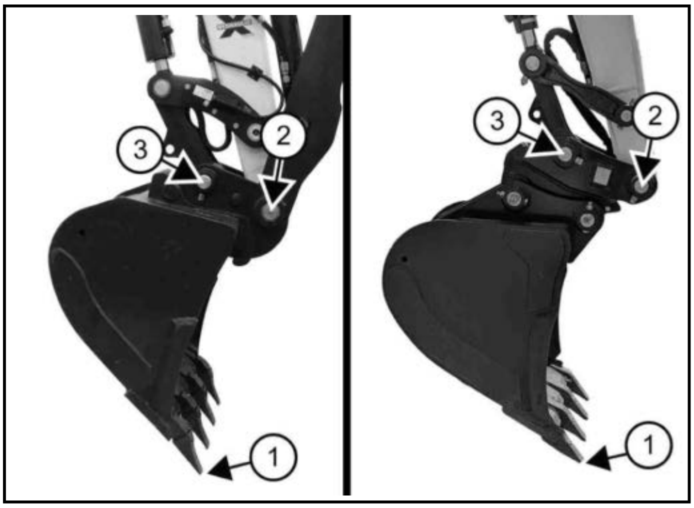
4. On the **CALIBRATION** screen, select **[ENTER A NAME]** (Item 1) [Figure 277].

   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 277] for the Attachment Inner Length.

**Figure 278**



C205740a

6. Measure the distance from the tip of the attachment (Item 1) to the center of the inner pin (Item 2) [Figure 278] and enter this value.

   Choose the correct pin (Item 2) [Figure 278] based on the type of attachment mounting system on your machine.

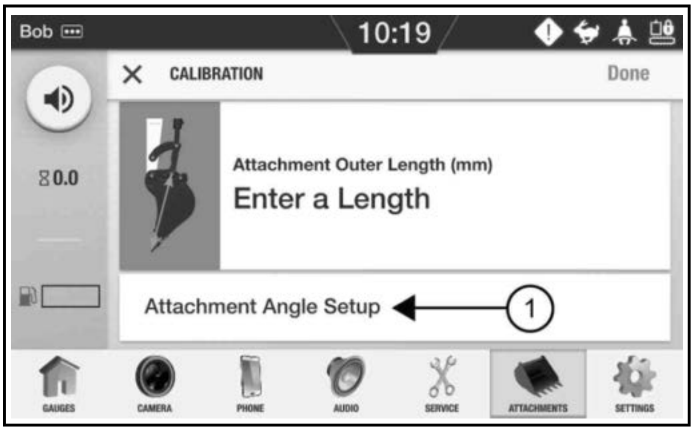
7. Select **[ENTER A LENGTH]** (Item 3) [Figure 277] for the Attachment Outer Length.

   **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 278] and enter this value.

   Choose the correct pin (Item 3) [Figure 278] based on the type of attachment mounting system on your machine.

**Figure 279**




NA3892a

9. If you are using a non-standard bucket or attachment and want the display to more accurately reflect its rotation, select **[ATTACHMENT ANGLE SETUP]** (Item 1) [Figure 279].

**Figure 280**


NA3891

10. Follow the instructions on the screen [Figure 280] and select **[DONE]**.

**Figure 281**


P132920a

11. Follow the instructions on the screen to align the attachment for sensor calibration.

    Use the plumb bob and pin extender to vertically align the inner pin (Item 2) and the attachment tip (Item 1) [Figure 278].

12. Select **[DONE]** (Item 1) [Figure 281] to store the calibration information.

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

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

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

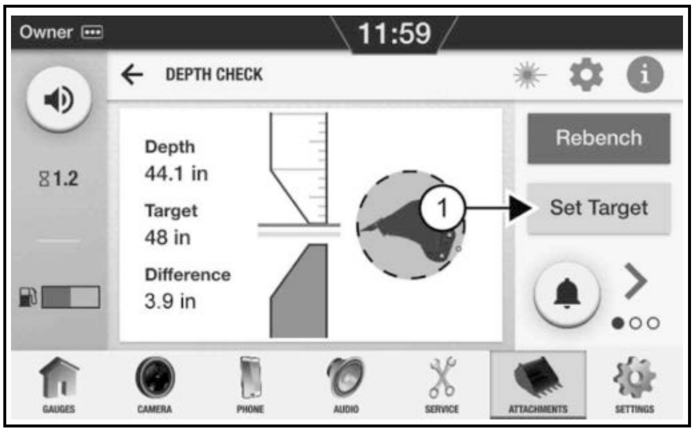
This finishes the calibration procedure, except if you are also installing a laser.
(See Setting Up A Laser With Depth Check on Page 137)

### Setting Target Depth

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

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

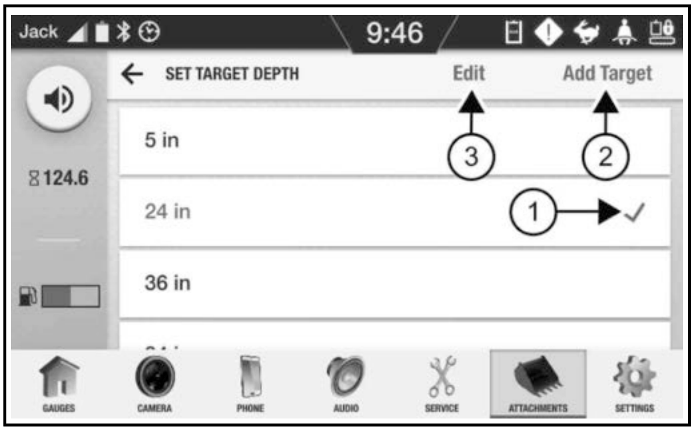
**Figure 282**




P132925d

2. Select **[SET TARGET]** (Item 1) [Figure 282].

**Figure 283**




P132927b

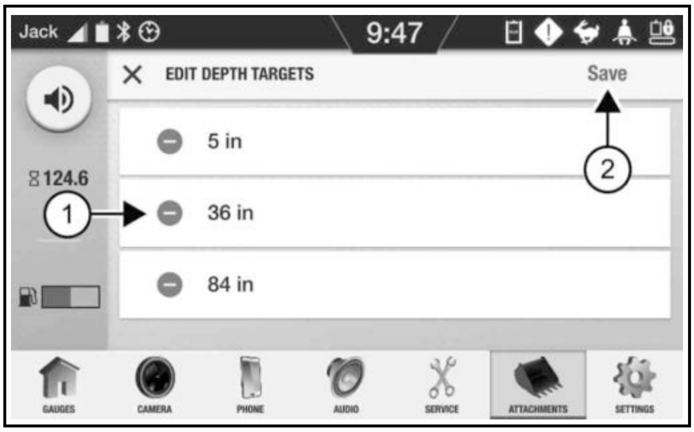
3. Select one of the existing target depths.

   OR

   Select **[ADD TARGET]** (Item 2) [Figure 283] to add a new target depth.

   A check mark will appear (Item 1) [Figure 283] by the selected target depth.

**Figure 284**




P132929a

4. To remove an existing target depth, select **[EDIT]** (Item 3) [Figure 283].

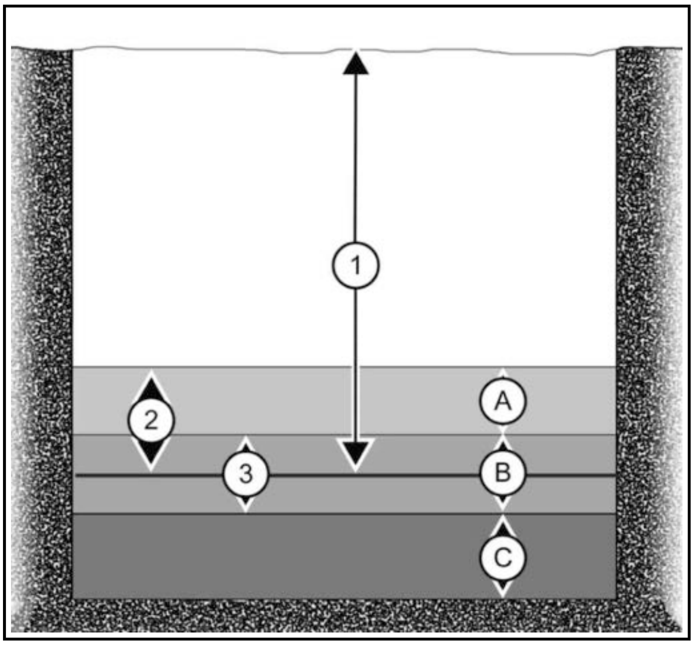
   a. Select the **[REMOVE]** icon (Item 1) [Figure 284] in front of a target depth to remove it.

      The active target depth can not be removed.

   b. Select **[SAVE]** (Item 2) [Figure 284] to confirm removal.

**Description Of Grade And Warning Zones**

**Figure 285**




NA20252a

The following three values can be set on the display:

| ITEM | DESCRIPTION |
|---|---|
| 1 | Target Depth |
| 2 | Warning Zone |
| 3 | Grade Zone |

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

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

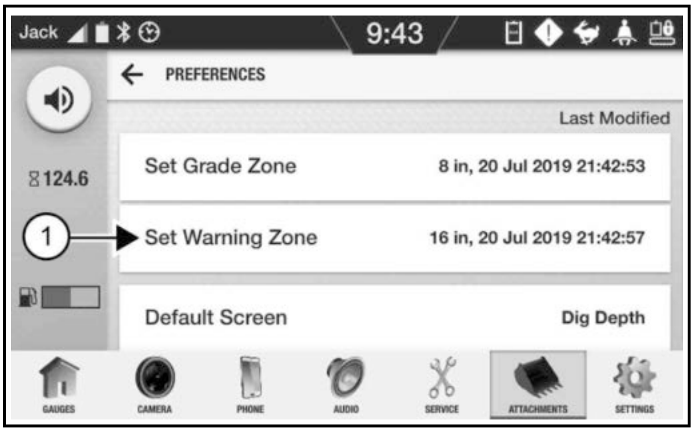
**EXAMPLE:** Operator sets Target Depth to 610 mm (24 in), Warning Zone to 100 mm (4 in), and Grade Zone to 50 mm (2 in). Operator will hear slow beeps from 508 – 584 mm (20 – 23 in), a solid beep from 584 – 635 mm (23 – 25 in), and fast beeps below 635 mm (25 in).

**Setting The Warning Zone**

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

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

**Figure 286**




P132923b

2. Select **[SET WARNING ZONE]** (Item 1) [Figure 286] and enter the dimension.

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

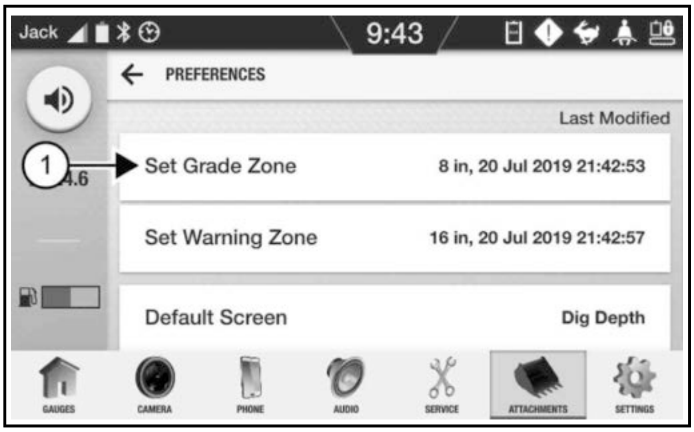
**Setting The Grade Zone**

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 287




P132923a

2. Select **[SET GRADE ZONE]** (Item 1) [Figure 287] and enter the dimension.

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

**Digging To A Target Depth**

**⚠ DANGER**

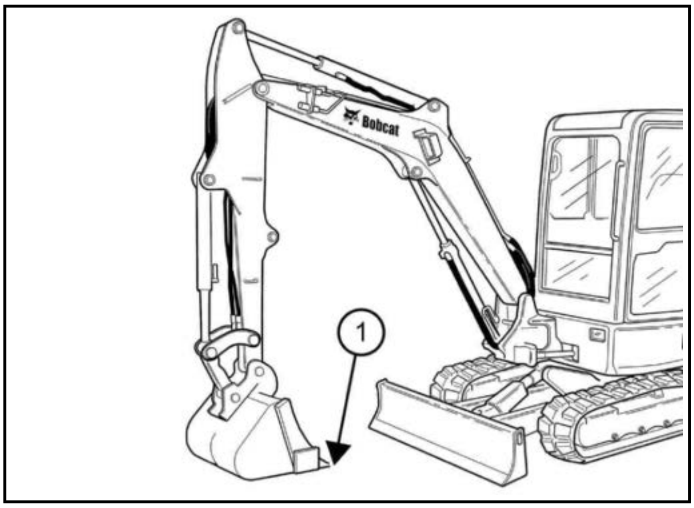
**EXPLOSION AND ELECTROCUTION HAZARDS**
**Contact with underground utility lines will cause death, serious injury, or property damage.**

- **Check the work area for buried electrical, gas, utility, or other service lines before excavating or operating ground engaging equipment.**
- **Follow all local rules and regulations regarding digging or working in areas around underground utilities. Have all underground utility lines clearly marked before operating.**
- **DO NOT depend on the Depth Check system for digging close to known utilities. The system accuracy is dependent upon calibration, slope of the ground, and other variables.**
- **Reported utility locations, such as the depth of the line, can also vary due to soil erosion, grading, and other factors.◂**

1222-7BFD3B03

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

Figure 288

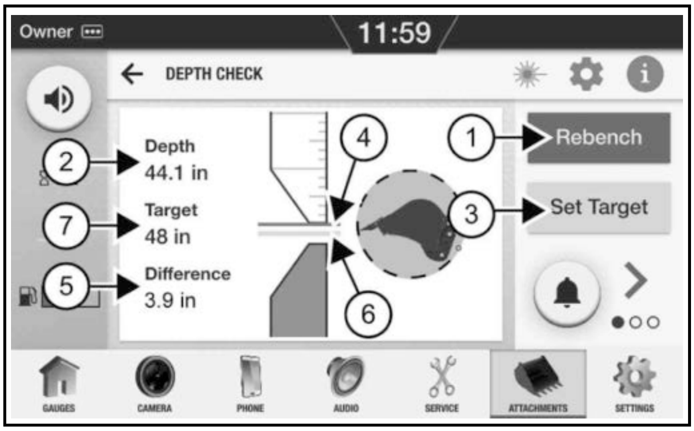



NA1400e

1. Set the bucket (Item 1) [Figure 288] 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 289




P132925c

3. Select **[REBENCH]** (Item 1) [Figure 289] on the display.

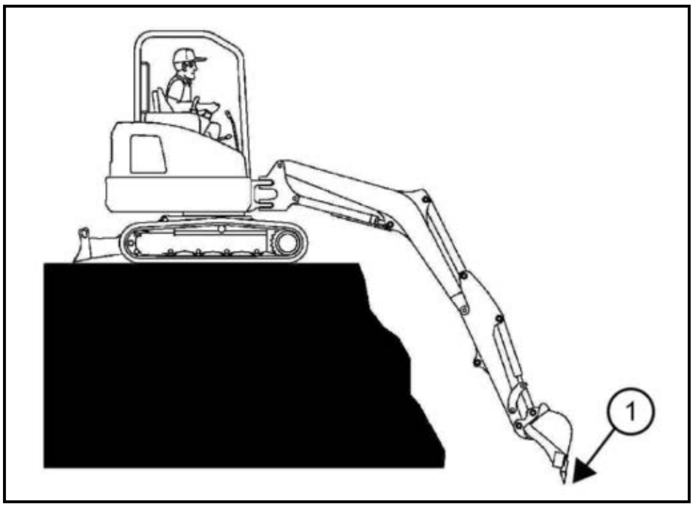
   OR

   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 289].

4. Select **[SET TARGET]** (Item 3) [Figure 289] to set the new depth target.

**Figure 290**




NA1437d

- As the hole is being dug, the position of the bucket (Item 1) [Figure 290] is dimensionally shown (Item 2) [Figure 289] and shown on the bar graph (Item 4) [Figure 289].
- The distance to target depth is shown dimensionally (Item 5) and on the bar graph (Item 6) [Figure 289].
- When the bucket is getting close to the target depth (Item 7) [Figure 289], a warning alarm (if activated) will start to slowly beep. The beeps will increase in frequency the closer the bucket gets to the target depth or grade zone. When the target depth or grade zone is reached, the alarm will sound continuously. (See Setting The Warning Zone on Page 134) (See Setting The Grade Zone on Page 134)

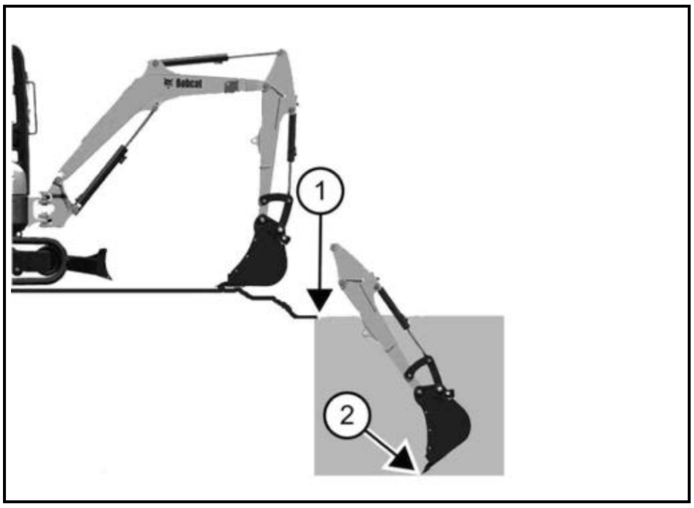
  **EXAMPLE:** The Target is 2 m (6.5 ft) and the Depth is 1,5 m (4.9 ft), the Difference will be 0,5 m (1.6 ft).

  2 m – 1,5 m = 0,5 m (6.5 ft – 4.9 ft = 1.6 ft).

### Repositioning The Excavator And Continuing To Dig To The Original Depth

After repositioning the excavator, choose one of the following options to continue to dig to the original depth.

**Figure 291**




P200242b

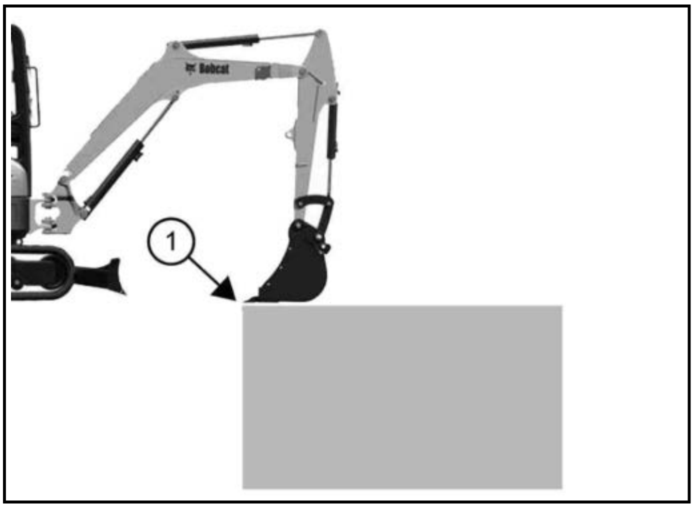
- Reposition the excavator so the bucket can be rebenched off the original bench point (Item 1) [Figure 291].
- Position the excavator so the bucket will reach to the bottom of the hole (Item 2) [Figure 291] at an area that is known to be the correct depth. When rebenching at the bottom of the trench, set the target depth to zero to continue digging at the original depth.

**NOTE:** Set the distance from the target depth to the point at which the alarm starts to beep on the **WARNING ZONE** screen.

### Digging To A Target Depth And Width

Follow the same procedure as for digging a hole to a target depth except as follows.
(See Digging To A Target Depth on Page 135)

**Figure 292**

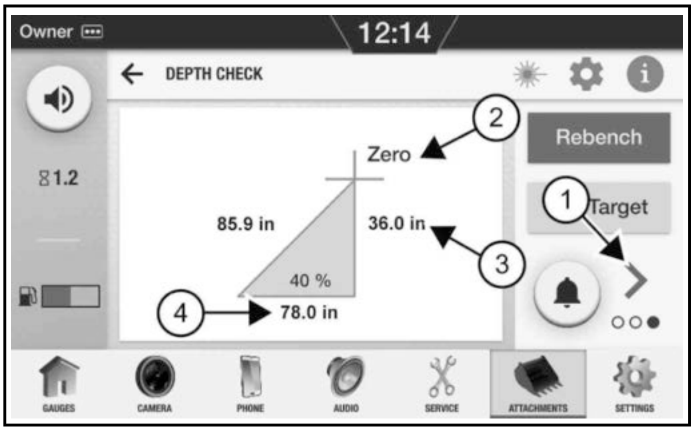



P200241a

1. When rebenching the bucket for setting to 0.0, position the bucket (Item 1) [Figure 292] at the starting point of the side of the hole.

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

**Figure 293**




NA3431c

2. Press the **[ARROW]** icon (Item 1) [Figure 293] to scroll to the **GRADE CHECK** screen [Figure 293].

   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 293].

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 293].

**⚠ DANGER**

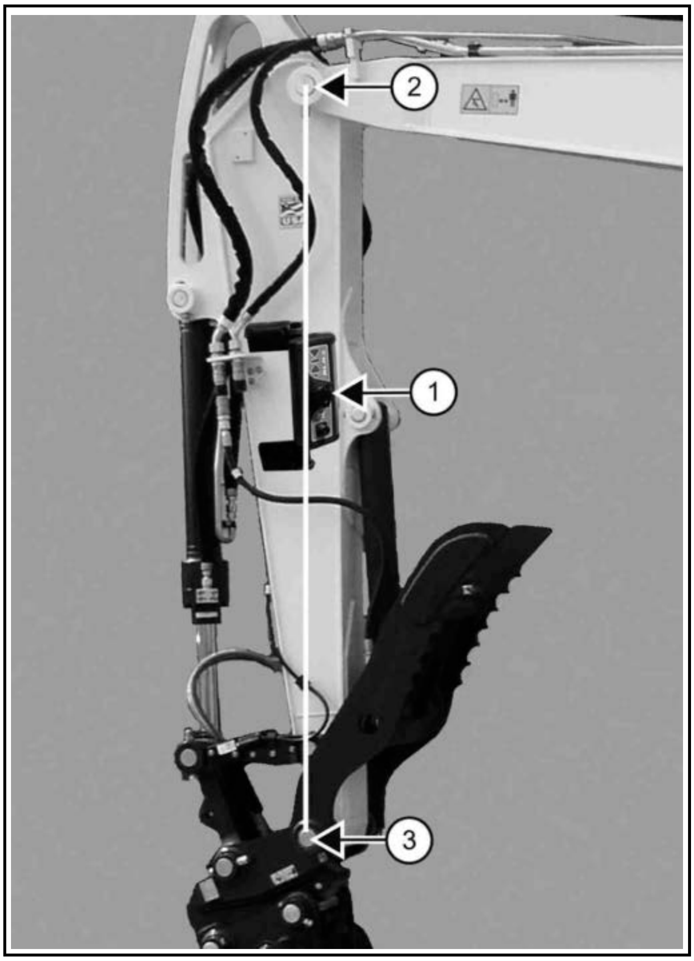
**EXPLOSION AND ELECTROCUTION HAZARDS**
**Contact with underground utility lines will cause death, serious injury, or property damage.**

- **Check the work area for buried electrical, gas, utility, or other service lines before excavating or operating ground engaging equipment.**
- **Follow all local rules and regulations regarding digging or working in areas around underground utilities. Have all underground utility lines clearly marked before operating.**
- **DO NOT depend on the Depth Check system for digging close to known utilities. The system accuracy is dependent upon calibration, slope of the ground, and other variables.**
- **Reported utility locations, such as the depth of the line, can also vary due to soil erosion, grading, and other factors.**

1222-7BFD3B03

## Setting Up A Laser With Depth Check

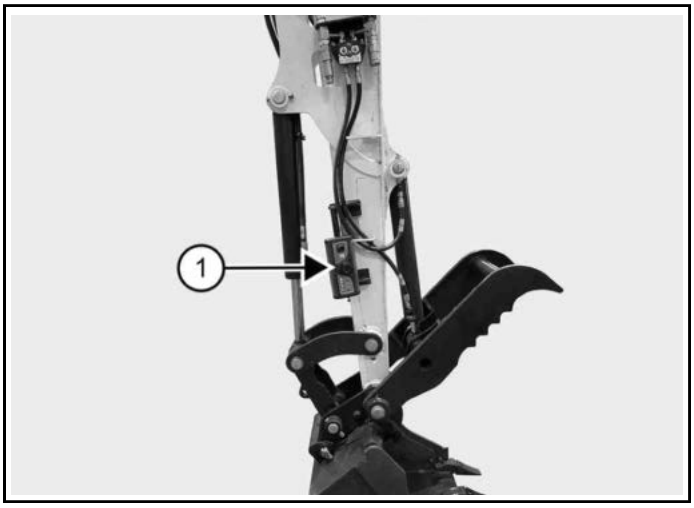
**Figure 294**




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 294].

**Figure 295**




C204995b

2. If your machine is equipped with options that make it difficult to install the laser receiver in the center of the arm, install it in an alternative location such as shown here (Item 1) [Figure 295].

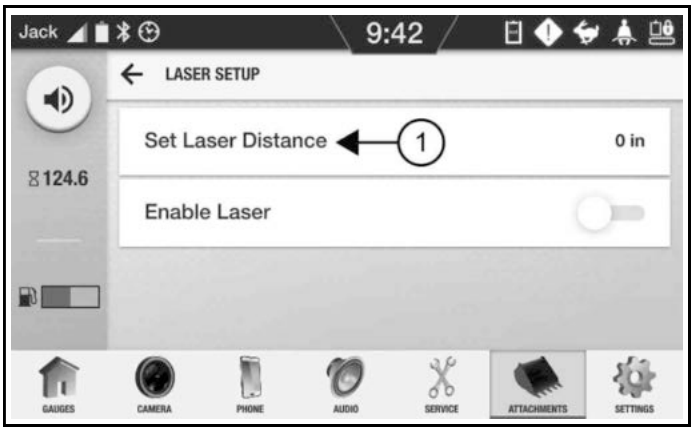
3. If your excavator is equipped with a clamp or arm that may interfere with the laser, make sure there is no hose-to-laser interference.

    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 296**

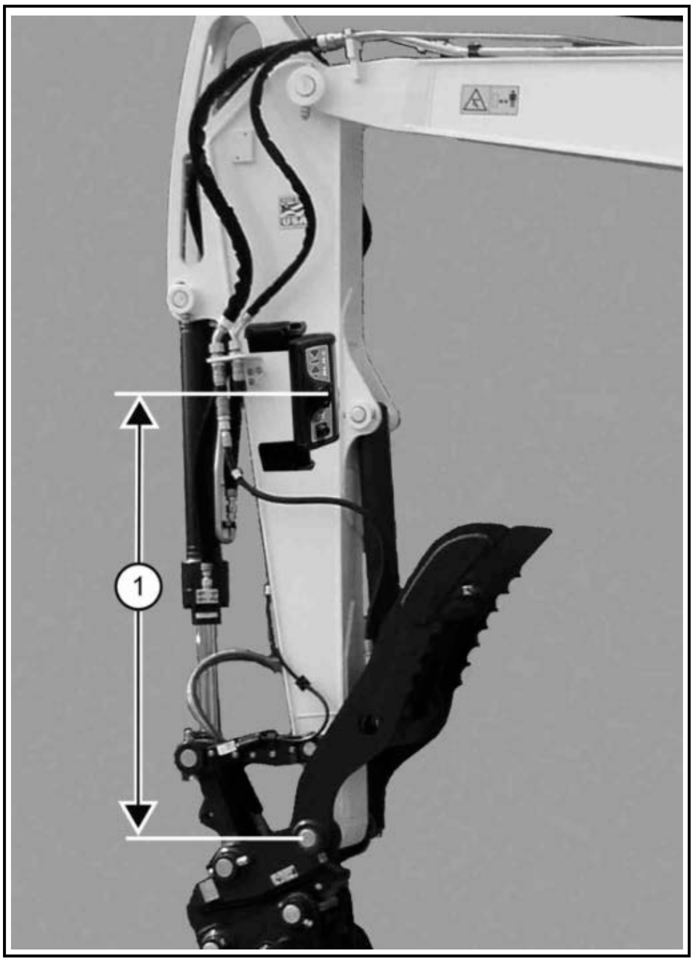



P132921a

5. Select **[SET LASER DISTANCE]** (Item 1) [Figure 296].

6. Measure from the center of the laser receiver to the bucket pivot pin (Item 1) [Figure 297].

**Figure 297**




p132078d

7. Enter this distance as the Laser Distance.

To dig a hole using the laser, see the following:
(See Benching With A Laser System on Page 138)

**Benching With A Laser System**

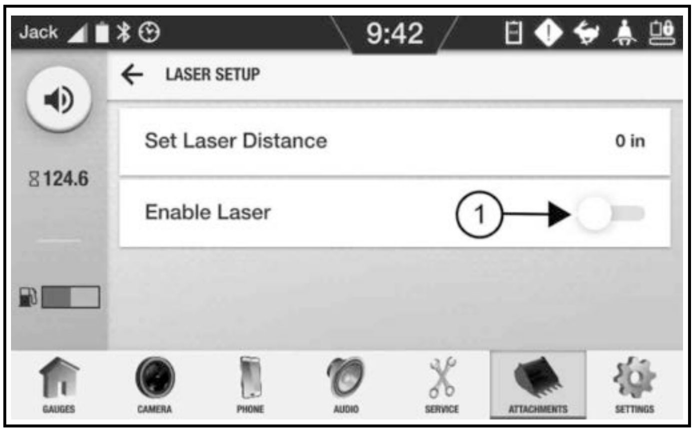
Read and understand the information supplied with the laser receiver for correctly setting up the laser system.

**When the laser feature is turned on, the target depth is the distance from the laser beam to grade point. Grade must be known prior to benching with a laser system. See (Item 3) [Figure 299].**

1. Make sure the laser receiver location on the arm has been entered into the Depth Check system. (See Setting Up A Laser With Depth Check on Page 137)

2. Select **[ATTACHMENTS]→ [DEPTH CHECK]→ [SETTINGS]→ [LASER SETUP]**.

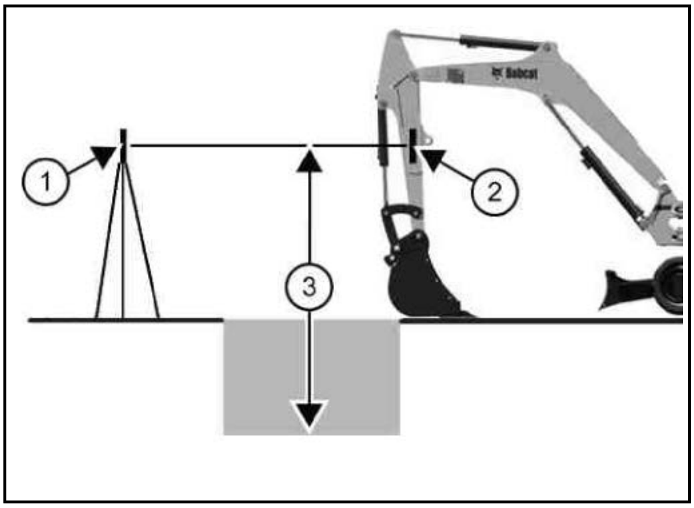
**Figure 298**




p132921b

3. Enable the laser by moving the slider (Item 1) [Figure 298].

**Figure 299**




P200243a

4. With the excavator arm vertical, raise or lower the boom and arm as needed until the laser (Item 1) strikes the receiver (Item 2) [Figure 299].

   If necessary, curl the bucket fully for increased bucket ground clearance, or dig a hole so that the bucket can be lowered to allow the laser to strike the receiver with the arm vertical.

5. When the laser strikes the receiver and the receiver light turns green, select **[REBENCH]**.

   OR

   Rebench by pressing the right joystick button.

**Figure 300**


NA3890

If the arm is not vertical when you try to rebench, the **ARM ALIGNMENT** screen [Figure 300] 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 299].

8. Adjust the Warning Zone and Grade Zone as needed. (See Setting The Grade Zone on Page 134) (See Setting The Warning Zone on Page 134)

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

## TROUBLESHOOTING THE DEPTH CHECK SYSTEM

Depth Check system measures inaccurately, shows the incorrect depth on the display, or gives an error code.

| Cause(s) | Solution(s) |
|---|---|
| Improper calibration of boom, arm, or attachment. | Recalibrate boom, arm, and attachment.<br>(See Depth Check (Standard Display) on Page 112)<br>(See Depth Check (Touch Display) on Page 125) |
| One or more sensors are not working correctly. | Determine which sensor is not working correctly and replace.<br>(See Checking The Bucket Sensor on Page 140)<br>(See Checking The Arm Sensor on Page 141)<br>(See Checking The Boom Sensor on Page 141) |
| Attachment was measured incorrectly. | Remeasure attachment and input new values.<br><br>For standard display<br>(See Calibrating The Attachment on Page 117)<br><br>For touch display<br>(See Calibrating The Attachment on Page 131) |
| Laser feature is activated but laser isn't being used. | Turn laser off.<br><br>For standard display<br>(See Benching With A Laser System on Page 124)<br><br>For touch display<br>(See Benching With A Laser System on Page 138) |
| Laser feature isn't activated, but a laser is being used to Rebench. | Turn laser feature on.<br><br>For standard display<br>(See Benching With A Laser System on Page 124)<br><br>For touch display<br>(See Benching With A Laser System on Page 138) |
| Rebenching isn't working correctly. | If you are not using a laser, make sure the laser feature is turned off.<br><br>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.

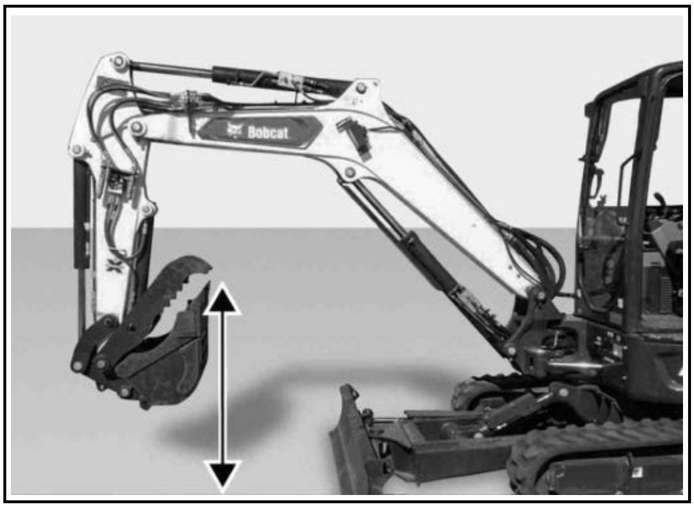
**Figure 301**


C209270

1. Place the bucket teeth on the ground with the teeth at the lowest point in the bucket movement arc [Figure 301].

2. Select **[REBENCH]**.

**Figure 302**




C209271a

3. Move only the bucket up to nearly the fully curled position [Figure 302].

   Do not move the boom or arm.

4. Measure how high the bucket teeth are off the ground [Figure 302].

5. Compare the measurement to the Depth value on the display.

If the display isn't showing the correct Depth, contact your Bobcat dealer.

**Checking The Arm Sensor**

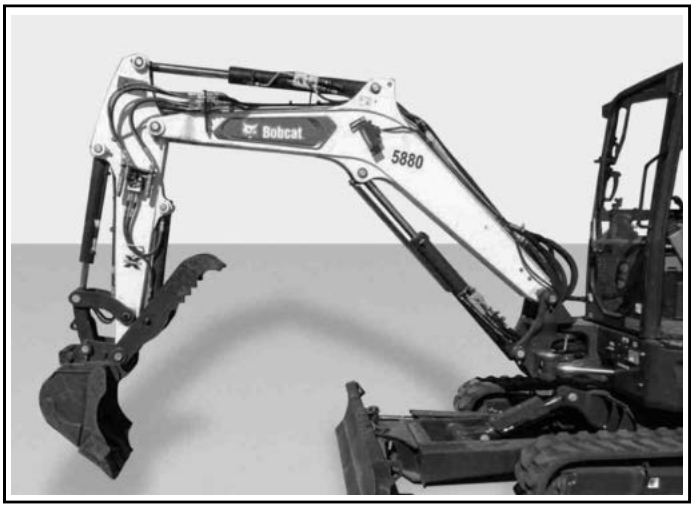
The following item is required for this task:

- Tape measure.

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

1. First verify that the bucket sensor is working correctly.
   (See Checking The Bucket Sensor on Page 140)

**Figure 303**




C209270

2. Place the bucket teeth on the ground with the teeth at the lowest point in the bucket movement arc [Figure 303].

3. Select **[REBENCH]**.

**Figure 304**


C209385a

4. Move only the arm out, extending it as much as possible [Figure 304].

   Do not move the boom.

5. Measure how high the bucket teeth are off the ground [Figure 304].

6. Compare this result to the Depth value on the display.

If the display isn't showing the correct Depth, contact your Bobcat dealer.

**Checking The Boom Sensor**

The following item is required for this task:

- Tape measure.

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

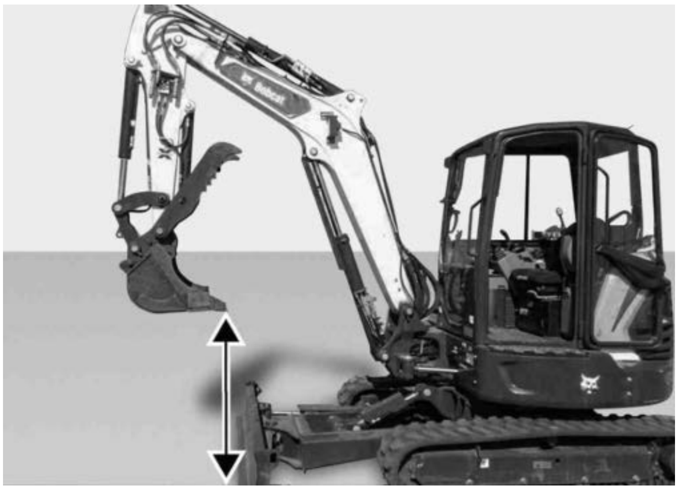
1. First verify that the bucket and arm sensors are working correctly.
   (See Checking The Bucket Sensor on Page 140)
   (See Checking The Arm Sensor on Page 141)

**Figure 305**


C209275

2. Set the bucket flat on the ground [Figure 305].
3. Select **[REBENCH]**.
4. Move the boom up.

**Figure 306**



5. Measure how high the bucket teeth are off the ground [Figure 306].
6. Compare the measurement with the Depth value on the display.

If the display isn't showing the correct Depth, contact your Bobcat dealer.

## TOWING THE MACHINE

### Towing The Machine

There is not a recommended towing procedure for the excavators.

- The excavator can be lifted onto the transport vehicle. (See Lifting The Machine on Page 143)
- The excavator can be skidded a short distance for service (for example, moving it onto a transport vehicle) without damaging the hydraulic system. (The tracks will not turn.)

  There might be slight wear to the tracks when the excavator is skidded.

**Figure 307**


P200086a

- Secure the towing chain to the loop located at the rear of the excavator (Item 1) [Figure 307].

  The towing chain (or cable) must be rated at 1.5 times the weight of the excavator.

## LIFTING THE MACHINE

### Lifting The Machine

**Figure 308**

P200405a

1. Fully extend the cylinders of the bucket, arm, and boom.
2. Raise the blade fully.
3. Turn the upperstructure so the boom and blade are at opposite ends of the excavator as shown in [Figure 308].
4. Put all the control levers in NEUTRAL and stop the machine.

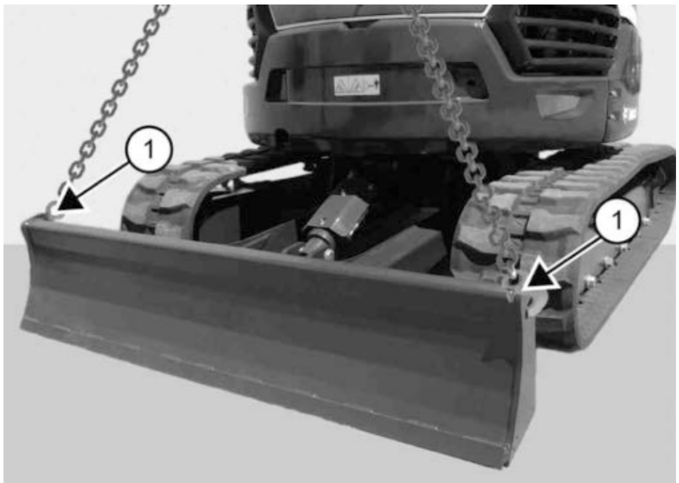
**⚠ WARNING**

**CRUSHING HAZARD**
**Falling machine can cause serious injury or death.**

- **Use chains and lifting equipment with sufficient capacity for the weight of the excavator plus any added attachments.**
- **Keep machine level and balanced when lifting.**
- **Do not swing boom or upperstructure.**
- **Never lift with operator on machine.**
- **Never lift with the blade angled (if equipped).**

W-2800

**Figure 309**

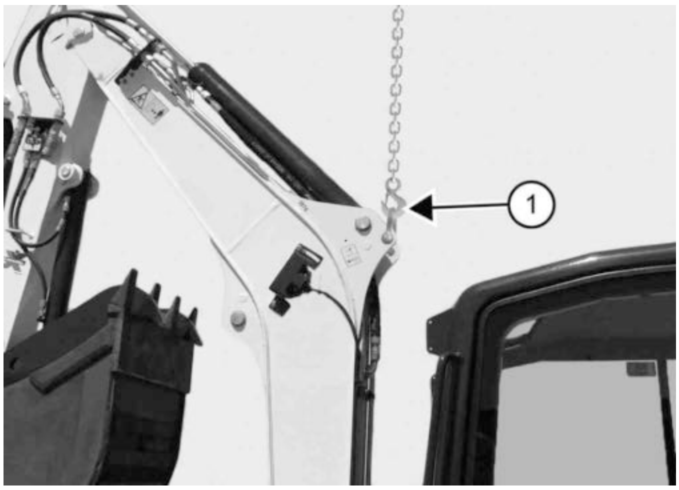



P200406a

5. Fasten chains to the ends of the blade (Item 1) [Figure 309] and up to a lifting fixture above the canopy / cab.

   The lifting fixture must extend over the sides of the canopy / cab to prevent the chains from hitting the canopy / cab.

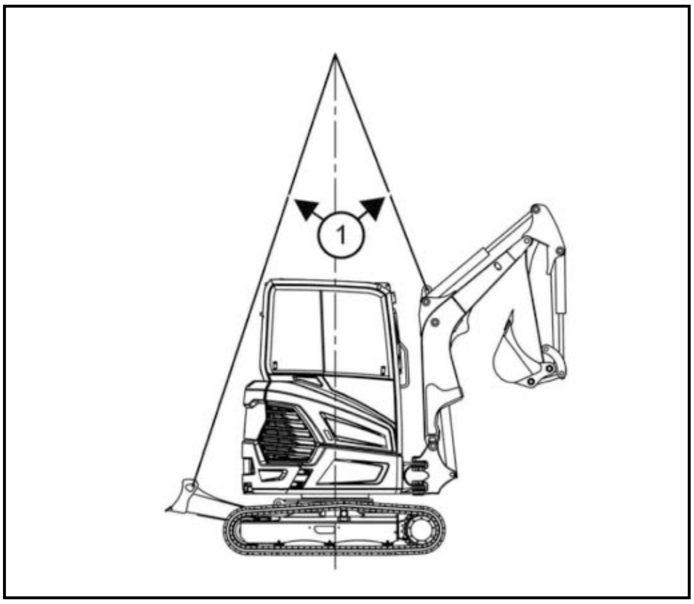
**Figure 310**




P200404a

6. Fasten a chain from the boom (Item 1) [Figure 310] to the lift fixture.

**Figure 311**




NA15059a

Keep the following in mind:

- The excavator should remain as close to horizontal as possible.
- To prevent damage, the chains should not contact any part of the canopy / cab.
- The chains should be at an angle of 45° (Item 1) [Figure 311].

## TRANSPORTING THE MACHINE

When transporting the machine, observe the rules, motor vehicle laws, and vehicle limit ordinances. Use a transport and towing vehicle of adequate length and capacity.

1. Secure the parking brakes and block the wheels of the transport vehicle.
2. Align the ramps with the centre of the transport vehicle.
3. Secure the ramps to the truck bed and be sure ramp angle does not exceed 15 degrees.

   Use metal loading ramps with a slip-resistant surface. Use ramps that are the correct length and width and that can support the weight of the machine.
4. Block and support the rear of the trailer during loading and unloading to prevent the front of the transport vehicle from raising.
5. Determine the direction of the track movement before moving the machine (blade forward).
6. Disengage the auto idle feature and move the two-speed travel to the low range position.

**⚠ WARNING**

**INSTABILITY HAZARD**
**Wood ramps can break and cause personal injury. Use adequately designed ramps of sufficient strength to support the weight of the machine loading onto a transport vehicle.** ◂

W-2058

**Figure 312**

C-97223d

7. Move the machine forward onto the transport vehicle [Figure 312].
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.

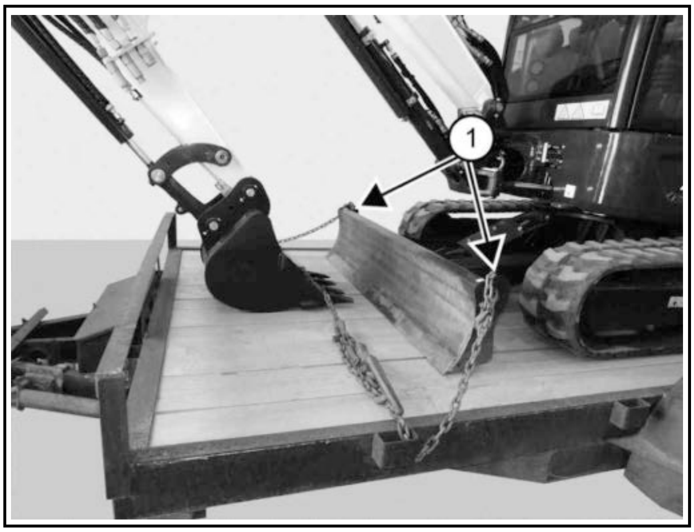
10. Stop the engine and remove the key (if equipped).

11. Put blocks at the front and rear of the tracks.

**Fastening The Machine To A Trailer**

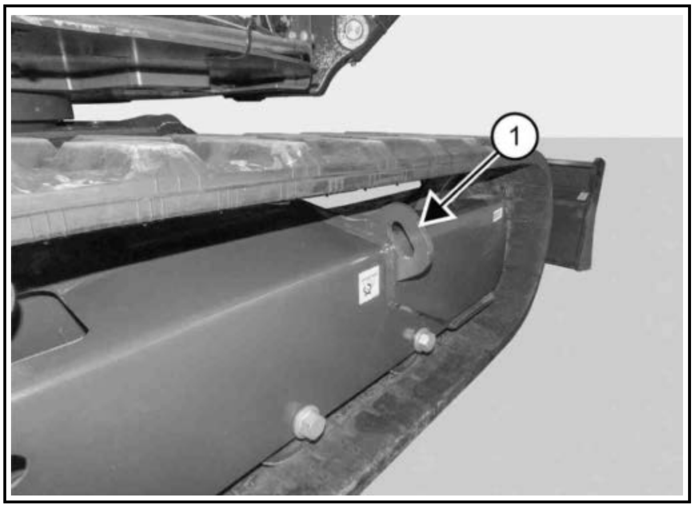
Tie down the excavator to prevent it from moving when going up or down slopes or during sudden stops. Use chain binders to tighten the chains and then safely tie the chain binder levers to prevent loosening.

**Figure 313**



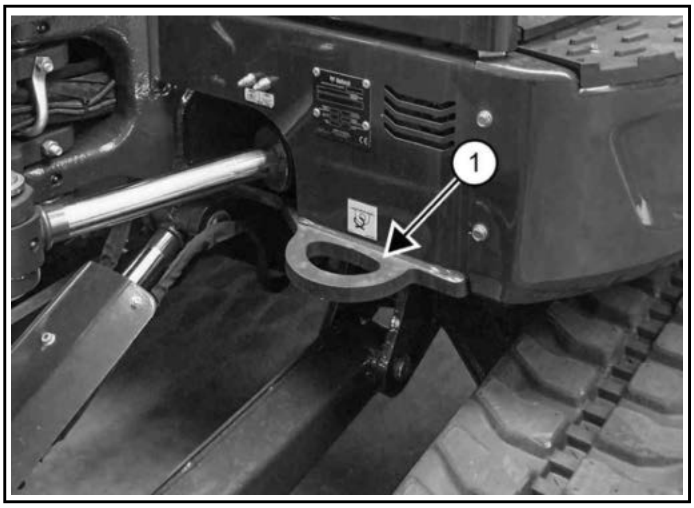

P134165a

**Figure 314**




C200606a

**Figure 315**




C206170a

1. At the front of the machine, fasten chains to the corners of the blade (Item 1) [Figure 313].

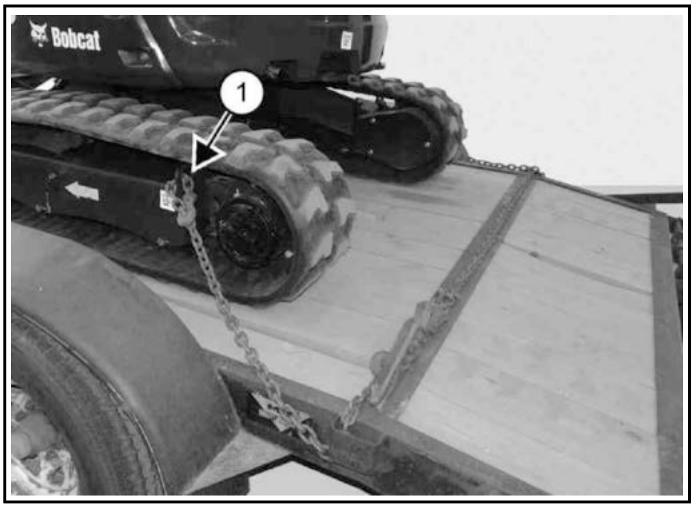
   OR

   Fasten chains to the tie-down loops on the outside of the tracks (Item 1) [Figure 314].

   OR

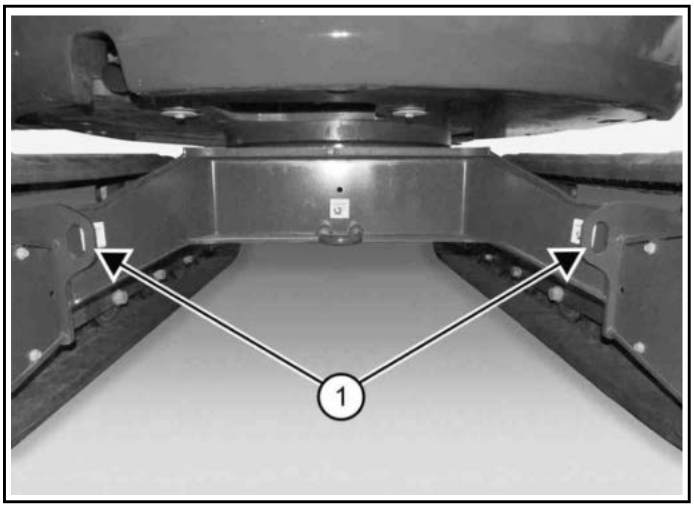
   Fasten chains to the tie-down loops on the front of the upperstructure (Item 1) [Figure 315].

**Figure 316**




P134166a

**Figure 317**



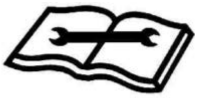

C200607a

2. At the rear of the machine, fasten chains to the tie-down loops on the exterior of the track (Item 1) [Figure 316]

   OR

   Fasten chains to the tie-down loops in the interior of the track (Item 1) [Figure 317].

# MAINTENANCE SAFETY WARNINGS



- Never service the Bobcat® machine without instructions. Read and understand the Operation & Maintenance Manual, Operator's Handbook, and signs (decals) on machine. Follow warnings and instructions in manuals when making repairs, adjustments, or servicing. Check for correct function after adjustments, repairs, or service.

- Untrained operators and failure to follow instructions can cause injury or death.

**Maintenance procedures that are given in the Operation & Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedures that are not in the Operation & Maintenance Manual must be performed ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL. Always use genuine Bobcat replacement parts. The Service Safety Training Course is available from your Bobcat dealer.**

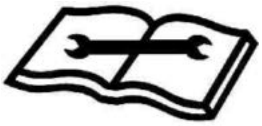
**This check mark means: "Follow instructions for proper operations." Carefully read the message that follows.**

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

# MAINTENANCE SAFETY WARNINGS

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

- **Use the correct procedure to lift and support the machine.**

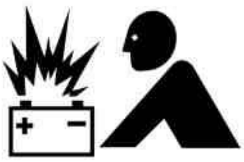


- **Cleaning and maintenance are required daily.**

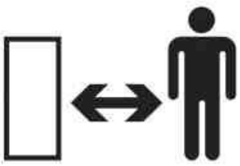
- **Vent exhaust to outside when engine must be run for service.**
- **Exhaust system must be tightly sealed. Exhaust fumes can kill without warning.**

- **Stop, cool, and clean engine of flammable materials before checking fluids.**
- **Never service or adjust machine with the engine running unless instructed to do so in the manual.**
- **Avoid contact with leaking hydraulic fluid or diesel fuel under pressure. It can penetrate the skin or eyes.**
- **Never fill fuel tank with engine running, while smoking, or when near open flame.**

- **Keep body, jewelry, and clothing away from moving parts, electrical contact, hot parts, and exhaust.**
- **Wear eye protection to guard from battery acid, compressed springs, fluids under pressure, and flying debris when engines are running or tools are used. Use eye protections approved for type of welding.**
- **Keep tailgate closed except for service. Close and latch tailgate before operating machine.**



- **Lead-acid batteries produce flammable and explosive gases.**
- **Keep arcs, sparks, flames, and lighted tobacco away from batteries.**
- **Batteries contain acid that burns eyes or skin on contact.**
- **Wear protective clothing. If acid contacts body, flush well with water. For eye contact, flush well and get immediate medical attention.**



- **Always lower the bucket and blade to the ground before doing any maintenance.**
- **Never modify equipment or add attachments not approved by Bobcat Company.**

## SERVICE SCHEDULE

### Maintenance Intervals

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures.

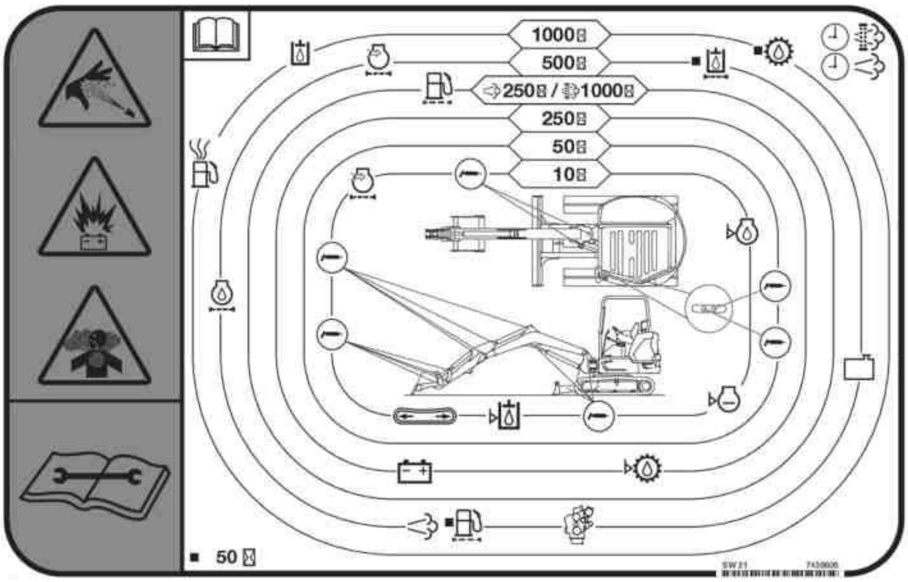
The service schedule decal is a guide for correct maintenance of the Bobcat excavator.

The maintenance items listed under the maintenance intervals on the following pages are the required tasks to be performed. Those items provide additional details and include maintenance that is not shown on the decal.

All maintenance intervals are for machines operating in general environmental conditions. Keep in mind that filter and oil life can be reduced:

- When machines are operating in high dust environments or extreme temperature applications,
- When fuel is taken from uncontrolled storage tanks,
- When other non-standard conditions exist.

For more details, contact your Bobcat dealer.




7438606

**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.
- **1500:** Every 1500 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 | 1500 |
| Engine Air Filters and Air System | (See Page 161)<br>• Outer Air Filter (6666375)<br>• Inner Air Filter (6666376) | D O | | | O | | |
| Engine Oil | (See Page 168)<br>• Engine Oil (Packaging: A = 5 L can, B = 25 L container, C = 209 L drum, D = 1000 L tank):<br>▹ SAE 15W-40 (-20°C – +40°C) (7395725)<br>▹ SAE 10W-30 (-25°C – +30°C) (7341377)<br>• Engine Oil Filter (7343102) | V | | | R | | |
| Hydraulic Fluid | (See Page 177)<br>• Hydraulic Fluid (Packaging: A = 5 L can, B = 20 L container, C = 210 L drum, D = 1000 L tank):<br>▹ Bobcat Superior SH Hydraulic (-35°C – +50°C) (6987791)<br>▹ Bobcat Biodegradable Hydraulic (-35°C – +50°C) (6987792) | V | | | | R | |
| Engine Coolant | Coolant level (check cold) (See Page 169)<br>• Coolant (Packaging: A = 5 L can, B = 20 L container, C = 210 L drum, D = 1000 L tank):<br>▹ Bobcat PG Coolant Premix (6987793) | V | | | | | R |
| Tracks | Tension (See Page 182) | O | | | | | |
| Operator Cab and HVAC | Filters (See Page 160)<br>• HVAC Air Filter (If Equipped):<br>▹ Fresh Air (7176099)<br>▹ Recirculation (7222791) | C | | | | | |
| Safety Signs (decals) | | C O | | | | | |
| Seat Belt | Seat belt, mounting hardware, and seat belt retractors (See Page 154) | C O | | | | | |

**Service Schedule**

| | | | |
|---|---|---|---|
| O | Check condition / proper operation. Adjust or replace as needed | V | Refill as needed. |
| D | Check the display. Service only when required. | C | Clean. |
| W | Service every 10 hours when operating in water. | R | Replace. |
| F | First time only. | G | Grease. |

| Item | Service Required | Service Interval (hours) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 10 | 50 | 250 | 500 | 1000 | 1500 |
| Control Console Lockout | (See Page 153) | O | | | | | |
| X-Change / Attachment Coupler | (See Quick Coupler on Page 188) | O | | | | | |
| Motion Alarm and Horn | (See Page 155) | O | | | | | |
| Operator Canopy / Cab | Canopy / cab, mounting hardware | O | | | | | |
| Indicators and Lights | | O | | | | | |
| Pivot Points | Pivot points, clamp (if equipped)<br>(See Machine Lubrication on Page 190)<br>• Grease (Packaging: 400 g tube):<br>▹ Bobcat Multipurpose Grease (Drop Point from 260°C) (6987888)<br>▹ Bobcat Supreme HD Grease (Drop Point from 280°C) (6987889)<br>▹ Bobcat Extreme HP Grease (Drop Point from 260°C) (6987890) | G | | | | | |
| Swing Bearing | Swing bearing, swing pinion<br>(See Machine Lubrication on Page 190)<br>• Grease (Packaging: 400 g tube):<br>▹ Bobcat Multipurpose Grease (Drop Point from 260°C) (6987888)<br>▹ Bobcat Supreme HD Grease (Drop Point from 280°C) (6987889)<br>▹ Bobcat Extreme HP Grease (Drop Point from 260°C) (6987890) | W | G | | | | |
| Travel Motors (Final Drive) | Fluid (See Page 185)<br>• Transmission Fluid (Packaging: A = 5 L, B = 20 L, C = 210 L)<br>▹ 80W-90 API GL-5 LS (6987805) | | F R | V | | R | |
| Hydraulic Filters | Hydraulic filter and case drain filter<br>(See Page 177)<br>• Primary Hydraulic Filter (6670207)<br>• Case Drain Filter (6516722) | | F R | | R | | |
| Alternator and Starter | Electrical connections | | F O | | O | | |

**Service Schedule**

| | | | |
|---|---|---|---|
| O | Check condition / proper operation. Adjust or replace as needed | V | Refill as needed. |
| D | Check the display. Service only when required. | C | Clean. |
| W | Service every 10 hours when operating in water. | R | Replace. |
| F | First time only. | G | Grease. |

| Item | Service Required | Service Interval (hours) | | | | | |
|---|---|---|---|---|---|---|---|
| | | 10 | 50 | 250 | 500 | 1000 | 1500 |
| Battery | Cables and electrical connections (See Page 174)<br>• Battery (7306047) | | | O | | | |
| Engine Oil Filter | (See Page 168)<br>• Engine Oil (Packaging: A = 5 L can, B = 25 L container, C = 209 L drum, D = 1000 L tank):<br>▹ SAE 15W-40 (-20°C – +40°C) (7395725)<br>▹ SAE 10W-30 (-25°C – +30°C) (7341377)<br>• Engine Oil Filter (7343102) | | | | R | | |
| Hydraulic Reservoir | Breather cap (See Page 177)<br>• Hydraulic Breather Cap (6692836) | | | | R | | |
| Engine Cooling System | Radiator, fuel cooler, hydraulic fluid cooler, air conditioning condenser (if equipped) (See Page 169)<br>• Radiator Cap (7337382) | | | | C | | |
| Alternator | Belt (See Page 186) | | | | O | | |
| Air Conditioning (if equipped) | Belt (See Page 186) | | | | O | | |
| HVAC | Housing and coils (See Page 160) | | | | C | | |
| Fuel Filter and Pre-Filter | Fuel Filter (See Page 165)<br>• Fuel Filter (7336334)<br>Fuel Pre-Filter (See Page 166)<br>• Fuel Pre-Filter (7348032) | | | | | R | |
| Fuel Tank | Vent filter (See Page 167)<br>• Fuel Tank Vent Filter (7340277) | | | | | R | |

### Inspection Checkbook

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures.

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

The Inspection Checkbook contains the following information:

- Doosan Bobcat EMEA s.r.o. Warranty Policy
- Doosan Bobcat EMEA s.r.o. Extended Warranty Policy

The inspection checkbook has to be filled in by the dealer for any maintenance and service work of your Bobcat machine. This book may be required anytime by an authorised dealer or by Bobcat Europe, should be a breakdown occur on the Bobcat equipment.

Your Bobcat dealer can order the Inspection Checkbook. The part number is 7296478.

## CONTROL CONSOLE LOCKOUTS

### Inspecting And Maintaining The Control Console Lockouts

**Figure 318**

P200109a

When the left console is raised [Figure 318], the hydraulic joysticks and traction system must not function.

1. Sit in the operator’s seat, fasten the seat belt, and start the engine.
2. Raise the left console [Figure 318].
3. Move the joysticks.

   There should be no movement of the boom, arm, slew, or bucket.
4. Move the steering control levers.

   There should be no movement of the excavator tracks.

If these controls do not deactivate when the left console is raised, see your Bobcat dealer for service.

## SEAT BELT

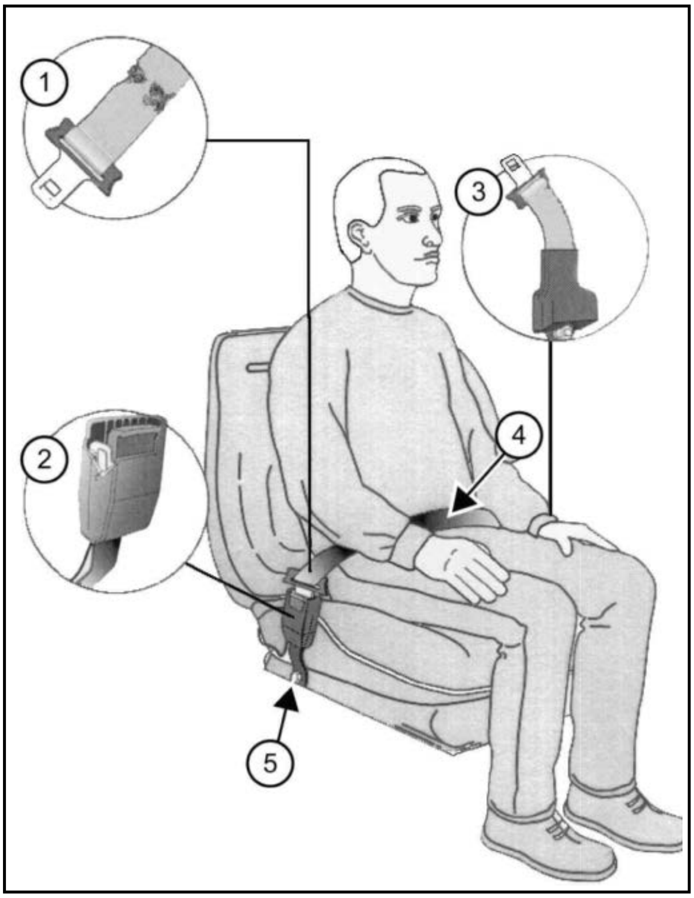
### Inspecting And Maintaining The Seat Belt

**⚠ WARNING**

**GENERAL HAZARD**
**Failure to properly inspect and maintain the seat belt can cause lack of operator restraint resulting in serious injury or death.◂**

W-2466

**Figure 319**




NA3113c

Check the seat belt daily for correct function. Inspect the seat belt system thoroughly at least once each year or more often if the machine is exposed to severe environmental conditions or applications.

The items below are referenced in [Figure 319].

1. Check the webbing. If the system is equipped with a retractor, pull the webbing completely out and inspect the full length of the webbing. Look for cuts, wear, fraying, dirt, and stiffness.

2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn or deformed, buckle is not damaged, and casing is not broken.

3. Check the retractor web storage device (if equipped) by extending webbing to determine if it looks correct and that it spools out and retracts webbing correctly.

4. Check webbing in areas exposed to ultraviolet (UV) rays from the sun or extreme dust or dirt. If the original colour of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength may have deteriorated.

5. Check the hardware on both sides of the seat. Hardware should be tight. Hardware must not be missing, rusted, corroded, or damaged.

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discolourations due to ultraviolet UV exposure, dusty / dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor (if equipped), hardware or any other obvious problem should be replaced immediately.

See your Bobcat dealer for seat belt system replacement parts for your machine.

## TRAVEL MOTION ALARM

### Travel Motion Alarm Description

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

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

If the alarm does not sound, see inspection instructions. (See Inspecting The Travel Motion Alarm System on Page 155)

**⚠ WARNING**

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

- **This machine is equipped with a motion alarm. ALARM MUST SOUND! when operating forward or backward.**
- **The operator is responsible for the safe operation of this machine.◂**

W-2786

### Inspecting The Travel Motion Alarm System

You will need to move the machine slightly in the forward and reverse directions to test the travel motion alarm. Keep all bystanders away from machine during test.

**⚠ WARNING**

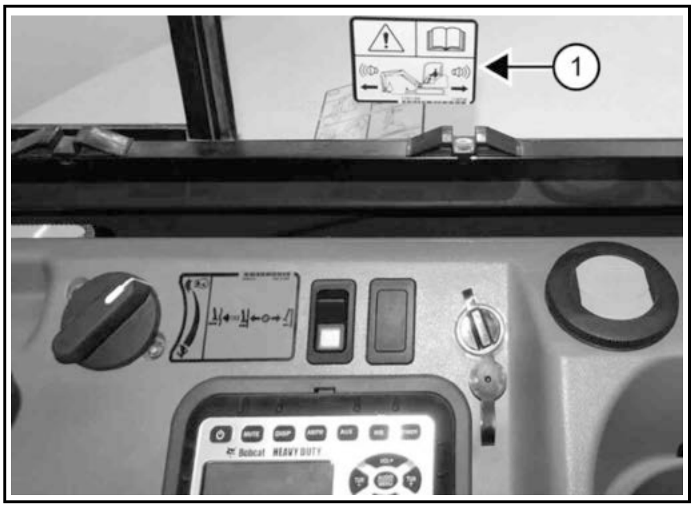
**CRUSHING HAZARD**
**Failure to maintain a clear view in the direction of travel can cause serious injury or death.**

- **This machine is equipped with a motion alarm. ALARM MUST SOUND! when operating forward or backward.**
- **The operator is responsible for the safe operation of this machine.◂**

W-2786

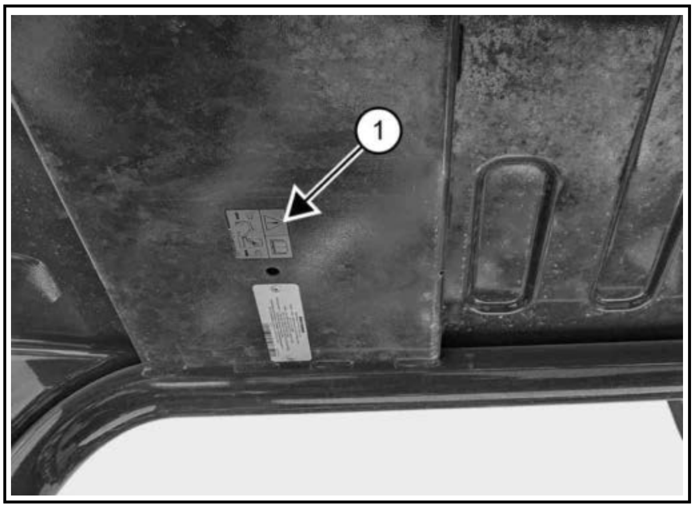
1. Sit in the operator's seat and fasten the seat belt. (See Pre-Starting Procedure on Page 75)

**Figure 320**




P200105a

**Figure 321**




C206637a

2. Inspect for damaged or missing travel motion alarm decal (Item 1) [Figure 320] (cab machine) or [Figure 321] (canopy machine).

   Replace if required.

3. Start the engine. (See Starting The Engine on Page 77)

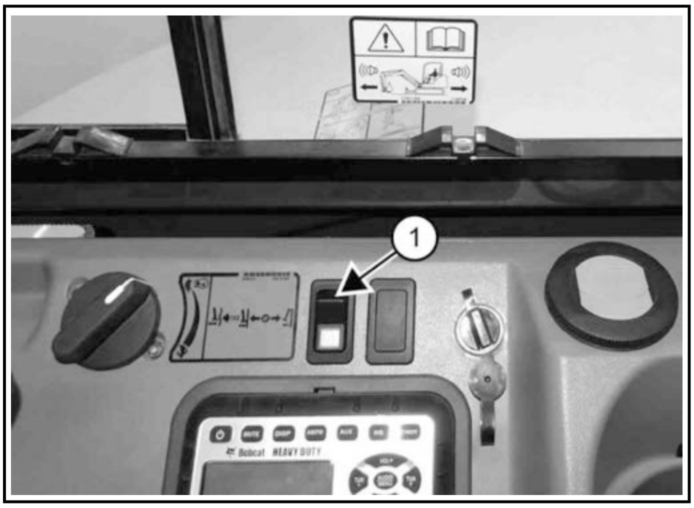
4. Move the travel control levers (one lever at a time) in the forward direction.

   The motion alarm must sound.

5. Move the travel control levers (one lever at a time) in the reverse direction.

   The travel motion alarm must sound.

**Figure 322**




P200105b

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 322].

   The travel motion alarm will shut off.

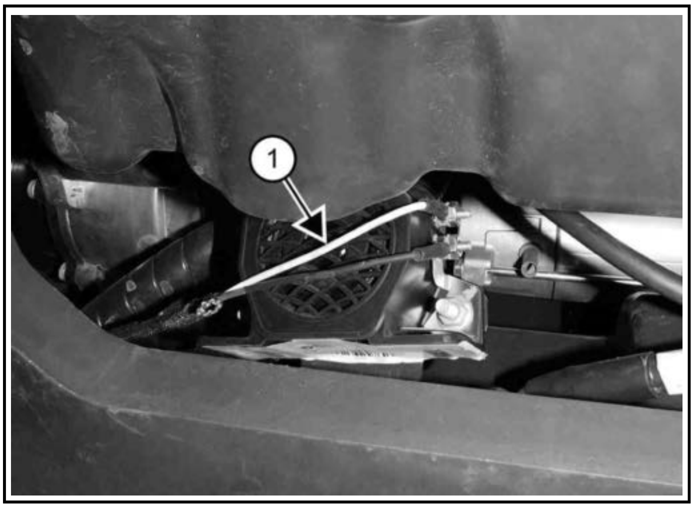
7. Slightly move both travel control levers in the reverse direction (until the machine is slowly moving backward) and then press the travel motion alarm cancel switch (Item 1) [Figure 322].

   The travel motion alarm will shut off.

8. Return both levers to neutral and turn excavator key to off position.

9. Exit the excavator.
   (See Stopping The Engine And Leaving The Machine on Page 85)

**Figure 323**



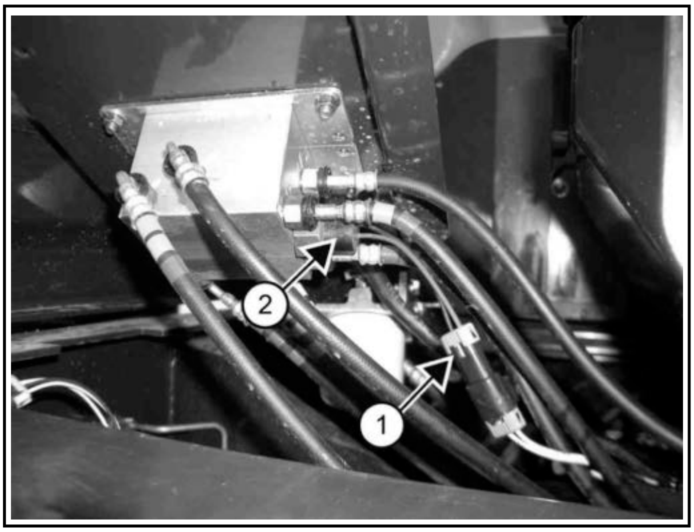

P200131a

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 323].

11. Inspect the travel motion alarm electrical connections and wire harness (Item 1) [Figure 323] for tightness and damage.

    a. Repair or replace any damaged components.

**Figure 324**




P92962a

12. Locate the travel motion alarm switch, which is in the travel control valve under the floorplate [Figure 324].

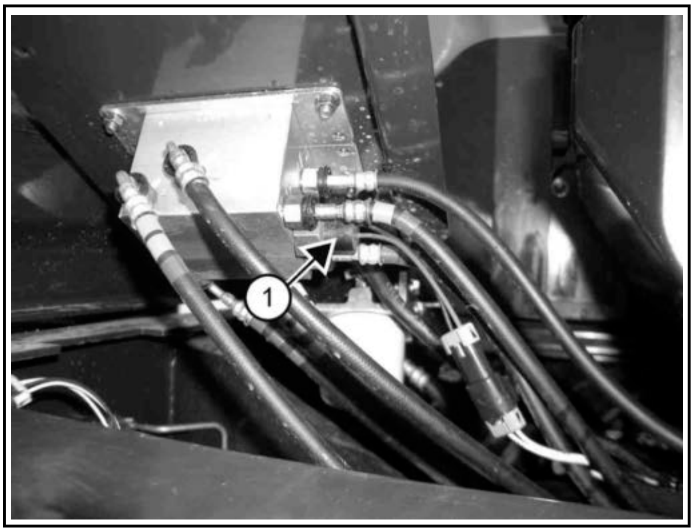
    a. Remove the floor mat and the floorplate to access the switch.

13. Inspect the wire harness (Item 1) and travel motion alarm switch (Item 2) for tightness and damage [Figure 324].

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

**Maintaining The Travel Motion Alarm Switch**

**Figure 325**




P92962b

The travel motion alarm switch (Item 1) [Figure 325] is located in the travel control valve located under the floorplate. In the event the travel motion alarm is not sounding, inspect the switch.

1. Remove the floor mat and the floorplate to access the switch.

2. Check that the switch is fully installed into the travel control valve housings and tightened.

   Tighten the switch to 18 – 20 N•m (13 – 15 ft-lb).

3. Recheck the travel motion alarm. (See Inspecting The Travel Motion Alarm System on Page 155)

   If the travel motion alarm still does not sound, replace the switch.

## TAILGATE

### Opening And Closing The Tailgate

**WARNING**

**GENERAL HAZARD**
**Failure to follow instructions can cause serious injury or death.**
**Never service or adjust the machine when the engine is running unless instructed to do so in the manual.**

W-2012

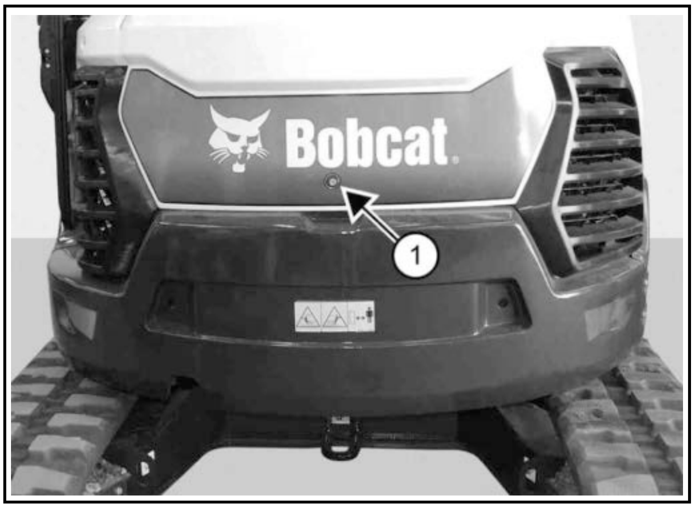
**WARNING**

**IMPACT HAZARD**
**Swinging rear door can seriously injure a bystander.**
**Keep the rear door closed when operating the machine.**

W-2020

The tailgate can be locked and unlocked using the start key.

**Figure 326**




P200085a

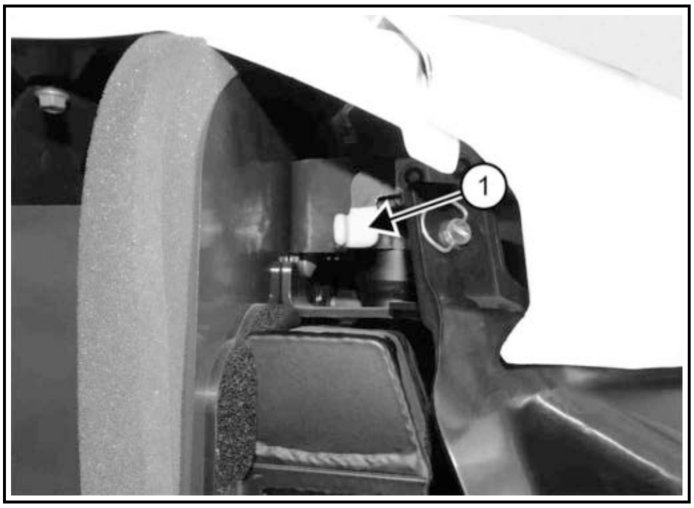
- Push the button (Item 1) [Figure 326] and pull the tailgate open.

- Push firmly to close the tailgate.

## RIGHT SIDE COVER

### Opening And Closing The Right Side Cover

**Figure 327**




P200111a

1. Open the tailgate to access the right side cover latch (Item 1) [Figure 327].

**Figure 328**

P141335

2. Pull the latch (Item 1) [Figure 327] toward the cover and allow the cover to rise slowly [Figure 328].

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.

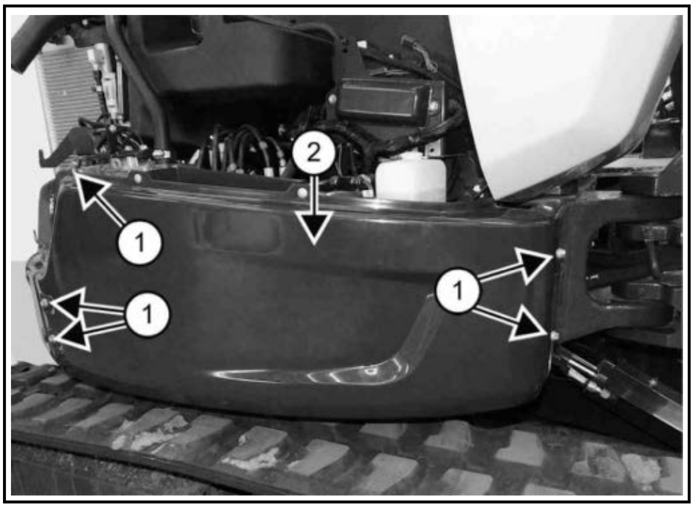
## RIGHT SIDE PANEL

### Removing And Installing The Right Side Panel

1. Open the tailgate. (See Tailgate on Page 157)

2. Open the right side cover. (See Right Side Cover on Page 158)

**Figure 329**




C200143a

3. Loosen the five bolts (Item 1) on the right side panel (Item 2) and remove the panel [Figure 329].

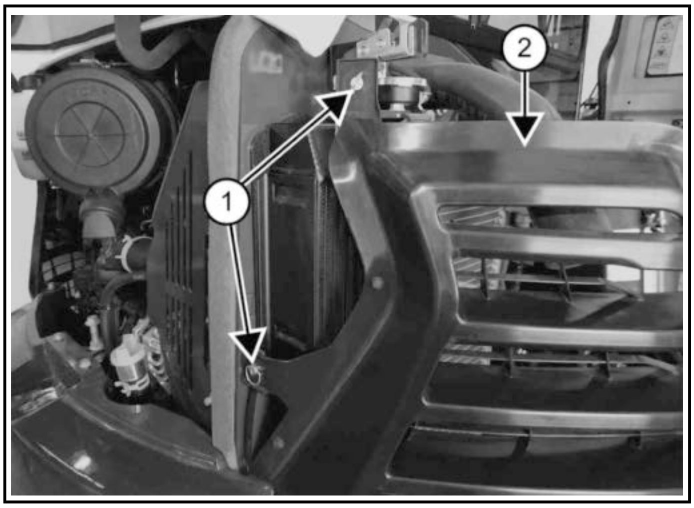
4. To reinstall the panel, fit the panel back onto the bolts (Item 1) [Figure 329] and tighten the bolts.

## RIGHT SIDE GRILLE

### Removing And Installing The Right Side Grille

1. Open the tailgate. (See Tailgate on Page 157)
2. Open the right side cover.
   (See Right Side Cover on Page 158)

**Figure 330**



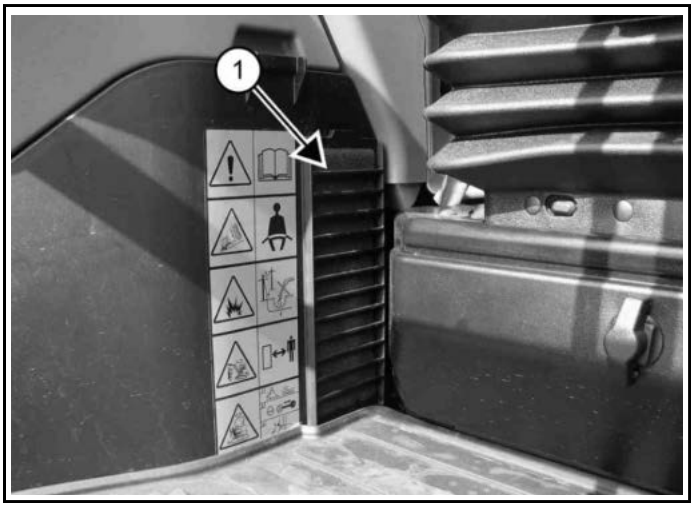
P200101a

3. Turn the two fasteners (Item 1) [Figure 330] a quarter turn.
4. Remove the right side grille (Item 2) [Figure 330].
5. To install the grille, position it in place and turn the two fasteners (Item 1) [Figure 330] a quarter turn.

## CAB FILTERS

### Cleaning And Maintaining The Recirculation Filter

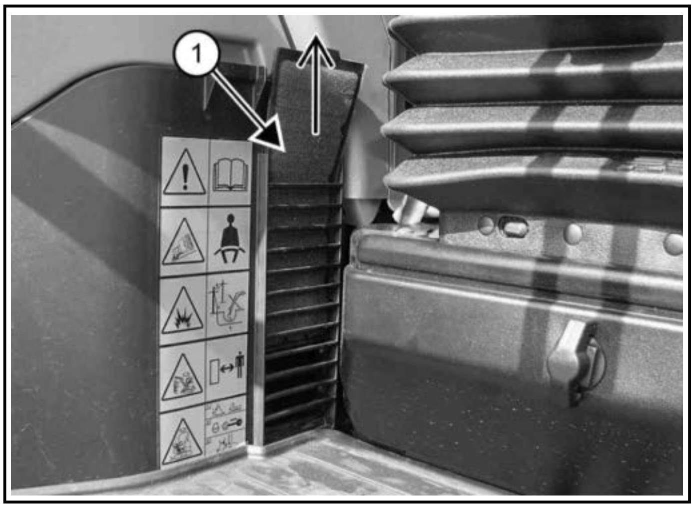
**Figure 331**



C206255a

The recirculation filter is located to the right of the operator seat (Item 1) [Figure 331]. It must be cleaned regularly.

**Figure 332**



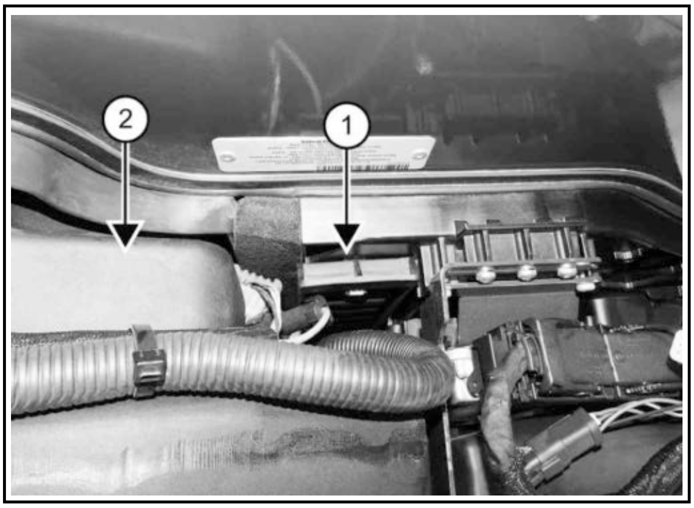
C206256a

1. Pull up on the filter (Item 1) [Figure 332] 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

**Figure 333**




P200114a

The fresh air filter (Item 1) is located behind the hydraulic tank (Item 2) [Figure 333] (view from the top). It must be cleaned regularly.

1. Open the right side cover.
   (See Right Side Cover on Page 158)

2. Pull out on the tab (Item 1) [Figure 333] and remove the cover.

3. Pull the filter 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 149)

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

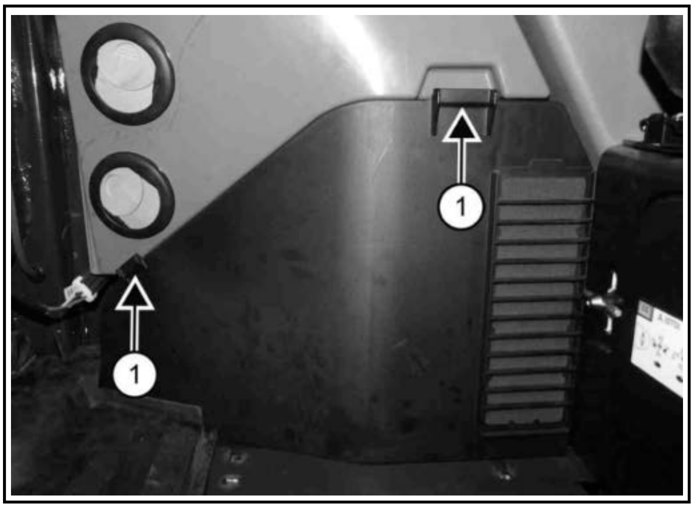
1. Rotate the upperstructure 90° to the right to allow water to drain from the housing during the cleaning process.

2. Use the blade to raise the front of the excavator so that water can run out of the housing.

3. Use jackstands to support the front of the undercarriage.

4. Remove the floor mat.

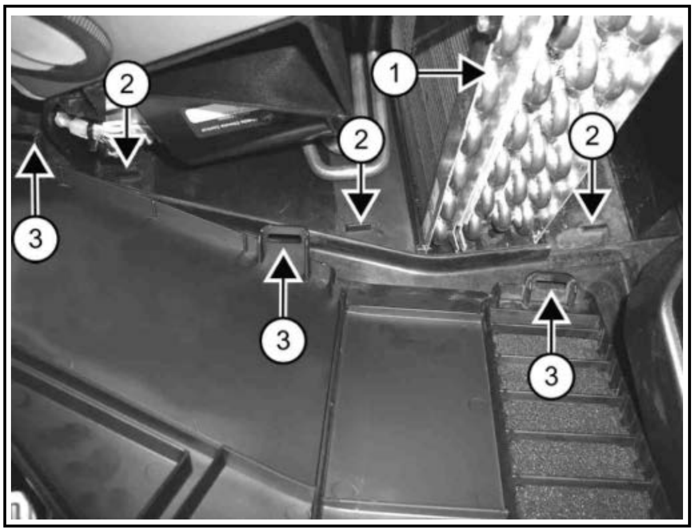
**Figure 334**




P200301a

5. Pull back on the two latches (Item 1) [Figure 334] and remove the HVAC side cover.

**Figure 335**




P113083d

6. Use a lower pressure air or low pressure water stream to remove debris and clean the coils (Item 1) [Figure 335].
7. After the housing has been cleaned and flushed, remove the jackstands and raise the blade so the front of the excavator is flat on the ground.
8. Stop the engine.
9. Access two of the rubber drain valves by opening the right side cover. The drain valves are located below the HVAC housing on the right side.
10. Clean the rubber drain valves by pinching the drain valves on the flat sides to open the valves and allow dirt and moisture to exit from the end of the valves.
11. Remove the center floorplate to access the third rubber drain valve that is located below the left rear corner of the HVAC housing.
12. Clean the rubber drain valve by pinching the drain valve on the flat side to open the valve and allow dirt and moisture to exit from the end of the valve.

    The rubber drain valves allow condensation to drain from the housing during normal usage. These drain valves can get clogged with dirt and should be cleaned at the same time the housing is cleaned.
13. Reinstall the center floorplate and close the right cover.
14. Fit the three retainers (Item 3) of the HVAC side cover into the three tabs on the bottom of the HVAC housing (Item 2) [Figure 335].
15. Press on the front of the cover to secure the front latch (Item 1) [Figure 334].
16. Press on the top edge of the side cover and work back to the rear of the cover and secure the rear latch.
17. Reinstall the floor mat.

## ENGINE AIR CLEANER

### Replacing The Outer Filter Of The Air Cleaner

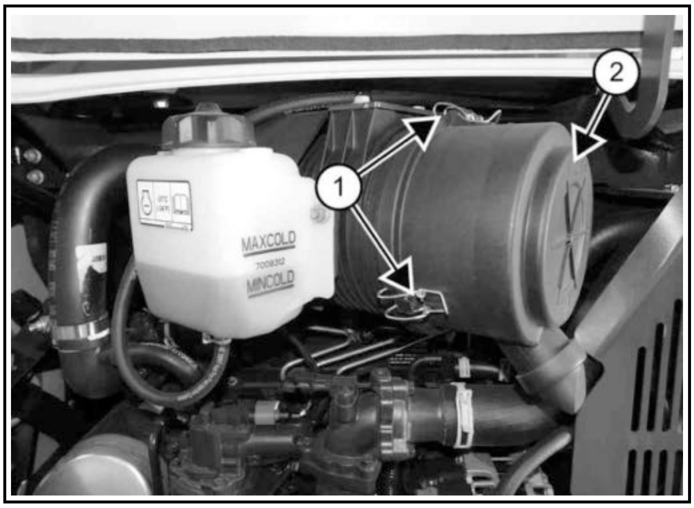
The engine air cleaner is located in the engine compartment.

See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

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 157)

**Figure 336**




P200115a

2. Release the three fasteners (Item 1) [Figure 336].
3. Remove and clean the dust cup (Item 2) [Figure 336].

**Figure 337**


P200116a

4. Pull the outer filter (Item 1) [Figure 337] from the air cleaner housing.

5. Check the housing for damage.

6. Clean the housing and the seal surface. Do not use compressed air.

7. Install a new filter.

8. Install the dust cup (Item 2) and engage the three fasteners (Item 1) [Figure 336].

9. Check the air intake hose and the air cleaner housing for damage. Make sure all connections are tight.

10. Close the tailgate.

**Replacing The Inner Filter Of The Air Cleaner**

Replace the inner filter only under the following conditions:

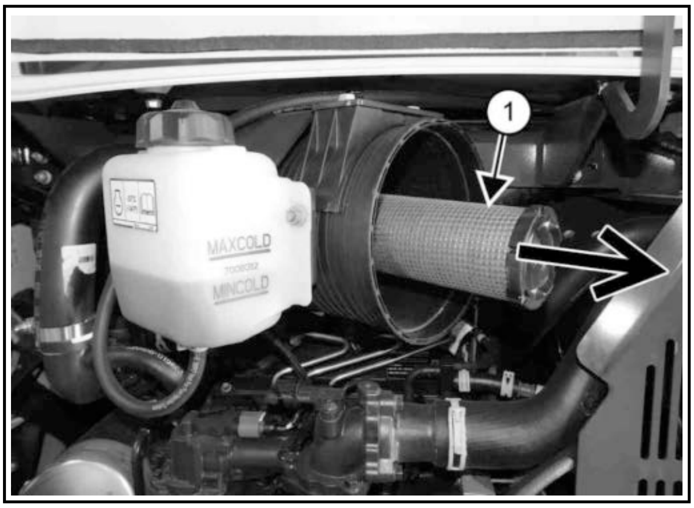
- Replace the inner filter every second time the outer filter is replaced.

- 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 157)

2. Remove the dust cup and the outer filter. (See Replacing The Outer Filter Of The Air Cleaner on Page 161)

**Figure 338**




P200117a

3. Remove the inner filter (Item 1) [Figure 338].

4. Check the housing for damage.

5. Clean the housing and the seal surfaces. Do not use compressed air.

6. Install a new inner filter.

7. Install the outer filter and dust cup.

8. Close the tailgate.

## FUEL SYSTEM

### Fuel Specifications

**NOTE:** Contact your local fuel supplier to receive recommendations for your region.

*U.S. Standard (ASTM D975)*

Use only clean, high quality diesel fuel, grade number 2-D or grade number 1-D.

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

The following is one suggested blending guideline that should prevent fuel gelling during cold temperatures:

| TEMPERATURE | GRADE 1–D | GRADE 2–D |
|---|---|---|
| Above -9°C (+15°F) | 0% | 100% |
| Down to -21°C (-5°F) | 50% | 50% |
| Below -21°C (-5°F) | 100% | 0% |

**NOTE:** Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than five percent biodiesel mixed with ultra-low sulfur petroleum based diesel. This biodiesel blend fuel is commonly marketed as B5 blended diesel fuel. B5 blended diesel fuel must meet ASTM specifications.

*E.U. Standard (EN590)*

Use only clean, high quality diesel fuel that meets the EN590 specifications listed below:

- Sulfur-free diesel fuel defined as 10 mg/kg (10 ppm) sulfur maximum.
- Diesel fuel with cetane number of 51.0 and above.

**NOTE:** Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than seven percent biodiesel mixed with sulfur-free petroleum based diesel. This biodiesel blend fuel is commonly marketed as B7 blended diesel fuel. B7 blended diesel fuel must meet EN590 specifications.

### Biodiesel Blend Fuel

Biodiesel blend fuel has unique qualities that should be considered before using in this machine:

- Cold weather conditions can lead to plugged fuel system components and hard starting.
- Biodiesel blend fuel is an excellent medium for microbial growth and contamination, which can cause corrosion and plugging of fuel system components.
- Use of biodiesel blend fuel may result in premature failure of fuel system components, such as plugged fuel filters and deteriorated fuel lines.
- Shorter maintenance intervals may be required, such as cleaning the fuel system and replacing fuel filters and fuel lines.
- Using biodiesel blended fuels containing more than the recommended amount of biodiesel can affect engine life and cause deterioration of hoses, tubelines, injectors, injector pump, and seals. (See Fuel Specifications on Page 163)

Apply the following guidelines if biodiesel blend fuel is used:

- Ensure the fuel tank is as full as possible at all times to prevent moisture from collecting in the fuel tank.
- Ensure that the fuel tank cap is securely tightened.
- Biodiesel blend fuel can damage painted surfaces. Remove all spilled fuel from painted surfaces immediately.
- Drain all water from the fuel filter daily before operating the machine.
- Do not exceed engine oil change interval. Extending oil change intervals can cause engine damage.
- Before vehicle storage, drain the fuel tank, refill with 100% petroleum diesel fuel, add fuel stabiliser, and run the engine for at least 30 minutes.

**NOTE:** Biodiesel blend fuel does not have long-term stability and should not be stored for more than three months.

### Filling The Fuel Tank

**⚠ WARNING**

**FIRE AND EXPLOSION HAZARDS**
**Failure to follow instructions can cause serious injury or death.**
**Stop and cool the engine before adding fuel. NO SMOKING!◂**

W-2063

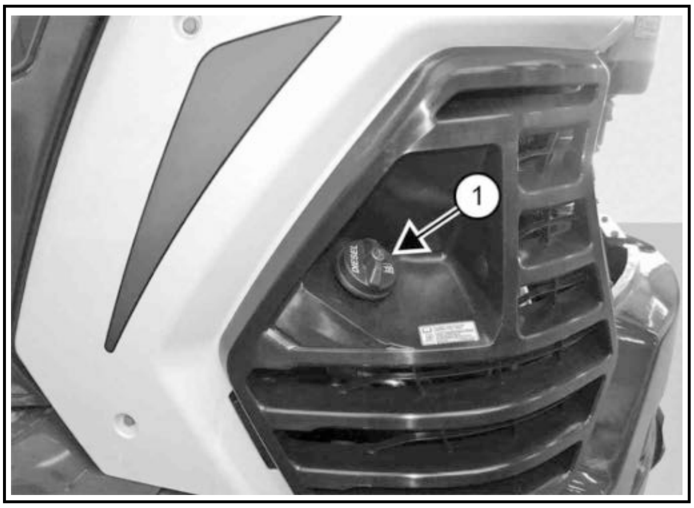
**⚠ WARNING**

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

W-2103

1. Use the start key to unlock the fuel cap.

**Figure 339**




P200118a

2. Remove the fuel fill cap (Item 1) [Figure 339].
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 149)

**Using The Fuel Fill Pump**

**⚠ WARNING**

**FIRE AND EXPLOSION HAZARDS**
**Failure to follow instructions can cause serious injury or death.**
**Stop and cool the engine before adding fuel. NO SMOKING!**

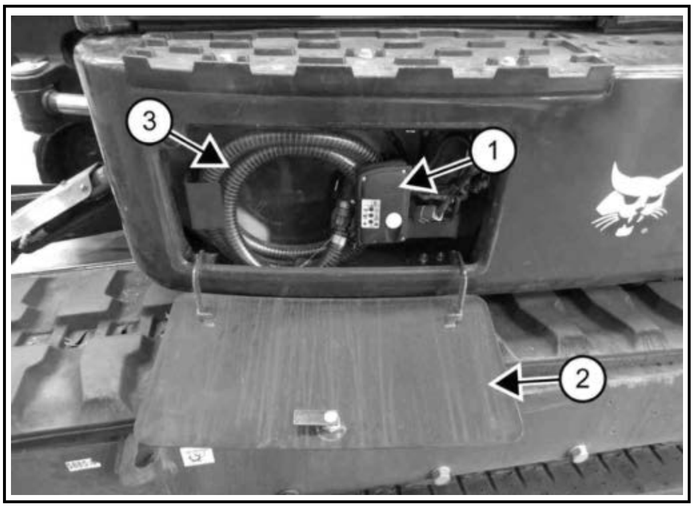
W-2063

**⚠ WARNING**

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

W-2103

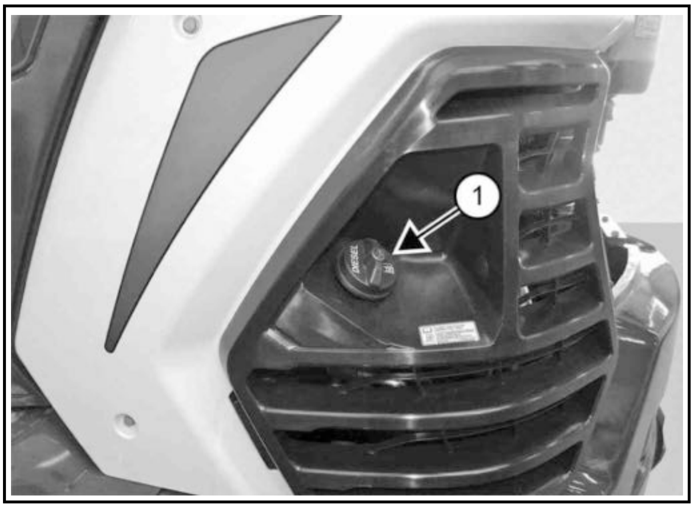
**Figure 340**




C206812a

Your machine may be equipped with a battery-operated fuel fill pump (Item 1) [Figure 340] located in the upperstructure under the operator door.

**Figure 341**



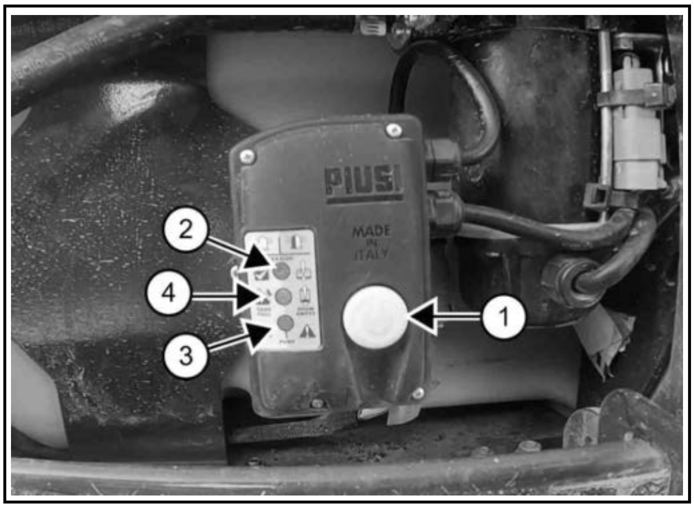

P200118a

1. Loosen the fuel fill cap (Item 1) [Figure 341] using the start key.
2. Open the left upperstructure access cover (Item 2) [Figure 340] that is located under the operator door.
3. Pull out the suction hose (Item 3) [Figure 340].
4. Ensure the suction hose (Item 3) [Figure 340] is clean.

   If necessary, wipe the suction hose with a clean, dry cloth to remove any contaminants.
5. Put the end of the hose into an external fuel resupply container.

- Add fuel only in an area that has a free movement of air and no flames or sparks.
- Do not smoke.

**Figure 342**




C208155a

6. Briefly push the button (Item 1) [Figure 342] on the fuel pump to wake the system from stand-by mode.

   The green light (Item 2) [Figure 342] will turn on.

7. Push the button (Item 1) [Figure 342] on the fuel pump to start fuel transfer.

   The red light (Item 3) [Figure 342] will turn on.

8. The yellow light (Item 4) [Figure 342] will turn on when the fuel tank is full and fuel transfer will stop automatically.

   OR

   Push the button (Item 1) [Figure 342] for several seconds to stop fuel transfer at any time.

9. When fuel transfer is done, place the suction hose back into its holder (Item 3) [Figure 340].

10. Close the left upperstructure access cover (Item 2) [Figure 340].

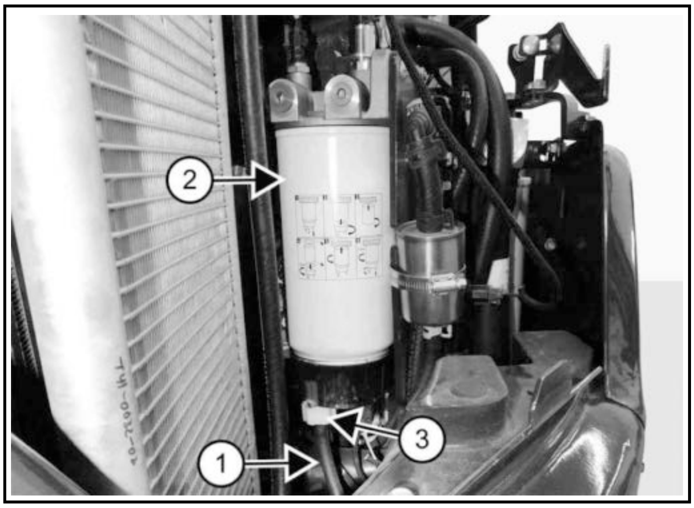
11. Tighten the fuel fill cap (Item 1) [Figure 341].

**Removing Water From The Fuel Filter**

Monitor your display for notifications. See the Service Schedule for the correct service interval.
(See Service Schedule on Page 149)

1. Rotate the upperstructure 90°.
2. Turn off the engine and exit the excavator.
3. Open the tailgate. (See Tailgate on Page 157)
4. Open the right side cover.
   (See Right Side Cover on Page 158)
5. Remove the right grille.
   (See Right Side Grille on Page 159)

**Figure 343**




P200129a

6. 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 343].
7. Loosen the drain (Item 3) [Figure 343] at the bottom of the filter to remove trapped water from the filter.
8. Tighten the drain.
9. Reinstall the right side grille and close the right side cover and tailgate.

**⚠ WARNING**

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

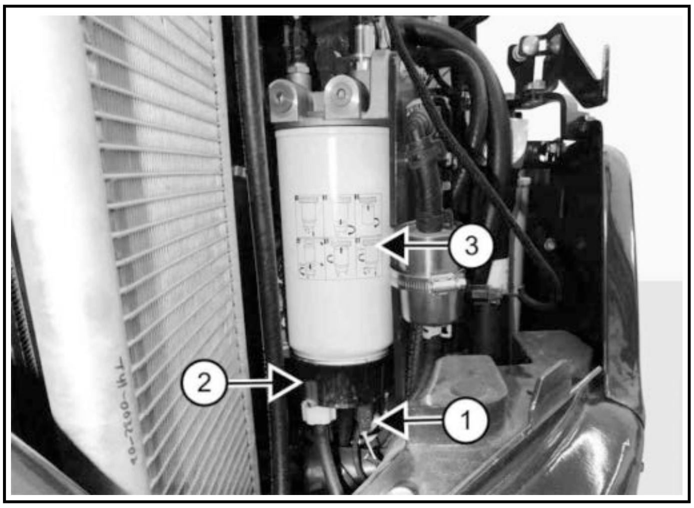
W-2103

**Replacing The Fuel Filter**

Monitor your display for notifications. See the Service Schedule for the correct service interval.
(See Service Schedule on Page 149)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 157)
3. Open the right side cover.
   (See Right Side Cover on Page 158)
4. Remove the right side grille.
   (See Right Side Grille on Page 159)

**Figure 344**




P200129b

5. Disconnect the electric connector (Item 1) [Figure 344] from the bottom of the fuel filter.

6. Unscrew and remove the water separator (Item 2) [Figure 344].

7. Remove the fuel filter (Item 3) [Figure 344].

8. Screw the water separator onto the replacement filter.

   Do not fill the new fuel filter with fuel at this time.

9. Put clean oil on the two new fuel filter O-rings.

10. Install the replacement filter and torque to 13,5 N•m (10 ft-lb).

11. Connect the electrical connector (Item 1) [Figure 344].

12. Turn the starter switch to ON to let the electronic fuel pump purge the air.

13. Start the engine and let it run for a few minutes.

14. Stop the engine and check for leaks at the filter.

15. Reinstall the right side grille, close the right side cover and 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 149)

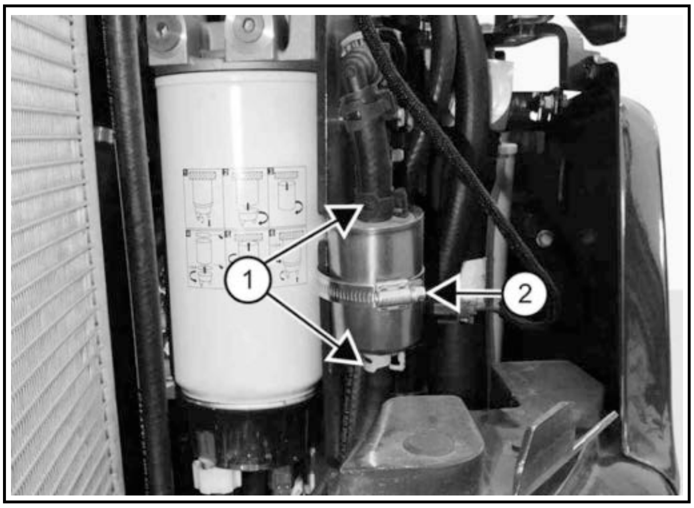
1. Stop the engine.

2. Open the tailgate. (See Tailgate on Page 157)

3. Open the right side cover. (See Right Side Cover on Page 158)

4. Remove the right side grille. (See Right Side Grille on Page 159)

**Figure 345**




P200129c

5. Pinch off the upper and lower hoses (Item 1) [Figure 345] to prevent spilled fuel while the hoses are disconnected from the pre-filter.

6. Reposition the upper and lower hose clamps (Item 1) [Figure 345] and remove the hoses from the pre-filter.

7. Loosen the clamp (Item 2) [Figure 345].

8. Remove the pre-filter and discard.

9. Install the new pre-filter into the clamp (Item 2) [Figure 345] and tighten the clamp.

10. Install the upper and lower hoses.

11. Move the hose clamps (Item 1) [Figure 345] back into the correct position as shown.

12. Remove tools used to pinch off the upper and lower hoses.

**⚠ WARNING**

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

W-2103

13. 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

14. Turn the switch to off and check for leaks at the filter.

15. Reinstall the right side grille and close the right side cover and tailgate.

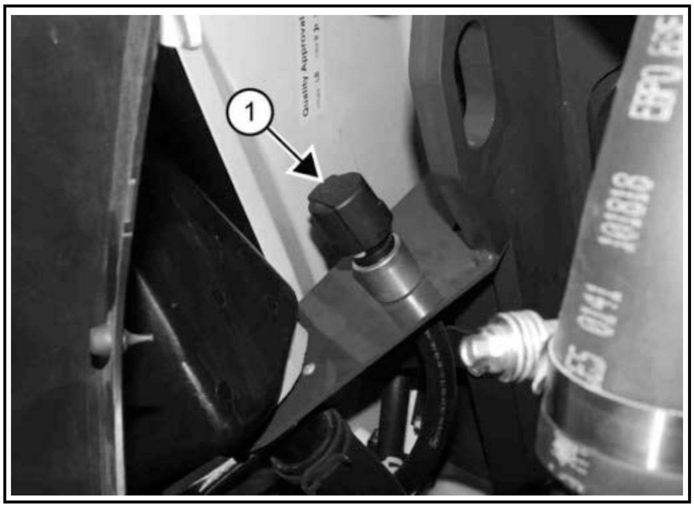
**Replacing The Fuel Tank Vent Filter**

See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

1. Stop the engine.

2. Open the tailgate. (See Tailgate on Page 157)

**Figure 346**




P200581a

3. Locate the fuel tank vent filter (Item 1) [Figure 346], which is near the fuel fill.

4. Remove the fuel tank vent filter (Item 1) [Figure 346].

5. Install the new fuel tank vent filter and tighten.

6. Close the tailgate.

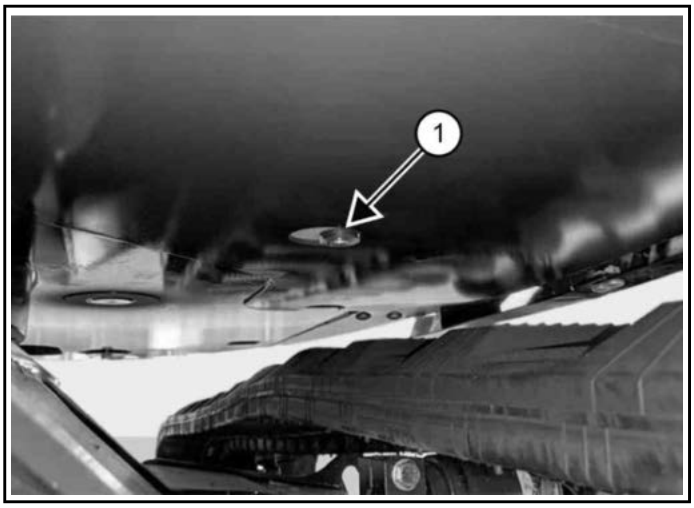
**Draining The Fuel Tank**

The following item is needed to complete this task:

- Container with a capacity of 72 L (19 US gal)

1. Stop the engine.

**Figure 347**




C200605a

2. Remove the plug (Item 1) [Figure 347] from the tank and drain the fuel into a container.

3. Replace the plug after fuel has been removed.

4. Reuse, recycle, or dispose of fuel in an environmentally safe manner.

**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

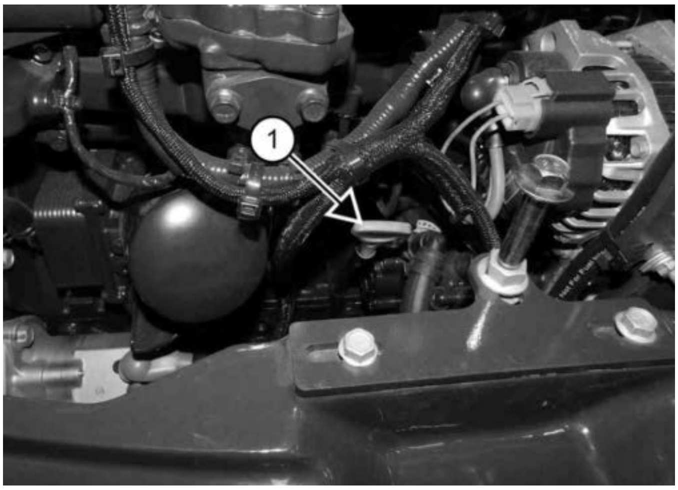
## ENGINE LUBRICATION SYSTEM

### Checking And Adding Engine Oil

See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 157)

**Figure 348**

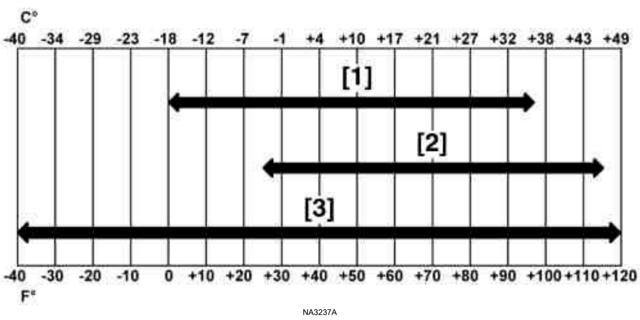



C200934a

3. Remove the dipstick (Item 1) [Figure 348].
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 |
| [3] Bobcat Synthetic Oil (SAE 5W-40) |

Bobcat engine oils are recommended for use in this machine. If Bobcat engine oil is not available, use a good quality engine oil that meets API Service Category of CK-4 or better, or ACEA E9 or better.

**⚠ IMPORTANT**

**MACHINE DAMAGE HAZARD**
**Failure to follow directions may result in severe engine damage.**
**Use of API Service Category FA-4 engine oil is not approved and may cause irreversible damage to the engine.** ◂

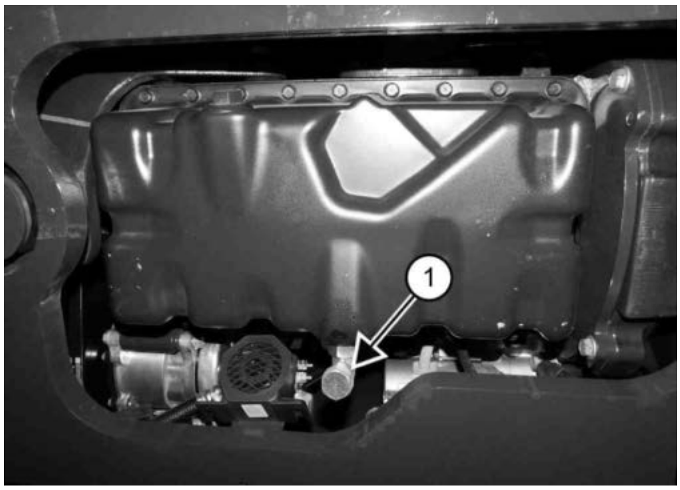
I-2384

### Replacing Engine Oil And Filter

See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

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 157)
5. Place a container under the oil pan.

**Figure 349**



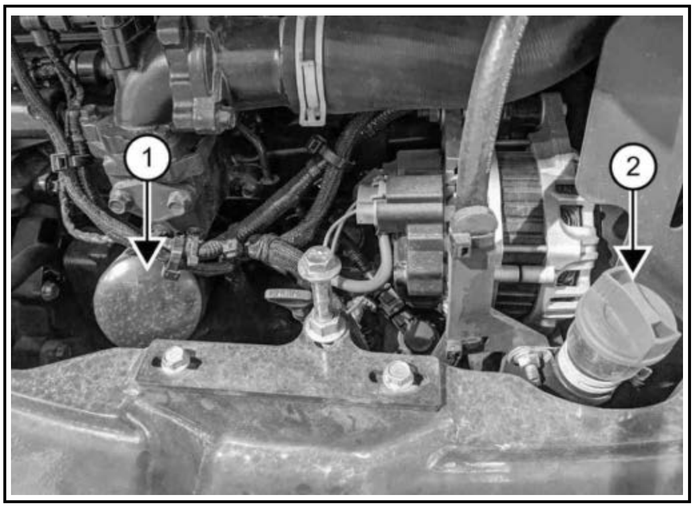

C200935a

6. Remove the drain plug (Item 1) [Figure 349] from the engine oil pan and drain the oil.
7. Recycle or dispose of used oil in an environmentally safe manner.

**⚠ WARNING**

**FIRE AND EXPLOSION HAZARD**
**Failure to use care around combustibles can cause serious injury or death.**
**Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.**
W-2103

**Figure 350**




C206638a

8. Remove the oil filter (Item 1) [Figure 350] 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 349].

12. Remove the fill cap (Item 2) [Figure 350].

13. Put oil in the engine.
    (See Capacities Specifications on Page 238)

    Do not overfill.

14. Install the fill cap (Item 2) [Figure 350].

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.

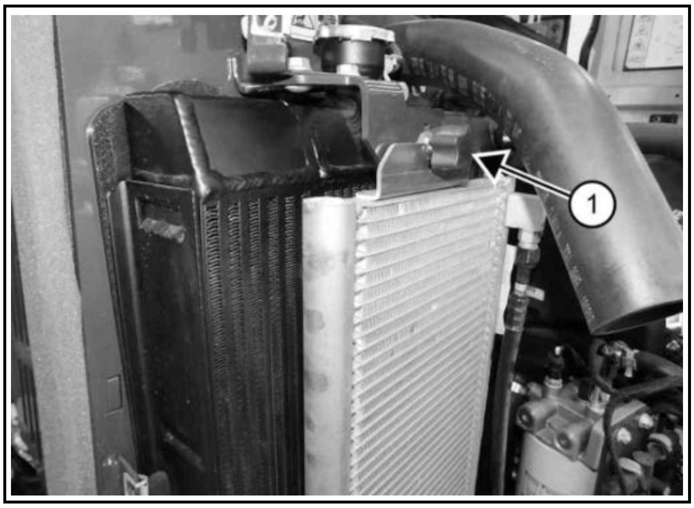
Check the cooling system every day to prevent overheating, loss of performance, or engine damage. (See Service Schedule on Page 149)

1. Stop the engine.

2. Open the right side cover.
   (See Right Side Cover on Page 158)

3. Remove the right side grille.
   (See Right Side Grille on Page 159)

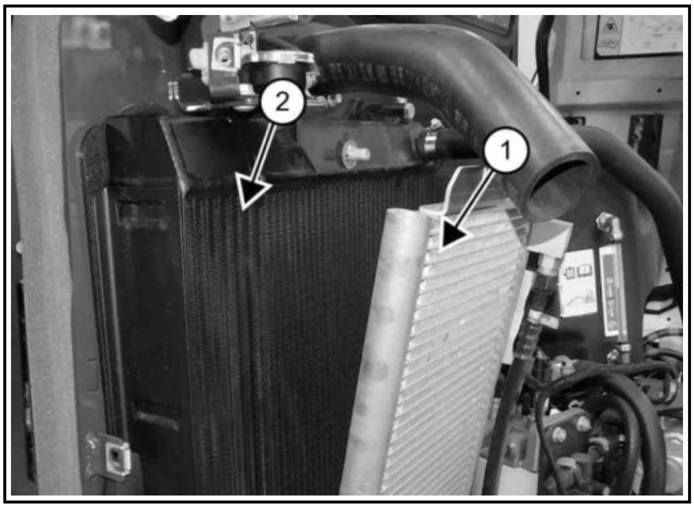
**Figure 351**




P200134a

4. Remove the knob (Item 1) [Figure 351] on the condenser (if equipped).

**Figure 352**




P200135a

5. Separate the condenser (Item 1) (if equipped) from the radiator (Item 2) [Figure 352].

Be careful not to damage fins.

6. Use air pressure or water pressure to clean the condenser (Item 1) and the radiator (Item 2) [Figure 352].

   Be careful not to damage fins when cleaning

7. Reposition the condenser (Item 1) [Figure 352] to the radiator.

8. Install and tighten the knob (Item 1) [Figure 351].

**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:**

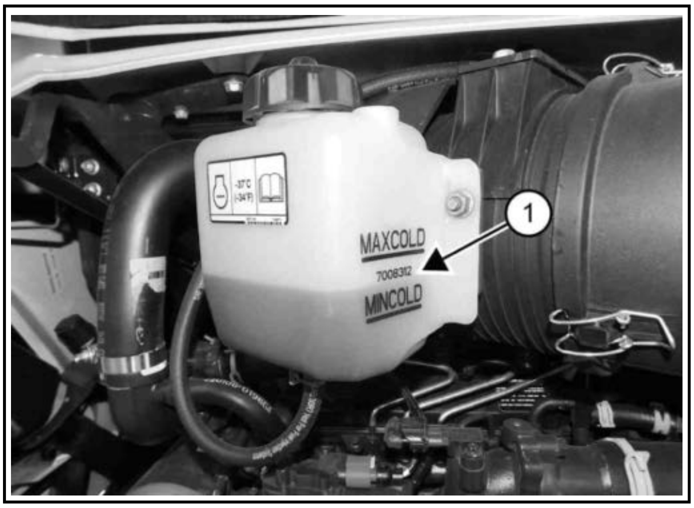
- **When fluids are under pressure.**
- **Flying debris or loose material.**
- **Engine is running.**
- **Tools are being used.**

W-2019

1. Stop the engine.

2. Open the tailgate. (See Tailgate on Page 157)

**Figure 353**




P200136a

3. Check the coolant level in the coolant recovery tank (Item 1) [Figure 353].

   It should be between the MAX and MIN marks.

4. Add fluid as needed.
   (See Capacities Specifications on Page 238)

   **NOTE:** The cooling system is factory filled with propylene glycol (purple colour). Do not mix propylene glycol with ethylene glycol.

**IMPORTANT**

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

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

I-2124

**Replacing Coolant (Cab Models)**

The following items are needed to complete this task:

- Container to catch the coolant
- Locking hose pinching pliers or a similar tool.

These instructions are for cab models only. For canopy models, see the canopy section.

See the Service Schedule for correct service interval. (See Service Schedule on Page 149)

1. Stop the engine.

2. Open the tailgate. (See Tailgate on Page 157)

3. Open the right side cover.
   (See Right Side Cover on Page 158)

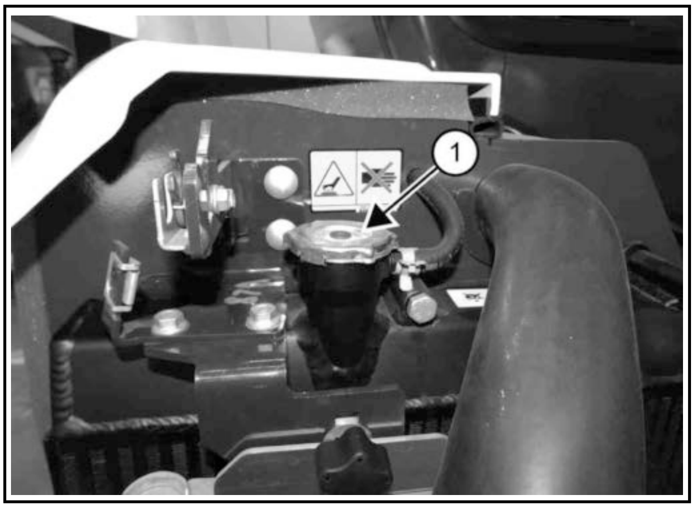
4. Remove the right side panel.
   (See Right Side Panel on Page 158)

**WARNING**

**BURN HAZARD**
**Failure to follow instructions can cause serious burns.**
**Stop the engine and allow it to cool before removing the radiator cap or adding coolant.**

W-2070

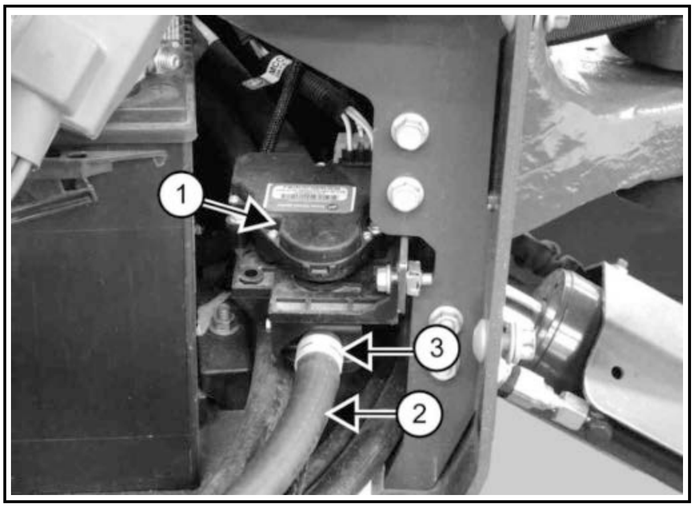
**Figure 354**




P200137a

5. When the engine is cool, loosen and remove the radiator cap (Item 1) [Figure 354].

**Figure 355**




P141382a

6. Locate the heater valve (Item 1) [Figure 355], which is directly in front of the battery.

   The coolant is drained at the heater valve.

7. Pinch off the coolant hose (Item 2) [Figure 355] using a locking hose pinching pliers or a similar tool.

8. Reposition the clamp (Item 3) and disconnect the hose (Item 2) from the heater valve (Item 1) [Figure 355].

9. Drain the coolant into a container.

10. Install the coolant hose (Item 2) into the heater valve (Item 1) and install the clamp (Item 3) [Figure 355].

11. Remove the tool used to pinch off the coolant hose.

12. Recycle or dispose of used coolant in an environmentally safe manner.

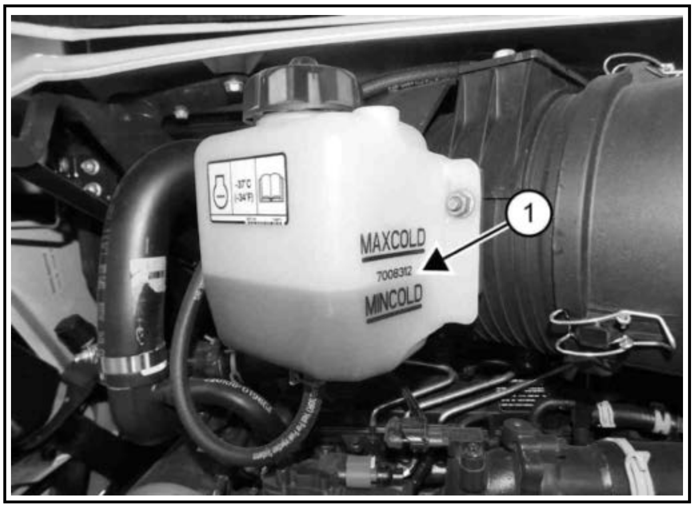
13. Mix new coolant in a separate container. (See Capacities Specifications on Page 238)

    The correct mixture of coolant to provide a -37°C (-34°F) freeze protection is 5 L propylene glycol mixed with 4,4 L of water or 1 U.S. gal propylene glycol mixed with 3.5 qt of water.

14. Add premixed coolant (47% water and 53% propylene glycol) to the radiator (Item 1) [Figure 354] until the coolant level reaches the top of the exchanger.

15. Install the radiator cap (Item 1) [Figure 354].

**Figure 356**




P200136a

16. Add premixed coolant (47% water and 53% propylene glycol) to the recovery tank (Item 1) [Figure 356] until it is between the MAX and MIN marks.

**⚠ 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

17. Run the engine until it is at operating temperature.

18. Stop the engine.

19. Add coolant to the recovery tank as needed.

20. Reinstall the right side panel.

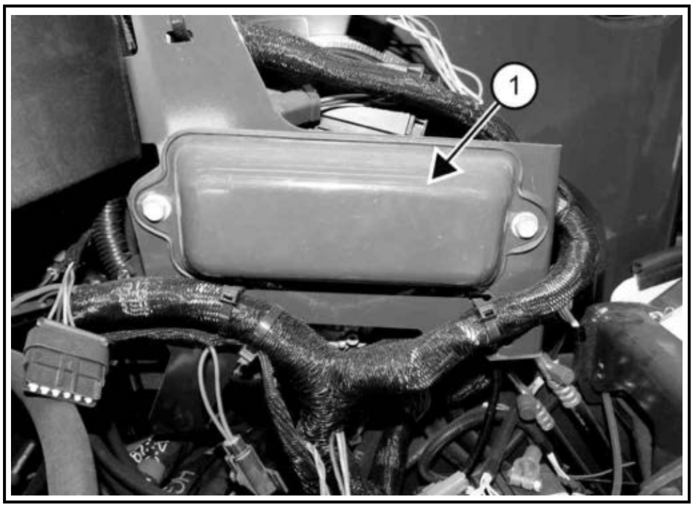
21. Close the right side cover.

22. Close the tailgate.

## ELECTRICAL SYSTEM

### Electrical System Description

**Figure 357**




P200138a

The excavator has a 12 volt, negative earth electrical system. The electrical system is protected by fuses (Item 1) [Figure 357] located under the right side cover of the excavator. 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.

**⚠ WARNING**

**CHEMICAL HAZARD**
**Contact with or ingestion of battery acid can cause serious injury or death.**

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

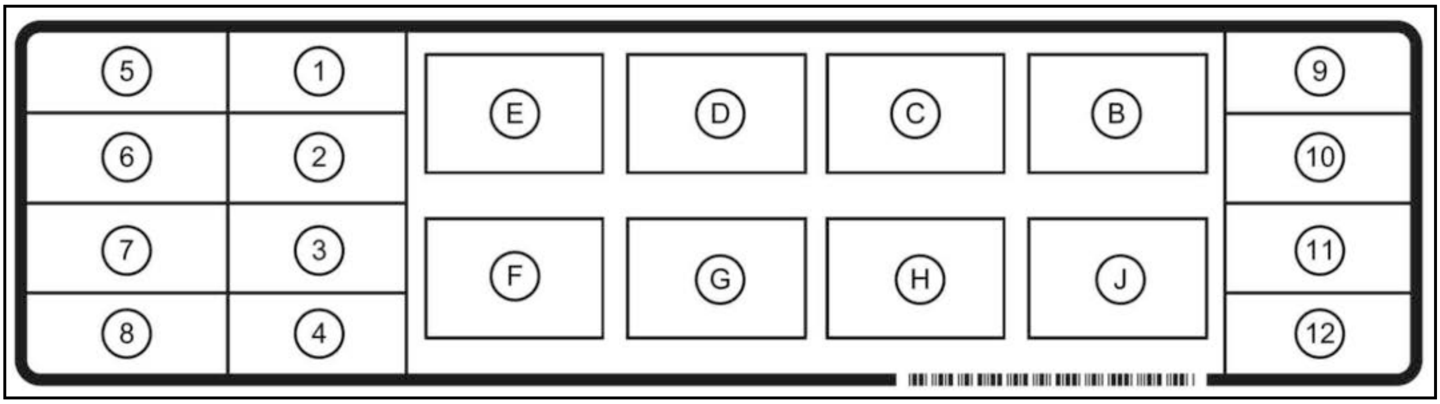
W-2065

### Fuse And Relay Identification

The decal inside the fuse cover (Item 1) [Figure 357] shows the location and amp ratings of the fuses.

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

**Figure 358**



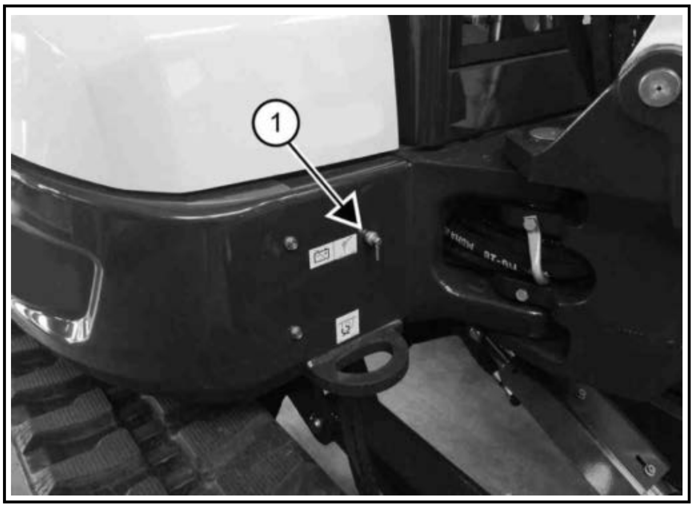

7172409b

The location and sizes are shown in the table below and on the decal [Figure 358]. Always replace fuses using the same type and capacity. Relays are identified by the letter "R" in the Amp column.

| REF. | ICON | DESCRIPTION | AMP |
|---|---|---|---|
| 1 | | Wiper / Washer | 10 |
| 2 | | Switched Power | 20 |
| 3 | ACD | ACD | 25 |
| 4 | | Alt / Fuel Pump | 25 |
| 5 | | Controller (ECU) | 25 |
| 6 | | HVAC | 40 |
| 7 | | Ignition | 5 |
| 8 | | ECU Sensor | 15 |
| 9 | | Controller | 25 |
| 10 | ACD | ACD | 25 |
| 11 | | Lights | 20 |
| 12 | | ACC | 25 |
| E | | Switched Power | R |
| D | | HVAC | R |
| C | | Engine ECU | R |
| B | | Horn | R |
| F | | Fuel Lift Pump | R |
| G | | Lights | R |
| H | | Glow Relay | R |
| J | | Starter | R |

### Battery Disconnect Switch

**Figure 359**




C206169a

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

The battery disconnect switch (Item 1) [Figure 359] (if equipped) is located on the right front of the excavator.

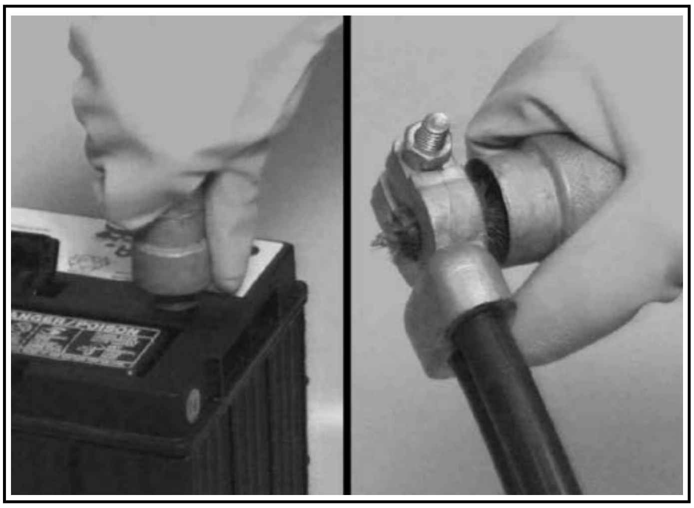
- Rotate the switch (Item 1) [Figure 359] counterclockwise to turn the switch to the OFF position.
- Rotate the switch (Item 1) [Figure 359] clockwise to turn to the ON position (shown here in the ON position).

### Battery Maintenance

See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

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 360**



P200188

Simple steps for reliability and long battery life:

- Keep battery posts and terminals clean [Figure 360].
- 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 175)
- Check the battery state of charge every 30 days on machines that are not frequently used. (See Testing The Battery on Page 175)

**⚠ WARNING**

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

W-2065

### Maintaining Battery Charge Level

All batteries will self-discharge over time. This machine has features that require battery power even when the machine is not being used. Use of a quality battery maintainer is highly recommended to ensure that your machine is ready to start when you need it and avoid costly battery replacement.

*Battery Maintainers*

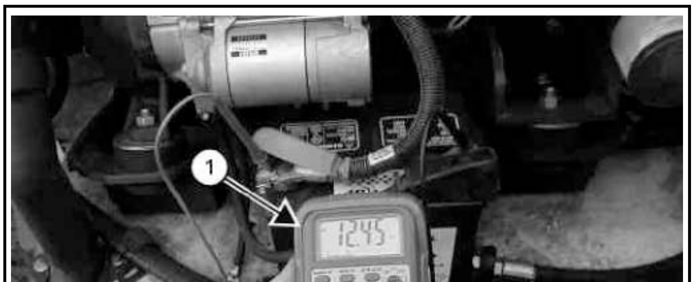
Use a good quality battery maintainer to keep the battery above 12.4 volts for machines that are not frequently used. Batteries below 12.4 volts must first be charged using a battery charger. Solar maintainers should have a minimum capacity of 10 watts to be effective.

### Battery Service During Machine Storage

- Remove the battery if storing the machine for an extended period of time.
- Fully charge the battery.
- Store the battery in a cool dry place above freezing and boost charge periodically.
- If battery removal is not desired, a good quality battery maintainer must be used to compensate for battery self-discharge and parasitic loads from machine controllers, accessories, and features such as connected machine intelligence.

### Testing The Battery

**Figure 361**




P30836a

The simplest and most common check to determine battery state of charge is to use a digital multimeter or voltmeter (Item 1) [Figure 361].

A battery found below 12.4 volts must be charged to 100% charge per the battery charger's recommendation. Allow at least 60 minutes after operating the machine or charging the battery to get an accurate reading.

If the reading is less than 12.4 volts after the battery has been charged for several hours, see your Bobcat dealer to have a more thorough battery test performed.

The freezing point of battery electrolyte is dependent on the battery state of charge. Keeping the battery voltage above 12.4 volts will help prevent batteries from freezing, even at extremely low temperatures.

If the battery freezes, the internal grid may be damaged and the case will be distorted or cracked. If this happens, dispose of the battery according to local regulations.

### Battery Charging

A battery charger designed for 12 volt charging systems is recommended. Follow the battery charger manufacturer's instructions to charge the battery to 12.6 volts (100% charge). Batteries should be charged at room temperature to avoid an undercharge or overcharge condition. Never attempt to charge a frozen battery.

The following table can be used to identify the approximate amount of time required to charge a discharged battery. Allow at least 60 minutes after operating the machine or charging the battery to get an accurate reading.

| Battery Voltage | State of Charge | Charger Maximum Rate | | |
|---|---|---|---|---|
| | | 30 Amps | 20 Amps | 10 Amps |
| 12.6 V | 100% | Ready to Use | | |
| 12.4 V | 75% | 0.9 hr | 1.3 hr | 2.5 hr |
| 12.2 V | 50% | 1.9 hr | 2.7 hr | 5.1 hr |
| 12.0 V | 25% | 2.9 hr | 4.3 hr | 7.8 hr |
| 11.8 V | 0% | 4.0 hr | 5.7 hr | 10.7 hr |

**NOTE:** Use a good quality charger to avoid battery damage from overcharging.

**⚠ WARNING**

**EXPLOSION HAZARD**
**Battery gas can explode and cause serious injury or death.**
- **Keep arcs, sparks, flames and lighted tobacco away from batteries. When jumping from booster battery make final connection (negative) at machine frame.**
- **Do not jump start or charge a frozen or damaged battery. Warm battery to 16°C (60°F) before connecting to a charger. Unplug charger before connecting or disconnecting cables to a battery. Never lean over battery while boosting, testing or charging.◂**

W-2066

### Using A Booster Battery (Jump Starting)

The following item is needed to complete this task:

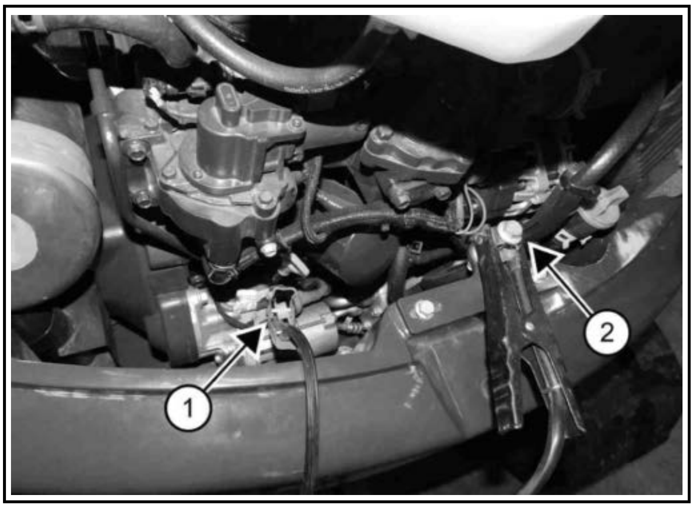
- 12 volt booster battery

If it is necessary to use a booster battery to start the engine, be careful! There must be one person in the operator's seat and one person to connect and disconnect the battery cables.

1. Be sure the key switch is OFF.

2. Open the tailgate. (See Tailgate on Page 157)

**Figure 362**




C200723a

3. Connect the cable to the positive (+) terminal (Item 1) [Figure 362] of the excavator starter.

4. Connect the other cable to the tailgate latch bolt (Item 2) [Figure 362].

5. Start the engine.

6. After the engine has started, remove the negative (ground) cable first (Item 2) [Figure 362].

7. Disconnect the cable from the positive terminal (Item 1) [Figure 362].

**⚠ IMPORTANT**

**MACHINE DAMAGE HAZARD**
**Damage to the alternator can occur**
**Do not operate machine if:**
- **Engine is operated with battery cables disconnected.**
- **Battery cables are connected when using a fast charger or when welding on the machine. Remove both cables from the battery.**
- **Extra battery cables (booster cables) are connected wrong.◂**

I-2023

**⚠ WARNING**

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

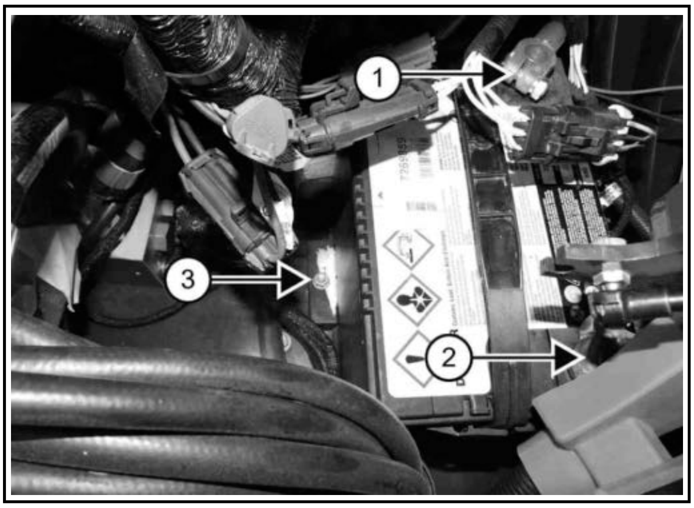
W-2065

**Removing And Installing The Battery**

1. Open the right side cover. (See Right Side Cover on Page 158)

2. Remove the right side panel. (See Right Side Panel on Page 158)

**Figure 363**




P200140a

3. Disconnect the negative (-) cable (Item 1) [Figure 363].

4. Disconnect the positive (+) cable (Item 2) [Figure 363].

5. Remove the bolts (Item 3) [Figure 363] on both sides of the battery and remove the hold-down clamp.

6. Remove the battery.

   Always clean the terminals and the cable ends, even when installing a new battery.

7. Install the battery.

8. Install the hold-down clamp and tighten the bolts.

9. Connect the positive (+) cable (Item 2) [Figure 363].

10. Connect the negative (-) cable (Item 1) [Figure 363] last to prevent sparks.

**⚠ WARNING**

**CHEMICAL HAZARD**
**Contact with or ingestion of battery acid can cause serious injury or death.**

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

W-2065

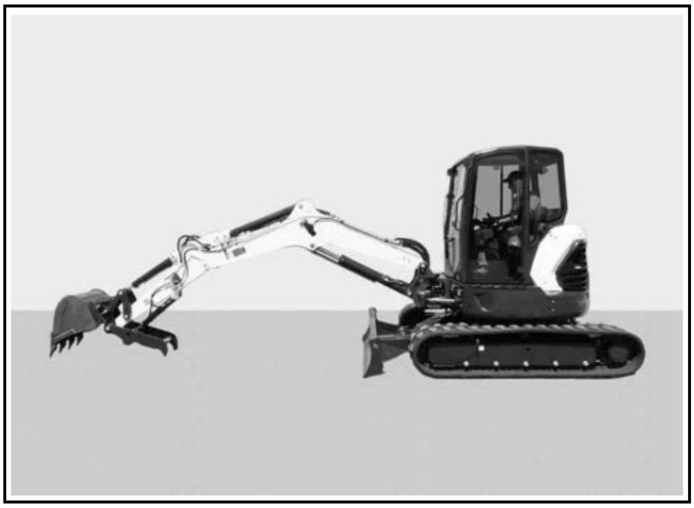
## HYDRAULIC SYSTEM

### Checking And Adding Hydraulic Fluid

The preferred method is to check the hydraulic fluid when it is cold. See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

1. Park the machine on a flat surface.

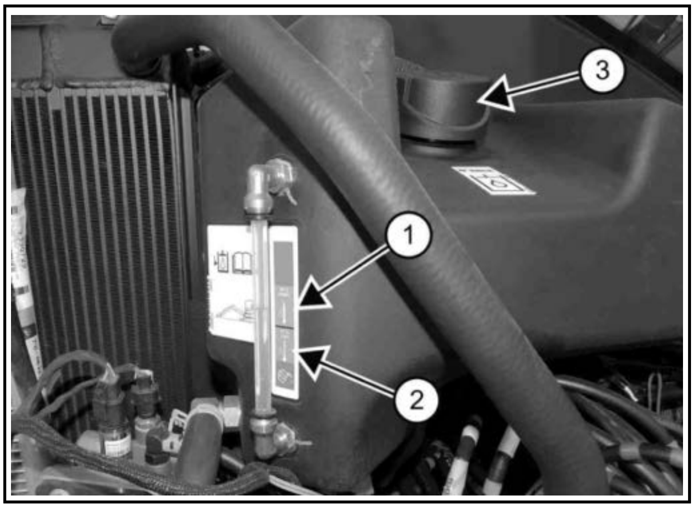
**Figure 364**



C200403a

2. Extend the boom, arm, and bucket. Lower the bucket to the ground and lower the blade so the machine is in the position shown [Figure 364].
3. Stop the engine.
4. Open the right side cover.
(See Right Side Cover on Page 158)

**Figure 365**




P200141a

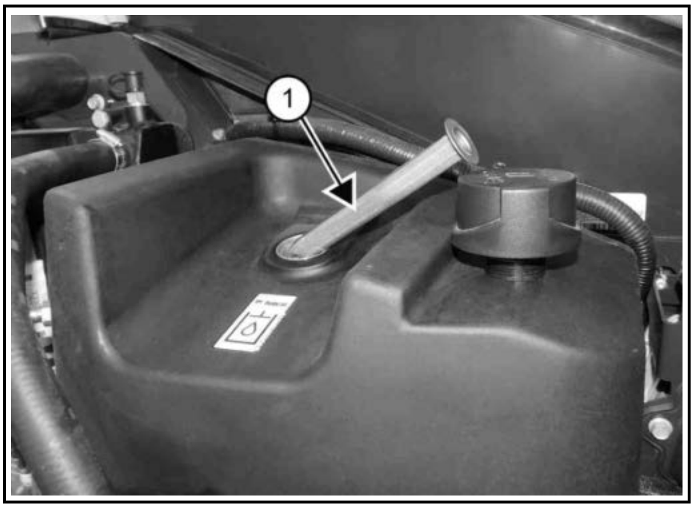
5. Check the hydraulic fluid level. It must be visible in the sight gauge (Item 1) [Figure 365].

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

- Item 1 [Figure 365] is the correct fluid level when the machine is HOT (optional).
- Item 2 [Figure 365] is the correct fluid level when the machine is COLD (preferred).

6. Clean the surface around the fill cap and remove the cap from the tank (Item 3) [Figure 365].

**Figure 366**




P200142a

7. Check the condition of the fill strainer screen (Item 1) [Figure 366].

**⚠ WARNING**

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

W-2103

Clean or replace as necessary.

8. Add the correct fluid to the tank until it is visible in the sight gauge [Figure 365].
(See Capacities Specifications on Page 238)

Be sure the screen is installed before adding fluid.

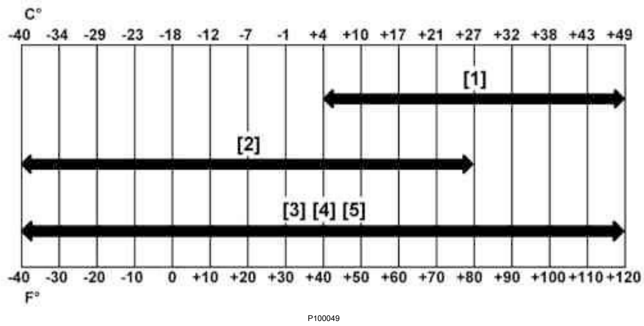
9. Check the cap.

Clean or replace as necessary.

10. Install the cap.
11. Close the right side cover.

**Hydraulic Fluid Chart**

| HYDRAULIC FLUID |
|---|
| Recommended ISO Viscosity Grade (VG) and Viscosity Index (VI) |




| |
|---|
| Refer to the temperature range anticipated before next oil change. |
| [1] VG 100; Minimum VI 130<br>[2] VG 46; Minimum VI 150<br>[3] Bobcat All-Season Fluid<br>[4] Bobcat Synthetic Fluid<br>[5] Bobcat Biodegradable Hydraulic / Hydrostatic Fluid (Unlike biodegradable fluids that are vegetable based, Bobcat biodegradable fluid is formulated to prevent oxidation and thermal breakdown at operating temperatures.) |

Use only recommended fluid in the hydraulic system.

**Replacing The Hydraulic Filter**

**⚠ WARNING**

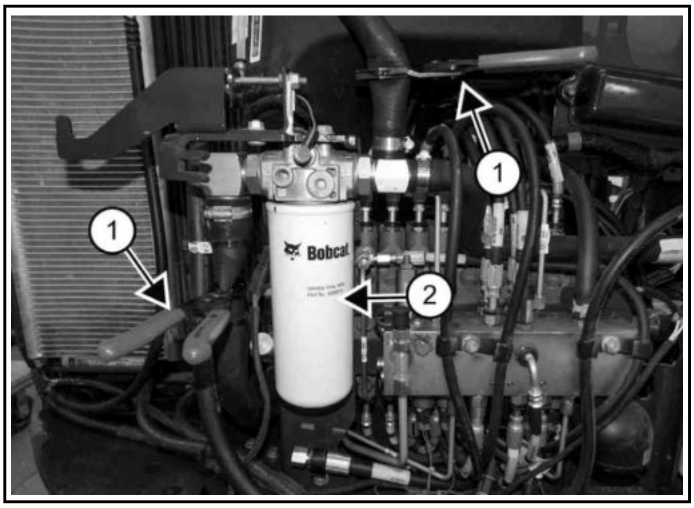
**FIRE AND EXPLOSION HAZARD**
**Failure to use care around combustibles can cause serious injury or death.**
**Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.**

W-2103

See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 157)
3. Open the right side cover.
(See Right Side Cover on Page 158)
4. Remove the right side panel.
(See Right Side Panel on Page 158)

**Figure 367**




C208221a

5. Install locking hose pliers (Item 1) [Figure 367] on the hoses running to the filter housing.

6. Remove the hydraulic filter (Item 2) [Figure 367].

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 367].

11. Install the right side panel.

12. Close the right side cover.

13. Close the tailgate.

**Replacing The Case Drain Filter**

**⚠ WARNING**

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

W-2103

See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

The case drain filter is located in the right front corner of the excavator.

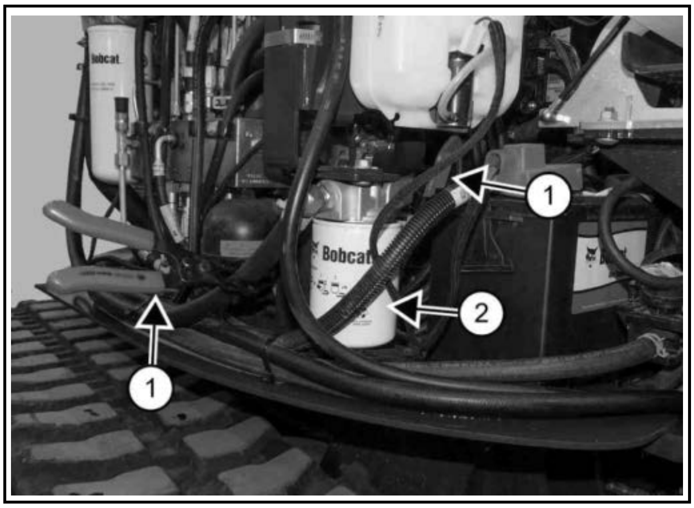
1. Stop the engine.

2. Open the tailgate. (See Tailgate on Page 157)

3. Open the right side cover. (See Right Side Cover on Page 158)

4. Remove the right side panel. (See Right Side Panel on Page 158)

**Figure 368**




C208222a

5. Install locking hose pliers (Item 1) [Figure 368] on the hoses running to the filter housing.

6. Remove the case drain filter (Item 2) [Figure 368].

7. Clean the housing where the filter gasket makes contact.

8. Apply clean hydraulic fluid to the filter gasket.

9. Install the new filter.

   Use a genuine Bobcat replacement filter.

   Tighten until the gasket first makes contact plus 3/4 turn.

10. Remove locking hose pliers (Item 1) [Figure 368].

11. Install the right side panel.

12. Close the right side cover.

13. Close the tailgate.

**Replacing Hydraulic Fluid**

The following items are needed to complete this task:

- Container for the hydraulic fluid
- Hose with female quick coupler on one end

**⚠ WARNING**

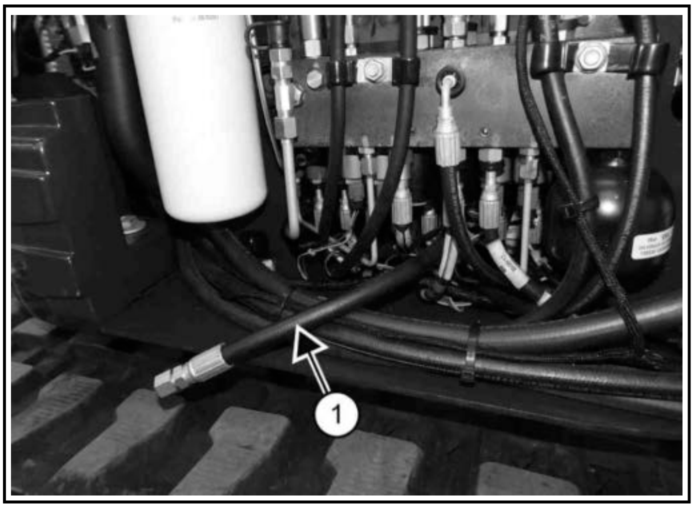
**INJECTION HAZARD**
**Pressurised diesel fuel or hydraulic fluid can penetrate skin and eyes, causing serious injury or death.**
**Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. DO NOT use your bare hand. Wear safety goggles. If fluid enters skin or eyes,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

W-2072

See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

1. Extend the boom, arm, and bucket. Lower the bucket to the ground and lower the blade so the machine is in the position shown [Figure 364].
2. Stop the engine.
3. Open the tailgate. (See Tailgate on Page 157)
4. Open the right side cover. (See Right Side Cover on Page 158)
5. Remove the right side panel. (See Right Side Panel on Page 158)

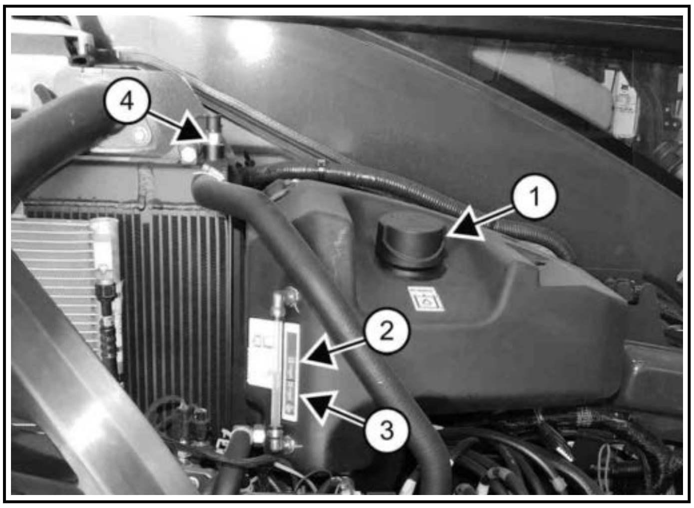
**Figure 369**



P200583a

6. Locate the drain hose (Item 1) [Figure 369], 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 370**



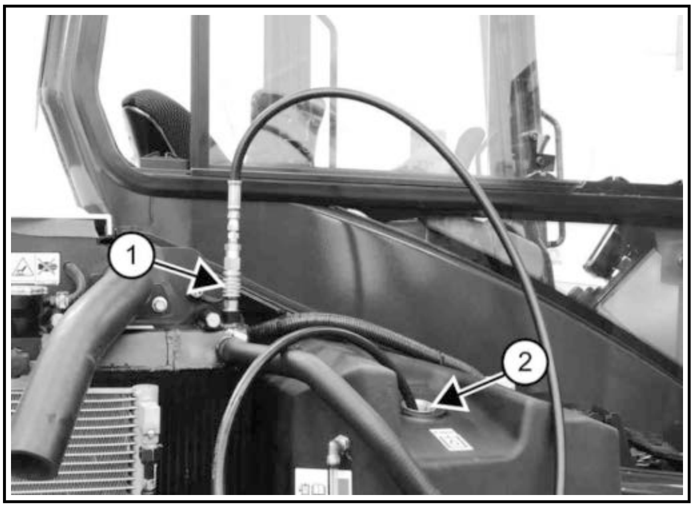
C200664b

11. Add fluid to the hydraulic tank (Item 1) [Figure 370]. (See Capacities Specifications on Page 238)

    The level should be between the hot fill (Item 2) and cold fill (Item 3) marks [Figure 370].

12. Locate the male coupler (Item 4) [Figure 370] that is to the left of the hydraulic tank and remove the cap.

**Figure 371**



P141795b

13. Install a female quick coupler and hose on the male quick coupler (Item 1) [Figure 371].
14. Route the hose (Item 1) from the male quick coupler into the hydraulic tank (Item 2) [Figure 371].
15. Start the machine.
16. Remove the female quick coupler (Item 1) [Figure 371] after a steady stream of hydraulic fluid, free of any air bubbles, drains from the hose.
17. Reinstall the fill cap (Item 1) [Figure 370] 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. Close the tailgate and right side 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.

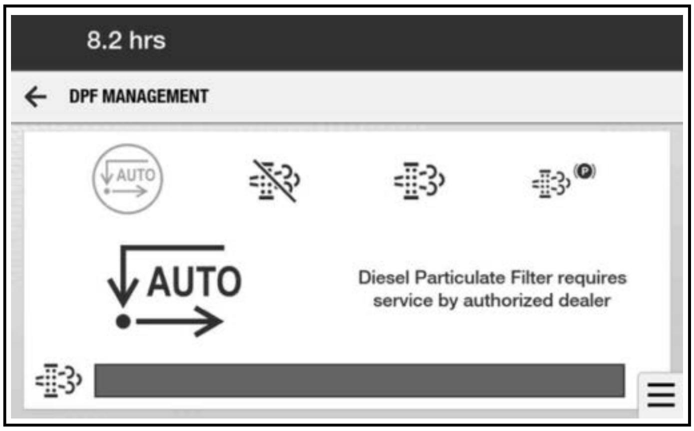
A service regeneration cycle may be required if too much soot is allowed to accumulate in the DPF. This can occur in the following situations:

- 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 372**




NA3858

The machine will alert the operator when DPF service is required [Figure 372].

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 149)

### Types of Track Tensioning Systems

See one of the following sections to adjust track tension depending on the track tensioning system on your machine.

- Manual track tensioning
  (See Adjusting Track Tension Manually on Page 182)
- Auto track tensioning
  (See Adjusting Track Tension Automatically on Page 184)

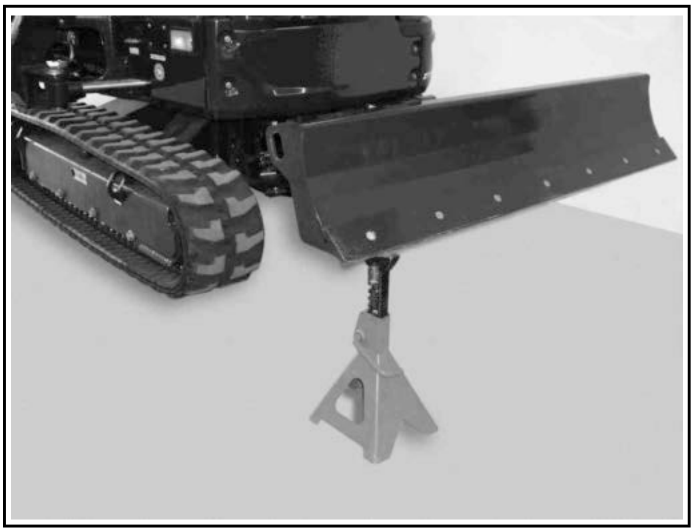
### Adjusting Track Tension Manually

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.

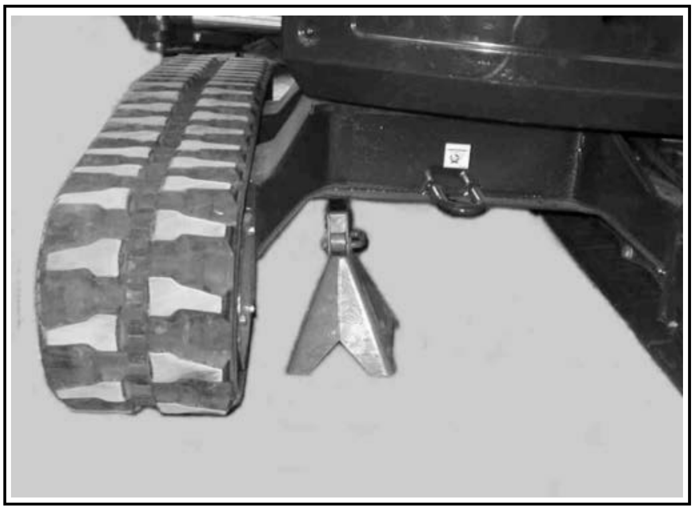
**Figure 373**



P128643b

2. Raise the blade fully and install jackstands under the blade [Figure 373].

**Figure 374**



P91969a

3. Install jackstands under the track frame [Figure 374].

4. Raise the boom until all machine weight is on the jackstands.

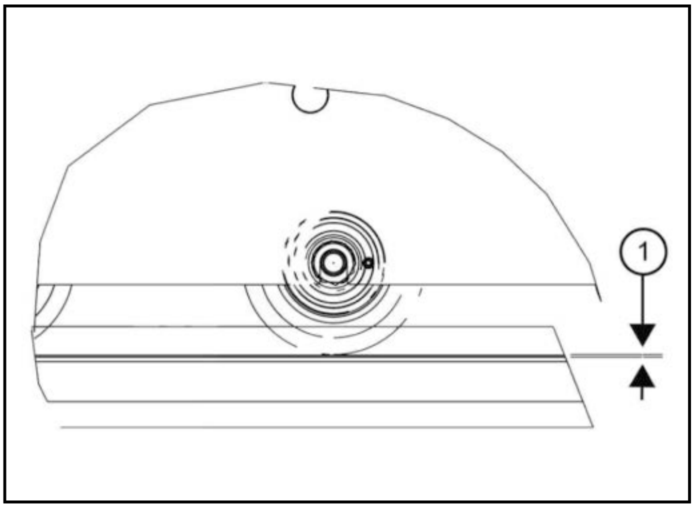
5. Stop the engine.

**⚠ WARNING**

**PINCHING HAZARD**
**Keep finger and hands out of pinch points when checking the track tension.**

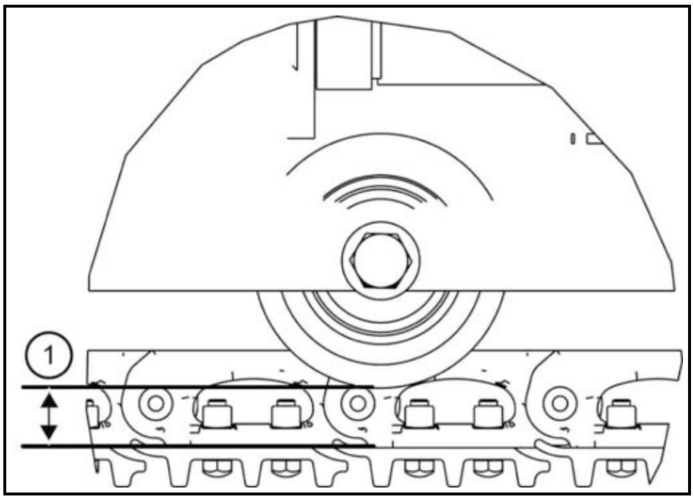
W-2142

**Figure 375**




NA15893a

**Figure 376**




NA15892a

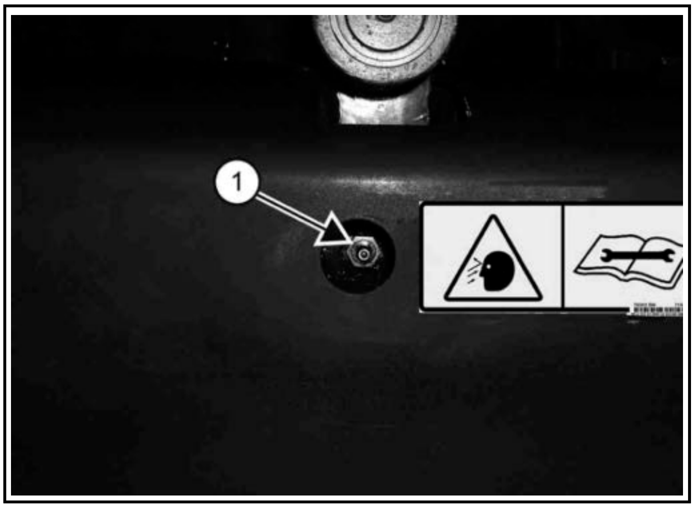
6. Measure the track clearance at the middle track roller.

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

   a. For rubber tracks, measure the gap between the contact surface of the roller and the track. The clearance (Item 1) [Figure 375] should be 30,0 – 25,0 mm (1.20 – 1.00 in).

   b. For steel or segmented tracks, measure the gap between the external roller flange and the track grouser. The clearance (Item 1) [Figure 376] should be 108,0 – 101,6 mm (4.25 – 4.00 in).

**Figure 377**




P113853a

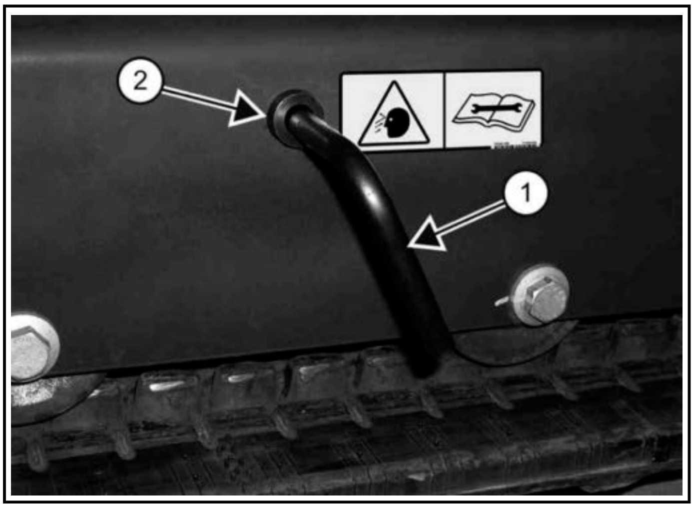
7. To **increase track tension**, add grease to the track tension fitting (Item 1) [Figure 377] until the track tension is correct.

**⚠ WARNING**

**INJECTION HAZARD**
**High pressure grease can penetrate skin and eyes, causing serious injury.**
**Do not loosen the track tension fitting more than 1 - 1/2 turns.◂**

W-2994

**Figure 378**




P113854a

8. To **decrease track tension**, install the bleed tool (Item 1) on the track tension fitting (Item 2) [Figure 378]. Turn the tool 90° counterclockwise and let the grease flow into a container. Continue to release pressure until the track tension is correct.

    a. Dispose of the grease in an environmentally friendly manner.

9. Tighten the track tension fitting to 24 – 30 N·m (18 – 22 ft-lb) torque.

10. Repeat the procedure for the opposite side.

### Adjusting Track Tension Automatically

In machines with auto track tensioning, the machine uses hydraulic fluid to automatically maintain track tension. Operators are not required to make adjustments to the track tensioning components for normal operation of the machine.

To tension the track automatically upon startup:

1. Start the engine.

2. Lower the left control console.

3. Wait for five seconds while the track automatically tensions.

The track tension may decrease if the machine is parked for an extended period of time without operation.

See your Bobcat dealer for service if the track tension is noticeably loose after the machine sits overnight.

### Adjusting The Hydraulic Pressure Reducing Valve

The hydraulic pressure reducing valve is adjusted at the factory to optimize track retention while maximising track life.

You can adjust the valve to allow a lower track tension, which could be beneficial in certain conditions.

The hydraulic pressure reducing valve is located on the pilot manifold.

**⚠ IMPORTANT**

**MACHINE DAMAGE HAZARD**
**Failure to follow directions may result in machine damage.**
**Exceeding factory settings can cause damage to the travel motors.◂**

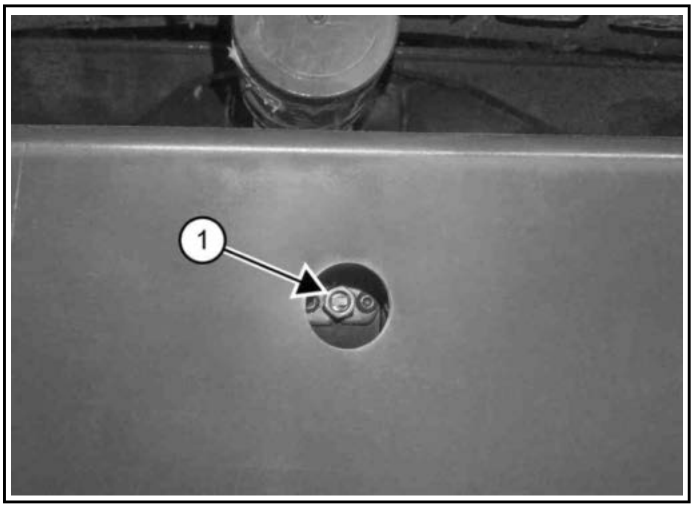
1311-89810C1D

**Figure 379**


C206258a

1. To decrease the track tension, loosen the nut shown here (Item 1) [Figure 379] on the pilot manifold and turn the hex head screw counterclockwise.

**Figure 380**




C144741a

2. After decreasing track tension, you must relieve the pressure in the cylinder. Relieve the pressure using the hydraulic tensioner valve (Item 1) [Figure 380] on the side of the tracks.

3. Make adjustments in one full turn increments and test the track tension by operating the machine.

   Continue to adjust until the desired track tension for your application is achieved.

**Returning The Hydraulic Pressure Reducing Valve To Factory Setting**

See your Bobcat dealer to return the hydraulic pressure reducing valve to the factory setting. To approximate the factory setting, follow the steps below.

1. Loosen the nut (Item 1) [Figure 379], turning the hex head screw clockwise until it bottoms out.

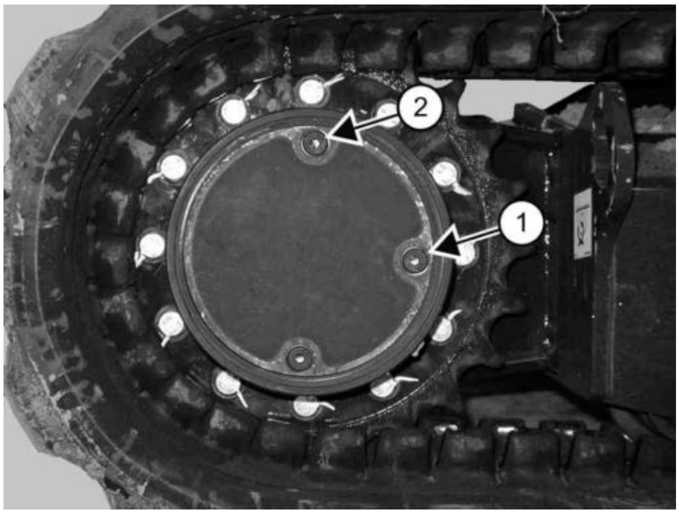
2. Turn the hex head screw counterclockwise five full turns.

3. Tighten the nut to 4,0 – 4,7 N•m (3.0 – 3.5 ft-lb) torque.

**TRAVEL MOTOR**

**Checking And Adding Travel Motor Fluid**

**Figure 381**




P97146d

1. Park the excavator on a level surface with the plugs (Items 1 and 2) [Figure 381] positioned as shown.

2. Remove the plug (Item 1) [Figure 381].

   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 381] 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 381].

5. Repeat the procedure for the opposite travel motor.

**Replacing Travel Motor Fluid**

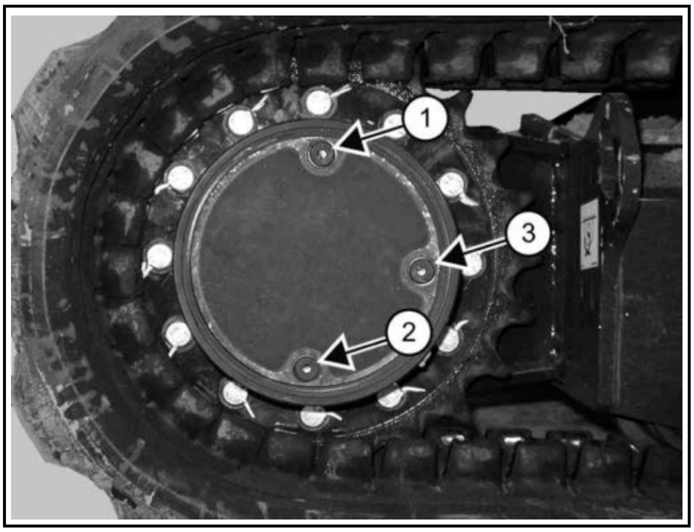
See the Service Schedule for the correct service interval. (See Service Schedule on Page 149)

**⚠ WARNING**

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

W-2103

**Figure 382**




P97146f

1. Park the excavator on a level surface with plugs (Items 1, 2, and 3) [Figure 382] positioned as shown.

2. Remove top and bottom plugs (Items 1 and 2) [Figure 382] and drain the lubricant into a container.

3. Install the bottom plug (Item 2) [Figure 382].

4. Remove the middle plug (Item 3) [Figure 382].

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 382].
   (See Capacities Specifications on Page 238)

   Lubricant should be API GL-4 or 5 containing extreme pressure additive (SAE 80W90).

6. Install the plugs (Item 1 and 3) [Figure 382].

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:

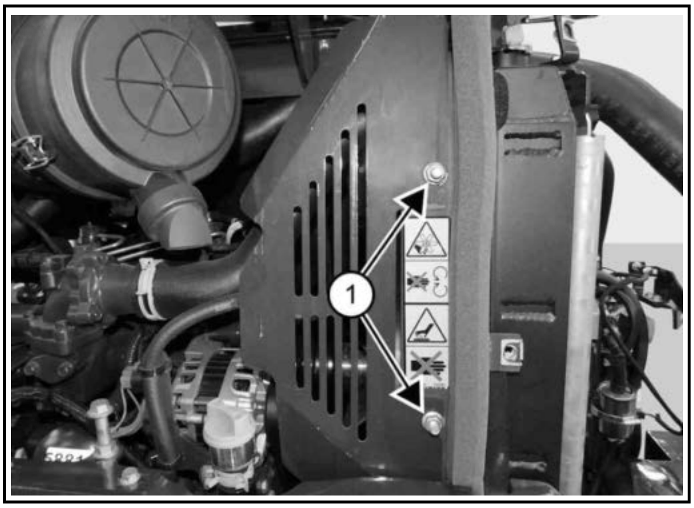
- Alternator belt installation tool. See your local Bobcat dealer.

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 157)

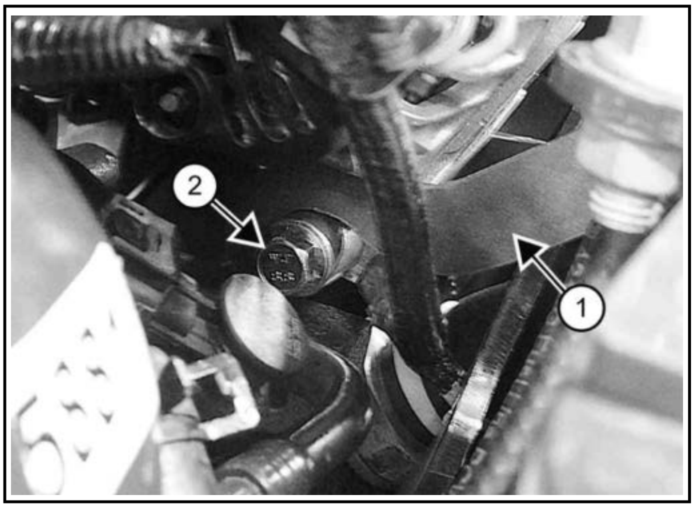
**Figure 383**




P200151a

3. Loosen the two bolts (Item 1) [Figure 383] on the fan guard and slide the fan guard off.

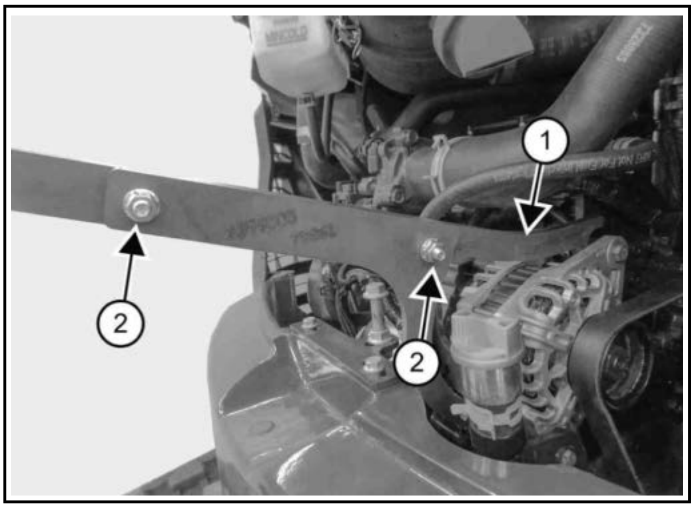
**Figure 384**




C143842b

4. Position the lower alternator tool (Item 1) around the spacer (Item 2) [Figure 384].

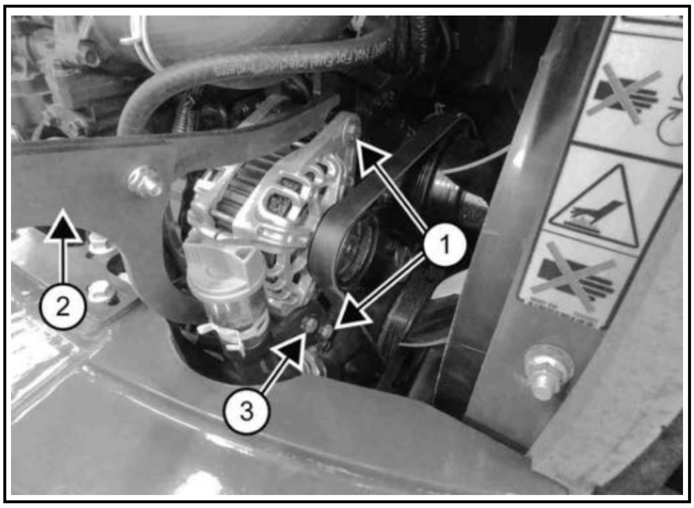
**Figure 385**




C143843b

5. Position the upper alternator tool (Item 1) and install the bolts and nuts on the tool (Item 2) [Figure 385].

**Figure 386**

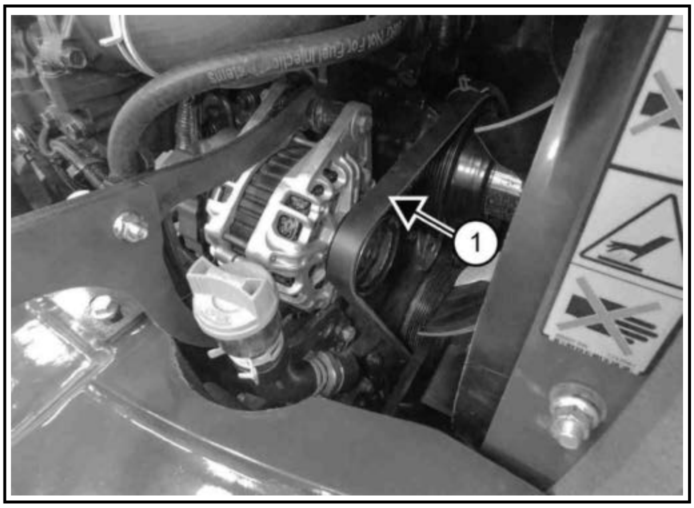



C143844b

6. Loosen the top and bottom bolts (Item 1) [Figure 386].

7. Lift up on the alternator tool (Item 2) and remove the bolt (Item 3) [Figure 386].

**Figure 387**



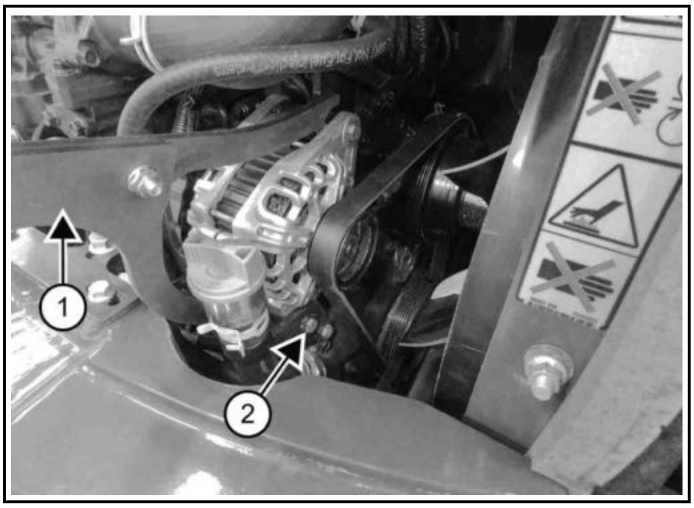

C143845b

8. Cut the old belt (Item 1) [Figure 387] and remove the belt from the pulleys.

9. Inspect the pulleys for wear.

10. Install the new belt.

**Figure 388**




C143844d

11. Use the alternator tool (Item 1) to align the alternator to the alternator mounting bolt (Item 2) [Figure 388].

12. Tighten all three alternator mounting bolts.

13. Install the fan guard and tighten the two 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.

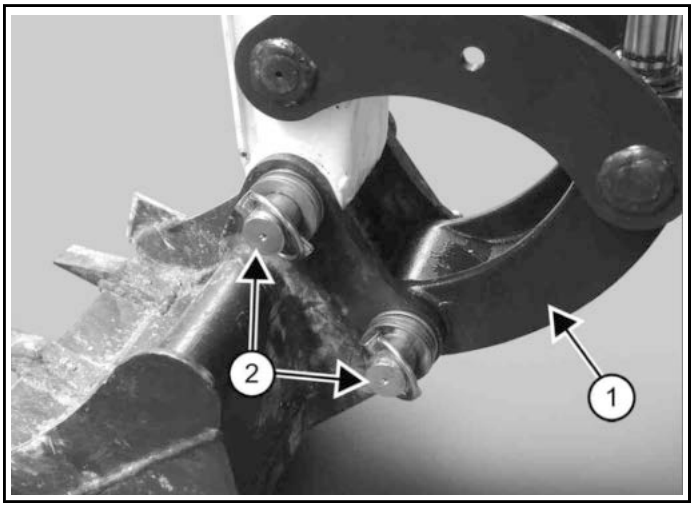
### Replacing Air Conditioning Belt

See your Bobcat dealer for air conditioning belt replacement.

## QUICK COUPLER

### Inspecting And Maintaining The Bucket Link And Coupler

**Figure 389**



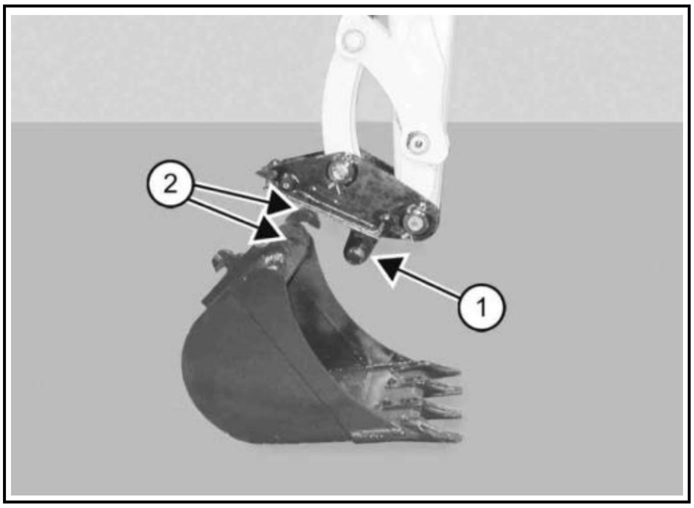

S35382a

- Inspect the bucket link (Item 1) [Figure 389] for wear or damage.

- Inspect the attachment pins (Item 2) [Figure 389] for wear or damage.

  Repair or replace damaged parts.

**Figure 390**




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 390].

  Repair or replace damaged parts.

## BUCKET TEETH

### Replacing Bucket Teeth

**⚠ WARNING**

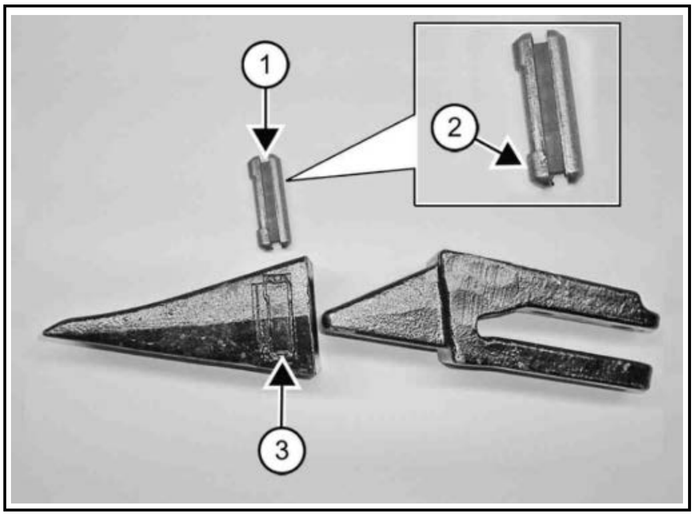
**IMPACT AND INJECTION HAZARDS**
**Flying debris and high pressure fluids can cause serious injury eye injury.**
**Wear safety glasses to prevent eye injury when any of the following conditions exist:**

- **High pressure fluids, springs or other stored energy components.**
- **Flying debris or loose material.**
- **Engine is running.**
- **Tools are being used.**

W-2505

1. Position the bucket so the bucket teeth are at a 30° angle up from the ground to better access the teeth.
2. Lower the boom until the bucket is fully on the ground.
3. Stop the engine and exit the excavator.
4. Inspect the pins and teeth of the bucket.
5. Remove any damaged teeth.

**Figure 391**




P69201d

6. Position a new tooth point on the shank and install a new retaining pin (Item 1) [Figure 391].

   a. Install the retaining pin (Item 1) as shown, with the notch (Item 2) [Figure 391] to the front, for proper fit and tooth retention.

   The correct orientation of the retaining pin is also shown on the sides of tooth points (Item 3) [Figure 391].

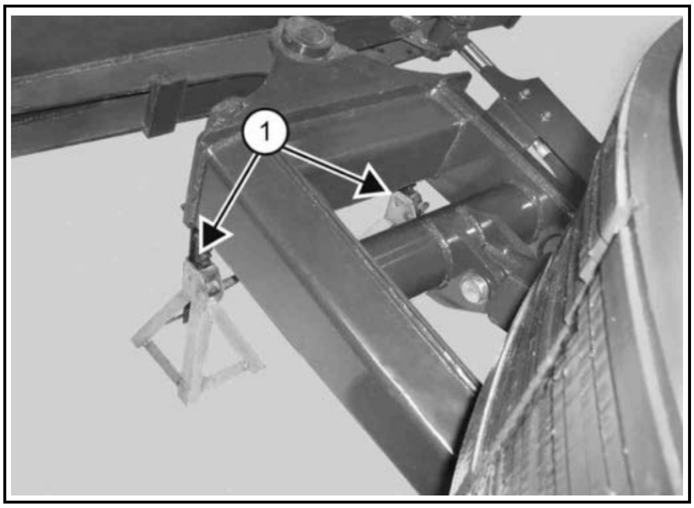
7. Push the retaining pin in until it is flush with the top of the point.

## CUTTING EDGE (ANGLE BLADE ONLY)

### Reversing Or Replacing The Angle Blade

The cutting edge is reversible and replaceable.

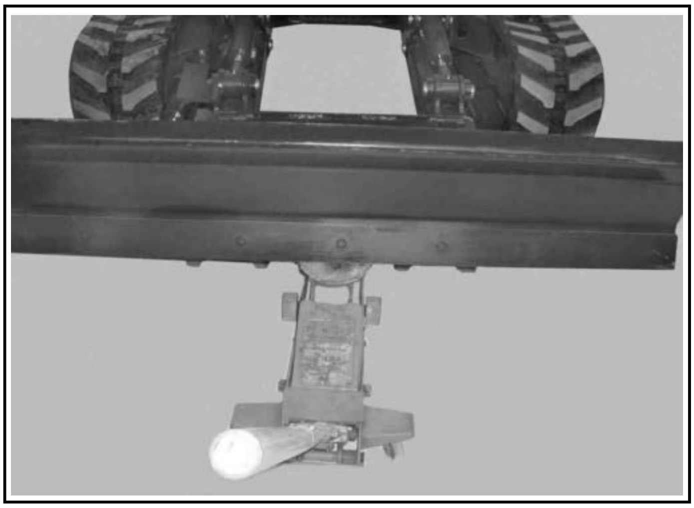
**Figure 392**




P92276a

1. Raise the blade fully and install jackstands (Item 1) [Figure 392] under the blade arms.

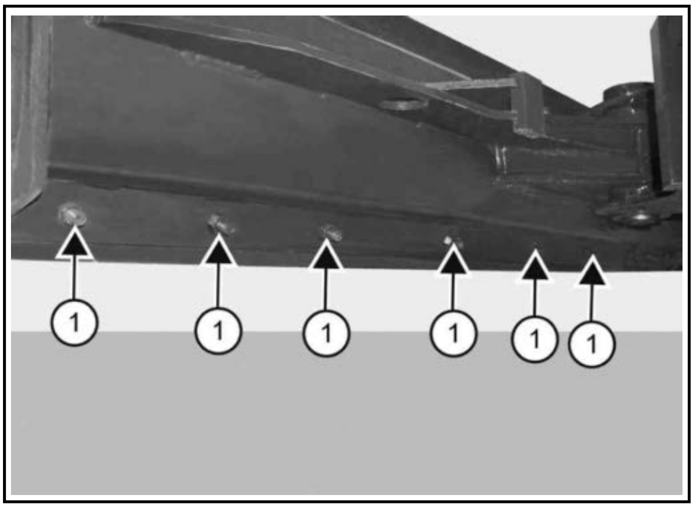
**Figure 393**



P72782a

2. Place a jack under the cutting edge [Figure 393].

**Figure 394**




P72780a

3. Remove the nuts and bolts (Item 1) [Figure 394] from the cutting edge.
4. Lower the jack and remove the cutting edge.
5. Reverse the cutting edge or replace it.
6. To install, tighten nuts to 125 N·m (90 ft-lb) torque.

## MACHINE LUBRICATION

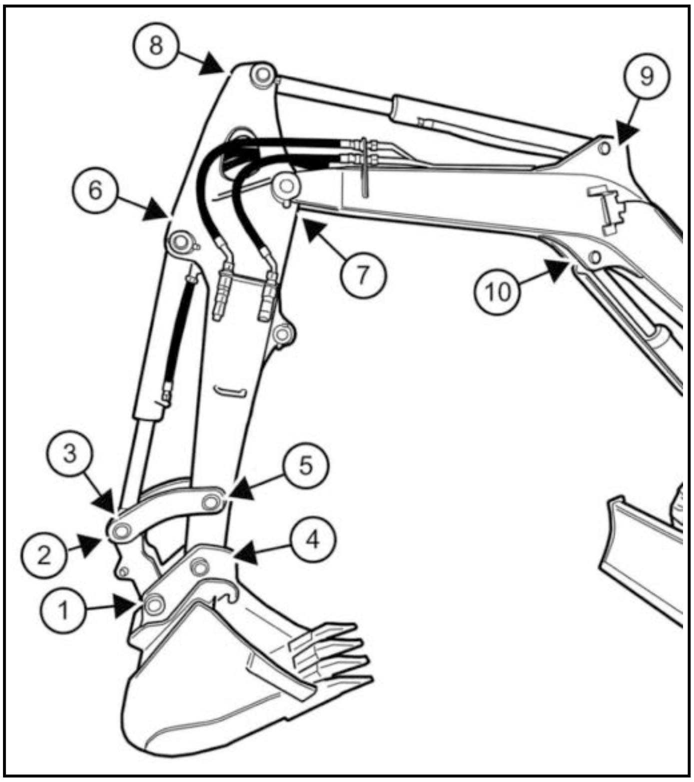
### Grease Fitting Locations

Always use a good quality lithium-based multipurpose grease when lubricating the machine. Apply the lubricant until extra grease shows.

### Lubricate Every 8 – 10 Hours

*Bucket, Arm, and Boom*

**Figure 395**

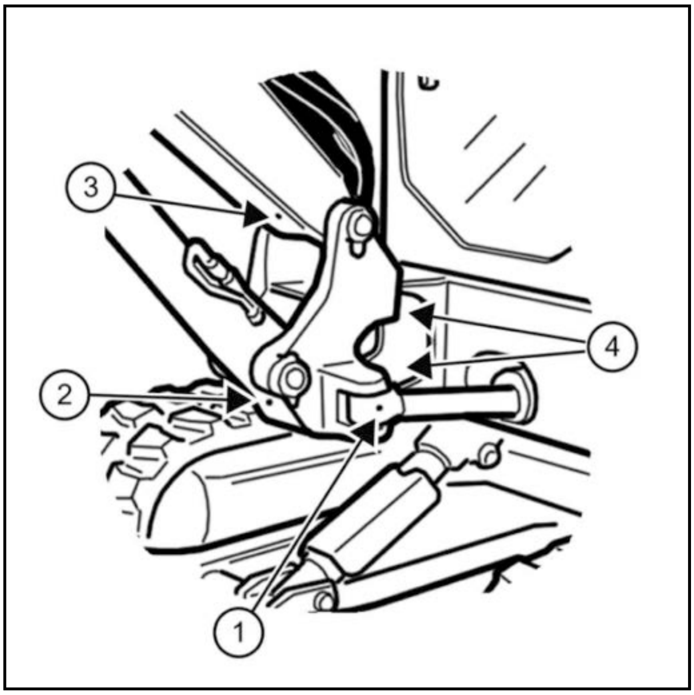



NA18172h

| REF | DESCRIPTION | QTY |
|---|---|---|
| 1 | Bucket Pivot | 3 |
| 2 | Bucket Link | 2 |
| 3 | Bucket Cylinder Rod End | 1 |
| 4 | Arm | 1 |
| 5 | Bucket Link Pin | 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 |

*Boom Base*

**Figure 396**

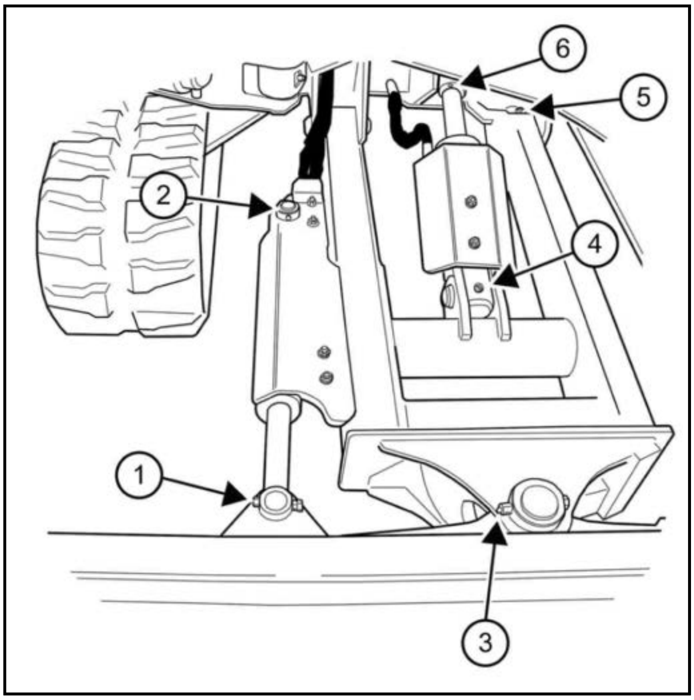


NA18172i

| 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 |

*Blade Cylinder*

**Figure 397**

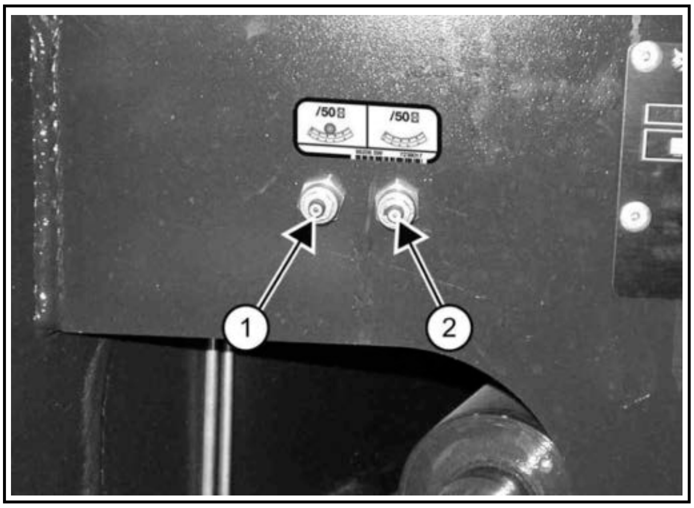


NA20141a

| 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 |

### Lubricate Every 50 Hours

**Figure 398**




P91982b

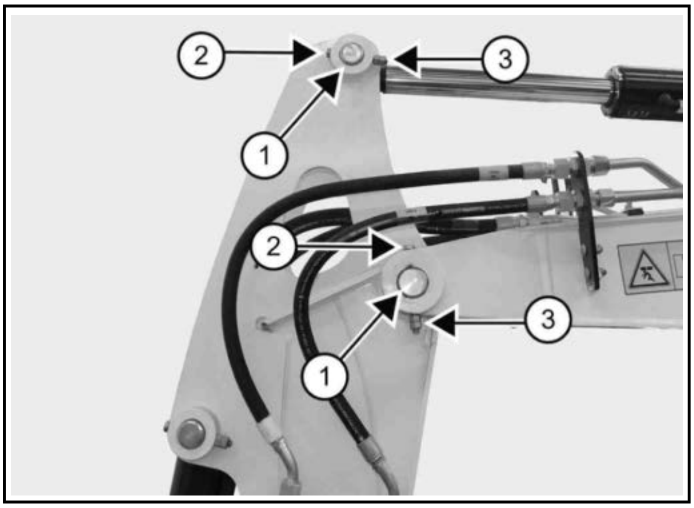
| REF | DESCRIPTION | QTY |
|---|---|---|
| 1 | Swing Pinion [A] | 1 |
| 2 | Swing Circle | 1 |

[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 slew pinion has been greased at four positions.

## PIVOT PINS

### Pivot Pin Inspection And Maintenance

**Figure 399**




P200155a

The pivots and cylinders (Item 1) have a large pin held in position with a bolt (Item 2) and a nut (Item 3) [Figure 399] securing the pin.

After the nut (Item 3) and bolt (Item 2) [Figure 399] are installed and nuts are tightened together, the bolt should be free to spin.

See your Bobcat dealer for replacement parts.

## STORAGE AND RETURN TO SERVICE

### Extended Storage Procedure

Sometimes it may be necessary to store your machine for an extended period of time. Below is a list of items to perform before storage.

- Thoroughly clean the machine including the engine compartment.
- Lubricate the machine.
- Replace worn or damaged parts.
- Drive the machine onto planks in a dry protected shelter.
- Lower the boom fully with the bucket flat on the ground.
- Put grease on any exposed cylinder rods.
- Put fuel stabiliser in the fuel tank and run the engine a few minutes to circulate the stabiliser to the pump and fuel injectors.

  **NOTE:** If biodiesel blend fuel has been used, perform the following:

  - Drain the fuel tank, refill with 100% petroleum diesel fuel, add fuel stabiliser and run the engine for at least 30 minutes.

- Drain and flush the cooling system. Refill with premixed coolant.
- Replace all fluids and filters (engine, hydraulic).
- Replace air cleaner, heater, and air conditioning filters.
- Put all controls in NEUTRAL position.
- Remove the battery. Charge the battery. Store the battery in a cool dry location above freezing temperatures and charge it periodically during storage.
- Cover the exhaust pipe opening.
- Tag the machine to indicate that it is in storage condition.
- Clean HVAC drain valves (if equipped).

### Returning Machine To Service

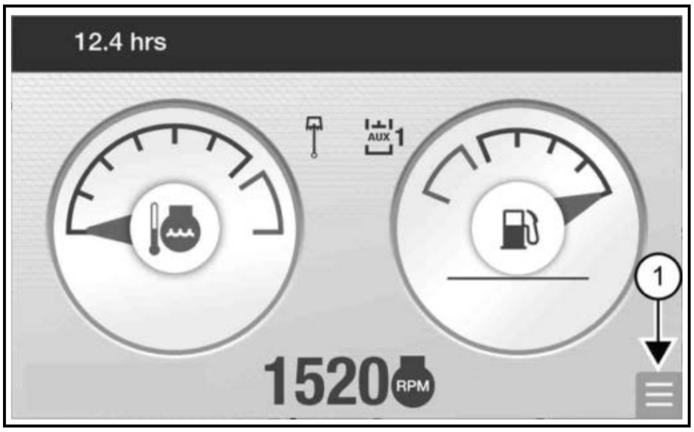
Follow this list of items to return the machine to service after it has been in extended storage.

- Check the engine and hydraulic oil levels.
- Check coolant level.
- Install a fully charged battery.
- Remove grease from exposed cylinder rods.
- Check all belt tensions.
- Be sure all shields and guards are in place.
- Lubricate the machine.
- Remove cover from exhaust pipe opening.
- Start the engine and let run for a few minutes while observing the instrument panels and systems for correct operation.
- Drive machine off the planks.
- Operate machine, check for correct function.
- Stop the engine and check for leaks. Repair as needed.

## NAVIGATION (STANDARD DISPLAY)

### Opening Navigation Bar

**Figure 400**




NA3773a

1. Select the navigation handle (Item 1) [Figure 400] to open the navigation bar.

2. Select one of the following screens that appear on the navigation bar:

    1. **GAUGES** screen

    2. **CAMERA** screen
    (See Operating Rear View Camera on Page 42)

    3. **VITALS** screen
    (See Vitals (Standard Display) on Page 195)

    4. **SERVICE** screen
    (See Service (Standard Display) on Page 196)

    5. **DEPTH CHECK** screen (if equipped)
    (See Depth Check (Standard Display) on Page 112)

    6. **SETTINGS** screen
    (See Settings (Standard Display) on Page 197)

### Active Shortcuts

**Figure 401**


NA3705

The following icons can appear in the navigation handle position [Figure 401]. Selecting an icon will take you directly to the indicated screen.

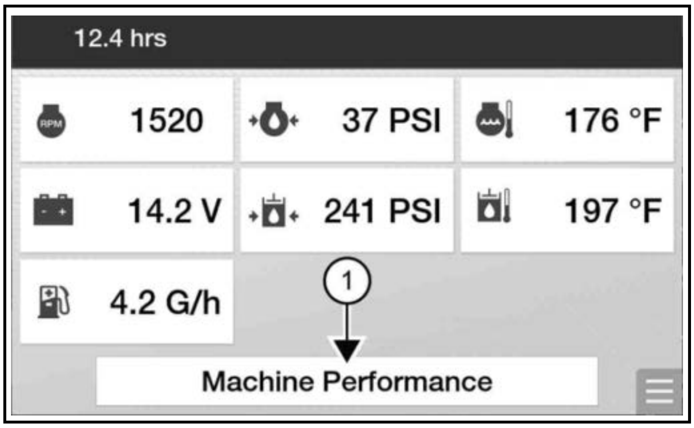
| ICON | DESCRIPTION | FUNCTION |
|---|---|---|
|  | Navigation Handle | Opens and closes the navigation bar. |
|  | Service Due | Opens **SERVICE** screen. |
|  | Software Update | Opens **SOFTWARE** screen. |
|  | Machine Derate | Opens **MACHINE PERFORMANCE** screen. |
|  | Warning | Opens **SERVICE CODES** screen. |

## VITALS (STANDARD DISPLAY)

### Accessing Vital Detail And Machine Performance

1. Select **[NAVIGATION HANDLE]→ [VITALS]**.

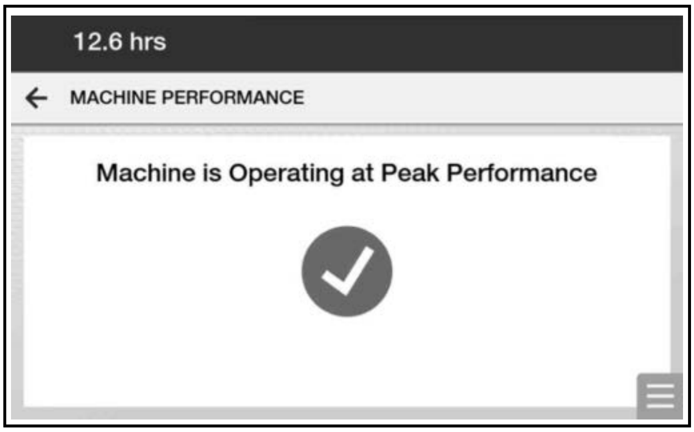
**Figure 402**




NA3752b

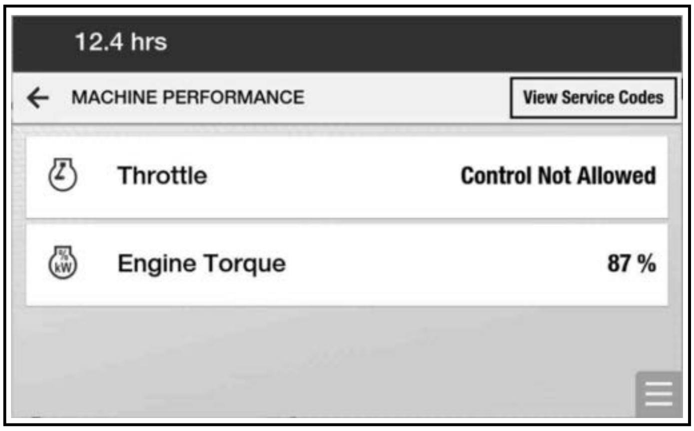
2. On the **VITAL DETAIL** screen [Figure 402], view a digital readout of the gauges. The screen provides real-time monitoring of:
   - Engine Speed (RPM)
   - Engine Oil Pressure
   - Engine Coolant Temperature
   - System Voltage
   - Hydraulic Fluid Pressure
   - Hydraulic Fluid Temperature
   - Fuel Usage (G/h or L/h)
3. Select **[MACHINE PERFORMANCE]** (Item 1) [Figure 402] to view any limitations or restrictions that prevent machine damage.

**Figure 403**




NA3702

**Figure 404**




NA3785

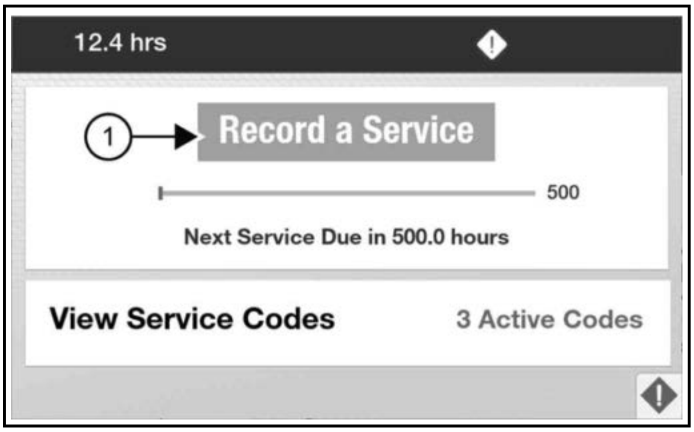
Examples of machine performance screens are shown in [Figure 403] and [Figure 404].

## SERVICE (STANDARD DISPLAY)

### Recording A Service

1. Select **[NAVIGATION HANDLE]→ [SERVICE]**.

**Figure 405**



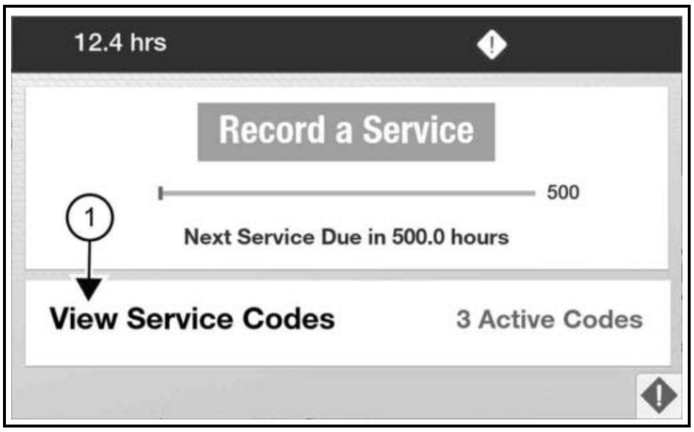

NA3748b

2. Select **[RECORD A SERVICE]** (Item 1) [Figure 405] to record the service as completed.

### Viewing Service Codes

1. Select the **[NAVIGATION HANDLE]→ [SERVICE]**.

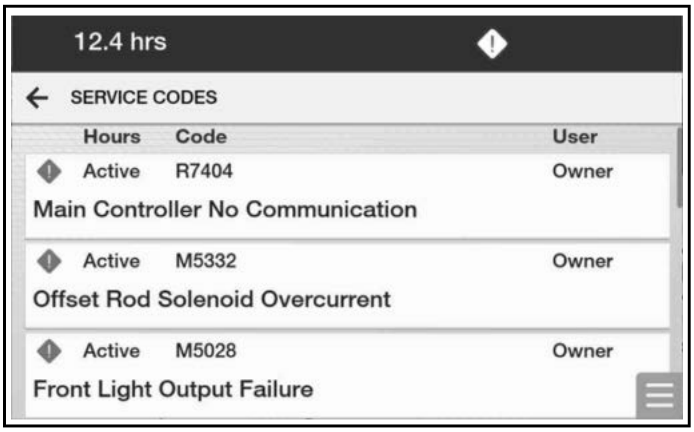
**Figure 406**




NA3748d

2. Select **[VIEW SERVICE CODES]** (Item 1) [Figure 406].

**Figure 407**




NA3733

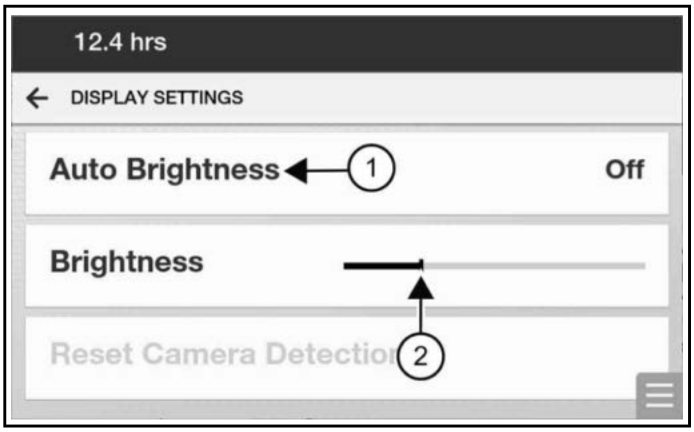
3. Scroll down if necessary to view service codes [Figure 407].

## SETTINGS (STANDARD DISPLAY)

### Adjusting Display Brightness

1. Select **[NAVIGATION HANDLE]→ [SETTINGS]→ [DISPLAY SETTINGS]**.

**Figure 408**




NA3731b

2. Select **[AUTO BRIGHTNESS]** (Item 1) [Figure 408] to turn it on / off. When on, the brightness will automatically adjust according to the ambient light.

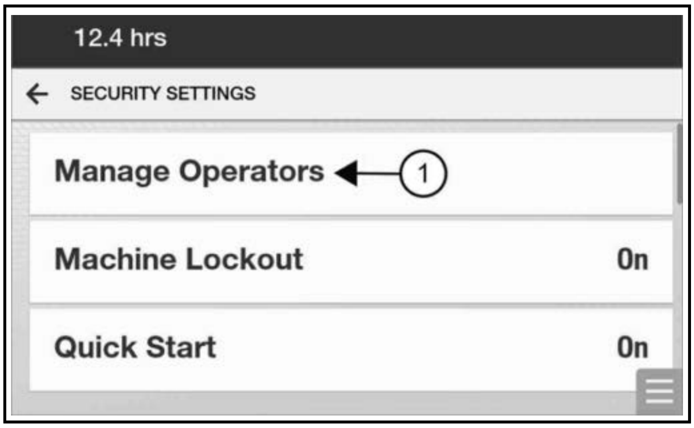
   OR

   To adjust the display brightness, move the slider (Item 2) [Figure 408] 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.

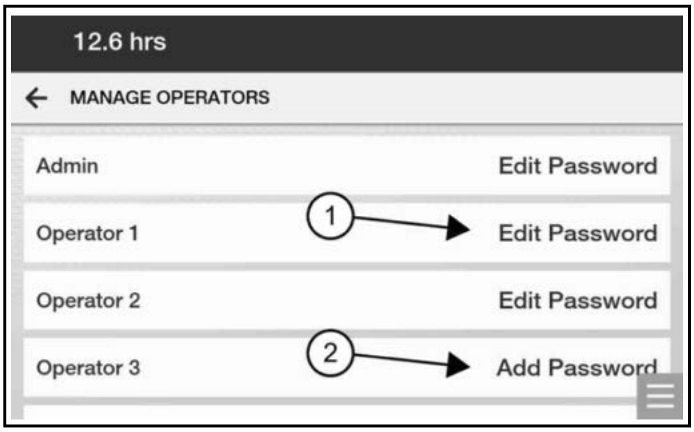
**Figure 409**




NA3747b

3. Select **[MANAGE OPERATORS]** (Item 1) [Figure 409].

**Figure 410**




NA3717A

4. Select **[EDIT PASSWORD]** (Item 1) [Figure 410] to change a password or remove an operator.

   OR

   Select **[ADD PASSWORD]** (Item 2) [Figure 410] 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.
- 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 Quick Start Description on Page 77)

### Password Description

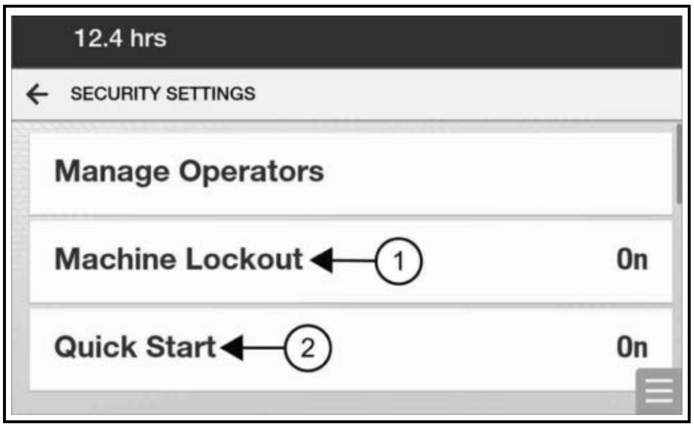
**Owner Password:** Allows for full use of the machine and to set up the display security settings. There is only one owner password. The owner password must be used to change the owner or operator passwords. If this password is lost, contact your Bobcat dealer to unlock the machine.

**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 411**




NA3747d

2. Select **[MACHINE LOCKOUT]** (Item 1) [Figure 411] to turn on / off.

3. Select **[QUICK START]** (Item 2) [Figure 411] to turn on / off.

   Quick Start is always enabled when the Machine Lockout is off.

**Setting The System Language**

1. Select **[NAVIGATION HANDLE]→ [SETTINGS]→ [LANGUAGE SETTINGS]**.

**Figure 412**


NA3718

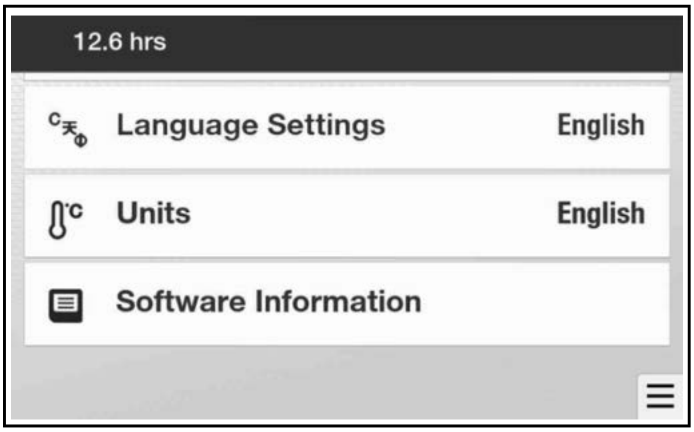
2. On the **SET LANGUAGE** screen, scroll through the languages and select the desired language.

   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 413**



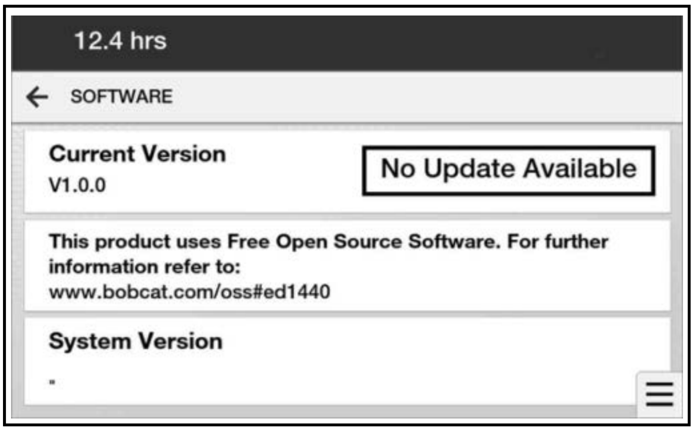

NA3678

2. Scroll down and select **[UNITS]** (Item 1) [Figure 413] to toggle between English and metric units.

**Software Version**

1. Select **[NAVIGATION HANDLE]→ [SETTINGS]→ [SOFTWARE INFORMATION]**.

**Figure 414**




NA3751

2. Use the **SOFTWARE** screen to find your software version and check for updates.

   To update the software, see your Bobcat dealer.

## GAUGES (TOUCH DISPLAY)

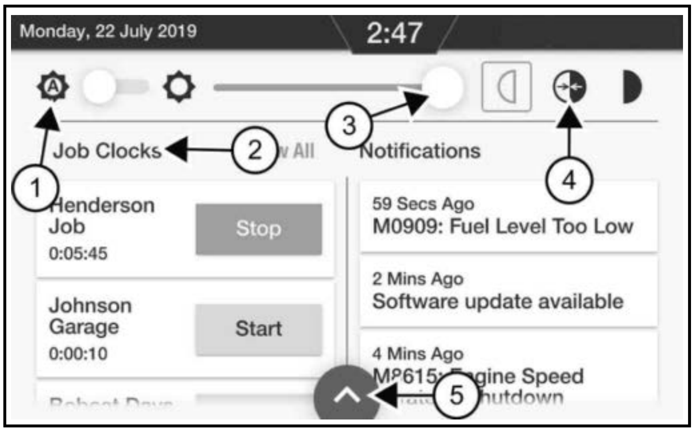
### Notification Drawer

**Figure 415**


NA3384r

1. Press the clock (Item 1) [Figure 415] to open the notification drawer.

**Figure 416**




C132984b

2. Use the notification drawer to gain quick access to:
   - Auto Brightness (Item 1)
   - Job Clocks (Item 2)
   - Screen Brightness (Item 3)
   - Night Mode Adjustment (Item 4)
3. Press the up arrow (Item 5) [Figure 416] to close the drawer.

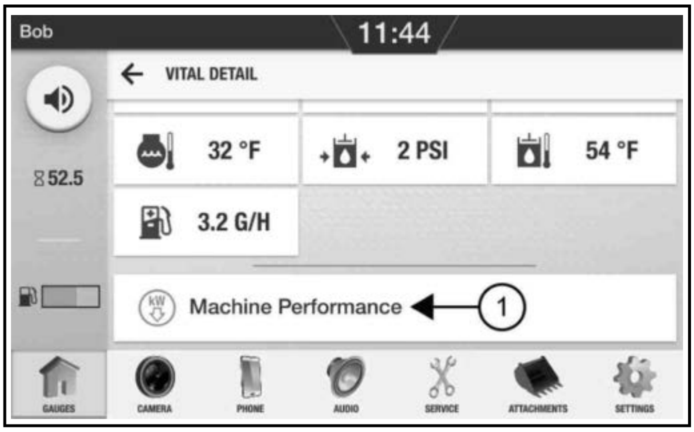
### Accessing Vital Detail And Machine Performance

**Figure 417**


NA3384q

1. Select the vitals icon (Item 1) to navigate to the **VITAL DETAIL** screen.

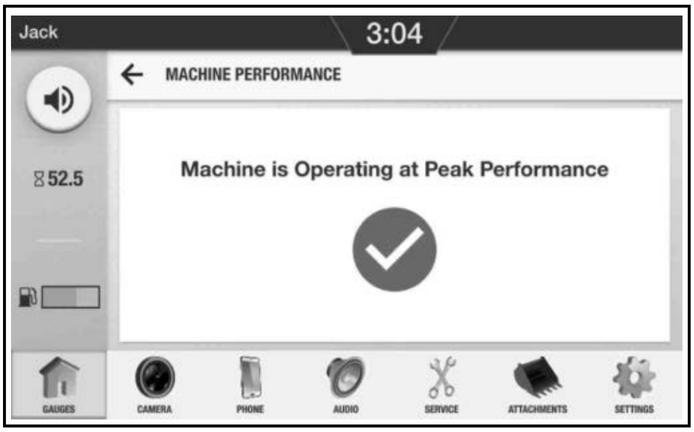
**Figure 418**




NA3762b

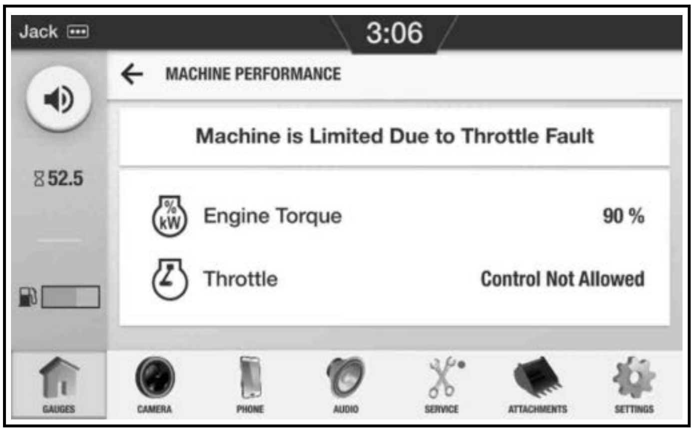
2. On the **VITAL DETAIL** screen, view a digital readout of the gauges. The screen provides real-time monitoring of:
   - Engine Speed (RPM)
   - Engine Oil Pressure
   - Engine Coolant Temperature
   - System Voltage
   - Hydraulic Fluid Pressure
   - Hydraulic Fluid Temperature
   - Fuel Usage (G/h or L/h)
3. Select **[MACHINE PERFORMANCE]** (Item 1) [Figure 418] to view any limitations or restrictions that prevent machine damage.

**Figure 419**




NA3786

**Figure 420**




NA3787

Examples of machine performance screens are shown in [Figure 419] and [Figure 420].

## CAMERA (TOUCH DISPLAY)

### Operating Rear View Camera

**Figure 421**


NA3384j

**Figure 422**

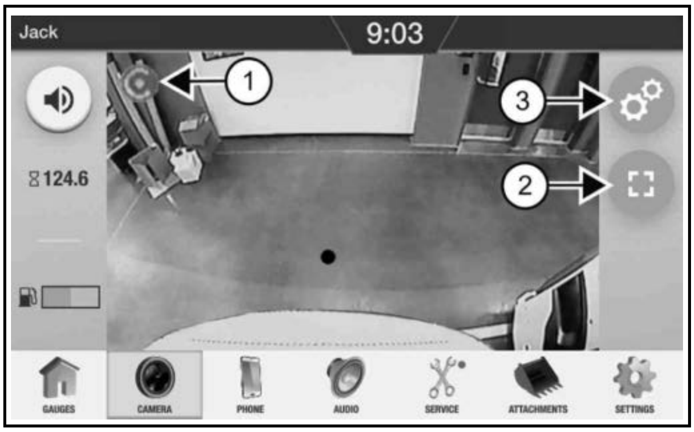

C206172a

- Select **[CAMERA]** (Item 1) [Figure 421] to access the **CAMERA** screen.

  OR

  Press the right joystick button (Item 1) [Figure 422] to toggle between the **CAMERA** screen and the current screen.

**Figure 423**




NA3428b

The rotating spinner icon (Item 1) [Figure 423] indicates you are viewing a live broadcast from the camera.

- Select the **[FULL SCREEN]** icon (Item 2) [Figure 423] to make the camera view full screen. Touch anywhere on the screen to go back to the view shown.

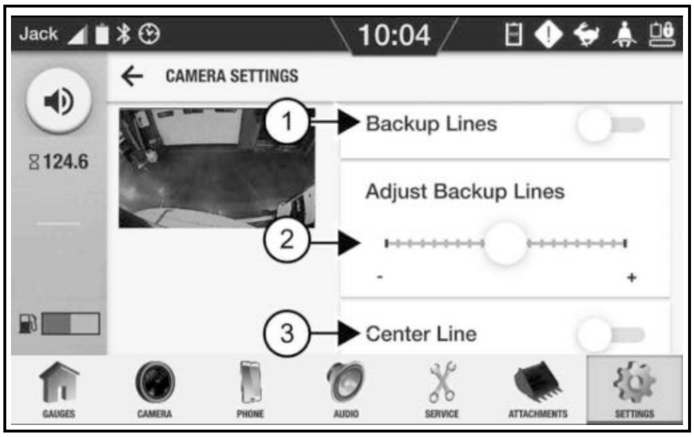
- Select the **[SETTINGS]** icon (Item 3) [Figure 423] to go to the **CAMERA SETTINGS** screen.

(See Adjusting Rear View Camera Settings on Page 201)

### Adjusting Rear View Camera Settings

Select the **[SETTINGS]** icon on the **CAMERA** screen (Item 3) [Figure 423] to go to the **CAMERA SETTINGS** screen.

**Figure 424**




P132904a

- Select **[BACKUP LINES]** (Item 1) [Figure 424] to turn the lines on / off.

- Use the slider (Item 2) [Figure 424] to adjust the Backup Lines in or out.

- Select **[CENTER LINE]** (Item 3) [Figure 424] 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 425**


NA3384i

1. Select **[SERVICE]** (Item 1) [Figure 425] and then navigate to **[VIEW SERVICE CODES]**.

**Figure 426**


P132935a

2. Select a code (Item 1) [Figure 426] to go to the **SERVICE CODE DETAILS** screen.

**Figure 427**


P132977a

3. On the **SERVICE CODE DETAIL** screen, you can select **[CALL DEALER]** (Item 1) [Figure 427] (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.

See the full list of service codes at the end of this chapter. (See Diagnostic Service Codes on Page 215)

**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 428**


NA3384i

1. Select **[SERVICE]** (Item 1) [Figure 428].

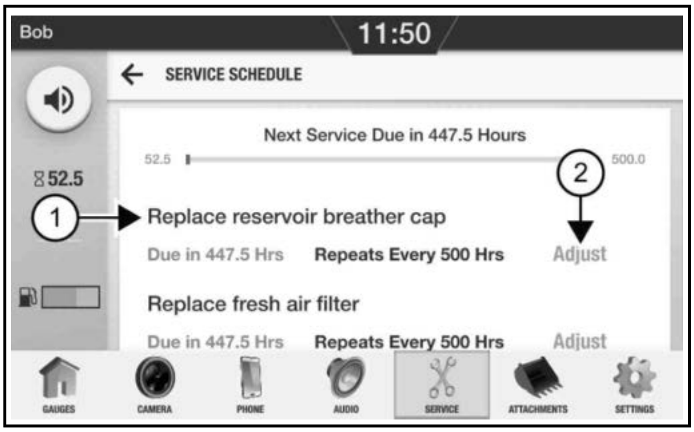
**Figure 429**


C132961b

2. View the hours remaining until next scheduled service is due (Item 1) [Figure 429] and any overdue service on the service screen.

3. Select **[VIEW SERVICE SCHEDULE]** (Item 2) [Figure 429].

**Figure 430**




NA3759b

4. On the **SERVICE SCHEDULE** screen, view the next scheduled maintenance (Item 1) [Figure 430].

5. To make the maintenance interval more frequent, select **[ADJUST]** (Item 2) [Figure 430].

   a. Select a new service interval and select **[ACCEPT]**.

**Recording A Service**

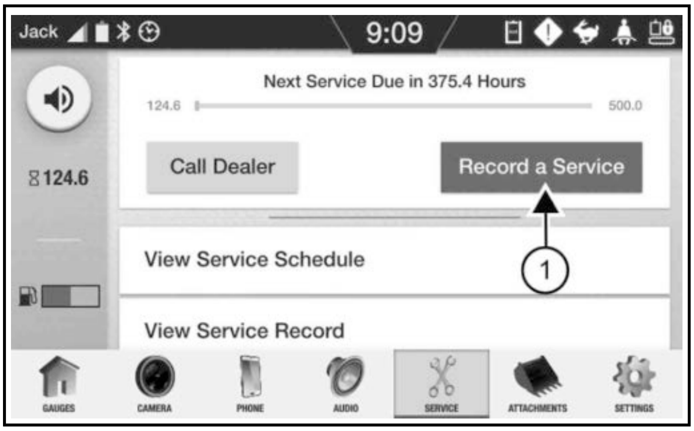
After a service has been completed, you can create a record of what was done.

**Figure 431**


NA3384i

1. Select **[SERVICE]** (Item 1) [Figure 431].

**Figure 432**




P132961c

2. Select **[RECORD A SERVICE]** (Item 1) [Figure 432].

**Figure 433**

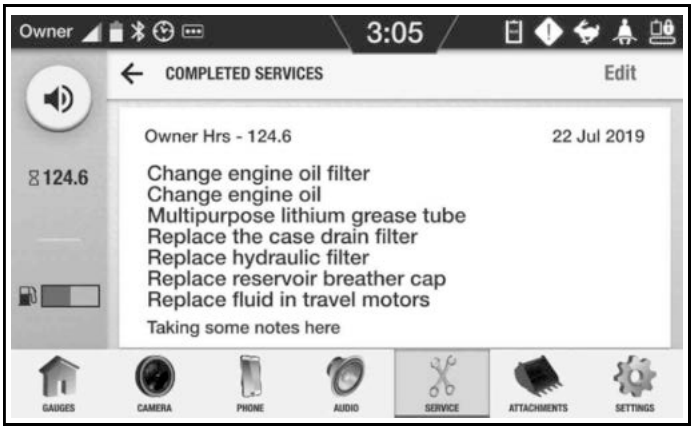

P132988a

3. Select **[+ADD SERVICE ITEM]** (Item 1) [Figure 433] to add additional items that were performed.

4. Select **[ADD NOTES]** (Item 2) [Figure 433] to add notes to the record.

5. Select **[RECORD SERVICE]** (Item 3) [Figure 433] to save the service record.

**Figure 434**




P132990

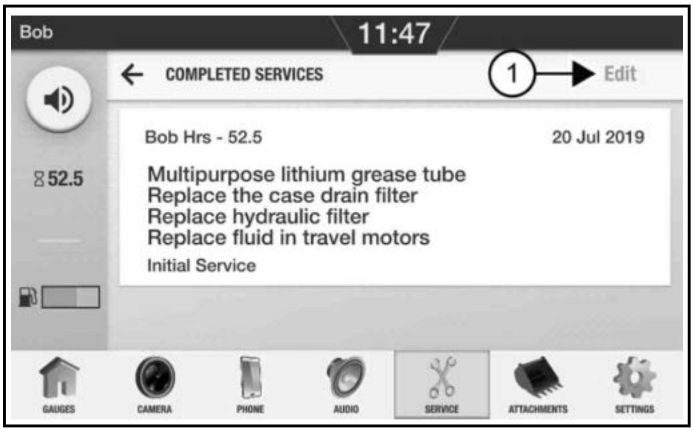
The Service Record will now list all the items that were marked as completed [Figure 434].

**Removing Service Records**

You must be logged in as the owner to complete this task.

1. Select **[SERVICE]→ [VIEW SERVICE RECORD]**.

**Figure 435**

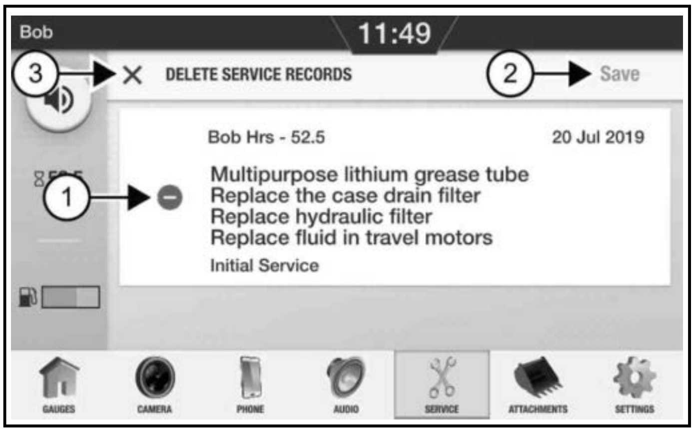



NA3758b

2. Select **[EDIT]** (Item 1) [Figure 435] to remove a service record.

3. After entering the password, select the **[ENTER]** icon.

**Figure 436**




NA3757b

4. Select the **[DELETE]** icon (Item 1) [Figure 436] to remove a service record.
5. Select **[SAVE]** (Item 2) [Figure 436] to confirm.

   OR

   Select **[X]** (Item 3) [Figure 436] 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.

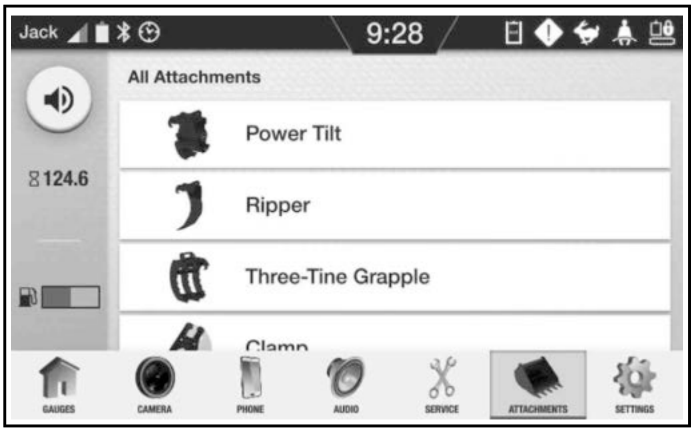
Always read and understand your Attachment Operator & Maintenance Manual before using attachments.

**Figure 437**


NA3384h

1. Select **[ATTACHMENTS]** (Item 1) [Figure 437].

**Figure 438**




P132992

2. Select one of the available attachments [Figure 438].

**Figure 439**


P132968a

The basic joystick information is shown on the tooltips screens [Figure 439].

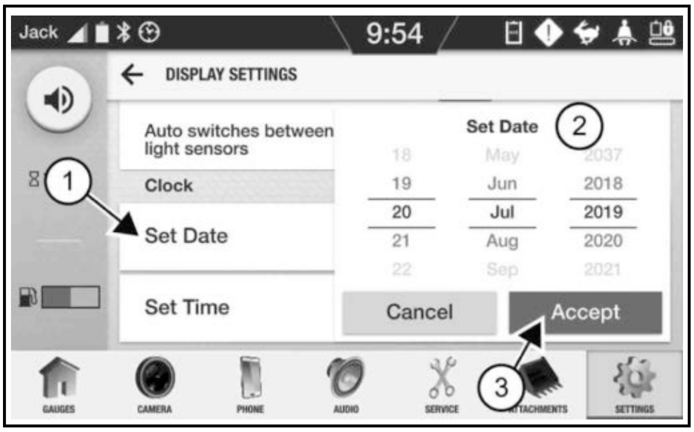
- Select the arrows (Item 1) [Figure 439] to access additional information.
- Scroll down to find the tooltips.

## SETTINGS (TOUCH DISPLAY)

### Setting Date And Time

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

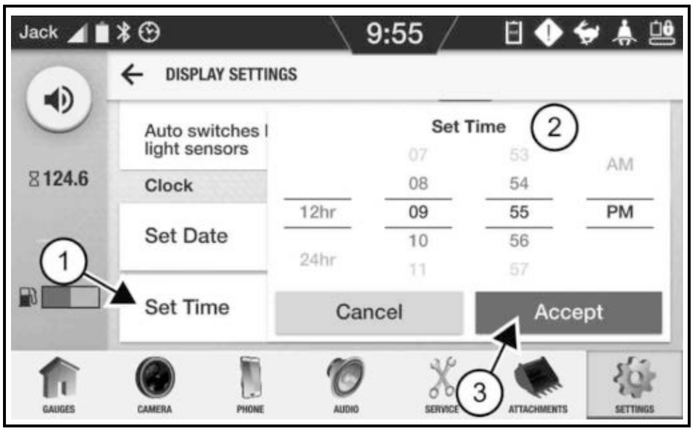
**Figure 440**




P132938a

2. Select **[SET DATE]** (Item 1) [Figure 440].
   a. Scroll to set the day, month, and year (Item 2) [Figure 440].
   b. Select **[ACCEPT]** (Item 3) [Figure 440] to save the change.

**Figure 441**



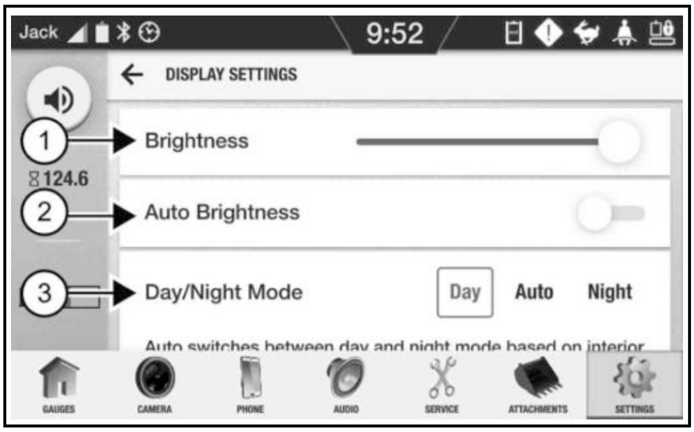

P132939a

3. Select **[SET TIME]** (Item 1) [Figure 441].
   a. Scroll to choose between a 12 hr or 24 hr clock (Item 2) [Figure 441].
   b. Scroll to set hour, minute, and AM / PM (Item 2) [Figure 441].
   c. Select **[ACCEPT]** (Item 3) [Figure 441] to save the change.

### Adjusting Display Brightness

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

**Figure 442**




P132942a

2. To adjust the display brightness, move the slider (Item 1) [Figure 442] to the left to dim, to the right to brighten.

   OR

   Select **[AUTO BRIGHTNESS]** (Item 2) [Figure 442] to turn it on / off. When on, the brightness will automatically adjust according to the ambient light.

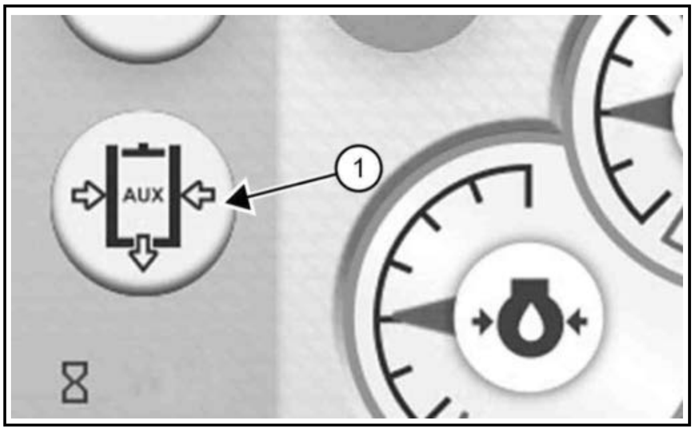
   OR

   Select **[DAY]**, **[AUTO]**, or **[NIGHT]** (Item 3) [Figure 442] 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 443**




C132900e

The Auxiliary Pressure Release icon (Item 1) [Figure 443] 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 443].

   OR

   Select **[SETTINGS]→ [MACHINE SETTINGS]→ [AUXILIARY PRESSURE RELEASE]**.

   Either will bring you to the **AUXILIARY PRESSURE RELEASE** screen.

**Figure 444**


P132896

5. To release auxiliary pressure, press the AUX button on the jog shuttle as shown on the screen [Figure 444].

**Figure 445**


P132897a

The spinner (Item 1) [Figure 445] 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.

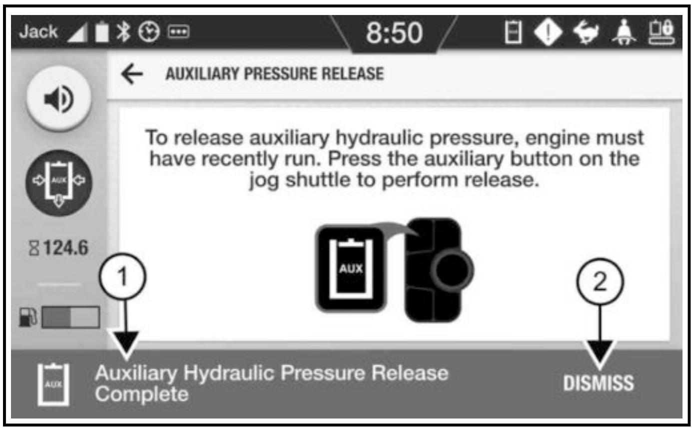
Possible reasons for a failure to release auxiliary pressure include:

- 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 446**

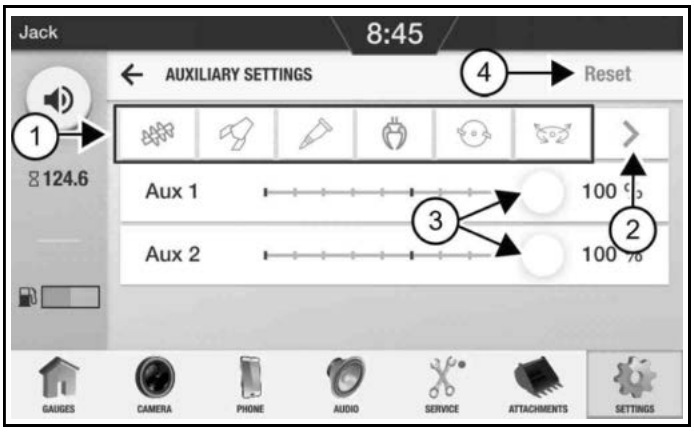



When the process is completed, a notification (Item 1) will appear indicating that the auxiliary pressure has been released. Press **[DISMISS]** (Item 2) [Figure 446].

**Setting The Auxiliary Hydraulics Flow**

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

**Figure 447**




C132895b

The **AUXILIARY SETTINGS** screen shows six commonly used attachments (Item 1) [Figure 447].

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 447].

   OR

   Press the arrow (Item 2) [Figure 447] icon to select a custom-set hydraulic flow icon. Adjust the hydraulic flow by moving the slider (Item 3) [Figure 447] from 0% flow (off) to 100% flow in 10% increments.

3. If necessary, press **[RESET]** (Item 4) [Figure 447] to revert the selected flow setting back to the original factory setting.

**NOTE:** Operators can set and save their own flows for the pre-set and custom-set flows.

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

### Activating Auto Idle

**Figure 448**

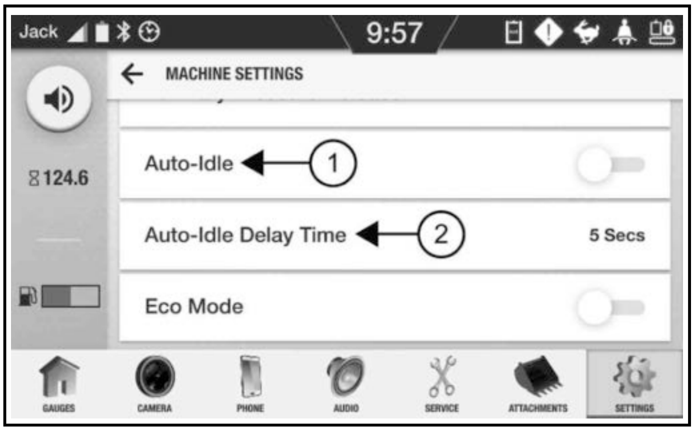

NA3384k

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

   OR

   Select the **[MACHINE SETTINGS]** icon (Item 1) [Figure 448].

**Figure 449**

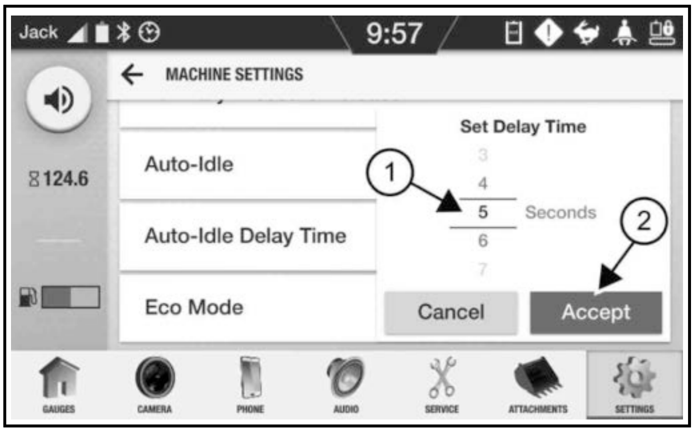



P132943b

2. Select **[AUTO-IDLE]** (Item 1) [Figure 449] to turn it on / off.

3. Select **[AUTO-IDLE DELAY TIME]** (Item 2) [Figure 449] to set the delay time.

**Figure 450**




P132944a

4. Swipe up or down (Item 1) [Figure 450] to select the auto-idle delay time to best suit the operating conditions.

5. Select **[ACCEPT]** (Item 2) [Figure 450] to set the new time delay setting.

### Password Description

**Owner Password:** Allows for full use of the machine and to set up the display security settings. There is only one owner password. The owner password must be used to change the owner or operator passwords. If this password is lost, contact your Bobcat dealer to unlock the machine.

**Operator Passwords:** Allows starting and operating of the machine. The owner password is needed to change an operator password. There can be multiple operator passwords.

### Changing The Owner And Operator Passwords

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

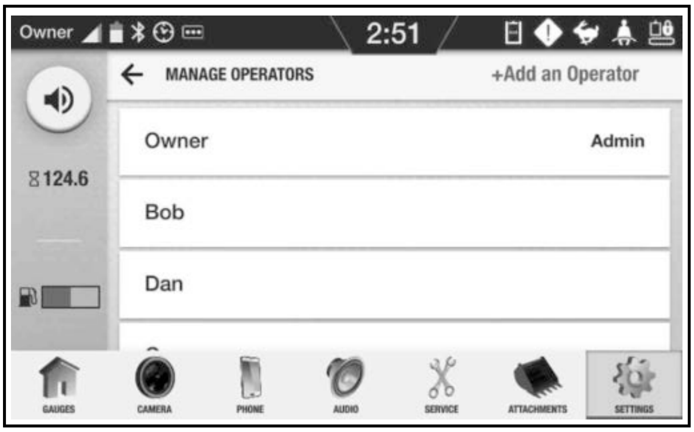
2. Enter the password if prompted.

**Figure 451**


P132953e

3. Select **[MANAGE OPERATORS]** (Item 1) [Figure 451].

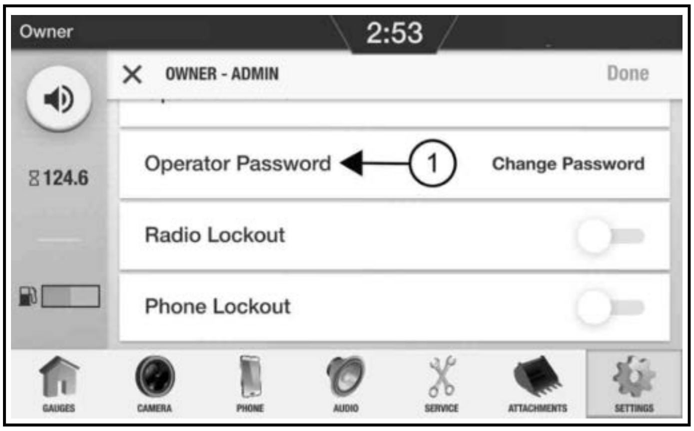
**Figure 452**




P132958a

4. Select the owner or an operator [Figure 452].

**Figure 453**




C132959a

5. Select **[OPERATOR PASSWORD]** (Item 1) [Figure 453].

6. Enter a new password and select **[ENTER]**.

**Adding An Operator**

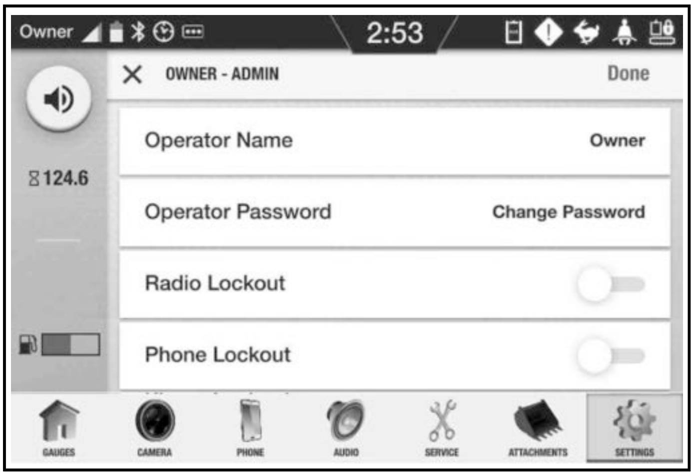
1. Select **[SETTINGS]→ [SECURITY SETTINGS]→ [MANAGE OPERATORS]**.

**Figure 454**


P132958b

2. Select **[+ADD AN OPERATOR]** (Item 1) [Figure 454].

**Figure 455**




P132959a

3. Select **[OPERATOR NAME]** and enter the new operator name.

4. Select **[OPERATOR PASSWORD]** and assign the operator password.

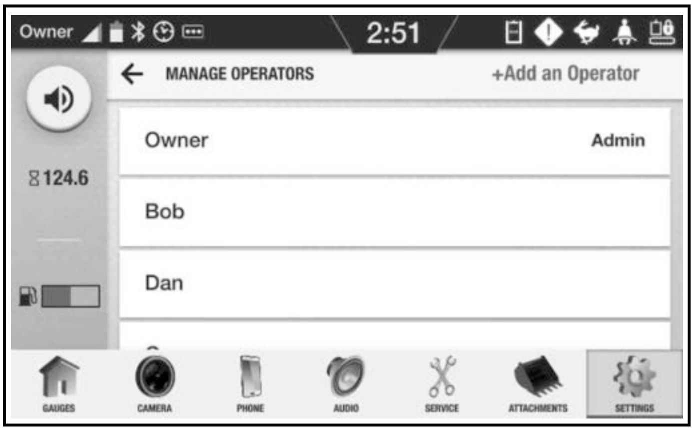
5. Select **[RADIO LOCKOUT]** and / or **[PHONE LOCKOUT]** if you want to prohibit the operator from using these functions.

6. Select **[DONE]**.

**Removing An Operator**

1. Select **[SETTINGS]→ [SECURITY SETTINGS]→ [MANAGE OPERATORS]**.

**Figure 456**




P132958a

2. Select an operator [Figure 456].

**Figure 457**


P132985a

3. Scroll down and select **[DELETE OPERATOR]** (Item 1) [Figure 457].

### 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.
- 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 77)

### Enabling Machine Lockout and Quick Start

1. Select **[SETTINGS]→ [SECURITY SETTINGS]**.
2. Select **[MACHINE LOCKOUT]** (Item 1) [Figure 458] to turn on / off.

**Figure 458**


C132953b

3. Select **[QUICK START]** (Item 2) [Figure 458] to turn on / off.

   Quick Start is always enabled when Machine Lockout is off.

### Auto Lock Time At Key OFF

The Auto Lock Time is the amount of time the operator has to key ON the machine without needing to re-enter a password.

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

**Figure 459**


P132953c

2. Select **[AUTO LOCK TIME AT KEY OFF]** (Item 1) [Figure 459].

**Figure 460**


C132955

3. Swipe up or down to set the Auto Lock Time (Item 1) [Figure 460].

4. Select **[ACCEPT]** (Item 2) [Figure 460].

**System Sleep Time At Key OFF**

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.

The sleep time is factory set and can be changed using the owner password.

Setting the sleep time to a shorter time will conserve the battery.

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

**Figure 461**


P132953d

2. Select **[SYSTEM SLEEP TIME AT KEY OFF]** (Item 1) [Figure 461].

**Figure 462**


C132954a

3. Swipe up or down to set the sleep time (Item 1) [Figure 462].

4. Select **[ACCEPT]** (Item 2) [Figure 462].

**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 463**

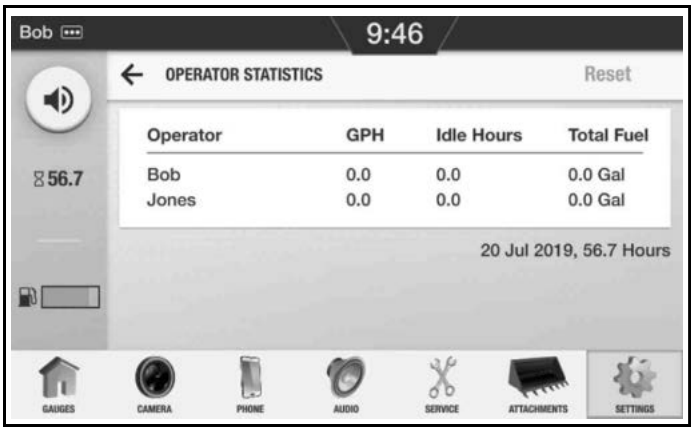

C132953c

2. Select **[PASSWORD ERROR LOCKOUT]** (Item 1) [Figure 463] to turn on / off.

**Accessing Operator Statistics**

1. Select **[SETTINGS]→ [OPERATOR STATISTICS]**.

**Figure 464**




NA3764

2. Use the **OPERATOR STATISTICS** screen [Figure 464] to view:
   - Operator Name
   - Fuel Used Per Hour (GPH or LPH)
   - Idle Hours
   - Total Fuel

**Using The Job Clock**

**Figure 465**

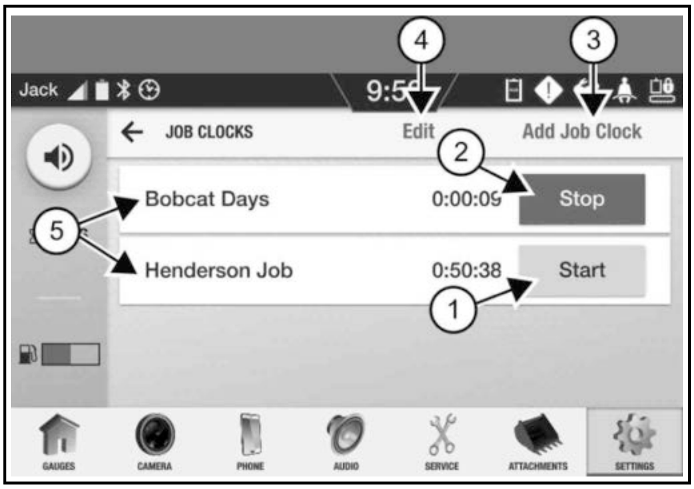

NA3384m

1. To open the **JOB CLOCK** screen, select the clock icon (Item 1) [Figure 465] and then **[VIEW ALL]**.

   OR

   Select **[SETTINGS]** (Item 2) [Figure 465] and then **[JOB CLOCKS]**.

**Figure 466**




P132946a

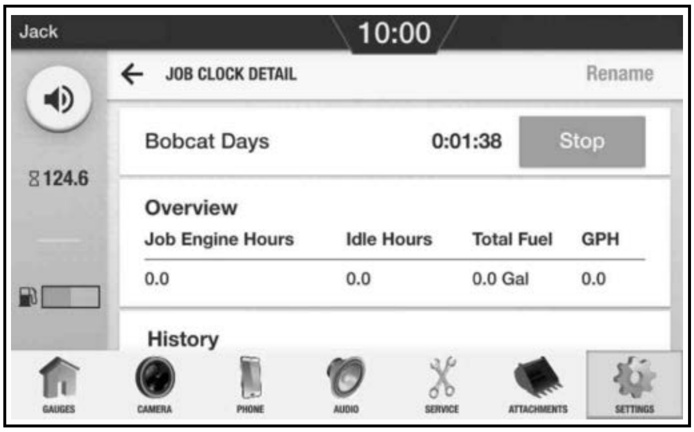
2. To start an existing job clock, select **[START]** (Item 1) [Figure 466].
3. Select **[STOP]** (Item 2) [Figure 466] to stop the job clock.

   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 466].
   a. Type in the new job clock name and select **[ENTER]**.
5. To delete an existing job clock, select **[EDIT]** (Item 4) [Figure 466].
   a. Select the delete icon by the job clock you want to delete.
   b. Select **[SAVE]**.
6. Select a job clock (Item 5) [Figure 466] to view the associated **JOB CLOCK DETAIL** screen [Figure 467].

**Figure 467**




C132948

The **JOB CLOCK DETAIL** [Figure 467] screen will show:

- Job Name
- Job Total Time
- Job Engine Hours
- Job Engine Idle Hours
- Total Fuel
- Fuel Used Per Hour (GPH or LPH)
- History by user

**Setting The System Language**

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

**Figure 468**


P132941a

2. On the **SET LANGUAGE** screen, scroll through the languages and select the desired language.

   A check mark (Item 1) [Figure 468] will appear when accepted.

**Switching Between English / Metric Units**

1. Select **[SETTINGS]**.

**Figure 469**


P132940a

2. Scroll down and select **[UNITS]** (Item 1) [Figure 469] 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 470**


C132951a

2. Use the **DEALER** screen to find your dealer information. You can call your dealer if a phone is paired (Item 1) [Figure 470].

**Software Version**

1. Select **[SETTINGS]→ [SOFTWARE]**.

**Figure 471**


P132952

2. Use the **SOFTWARE** screen to find your software version and check for updates.

   To update the software, see your Bobcat dealer.

## DIAGNOSTIC SERVICE CODES

### Service Codes List

| CODE | DESCRIPTION |
|---|---|
| H0104 | Boom Angle Sensor No Communication |
| H0204 | Arm Angle Sensor No Communication |
| H0304 | Bucket Angle Sensor No Communication |
| H0405 | Angle Sensor Supply Short To Battery |
| H0406 | Angle Sensor Supply Short To Ground |
| H0407 | Angle Sensor Supply Open Circuit |
| H0705 | Aux 4 Base Short to Battery |
| H0706 | Aux 4 Base Short to Ground |
| H0707 | Aux 4 Base Open Circuit |
| H0732 | Aux 4 Base Overcurrent |
| H0805 | Aux 4 Rod Short to Battery |
| H0806 | Aux 4 Rod Short to Ground |
| H0807 | Aux 4 Rod Open Circuit |
| H0832 | Aux 4 Rod Overcurrent |
| H0905 | Direct To Tank Short to Battery |
| H0906 | Direct to Tank Short to Ground |
| H0907 | Direct to Tank Open Circuit |
| H0932 | Direct to Tank Overcurrent |
| H2521 | Angle Blade Control Switch Out Of Range High |
| H2522 | Angle Blade Control Switch Out Of Range Low |
| H2524 | Angle Blade Control Switch Out Of Neutral |
| H2605 | Angle Blade Base Solenoid Short To Battery |
| H2606 | Angle Blade Base Solenoid Short To Ground |
| H2607 | Angle Blade Base Solenoid Open Circuit |
| H2632 | Angle Blade Base Solenoid Overcurrent |
| H2705 | Angle Blade Rod Solenoid Short To Battery |
| H2706 | Angle Blade Rod Solenoid Short To Ground |
| H2707 | Angle Blade Rod Solenoid Open Circuit |
| H2732 | Angle Blade Rod Solenoid Overcurrent |
| H2805 | Diverter Output Short To Battery |
| H2806 | Diverter Output Short To Ground |

| CODE | DESCRIPTION |
|---|---|
| H2807 | Diverter Output Open Circuit |
| H2832 | Diverter Output Overcurrent |
| H2848 | Diverter Multiple Input |
| H3128 | Interrupted Power Failure |
| H3904 | Left Joystick In Error |
| H3912 | Left Joystick Thumb Switch Not In Neutral |
| H3913 | Left Joystick Grip No Communication |
| H3916 | Left Joystick No Communication |
| H3928 | Left Joystick Internal Failure |
| H3948 | Left Joystick Multiple |
| H4423 | Secondary Not Programmed |
| H4497 | Secondary Controller Programmed |
| H4621 | 5 Volt Sensor Supply Out Of Range High |
| H4622 | 5 Volt Sensor Supply Out Of Range Low |
| H4721 | 8 Volt Sensor Supply Out Of Range High |
| H4722 | 8 Volt Sensor Supply Out Of Range Low |
| H5705 | Angle Blade Aux 4 Base Short to Battery |
| H5706 | Angle Blade Aux 4 Base Short to Ground |
| H5707 | Angle Blade Aux 4 Base Open Circuit |
| H5732 | Angle Blade Aux 4 Base Overcurrent |
| H5805 | Angle Blade Aux 4 Rod Short to Battery |
| H5806 | Angle Blade Aux 4 Rod Short to Ground |
| H5807 | Angle Blade Aux 4 Rod Open Circuit |
| H5832 | Angle Blade Aux 4 Rod Overcurrent |
| H7404 | Main Controller No Communication |
| H7604 | Display No Communication |
| H7902 | Door Unlock Error On |
| H7903 | Door Unlock Error Off |
| H8002 | Door Lock Error On |
| H8003 | Door Lock Error Off |
| L0102 | Lights Button Error On |
| L0202 | High Flow Enable Button Error On |
| L0302 | Auxiliary Enable Button Error On |
| L0402 | Information Button Error On |
| L7404 | Information Button Error On |

| CODE | DESCRIPTION |
|---|---|
| L7672 | Information Button Error On |
| LOWVL-TG | Low Battery Voltage |
| M0116 | Air Filter Not Connected |
| M0117 | Air Filter Plugged |
| M0144 | Air Filter Derate Level 1 |
| M0145 | Air Filter Derate Level 2 |
| M0216 | Hydraulic/hydrostatic Filter Not Connected |
| M0217 | Hydraulic/hydrostatic Filter Plugged |
| M0309 | System Voltage Too Low |
| M0310 | System Voltage Too High |
| M0311 | System Voltage Extremely High |
| M0314 | System Voltage Extremely Low |
| M0322 | System Voltage Out Of Range Low |
| M0414 | Engine Oil Pressure Extremely Low |
| M0415 | Engine Oil Pressure In Shutdown |
| M0610 | Engine Speed Too High |
| M0611 | Engine Speed Extremely High |
| M0613 | Engine Speed No Signal |
| M0615 | Engine Speed In Shutdown |
| M0618 | Engine Speed Out Of Range |
| M0710 | Hydraulic Oil Temp Too High |
| M0711 | Hydraulic Oil Temp Extremely High |
| M0715 | Hydraulic Oil Temp In Shutdown |
| M0721 | Hydraulic Oil Temp Out Of Range High |
| M0722 | Hydraulic Oil Temp Out Of Range Low |
| M0810 | Engine Coolant Temp Too High |
| M0811 | Engine Coolant Temp Extremely High |
| M0815 | Engine Coolant Temp In Shutdown |
| M0821 | Engine Coolant Temp Out Of Range High |
| M0822 | Engine Coolant Temp Out Of Range Low |
| M0826 | Engine Coolant Temp Out Of Range Low |
| M0909 | Fuel Level Too Low |
| M0921 | Fuel Level Out Of Range High |
| M0922 | Fuel Level Out Of Range Low |

| CODE | DESCRIPTION |
|---|---|
| M1121 | Console Sensor Out Of Range High |
| M1122 | Console Sensor Out Of Range Low |
| M1128 | Console Sensor Failure |
| M1305 | Fuel Hold Solenoid Short To Battery |
| M1306 | Fuel Hold Solenoid Short To Ground |
| M1307 | Fuel Hold Solenoid Open Circuit |
| M1402 | Fuel Pull Solenoid Error On |
| M1403 | Fuel Pull Solenoid Error Off |
| M1407 | Fuel Pull Solenoid Open Circuit |
| M1428 | Fuel Pull Solenoid Failure |
| M1605 | Hydraulic Bypass Short to Battery |
| M1606 | Hydraulic Bypass Short to Ground |
| M1607 | Hydraulic Bypass Open Circuit |
| M1632 | Hydraulic Bypass Overcurrent |
| M1705 | Hydraulic Lock Valve Short To Battery |
| M1706 | Hydraulic Lock Valve Short To Ground |
| M1707 | Hydraulic Lock Valve Open Circuit |
| M1732 | Hydraulic Lock Valve Overcurrent |
| M1802 | Power Beyond Valve Output Error On |
| M1803 | Power Beyond Valve Output Error Off |
| M1902 | Power Beyond Valve Relay Error On |
| M1903 | Power Beyond Valve Relay Error Off |
| M2005 | Two Speed Primary Solenoid Short To Battery |
| M2006 | Two Speed Primary Solenoid Short To Ground |
| M2007 | Two Speed Primary Solenoid Open Circuit |
| M2102 | Glow Plug Output Error On |
| M2103 | Glow Plug Output Error Off |
| M2107 | Glow Plug Output Open Circuit |
| M2128 | Glow Plug Output Failure |
| M2202 | Starter Output Error On |
| M2203 | Starter Output Error Off |
| M2207 | Starter Output Open Circuit |
| M2228 | Starter Output Failure |
| M2302 | Starter Relay Error On |

| CODE | DESCRIPTION |
|---|---|
| M2303 | Starter Relay Error Off |
| M2402 | Fuel Pull Relay Error On |
| M2403 | Fuel Pull Relay Error Off |
| M2521 | Load Sense Sensor Out Of Range High |
| M2522 | Load Sense Sensor Out Of Range Low |
| M2602 | Glow Plug Relay Error On |
| M2603 | Glow Plug Relay Error Off |
| M2721 | Throttle Primary Sensor Out Of Range High |
| M2722 | Throttle Primary Sensor Out Of Range Low |
| M2805 | Diverter Output Short To Battery |
| M2806 | Diverter Output Short To Ground |
| M2807 | Diverter Output Open Circuit |
| M3128 | Interrupted Power Failure |
| M3204 | Throttle Controller No Communication To Bobcat Controller |
| M3223 | Throttle Controller Not Calibrated |
| M3228 | Throttle Controller Failure |
| M3299 | Throttle Controller Calibration In Process |
| M3304 | Deluxe Panel No Communication |
| M3372 | Display Software Incompatible |
| M3373 | Display Software Outdated |
| M3702 | HYD Exchange Output Error On |
| M3703 | HYD Exchange Output Error Off |
| M3904 | Jog Shuttle No Communication |
| M4028 | Wrong ECU Detected |
| M4109 | Alternator Voltage Too Low |
| M4110 | Alternator Voltage High |
| M4204 | Keyless Entry No Communication |
| M4304 | Keyless Start Panel No Communication |
| M4404 | Secondary No Communication |
| M4472 | Secondary Controller Software Incompatible |
| M4473 | Secondary Controller Software Outdated |
| M4621 | 5 Volt Sensor Supply Out Of Range High |
| M4622 | 5 Volt Sensor Supply Out Of Range Low |

| CODE | DESCRIPTION |
|---|---|
| M4721 | 8 Volt Sensor Supply Out Of Range High |
| M4722 | 8 Volt Sensor Supply Out Of Range Low |
| M4802 | Front Light Relay Error On |
| M4803 | Front Light Relay Error Off |
| M5002 | Front Light Output Error On |
| M5003 | Front Light Output Error Off |
| M5205 | Offset Base Solenoid Short To Battery |
| M5206 | Offset Base Solenoid Short To Ground |
| M5207 | Offset Base Solenoid Open Circuit |
| M5232 | Offset Base Solenoid Overcurrent |
| M5305 | Offset Rod Solenoid Error On |
| M5306 | Offset Rod Solenoid Short To Ground |
| M5307 | Offset Rod Solenoid Open Circuit |
| M5332 | Offset Rod Solenoid Overcurrent |
| M5421 | Offset Control Switch Out Of Range High |
| M5422 | Offset Control Switch Out Of Range Low |
| M5424 | Offset Control Switch Out Of Neutral |
| M5505 | Auxiliary Base Solenoid Short To Battery |
| M5506 | Auxiliary Base Solenoid Short To Ground |
| M5507 | Auxiliary Base Solenoid Open Circuit |
| M5532 | Auxiliary Base Solenoid Overcurrent |
| M5605 | Auxiliary Rod Solenoid Short To Battery |
| M5606 | Auxiliary Rod Solenoid Short To Ground |
| M5607 | Auxiliary Rod Solenoid Open Circuit |
| M5632 | Auxiliary Rod Solenoid Overcurrent |
| M5721 | Auxiliary Control Switch Out Of Range High |
| M5722 | Auxiliary Control Switch Out Of Range Low |
| M5724 | Auxiliary Control Switch Out Of Neutral |
| M5810 | Fuel Temperature High |
| M5811 | Fuel Temperature Extremely High |
| M5815 | Fuel Temperature In Shutdown |
| M5826 | Fuel Temperature In Shutdown |
| M6021 | Left Control Switch Out of Range High |
| M6022 | Left Control Switch Out of Range Low |

| CODE | DESCRIPTION |
|---|---|
| M6024 | Left Control Switch Out of Neutral |
| M6121 | Right Control Switch Out of Range High |
| M6122 | Right Control Switch Out of Range Low |
| M6124 | Right Control Switch Out of Neutral |
| M6204 | Load Moment Sensor In Error |
| M6221 | Overload Warning Sensor Out of Range High |
| M6222 | Overload Warning Sensor Out of Range Low |
| M6402 | Switched Power Relay Error On |
| M6403 | Switched Power Relay Error Off |
| M6505 | ECU Power Short To Battery |
| M6506 | ECU Power Short To Ground |
| M6507 | ECU Power Open Circuit |
| M6604 | ECU No Communication |
| M6702 | HVAC Output Error On |
| M6703 | HVAC Output Error Off |
| M6905 | Dump Valve Short to Battery |
| M6906 | Dump Valve Short to Ground |
| M6907 | Dump Valve Open Circuit |
| M6932 | Dump Valve Overcurrent |
| M7002 | Switched Power Output Error On |
| M7003 | Switched Power Output Error Off |
| M7007 | Switched Power Output Open Circuit |
| M7028 | Switched Power Output Failure |
| M7423 | Main Controller Not Programmed |
| M7472 | Main Controller Software Incompatible |
| M7473 | Main Controller Software Outdated |
| M7497 | Main Controller Controller Programmed |
| M7604 | Standard Display Panel No Communication |
| M7748 | Key Switch Multiple |
| M7839 | Hourmeter Changed |
| M8004 | Cooling Fan Controller No Communication |
| M8005 | Cooling Fan Short To Battery |
| M8006 | Cooling Fan Short To Ground |

| CODE | DESCRIPTION |
|---|---|
| M8021 | Cooling Fan Out Of Range High |
| M8022 | Cooling Fan Out Of Range Low |
| M8025 | Cooling Fan Unresponsive |
| M8027 | Cooling Fan CAN Error |
| M8028 | Cooling Fan Failure |
| M8029 | Cooling Fan Wiring Fault |
| M8030 | Cooling Fan Controller Fault |
| M8302 | Wait to Start Lamp Error On |
| M8303 | Wait to Start Lamp Error Off |
| M8615 | Engine Speed Derate In Shutdown |
| M8625 | Engine Speed Derate Unresponsive |
| M9111 | Fuel Filter Extremely Plugged |
| M9117 | Fuel Filter Plugged |
| M9144 | Fuel Filter Derate Level 1 |
| M9145 | Fuel Filter Derate Level 2 |
| M9202 | Fuel Lift Pump Error On |
| M9203 | Fuel Lift Pump Error Off |
| M9287 | Fuel Pump Failure Time Exceeded |
| M9309 | Fuel Pressure Low |
| M9314 | Fuel Pressure Extremely Low |
| M9321 | Fuel Pressure Out Of Range High |
| M9322 | Fuel Pressure Out Of Range Low |
| M9344 | Fuel Pressure Derate Level 1 |
| M9701 | Turbo Prime Sequence Active |
| P0002 | Fuel Rail Pressure Fault |
| P0003 | Fuel Rail Pressure Fault |
| P0004 | Fuel Rail Pressure Fault |
| P000F | Fuel Rail Pressure High - Over Relief |
| P0072 | Engine Compartment Temperature Sensor Out of Range Low |
| P0073 | Engine Compartment Temperature Sensor Out of Range High |
| P007C | Inlet Air Temperature Sensor Out of Range Low |
| P007D | Inlet Air Temperature Sensor Out of Range High |
| P0087 | Fuel Rail Pressure Fault |

| CODE | DESCRIPTION |
|---|---|
| P009B | Common Rail Pressure Relief Valve Open Count Exceeds Limit |
| P009C | Common Rail Pressure Relief Valve Opened |
| P009D | Common Rail Pressure Relief Valve Opened |
| P009F | High Rail Pressure |
| P00AC | Intake Manifold Temperature Sensor Out of Range Low |
| P00AD | Intake Manifold Temperature Sensor Out of Range High |
| P00BC | Low Manifold Absolute Pressure (Low boost) |
| P00BE | Air Flow Fault (MAF / MAP agreement) |
| P0100 | Mass Air Flow Sensor Short to Battery or Open Circuit |
| P0101 | Mass Air Flow Sensor Electrical Fault |
| P0102 | Mass Air Flow Sensor Out of Range Low |
| P0103 | Mass Air Flow Sensor Out of Range High |
| P0107 | Manifold Absolute Pressure Sensor Out of Range Low |
| P0108 | Manifold Absolute Pressure Sensor Out of Range High |
| P0117 | Coolant Temperature Sensor Out of Range Low |
| P0118 | Coolant Temperature Sensor Out of Range High |
| P011E | Coolant Temperature Low Fault |
| P0121 | Engine Speed Control Signal Fault |
| P0122 | Engine Speed Control Signal Fault |
| P0123 | Engine Speed Control Signal Fault |
| P0124 | Engine Speed Control Signal Fault |
| P0182 | Fuel Temperature Sensor Out of Range Low |
| P0183 | Fuel Temperature Sensor Out of Range High |
| P018C | Low Fuel Filter Pressure |
| P018D | High Fuel Filter Pressure |
| P018F | Common Rail Pressure Relief Valve Open Time Exceeds Limit |
| P0192 | Rail Pressure Sensor Out of Range Low |
| P0193 | Rail Pressure Sensor Out of Range High |

| CODE | DESCRIPTION |
|---|---|
| P0196 | Oil Level/Temp Sensor Fault |
| P01C2 | Fuel Filter Pressure Sensor Out of Range Low |
| P01C4 | Low Fuel Filter Pressure Warning |
| P01C5 | Low Fuel Filter Pressure - Derate |
| P01C6 | Fuel Filter Pressure Sensor Out of Range High |
| P0201 | Injector #1 Open Circuit |
| P0202 | Injector #2 Open Circuit |
| P0203 | Injector #3 Open Circuit |
| P0204 | Injector #4 Open Circuit |
| P0215 | Engine Shutoff Request Signal Detected |
| P0218 | CAN Communication Fault - Transmission Oil Temperature |
| P0219 | Engine Overspeed Detected |
| P0221 | Engine Speed Control Signal Fault |
| P0222 | Engine Speed Control Signal Fault |
| P0223 | Engine Speed Control Signal Fault |
| P0224 | Engine Speed Control Signal Fault |
| P0252 | Low Fuel Rail Pressure |
| P0254 | Fuel Rail Pressure Control Fault |
| P025A | Fuel Metering Unit Open Circuit |
| P025B | Fuel Metering Unit Fault |
| P025C | Fuel Metering Unit Short to Ground |
| P025D | Fuel Metering Unit Short to Battery |
| P028A | Fan PWM  Open Circuit |
| P028D | Fan PWM Short to Ground |
| P028E | Fan PWM Short to Battery |
| P02E0 | Air Control Valve H-Bridge Drive Open Circuit |
| P02E2 | Air Control Valve H-Bridge Drive Short to Ground |
| P02E3 | Air Control Valve H-Bridge Drive Short to Battery |
| P02E4 | Air Control Valve Position Fault |
| P02E5 | Air Control Valve Position Fault |
| P02E7 | Air Control Valve Close Position Fault |
| P02E8 | Air Control Valve Sensor Out of Range Low |

| CODE | DESCRIPTION |
|---|---|
| P02E9 | Air Control Valve Sensor Out of Range High |
| P02EA | Air Control Valve Close Position Fault |
| P02EB | Air Control Valve Close Position Fault |
| P02EE | Injector #1 Short Circuit |
| P02EF | Injector #2 Short Circuit |
| P02F0 | Injector #3 Short Circuit |
| P02F1 | Injector #4 Short Circuit |
| P0340 | Cam Sensor Signal Fault |
| P0342 | Cam Sensor Signal Fault |
| P0344 | Cam Sensor Signal Fault |
| P0372 | Crank Sensor Signal Fault |
| P0374 | Crank Sensor Signal Fault |
| P0380 | Glow Plug Relay Open Circuit |
| P0381 | Glow Plug Lamp Open Circuit |
| P0383 | Glow Plug Relay Short to Ground |
| P0384 | Glow Plug Relay Short to Battery |
| P0406 | EGR Position Sensor Out of Range High |
| P0407 | EGR Position Sensor Out of Range Low |
| P0408 | EGR Flow Rate Error |
| P0421 | DOC Efficiency Fault (During Regen) |
| P042E | EGR Control Position Fault |
| P042F | EGR Control Position Fault |
| P049B | EGR Flow Rate Error |
| P0512 | Engine Start Switch Stuck On |
| P0522 | Engine Oil Pressure Sensor Out of Range Low |
| P0523 | Engine Oil Pressure Sensor Out of Range High |
| P0527 | Fan Speed Timeout Fault |
| P0528 | Cooling Fan Overspeed |
| P0529 | Cooling Fan Underspeed |
| P0544 | Turbine Inlet Temperature Fault |
| P0545 | Turbine Inlet Temperature Sensor Out of Range Low |
| P0546 | Turbine Inlet Temperature Sensor Out of Range High |

| CODE | DESCRIPTION |
|---|---|
| P055B | Oil Pressure Warning Lamp Open Circuit |
| P055C | Oil Pressure Warning Lamp Short to Ground |
| P055D | Oil Pressure Warning Lamp Short to Battery |
| P0562 | ECU Battery Voltage Extremely Low |
| P0563 | ECU Battery Voltage Extremely High |
| P056D | DEF Supply Module Communication Fault |
| P0591 | PTO Lamp Open Circuit |
| P0592 | PTO Lamp Short to Ground |
| P0593 | PTO Lamp Short to Battery |
| P05ED | DEF Heater Line Short to Battery |
| P060B | ECU Calculation Error |
| P060C | ECU Communication Fault |
| P0615 | Starter Relay Open Circuit |
| P0616 | Starter Relay Short to Ground |
| P0617 | Starter Relay Short to Battery |
| P062D | Injector Bank Short Circuit 1 |
| P062E | Injector Bank Short Circuit 2 |
| P062F | ECU Data Read Fault |
| P0630 | ECU Data Write Fault |
| P0641 | ECU 5V Sensor Supply Voltage Out of Range High |
| P0642 | ECU 5V Sensor Supply Voltage Out of Range Low |
| P0657 | ECU Sensor Supply 1 Short to Ground |
| P0658 | ECU Sensor Supply 1 Voltage Low |
| P0659 | ECU Sensor 1 Voltage High |
| P0669 | High ECU Temperature |
| P0685 | ECU Main Relay Fault |
| P068A | ECU Main Relay Fault |
| P06AD | ECU Temperature Sensor Short to Ground |
| P06AE | ECU Temperature Sensor Short to Battery |
| P06F0 | DEF Supply Module Fault |
| P06F1 | DEF Supply Module Fault |
| P0C17 | EGR Closed Position Fault |
| P0C18 | EGR Closed Position Fault |

| CODE | DESCRIPTION |
|---|---|
| P0C19 | EGR Closed Position Fault |
| P1013 | Engine Speed Fault |
| P101A | ECU Internal Fault |
| P1033 | High DPF Inlet Temperature |
| P1044 | DEF Tank Temperature Sensor Error Low |
| P1045 | DEF Tank Temperature Sensor Error High |
| P106C | Low DEF Quality |
| P106D | High DEF Quality |
| P1073 | High Engine Compartment Temperature |
| P107D | High Inlet Air Temperature |
| P108A | DEF Supply Pump Motor Speed Fault |
| P108B | DEF Supply Pump Motor Speed Fault |
| P108C | DEF Supply Pump Motor Fault |
| P10AD | High Intake Manifold Temperature |
| P1118 | High Engine Coolant Temp |
| P1183 | High Fuel Temperature |
| P1227 | Low DEF Tank Temperature Fault |
| P1230 | DEF Tank Level Signal Error |
| P12E5 | EGR Fault - Level 1 Inducement |
| P12E6 | EGR Fault - Level 2 Inducement |
| P12E7 | EGR Fault - Level 3 Inducement |
| P12E8 | EGR Fault - Warning |
| P12E9 | SCR Dosing Interrupted - Level 1 Inducement |
| P12EA | SCR Dosing Interrupted - Level 2 Inducement |
| P12EB | SCR Dosing Interrupted - Level 3 Inducement |
| P12EC | SCR Dosing Interrupted - Warning |
| P12F2 | DEF Quality - Level 1 Inducement |
| P12F3 | DEF Quality - Level 2 Inducement |
| P12F4 | DEF Quality - Level 3 Inducement |
| P12F5 | DEF Quality - Warning |
| P12F6 | SCR Tampering - Level 1 Inducement |
| P12F7 | SCR Tampering - Level 2 Inducement |
| P12F8 | SCR Tampering - Level 3 Inducement |

| CODE | DESCRIPTION |
|---|---|
| P12F9 | SCR Tampering - Warning |
| P1303 | SCR Fault Repeat Offense - Level 1 Inducement |
| P1304 | SCR Fault Repeat Offense - Level 2 Inducement |
| P1305 | SCR Fault Repeat Offense - Level 3 Inducement |
| P1450 | High DEF Pump Pressure |
| P1451 | Low DEF Pump Pressure |
| P1452 | High DEF Pump Pressure |
| P1453 | DEF Pump Pressure Stabilization Fault |
| P1454 | Low DPF Differential Pressure |
| P1457 | Low DEF Pump Pressure |
| P1459 | DEF Pressure Reduction Fault |
| P1460 | DEF Afterrun Error |
| P1461 | DEF Reverting Valve Pressure Fault |
| P1522 | Low Engine Oil Pressure |
| P1546 | High Turbine Inlet Temperature |
| P1562 | ECU Battery Voltage Low |
| P1563 | ECU Battery Voltage High |
| P1564 | ECU Battery Voltage Extremely High |
| P1565 | ECU Battery Voltage Extremely Low |
| P160B | ECU Internal Fault |
| P160C | ECU Internal Fault |
| P160D | ECU Internal Fault |
| P160E | ECU Internal Fault |
| P160F | ECU Memory Fault |
| P1610 | ECU Internal Fault |
| P1611 | ECU Internal Fault |
| P1612 | ECU Internal Fault |
| P1613 | ECU Internal Fault |
| P1614 | ECU Internal Fault |
| P1615 | ECU Internal Fault |
| P1616 | ECU Internal Fault |
| P1617 | ECU Internal Fault |
| P1618 | ECU Internal Fault |
| P1619 | ECU Internal Fault |
| P1657 | ECU Sensor Suplly 1 Voltage Fault |

| CODE | DESCRIPTION |
|---|---|
| P1669 | ECU Sensor Supply 2 Voltage Fault |
| P1684 | ECU Sensor Suplly 3 Voltage Fault |
| P1893 | DEF Backflow Line Pressure Fault |
| P1904 | Glow Plug Lamp Short to Ground |
| P1906 | DPF Regeneration Switch Inhibit Lamp Open Circuit |
| P1907 | DPF Regeneration Switch Inhibit Lamp Short to Ground |
| P1908 | DPF Regeneration Switch Inhibit Lamp Short to Battery |
| P190B | High Fuel Rail Pressure |
| P190C | Low Fuel Rail Pressure |
| P192E | Check Engine Lamp Open Circuit |
| P192F | Check Engine Lamp Short to Ground |
| P1931 | Check Engine Lamp Short to Battery |
| P1934 | Pressure Relief Valve Fault |
| P202D | DEF Leakage Fault |
| P202E | DEF Dosing Valve Error |
| P2032 | DPF Inlet Temperature Sensor Out of Range Low |
| P2033 | DPF Inlet Temperature Sensor Out of Range High |
| P2034 | DPF Inlet Temperature Fault |
| P203A | DEF Level Sensor Open Circuit |
| P203F | DEF Tank Empty |
| P2041 | DEF Level Sensor Short Circuit |
| P2043 | DEF Temperature Sensor Open Circuit |
| P2046 | DEF Temperature Sensor Short Circuit |
| P2047 | DEF Dosing Valve Short to Battery |
| P2048 | DEF Dosing Valve Short to Ground |
| P2049 | DEF Dosing Valve Open Circuit |
| P204A | DEF Pressure Fault |
| P204C | DEF Supply Pump Pressure Sensor Out of Range Low |
| P204D | DEF Supply Pump Pressure Sensor Out of Range High |
| P2050 | DEF Dosing Valve Short to Battery |
| P2051 | DEF Dosing Valve Short to Ground |

| CODE | DESCRIPTION |
|---|---|
| P205E | High DEF Tank Temperature |
| P208A | DEF Supply Pump Motor Open Circuit |
| P208B | DEF Supply Pump Motor Signal Error |
| P208C | DEF Supply Pump Motor Short to Ground |
| P208D | DEF Supply Pump Motor Short to Battery |
| P208E | DEF Dosing Valve Blocked |
| P20A0 | DEF Reverting Valve Open Circuit |
| P20A1 | High DEF Reverting Valve Temperature |
| P20A2 | DEF Reverting Valve Short to Ground |
| P20A3 | DEF Reverting Valve Short to Battery |
| P20A5 | DEF Reverting Valve Pressure Fault |
| P20AC | DEF Supply Module Heater Fault |
| P20AD | DEF Supply Module Heater Fault |
| P20B0 | DEF Supply Module Temperature Fault |
| P20B1 | DEF Tank Heater Valve Open Circuit |
| P20B3 | DEF Tank Heater Valve Short to Ground |
| P20B4 | DEF Tank Heating/Coolant Valve Short to Battery |
| P20B9 | DEF Supply Module Heater Relay Open Circuit |
| P20BA | DEF Supply Module Heater Fault |
| P20BB | DEF Supply Module Heater Relay Short to Ground |
| P20BC | DEF Supply Module Heater Relay Short to Battery |
| P20BD | DEF Pressure Line Heater Relay Open Circuit |
| P20BE | DEF Pressure Line Heater Fault |
| P20BF | DEF Pressure Line Heater Relay Short to Ground |
| P20C0 | DEF Pressure Line Heater Relay Short to Battery |
| P20C1 | DEF Backflow Line Heater Relay Open Circuit |
| P20C2 | DEF Backflow Line Heater Fault |
| P20C3 | DEF Backflow Line Heater Relay Short to Ground |
| P20C4 | DEF Backflow Line Heater Relay Short to Battery |
| P20C5 | DEF Suction Line Heater Relay Open Circuit |

| CODE | DESCRIPTION |
|---|---|
| P20C6 | DEF Suction Line Heater Fault |
| P20C7 | DEF Suction Line Heater Relay Short to Ground |
| P20C8 | DEF Suction Line Heater Relay Short to Battery |
| P20EE | SCR Efficiency Low |
| P20FF | DEF Supply Module Communication Timeout |
| P2135 | Engine Speed Control Signal Fault |
| P2136 | Engine Speed Control Signal Fault |
| P213E | ECU Internal Shutdown |
| P2143 | EGR H-Bridge Driver Open Circuit |
| P2144 | EGR H-Bridge Driver Short to Ground |
| P2145 | EGR H-Bridge Driver Short to Battery |
| P214F | DEF Supply Module Heater Open Circuit |
| P215E | DEF Suction Line Heater SC/STG Fault |
| P215F | DEF Suction Line Heater Open Circuit |
| P21C2 | DEF Main Heater Relay Open Circuit |
| P21C3 | DEF Main Heater Relay Short to Ground |
| P21C4 | DEF Main Heater Relay Short to Battery |
| P21C7 | SCR System Main Relay Fault |
| P21C8 | SCR System Main Relay Short to Ground |
| P21C9 | SCR System Main Relay Short to Battery |
| P21DD | DEF Supply Module Heater Short to Ground |
| P2202 | Upstream NOx Sensor Short Circuit |
| P2203 | Upstream NOx Sensor Open Circuit |
| P2215 | Downstream NOx Sensor Short Circuit |
| P2216 | Downstream NOx Sensor Open Circuit |
| P221C | DEF Pressure Line Heater Electrical Fault |
| P221D | DEF Pressure Line Heater Open Circuit |
| P221E | DEF Backflow Line Heater Electrical Fault |
| P221F | DEF Backflow Line Heater Open Circuit |
| P2228 | Atmospheric Pressure Low Fault |
| P2229 | Atmospheric Pressure High Fault |
| P225D | Low Upstream NOx Concentration |
| P2265 | Water in Fuel Detected - Derate |

| CODE | DESCRIPTION |
|---|---|
| P2266 | Water in Fuel Sensor Out of Range Low |
| P2267 | Water in Fuel Sensor Out of Range High |
| P2269 | Water in Fuel Detected |
| P2381 | Glow Plug Lamp Short to Battery |
| P2383 | Upstream NOx Sensor Installation Fault |
| P2384 | Downstream NOx Sensor Installation Fault |
| P2397 | Upstream NOx Concentration Low |
| P2398 | Downstream NOx Concentration Low |
| P23B2 | DEF Supply Module Heater Fault |
| P23B3 | DEF Supply Module Heater Temperature Fault |
| P23B4 | DEF Supply Module Heater Temperature Fault |
| P23B5 | DEF Supply Module Temperature Fault |
| P23B6 | DEF Supply Module Temperature Fault |
| P242F | High DPF Ash Content - Ash Cleaning Needed |
| P2454 | DPF Differential Pressure Sensor Out of Range Low |
| P2455 | DPF Differential Pressure Sensor Out of Range High |
| P2463 | High DPF Soot Mass - Regen Required |
| P246B | DPF Regeneration Failure |
| P246C | High DPF Differential Pressure - DPF Plugged |
| P24A3 | Very High DPF Soot Mass - Service Regen Required |
| P2505 | High ECU Temperature |
| P2506 | ECU Software Reset |
| P2507 | ECU Internal Fault |
| P2508 | ECU Internal Fault |
| P2509 | ECU Internal Fault |
| P250A | Oil Level/Temp Sensor Open Circuit |
| P250C | Oil Level/Temp Sensor Short to Ground |
| P250D | Oil Level/Temp Sensor Short to Battery |
| P250F | Check Engine Oil Level |
| P2511 | ECU Internal Fault |
| P2546 | Multi-Torque Switch Out of Range Low |
| P2547 | Multi-Torque Switch Out of Range High |

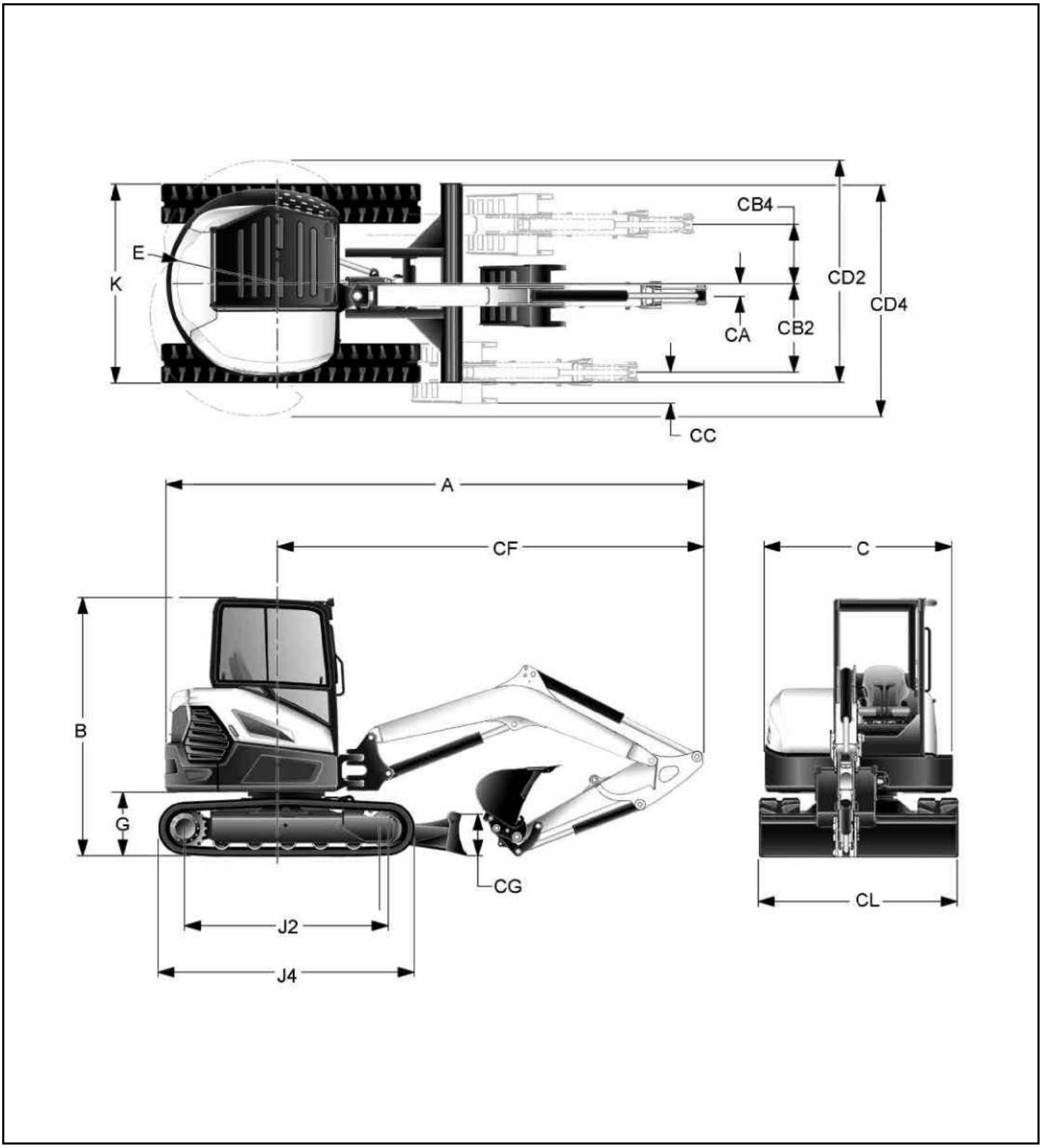
| CODE | DESCRIPTION |
|---|---|
| P25BA | DPF Regeneration Inhibit and Enable Switch Fault |
| P25BB | DPF Regeneration Enable Switch Short to Battery |
| P25BC | DPF Regeneration Inhibit Switch Short to Battery |
| P260E | DPF Regeneration Enable Switch Lamp Open Circuit |
| P260F | DPF Regeneration Enable Switch Lamp Short to Ground |
| P2611 | DPF Regeneration Enable Switch Lamp Short to Battery |
| P2632 | Fuel Feed Pump Open Circuit |
| P2633 | Fuel Feed Pump Short to Ground |
| P2634 | Fuel Feed Pump Short to Battery |
| P2635 | Fuel Feed Pump Fault |
| P263D | DEF Pressure Line Heating Fault |
| P2669 | ECU Sensor Supply 2 Short to Ground |
| P2670 | ECU Sensor Supply 2 Out of Range Low |
| P2671 | ECU Sensor Supply 2 Out of Range High |
| P2684 | ECU Sensor Supply 3 Short to Ground |
| P2685 | ECU Sensor Supply 3 Out of Range Low |
| P2686 | ECU Sensor 3 Out of Range High |
| P268C | Injector #1 IQA Code Missing |
| P268D | Injector #2 IQA Code Missing |
| P268E | Injector #3 IQA Code Missing |
| P268F | Injector #4 IQA Code Missing |
| P273F | High Transmission Oil Temperature (CAN) |
| P274F | High Transmission Oil Temperature (H/W Switch) |
| P2C11 | DEF Dosing Valve Fault |
| P304C | Low DEF Supply Pump Pressure |
| P304D | High DEF Supply Pump Pressure |
| P3052 | DPF Differential Pressure Sensor Fault |
| P30B1 | High DEF Tank Heating/Coolant Valve Fault |
| P30B9 | High DEF Supply Module Heater Relay Fault |
| P30BD | High DEF Pressure Line Heater Relay Fault |

| CODE | DESCRIPTION |
|---|---|
| P30C1 | High DEF Backflow Line Heater Relay Fault |
| P30C5 | High DEF Suction Line Heater Relay Fault |
| P31C5 | High DEF Main Heater Relay Fault |
| P32EE | Injector #1 Short Circuit |
| P32EF | Injector #2 Short Circuit |
| P32F0 | Injector #3 Short Circuit |
| P32F1 | Injector #4 Short Circuit |
| P350D | Oil Level/Temp Sensor Communication Fault |
| P350E | Oil Level/Temp Sensor Fault |
| P350F | Low Engine Oil Level |
| P360E | DPF Regeneration Active Lamp Open Circuit |
| P360F | DPF Regeneration Active Lamp Short to Ground |
| P3611 | DPF Regeneration Active Lamp Short to Battery |
| R3327 | Display CAN Error |
| R3334 | Display CAN Error |
| R3335 | Display CAN Error |
| R3904 | Jog Shuttle No Communication |
| R4304 | Keyless Start Panel No Communication |
| R7404 | Main Controller No Communication |
| R7423 | Display Not Programmed |
| R7492 | Main Controller Authentication Failed |
| R9604 | Radio No Communication |
| U0028 | ECU CAN Communication Fault |
| U0029 | ECU CAN Communication Fault |
| U010F | ECU CAN Communication Fault |
| U013C | ECU CAN Communication Fault - Engine Speed |
| U01B7 | ECU CAN Communication Fault - Regeneration Switch |
| U01B8 | ECU CAN Communication Fault - Multiple Torque Switch |
| U01B9 | ECU CAN Communication Fault - Engine Shut Down |
| U029D | ECU CAN Communication Fault - Upstream NOx Sensor |

| CODE | DESCRIPTION |
|---|---|
| U029E | ECU CAN Communication Fault - Downstream NOx Sensor |
| U02A2 | ECU CAN Communication Fault - DEF Tank |
| U030D | Upstream NOx Sensor Heating Fault |
| U030E | Downstream NOx Sensor Heating Fault |
| U043D | ECU CAN Communication Fault - Engine Speed Control |
| U0606 | ECU CAN Communication Fault - Engine Speed Control |
| U0607 | ECU CAN Communication Fault |
| U0608 | ECU CAN Communication Fault - Engine Speed Control |
| U0619 | ECU CAN Communication Fault - DEF Sensor |
| U0632 | ECU CAN Communication Fault - Cooling Fan Control |
| U1001 | CAN Communication Fault - Hydraulic Oil Temperature |
| U1003 | ECU Received Engine Shutdown Request from Machine Controller |
| U1028 | DEF Quality Sensor Open Circuit |
| U1030 | DEF Quality Sensor Short Circuit |
| U1031 | ECU CAN Communication Fault |
| U1032 | ECU CAN Communication Fault - PTO |
| U1033 | ECU CAN Communication Fault - Starter Relay |
| VRLOW-VLTG | Very Low Battery Voltage |

## MACHINE DIMENSIONS

**Figure 472**

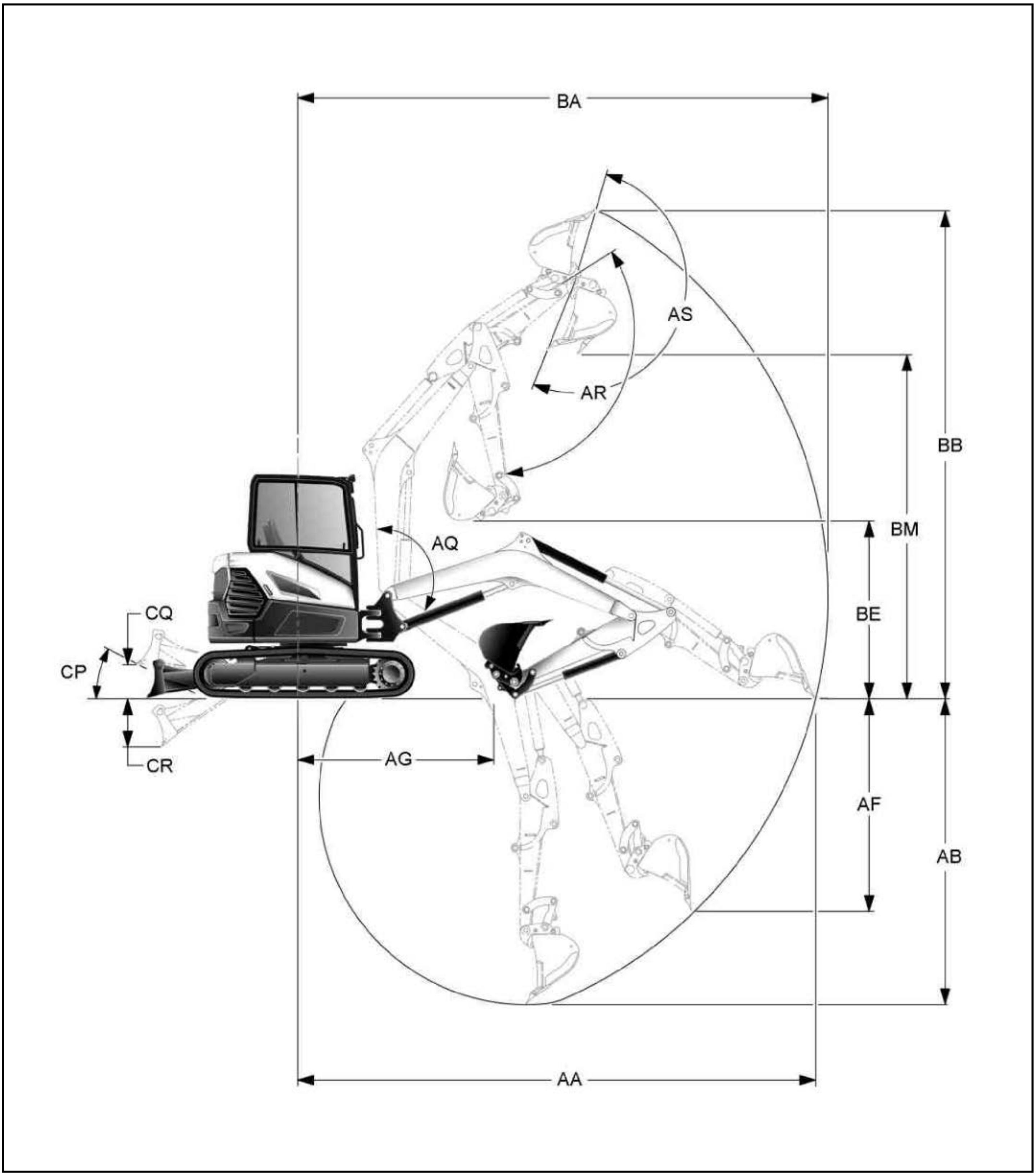



NA20143a

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

| REF | DESCRIPTION | STANDARD ARM | LONG ARM |
|---|---|---|---|
| A | OVERALL LENGTH WITH STANDARD COUNTERWEIGHT | 5543 mm (218.2 in) | 5541 mm (218.1 in) |
| | OVERALL LENGTH WITH ADD-ON COUNTERWEIGHT | - | 5612 mm (220.9 in) |
| B | OVERALL HEIGHT | 2551 mm (100.4 in) | 2551 mm (100.4 in) |
| C | WIDTH OF UPPERSTRUCTURE | 1849 mm (72.8 in) | 1849 mm (72.8 in) |
| E | SLEW CLEARANCE, REAR OF UPPERSTRUCTURE WITH STANDARD COUNTERWEIGHT | 1265 mm (49.8 in) | 1265 mm (49.8 in) |
| | SLEW CLEARANCE, REAR OF UPPERSTRUCTURE WITH ADD-ON COUNTERWEIGHT | - | 1335 mm (52.6 in) |
| G | CLEARANCE, UPPERSTRUCTURE TO GROUNDLINE | 637 mm (25.1 in) | 627 mm (24.7 in) |
| J2 | NOMINAL DISTANCE BETWEEN CENTERLINES OF DRIVE SPROCKETS AND IDLERS | 2004 mm (78.9 in) | 2004 mm (78.9 in) |
| J4 | NOMINAL OVERALL LENGTH OF TRACK ASSEMBLY | 2523 mm (99.3 in) | 2523 mm (99.3 in) |
| K | OVERALL WIDTH OF CRAWLER | 1960 mm (77.2 in) | 1960 mm (77.2 in) |
| CA | MACHINE CENTERLINE TO WORKING EQUIPMENT CENTERLINE, NORMAL OPERATION | 125 mm (4.9 in) | 125 mm (4.9 in) |
| CB2 | MACHINE CENTERLINE TO WORKING EQUIPMENT CENTERLINE, WORK WIDTH AT MAX RH ROTATION | 730 mm (28.7 in) | 730 mm (28.7 in) |
| CB4 | MACHINE CENTERLINE TO WORKING EQUIPMENT CENTERLINE, WORK WIDTH AT MAX LH ROTATION | 473 mm (18.6 in) | 473 mm (18.6 in) |
| CC | BUCKET EDGE TO WORKING EQUIPMENT CENTERLINE | 300 mm (11.8 in) | 300 mm (11.8 in) |
| CD2 | WORKING WIDTH MAX RH ROTATION WITH STANDARD COUNTERWEIGHT | 2245 mm (88.4 in) | 2245 mm (88.4 in) |
| | WORKING WIDTH MAX RH ROTATION WITH ADD-ON COUNTERWEIGHT | - | 2315 mm (91.1 in) |
| CD4 | WORKING WIDTH MAX LH ROTATION WITH STANDARD COUNTERWEIGHT | 2227 mm (87.7 in) | 2227 mm (87.7 in) |
| | WORKING WIDTH MAX LH ROTATION WITH ADD-ON COUNTERWEIGHT | - | 2273 mm (89.5 in) |
| CF | MIN. RADIUS IN TRAVEL POSITION | 4278 mm (168.4 in) | 4276 mm (168.3 in) |
| CG | BLADE HEIGHT | 422 mm (16.6 in) | 422 mm (16.6 in) |
| CL | BLADE WIDTH | 1959 mm (77.1 in) | 1959 mm (77.1 in) |

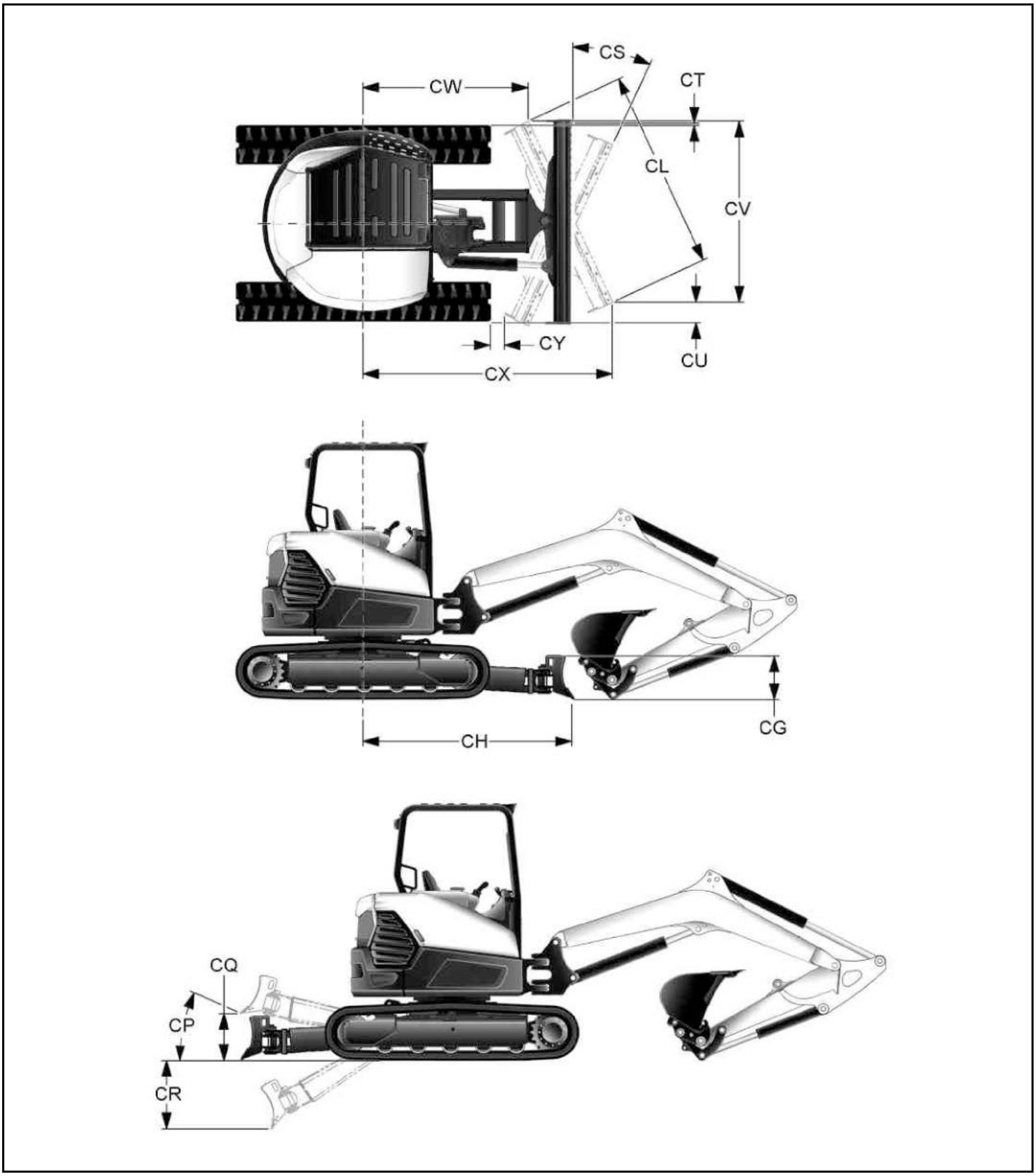
**Figure 473**




Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

| REF | DESCRIPTION | STANDARD ARM | LONG ARM |
|---|---|---|---|
| AA | MAX. RADIUS AT GROUNDLINE | 5822 mm (229.2 in) | 6209 mm (244.5 in) |
| AB | MAX. DIGGING DEPTH | 3537 mm (139.3 in) | 3937 mm (155.0 in) |
| AF | MAX. DEPTH OF VERTICAL WALL THAT CAN BE EXCAVATED. | 2561 mm (100.8 in) | 2942 mm (115.8 in) |
| AG | BUCKET FLAT ON GROUNDLINE | 2215 mm (87.2 in) | 2104 mm (82.8 in) |
| AQ | BOOM PIVOT ANGLE | 126° | 126° |
| AR | ARM PIVOT ANGLE | 116° | 116° |
| AS | BUCKET PIVOT ANGLE | 186° | 186° |
| BA | MAX. RADIUS OF WORKING EQUIPMENT | 5958 mm (234.6 in) | 6336 mm (249.4 in) |
| BB | MAX. HEIGHT OF WORKING EQUIPMENT | 5630 mm (221.7 in) | 5885 mm (231.7 in) |
| BE | MIN. CLEARANCE OF FULLY CURLED BUCKET AT MAX. BOOM HEIGHT | 2156 mm (84.9 in) | 1768 mm (69.6 in) |
| BM | MIN. CLEARANCE OF FULLY CURLED BUCKET AT MAX. ARM HEIGHT | 4126 mm (162.4 in) | 4381 mm (172.5 in) |
| CP | MAX. APPROACH ANGLE | 27° | 27° |
| CQ | MAX. BLADE HEIGHT | 390 mm (15.4 in) | 390 mm (15.3 in) |
| CR | MAX. BLADE DEPTH | 547 mm (21.6 in) | 547 mm (21.6 in) |

**Figure 474**

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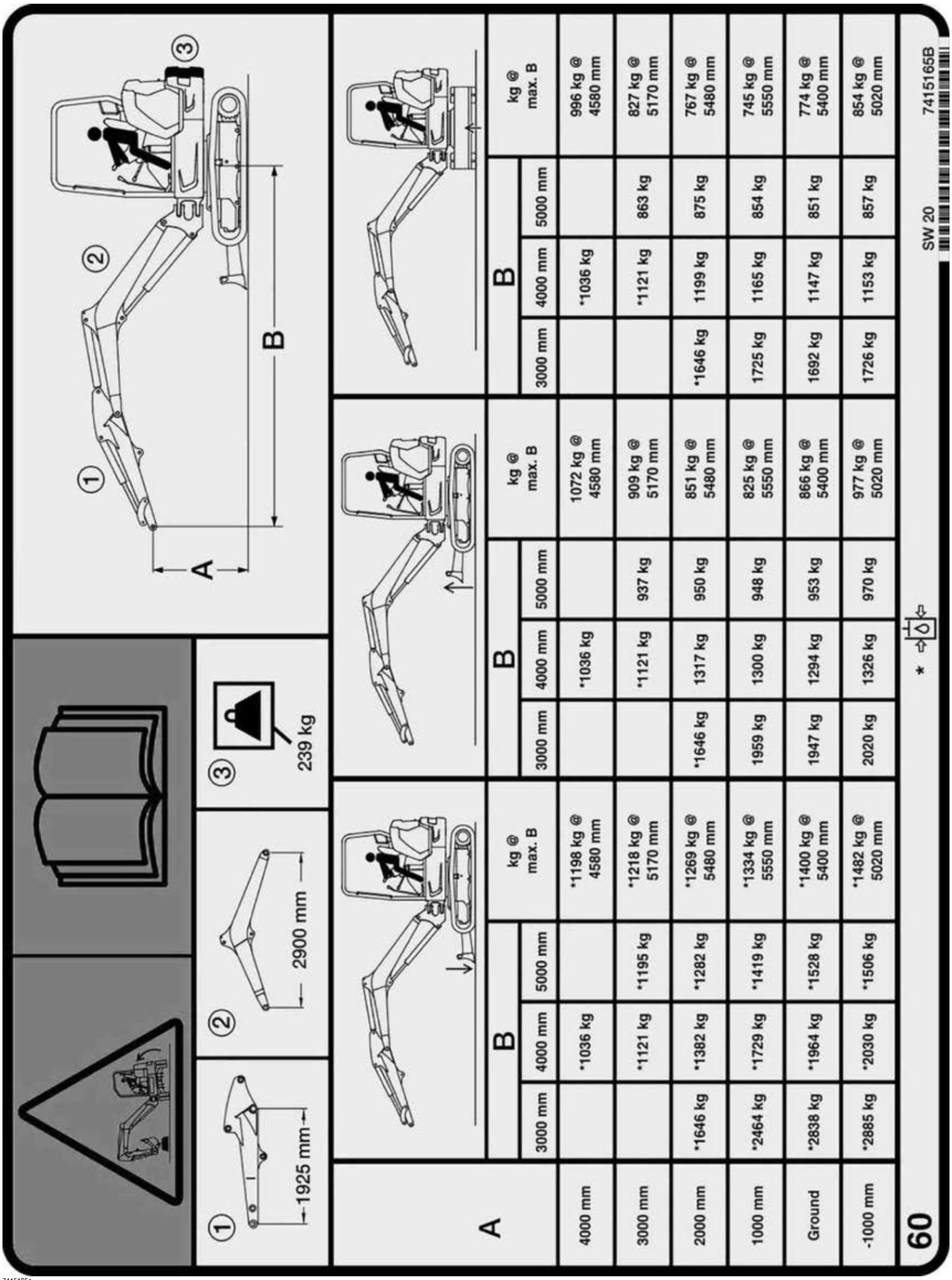
Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.

| REF | DESCRIPTION | WITH ANGLE BLADE |
|---|---|---|
| CG | BLADE HEIGHT | 434 mm (17.1 in) |
| CH | MACHINE CENTERLINE TO BLADE | 2062 mm (81.2 in) |
| CL | BLADE WIDTH | 1976 mm (77.8 in) |
| CP | MAX. APPROACH ANGLE | 24° |
| CQ | MAX. BLADE HEIGHT | 467 mm (18.4 in) |
| CR | MAX. BLADE DEPTH | 675 mm (26.6 in) |
| CS | MAX. BLADE ANGLE, RIGHT / LEFT | 25° |
| CT | TRACKS TO ANGLE BLADE CUT EDGE | 8 mm (0.3 in) |
| CU | TRACKS TO ANGLE BLADE CAST EDGE | 193 mm (7.6 in) |
| CV | BLADE WIDTH FULLY ANGLED, RIGHT / LEFT | 1790 mm (70.5 in) |
| CW | MACHINE CENTERLINE TO ANGLE BLADE CUT EDGE | 1608 mm (63.3 in) |
| CX | MACHINE CENTERLINE TO ANGLE BLADE CAST EDGE | 2446 mm (96.3 in) |
| CY | TRACK TO BLADE CLEARANCE WITH BLADE FULLY ANGLED, RIGHT / LEFT | 138 mm (5.4 in) |

## RATED LIFT CAPACITY – LONG ARM AND ADD ON COUNTERWEIGHT

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.




| A | B 3000 mm | B 4000 mm | B 5000 mm | kg @ max. B | B 3000 mm | B 4000 mm | B 5000 mm | kg @ max. B | B 3000 mm | B 4000 mm | B 5000 mm | kg @ max. B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4000 mm | | *1036 kg | | *1198 kg @ 4580 mm | | *1036 kg | | 1072 kg @ 4580 mm | | *1036 kg | | 996 kg @ 4580 mm |
| 3000 mm | | *1121 kg | *1195 kg | *1218 kg @ 5170 mm | | *1121 kg | 937 kg | 909 kg @ 5170 mm | | *1121 kg | 863 kg | 827 kg @ 5170 mm |
| 2000 mm | *1646 kg | *1382 kg | *1282 kg | *1269 kg @ 5480 mm | *1646 kg | 1317 kg | 950 kg | 851 kg @ 5480 mm | *1646 kg | 1199 kg | 875 kg | 767 kg @ 5480 mm |
| 1000 mm | *2464 kg | *1729 kg | *1419 kg | *1334 kg @ 5550 mm | 1959 kg | 1300 kg | 948 kg | 825 kg @ 5550 mm | 1725 kg | 1165 kg | 854 kg | 745 kg @ 5550 mm |
| Ground | *2838 kg | *1964 kg | *1528 kg | *1400 kg @ 5400 mm | 1947 kg | 1294 kg | 953 kg | 866 kg @ 5400 mm | 1692 kg | 1147 kg | 851 kg | 774 kg @ 5400 mm |
| -1000 mm | *2885 kg | *2030 kg | *1506 kg | *1482 kg @ 5020 mm | 2020 kg | 1326 kg | 970 kg | 977 kg @ 5020 mm | 1726 kg | 1153 kg | 857 kg | 854 kg @ 5020 mm |

*

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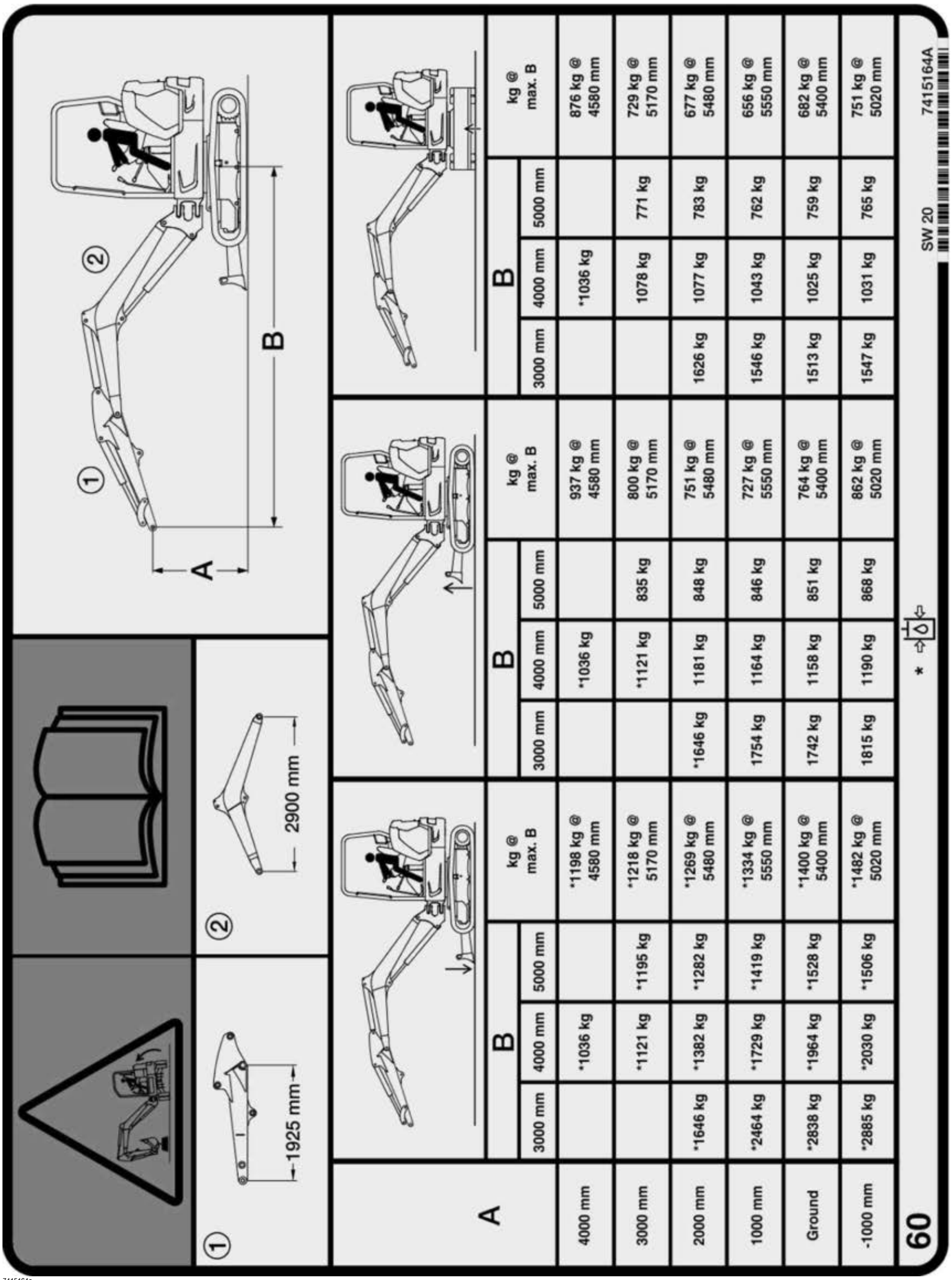
## RATED LIFT CAPACITY – LONG ARM AND HEAVY COUNTERWEIGHT

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.




| A | B 3000 mm | B 4000 mm | B 5000 mm | kg @ max. B | B 3000 mm | B 4000 mm | B 5000 mm | kg @ max. B | B 3000 mm | B 4000 mm | B 5000 mm | kg @ max. B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4000 mm | | *1036 kg | | *1198 kg @ 4580 mm | | *1036 kg | | 937 kg @ 4580 mm | | *1036 kg | | 876 kg @ 4580 mm |
| 3000 mm | | *1121 kg | *1195 kg | *1218 kg @ 5170 mm | | *1121 kg | 835 kg | 800 kg @ 5170 mm | | 1078 kg | 771 kg | 729 kg @ 5170 mm |
| 2000 mm | *1646 kg | *1382 kg | *1282 kg | *1269 kg @ 5480 mm | *1646 kg | 1181 kg | 848 kg | 751 kg @ 5480 mm | 1626 kg | 1077 kg | 783 kg | 677 kg @ 5480 mm |
| 1000 mm | *2464 kg | *1729 kg | *1419 kg | *1334 kg @ 5550 mm | 1754 kg | 1164 kg | 846 kg | 727 kg @ 5550 mm | 1546 kg | 1043 kg | 762 kg | 656 kg @ 5550 mm |
| Ground | *2838 kg | *1964 kg | *1528 kg | *1400 kg @ 5400 mm | 1742 kg | 1158 kg | 851 kg | 764 kg @ 5400 mm | 1513 kg | 1025 kg | 759 kg | 682 kg @ 5400 mm |
| -1000 mm | *2885 kg | *2030 kg | *1506 kg | *1482 kg @ 5020 mm | 1815 kg | 1190 kg | 868 kg | 862 kg @ 5020 mm | 1547 kg | 1031 kg | 765 kg | 751 kg @ 5020 mm |

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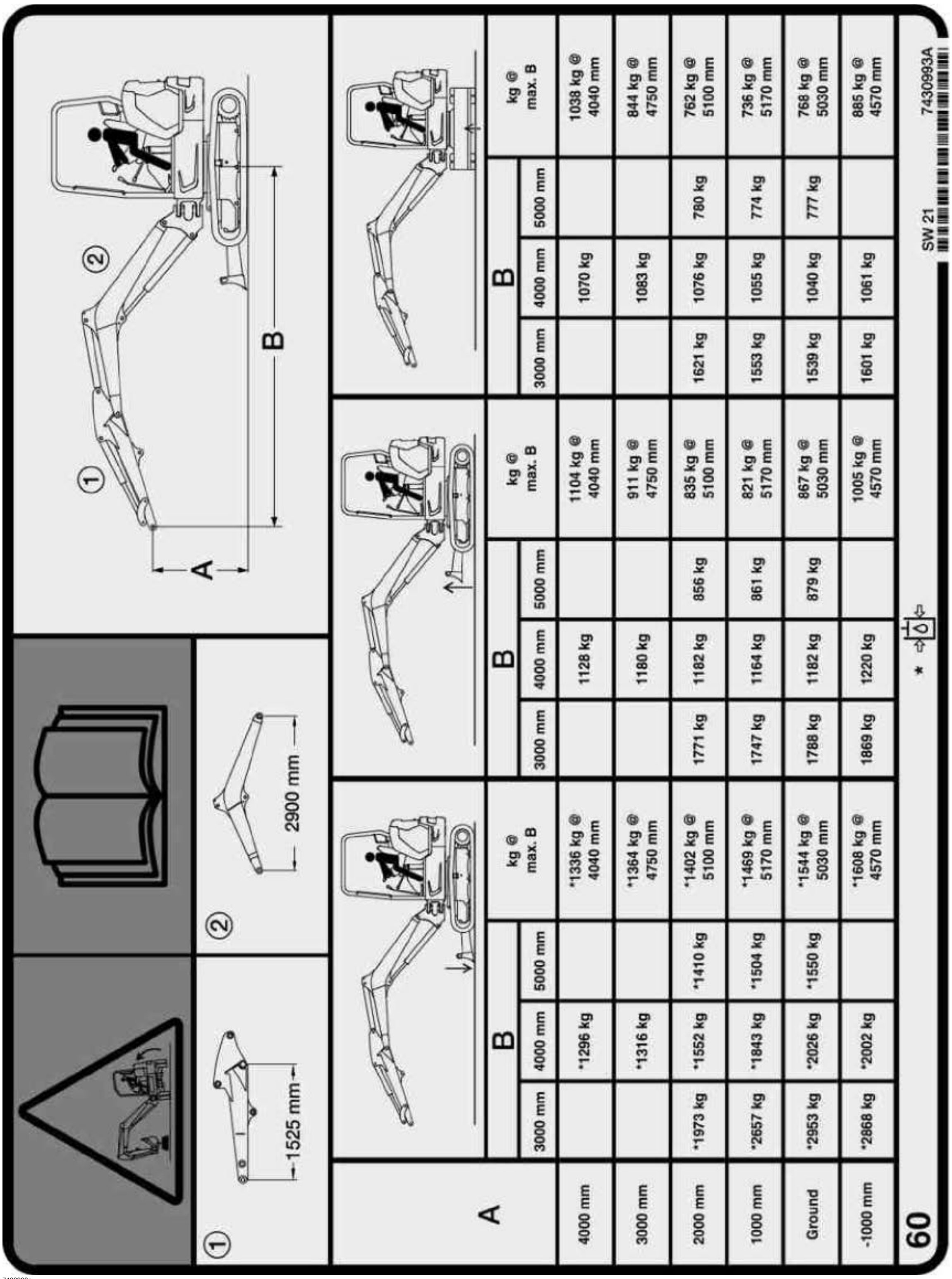
## RATED LIFT CAPACITY – STANDARD ARM AND HEAVY COUNTERWEIGHT

Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.




| A | B 3000 mm | B 4000 mm | B 5000 mm | kg @ max. B | B 3000 mm | B 4000 mm | B 5000 mm | kg @ max. B | B 3000 mm | B 4000 mm | B 5000 mm | kg @ max. B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4000 mm | | *1296 kg | | *1336 kg @ 4040 mm | | 1128 kg | | 1104 kg @ 4040 mm | | 1070 kg | | 1038 kg @ 4040 mm |
| 3000 mm | | *1316 kg | | *1364 kg @ 4750 mm | | 1180 kg | | 911 kg @ 4750 mm | | 1083 kg | | 844 kg @ 4750 mm |
| 2000 mm | *1973 kg | *1552 kg | *1410 kg | *1402 kg @ 5100 mm | 1771 kg | 1182 kg | 856 kg | 835 kg @ 5100 mm | 1621 kg | 1076 kg | 780 kg | 762 kg @ 5100 mm |
| 1000 mm | *2657 kg | *1843 kg | *1504 kg | *1469 kg @ 5170 mm | 1747 kg | 1164 kg | 861 kg | 821 kg @ 5170 mm | 1553 kg | 1055 kg | 774 kg | 736 kg @ 5170 mm |
| Ground | *2953 kg | *2026 kg | *1550 kg | *1544 kg @ 5030 mm | 1788 kg | 1182 kg | 879 kg | 867 kg @ 5030 mm | 1539 kg | 1040 kg | 777 kg | 768 kg @ 5030 mm |
| -1000 mm | *2868 kg | *2002 kg | | *1608 kg @ 4570 mm | 1869 kg | 1220 kg | | 1005 kg @ 4570 mm | 1601 kg | 1061 kg | | 885 kg @ 4570 mm |

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## EXCAVATOR SPECIFICATIONS

Certain specification(s) are based on engineering calculations and are not actual measurements. Specification(s) are provided for comparison purposes only and are subject to change without notice. Specification(s) for your individual Bobcat equipment will vary based on normal variations in design, manufacturing, operating conditions, and other factors.

### Performance Specifications

| | |
|---|---|
| Operating weight (for cab with heater, rubber tracks, counterweight, standard bucket, and no operator) | 5610 kg (12368 lb) |
| If equipped with the following | Cab with HVAC, add 19 kg (42 lb)<br>Steel Tracks, add 125 kg (276 lb)<br>Segmented Tracks, add 243 kg (536 lb)<br>Standard Arm, subtract 21 kg (57 lb)<br>Add On Counterweight, add 239 (528 lb)<br>Angle Blade, add 176 kg (387 lb) |
| Travel speed (Low / High) | 2,9 km/h / 4,9 km/h (1.8 mph / 3.0 mph) |
| Digging Force (per ISO 6015) (long arm) | 28405 N (6386 lbf) |
| Digging Force (per ISO 6015) (standard arm) | 33472 N (7525 lbf) |
| Digging Force (per ISO 6015) (bucket) | 47841 N (10755 lbf) |

### Controls Specifications

| | |
|---|---|
| Steering | Two hand levers and foot pedals |
| Hydraulics | Two hand-operated joysticks control boom, bucket, arm, and upperstructure slew. Thumb switch controls auxiliary hydraulics and boom swing. |
| Standard Blade | Hand lever |
| Angle Blade (if equipped) | Switch on blade lever |
| Two Speed | 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 / Cooling | Diesel / Liquid |

| | |
|---|---|
| Horsepower:<br>– Gross power (ISO 14396)<br>– Gross power (SAE J1995)<br>– Rated Power | <br>41,0 kW (55.0 hp)<br>41,2 kW (55.3 hp)<br>41,0 kW (55.0 hp) |
| Torque:<br>– Gross Torque (ISO 14396)<br>– Gross Torque (SAE J1995)<br>– Rated Torque | <br>190,0 N•m (140.1 lb-ft)<br>191,0 N•m (140.8 lb-ft)<br>190,0 N•m (140.1 lb-ft) |
| Number Of Cylinders | 4 |
| Displacement | 2,392 L (146.0 $in^3$) |
| 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 | Diesel – Compression |
| Low Idle Speed | 1050 ± 25 rpm |
| High Idle Speed | 2200 ± 25 rpm |
| Engine Coolant | Propylene Glycol / water mixture (53% PG / 47% water) |

**Hydraulic System Specifications**

| | |
|---|---|
| Pump Type | single outlet variable displacement piston pump with gear pumps |
| Pump Capacity | 138,5 L/min (36.6 U.S. gpm) |
| Auxiliary Flow | 85,7 L/min (22.6 U.S. gpm) |
| 2nd Auxiliary Flow | 45,4 L/min (12.0 U.S. gpm) |
| Control Valves | closed center individually compensated |
| System Relief Pressure | 270 bar (3916 psi) |
| Slew Relief Pressure | 245 bar (3553 psi) |
| Joystick Control Pressure | 30 bar (435 psi) |
| Arm Port Relief, Base End And Rod End | 310 bar (4496 psi) |
| Boom Port Relief, Base End And Rod End | 310 bar (4496 psi) |
| Bucket Port Relief, Base End And Rod End | 310 bar (4496 psi) |
| Blade Port Relief, Base End | 280 bar (4061 psi) |
| Angle Blade (If Equipped) Port Relief, Base End And Rod End | 290 bar (4206 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) |
| Automatic Track Tensioning System | |
| – Rubber Tracks | 70 bar (1015 psi) |
| – Steel Tracks | 30 bar (435 psi) |

**Hydraulic Cylinders**

| Cylinder | Bore | Rod | Stroke |
|---|---|---|---|
| Boom (cushion up) | 101,6 mm (4.00 in) | 57,2 mm (2.25 in) | 697,2 mm (27.45 in) |
| Arm (cushion retract / extend) | 88,9 mm (3.50 in) | 57,2 mm (2.25 in) | 757,4 mm (29.82 in) |
| Bucket | 82,6 mm (3.25 in) | 50,8 mm (2.00 in) | 524,0 mm (20.63 in) |
| Boom Swing | 95,3 mm (3.75 in) | 50,8 mm (2.00 in) | 490,7 mm (19.32 in) |
| Blade | 101,6 mm (4.00 in) | 50,8 mm (2.00 in) | 218,4 mm (8.60 in) |
| Angle Blade (If Equipped) | 63,5 mm (2.50 in) | 38,1 mm (1.50 in) | 422,9 mm (16.65 in) |

**Hydraulic Cycle Times**

| | |
|---|---|
| Bucket Curl | 3.1 seconds |
| Bucket Dump | 2.2 seconds |
| Arm Retract | 3.3 seconds |
| Arm Extend | 3.7 seconds |
| Boom Raise | 5.3 seconds |
| Boom Lower | 5.9 seconds |
| Boom Swing Left | 5.2 seconds |
| Boom Swing Right | 4.6 seconds |
| Blade Raise | 3.3 seconds |
| Blade Lower | 3.9 seconds |
| Angle Blade Left (If Equipped) | 1.9 seconds |
| Angle Blade Right (If Equipped) | 2.0 seconds |

**Electrical System Specifications**

| | |
|---|---|
| Starting Aid | Glow Plugs |
| Alternator | 12 volt, 90 amp open frame with internal regulator |
| Battery | 12 volt negative earth, 700 CCA at -18ºC (0ºF), 110 min reserve capacity at 25 amp |
| Starter | 12 volt, 2.0 kW reduction drive |
| LED Lights | 20 watts (each) |

### Drive System Specifications

| | |
|---|---|
| Final Drive | Each track driven by hydraulic axial piston motor |
| Drive Reduction | 58.9:1 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 | 8,9 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 | 1960 mm (77.2 in) |

### Capacities Specifications

| | |
|---|---|
| Fuel Tank | 72,0 L (19.0 U.S. gal) |
| Hydraulic Reservoir | 15,1 L (4.00 U.S. gal) |
| Hydraulic System Capacity (Center of Sight Glass) | 60,0 L (15.85 U.S. gal) |
| Cooling System | 9,5 L (2.50 U.S. gal) |
| Engine Oil and Filter | 9,8 L (10.35 qt) |
| Final Drive (each) | 1,0 L (1.1 qt) |
| Air Conditioning Refrigerant (R-134a) | 0,77 kg (1.7 lb) |

### Track Specifications

| Type | Rubber | Steel | Segmented |
|---|---|---|---|
| Width | 400 mm (15.7 in) | 400 mm (15.7 in) | 400 mm (15.7 in) |
| Number of Shoes | Single Assembly | 39 | 39 |
| Number of Track Rollers (per side) | 5 | 5 | 5 |

### Ground Pressure Specifications

| Machine Configuration | Rubber Tracks | Steel Tracks | Segmented Tracks |
|---|---|---|---|
| Standard Arm | 31,7 kPa (4.59 psi) | 32,3 kPa (4.69 psi) | 33,0 kPa (4.79 psi) |
| Long Arm | 31,8 kPa (4.61 psi) | 32,5 kPa (4.71 psi) | 33,1 kPa (4.81 psi) |
| Add-On Counterweight | 33,1 kPa (4.80 psi) | 33,8 kPa (4.90 psi) | 34,5 kPa (5.00 psi) |

**Environmental Specifications**

| DECLARED SINGLE-NUMBER NOISE EMISSION VALUES<br>In accordance with ISO 6395 | |
|---|---|
| Bystander noise level per Directive 2000/14/EC – $L_{wA}$ | 97 dB(A) |
| Operator noise level per Directive 2006/42/EC – $L_{pA}$ | 78 dB(A) |

| DECLARED VIBRATION EMISSION VALUES<br>In accordance with EN 12096 | |
|---|---|
| Whole-body vibration per ISO 2631-1 | 0,30 $m/s^2$ (0.984 $ft/s^2$) |
| Hand-arm vibration per ISO 5349-1 | 0,46 $m/s^2$ (1.509 $ft/s^2$) |

| FLUORINATED GREENHOUSE GAS (F-GAS) VALUES<br>(for machines equipped with HVAC) | |
|---|---|
| F-gas type | HFC-134a |
| F-gas mass | 0,77 kg |
| $CO_2$ equivalent (t) | 1,10 t |
| GWP | 1430 |

| ENGINE $CO_2$ EMISSION VALUES | |
|---|---|
| $CO_2$ emission | 750,6 g/kWh |
| This $CO_2$ measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine. | |

**Temperature Range**

| | |
|---|---|
| Operation and storage | -17° – +43°C (-1.3° – +109.4°F) |

# BOBCAT® EXCAVATORS WARRANTY

Doosan Bobcat EMEA s.r.o. ("Bobcat") warrants that this Bobcat® Excavator will be free from defects in design, material or workmanship for twenty four (24) months from the retail date to the owner or 2000 hours of machine usage, whichever occurs first. During the warranty period, only official Bobcat dealers (as listed on www.bobcat.com) are entitled to deal with warranty claims and shall repair or replace, at Bobcat's option, without charge for parts, labour or travel of technicians, any part of the Bobcat® equipment which fails because of defects in design, material or workmanship. The owner shall provide any official Bobcat dealer with prompt written notice of the defect and allow reasonable time for replacement or repair. Bobcat may, at its option, request failed parts to be returned to the factory or to any other designated location. Transportation of the Bobcat® equipment to the official Bobcat dealer for warranty work is not the responsibility of Bobcat. Service schedules must adhere to prescribed intervals and Bobcat® genuine parts/lubricants must be used. The warranty does not apply to tires, tracks or other accessories not manufactured by Bobcat. For warranty coverage on engines, consult with your official Bobcat dealer. For these non-covered items, the owner shall refer solely to the warranty, if any, of the respective manufacturers thereof, in accordance with the respective manufacturers warranty statement. Coverage for air-conditioning refill and couplers is limited as failures generally originate from factors not under Bobcat's control such as, but not limited to, prolonged storage or abuse. This limited coverage is, depending on the component, 50 to 500 hours of machine usage. The warranty does not cover: (i) Oils and lubricants, coolant fluids, filter elements, brake linings, tune-up parts, bulbs, fuses, alternator fan belts, drive belts, pins, bushings and other high-wear items. (ii) Damages resulting from abuse, misuse, accidents, alterations, use of non-genuine Bobcat parts, use of the product with any bucket or attachment not approved by Bobcat, air flow obstructions, or failure to maintain or use the Bobcat product according to the instructions applicable to it. (iii) Ground engaging parts such as bucket teeth and cutting edges. (iv) Fuel or hydraulic system cleaning, engine tune-up, brake inspection or adjustment. (v) Adjustments or slight defects which generally do not affect the stability or reliability of the machine. (vi) Damage or defect resulting from improper storage, weathering, lack of use, use and operation in a corrosive or chemical environment. (vii) Damage or defect caused by operation of the product under extreme weather or geographical conditions without the written agreement of Bobcat.

BOBCAT EXCLUDES OTHER CONDITIONS, WARRANTIES OR REPRESENTATIONS OF ALL KINDS, EXPRESSED OR IMPLIED, STATUTORY OR OTHERWISE (EXCEPT THAT OF TITLE) INCLUDING ALL IMPLIED WARRANTIES AND CONDITIONS RELATING TO MERCHANTABILITY, SATISFACTORY QUALITY AND FITNESS FOR A PARTICULAR PURPOSE. CORRECTIONS BY BOBCAT OF NON-CONFORMITIES WHETHER PATENT OR LATENT, IN THE MANNER AND FOR THE WARRANTY PERIOD PROVIDED ABOVE, SHALL CONSTITUTE FULFILLMENT OF ALL LIABILITIES OF BOBCAT FOR SUCH NON-CONFORMITIES, WHETHER BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE WITH RESPECT TO OR ARISING OUT OF SUCH PRODUCT. THE REMEDIES OF THE END-USER/OWNER SET FORTH UNDER THE PROVISIONS OF THE WARRANTY OUTLINED ABOVE ARE EXCLUSIVE AND THE TOTAL LIABILITY OF BOBCAT INCLUDING ANY HOLDING, SUBSIDIARY, ASSOCIATED OR AFFILIATED COMPANY OR DISTRIBUTOR WITH RESPECT TO THIS SALE OR THE PRODUCT AND SERVICE FURNISHED HEREUNDER IN CONNECTION WITH THE PERFORMANCE OR BREACH THEREOF, OR FROM DELIVERY, INSTALLATION, REPAIR OR TECHNICAL DIRECTION COVERED BY OR FURNISHED UNDER THIS SALE, WHETHER BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE SHALL NOT EXCEED THE PURCHASE PRICE OF THE PRODUCT UPON WHICH SUCH LIABILITY IS BASED. BOBCAT INCLUDING ANY HOLDING, SUBSIDIARY, ASSOCIATED OR AFFILIATED COMPANY AND DISTRIBUTOR SHALL IN NO EVENT BE LIABLE TO THE END-USER/OWNER, ANY SUCCESSORS IN INTEREST OR ANY BENEFICIARY OR ASSIGNEE RELATING TO THIS SALE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, SPECIAL OR PUNITIVE DAMAGES ARISING OUT OF THIS SALE OR BY ANY BREACH THEREOF, OR ANY DEFECT IN, OR FAILURE OF, OR MALFUNCTION OF THE PRODUCT UNDER THIS SALE, WHETHER BASED UPON LOSS OF USE, LOST PROFITS OR REVENUE, INTEREST, LOST GOODWILL, WORK STOPPAGE, IMPAIRMENT OF OTHER GOODS, LOSS BY REASON OF SHUTDOWN OR NON-OPERATION, INCREASED EXPENSES OF OPERATION OR CLAIMS OF USER OR CUSTOMERS OF THE USER FOR SERVICE INTERRUPTION WHETHER OR NOT SUCH LOSS OR DAMAGE IS BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, INDEMNITY, STRICT LIABILITY OR OTHERWISE.

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Bobcat

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Bobcat®

**Reference Information**

Compact Excavator Serial Number: ........................................

Engine Serial Number: ........................................

NOTES: ........................................

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YOUR BOBCAT DEALER NAME:

Dealer Address:

| Affix Business Card Here or enter dealer information | | Affix Business Card Here or enter dealer information | |
|---|---|---|---|
| **Sales Contact** | (Name): ______ | **Service Contact** | (Name): ______ |
| | (Phone): ______ | | (Phone): ______ |
| | (Email): ______ | | (Email): ______ |
| **Rental Contact** | (Name): ______ | **Parts Contact** | (Name): ______ |
| | (Phone): ______ | | (Phone): ______ |
| | (Email): ______ | | (Email): ______ |