EN

Operation & Maintenance Manual

Compact Excavator

E17 S/N: B4PR11001 & Above

7349201enGB (D)
December 2020

Printed in Belgium
Original Instructions

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

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

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

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

MANUFACTURING LOCATIONS

North America

Bobcat Company

P.O. Box 128

Gwinner, ND 58040-0128

United States of America

Czech Republic

Doosan Bobcat EMEA s.r.o.

U Kodetky 1810

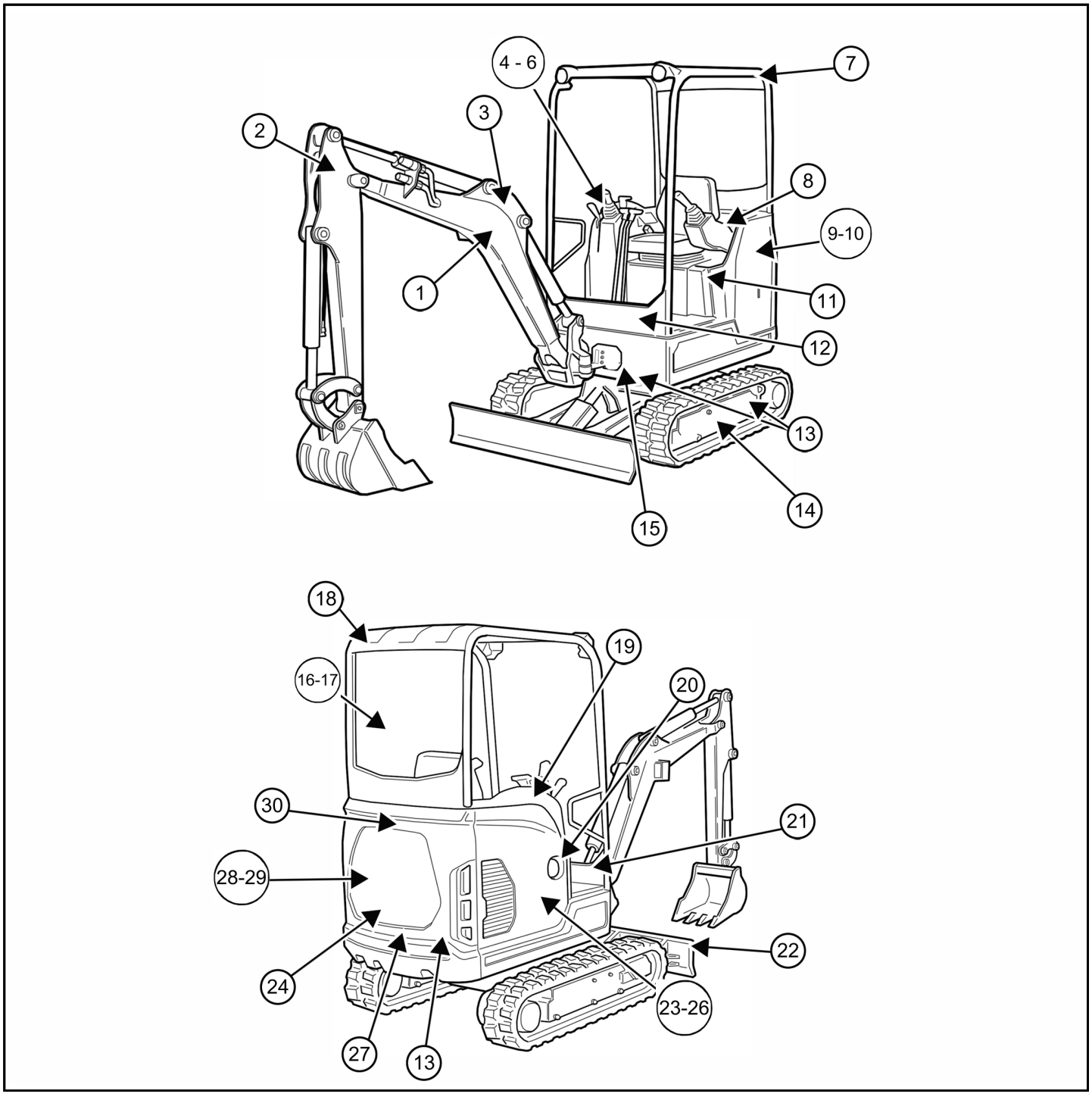
263 12 Dobřiš

Czech Republic

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



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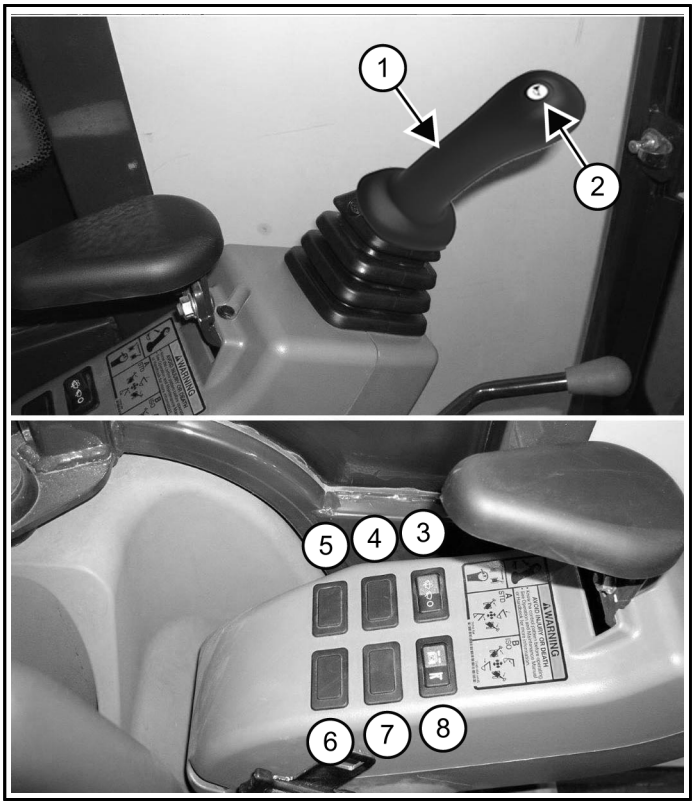
INSTRUMENTS AND CONSOLES

Left Console

Figure 11



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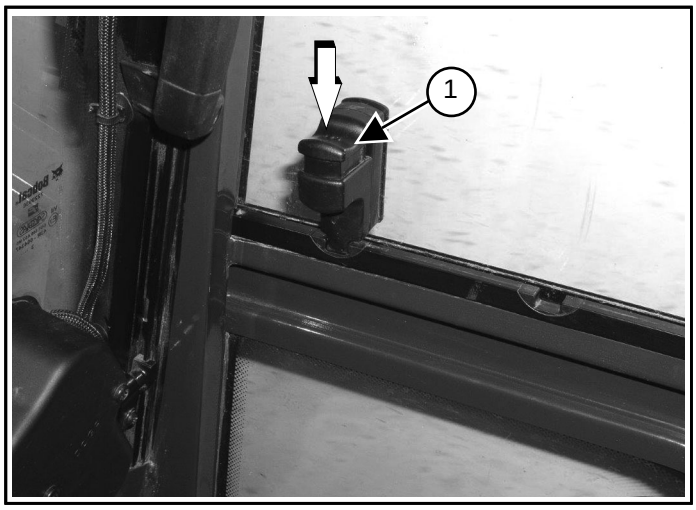
REF	DESCRIPTION	FUNCTION
1	Left Joystick	Operates the hydraulic controls. (See Hydraulic Controls on Page 42)
2	Horn	Sounds the horn.
3	Wiper / Washer Switch (if equipped)	Operates the windshield wiper and washer. (See Operating Windshield Wiper on Page 37)
4	Not Used	
5	Beacon / Strobe Light (if equipped)	Turns beacon / strobe light ON / OFF.
6	Overload Warning Device Switch (if equipped)	Turns the overload warning device ON / OFF. (See Operating The Overload Warning Device on Page 51)
7	Blade / Track Control Switch	Toggles the function of the lever between raising and lowering the blade and extending and retracting the tracks. (See Track Frame Expansion on Page 49)
8	Not used	

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

Operating The Right Window

Figure 29



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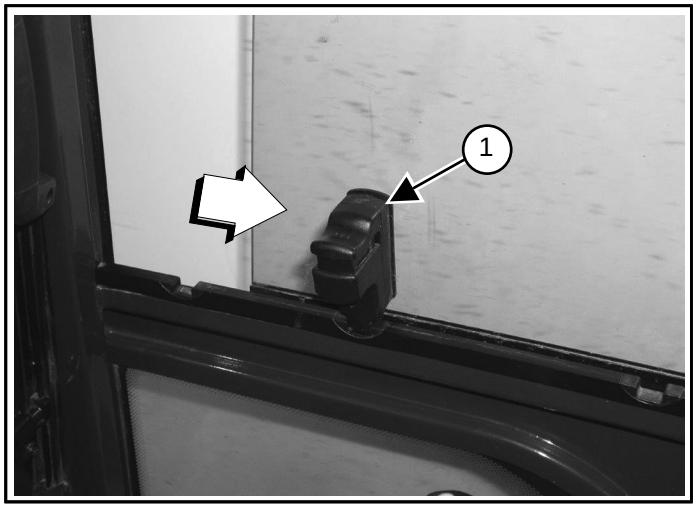
1. Press down on the latch (Item 1) [Figure 29] located at the front of the right window.

Figure 30



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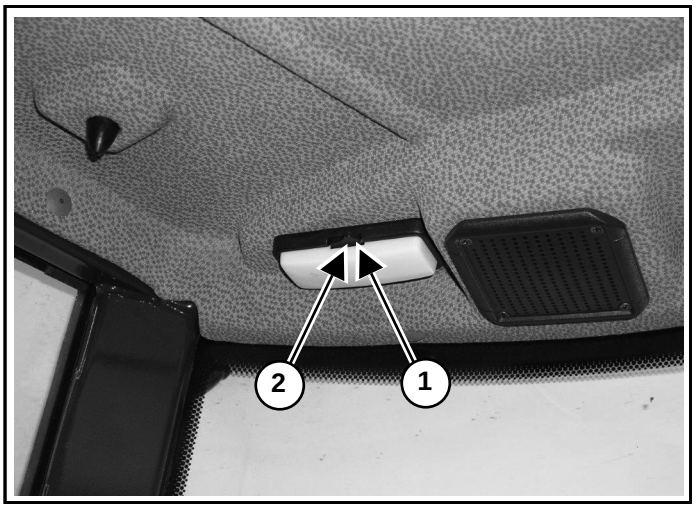
2. Pull the latch (Item 1) [Figure 30] backward to open the window.
3. Release the latch to secure the window in place.
4. To close the window, press down on the latch (Item 1) [Figure 29] and push the latch forward.

Operating The Cab Interior Light

Figure 31



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1. Press the switch to the right (Item 1) [Figure 31] to turn the light ON.
2. Press the switch to the left (Item 2) [Figure 31] to turn the light OFF.

Operating Windshield Wiper

Figure 32

P200099a

The front window is equipped with a windshield wiper (Item 1) [Figure 32] and washer.

Figure 52

p-97988g

2. To change the flow rate, press the AUX button (Item 1) [Figure 52] to toggle through the settings.

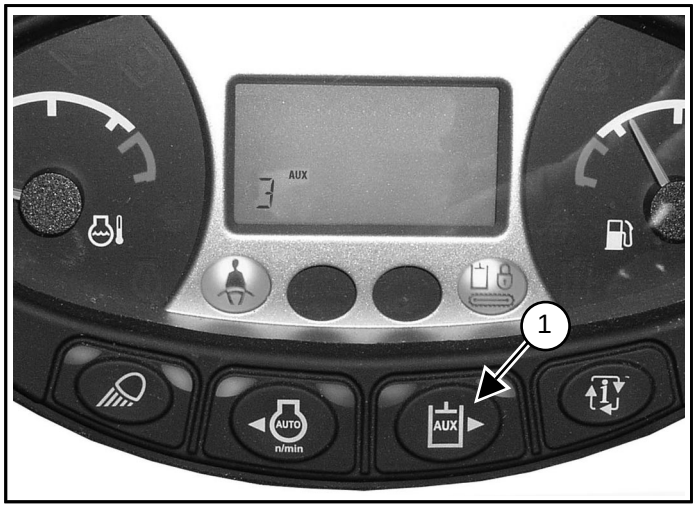
   The flow rate will display in the lower left corner of the display screen (3^{AUX}, 2^{AUX}, or 1^{AUX}) (Item 2) [Figure 52].

Releasing Hydraulic Pressure In Excavator With Joystick

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.

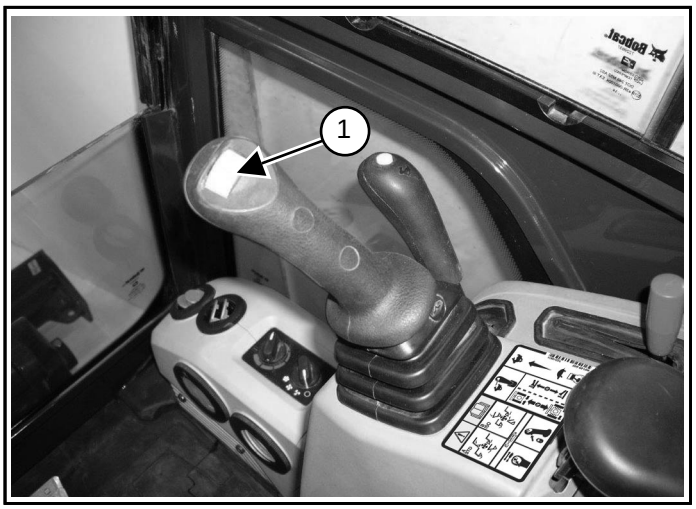
Figure 53



P97988e

4. Press the AUX button (Item 1) [Figure 53] to enable auxiliary hydraulics.

Figure 54



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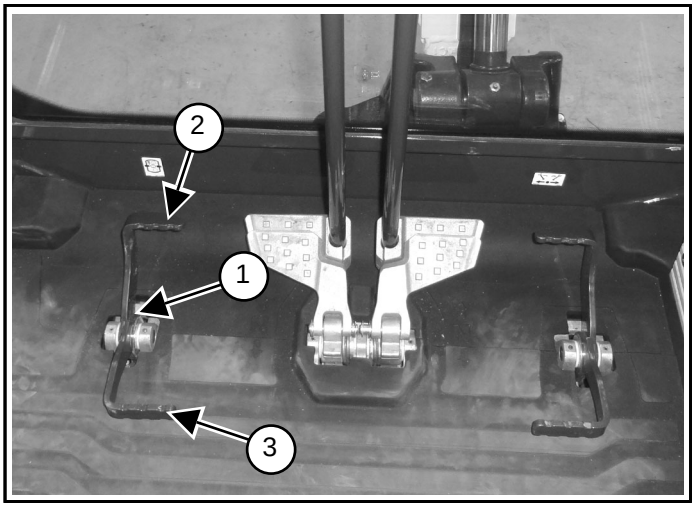
5. Move the right joystick switch (Item 1) [Figure 54] to the right and left several times to release pressure.

Releasing Hydraulic Pressure In Excavator With Pedal

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 55



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4. Move the pedal (Item 1) in both directions (Items 2 and 3) several times to release pressure [Figure 55].

Releasing Hydraulic Pressure In Attachments

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

STARTING THE ENGINE

Starting Engine With Key Switch

⚠ WARNING

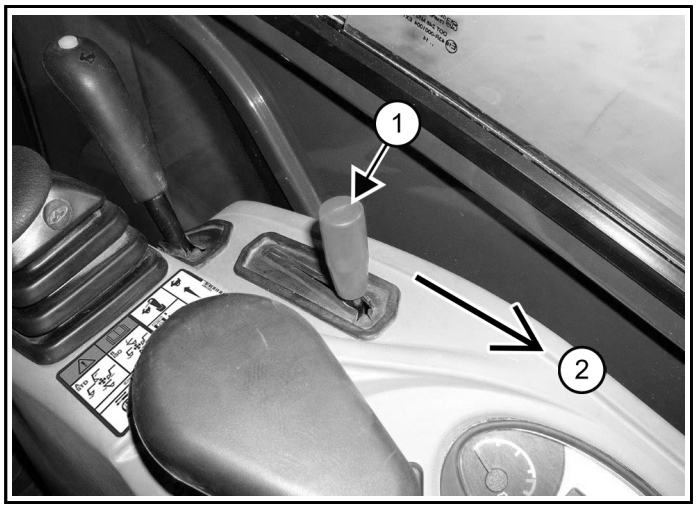
GENERAL HAZARD
Failure to follow instructions can cause serious injury or death.
- **Fasten seat belt, start, and operate only from the operator's seat.**
- **Never wear loose clothing when working near machine.◂**

W-2135

1. Perform the Pre-Starting Procedure.
   (See Pre-Starting Procedure on Page 55)

2. Put control levers in the NEUTRAL position.

Figure 80



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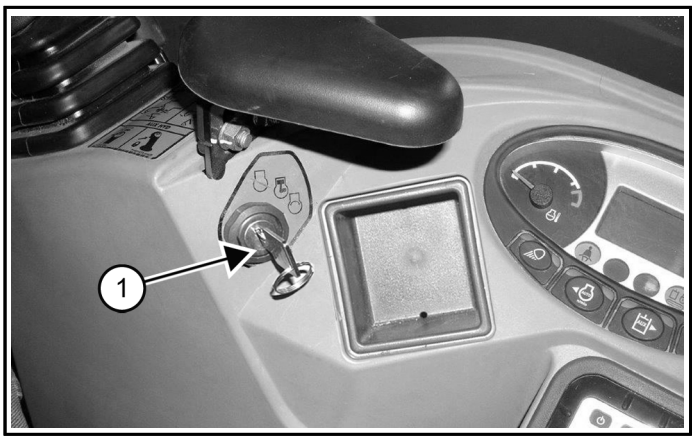
3. Move the engine speed control lever (Item 1) back to low idle (Item 2) [Figure 80].

⚠ 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

Figure 81



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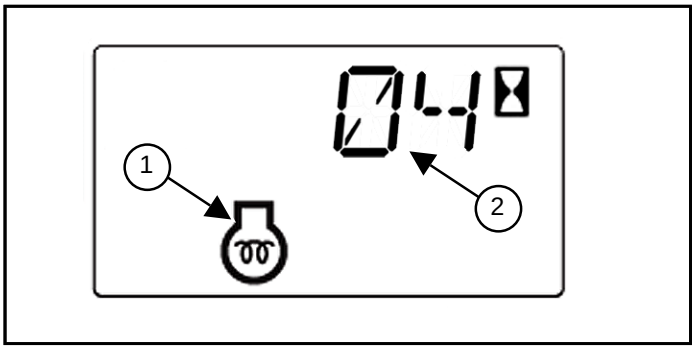
4. Turn the key (Item 1) [Figure 81] to the ON position.

Figure 82



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If preheating is required, the glow plugs will automatically cycle and the preheat icon will be ON (Item 1) [Figure 82]. The remaining preheat time (in seconds) will show in the data display screen (Item 2) [Figure 82].

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

5. When the engine preheat icon goes OFF, turn the key to START and release the key when the engine starts.

6. Stop the engine if the warning lights and alarm do not go OFF.

   Check for the cause before starting the engine again.

7. Turn the key switch 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

INSTALLING ATTACHMENTS (PIN-ON X-CHANGE)

Installation of the bucket is shown. The procedure is the same for other attachments.

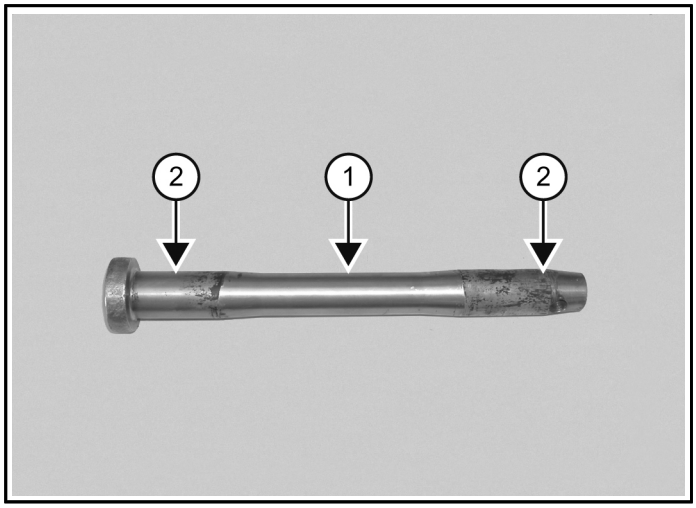
⚠ WARNING

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

CRUSHING HAZARD
Failure to fully engage and lock both hydraulic pins can allow attachment to come off and cause serious injury or death.
Both hydraulic pins must be fully extended through the attachment mounting holes and locked with both retainer pins and clips.
W-2507

Figure 103



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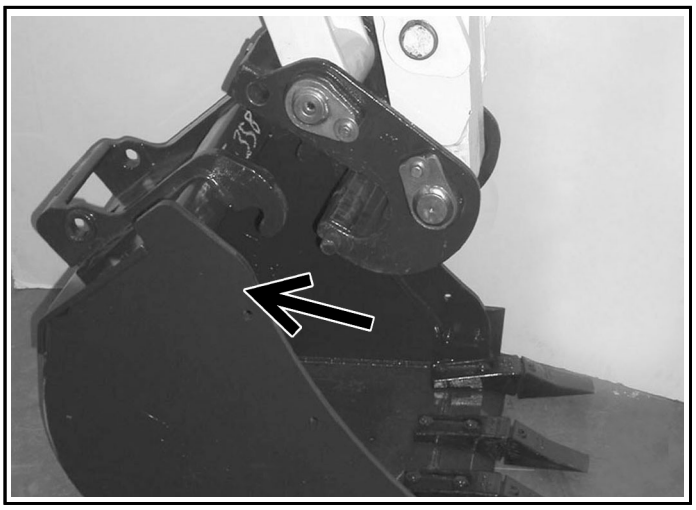
1. Inspect the pin (Item 1) [Figure 103] for wear or damage.

   Replace the pin as needed.

2. Apply a light coat of grease to the ends of the pin (Item 2) [Figure 103].

Figure 104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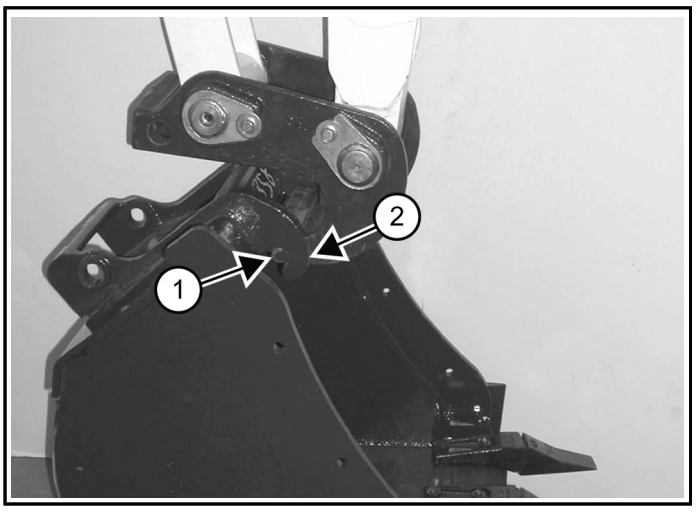
3. Start the engine and move the arm toward the bucket [Figure 104].

Figure 105



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4. Raise the boom until the pins (Item 1) engage the hooks (Item 2) [Figure 105] on the bucket.

REMOVING ATTACHMENTS (QUICK COUPLER, KLAC SYSTEM)

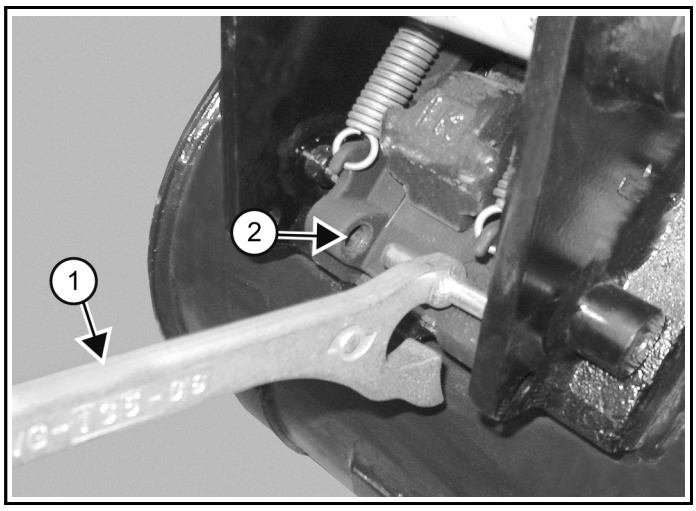
Removal of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ 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 131



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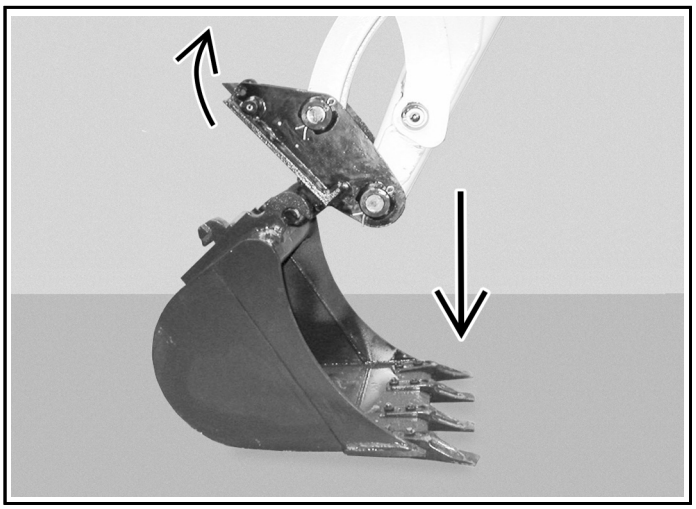
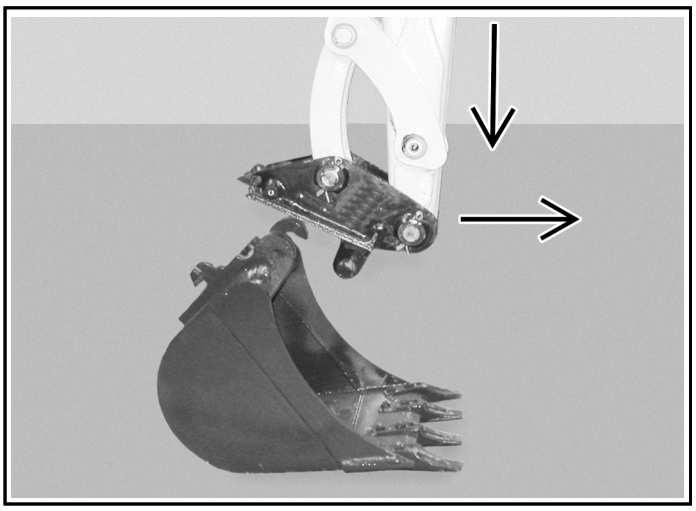
2. Install the quick coupler tool (Item 1) into the hole (Item 2) in the quick coupler [Figure 131].
3. Push down on the tool (Item 1) [Figure 131] to unlock the latch.
4. Remove the tool.
5. Enter the excavator, fasten the seat belt, and start the engine.

Figure 132


p-72282a

6. Retract the bucket cylinder fully and lower the boom until the attachment is on the ground [Figure 132].

Figure 133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7. Continue to lower the boom and move the arm towards the excavator until the quick coupler is clear of the attachment [Figure 133].

⚠ WARNING

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

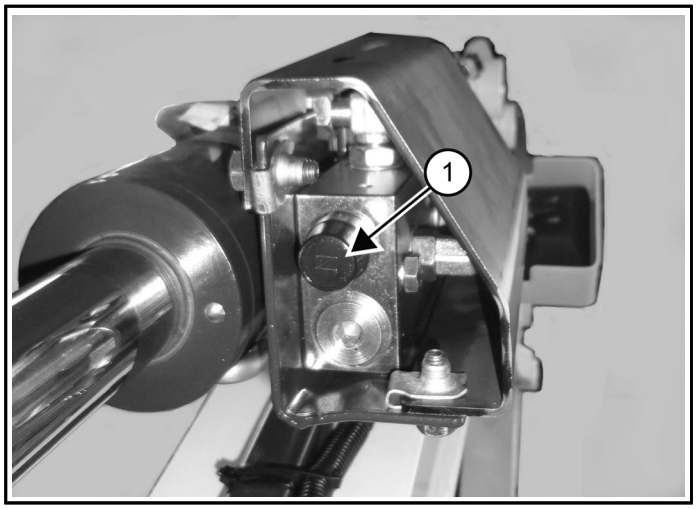
Lowering Boom With Load Holding Valve

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

For Base End Hose Failure, Or For Rod End Hose Failure And No Accumulator Pressure, Or For Loss Of Hydraulic Pressure

If the relief valve must be adjusted to lower the boom, the relief valve must be replaced. It can not be reset back to the factory setting.

Figure 157



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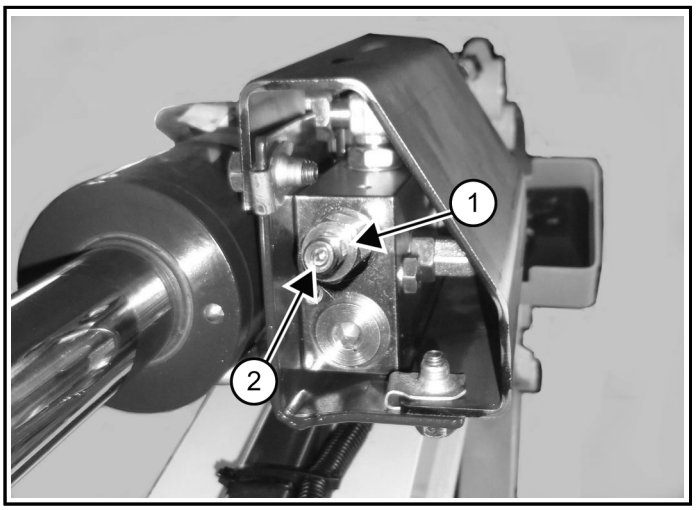
1. Place a container to catch any hydraulic fluid that is leaking.
2. Remove the plastic protective cap (Item 1) [Figure 157] from the valve.

⚠ 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 158



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3. Loosen the locknut (Item 1) [Figure 158].
4. Install a hex wrench into the valve screw (Item 2) [Figure 158] and slowly rotate the screw clockwise and allow the boom to lower to the ground.
5. Replace the relief valve. See your Bobcat dealer for service parts.

For 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 switch to the ON position or press the Enter Code button (Keyless Panel), but do not start the engine.
3. Slowly lower the boom to the ground with the joystick.

Service Schedule					
O	Check condition / proper operation. Adjust or replace as needed.		V	Refill as needed.	
D	Drain water.		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	100	250	500	1000	2000
Operator Cab (if equipped) 	Filter (See Page 104) • Fresh Air Filter (7176099)	C O						
Safety Signs (decals)	(See Page 17)	C O						
Seat Belt	Seat belt, mounting hardware, and seat belt retractors (See Page 99)	C O						
Control Console Lockout	(See Page 99)	O						
Attachment Coupler (if equipped)	(See Page 128)	O						
Motion Alarm and Horn (if equipped)	(See Page 100)	O						
Operator Canopy / Cab	Canopy / cab, mounting hardware	O						
Indicators and Lights		O						
Pivot Points 	Pivot points, clamp (if equipped) (See Page 129) • Grease (Packaging: 400 g tube): ▹ Bobcat Multipurpose Grease (Drop Point from 260°C) (6987888) ▹ Bobcat Supreme HD Grease (Drop Point from 280°C) (6987889) ▹ Bobcat Extreme HP Grease (Drop Point from 260°C) (6987890)	G						
Swing Bearing 	Swing bearing, swing pinion (See Page 129) • Grease (Packaging: 400 g tube): ▹ Bobcat Multipurpose Grease (Drop Point from 260°C) (6987888) ▹ Bobcat Supreme HD Grease (Drop Point from 280°C) (6987889) ▹ Bobcat Extreme HP Grease (Drop Point from 260°C) (6987890)	W	G					

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 five percent biodiesel can affect engine life and cause deterioration of hoses, tubelines, injectors, injector pump and seals.

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

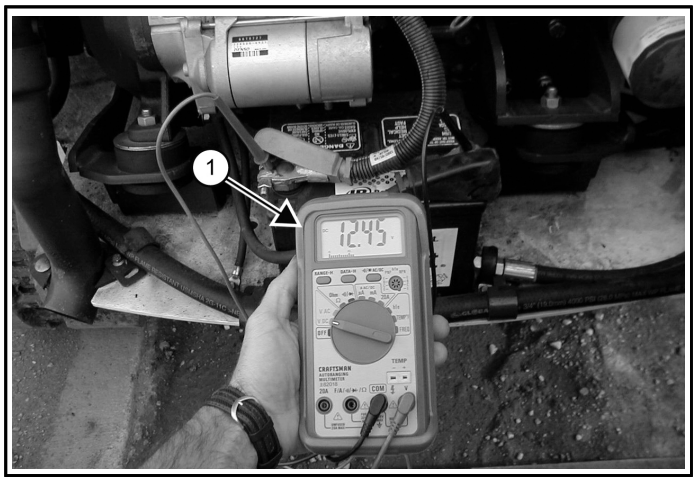
FIRE AND EXPLOSION HAZARD
Failure to use care around combustibles can cause serious injury or death.
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil.
W-2103

1. Use the start key to unlock the fuel cap.

- 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 205



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The simplest and most common check to determine battery state of charge is to use a digital multimeter or voltmeter (Item 1) [Figure 205].

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.

To access the battery for jump starting, you will have to remove the battery hold-down and move the battery outward to access the positive battery post.

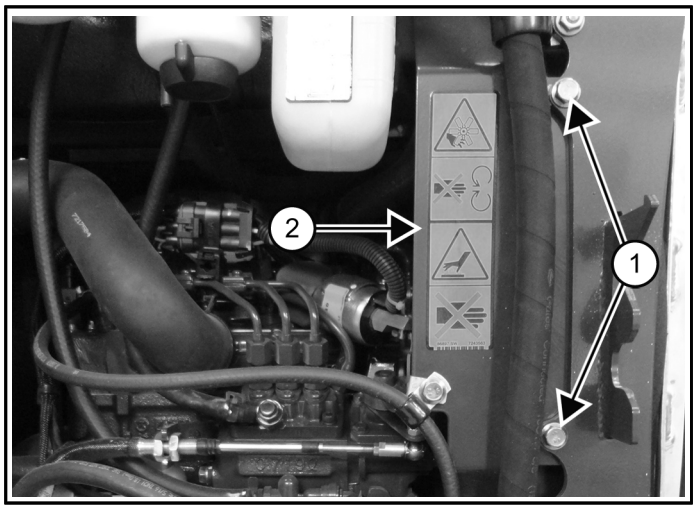
1. Be sure the key switch is OFF.
2. Open the tailgate. (See Tailgate on Page 102)

BELTS

Adjusting Alternator And Fan Belt

1. Stop the engine.
2. Open the tailgate. (See Tailgate on Page 102)

Figure 225



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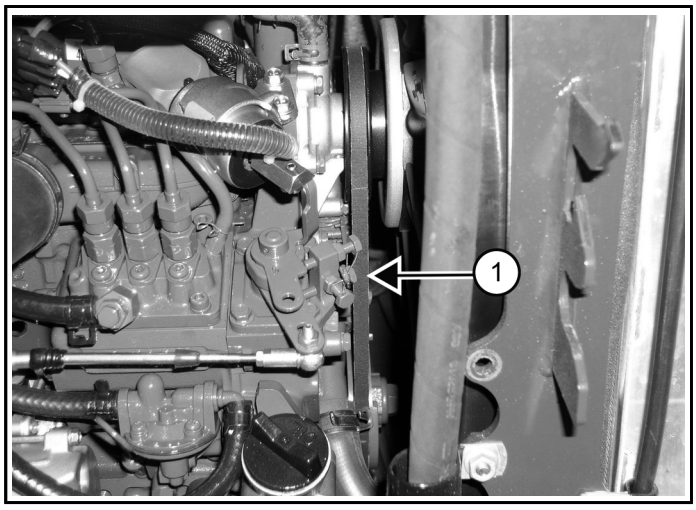
3. Remove the two bolts (Item 1) and reposition the belt guard (Item 2) [Figure 225] out of the way.

Figure 226



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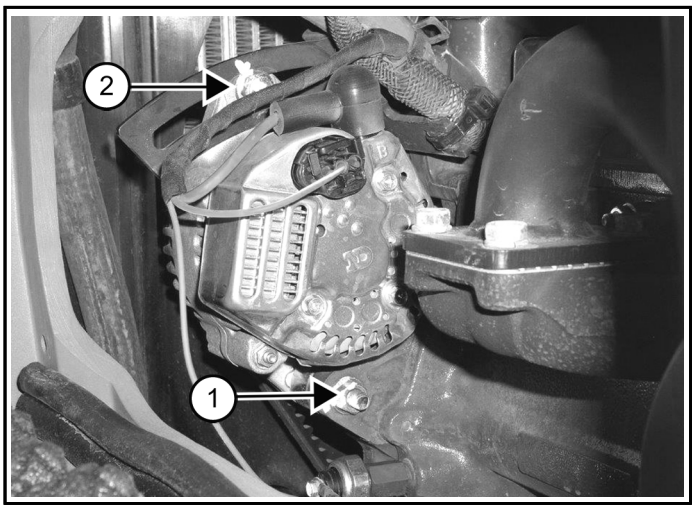
4. Measure the belt tension at the middle of the belt span (Item 1) [Figure 226].

Figure 227



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5. If the belt tension is not correct, loosen the bolt and nut (Item 1) and the bolt (Item 2) until the alternator can be rotated for adjustment [Figure 227].

   The seat is shown removed for photo clarity. The storage box below the seat can be removed to access the engine from below the seat. The alternator adjusting bolts can be accessed by reaching around the engine.

6. Adjust belt tension to correct specifications:

   - If a belt tension tool is available, move the alternator until the belt has new belt (272 – 292 N (61 – 65 lbf)) or used belt (233 – 252 N (53 – 57 lbf)) tension.
   - If a belt tension tool is not available, move the alternator until the belt has 8,0 mm (5/16 in) movement at the middle of the belt span with 66 N (15 lbf) of force.

7. Tighten the mounting and adjustment bolts.
8. Recheck the belt tension to confirm it did not change when the alternator bolts were tightened.
9. Reinstall the belt guard (Item 2) and the two bolts (Item 1) [Figure 225].
10. Close the tailgate.

Replacing Alternator And Fan Belt

1. Remove the belt guard (Item 2) [Figure 225].

The system will return to its previous state. Either the lock key (Item 2) red light or the unlock key (Item 3) [Figure 235] green light will become solid.

The display screen will show “ERROR” if:

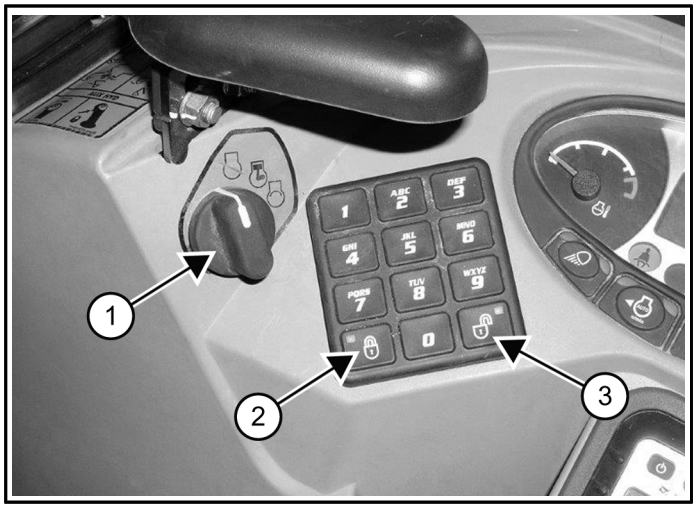
- The second five-digit password is different from the first one entered.
- No number key was pressed for more than 20 seconds.
- The password entered was **[00000]**.

Disabling Password Lockout

The owner can disable the password lockout feature so that a password does not have to be entered every time the engine is started.

1. Turn the start switch (Item 1) [Figure 236] to ON.

Figure 236



2. Enter the five-digit owner password using the keypad.
3. Press the unlock key (Item 3) [Figure 236].
4. The left panel display screen will show “CODE”.
5. Enter the five-digit owner password using the keypad.

   The unlock key green light will flash, then become solid.

The excavator can now be started without using a password.

Enabling Password Lockout

The owner can enable the password lockout feature so that operators must enter a password every time the engine is started.

1. Turn the start switch (Item 1) [Figure 236] to ON.
2. Press the lock key (Item 2) [Figure 236].

   The lock key red light will flash, and the left panel display screen will show “CODE”.
3. Enter the five-digit owner password using the keypad.

   The unlock key green light will flash, then the lock key red light will become solid.

Operators must now enter a password every time to start the excavator.

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 (canopy, standard arm, standard blade, basic seat, standard bucket, and 75 kg operator)	1711 kg (3772 lb)
If equipped with the following:	Cab with Heater, add 96 kg (211 lb) Long Blade, add 9 kg (20 lb) Standard Seat, add 8 (18 lb) Suspension Seat, add 14 kg (30 lb)
Travel Speed	2,1 km/h / 4,3 km/h (1.3 mph / 2.7 mph)
Digging Force (per ISO 6015) Arm Bucket	 9108 N (2048 lbf) 16177 N (3637 lbf)

Controls Specifications

Steering	Two hand-operated joysticks (optional foot pedals)
Hydraulics	Two hand-operated joysticks control boom, bucket, arm, and upperstructure slew
Blade	Hand lever
Two-Speed	Switch on blade lever
Boom Swing	Electric switch in left joystick or right foot pedal
Auxiliary Hydraulics	Electric switch in right joystick or left foot pedal
Auxiliary Pressure Release	Electric switch in right joystick or left foot pedal
Engine	Engine speed control lever, key type start switch
Starting Aid	Glow plugs activated by start switch
Travel Brakes (Service & Parking)	Hydraulic lock in motor circuit
Slew Brakes (Service)	Hydraulic lock on motor
Slew Brakes (Holding)	Spring applied - hydraulic release

Engine Specifications

Make / Model	Kubota® D722-E4B-BCZ-7 Stage 5 / Tier 4
Fuel / Cooling	Diesel NO.2-D / Liquid
Horsepower: – Gross Power (ISO 14396) – Gross Power (SAE J1995) – Net Power (SAE J1349)	 10,2 kW (13.7 hp) @ 2500 rpm 10,4 kW (13.9 hp) @ 2500 rpm 9,9 kW (13.3 hp) @ 2500 rpm