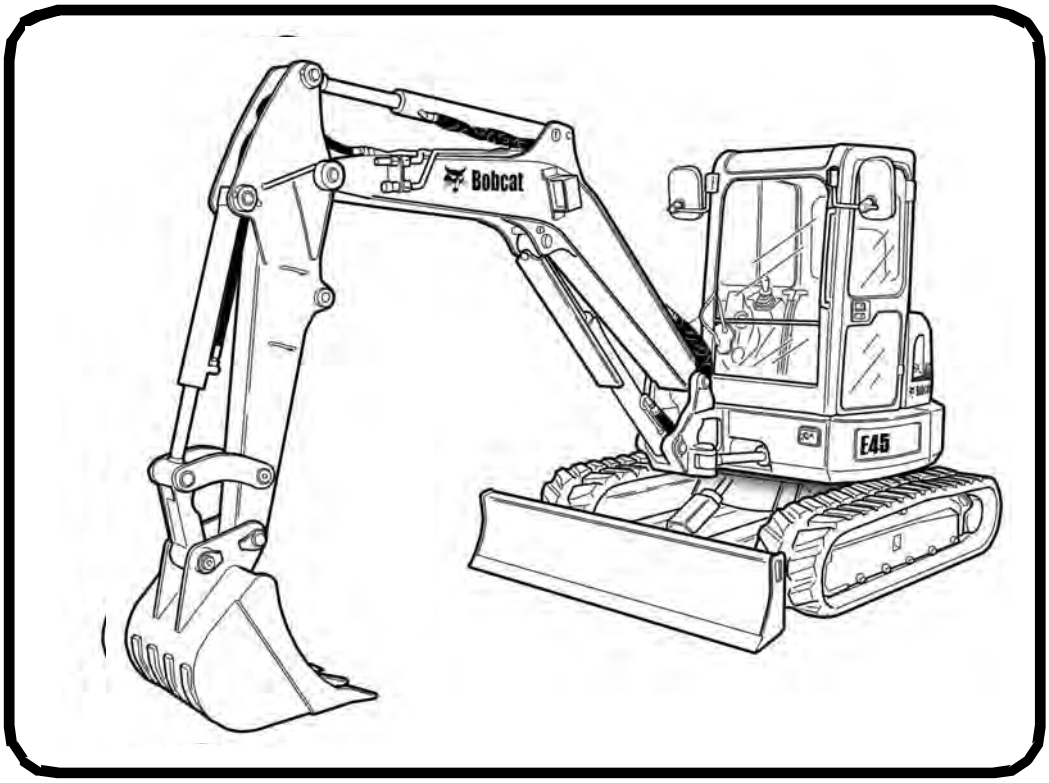
EN

Bobcat

Operation & Maintenance Manual
E45 Compact Excavator

S/N AHHC13000 & Above



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Printed in Belgium
Original Instructions

MEA S3B

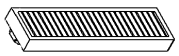
BOBCAT COMPANY IS IS0 9001 CERTIFIED

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

British Standards Institute (**BSI**) is the Certified Registrar Bobcat Company chose to assess the company's compliance with the 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 Bobcat Company chose to assess the company's compliance with the ISO 9001 at Bobcat's manufacturing facility in Dobris (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.

REGULAR MAINTENANCE ITEMS

	ENGINE OIL FILTER (6 Pack) 6675517		HVAC AIR FILTER (IF EQUIPPED) Fresh Air 7176099 Recirculation 7222791
	FUEL FILTER 6667352		BATTERY 6670251
 	AIR FILTER, Outer 6666375 AIR FILTER, Inner 6666376		HYDRAULIC FILL / BREATHER CAP 6692836
	PRIMARY HYDRAULIC FILTER 6668819 CASE DRAIN HYDRAULIC FILTER 6516722		RADIATOR CAP 6646678

NOTE: Always verify Part Numbers with your Bobcat dealer.

Avoid Silica Dust

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

FIRE PREVENTION

Maintenance

The machine 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

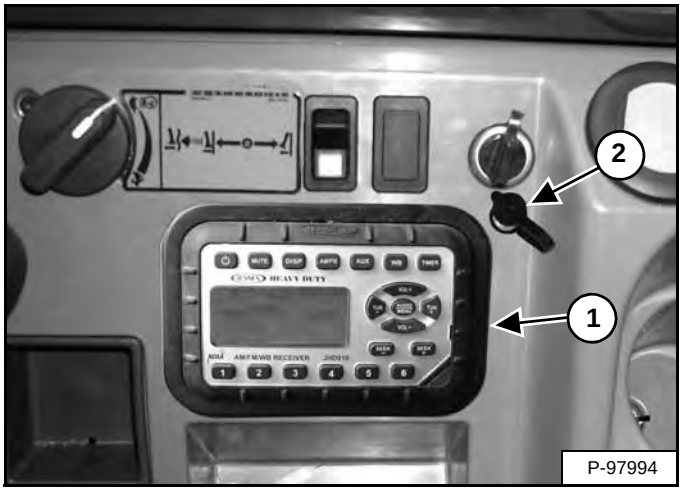
Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part or wires that are loose or frayed.

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.

OPERATING INSTRUCTIONS

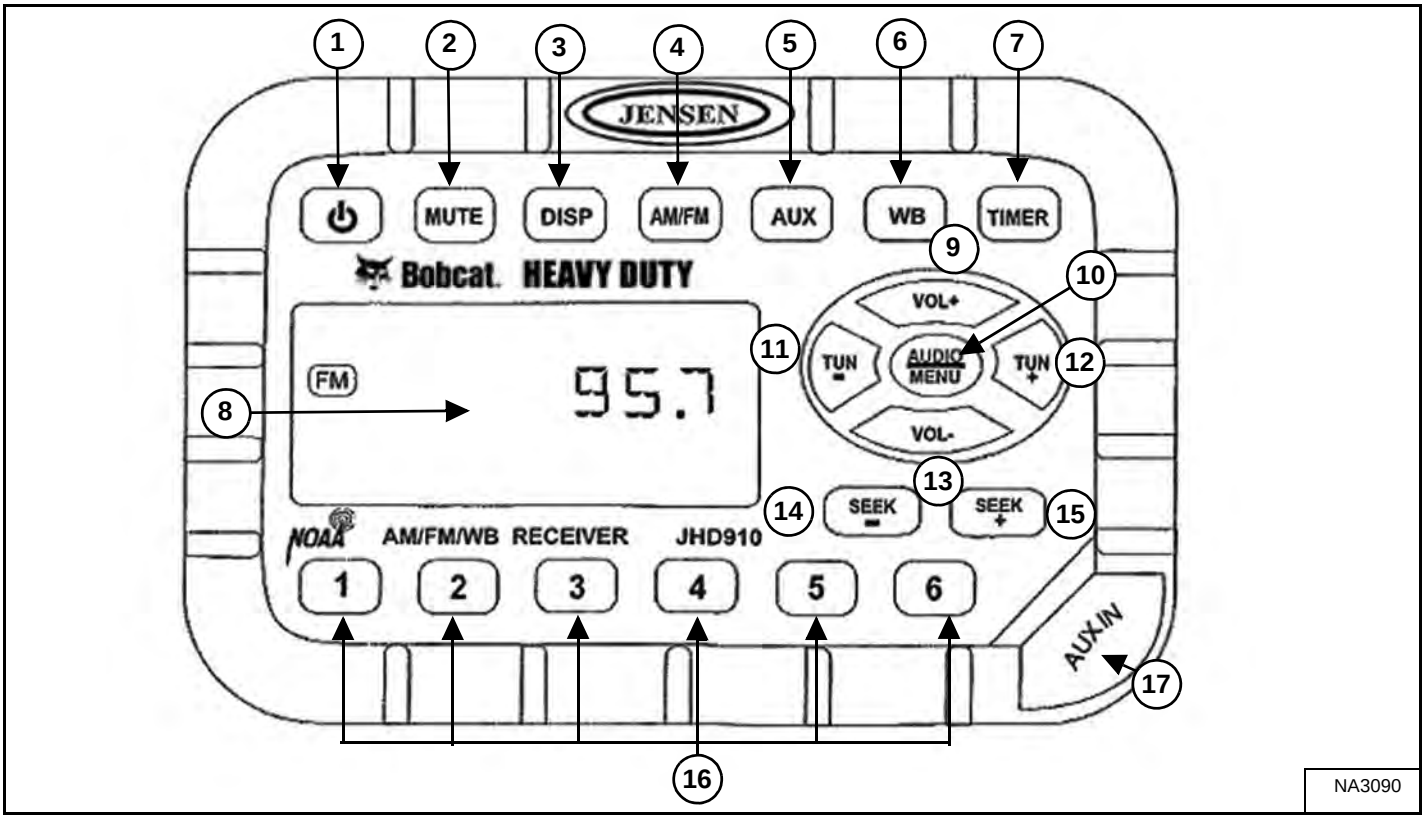
Radio Option

Figure 15



This excavator may be equipped with a radio (Item 1) and the headphone jack (Item 2) **[Figure 15]**.

Figure 16



NOTE: See DISPLAY (Item 3) in the following table for clock setting instructions.

EMERGENCY EXIT

The door, the right side rear window and the front window provide exits.

Right Side Rear Window

Figure 38

Exit through the window **[Figure 38]**.

Front Window

Figure 39

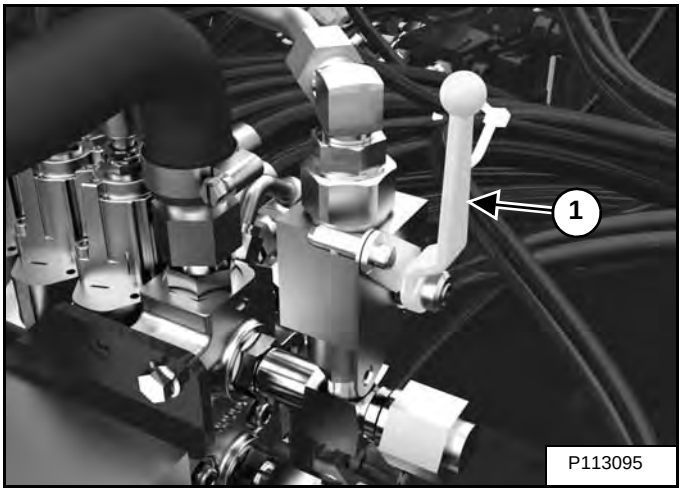
Open the front window and exit **[Figure 39]**.

NOTE: If the excavator has a Special Applications Kit installed, the front window is NOT an emergency exit.

Return To Tank Valve

The return to tank valve is located under the right side cover at the front of the control valve (if equipped).

Figure 62



Rotate the lever (Item 1) **[Figure 62]** clockwise to direct auxiliary return hydraulic fluid to the reservoir.

Rotate the lever (Item 1) **[Figure 62]** anticlockwise for two way hydraulic auxiliary flow operation.

OVERLOAD WARNING DEVICE

Description

The overload warning device, when engaged, will alert the operator with a warning buzzer and the general warning icon on the instrument panel when the work group is overloaded.

If overload occurs, immediately bring the arm toward the machine, lower the boom and reduce the load before continuing operation.

Operation

Figure 63

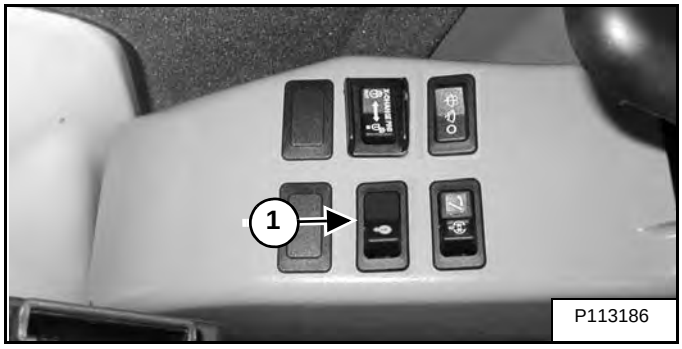
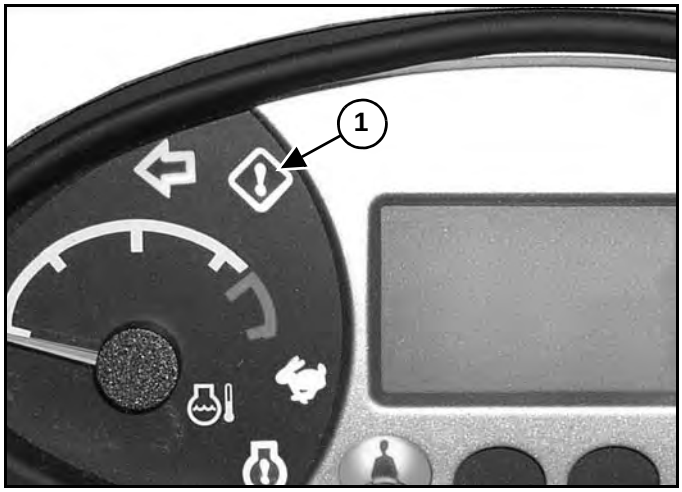


Figure 64



Press the switch (Item 1) **[Figure 63]** to the right to enable the Overload Warning Device.

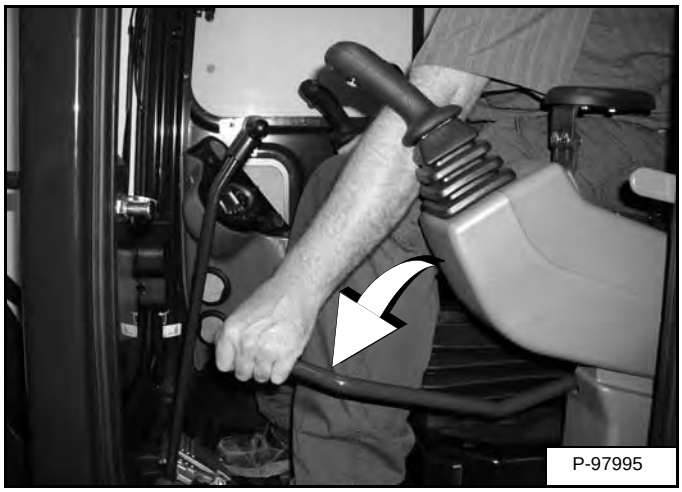
A buzzer will sound and the general warning icon (Item 1) **[Figure 64]** will illuminate when the boom is overloaded.

To disengage the overload warning device, press the switch (Item 1) **[Figure 63]** to the left. The icon (Item 1) **[Figure 64]** will turn off when the overload warning device is disabled.

NOTE: The Overload Warning Device must be turned on for objected handling applications.

Control Console

Figure 82



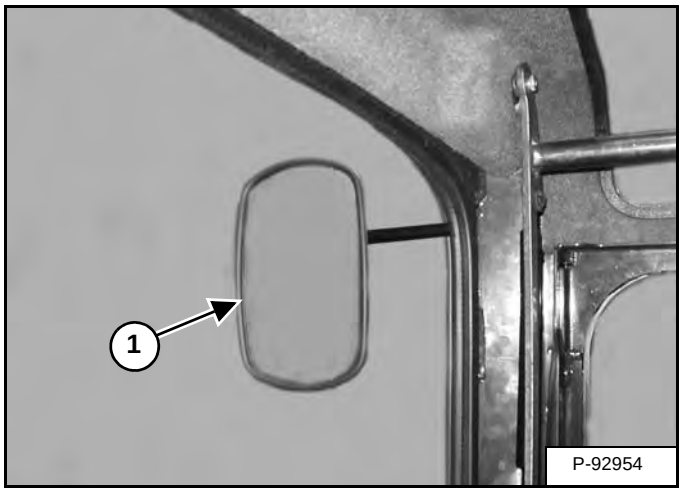
Lower the control console **[Figure 82]**.

NOTE: There is a control lock sensor in the left console which deactivates the hydraulic control levers (joysticks) and the traction drive system when the control console is raised. The console must be in the locked down position for the hydraulic control levers (joysticks) and traction system to operate.

NOTE: If the control lock sensor does not deactivate the control levers and traction system when console is raised, see your Bobcat dealer for service.

Mirror Adjustment

Figure 83



Adjust mirrors (Item 1) **[Figure 83]** (if equipped).

Installing And Removing The Attachment (Quick Coupler, Klac™ System)

Installation

NOTE: Installation and 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.).

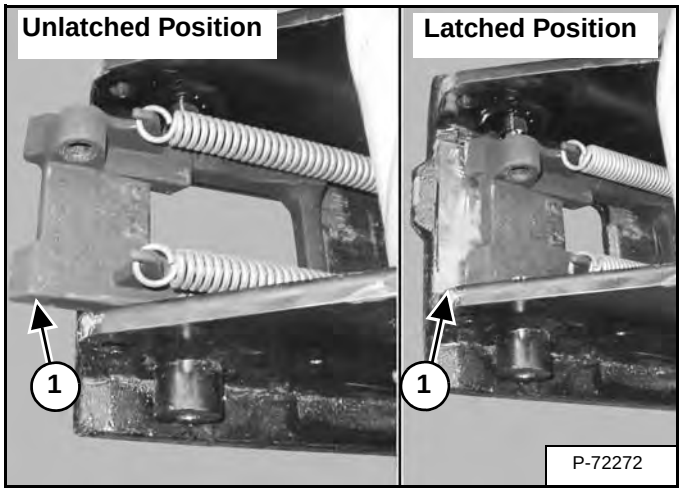
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2052-0907

Figure 106



Fully retract the bucket cylinder.

Stop the engine and exit the excavator.

Inspect the quick coupler to make sure the latch is in the unlatched position (Item 1) **[Figure 106]**.

If in the latched position, see **[Figure 107]** for additional information.

If the latch is in the unlatched position, proceed to **[Figure 108]**.

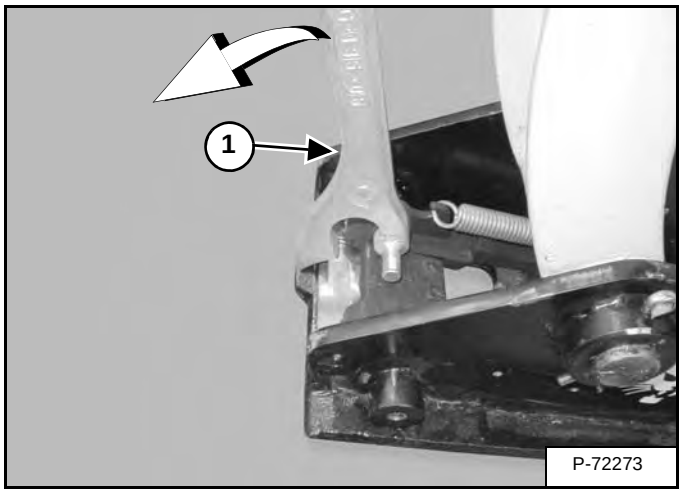
⚠ WARNING

AVOID INJURY

Keep fingers and hands out of pinch points when latching and unlatching the attachment quick coupler.

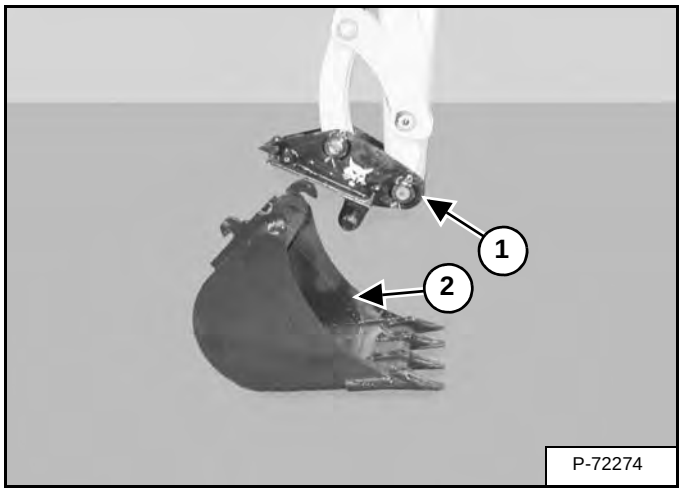
W-2541-1106

Figure 107



To unlatch the quick coupler, install the tool (Item 1) **[Figure 107]** and pull the handle. The latch will move completely forward. The latch will lock in the unlatched position.

Figure 108



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

Position the quick coupler (Item 1) to the attachment (Item 2) **[Figure 108]**.

Installing And Removing The Attachment (Pin Grabber Quick Coupler) (Cont'd)

Removal

NOTE: Removal and 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

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

W-2119-0910

Figure 137

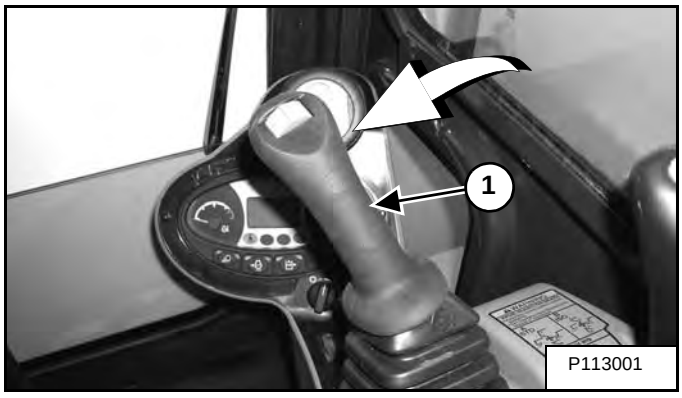
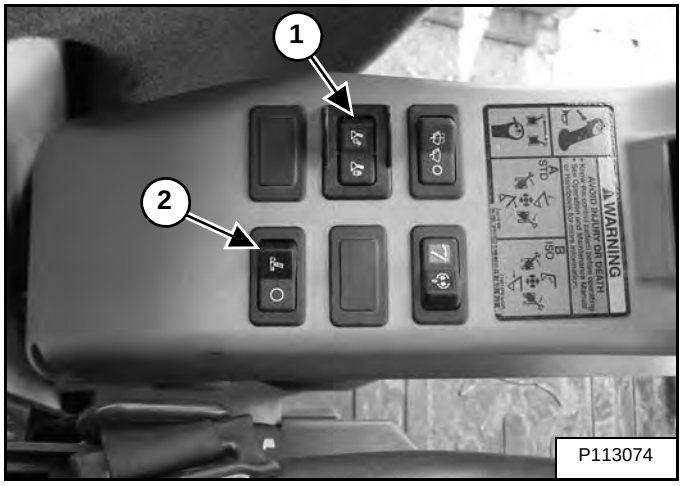


Figure 138

Move the right joystick (Item 1) **[Figure 137]** to the left (IN) and curl the quick coupler (Item 1) **[Figure 138]** fully.

Figure 139

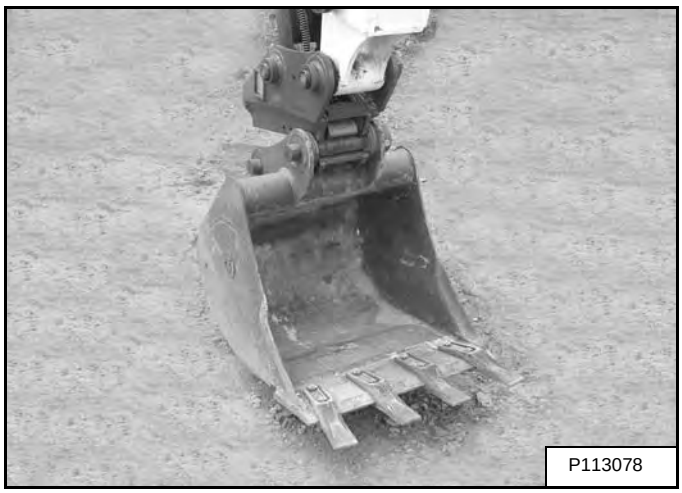


Press the coupler ON / OFF switch (Item 1) **[Figure 139]** to the left (ON) position to enable the pin grabber quick coupler feature. The switch will illuminate when in the ON position and a buzzer will sound.

Press and release the INTENT switch (Item 2) within five seconds. (The buzzer will continue to sound and the light (Item 1) **[Figure 139]** will stay ON.)

Move the right joystick (Item 1) **[Figure 137]** to the left (IN) and continue to curl the quick coupler **[Figure 138]**. The coupler locking clasps will lift fully to unlock the attachment from the quick coupler.

Figure 140



With the attachment slightly off of the ground, roll the quick coupler back until the coupler starts to disengage from the attachment **[Figure 140]**.

Object Handling With The Lifting Device

The excavator must be equipped with the optional lift eye link (Item 1) **[Figure 158]**, the boom and arm load hold valves and the overload warning device option. See your Bobcat dealer for available Kits.

⚠ WARNING

AVOID INJURY OR DEATH

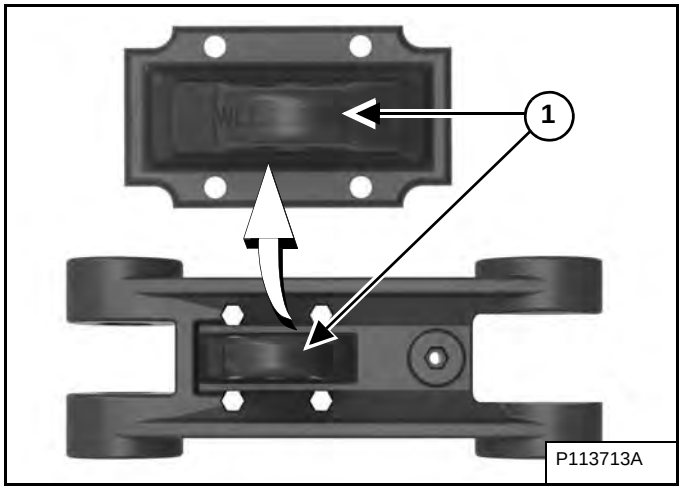
- **Do not exceed rated lift capacity.**
- **Excessive load can cause tipping or loss of control.**
- **Excessive load can cause failure of the lift eye and cause the load to drop.**

W-2991-0714

Do not exceed the machine's Rated Lift Capacity or the Rated Lift Load (RLL) of the lifting device (lift eye). (See Rated Lift Capacity (Standard Arm) on Page 214.) or (See Rated Lift Capacity (Long Arm) on Page 215.)

Make sure the secondary lifting system (chain) is of sufficient strength to lift the object.

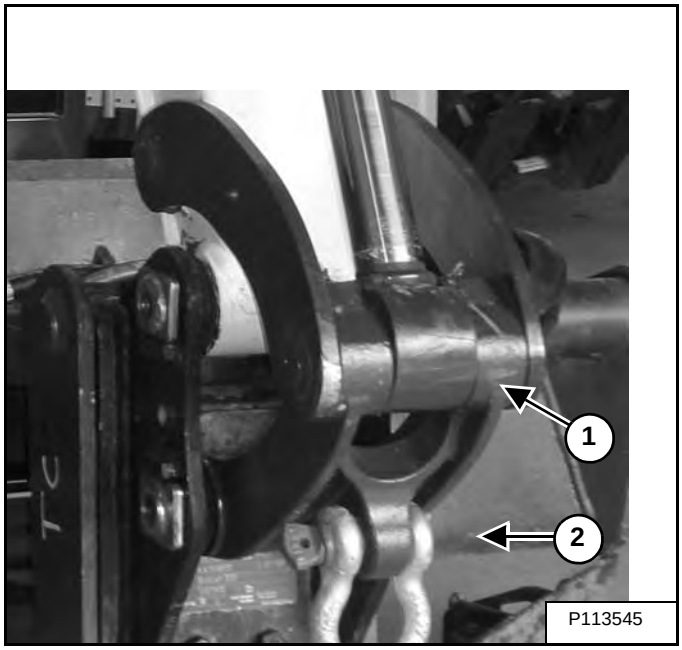
Figure 157



The maximum RLL (Item 1) **[Figure 157]** is shown on the lifting device.

Extend the bucket cylinder completely and lower the boom to the ground. Stop the engine. Exit the excavator. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 75.)

Figure 158



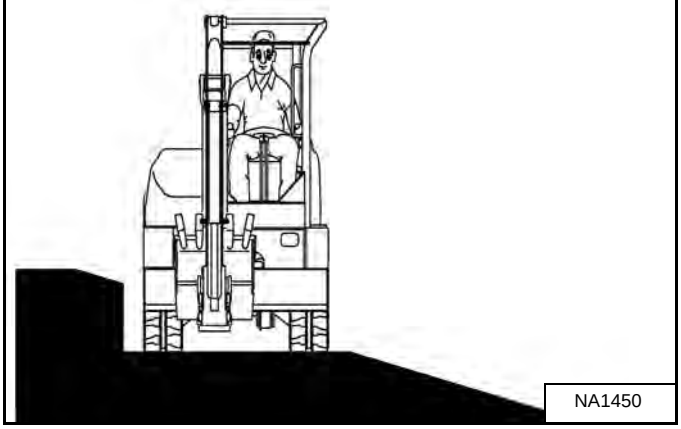
Install the clevis (Item 2) through the lift eye (Item 1) **[Figure 158]**.

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

Operating On Slopes (Cont'd)

Figure 181

Recommended Position For Working On A Slope



When operating on a slope, level the work area before beginning **[Figure 181]**.

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

Do not work on slopes which are over 15 degrees.

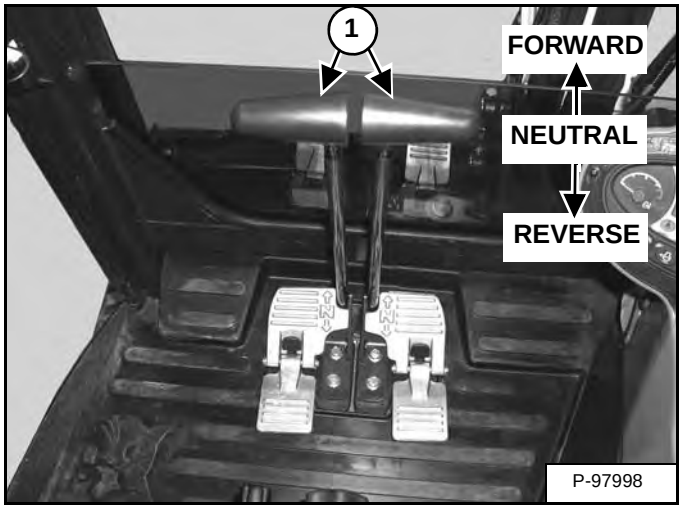
Use a slow work cycle.

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 blade downhill and lowered.

Avoid swinging or extending the bucket more than necessary in a down hill 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 182



To brake the machine when going down a slope, move the steering levers (Item 1) **[Figure 182]** to the NEUTRAL position. This will engage the hydrostatic braking.

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

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

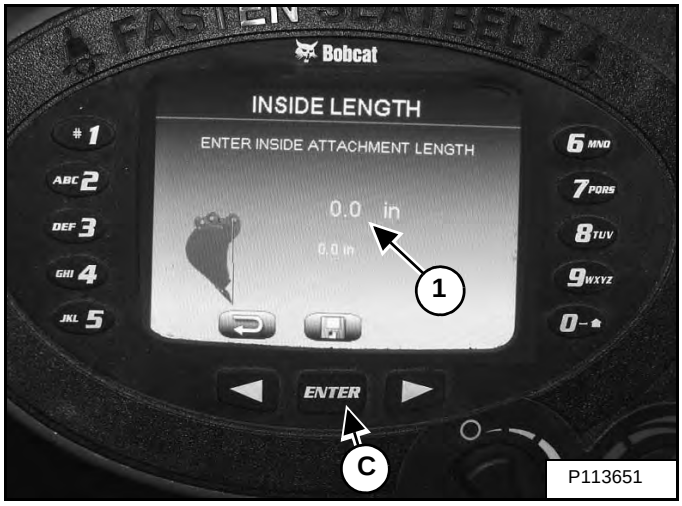
The console must be in the locked down position, and the key switch in the ON position.

Use the control lever to lower the boom.

Start the engine and resume operation.

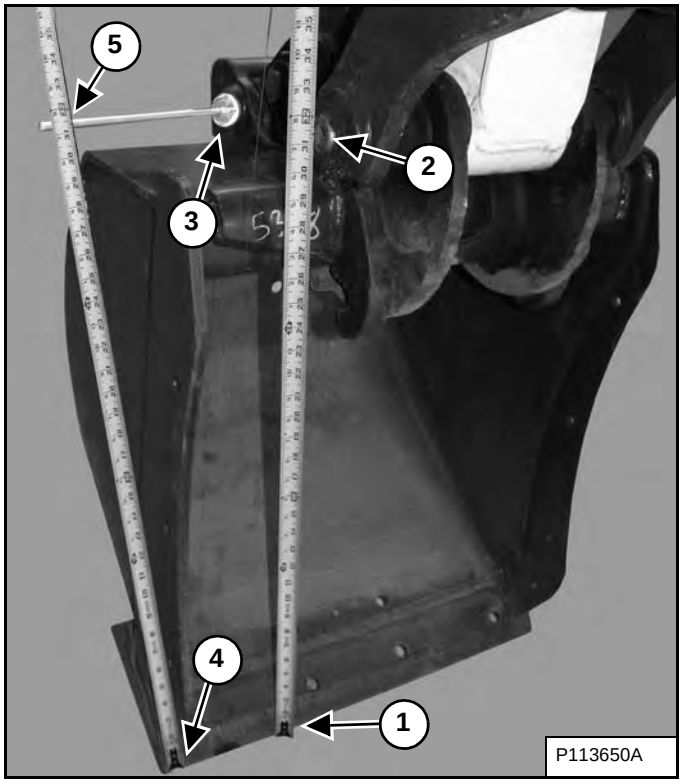
Setup / Calibration (Cont'd)

Figure 208



The inside length screen **[Figure 208]** is where the first attachment dimensions will be added from the information determined in step **[Figure 209]**.

Figure 209



This two part step will measure the distance between the bucket pin (Item 2) **[Figure 209]** or the furthest point away from the bucket pin on any attachment used with the Depth Check system. We will be using a bucket as an example, but all attachments will be similar for this setup. (*The accuracy of these dimensions affect the accuracy of the Depth Check.)*

Position the bucket vertical. Use the plumb bob to locate the furtherest vertical cutting point (Item 1) from the center of the bucket pin (Item 2) **[Figure 209]**.

Set the tip of the bucket (Item 1) on the ground ensuring that everything is still vertical. Using a tape measure, measure the distance between the cutting edge (Item 1) and the center of the bucket pin (Item 2) **[Figure 209]**.

NOTE: With usage of any attachment, the cutting surfaces wear. Example: The cutting edge (Item 1) [Figure 209] wears with the use of the bucket. 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.

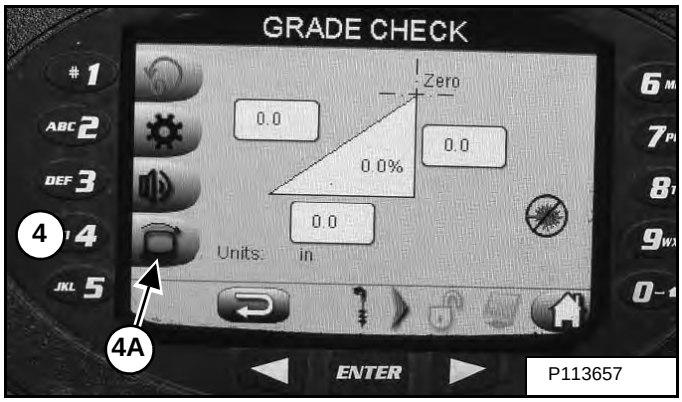
The **[INSIDE LENGTH]** screen **[Figure 208]** is where the attachment dimensions will be added from the information determined in **[Figure 209]**.

Using the key pad (Item 1 through 0) **[Figure 208]**, enter this dimension. After the measurement is entered and verified, press the **[ENTER]** button (Item C) **[Figure 208]**. As soon as the **[ENTER]** button is pressed, the **[OUTSIDE LENGTH] [Figure 210]** screen will be activated.

Initial Setup (Cont'd)

Preferences (Cont'd)

Figure 238



Grade Check **[Figure 238]** screen.

NOTE: You can also press button (Item 4) [Figure 236], [Figure 237] or [Figure 238] to toggle between these three screens any time that the icon (Item 4A) is visible on any Depth Check screen.

Operation

The following will give some basic operation information for:

WARNING

AVOID INJURY OR DEATH

Check area to be excavated for overhead or underground lines such as electrical, gas, oil, water, etc. CALL 1-888-258-0808 and consult local utilities before digging. Extreme caution must be used in areas where utility lines are present.

W-2116-0903

IMPORTANT

When digging in an area with underground utilities, do not depend on the Depth Check system for digging close to known utilities. The Depth Check system accuracy is dependent on the accuracy of the calibration, slope of the ground and other unknown variables. The current depth of utility lines varies and may not be to the same depth as when the utility was buried due to soil erosion, grading and many other factors. Some laws require non-mechanical (hand) digging in the area of marked underground utilities. Make sure you follow all local rules and regulations regarding digging in the area of underground utilities.

I-2383-1214

PREVENTIVE MAINTENANCE

MOTION ALARM SYSTEM

Description

This excavator may be equipped with a motion alarm system. The motion alarm will sound when the operator moves the travel control levers in either the forward or reverse direction. Slight movement of the steering levers in either the forward or reverse direction is required with hydraulic components before the motion alarm will sound.

Inspecting

Figure 259

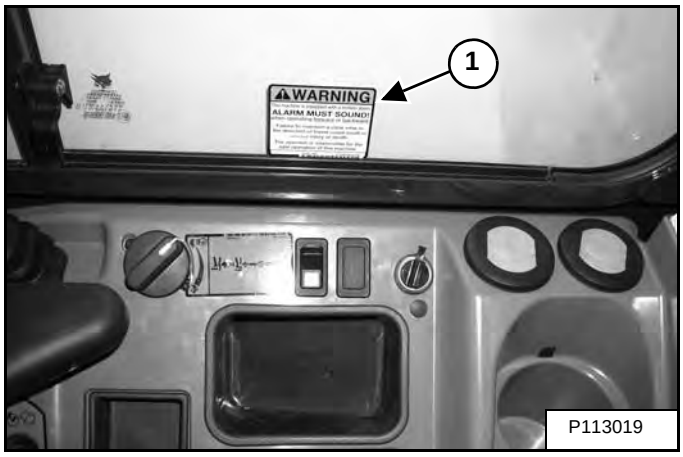
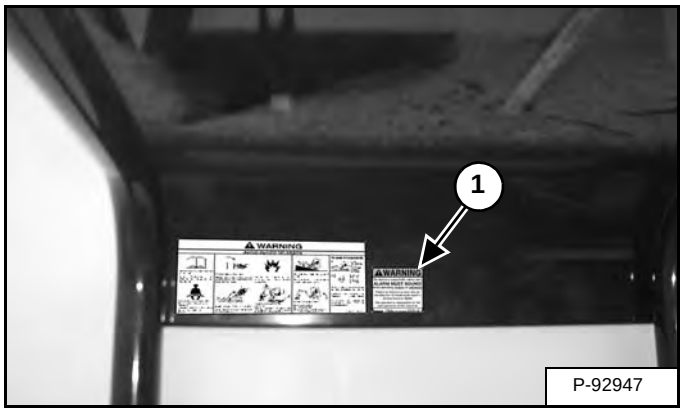


Figure 260



Inspect for damaged or missing motion alarm decal (Item 1) **[Figure 259]** (cab machine) or (Item 1) **[Figure 260]** (canopy machine). Replace if required.

NOTE: The excavator will need to be moved slightly in both the forward and reverse direction to test the motion alarm. Keep all bystanders away from machine during test.

WARNING

AVOID INJURY OR DEATH

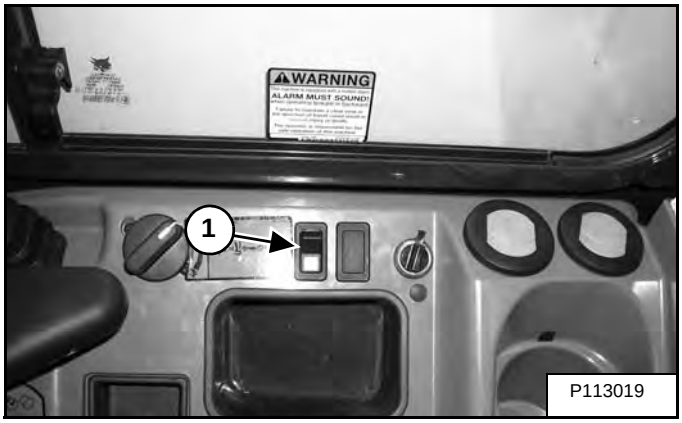
When an engine is running in an enclosed area, fresh air must be added to avoid concentration of exhaust fumes. If the engine is stationary, vent the exhaust outside. Exhaust fumes contain odorless, invisible gases which can kill without warning.

W-2050-0807

Sit in the operator's seat and fasten the seat belt. Start the engine. (See PRE-STARTING PROCEDURE on Page 67.)

Move the travel control levers (one lever at a time) in the forward direction. The motion alarm must sound. Move the travel control levers (one lever at a time) in the reverse direction. The motion alarm must sound.

Figure 261



Slightly move both travel control levers in the forward direction (until the machine is slowly moving forward) and then press the motion alarm cancel switch (Item 1) **[Figure 261]**. The motion alarm will shut off. With the machine still moving forward, move one of the levers to the NEUTRAL position, the motion alarm must sound.

Slightly move both travel control levers in the reverse direction (until the machine is slowly moving backward) and then press the motion alarm cancel switch (Item 1) **[Figure 261]** (the switch icon will be illuminated when the motion alarm is deactivated). The motion alarm will shut off. With the machine still moving backward, move one of the levers to the NEUTRAL position, the motion alarm must sound.

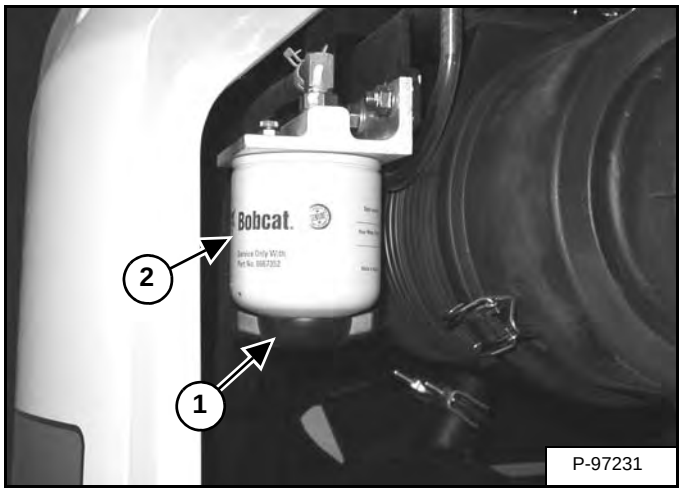
Return both levers to NEUTRAL and turn excavator key to OFF position. Exit the excavator. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 75.)

Fuel Filters

Removing Water

Open the tailgate. (See TAILGATE on Page 151.)

Figure 281



Loosen the drain (Item 1) **[Figure 281]** at the bottom of the filter to drain water from the filter into a container.

Clean up any spilled fuel.

Replacing Elements

Remove the filter (Item 2) **[Figure 281]**.

Clean the area around the filter housing. Put clean oil on the seal of the new filter. Install the fuel filter and hand tighten.

Remove the air from the fuel system. (See Removing Air From The Fuel System on Page 160.)

⚠ WARNING

AVOID INJURY OR DEATH

Diesel fuel or hydraulic fluid under pressure can penetrate skin or 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-EN-0909

Draining The Fuel Tank

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 145.)

Figure 282

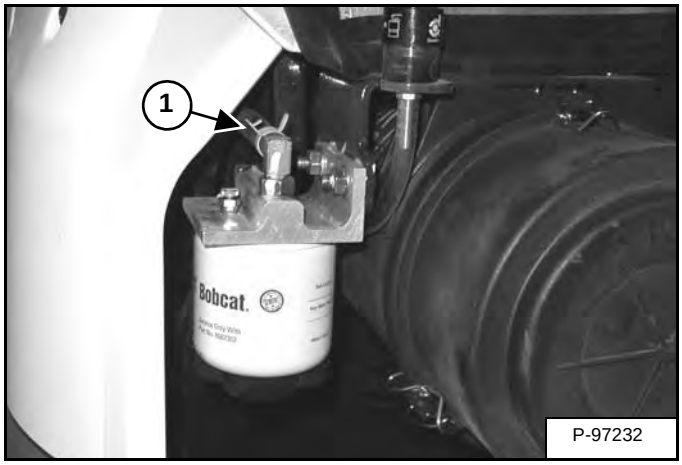
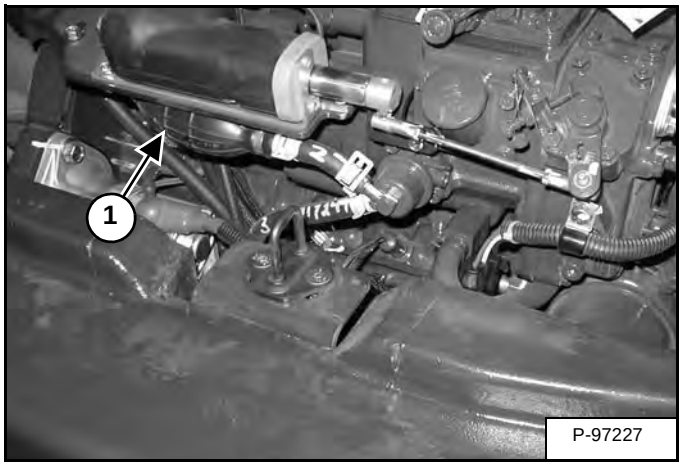


Figure 283



Remove the hose (Item 1) **[Figure 282]** from the fuel filter. Route the hose to a container.

Squeeze the hand pump (priming bulb) (Item 1) **[Figure 283]** to start the fuel siphoning from the fuel tank.

Drain the fuel into the container.

Reuse, recycle or dispose of fuel in an environmentally safe manner.

Reinstall the hose (Item 1) **[Figure 282]** after the fuel is removed from fuel tank.

Using A Booster Battery (Jump Starting)

IMPORTANT

If jump starting the excavator from a second machine:

When jump starting the excavator from a battery installed in a second machine, make sure the engine is NOT running while using the glow plugs. High voltage spikes from a running machine can burn out the glow plugs.

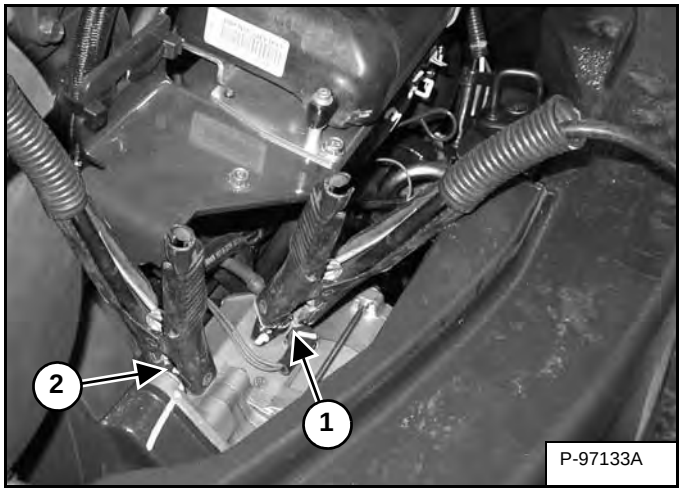
I-2060-0906

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.

Be sure the key switch is OFF. The booster battery must be 12 volt.

Open the tailgate. (See TAILGATE on Page 151.)

Figure 304



Connect one end of the first cable to the positive (+) terminal of the booster battery. Connect the other end of the same cable to the positive (+) terminal (Item 1) **[Figure 304]** of the excavator starter.

Connect one end of the second cable to the negative (-) terminal of the booster battery. Connect the other end of the same cable to the starter mounting bolt (Item 2) **[Figure 304]**.

Start the engine. After the engine has started, remove the earth (-) cable first (Item 2) **[Figure 304]**.

Disconnect the cable from the excavator starter (Item 1) **[Figure 304]**.

NOTE: (See Cold Temperature Starting on Page 73.)

IMPORTANT

Damage to the alternator can occur if:

- **Engine is operated with battery cables disconnected.**
- **Battery cables are connected when using a fast charger or when welding on the excavator. (Remove both cables from the battery.)**
- **Extra battery cables (booster cables) are connected wrong.**

I-2223-0903

⚠ WARNING

AVOID INJURY OR DEATH

Batteries contain acid which burns eyes and skin on contact. Wear goggles, protective clothing and rubber gloves to keep acid off body.

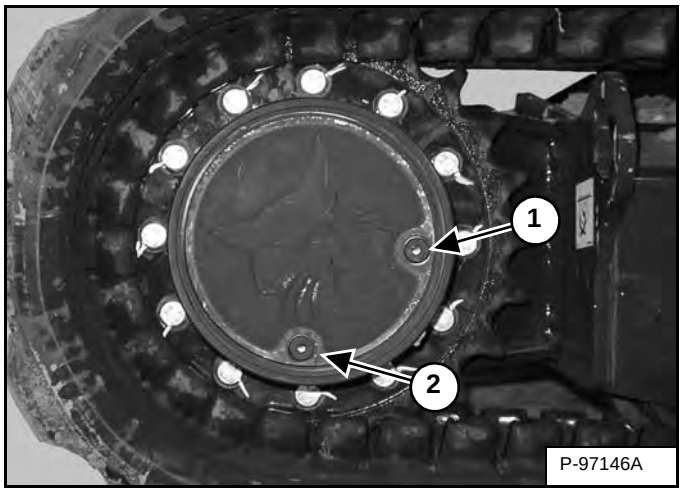
In case of acid contact, wash immediately with water. In case of eye contact get prompt medical attention and wash eye with clean, cool water for at least 15 minutes.

If electrolyte is taken internally drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention.

W-2065-0807

Checking And Adding Oil

Figure 326



Park the excavator on a level surface with the plugs (Items 1 and 2) **[Figure 326]** positioned as shown.

Remove the plug (Item 1) **[Figure 326]**. The lube level must be at the bottom edge of the hole.

Add lubricant (SAE 90W) through the hole (Item 1) **[Figure 326]** if the lube level is low.

Repeat the procedure for the opposite travel motor.

Removing And Replacing Oil

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 145.)

⚠ WARNING

AVOID INJURY OR DEATH

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire.

W-2103-0508

Park the excavator on a level surface with plugs (Items 1 and 2) **[Figure 326]** positioned as shown. Remove both plugs and drain the lubricant into a container.

Install the bottom plug (Item 2). Add lubricant (SAE 90W) through the plug hole (Item 1) **[Figure 326]** until the lube level is at the bottom edge of the hole. (See Capacities on Page 220.)

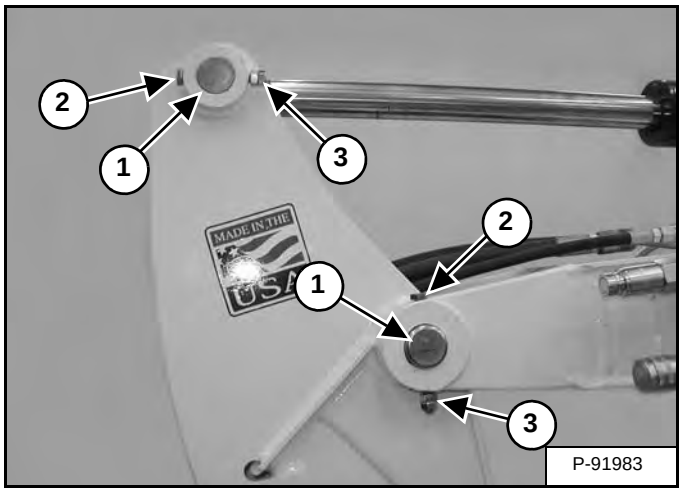
Install the plug (Item 1) **[Figure 326]**.

Repeat the procedure for the opposite travel motor.

PIVOT PINS

Inspection And Maintenance

Figure 349



The pivots and cylinders (Item 1) have a large pin held in position with a bolt (Item 2) and double nuts (Item 3) **[Figure 349]** securing the pin.

The two nuts (Item 3) are used as jam nuts to hold the bolt (Item 2) with out tightening the bolt (Item 2) to the pin boss. After the nuts (Item 3) are tightened together, the bolt (Item 2) should be free to spin. See your Bobcat dealer for replacement parts.

Panel Setup (Deluxe Instrument Panel) (Cont'd)

Auto Idle Time Delay

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[3. MACHINE PERFORMANCE]**.
	Select **[1. AUTO IDLE DELAY TIME]**.
	Use the keypad to enter the desired delay time between 4 and 250 seconds. Press **[ENTER]** to save and continue. Press left scroll button to exit without saving.

Job Clock Reset

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[1. USER SETTINGS]**.
	Select user.
	Press **[9]** to reset job statistics. Press left scroll button or **[0]** to exit without saving.

SPECIFICATIONS

E45 EXCAVATOR SPECIFICATIONS (CONT'D)

Hydraulic Cylinders

Cylinder	Bore	Rod	Stroke
Boom (cushion up)	95,2 mm (3.75 in)	50,8 mm (2.00 in)	697 mm (27.45 in)
Arm (cushion retract / extend)	82,6 mm (3.25 in)	50,8 mm (2.00 in)	644 mm (25.35 in)
Bucket	76,2 mm (3.00 in)	44,5 mm (1.75 in)	524 mm (20.63 in)
Boom Swing	88,9 mm (3.50 in)	44,5 mm (1.75 in)	491 mm (19.32 in)
Blade	95,2 mm (3.75 in)	50,8 mm (2.00 in)	195 mm (7.68 in)

Hydraulic Cycle Times

Bucket Curl	2.3 Seconds
Bucket Dump	2.1 Seconds
Arm Retract	2.7 Seconds
Arm Extend	2.7 Seconds
Boom Raise	4.1 Seconds
Boom Lower	4.5 Seconds
Boom Swing Left	7.7 Seconds
Boom Swing Right	7.4 Seconds
Blade Raise	3.1 Seconds
Blade Lower	2.8 Seconds

Drive System

Final Drive	Each track is driven by hydrostatic axial piston motor
Type of Reduction	56.4:1 two stage planetary

Slew System

Slew Motor	Axial piston connected to a planetary drive
Slew Circle	Single row shear type ball bearing with internal gear
Slew Speed	9.0 rpm

Undercarriage

Crawler Track Design	Sealed track rollers with boxed section track roller frame, grease type track adjuster with shock absorbing recoil spring
Width of crawler	1960 mm (77.2 in)