

CONTENTS

FOREWORD	III
SAFETY & TRAINING RESOURCES	XI
OPERATING INSTRUCTIONS	OI-1
PREVENTIVE MAINTENANCE	PM-1
MACHINE SIGN TRANSLATIONS	MST-1
SPECIFICATIONS	SPEC-1
WARRANTY	WARRANTY-1
ALPHABETICAL INDEX	INDEX-1

REFERENCE INFORMATION

Write the correct information for YOUR excavator in the spaces below. Always use these numbers when referring to your Bobcat Excavator.

Bobcat Excavator
Serial Number

Engine Serial Number

NOTES

YOUR BOBCAT EXCAVATOR DEALER:

ADDRESS:

PHONE:

FOREWORD

**SAFETY &
TRAINING
RESOURCES**

**OPERATING
INSTRUCTIONS
(OI)**

**PREVENTIVE
MAINTENANCE
(PM)**

**MACHINE SIGN
TRANSLATIONS
(MST)**

**SPECIFICATIONS
(SPEC)**

WARRANTY

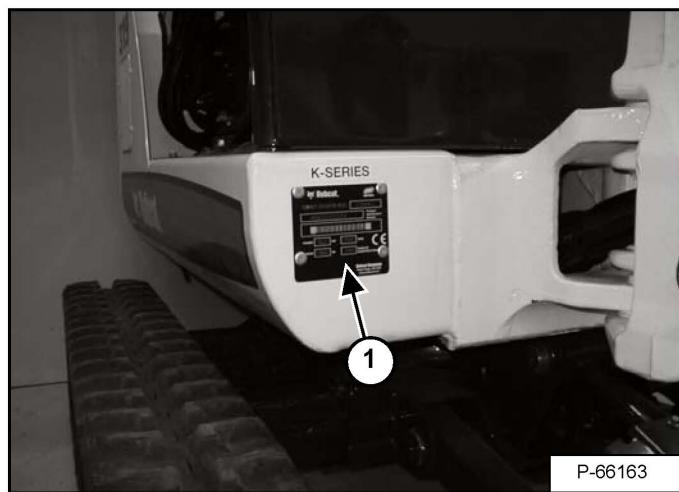
**ALPHABETICAL
INDEX**

SERIAL NUMBER LOCATIONS

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

Excavator Serial Number

Figure 1



The excavator serial number plate (Item 1) [Figure 1] is located on the front right hand corner of the frame.

Explanation of Excavator Serial Number:

XXXX XXXXX

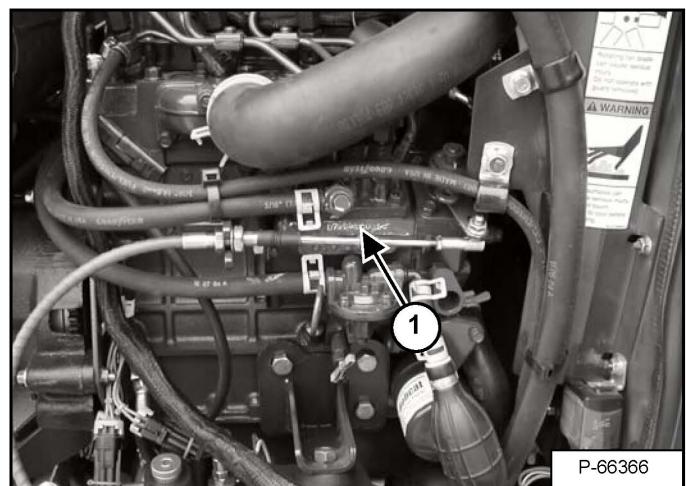
Module 2. - Production Sequence (Series)

Module 1. - Model / Engine Combination

1. The four digit Model/Engine Combination Module number identifies the model number and engine combination.
2. The five digit Production Sequence Number identifies the order which the excavator is produced.

Engine Serial Number

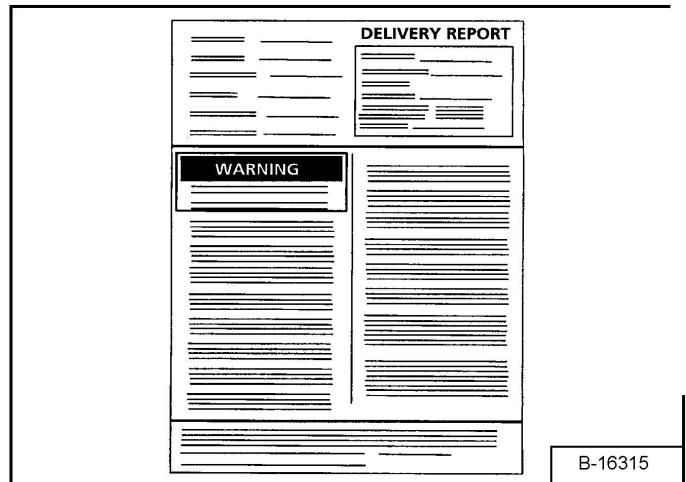
Figure 2



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

DELIVERY REPORT

Figure 3



The delivery report must be filled out by the dealer and signed by the owner or operator when the Bobcat Excavator is delivered. An explanation of the form must be given to the owner. Make sure it is filled out completely [Figure 3].

SAFETY INSTRUCTIONS (CONT'D)

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

Operator must have instructions before running the machine. Untrained operators can cause injury or death.

W-2001-1285

IMPORTANT

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

I-2019-0284



WARNING

Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause injury or death.

W-2044-1285

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

Check all of the items on the Bobcat Service Schedule Decal under the 8-10 hour column 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 coordination 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, Safety Manual and machine signs (decals).
- Check the rules and regulations at your location. The rules may include an employer's work safety requirements. Regulations may apply to local driving requirements or use of a Slow Moving Vehicle (SMV) emblem. 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.
- Operator Training Courses are available from your Bobcat dealer in English and Spanish. They provide information for safe and efficient equipment operation. Safety videos are also available.
- Service Safety Training Courses are available from your Bobcat dealer. They provide information for safe and correct service procedures.

Know the Work Conditions

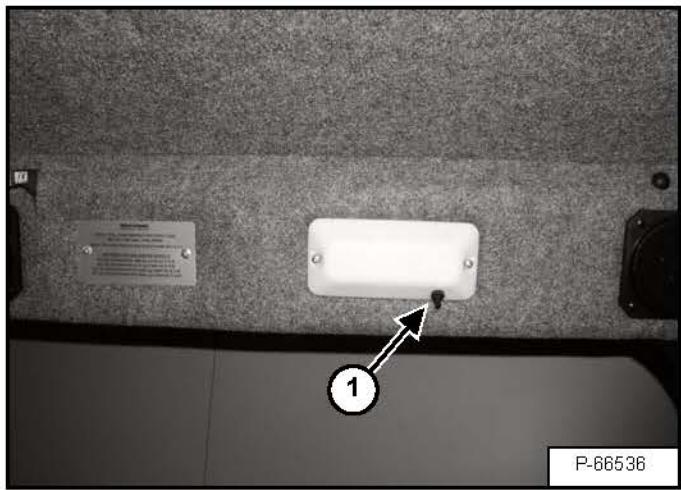
- Know the weight of the materials being handled. Avoid exceeding the Rated Lift Capacity of the machine. Material which is very dense will be heavier than the same volume of less dense material. Reduce the size of load if handling dense material.
- The operator must know any prohibited uses or work areas, for example, he or she needs to know about excessive slopes.
- Know the location of any underground lines. Call local utilities or the TOLL FREE phone number found in the **Before Operation** Section of this manual.
- Wear tight fitting clothing. Always wear safety glasses when doing maintenance or service. Safety glasses, hearing protection or Special Applications Kits are required for some work. See your Bobcat dealer about Bobcat Safety Equipment for your model.

SI EXC-0805

INSTRUMENTS AND CONSOLES

Cab Interior Light (If Equipped)

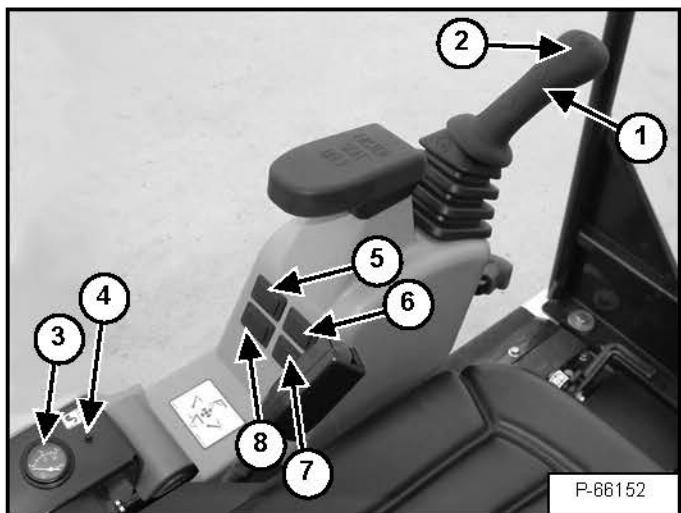
Figure OI-1



Press the button (Item 1) [Figure OI-1] to turn the light ON. Press again to turn light OFF.

Left Console

Figure OI-2

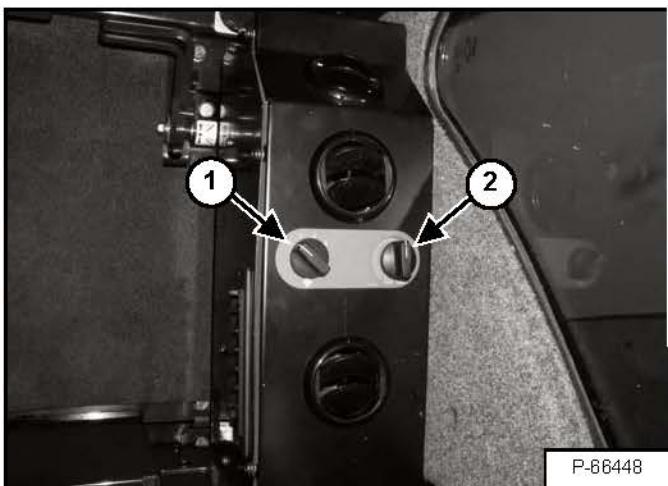


Left Console [Figure OI-2]

REF. NO.	DESCRIPTION	FUNCTION/OPERATION
1	Horn	Press button to sound horn.
2	Left Joystick	(See HYDRAULIC CONTROLS on Page OI-14)
3	Fuel Gauge	Shows the amount of fuel in the tank.
4	Hydraulic Lockout Indicator	When consoles are down and locked, indicator light will be ON. Hydraulic and traction system controls will operate.
5	Wiper / Washer (If Equipped)	Press left side to turn wiper ON. Press and hold for washer. Press right side to turn OFF.
6	Not Used	---
7	Not Used	---
8	Beacon (If Equipped)	Press left side of switch to turn beacon ON, right side to turn OFF.

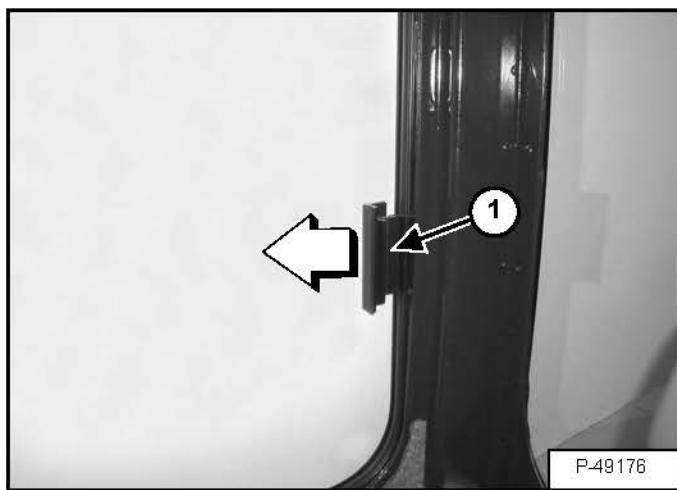
Heater (If Equipped)

Figure OI-3

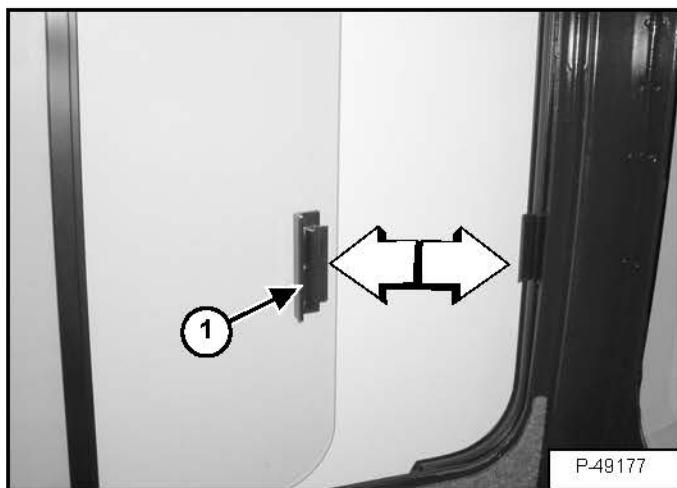


Heater [Figure OI-3]

REF. NO.	DESCRIPTION	FUNCTION/OPERATION
1	Fan Motor Switch	Turn clockwise to increase fan speed; counterclockwise to decrease.
2	Temperature Control	Turn clockwise to increase temperature; counterclockwise to decrease.

Right Side Window*Opening the right rear window***Figure OI-16**

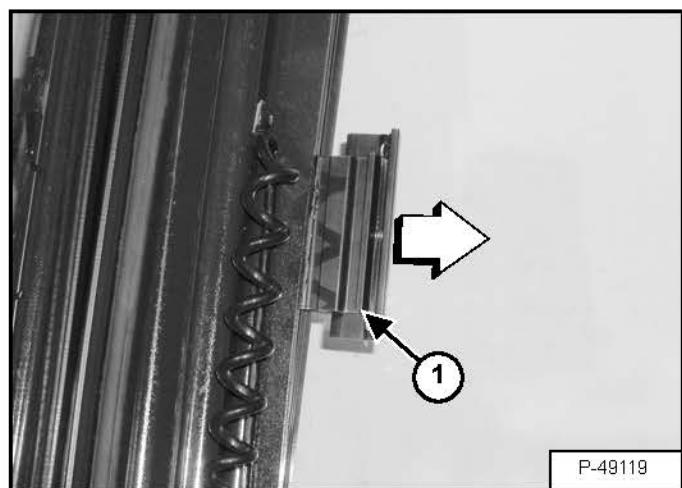
Pull forward on the latch / handle (Item 1) [Figure OI-16].

Figure OI-17

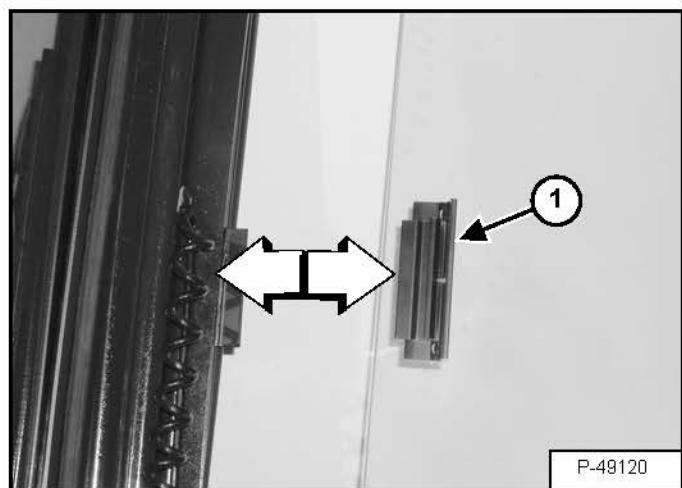
Pull the latch / handle (Item 1) [Figure OI-17] forward to open the window.

Closing the right rear window

Push the handle back to close the window.

Figure OI-18

Pull back on the latch / handle (Item 1) [Figure OI-18].

Figure OI-19

Pull the latch / handle (Item 1) [Figure OI-19] back to open the window.

Closing the right front window

Push the handle forward to close the window.

HYDRAULIC CONTROLS

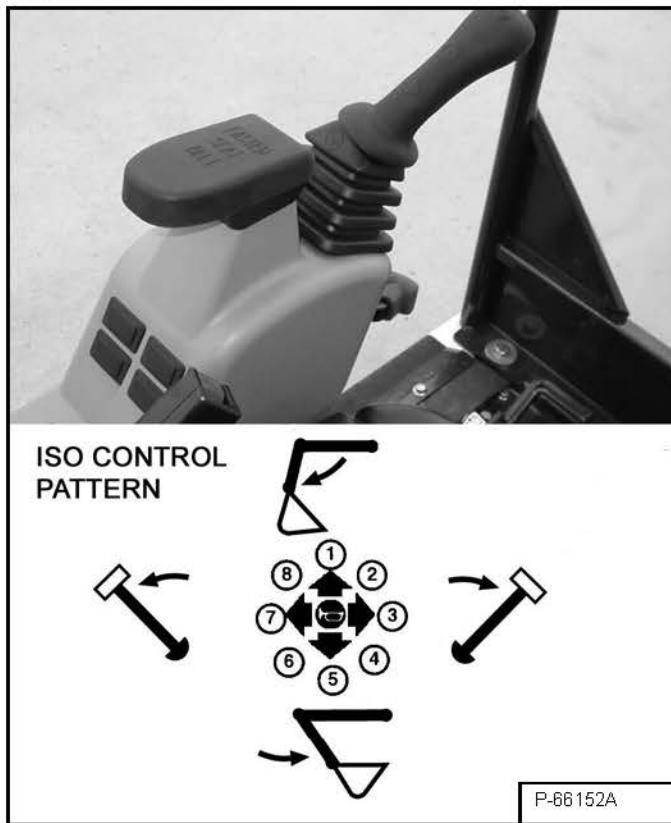
Description

The work equipment (boom, arm, bucket, and upperstructure slew) is operated by using the left and right control levers (joysticks) [Figure OI-28] & [Figure OI-29].

ISO Control Lever

Left Control Lever (Joystick)

Figure OI-28

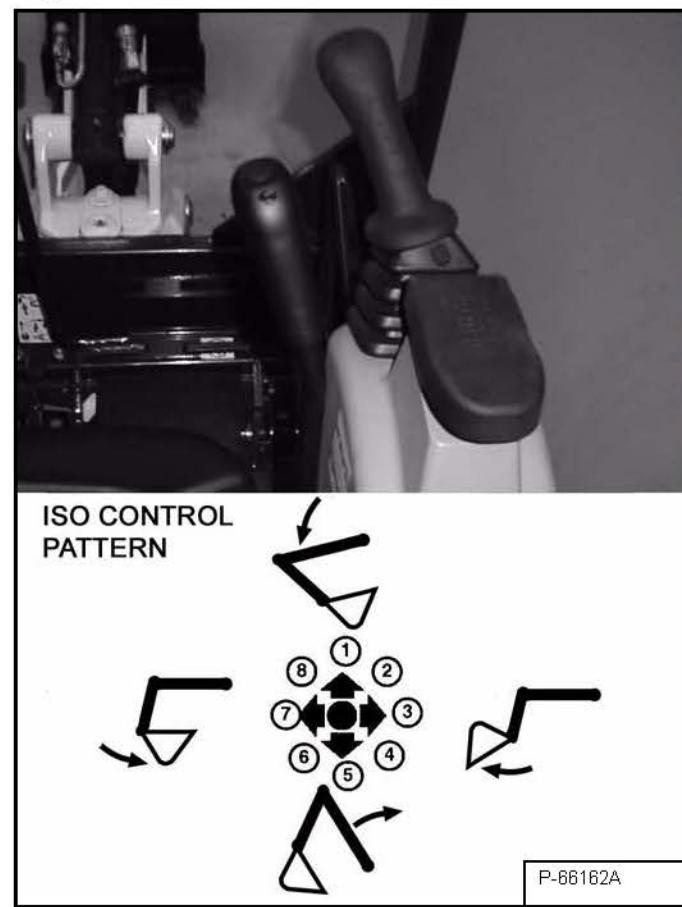


The left lever (joystick) is used to operate the arm and slew the upperstructure [Figure OI-28].

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 Control Lever (Joystick)

Figure OI-29



The right lever (joystick) is used to operate the boom and bucket [Figure OI-29].

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.



WARNING

AVOID INJURY OR DEATH

Before leaving the machine:

- Lower the work equipment to the ground.
- Lower the blade to the ground.
- Stop the engine & remove the key.

W-2196-0595

IMPORTANT

Before slewing the upperstructure, make sure the slew lock is disengaged.

I-2051-0905

Cold Temperature Starting



WARNING

Do not use ether with glow plug (preheat) systems. Explosion can result which can cause injury, death, or severe engine damage.

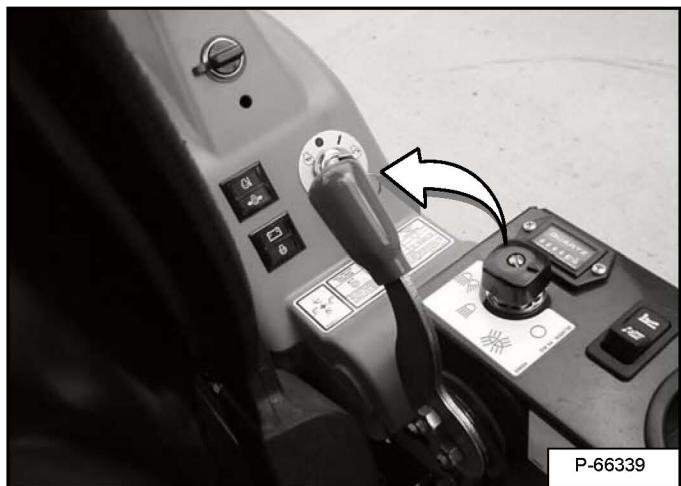
W-2071-0903

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 LUBRICATION SYSTEM on Page PM-15)
- Make sure the battery is fully charged:
- Install an engine heater, available from your Bobcat Loader dealer.

NOTE: 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 PM-23)

Figure OI-59



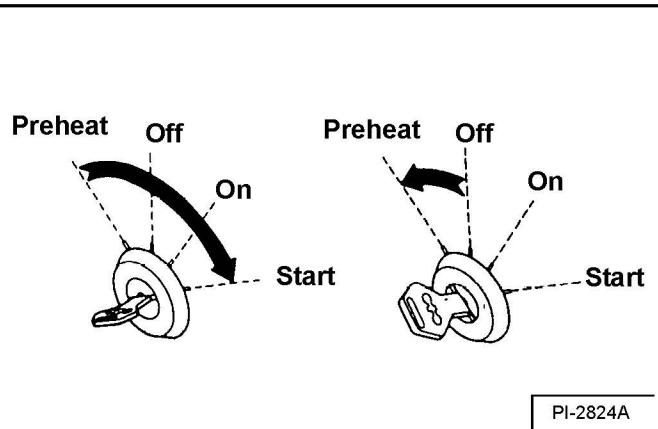
Push the speed control lever fully forward [Figure OI-59].

IMPORTANT

Do not engage the starter for longer than 15 seconds at a time. Longer use can damage the starter by overheating. Allow starter to cool for one minute before using starter again.

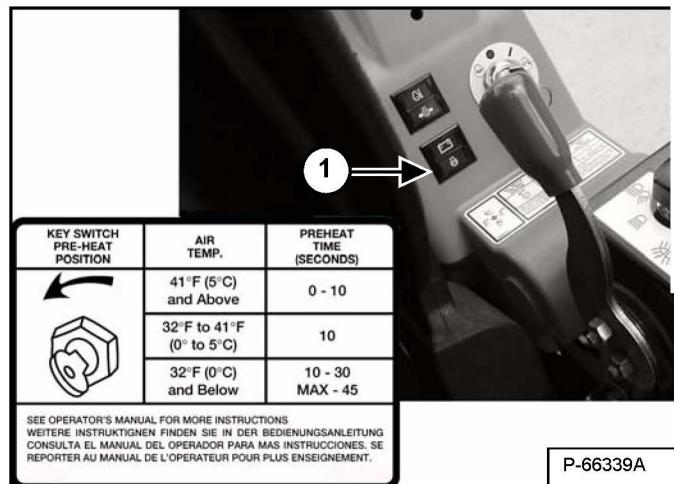
I-2034-0700

Figure OI-60



PI-2824A

Figure OI-61



P-66339A

Turn the key to PREHEAT [Figure OI-60]. The light (Item 1) [Figure OI-61] will come ON. Preheat the engine for 15 seconds maximum.

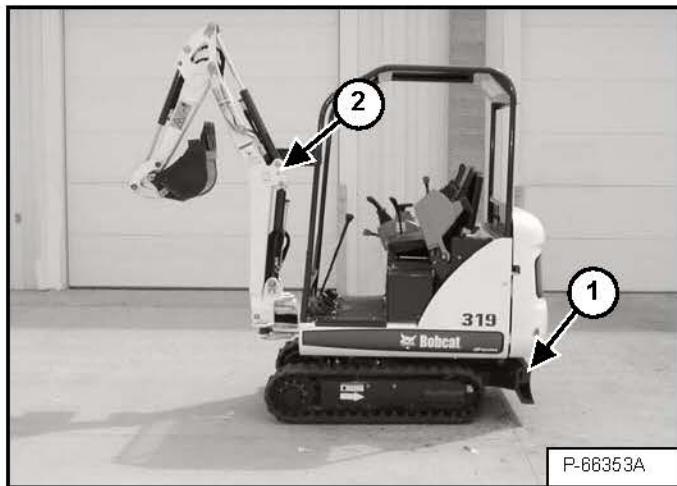
Turn the key to START [Figure OI-60] and release the key when the engine starts. It will return to the ON position.

When the engine speed increases, move the speed control lever to the low idle position.

Turn the key switch OFF to stop the engine [Figure OI-60].

Procedure

Figure OI-89



Fully extend the bucket and arm cylinders, and fully retract the boom cylinder so that the excavator is in the position shown [Figure OI-89].

Engage the upperstructure slew lock. (See Upperstructure Slew Lock on Page OI-5)

Raise the blade all the way.

Put all the control levers in neutral.



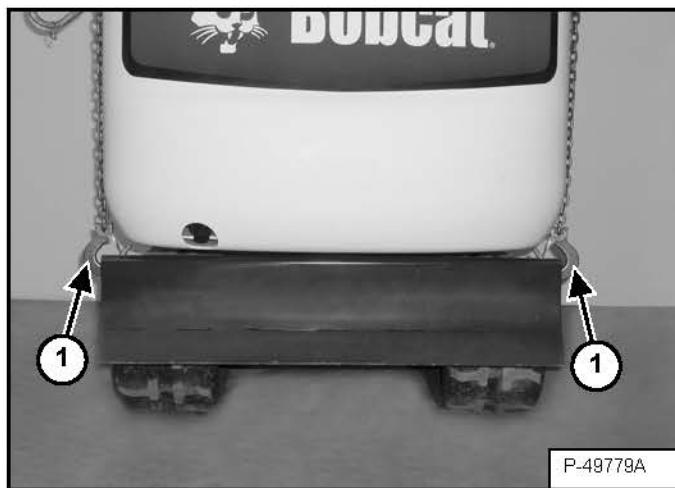
WARNING

AVOID INJURY OR DEATH

- Use a lifting fixture with sufficient capacity for the weight of the excavator plus any added attachments.
- Maintain center of gravity and balance when lifting.
- Do not swing boom or upperstructure. Engage the swing locking lever.
- Never lift with operator on machine.

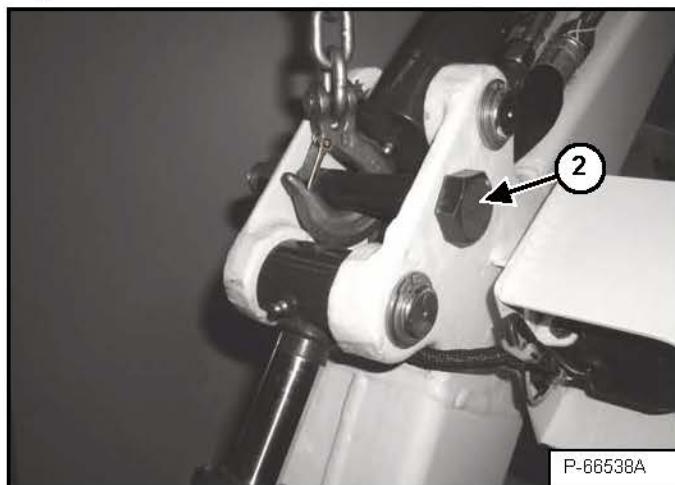
W-2202-0595

Figure OI-90



Fasten chains to the ends of the blade (Item 1) [Figure OI-89] and [Figure OI-90] 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 ROPS/TOPS.

Figure OI-91



Install a one inch (25 mm) bolt and nut (Grade 5 or 8) through the holes at the boom (Item 2) [Figure OI-89] and [Figure OI-91]. Fasten a chain from the bolt to the lift fixture.

FUEL SYSTEM

Fuel Specifications

Use only clean, high quality diesel fuel, Grade No. 2 or Grade No. 1.

The following is a suggested blending guideline which should prevent fuel gelling problems during freezing temperature.

TEMPERATURE F° (C°)	NO. 2	NO. 1
+15°(9°)	100%	0%
Down to -20° (-29°)	50%	50%
Below -20° (-29°)	0%	100%

Contact your fuel supplier for local recommendations.



WARNING

Stop and cool the engine before adding fuel. NO SMOKING! Failure to obey warnings can cause an explosion or fire.

W-2063-0887



WARNING

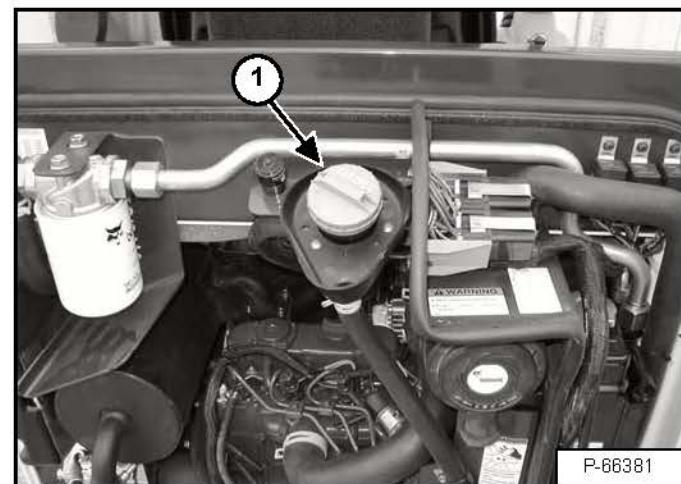
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W-2103-1285

Filling The Fuel Tank

Open the tailgate.

Figure PM-13



Remove the fuel fill cap (Item 1) [Figure PM-13].

Use a clean, approved safety container to add fuel. Add fuel only in an area that has a free movement of air and no flames or sparks. NO SMOKING!

Install and tighten the fuel fill cap. Close the tailgate.

See the SERVICE SCHEDULE for the service interval when to remove water from or replace the fuel filter.(See SERVICE SCHEDULE on Page PM-5)

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 second machine is NOT running while using the glow plugs. High voltage spikes from a running machine can burn out the glow plugs.

I-2060-0195

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.

Engage the upperstructure slew lock. Be sure the key switch is OFF. The booster battery must be 12 volt.

Figure PM-33

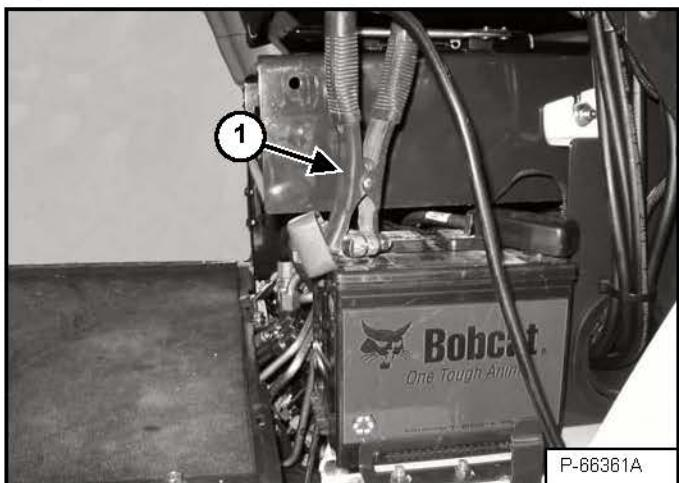
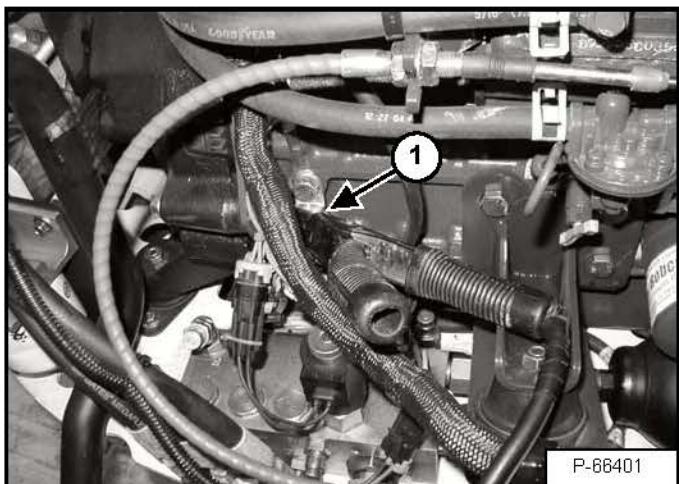


Figure PM-34



Open the tailgate.

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 PM-33] on the excavator battery.

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 negative cable (Item 2) [Figure PM-34] on the excavator engine.

NOTE: (See Cold Temperature Starting on Page PM-27)

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-2222-0903

Start the engine. After the engine has started, remove the negative (-) cable first (Item 1) [Figure PM-34].

Disconnect the cable from the battery (Item 1) [Figure PM-35].

WARNING

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-2065-1296

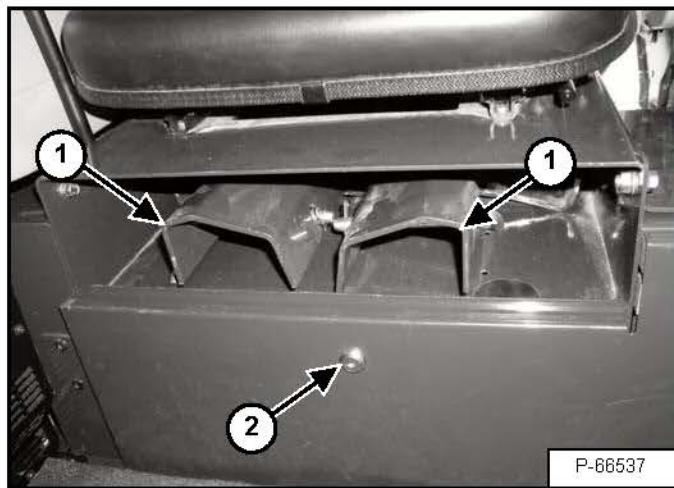
ALTERNATOR BELT

Belt Adjustment

Replace the belt if it has stretched or there are cracks in the belt. Replace the pulley if the belt contacts the bottom of the groove in the pulley.

Stop the engine.

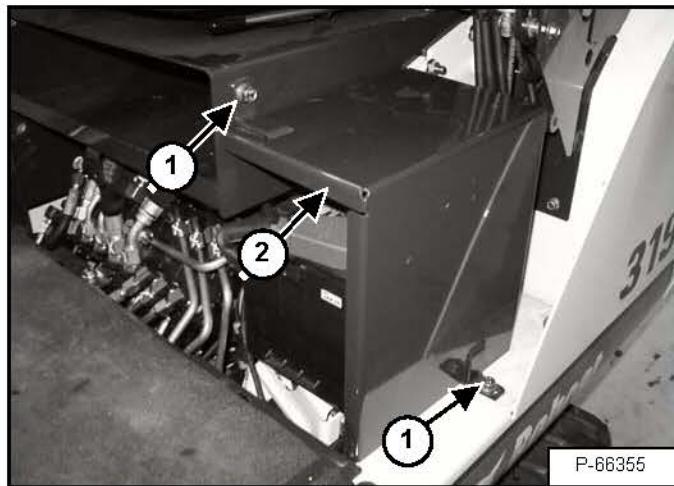
Figure PM-52



Remove the 2 blade extensions (Item 1) [Figure PM-52] from the storage compartment.

Use the start key to remove the access cover (Item 2) [Figure PM-52].

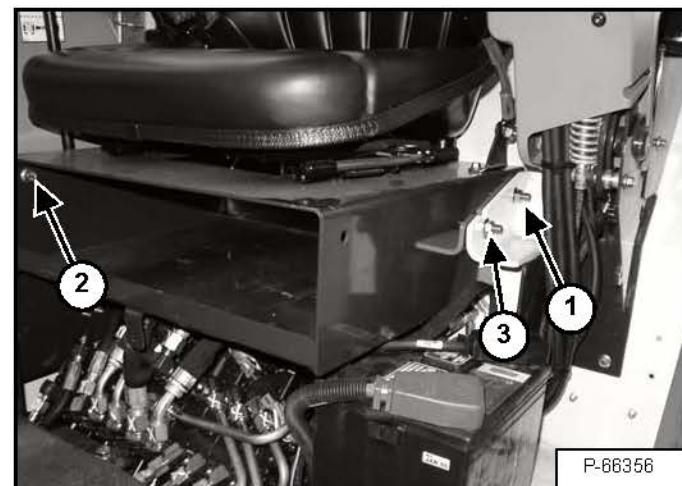
Figure PM-53



Remove the 2 bolts (Item 1) [Figure PM-53] and brackets from the battery cover.

Remove the cover (Item 2) [Figure PM-53].

Figure PM-54



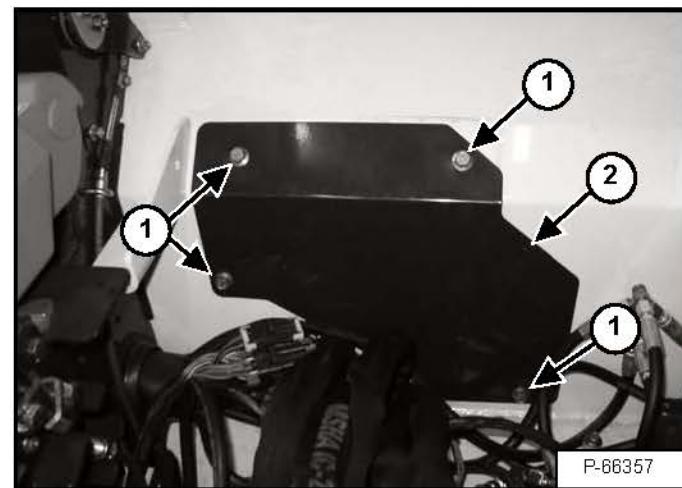
Remove the 2 bolts (Item 1) [Figure PM-54] and nuts from both sides of the seat mount.

Remove the bolt (Item 2) [Figure PM-54], nut and bracket from the right side of the seat mount.

Loosen the 2 bolts (Item 3) [Figure PM-54] and nuts from both sides of the seat mount.

Remove the seat and seat mount.

Figure PM-55



Remove the 4 bolts (Item 1) and remove the access panel (Item 2) [Figure PM-55].

Storage

Sometimes it may be necessary to store your Bobcat Excavator for an extend period of time. Below is a list of items to perform before storage.

- Thoroughly clean the excavator including the engine compartment.
- Lubricate the excavator.
- Replace worn or damaged parts.
- Drive the excavator 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 stabilizer in the fuel tank and run the engine a few minutes to circulate the stabilizer to the pump and fuel injectors.
- Drain and flush the cooling system. Refill with premixed coolant.
- Replace all fluids and filters (engine, hydraulic).
- Replace all filters (i.e.: air cleaner, heater, etc.).
- Put all controls in neutral position.
- Remove the battery. Be sure the electrolyte level is correct then charge the battery. Store it in a cool dry place 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.

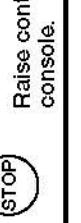
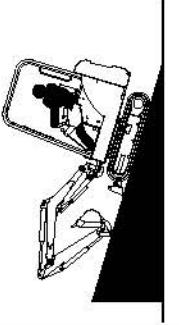
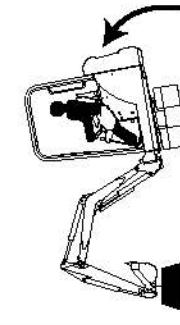
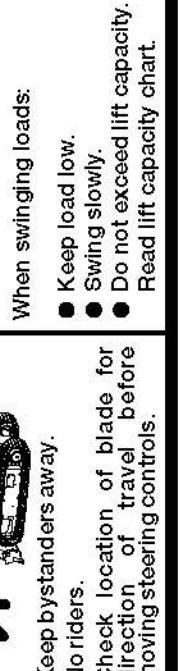
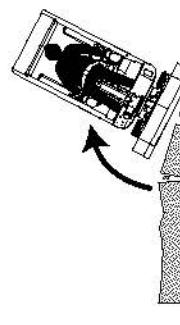
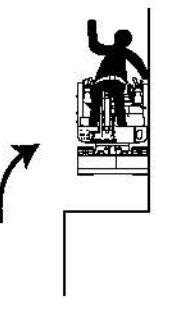
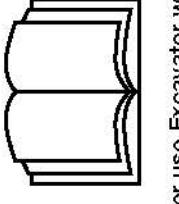
Return to Service

After the Bobcat Excavator has been in storage, it is necessary to follow a list of items to return the excavator to service.

- 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 excavator.
- 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 the excavator off of the planks.
- Operate machine, check for correct function.
- Stop the engine and check for leaks. Repair as needed.

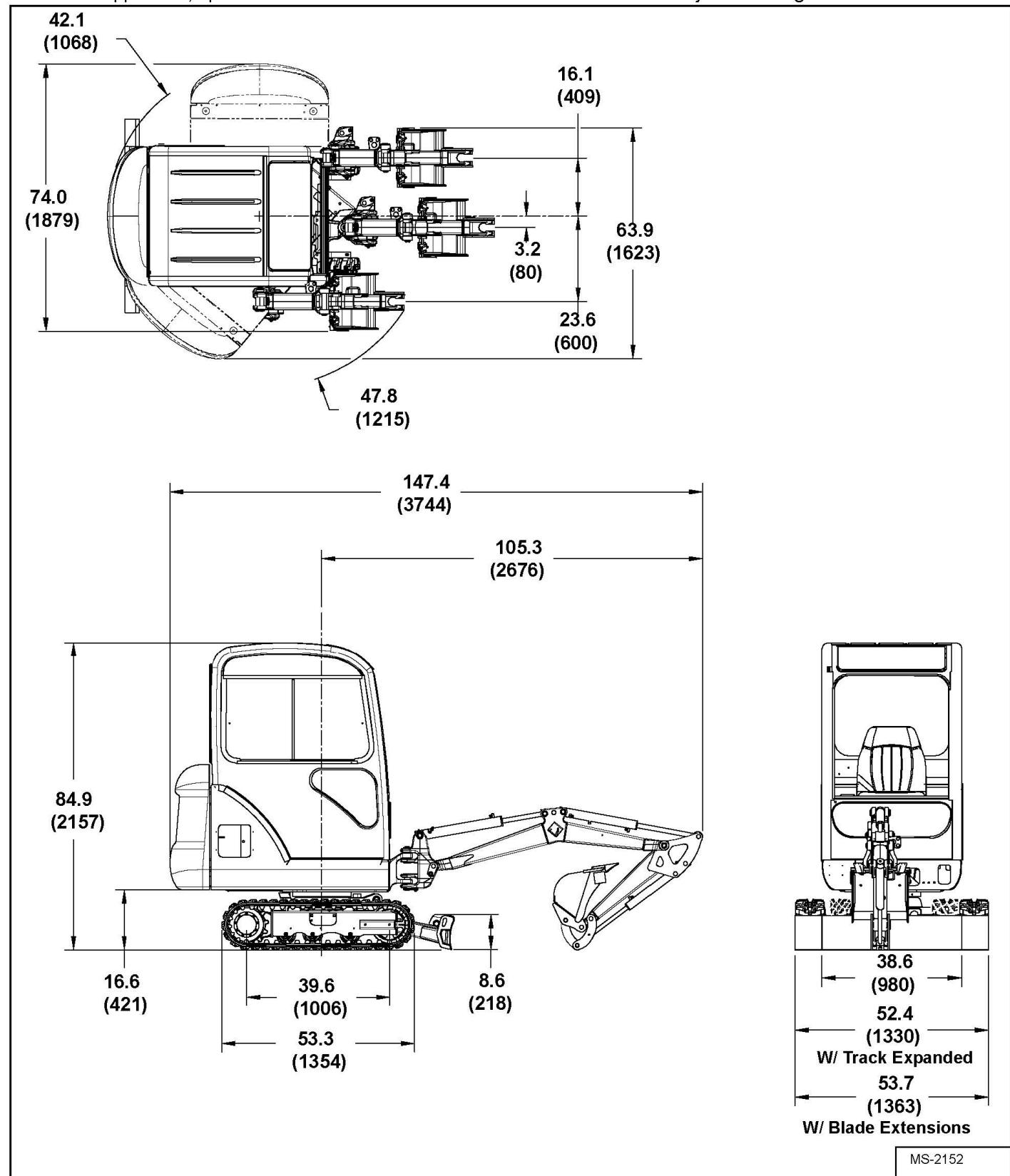
⚠ WARNING

AVOID INJURY OR DEATH

TO LEAVE THE EXCAVATOR:	
1 	Lower attachment. Never park with tracks pointed down hill.
2 	Stop the engine. Raise control console.
	On slopes, keep heavy end uphill. Do not travel or turn with attachment extended.
	Check for overhead or underground lines before operating.
	When swinging loads: ● Keep load low. ● Swing slowly. ● Do not exceed lift capacity. ● Read lift capacity chart.
	Keep bystanders away. No riders. Check location of blade for direction of travel before moving steering controls.
	Fasten seat belt securely. Keep feet and hands on controls. Operate controls only from operator's position. 42088
TO LEAVE THE EXCAVATOR:	
	Never use Excavator without instructions. Read Operation and Maintenance Manual and Handbook.
	Always use cab/canopy. Never modify equipment or use attachments not approved by Bobcat Company.

Dimensions

- All dimensions are shown in inches. Respective metric dimensions are given in millimeters enclosed by parentheses.
- Where applicable, specification conform to SAE or ISO standards and are subject to change without notice.



319 EXCAVATOR SPECIFICATIONS (CONT'D)

Drive System

Final Drive	Each track is independently driven by an Axial Piston Motor
Type of Reduction	Two-stage planetary gear reduction

Slew System

Slew Motor	Orbit Motor
Slew Circle	Single row shear type ball bearing with internal gear
Slew Speed	11 RPM

Undercarriage

Crawler Track Design	Sealed track rollers with boxed section track, Roller frame, Grease type track adjuster
Width of crawler	Retracted; 38.6 in. (980 mm) Extended; 52.4 in. (1330 mm)

Capacities

Fuel Tank	6.3 Gal. (23,8 L)
Hydraulic Reservoir	6.8 qt. (6,4 L)
Cooling System	6.0 qt. (5,7 L)
Engine Oil and Filter	3.75 qt. (3,5 L)
Final Drive (each)	0.53 qt. (0,5 L)

Tracks

Type	Rubber
Width	7.87 in. (200 mm)
Number Of Shoes	Single Assembly
Number of Track Rollers (per side)	3

Ground Pressure

Rubber Tracks (per SAE J1309)	4.24 PSI (0,29 bar)
-------------------------------	---------------------