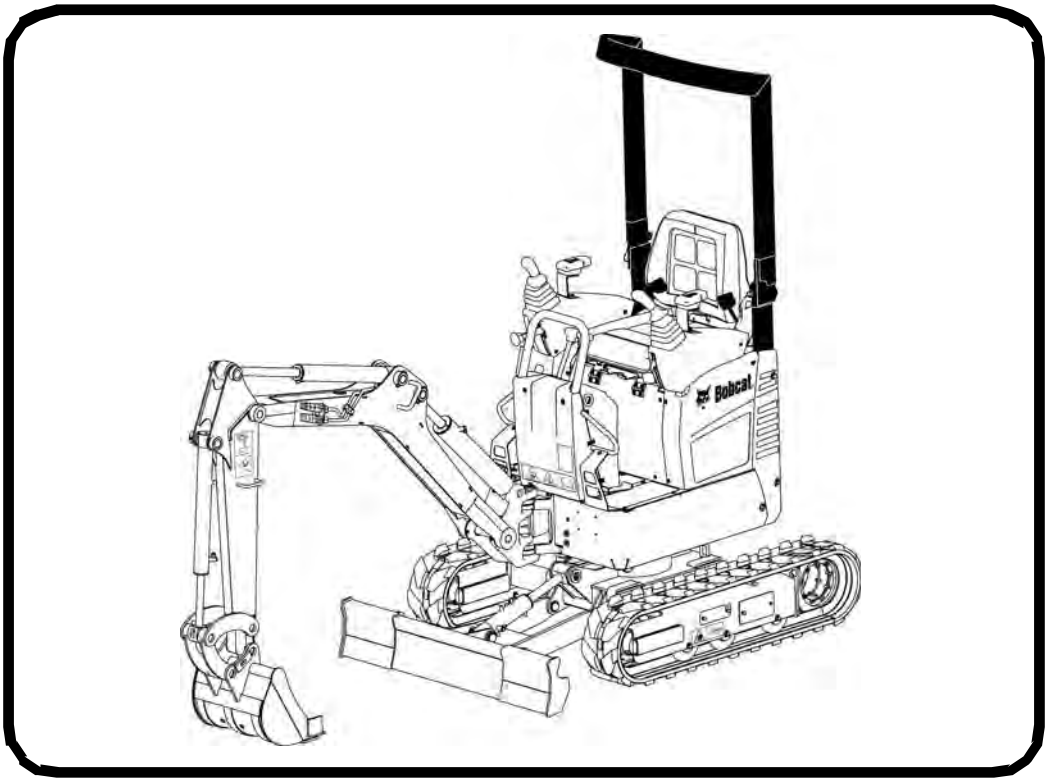
Operation & Maintenance Manual
418 Compact Excavator

S/N AB4711000 & Above
S/N B39211000 & Above



6986852enUS (04-14) (B)

Printed in U.S.A.

OPERATOR SAFETY WARNING

WARNING

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

W-2001-0502

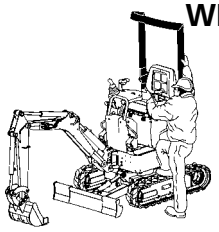
Safety Alert Symbol: **This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.**

CORRECT

P-90216

- **Never operate without instructions.**
- **Read machine signs, Operation & Maintenance Manual, and Operator's Handbook.**

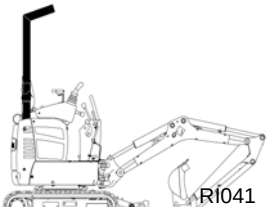
WRONG



RI078

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

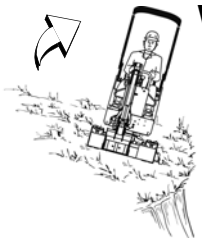
CORRECT



RI041

- **Never operate without approved TOPS.**
- **Never modify equipment.**
- **Never use attachments not approved by Bobcat Company.**

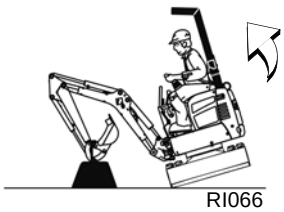
WRONG



RI065

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

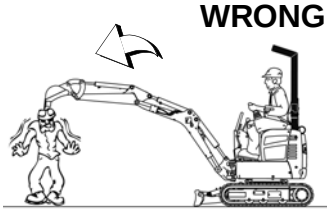
WRONG



RI066

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

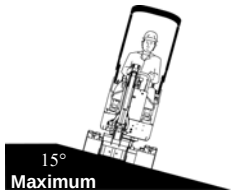
WRONG



RI067

- **Keep bystanders out of maximum reach area.**
- **Do not travel or turn with bucket extended.**
- **Never carry riders.**

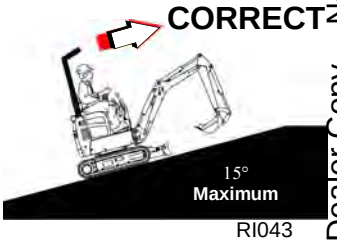
CORRECT



RI027

- **Never exceed a 15° slope to the side.**

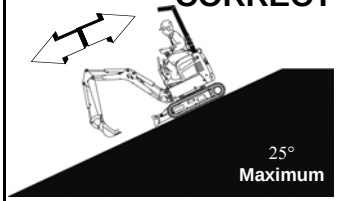
CORRECT



RI043

- **Never travel up a slope that exceeds 15°.**

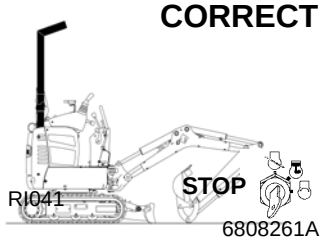
CORRECT



RI019

- **Never exceed 25° when going down or backing up a slope.**

CORRECT



RI041 6808261A

- **To leave excavator, lower the attachment.**
- **Stop the engine.**

CORRECT

B-21928

- **Use TOPS and fasten seat belt securely.**
- **Operate controls only from operator's seat.**
- **Keep feet and hands on controls.**

SAFETY EQUIPMENT

1. **Seat Belt**
2. **Slew Lock**
3. **TOPS**
4. **Safety Signs (Decals)**
5. **Safety Tread**
6. **Grab Handles**
7. **Operator's Handbook: Must be on machine.**

OSW56-0409

CONTENTS

REFERENCE INFORMATION

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

Excavator Serial Number _____

Engine Serial Number _____

NOTES:

_____

_____

_____

_____

YOUR BOBCAT DEALER:

_____

ADDRESS:

_____

PHONE:

_____

Bobcat Company
P.O. Box 128
Gwinner, ND 58040-0128

Doosan Benelux SA
Drève Richelle 167
B-1410 Waterloo
BELGIUM

Bobcat®

FOREWORD

This Operation & Maintenance Manual was written to give the owner / operator instructions on the safe operation and maintenance of the Bobcat excavator. READ AND UNDERSTAND THIS OPERATION & MAINTENANCE MANUAL BEFORE OPERATING YOUR BOBCAT EXCAVATOR. If you have any questions, see your Bobcat dealer. This manual may illustrate options and accessories not installed on your excavator.

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 and Bismarck, North Dakota (U.S.A.), Pontchateau (France), Dobris (Czech Republic) and the Bobcat corporate offices (Gwinner, Bismarck and West Fargo) in North Dakota. Only certified assessors, like BSI, 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.

CALIFORNIA PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the state of California to cause cancer, birth defects and other reproductive harm.

REGULAR MAINTENANCE ITEMS

	ENGINE OIL FILTER (6 Pack) 6671057		BATTERY 6670251
	FUEL FILTER 6667352		HYDRAULIC FILL / BREATHER CAP 6692836
 	AIR FILTER, Outer 6673752 AIR FILTER, Inner 6673753		FLUID, Hydraulic / Hydrostatic 6903117 - (2.5 U.S. gal) 6903118 - (5 U.S. gal) 6903119 - (55 U.S. gal)
	PRIMARY HYDRAULIC FILTER 6653336		ANTI-FREEZE, Propylene Glycol 6983128 - Premixed 6983129 - Concentrate
			RADIATOR CAP 056723
ENGINE OIL 6903105 6903107 6903109 6903113 6903112 6903111	 SAE 15W40 CE/SG (12 qt) SAE 10W30 CE/SG (12 qt) SAE 30W CE/SG (12 qt) SAE 15W40 CE/SG (2.5 U.S. gal) SAE 10W30 CE/SG (2.5 U.S. gal) SAE 30W CE/SG (2.5 U.S. gal)	**ENGINE OIL** 6903106 6903108 6903110	 SAE 15W40 CE/SG (1 U.S. gal) SAE 10W30 CE/SG (1 U.S. gal) SAE 30W CE/SG (1 U.S. gal)

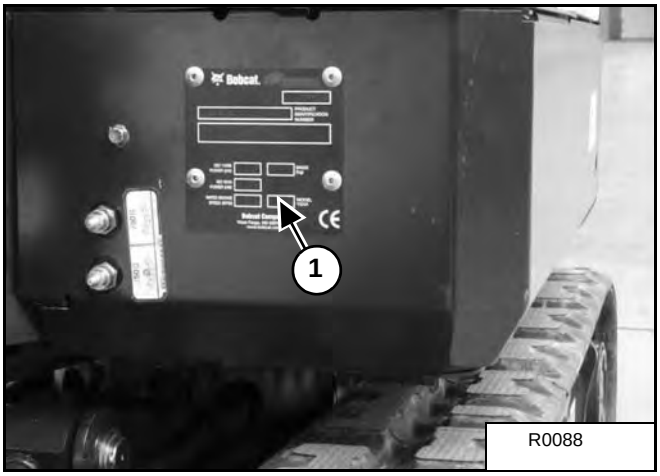
NOTE: Always verify Part Numbers with your Bobcat dealer.

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.

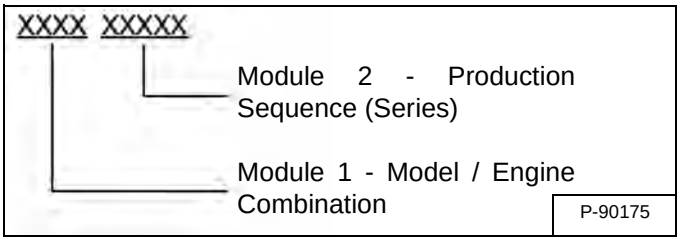
Excavator Serial Number

Figure 1



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

Figure 2



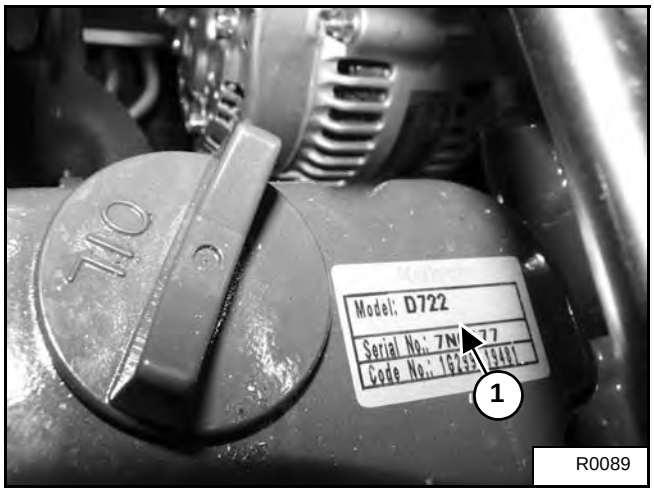
Explanation of excavator Serial Number **[Figure 2]**:

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.

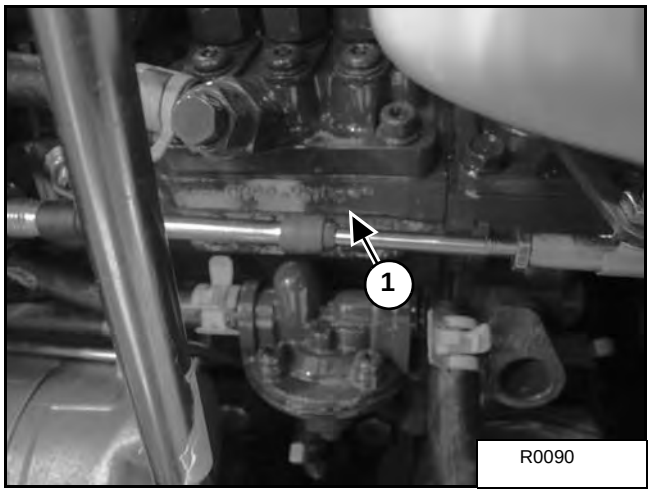
Engine Serial Number

Figure 3



The engine serial number is located as a plate (Item 1) on the top of the engine **[Figure 3]**.

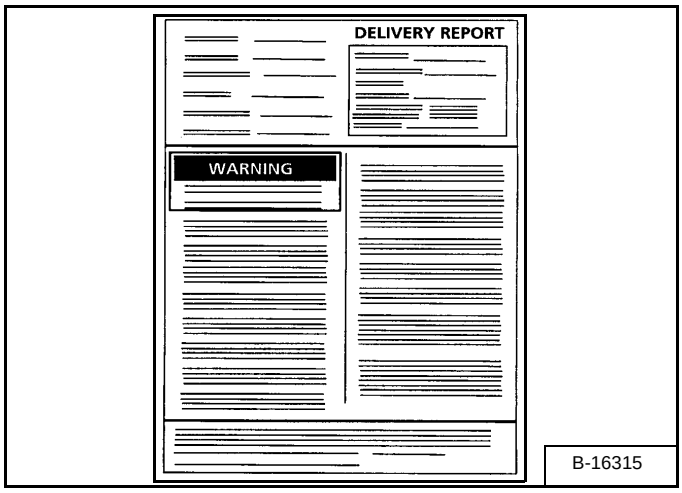
Figure 4



It also appears engraved on the side of the engine (Item 1) **[Figure 4]**.

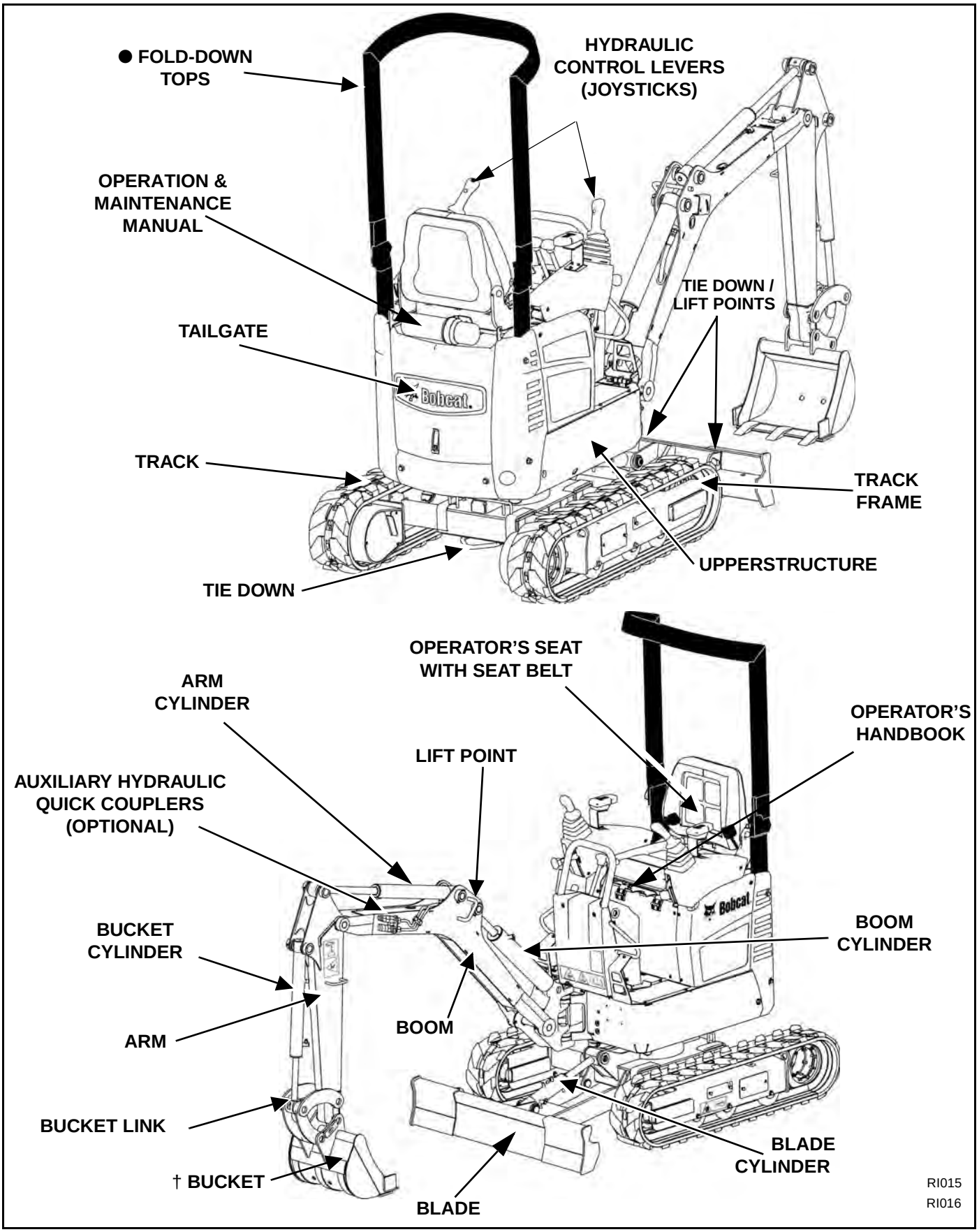
DELIVERY REPORT

Figure 5



The delivery report **[Figure 5]** contains a list of items that must be explained or shown to the owner or operator by the dealer when the Bobcat excavator is delivered.

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



† BUCKET - Several different buckets and other attachments are available for the Bobcat excavator.

● TOPS (Tip-Over Protective Structure) as standard equipment. The TOPS meets ISO 12117.

FEATURES, ACCESSORIES AND ATTACHMENTS

Standard Items

Model 418 Bobcat excavators are equipped with the following standard items:

- 3 inch Seat Belt
- 7.1'' rubber track
- 27.9'' dozer blade / 43.3'' extended
- Adjustable Joystick Consoles
- Auxiliary hydraulics
- Boom Light
- Control console locks
- Control Pattern Selector Valve (ISO / STD)
- Fold-down TOPS*
- Horn
- Hydraulic joystick controls
- Hydraulically retractable undercarriage: 27.9'' - 43.3''
- Power Port
- Retractable seat belt
- Spark arrestor muffler
- Suspension seat
- TOPS - 2 post, foldable
- Two-speed travel
- Track Expansion Valve
- Working lights
- Zero Tail Swing (undercarriage expanded)

Options And Accessories

Below is a list of some equipment available from your Bobcat excavator dealer as Dealer and / or Factory Installed Accessories and Factory Installed Options. See your Bobcat dealer for other available options, accessories and attachments.

- Beacon Kit
- Boom Light
- Boom Light Housing
- Blade Extensions
- Catalytic Exhaust Purifier
- 3 in Seat Belt
- Keyless Switch
- Hydraulic Oil Cooler Kit (For use with hydraulic breaker applications)
- Motion alarm
- Strobe Kit

Specifications subject to change without notice and standard items may vary.

Attachments

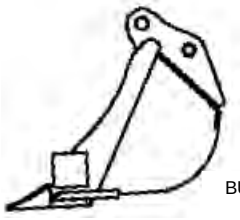
These and other attachments are approved for use on this model Bobcat excavator. Do not use unapproved attachments. Attachments not manufactured by Bobcat may not be approved.

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.

- Digging bucket
- Grading bucket
- Hydraulic breaker

Buckets Available



BUCKET

Many bucket styles, widths and different capacities are available for a variety of different applications. See your Bobcat dealer for the correct bucket for your Bobcat excavator and application.

SAFETY AND TRAINING RESOURCES

SAFETY INSTRUCTIONS

Before Operation

Carefully follow the operating and maintenance instructions in this manual.

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

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

The dealer explains the capabilities and restrictions of the Bobcat excavator 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 Bobcat excavator. 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 is 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 excavator. It's brief instructions are convenient to the operator. The handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.

- The AEM Safety Manual delivered with the machine gives general safety information.

- The Compact Excavator Operating Training Course is available through your Bobcat dealer. This course is intended to provide rules and practices of correct operation of the Bobcat excavator. The course is available in English and Spanish versions.

- Service Safety Training Courses are available from your Bobcat dealer. They provide information for safe and correct service procedures.

- See the PUBLICATIONS AND TRAINING RESOURCES Page in this manual or your Bobcat dealer for Service and Parts Manuals, printed materials, videos, or training courses available. Also check the Bobcat web sites **www.training.bobcat.com** or **www.bobcat.com**

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.

Call Before You Dig
Dial 811 (USA Only)
1-888-258-0808 (USA & Canada)

When you call, you will be directed to a location in your state / province, or city for information about buried lines (telephone, cable TV, water, sewer, gas, etc.).

SI EXC-0913

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 operating the machine. Untrained operators can cause injury or death.

W-2001-0502

IMPORTANT

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

I-2019-0284

DANGER

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

D-1002-1107

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-2044-1107

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, respiratory equipment, hearing protection or Special Applications Kits are required for some work. See your Bobcat dealer about Bobcat safety equipment for your model.

SI EXC-0913

Avoid Silica Dust

Cutting or drilling concrete containing sand or rock containing quartz may result in exposure to silica dust. Do not exceed Permissible Exposure Limits (PEL) to silica dust as determined by OSHA or other job site Rules and Regulations. Use a respirator, water spray or other means to control dust. Silica dust can cause lung disease and is known to the state of California to cause cancer.

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 coolant mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Operation

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

Electrical

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

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

SI EXC-0913

FIRE PREVENTION (CONT'D)

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 gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.

Fueling

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 fueling standards for proper grounding 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.

Spark Arrester Exhaust System

The spark arrester exhaust system 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 dust mask when grinding painted parts. Toxic dust or gas can be produced.

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

Fire Extinguishers

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

SI EXC-0913

PUBLICATIONS AND TRAINING RESOURCES

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

For the latest information on Bobcat products and the Bobcat Company, visit our web site at **www.bobcat.com**; you can also order Operator and Service Training materials online through **www.bobcatstore.com**

OPERATION & MAINTENANCE MANUAL

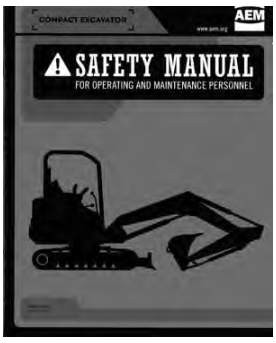
6986852enUS

- Complete instructions on the correct operation and the routine maintenance of the BOBCAT excavator.

SERVICE MANUAL

6986853

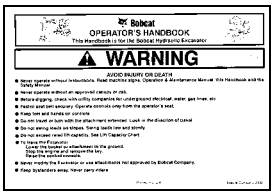
- Complete maintenance instructions for your BOBCAT Excavator.



SAFETY MANUAL (English and Spanish)

6901951

- Provide basic safety procedures and warnings for your BOBCAT excavator in both English and Spanish.



OPERATOR'S HANDBOOK

6986962enUS

Gives basic operation instructions and safety warnings

COMPACT EXCAVATOR OPERATOR TRAINING COURSE

6903186

Introduces operator to step-by-step basics of Compact Excavator operation. Also available in Spanish P/N 6903228

EXCAVATOR SERVICE SAFETY COURSE

6900916

Introduces Service Technicians to step-by-step basics of proper and safe excavator maintenance and servicing procedures

OPERATOR SAFETY DVD

6904762

Provides basic safety instructions contained in all Bobcat Safety Videos in both English and Spanish.

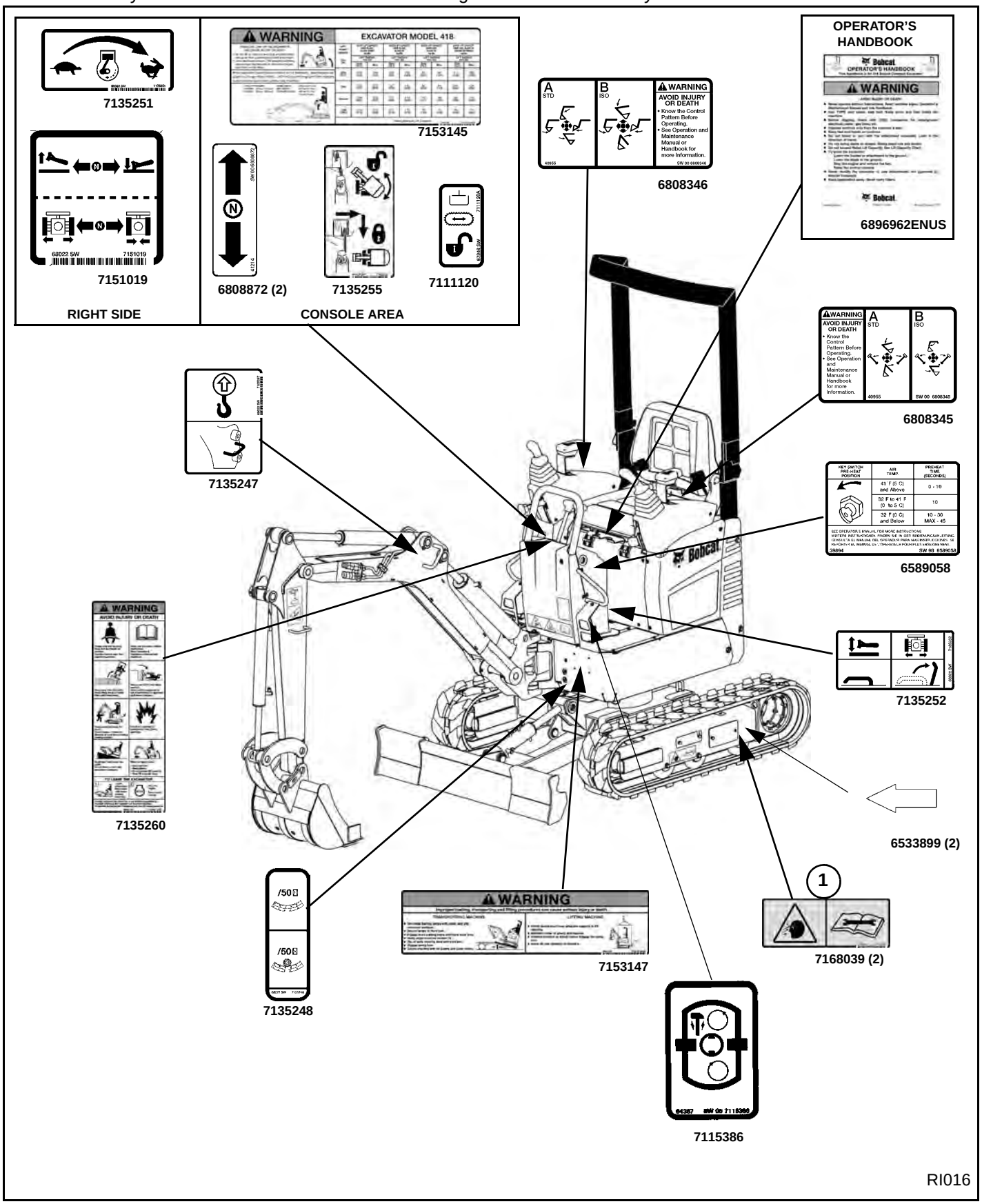
EXCAVATOR SAFETY VIDEO

(Mobile device with quick response code application required)

Scan the code above to watch the excavator safety video or view at **www.training.bobcat.com**.

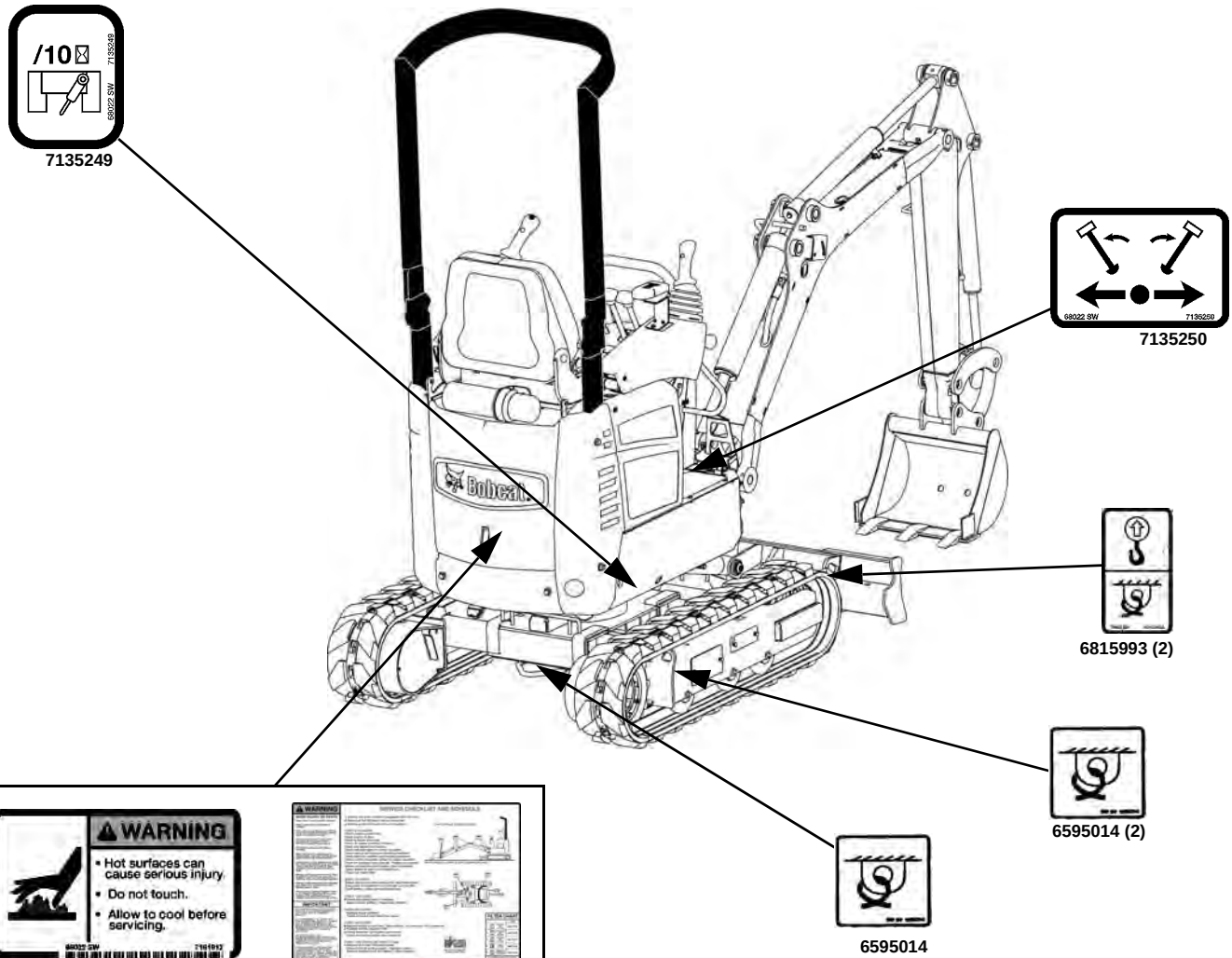
MACHINE SIGNS (DECALS)

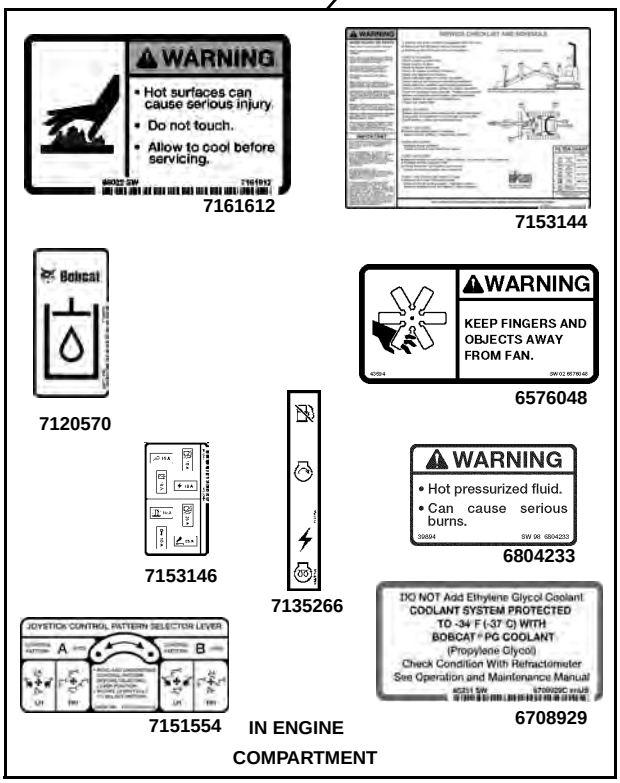
Follow the instructions on all the Machine Signs (Decals) that are on the excavator. Replace any damaged machine signs and be sure they are in the correct locations. Machine signs are available from your Bobcat excavator dealer.



MACHINE SIGNS (DECALS) (CONT'D)

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





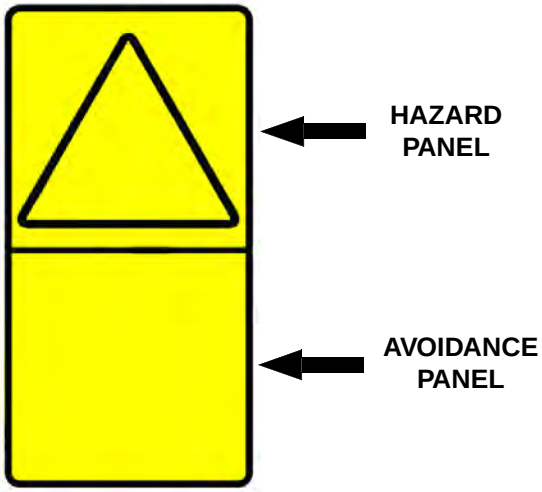
RI015

MACHINE SIGNS (DECALS) (CONT'D)

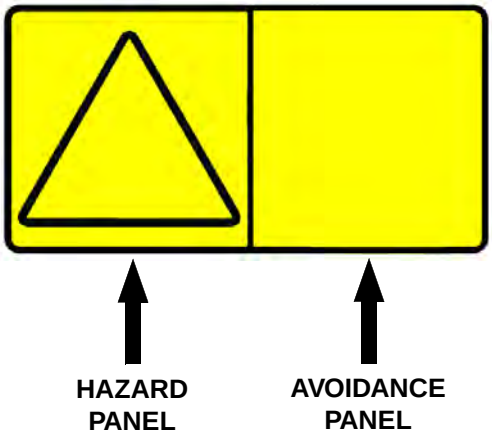
No-Text Safety Signs

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 familiarized with all safety signs installed on the excavator.

Vertical Configuration



Horizontal Configuration



The format consists of the hazard panel(s) and the avoidance panel(s):

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.

NOTE: See the numbered MACHINE SIGNS (DECALS) on Page 20 and Machine Signs (Decals) (Cont'd) on Page 21 for the machine location of each corresponding numbered no-text decals as shown below.

1. Thrown Or Flying Objects (7120574)

This safety sign is located on the outside of both tracks.

⚠ WARNING

High pressure grease can cause serious injury. Do not loosen grease fitting. Do not loosen bleed fitting more than 1 - 1/2 turns.

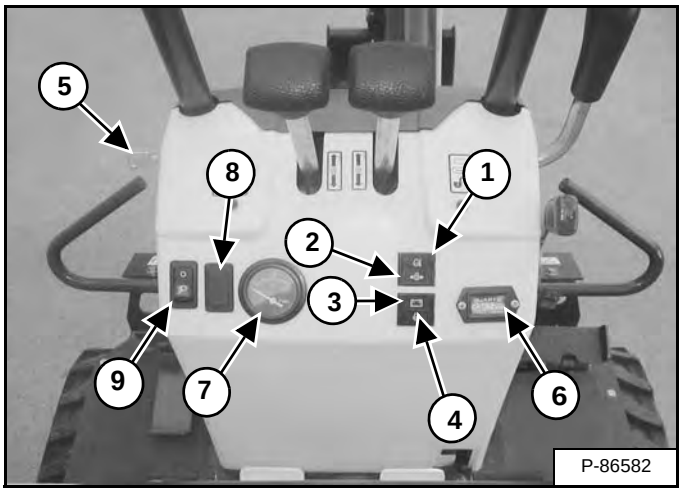
Read and understand the Operation & Maintenance Manual for more information.

W-2516-0110

OPERATING INSTRUCTIONS

Instrumentation

Figure 6

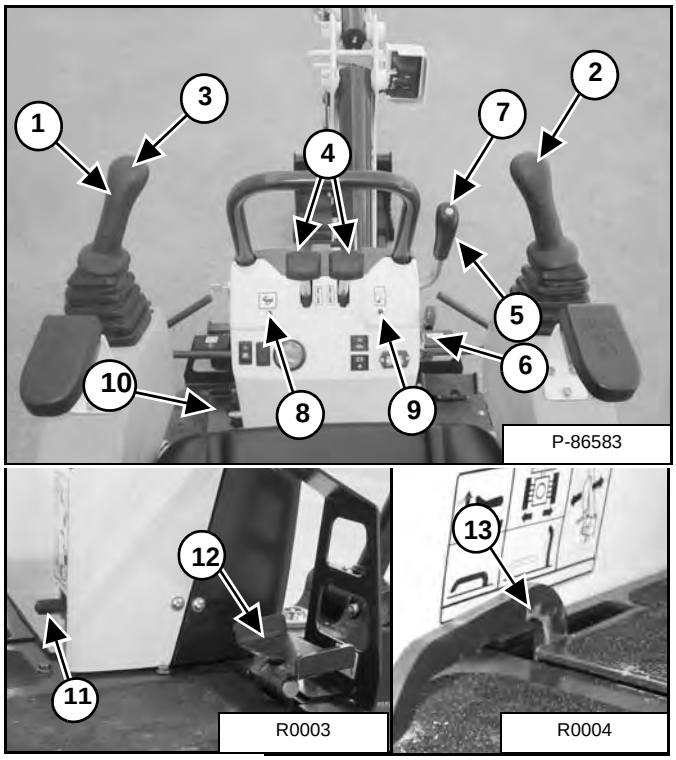


All the instruments are located on the control console **[Figure 6]**.

REF. NO.	DESCRIPTION	FUNCTION / OPERATION
1	Engine Coolant Temperature Warning Light	Light comes ON when coolant temperature is above allowable range. Alarm also sounds. STOP the engine if light comes ON.
2	Engine Oil Pressure Warning Light	Light comes ON when pressure is below allowable range. Alarm also sounds. STOP the engine if light comes ON.
3	Charging System Light	Light comes ON when the alternator is NOT charging the battery.
4	Preheat Light	Light comes ON when key is turned in PREHEAT position
5	Key Switch	Used to activate glow plugs, start and stop engine.
6	Hourmeter	Records the total operating hours of the machine.
7	Fuel Gauge	Shows the amount of fuel in the tank.
8	Not used	Early Models Only
	Blade / Track Expansion Switch	Later Models Only - Switch functions between raise / lower the blade and track expansion. (See Blade / Track Expansion Lever on Page 39.) or (See Blade / Track Expansion Switch on Page 39.)
9	Boom Light Switch	Turns work light ON or OFF.

Operator Controls

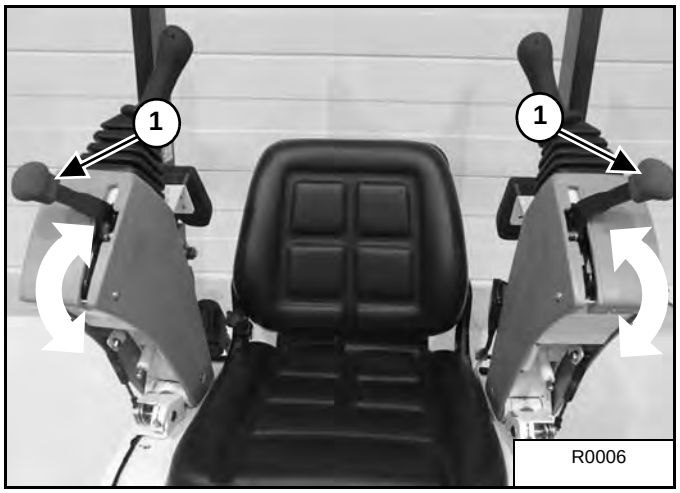
Figure 7



REF. NO.	DESCRIPTION	FUNCTION / OPERATION
1	Left Joystick	(See HYDRAULIC CONTROLS on Page 34.)
2	Right Joystick	(See HYDRAULIC CONTROLS on Page 34.)
3	Horn	Press button to sound horn
4	Travel controls	Control the movement of the excavator. (See TRAVEL CONTROLS on Page 32.)
5	Blade / Track Expansion Lever	Use with Blade / Track Expansion Lever to raise / lower the blade or expand / retract the tracks. (See BLADE CONTROL on Page 39.) or (See TRACK FRAME EXPANSION on Page 40.)
6	Engine Speed Control	Controls rpm of the engine. (See Engine Speed Control Lever on Page 28.)
7	Two-Speed Switch	Engages and disengages the High Range Travel Speed (See Two-Speed Travel on Page 28.)
8	Two-Speed Indicator Light	ON when Two-Speed is engaged, OFF when Two-Speed is disengaged. (See Two-Speed Travel on Page 28.)
9	Console Light	Light is OFF when the console(s) are raised, ON when the console(s) are lowered. (See Raising and Lowering the Console(s) on Page 27.)
10	Auxiliary Hydraulic Pedal	Controls the fluid flow to the auxiliary quick couplers (attachment). (See Auxiliary Hydraulic Pedal on Page 37.)
11	Upperstructure Slew Lock	Locks and unlocks the upperstructure of the excavator to the track frame. (See Upperstructure Slew Lock on Page 28.)
12	Boom Swing Pedal	Swings the boom to the right and to the left. (See BOOM SWING PEDAL on Page 38.)
13	Blade / Track Expansion Selector Lever (Early Models Only)	Lower the lever for Blade function / raise lever for Track Expansion function. (See BLADE CONTROL on Page 39.) or (See TRACK FRAME EXPANSION on Page 40.)

Raising and Lowering the Console(s)

Figure 8



Pull up on the release handle (Item 1) **[Figure 8]**. The gas spring will assist in raising the console.

NOTE: When the console(s) are raised, the hydraulic and traction drive 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 console must be in the locked down position and the key switch in the ON position to lower the boom / bucket.

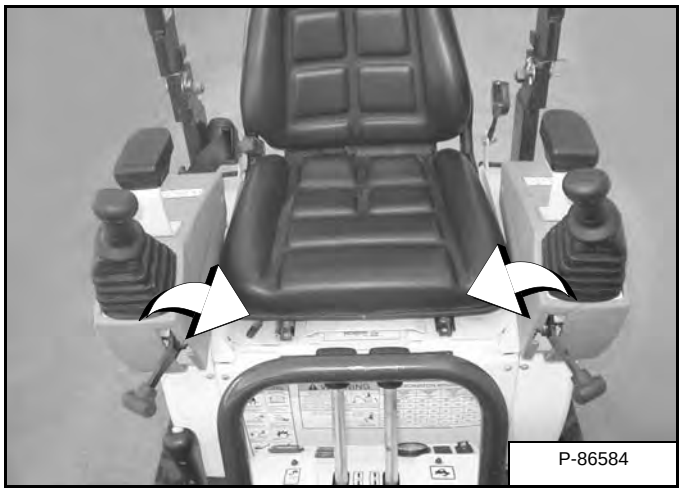
Lower the consoles before operating the excavator.

Push down on the console **[Figure 8]** until the latch is engaged.

NOTE: The console light (Item 9) [Figure 7] will be ON when the console(s) are raised, OFF when console(s) are lowered.

Adjusting Console Position

Figure 9

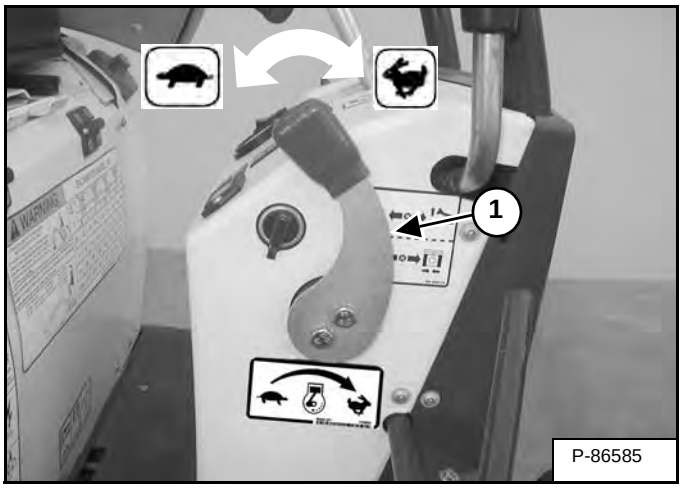


The control consoles can be adjusted in or out for operator comfort **[Figure 9]**. Raise the consoles (Item 1) **[Figure 8]** and move them in or out as desired.

NOTE: Make sure consoles are fully inward when traveling through narrow areas.

Engine Speed Control Lever

Figure 10

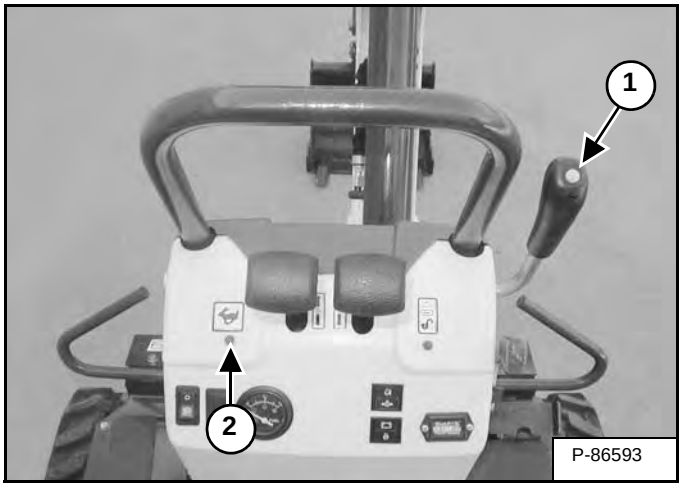


The engine speed control lever (Item 1) **[Figure 10]** controls the rpm of the engine.

Move the lever (Item 1) **[Figure 10]** forward to increase engine rpm, move the lever back to decrease engine rpm.

Two-Speed Travel

Figure 11



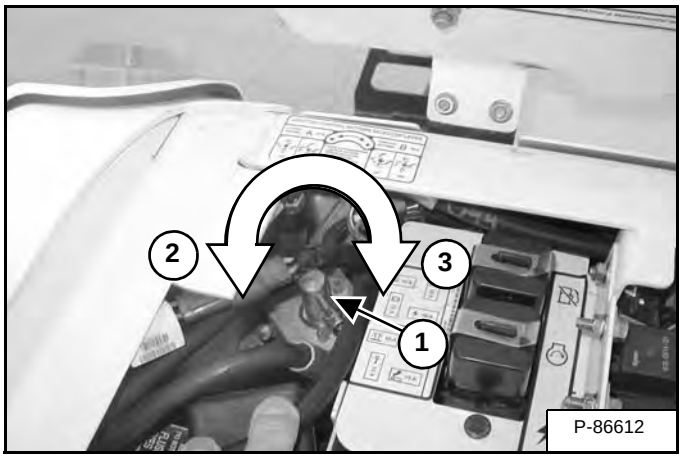
Push the button (Item 1) **[Figure 11]** to engage the high range.

When high range is engaged, the two-speed travel light (Item 2) **[Figure 11]** will illuminate.

Press the button again to disengage.

STD / ISO Selector Valve

Figure 12

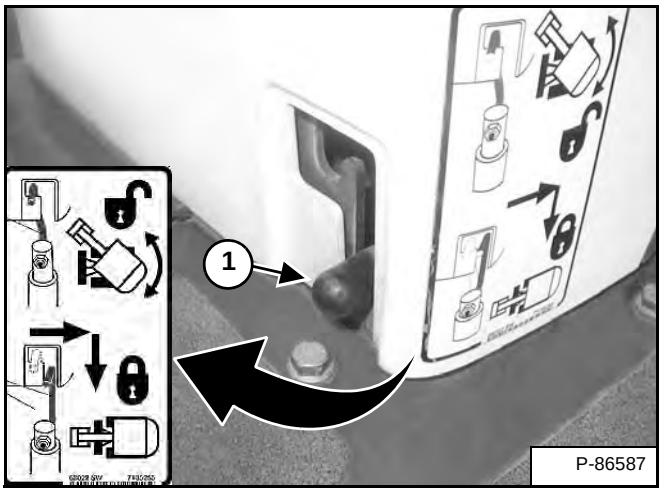


Open the rear cover and tilt the operator's seat forward.

Move the lever (Item 1) counterclockwise (Item 2) for STANDARD Control Pattern, clockwise (Item 3) for ISO Control Pattern **[Figure 12]**.

Upperstructure Slew Lock

Figure 13



Move the slew lock pin (Item 1) **[Figure 13]** to the right and down to engage the upperstructure slew lock. When the slew lock is engaged (locked), the upperstructure of the excavator is locked to the track frame and will not rotate.

NOTE: The upperstructure must be in the straight forward or straight rearward position for the upperstructure to lock.

Move the slew lock pin (Item 1) **[Figure 13]** up and to the left to disengage (unlocked) the upperstructure from the track frame. Secure the lever in the unlocked position.

TIP-OVER PROTECTIVE STRUCTURE (TOPS)

TOPS Position

WARNING

AVOID INJURY OR DEATH

Use the Tip Over Protective Structure (TOPS). TOPS changes not approved by Bobcat Company can cause loss of operator protection and result in injury or death. The TOPS must be in the raised position with the seat belt fastened. There is no tip-over protection when the TOPS is in the lowered position.

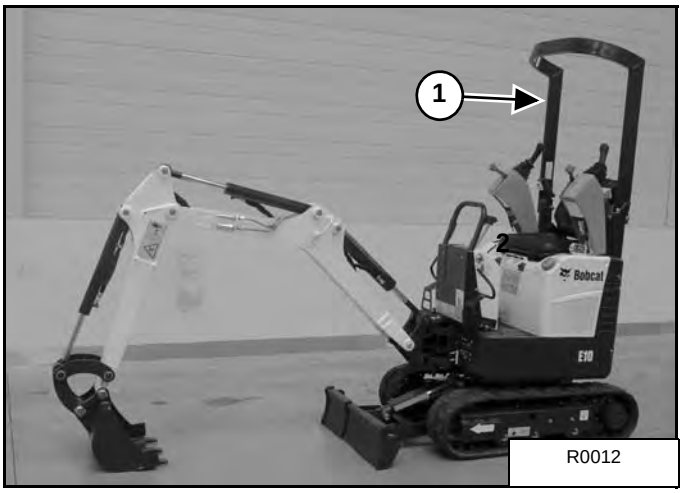
W-2742-0608

The excavator can be operated temporarily with the TOPS lowered for access through height restricted openings. Do not fasten seat belt when the TOPS is in the DOWN position.

Stop the engine, exit the machine and put the TOPS in the UP and LOCKED position after passing through height restricted opening.

Raising And Lowering The TOPS

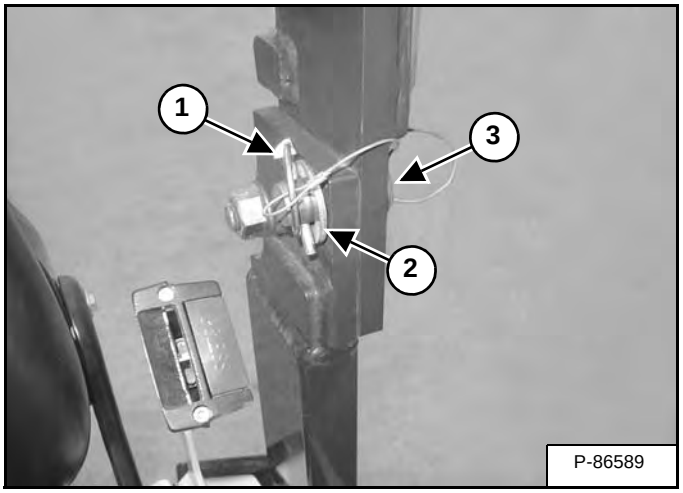
Figure 14



The excavator is equipped with a Tip-Over Protective Structure (TOPS) (Item 1) **[Figure 14]**.

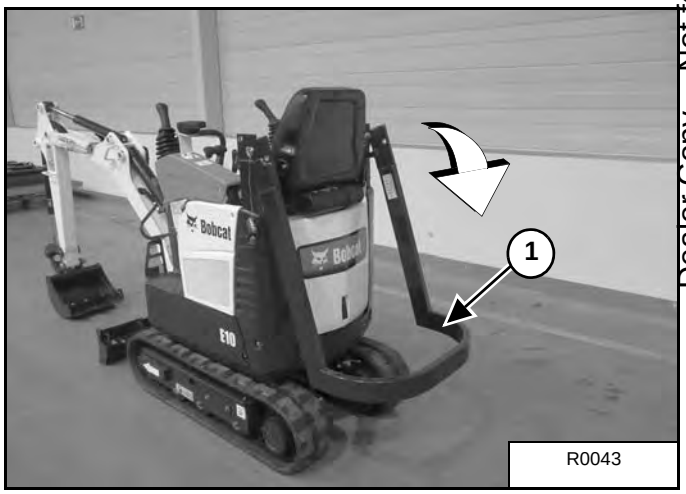
To Lower the TOPS:

Figure 15



Remove the retainer clip (Item 1) and washer (Item 2) **[Figure 15]** (both sides).

Figure 16

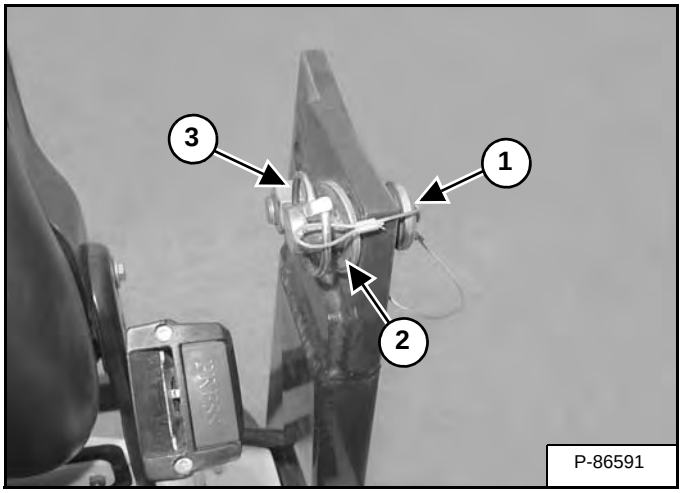


Securely grasp the TOPS (Item 1) **[Figure 14]** with one hand and remove the pin (Item 3) **[Figure 15]** (both sides) and lower the TOPS (Item 1) **[Figure 16]** to the down position.

Raising And Lowering The TOPS (Cont'd)

To Lower the TOPS (Cont'd):

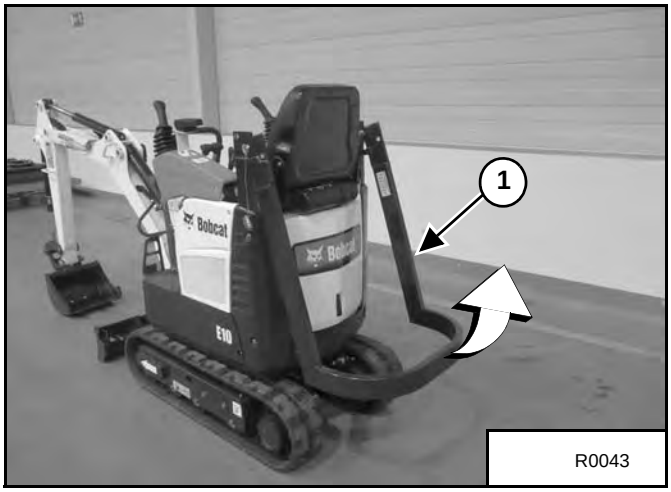
Figure 17



Reinstall the pin (Item 1) and the washer (Item 2) on the retainer clip (Item 3) **[Figure 17]** into the TOPS for storage.

To Raise the TOPS:

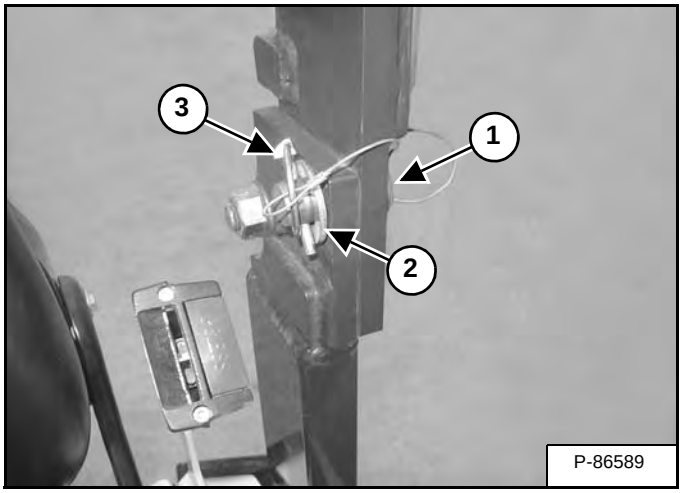
Figure 18



Remove the retainer clip (Item 3) and the washer (Item 2) from the pin (Item 1) **[Figure 17]** (both sides).

Securely grasp the TOPS (Item 1) **[Figure 18]** and raise to the upright position and install the pin (Item 1) **[Figure 19]** (both sides).

Figure 19



Install the washer (Item 2) and the retainer clip (Item 3) **[Figure 19]** (both sides).

⚠ WARNING

AVOID INJURY OR DEATH

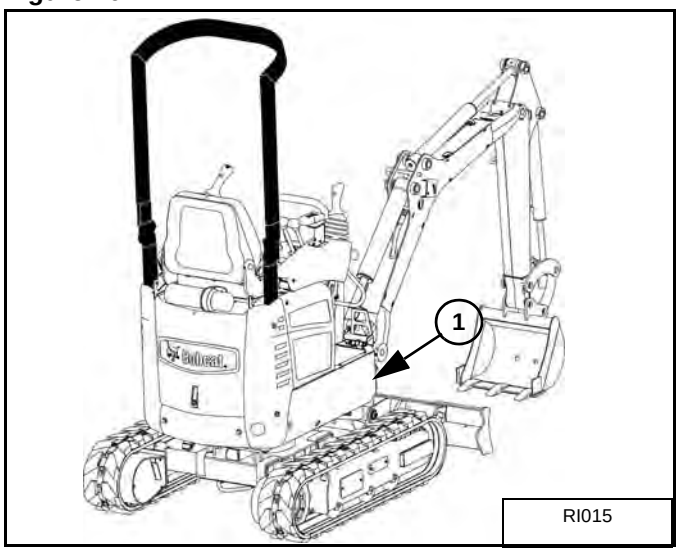
The Tip Over Protective Structure (TOPS) must be properly secured in the raised position. Make sure the pins are correctly installed through the mounting frame and the TOPS tube and secured with the retainer pins. Improperly installed fasteners will cause loss of TOPS protection.

W-2753-0808

MOTION ALARM SYSTEM

Operation

Figure 20



This excavator may be equipped with a motion alarm system. The motion alarm (Item 1) **[Figure 20]** is located on the lower part of the frame, on top of the swing cylinder.

⚠ WARNING

This machine is equipped with a motion alarm.
ALARM MUST SOUND!
when operating forward or backward.

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

The operator is responsible for the safe operation of this machine.

W-2786-0309

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

If alarm does not sound or for adjustment instructions, see inspection and maintenance instructions for the motion alarm system in the Preventive Maintenance section of this manual. (See MOTION ALARM SYSTEM on Page 31.)

TRAVEL CONTROLS

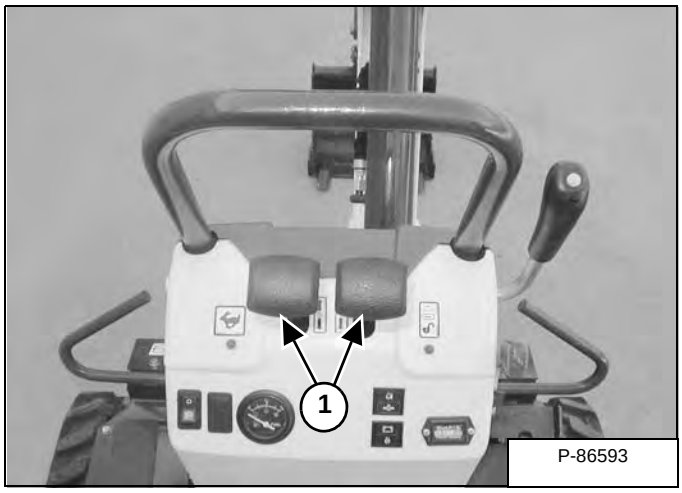
Description

The travel control levers control the movement of the excavator.

Forward and Reverse Travels

NOTE: The following procedures describe forward, reverse, left and right as seated in the operator's seat.

Figure 21



Put the blade so that it is at the front of the machine (as you sit in the operator's seat). Slowly move both steering levers (Item 1) **[Figure 21]** forward for forward travel; backward for reverse travel.

⚠ WARNING

AVOID INJURY OR DEATH

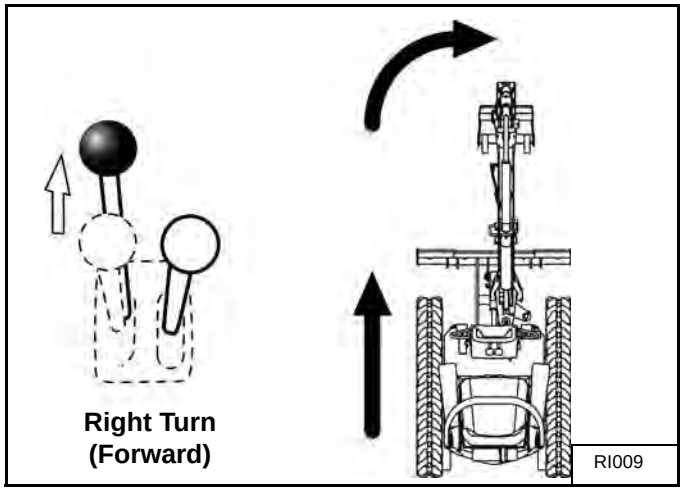
- **Check the blade location before traveling. When the blade is to the rear, operate the steering levers / foot pedals in the opposite direction to when the blade is in the front.**
- **Move the steering levers / foot pedals slowly. Abrupt lever motion will cause the machine to jerk.**

W-2235-0396

Turning

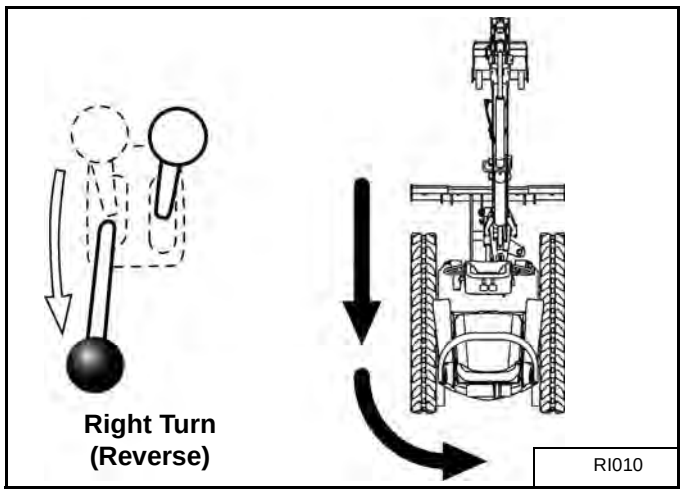
Right Turn

Figure 22



Push the left steering lever forward to turn right **[Figure 22]** while driving forward.

Figure 23

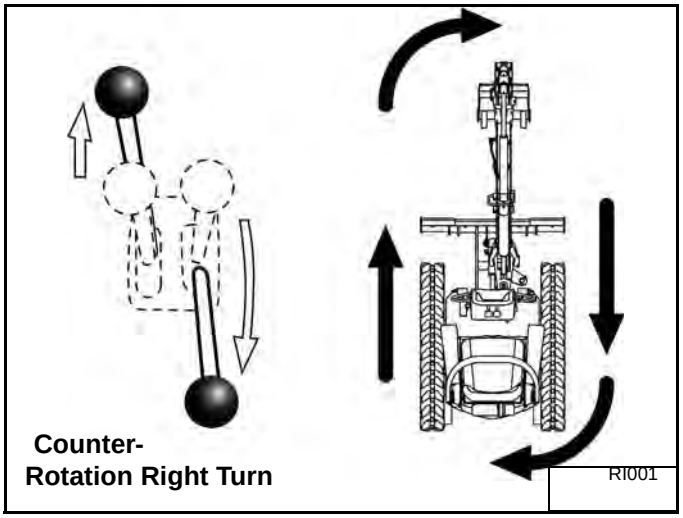


Pull the left steering lever backward to turn right **[Figure 23]** while reversing.

Turning (Cont'd)

Counter-Rotation Right Turn

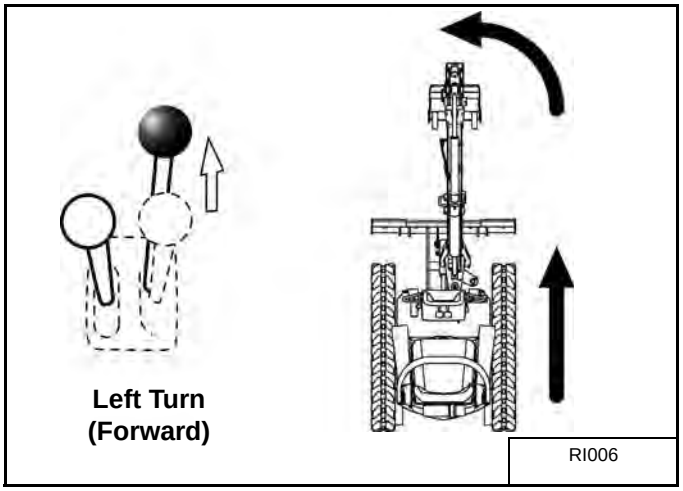
Figure 24



Push the left steering lever forward and pull the right steering lever backward **[Figure 24]**.

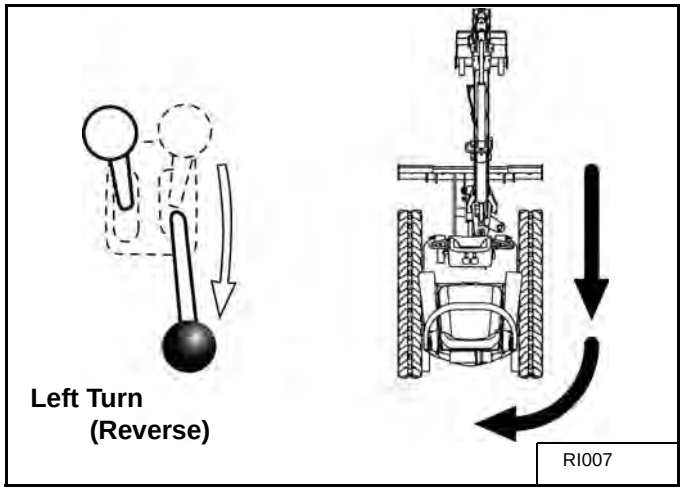
Left Turn

Figure 25



Push the right steering lever forward to turn left **[Figure 25]** while driving forward.

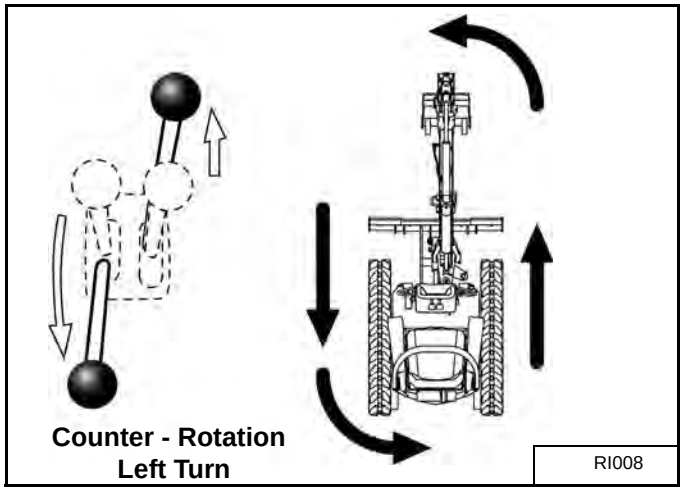
Figure 26



Pull the right steering lever backward to turn left while reversing **[Figure 26]**.

Counter-Rotation Left Turn

Figure 27



Push the right steering lever forward and pull the left steering lever backward **[Figure 27]**.

HYDRAULIC CONTROLS

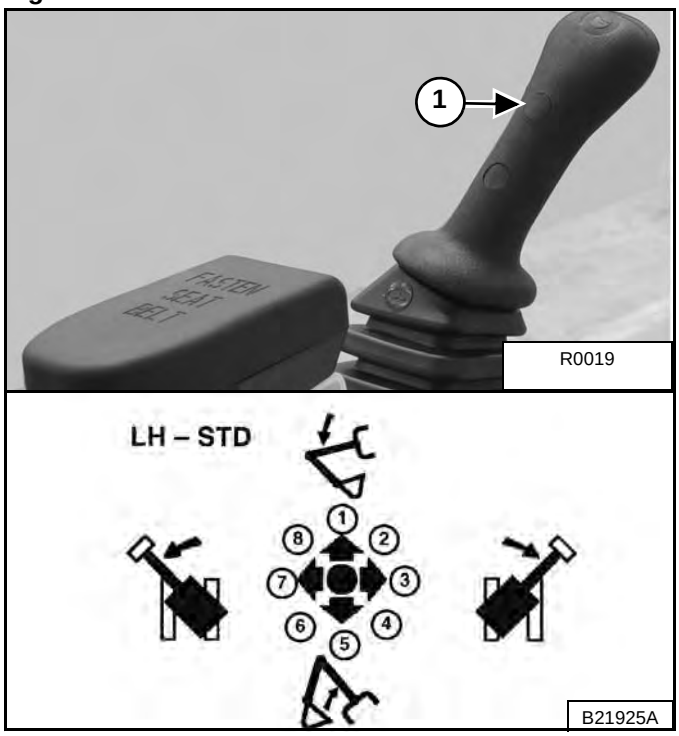
Description

The work equipment (boom, arm, bucket, and upperstructure slew) is operated by using the left and right control levers (joysticks). These joysticks can be used in either a STANDARD Control Pattern **[Figure 28]** and **[Figure 29]** or in the ISO Control Pattern **[Figure 30]** and **[Figure 31]**.

STANDARD Control Pattern

Left Control Lever (Joystick)

Figure 28



The left control lever (joystick) (Item 1) is used to operate the arm and slew the upperstructure **[Figure 28]**.

1. Boom lower.
2. Boom lower and slew right.
3. Slew right.
4. Boom raise and slew right.
5. Boom raise.
6. Boom raise and slew left.
7. Slew left.
8. Boom lower and slew left.

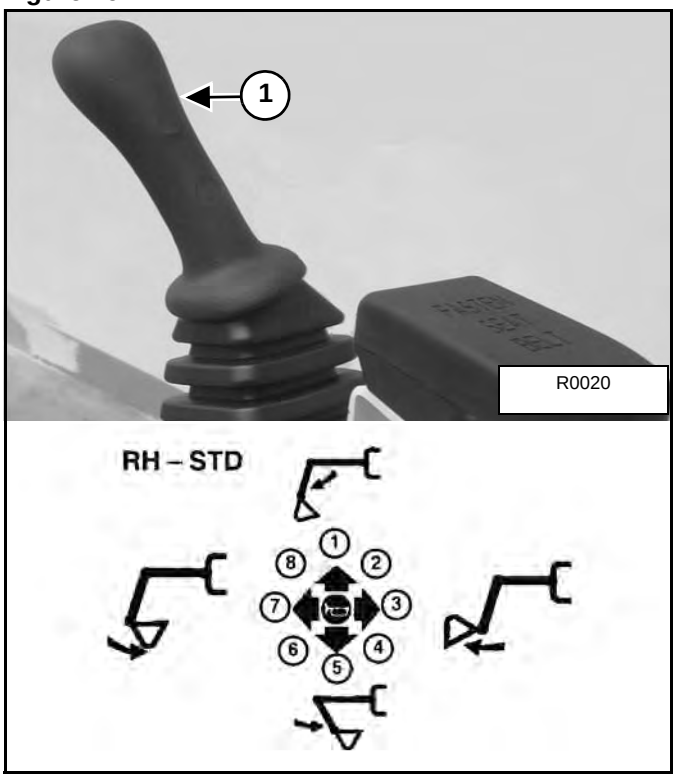
IMPORTANT

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

I-2051-0905

Right Control Lever (Joystick)

Figure 29



The right control lever (joystick) (Item1) is used to operate the boom and bucket **[Figure 29]**.

1. Arm out
2. Arm out and bucket dump.
3. Bucket dump.
4. Arm in and bucket dump.
5. Arm in.
6. Arm in and bucket curl.
7. Bucket curl.
8. Arm out and bucket curl.

WARNING

AVOID INJURY OR DEATH

Before leaving the machine:

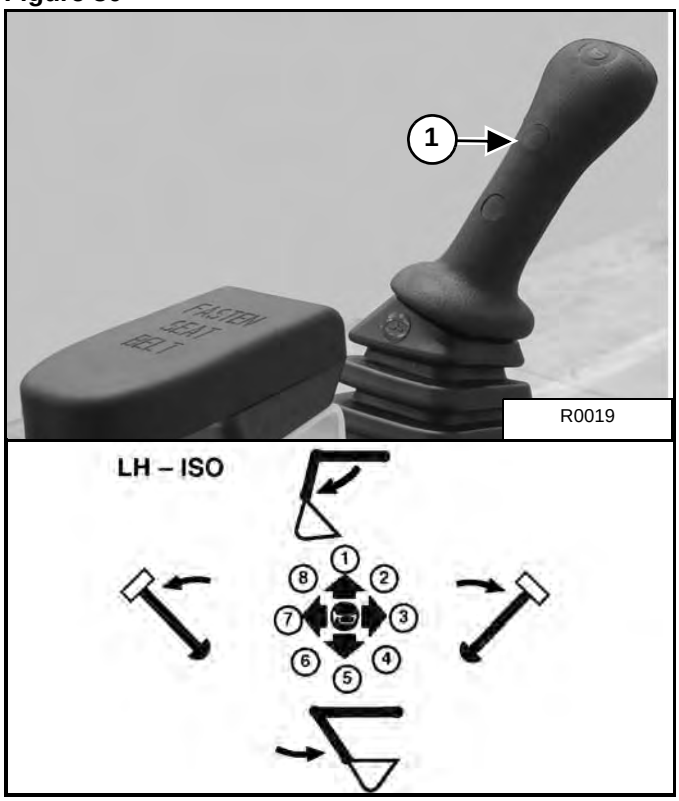
- **Lower the work equipment to the ground.**
- **Lower the blade to the ground.**
- **Stop the engine and remove the key.**

W-2196-0595

ISO Control Pattern

Left Control Lever (Joystick)

Figure 30



The left control lever (joystick) (Item 1) is used to operate the arm and slew the upperstructure **[Figure 30]**.

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.

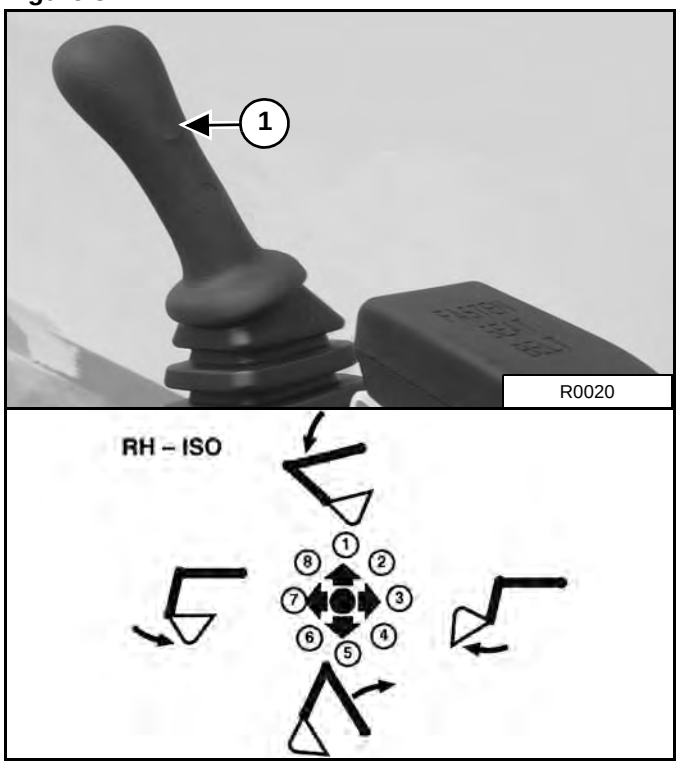
IMPORTANT

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

I-2051-0905

Right Control Lever (Joystick)

Figure 31



The right control lever (joystick) (Item 1) is used to operate the boom and bucket **[Figure 31]**.

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

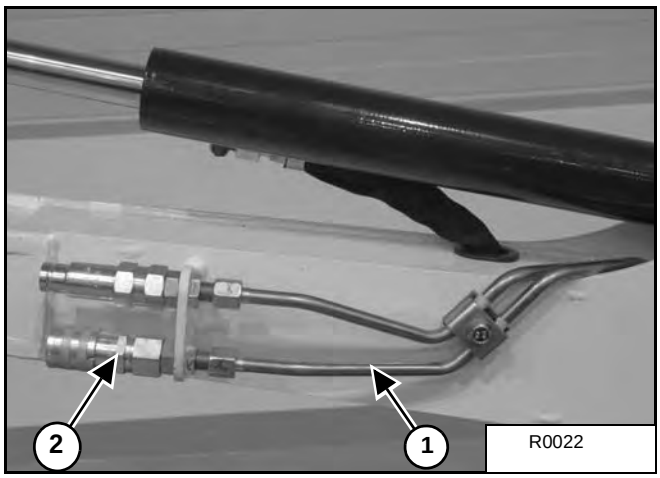
Before leaving the machine:

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

W-2196-0595

Quick Couplers

Figure 32



Excavators have auxiliary hydraulic lines (Item 1) **[Figure 32]** located on the boom.

Quick couplers (If equipped) (Item 2) **[Figure 32]** are available for use with hydraulically controlled attachments.

See your Bobcat dealer for hydraulic quick couplers.

⚠ WARNING

AVOID BURNS

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

W-2220-0396

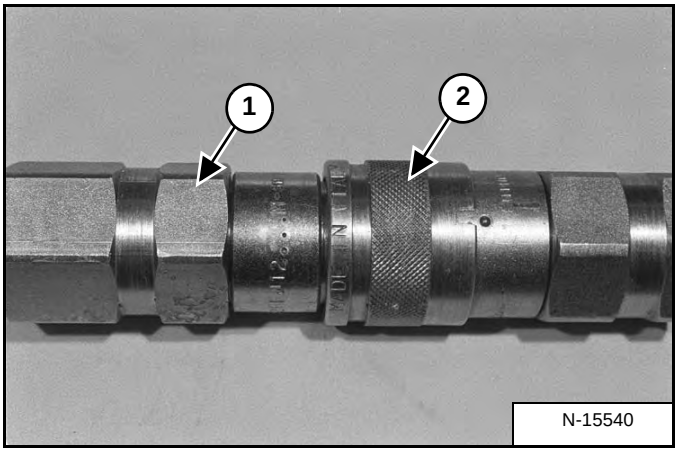
To Connect:

Clean the surface and the outside diameter of both the male and female couplers. Replace couplers that show signs of corroding, cracking, damage, or excessive wear **[Figure 32]**.

Install the male coupler into the female coupler. Full connection is made when the ball release sleeve slides forwards on the female coupler.

To Disconnect:

Figure 33



Hold the male coupler (Item 1). Pull back the sleeve (Item 2) **[Figure 33]** on the female coupler until the couplers disconnect.

Auxiliary Hydraulic Pedal

Figure 34

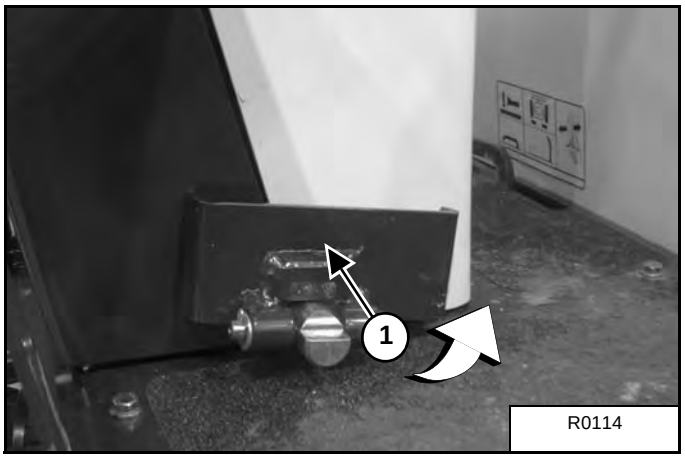
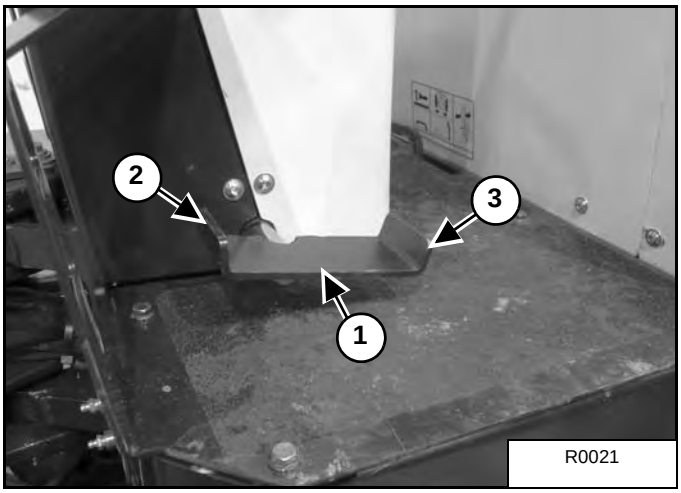


Figure 35



The left pedal **[Figure 34]** and **[Figure 35]** controls hydraulic oil flow to attachments (such as a hydraulic breaker) when mounted on the arm.

Release the pedal by pivoting the pedal to the left.

The excavator is equipped with 2-way flow auxiliary hydraulics (either coupler can be pressurized).

Push the toe of the pedal (Item 2) to activate hydraulic pressure / flow to the female coupler; push the heel of the pedal (Item 3) **[Figure 35]** to activate hydraulic pressure / flow to the male coupler.

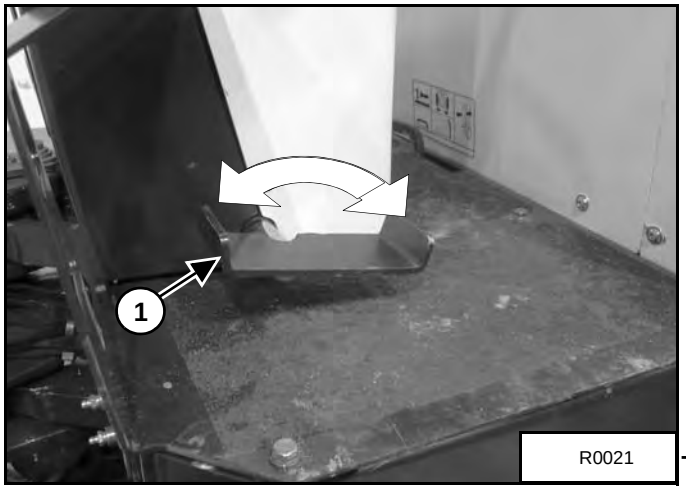
When you are not using the auxiliary flow, the pedal (Item 1) **[Figure 34]** and **[Figure 35]** can be folded up to prevent operation of the hydraulic functions.

Relieve Hydraulic Pressure (Excavator and Attachment)

Put the attachment flat on the ground.

Stop the engine.

Figure 36



Excavator:

With the engine off, move the pedal (Item 1) **[Figure 36]** in both directions several times.

Attachments:

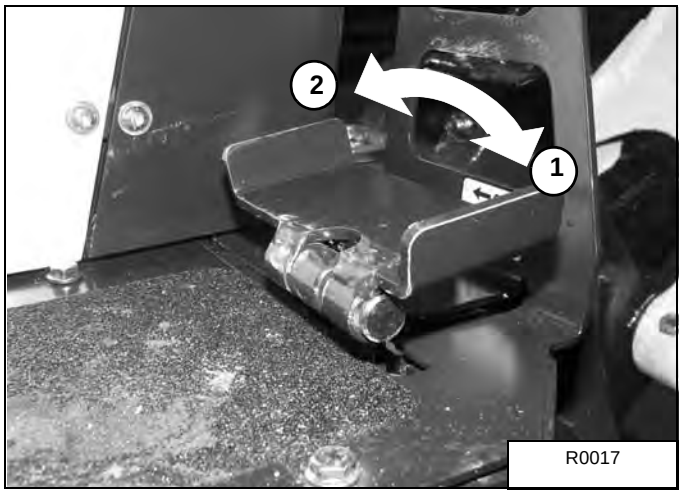
- Follow the procedure above to release pressure in the excavator.
- Connect the male coupler from attachment to the female coupler of the excavator. Then repeat procedure above. This will release pressure in the attachment.
- Connect the female coupler from the attachment.

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

BOOM SWING PEDAL

Operation

Figure 37

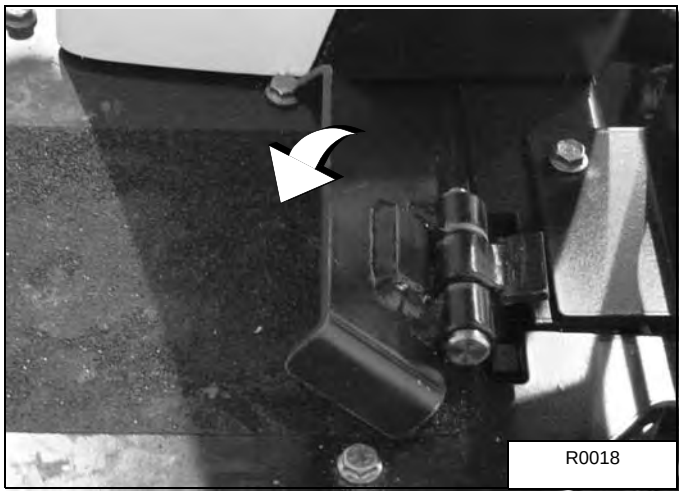


The boom swing pedal is located at the right side of the control console **[Figure 37]**.

Press the right side of the pedal (Item 1) **[Figure 37]** to swing the boom to the right.

Press the left side of the pedal (Item 2) **[Figure 37]** to swing the boom to the left.

Figure 38



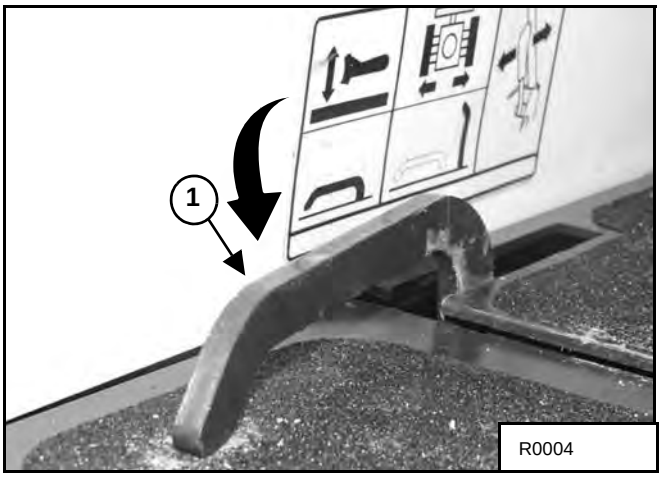
When not in use, the boom swing pedal can be folded down to prevent operation of the boom swing function. In this position it can be used as a footrest **[Figure 38]**.

BLADE CONTROL

Blade / Track Expansion Lever

Early Models

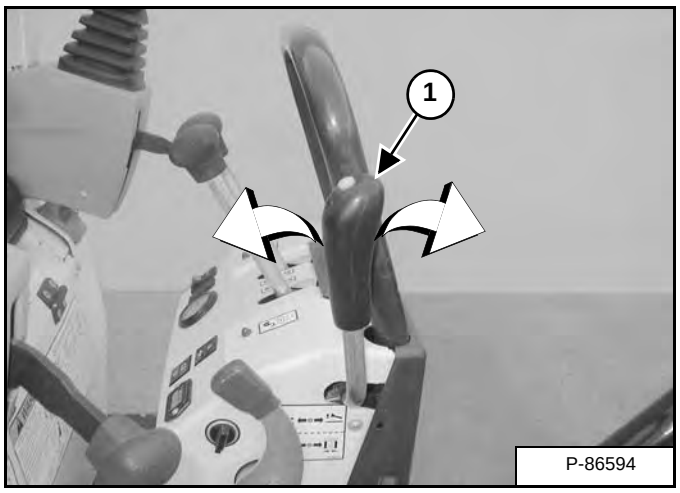
Figure 39



Lower the Blade / Track Expansion Lever (Item 1) **[Figure 39]** in the BLADE position.

Raising and Lowering the Blade

Figure 40



With the Blade / Track Expansion Lever (Item 1) **[Figure 39]** in the BLADE position, move the Blade / Track Expansion Lever (Item 1) **[Figure 40]** forward to lower the blade.

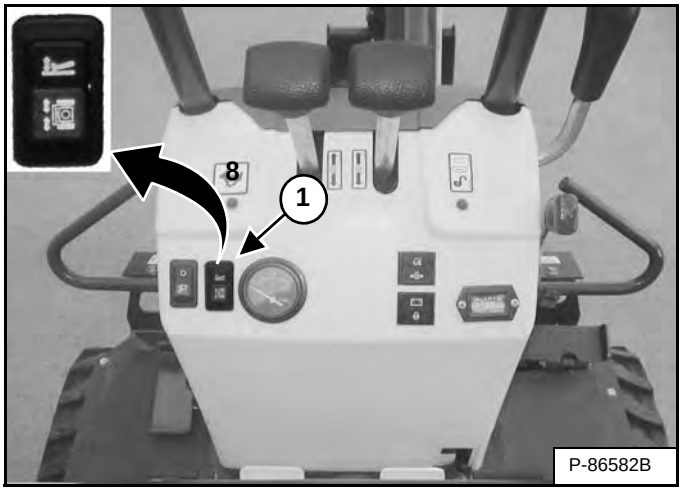
Move the Blade / Track Expansion Lever (Item 2) **[Figure 40]** backward to raise the blade.

NOTE: Keep the blade lowered when digging to improve digging performance.

Blade / Track Expansion Switch

Later models

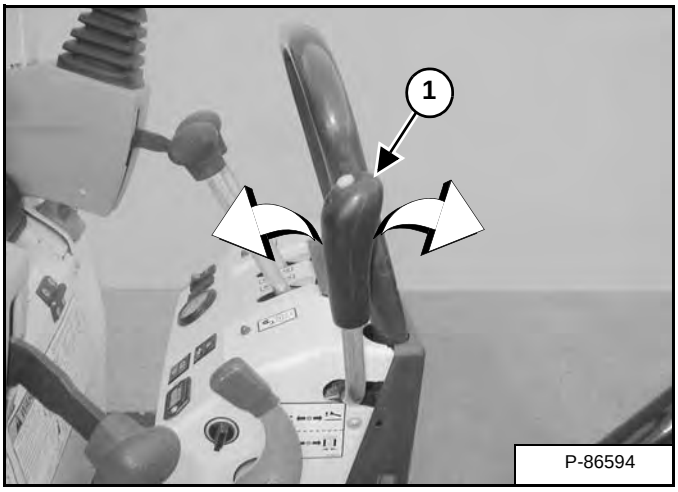
Figure 41



Press the top of the Blade / Track Expansion Switch (Item 1) **[Figure 41]** to put the switch in the BLADE position.

Raising and Lowering the Blade

Figure 42



With the Blade / Track Expansion Switch (Item 1) **[Figure 41]** in the BLADE position, move the Blade / Track Expansion Lever (Item 1) **[Figure 42]** forward to lower the blade.

Move the Blade / Track Expansion Lever (Item 2) **[Figure 42]** backward to raise the blade.

NOTE: Keep the blade lowered when digging to improve digging performance.

TRACK FRAME EXPANSION

Expanding and Retracting the Tracks

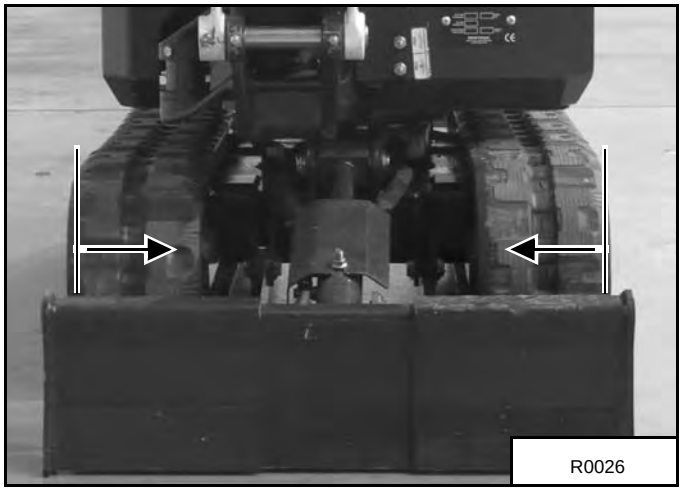
NOTE: Always expand tracks when working on slopes or in rough conditions.

IMPORTANT

To prevent wear and damage to the track, always lift the excavator before expanding or retracting the track frame.

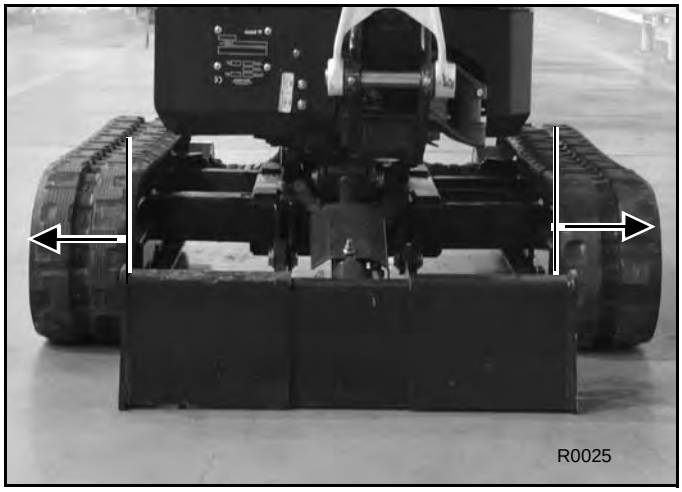
I-2193-0599

Figure 43



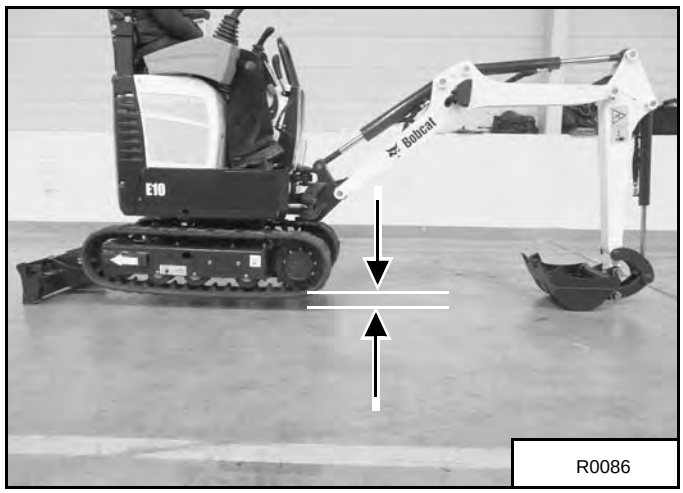
The excavator can be operated with the track frame retracted for transport on a trailer or to access narrow areas **[Figure 43]**.

Figure 44



Expand the track frame **[Figure 42]** for increased digging performance.

Figure 45



With the boom and arm positioned over the blade, lower the blade until the tracks are raised 25 to 50 mm (0.98-1.97 in) off the ground **[Figure 45]**.

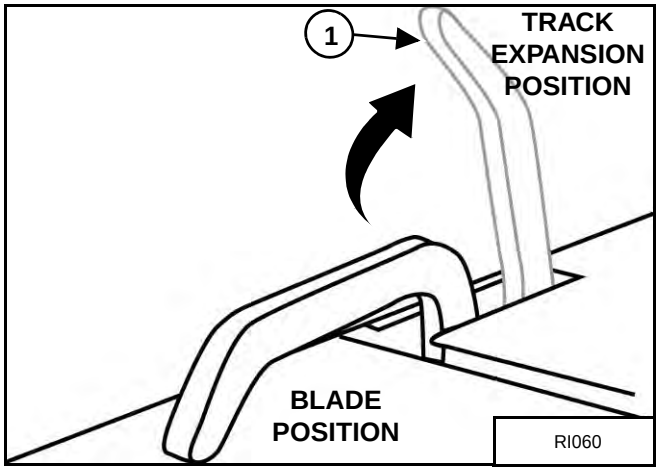
Rotate the upper structure 180 degrees.

Lower the boom and arm to raise the rear of the excavator until the track is 25 - 50 mm (1.0 - 2.0 in) off the ground **[Figure 45]**.

Expanding and Retracting the Tracks (Cont'd)

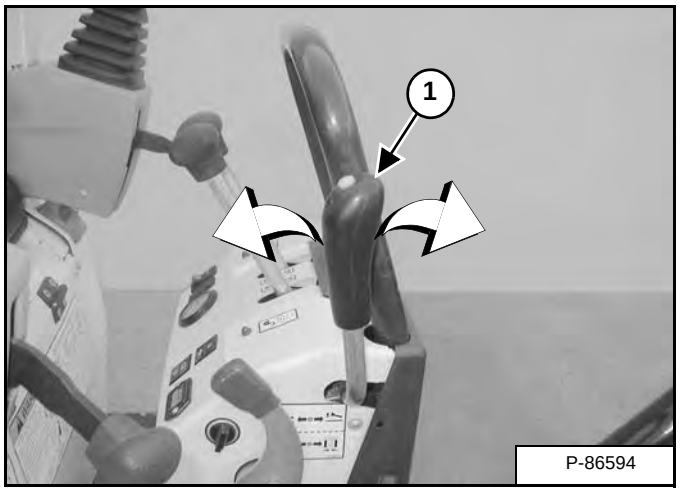
Early Models

Figure 46



Raise the Blade / Track Expansion Lever (Item 1) **[Figure 46]** into the TRACK position.

Figure 47

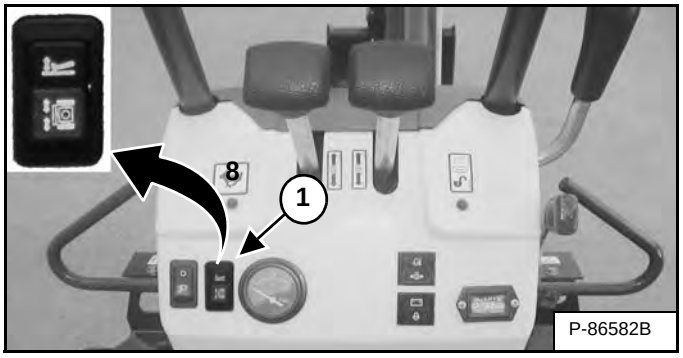


Move the Blade / Track Expansion Lever (Item 1) **[Figure 47]** forward to expand the tracks.

Move the Blade / Track Expansion Lever (Item 1) **[Figure 47]** back to retract the tracks.

Later models

Figure 48



Press the bottom of the Blade / Track Expansion Switch (Item 1) **[Figure 48]** to put the switch in the TRACK position.

With the Blade / Track Expansion Switch (Item 1) **[Figure 48]** in the TRACK position, move the Blade / Track Expansion Lever (Item 1) **[Figure 47]** forward to expand the tracks.

Move the Blade / Track Expansion Lever (Item 2) **[Figure 47]** back to retract the tracks.

Expanding And Retracting The Track - All Models

NOTE: Always return the Blade / Track Expansion Lever (Item 1) [Figure 46] or Switch (Item 1) [Figure 48] to the BLADE position during operation so that the track does not move when using the blade lever.

NOTE: Always operate the machine with the tracks expanded all the way or retracted all the way.

Raise the boom and arm to lower the rear of the excavator to the ground.

Raise the blade all the way.

Rotate the upperstructure 180 degrees.

Figure 49

Daily Inspection and Maintenance

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The Service Schedule **[Figure 49]** is a guide for correct maintenance of the Bobcat Excavator.

Check the following items before each day of operation:

- Tip-Over Protective Structure (TOPS) and mounting hardware
- Seat belt and mounting hardware
- Damaged decals, replace as needed
- Check function of the control lockout levers
- Air cleaner system
- Engine coolant level and for coolant leaks
- Clean engine area of any flammable material
- Hydraulic fluid level and system for leaks
- Grease all pivot points
- Track tension
- Engine cover latch
- Repair broken and loose parts

⚠ WARNING

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

W-2001-0502

Fluids such as engine oil, hydraulic fluid, coolants, etc., must be recycled or 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, state, and federal regulations for correct disposal.

IMPORTANT

PRESSURE WASHING DECALS

- **Never direct the stream at a low angle toward the decal that could damage the decal causing it to peel from the surface.**
- **Direct the stream at a 90 degree angle and at least 300 mm (12 in) from the decal. Wash from the center of the decal toward the edges.**

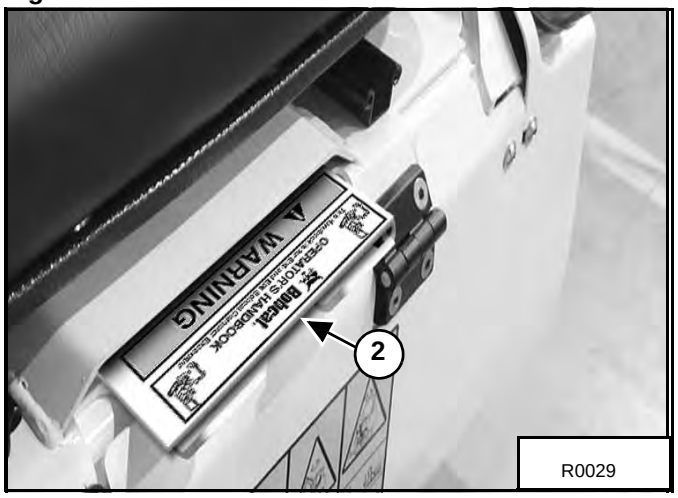
I-2226-0910

PRE-STARTING PROCEDURE

Operation & Maintenance Manual and Operator's Handbook Locations

Figure 50

Figure 51



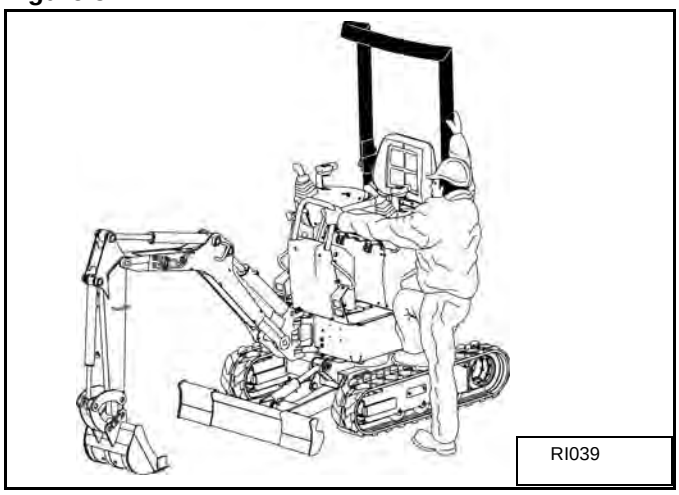
Read and understand the Operation & Maintenance Manual (Item 1) **[Figure 50]** and the Operator's Handbook (Item 2) **[Figure 51]** before operating.

The Operation & Maintenance Manual and other manuals can be kept in a container (Item 1) **[Figure 50]** provided behind the operator's seat.

NOTE: Make sure the engine cover is latched.

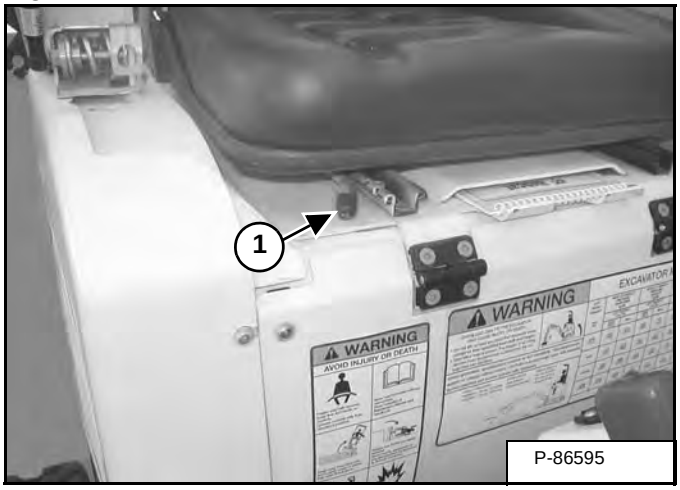
Entering the Excavator

Figure 52



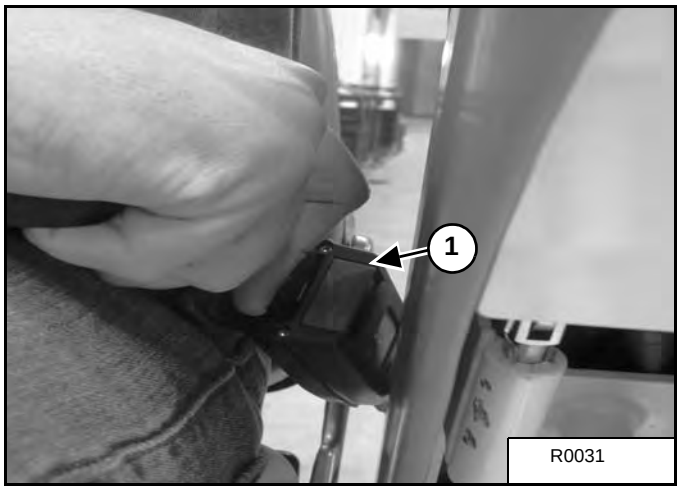
Use the TOPS, tracks and safety treads to enter.

Figure 53



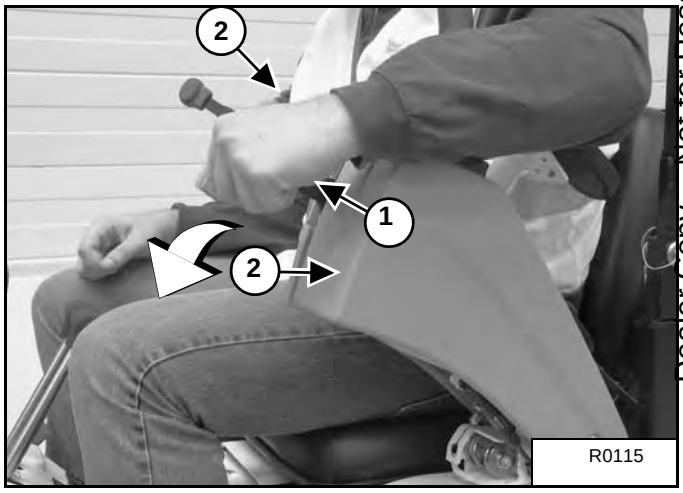
Release the seat lever (Item 1) **[Figure 53]** to adjust the seat forward or backward for comfortable operation.

Figure 54



Fasten the seat belt (Item 1) **[Figure 54]**.

Figure 55



Lower the control console(s) (Item 2) **[Figure 55]** to the locked down position.

NOTE: The console(s) must be in the locked down position for the control levers (joysticks) and traction system to operate.

STARTING THE ENGINE

Key Switch

Perform the PRE-STARTING PROCEDURE. (See PRE-STARTING PROCEDURE on Page 44.)

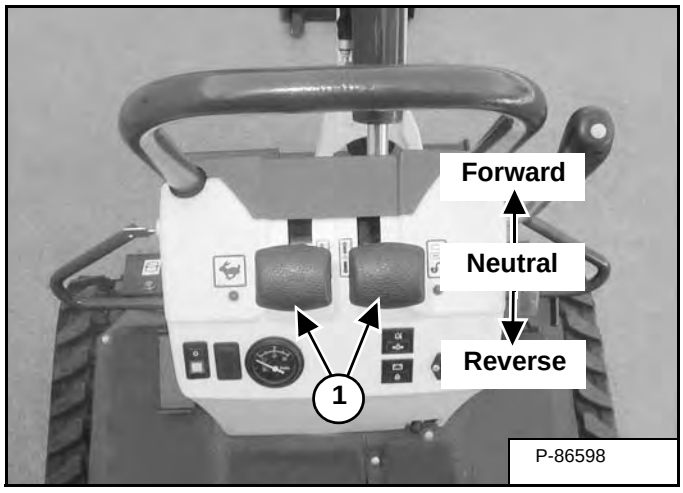
WARNING

AVOID INJURY OR DEATH

- **Fasten seat belt, start and operate only from the operator's seat.**
- **Never wear loose clothing when working near machine.**

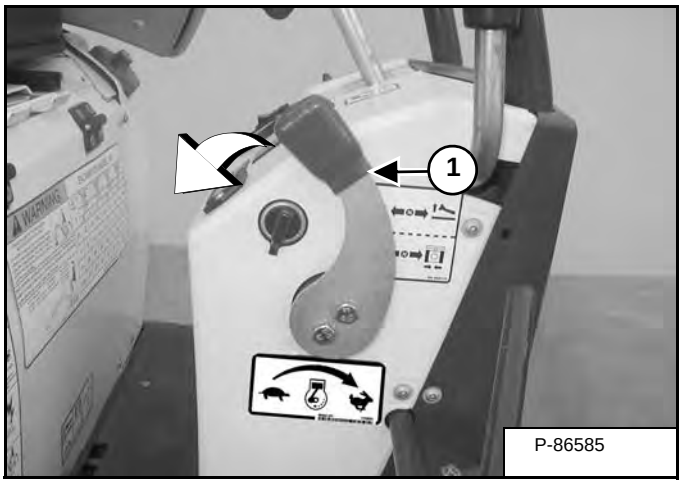
W-2135-1108

Figure 56



Put the steering levers (Item 1) **[Figure 56]** in the NEUTRAL position.

Figure 57



Move the engine speed control lever (Item 1) **[Figure 57]** to low idle.

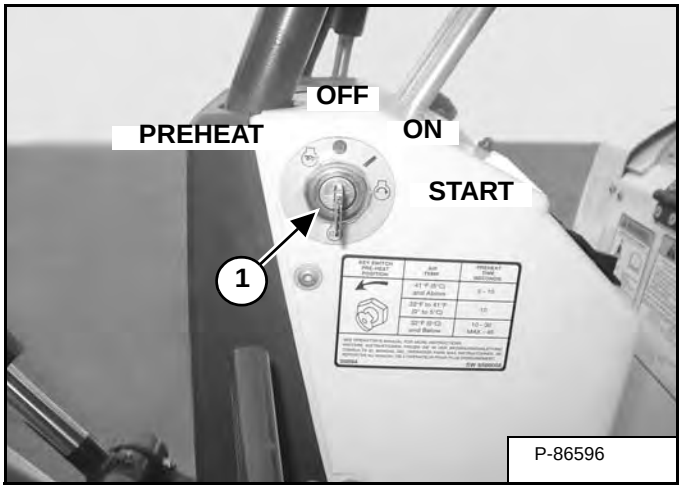
WARNING

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

Figure 58



Turn the key (Item 1) **[Figure 58]** to the PREHEAT position (if required).

Turn the key (Item 1) **[Figure 58]** to the START position and release the key when the engine starts. It will return to the ON position.

Stop the engine if the warning lights and alarm do not go OFF. Check for the cause before starting the engine again.

Turn the key switch OFF to stop the engine.

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

Cold Temperature Starting Procedure

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2071-0907

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

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH

- **Engines can have hot parts and hot exhaust gas. Keep flammable material away.**
- **Do not use machines in atmosphere containing explosive dust or gases.**

W-2051-0212

Figure 59

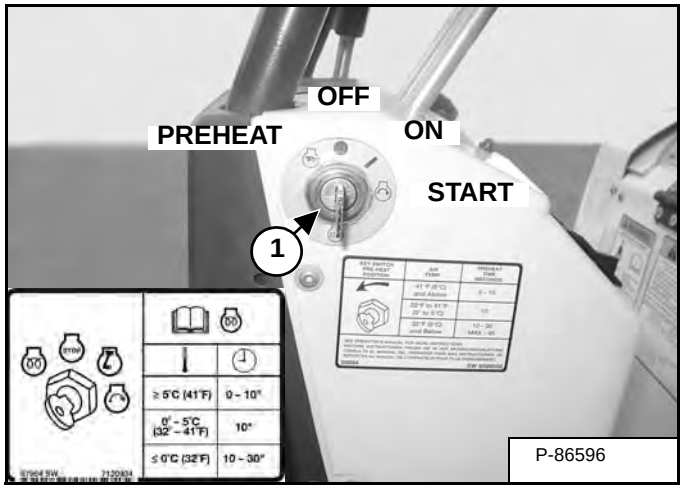
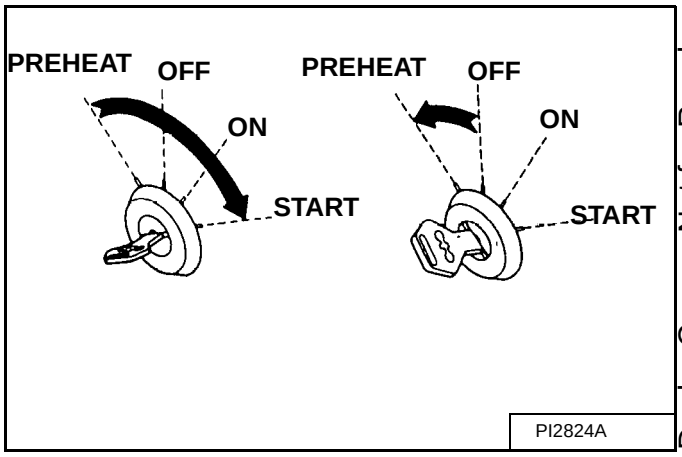


Figure 60



Turn the key (Item 1) **[Figure 59]** and **[Figure 60]** to the PREHEAT position. Preheat the engine for 30 seconds maximum.

Turn the key to the START position **[Figure 59]** and **[Figure 60]** and release the key when the engine starts. It will return to the ON position.

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

Turn the key switch OFF to stop the engine **[Figure 59]** and **[Figure 60]**.

Warming the Hydraulic System

Let the engine run at least 5 minutes to warm the engine and hydraulic fluid before operating the excavator.

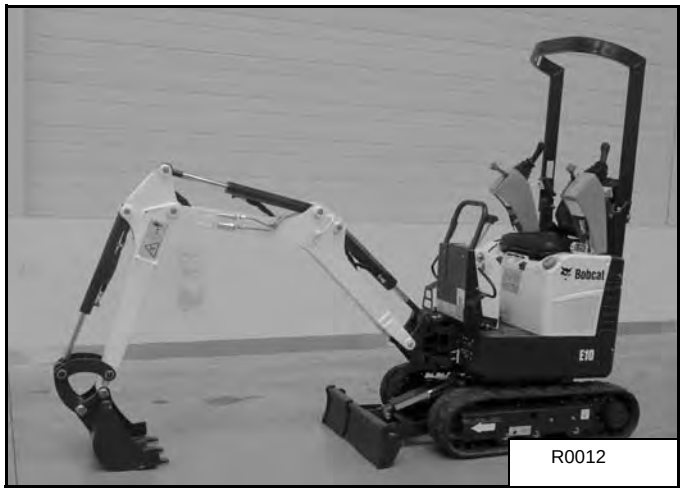
⚠ WARNING

During cold weather 0°C (32°F) and below, do not operate machine until the engine has run for at least five (5) minutes at less than half throttle. This warm-up period is necessary. Do not operate controls during warm-up period. When temperatures are below 30°C (-20°F), the hydraulic oil must be heated or kept warm. The hydraulic system will not get enough oil at low temperatures. Park the machine in an area where the temperature will be above -18°C (0°F), is possible.

W-2381-0211

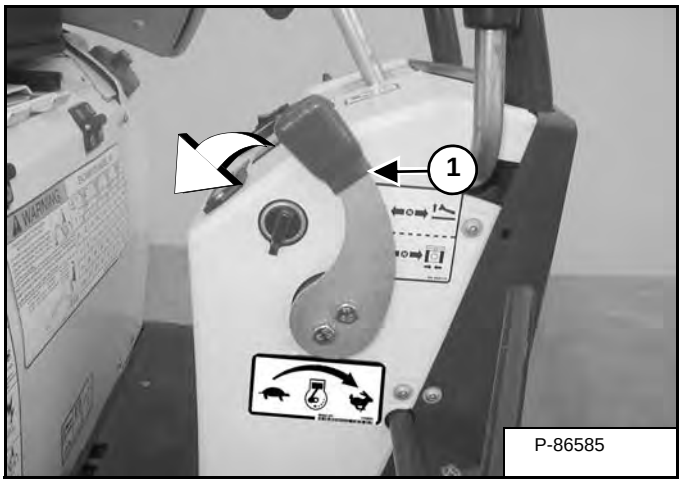
STOPPING THE ENGINE AND LEAVING THE EXCAVATOR

Figure 61



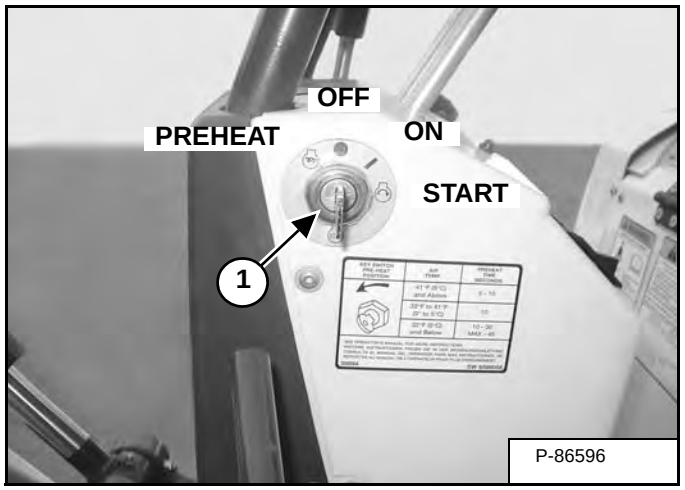
Stop the machine on level ground. Lower the work equipment and the blade to the ground **[Figure 61]**.

Figure 62



Move the engine speed control lever (Item 1) **[Figure 62]** fully back and run the engine at low idle for about 5 minutes to allow engine to cool.

Figure 63



Turn the key (Item 1) **[Figure 63]** to the OFF position.

Stop the engine.

Raise the control console(s).

Disconnect the seat belt.

Remove the key from the switch to prevent operation of machine by unauthorized personnel.

Exit machine.

Installing and Removing Attachments

Installation

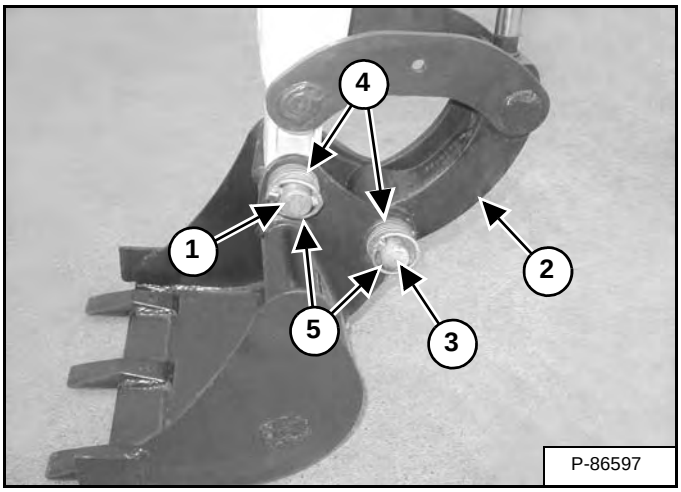
WARNING

AVOID INJURY OR DEATH

Stop the machine on a firm flat surface. When removing or installing attachments (such as a bucket), always have a second person in the operator's seat, give clear signals and work carefully.

W-2140-0189

Figure 64



Install the arm into the bucket, align the hole, install the pivot pin (Item 1) **[Figure 64]**.

Install the link (Item 2) into the bucket, align the hole, install the pivot pin (Item 3) **[Figure 64]**.

Install washer(s) (Item 3) **[Figure 64]** as needed.

Install the two retainer pins (Item 4) **[Figure 64]**. Add grease to the pivot pins before operation.

Removal

Park the excavator on flat level ground and put the bucket on the ground.

Remove the retainer pins (Item 5), washers (Item 4) and pins (Items 1 and 3) **[Figure 64]**. Keep the pivot pins clean.

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

Inspecting the Work Area

Before beginning operation, inspect the work area 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 excavator or cause personal injury.

Always check ground conditions before starting your work:

- Look 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 highway, always follow local regulations. For example: A slow moving vehicle (SMV) sign, or direction signals may be required.

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

IMPORTANT

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

I-2015-0284

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

Operating Near An Edge Or Water

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

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

Lowering the Work Equipment (Engine STOPPED)

The hydraulic control levers control the movement of the boom, arm, bucket and upperstructure slew functions.

Figure 65

The joystick lock disengages the hydraulic control functions from the joysticks when the console(s) are raised **[Figure 65]**.

NOTE: If the engine stops, the boom / bucket (attachments) can be lowered to the ground using hydraulic pressure in the accumulator. The control console(s) must be in the locked down position, and the key switch in the ON position.
Use the control lever to lower the boom.

Lower the control console(s) to engage the hydraulic control functions of the joysticks **[Figure 65]**.

Object Handling

Do not exceed the Rated Lift Capacity. (See Lift Chart (7153145) on Page 109.)

⚠ WARNING

AVOID INJURY OR DEATH

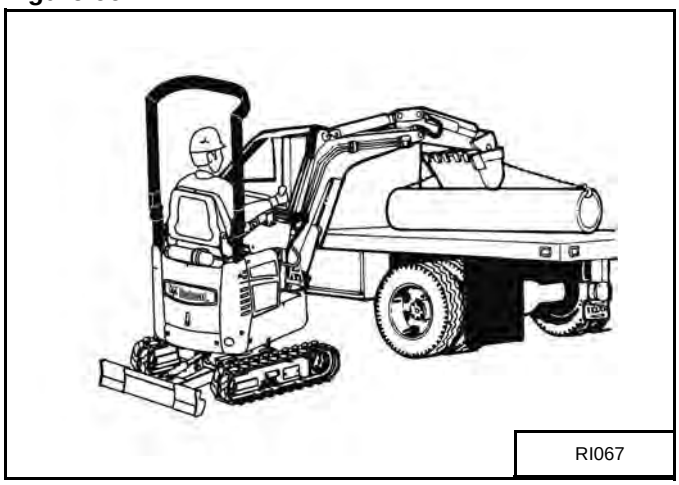
Do not exceed rated lift capacity. Excessive load can cause tipping or loss of control.

W-2374-0500

Extend the bucket cylinder completely and lower the boom to the ground. Stop the engine.

Wrap the chain assembly around the bucket mounting plate.

Figure 66



Make sure the load is evenly weighted and centered on the lifting chain, and is secured to prevent the load from shifting **[Figure 66]**.

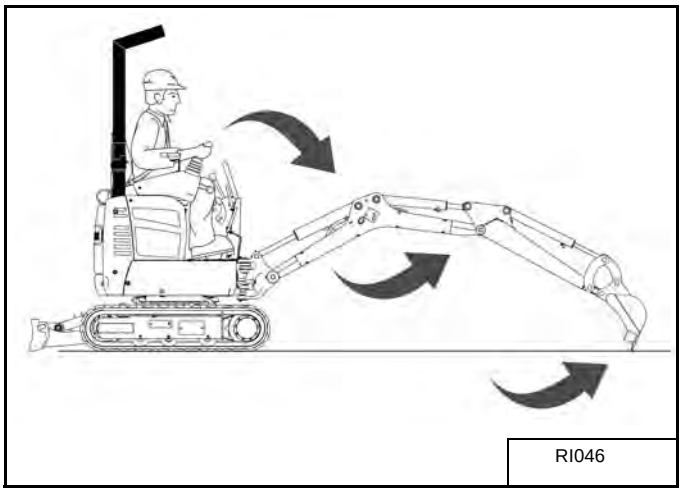
Lift and position the load. Once the load is in position and tension is removed from the lift chain (secondary lift system), remove the secondary lift system.

Excavating

Lower the blade to provide stability.

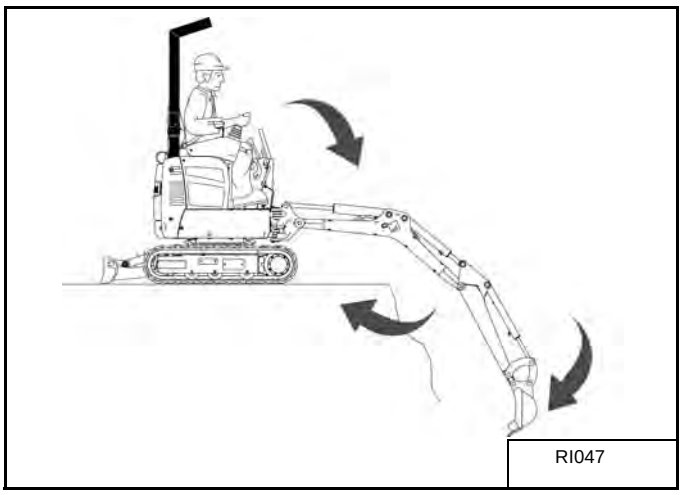
Expand the tracks for increased excavating performance.

Figure 67



Extend the arm, lower the boom, and open the bucket **[Figure 67]**.

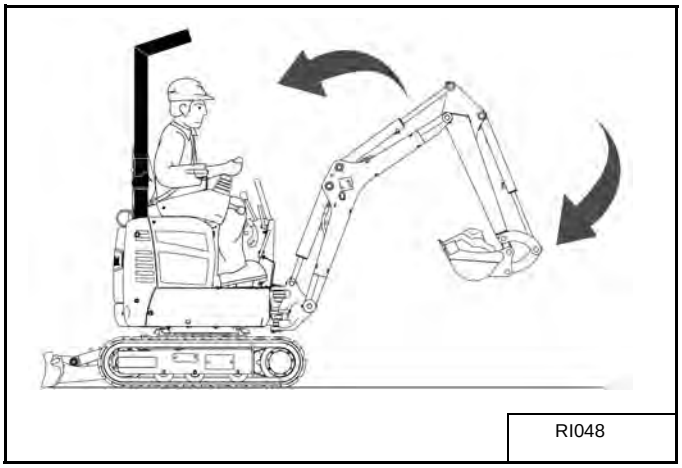
Figure 68



Retract the arm, while lowering boom and curling the bucket **[Figure 68]**.

Excavating (Cont'd)

Figure 69



Raise the boom, retract the arm and curl the bucket **[Figure 69]**.

Rotate the upperstructure. (See HYDRAULIC CONTROLS on Page 34.)

NOTE: Do not allow the bucket teeth to make contact with the ground when slewing the upperstructure.

⚠ 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

⚠ WARNING

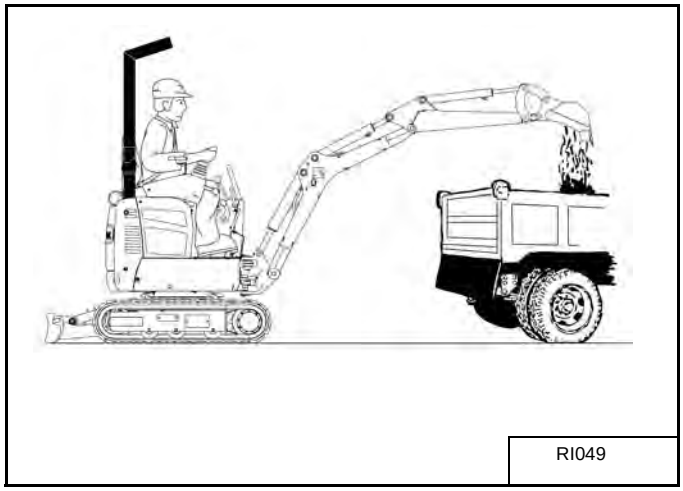
AVOID INJURY OR DEATH

Check area to be excavated for overhead or underground electrical power lines. Keep a safe distance from electrical power lines.

LINE VOLTAGE	MINIMUM APPROACH DISTANCE
50 kV	At least 3 m (10 ft)
230 kV	At least 5 m (17 ft)
740 kV	At least 10 m (33 ft)

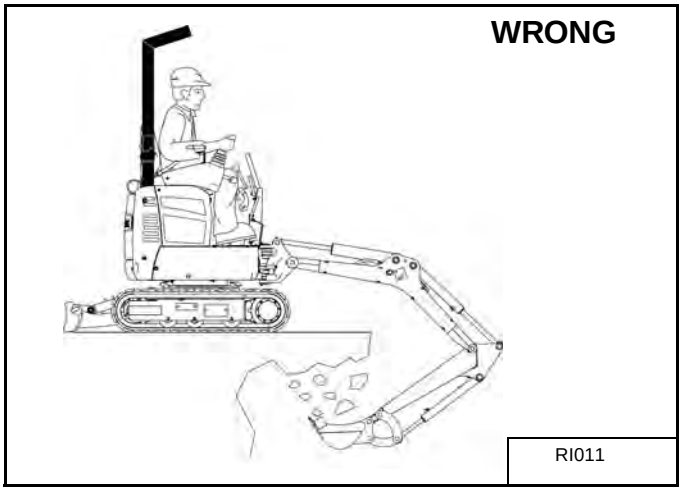
W-2757-0910

Figure 70



Extend the arm and uncurl the bucket to dump the material into a pile or truck **[Figure 70]**.

Figure 71



Do not dig under the excavator **[Figure 71]**.

Do not use the bucket as a breaker or pile driver. It is better to excavate hard or rocky ground after breaking it with other equipment. This will reduce damage to the excavator.

Do not move the excavator while the bucket is in the ground.

Boom Swing

Figure 72

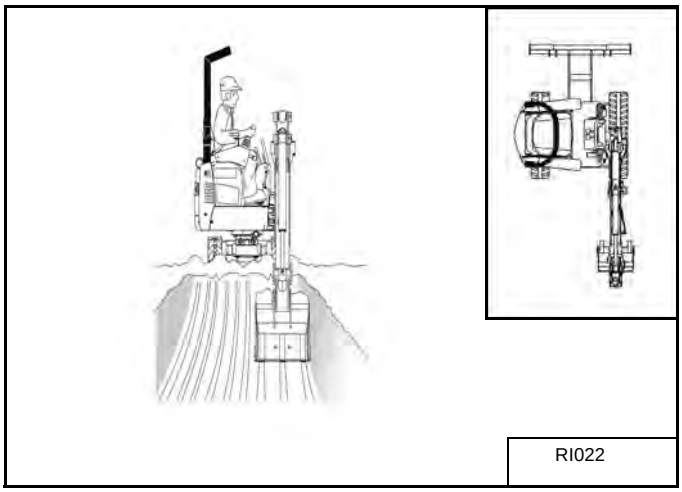


Figure 73

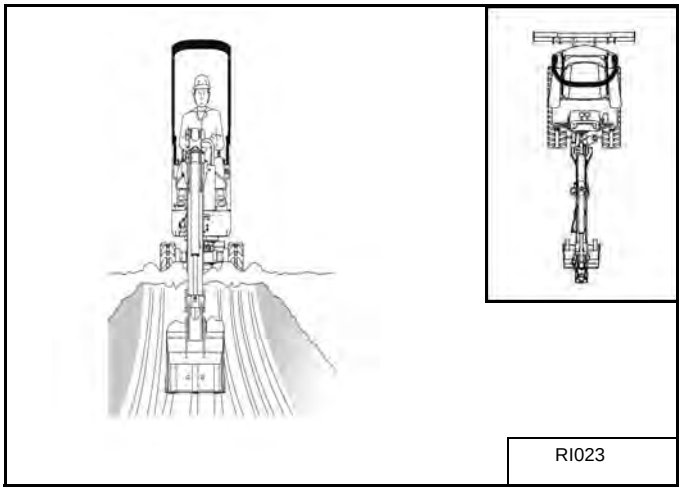
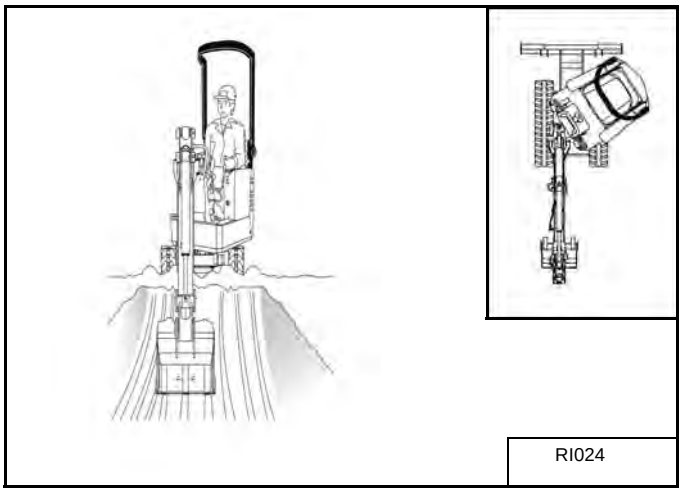
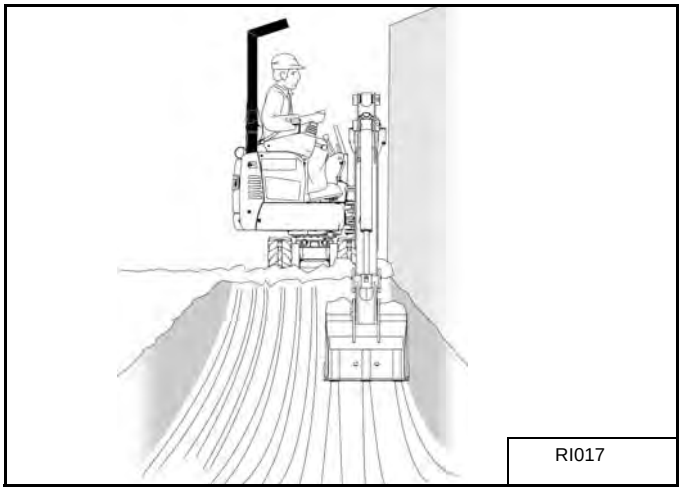


Figure 74



Slew the upperstructure, offset the boom to the left **[Figure 72]**, center **[Figure 73]** and right **[Figure 74]** to dig a square hole the width of the machine without repositioning the excavator.

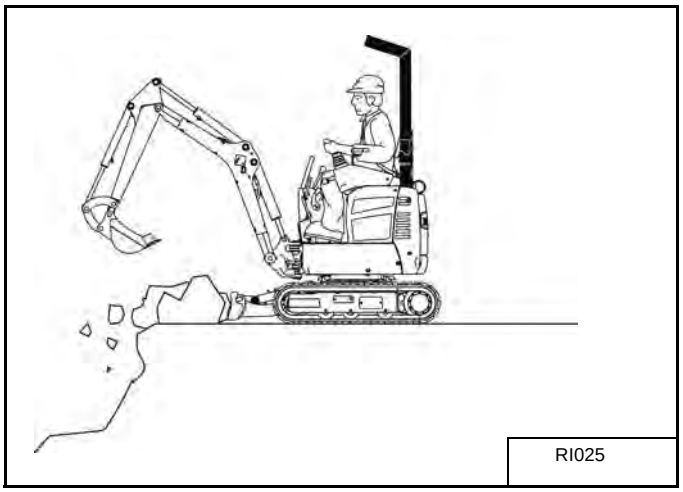
Figure 75



The boom offset allows the operator to dig close to buildings and other structures **[Figure 75]**.

Backfilling

Figure 76



Use the blade to backfill the trench or hole after excavating **[Figure 76]**.

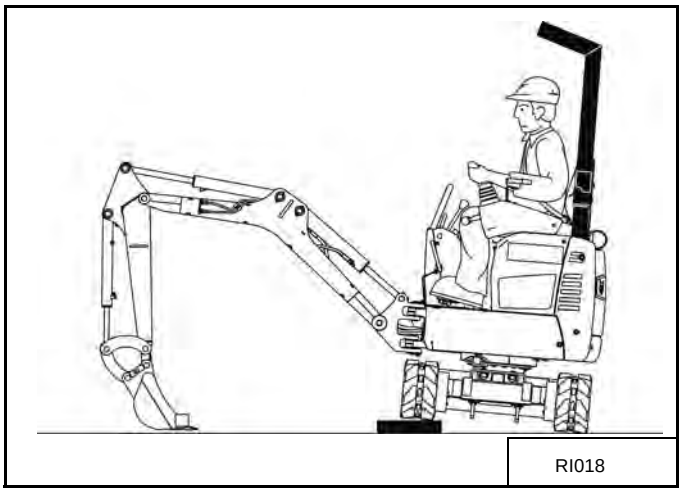
Driving the Excavator

When operating on uneven ground, operate as slowly as possible and avoid sudden changes in direction.

Avoid driving over objects such as rocks, trees, stumps, etc.

When working on wet or soft ground, put planks on the ground to provide a solid base to drive on and prevent the excavator from getting stuck.

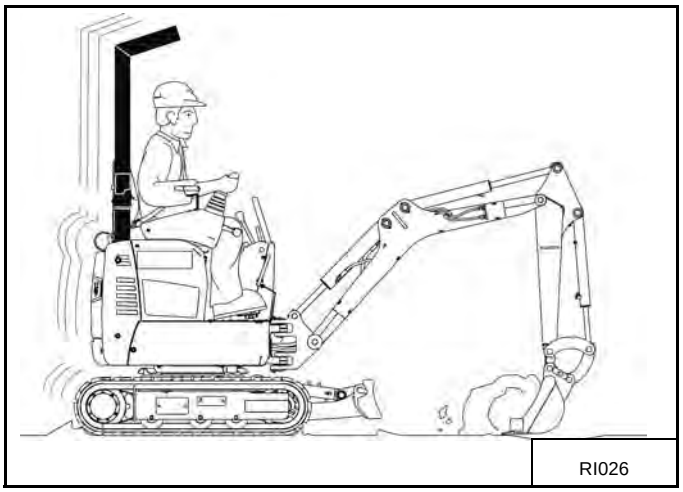
Figure 77



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 **[Figure 77]**.

Put planks under the tracks and drive the excavator to dry ground.

Figure 78



The bucket may also be used to pull the excavator. Raise the blade, extend the arm and lower the boom. Operate the boom and arm in a digging manner **[Figure 78]**.

Operating on Slopes

NOTE: Always expand tracks when working on slopes or in rough conditions.

⚠ WARNING

AVOID INJURY OR DEATH

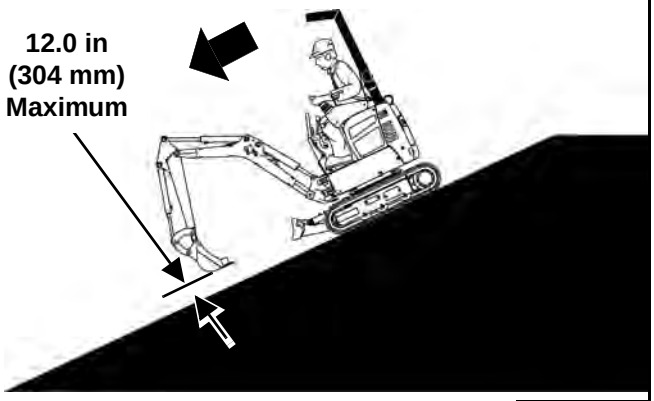
- **Do not travel across or up slopes that are over 15 degrees.**
- **Do not travel down or back up slopes that exceed 25 degrees.**
- **Look in the direction of travel.**

W-2497-0304

When going down a slope, control the speed with the steering levers and the engine speed control lever.

Figure 79

Traveling Down or Backing Up Slopes



25° Maximum RI019-A

When going down or backing up grades that exceed 15 degrees, put the machine in the position shown, and run the engine slowly **[Figure 79]**.

Operate as slowly as possible and avoid sudden changes in lever direction.

Avoid driving 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

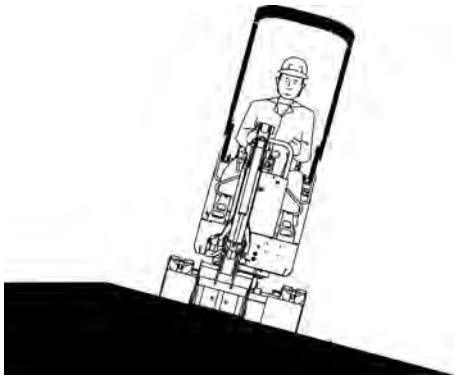
AVOID INJURY OR DEATH

- **Avoid steep areas or banks that could break away.**
- **Keep boom centered and attachments as low as possible when traveling on slopes or in rough conditions. Look in the direction of travel.**
- **Always fasten seat belt.**

W-2498-0304

Figure 80

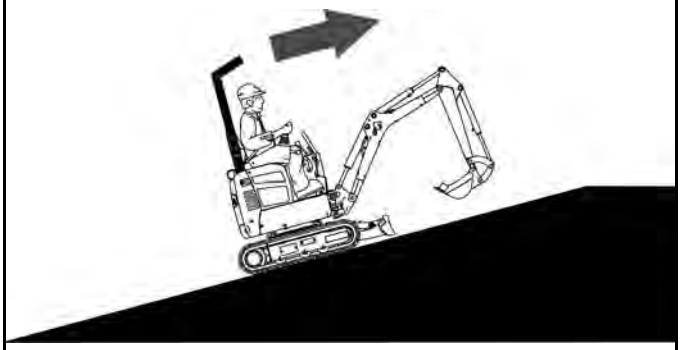
Traveling Up Slopes



15° Maximum RI027

Figure 81

Traveling On Side Slopes

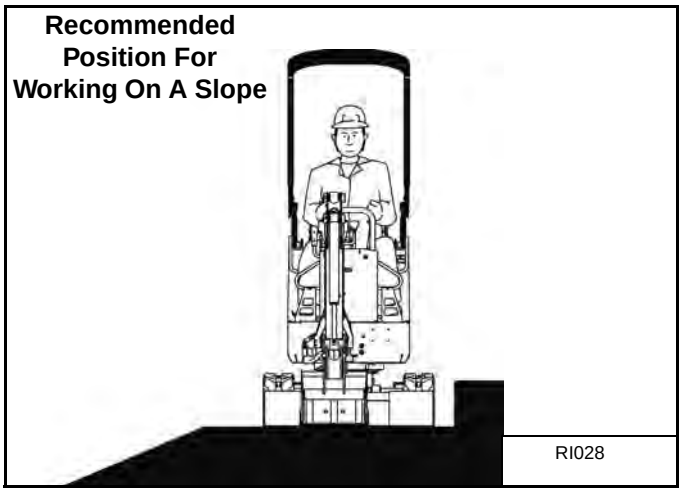


15° Maximum RI043

When going up slopes or on side slopes that are 15 degrees or less, position the machine as shown and run the engine slow **[Figure 80]** and **[Figure 81]**.

Operating on Slopes (Cont'd)

Figure 82



When operating on a slope, level the work area before beginning **[Figure 82]**.

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

Do not work on slopes which are over 15 degrees.

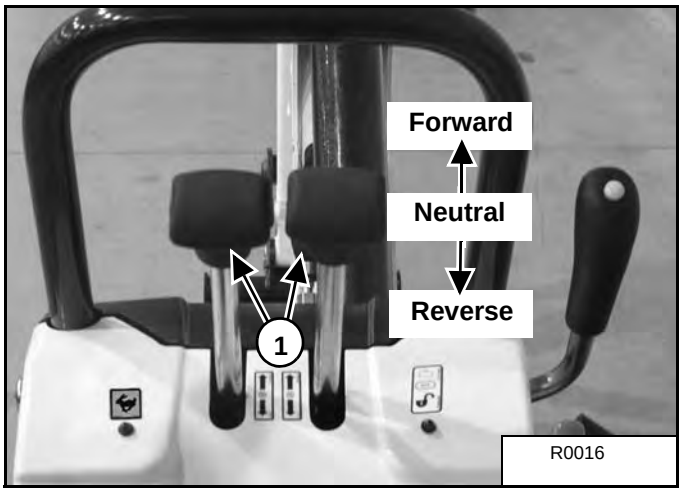
Use a slow work cycle.

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 83



To brake the machine when going down a slope, move the steering levers (Item 1) **[Figure 83]** 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.

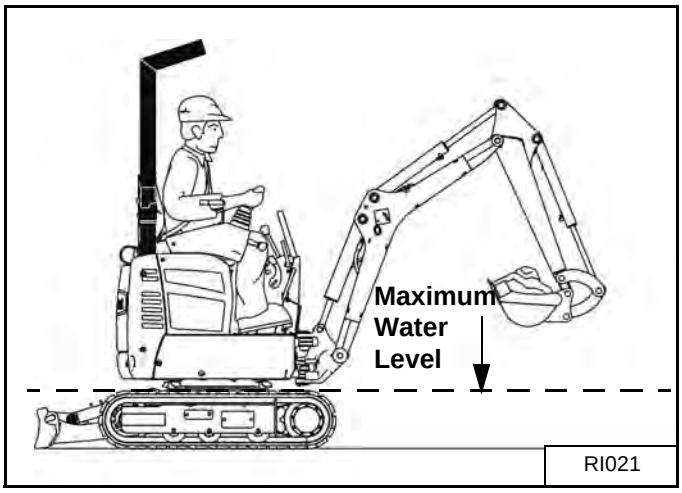
NOTE: If the engine stops, the boom / bucket (attachments) can be lowered to the ground using hydraulic pressure in the accumulator. The console must be in the locked down position, and the key switch in the ON position. Use the control lever to lower the boom. Use the control lever to lower the boom.

Start the engine and resume operation.

Operating in Water

Mud and water should be removed 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.

Figure 84



Do not operate or immerse the excavator in water higher than the bottom of the swing bearing **[Figure 84]**.

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.

Water must be removed from the cylinder rods. If water freezes to the cylinder rod, the cylinder seals can be damaged when the rod is retracted.

TOWING THE EXCAVATOR

There is not a recommended towing procedure for the excavators.

- The excavator can be lifted onto the transport vehicle.
- The excavator can be skidded a short distance for service (EXAMPLE: Move onto a transport vehicle) without damage to the hydraulic system. (The tracks will not turn.) There might be slight wear to the tracks when the excavator is skidded.
- The towing chain (or cable) must be rated at 1.5 times the weight of the excavator. (See Performance on Page 123.)

LIFTING THE EXCAVATOR

Fully extend the cylinders of the bucket, arm and boom.

Raise the blade all the way.

Turn the upper structure so that the boom is at the opposite end as the blade.

Put all the controls in neutral and engage the slew lock. (See Upperstructure Slew Lock on Page 28.)

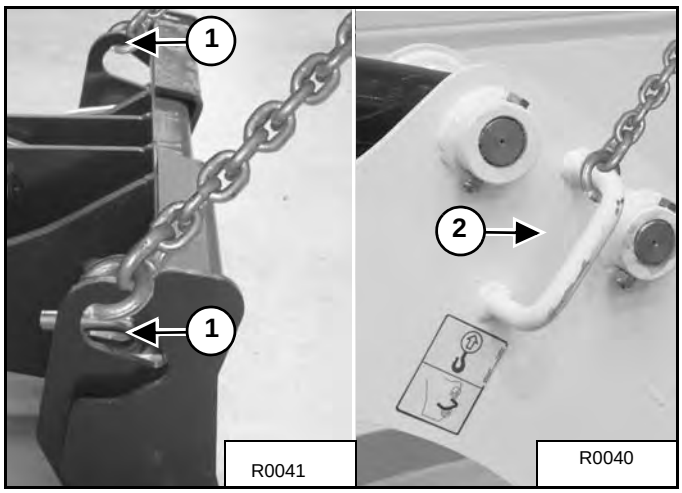
⚠ WARNING

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 upperstructure slew lock.**
- **Never lift with operator on machine.**

W-2202-0607

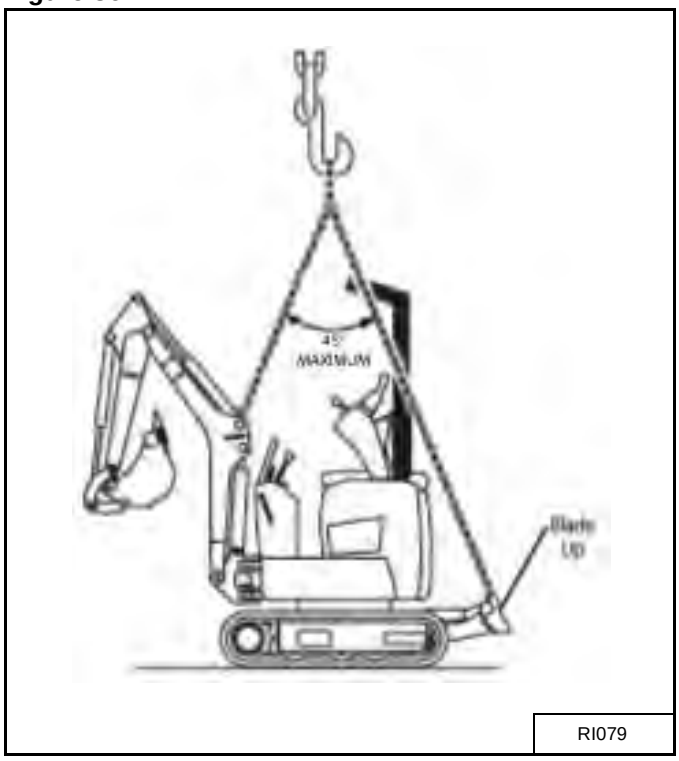
Figure 85



Fasten the chains to the ends of the blade (Item 1) **[Figure 85]** and up to a lifting fixture above the canopy.

Fasten a chain in the hook of the boom (Item 2) **[Figure 85]**.

Figure 86



The maximum angle between the front and rear chains must not exceed 45° **[Figure 86]**.

TRANSPORTING THE EXCAVATOR

Loading onto Transport Vehicle

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.

Secure the brakes and block the wheels of the transport vehicle.

Align the ramps with the center of the transport vehicle. Secure the ramps to the truck (or trailer) 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 can support the weight of the machine.

The rear of the trailer must be blocked or supported when loading or unloading to prevent the front of the transport vehicle from raising.

Determine the direction of the track movement before moving the machine (blade forward). Engage the upperstructure slew lock.

Figure 87

Move the machine forward onto the transport vehicle **[Figure 87]**.

Do not change direction of the machine while it is on the ramps.

Lower the boom, arm, bucket and blade to the transport vehicle.

Stop the engine and remove the key.

Put blocks under the front and rear of the track shoes.

Fastening to Transport Vehicle

Figure 88

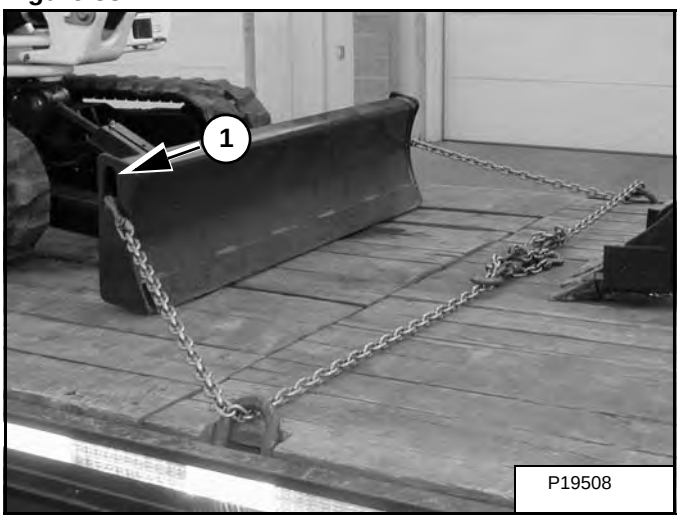
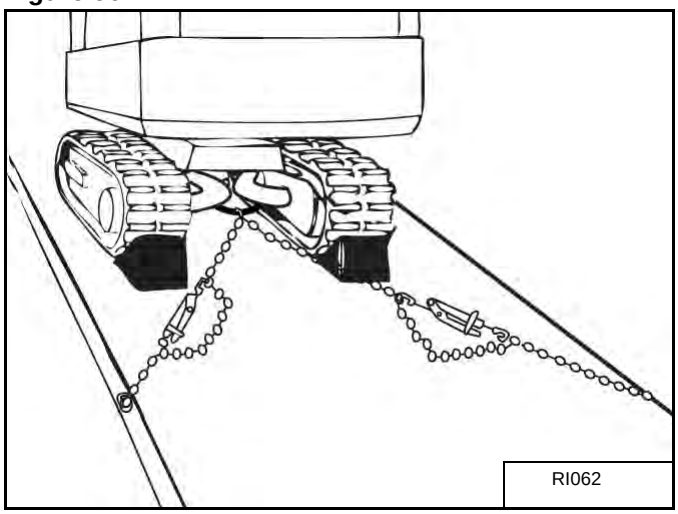


Figure 89

Figure 90



Fasten chains to the front corners of the blade (Item 1) **[Figure 88]**, to both sides of the tracks (Item 2) **[Figure 89]** and to the tie down loop at the rear of the track frame (Item 3) **[Figure 90]**.

Use chain binders to tighten the chains and then safely tie the chain binder levers to prevent loosening.

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH

Adequately designed ramps of sufficient strength are needed to support the weight of the machine when loading onto a transport vehicle. Wood ramps can break and cause personal injury.

W-2058-0807

PREVENTIVE MAINTENANCE

MAINTENANCE SAFETY

⚠ WARNING

Training is necessary before operating or servicing machine. Read and understand the Operation and Maintenance Manual, Operator's Handbook and signs (stickers) on machine. Follow warnings and instructions in the 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.

W-2003-0807

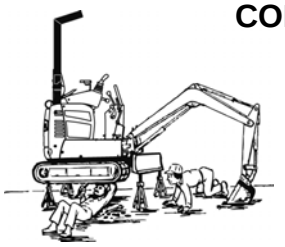
Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

CORRECT

P-90216

Never service the Bobcat Compact Excavator without instructions.

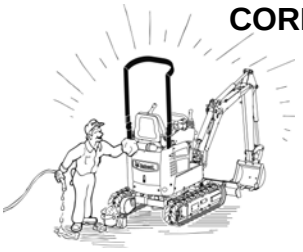
CORRECT



RI075

Use the correct procedure to lift and support the excavator.

CORRECT



RI072

Cleaning and maintenance are required daily.

WRONG

RI076

Have good ventilation when welding or grinding painted parts.

Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.

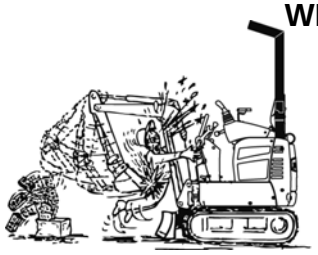
WRONG

RI073

Vent exhaust to outside when engine must be run for service.

Exhaust system must be tightly sealed. Exhaust fumes can kill without warning.

WRONG



RI077

Always lower the bucket and blade to the ground before doing any maintenance.

Never modify equipment or add attachments not approved by Bobcat Company.

WRONG

RI074

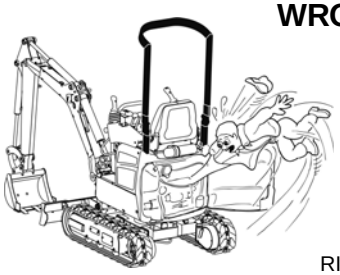
Stop, cool and clean engine of flammable materials before checking fluids.

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.

WRONG



RI071

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 the excavator.

WRONG

B-19798

Lead-acid batteries produce flammable and explosive gases.

Keep arcs, sparks, flames and lighted tobacco away from batteries.

Batteries contain acid which 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.

Maintenance procedures which are given in the Operation and Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedures which are **not** in the Operation and Maintenance Manual must be performed **ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL. Always use genuine Bobcat replacement parts.**

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 is a guide for correct maintenance of the Bobcat excavator.

⚠ WARNING

AVOID INJURY OR DEATH

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (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. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0807

Every 10 Hours (Before Starting The Excavator)

- **Engine Oil** - Check level and add as needed. (See Page 79.)
- **Engine Air Filters and Air System** - Check condition indicator and empty dust cup as needed. Check air system for leaks. (See Page 74.)
- **Engine Cooling System** - Check coolant level COLD and add premixed coolant as needed. (See Page 81.) and (See Page 82.)
- **Seat Belt, Seat Belt Retractors, Seat Belt Mounting hardware, Control Console Lockout** - Check the condition of seat belt and mounting hardware. Clean or replace seat belt retractors as needed. Check the control console lockout lever for proper operation. Clean dirt and debris from moving parts. (See Page 70.)
- **Motion Alarm** - Check for proper function. (See Page 71.)
- **TOPS** - Check condition. Check mounting hardware. (See Page 29.)
- **Indicators and Lights** - Check for correct operation of all indicators and lights. (See Page 25.)
- **Safety Signs and Safety Tread** - Check for damaged signs (decals) and safety treads. Replace any signs or safety treads that are damaged. (See Page 20.)
- **Hydraulic Fluid, Hoses and Tubelines** - Check fluid level and add as needed. Check for damage and leaks. Repair or replace as needed. (See Page 87.)
- **Track Tension** - Check tension and adjust as needed. (See Page 91.)
- **Pivot Points** - Grease all machinery pivot points. (See Page 98.)

Every 50 Hours

- **Swing Bearing** - Grease swing bearing and swing pinion. Service every 10 hours when operating in water. (See Page 98.)
- **Battery** - Check cables, connections, and electrolyte level; add distilled water as needed. (See Page 83.)
- **Fuel Tank** - Drain water and sediment from fuel tank and fuel filter. (See Page 77.)

Every 100 Hours

- **Spark Arrestor Muffler** - Clean spark chamber. (See Page 90.)
- **Drive Belts (Alternator / Fan)** - Check condition. Replace as needed. Service at first 50 hours, then as scheduled. (See Page 94.)
- **Alternator and Starter** - Service at first 50 hours, then as scheduled. Check connections.

Every 250 Hours Or Every 12 Months

- **Fuel Filter** - Replace filter. (See Page 77.)
- **Travel Motors (Final Drive)** - Check fluid level and add as needed. (See Page 93.)

Maintenance Intervals (Cont'd)

Every 500 Hours Or Every 12 Months

- **Engine Oil and Filter** - Service at first 50 hours, then as scheduled. Replace oil and filter. (See Page 80.)
- **Cooling System** - Clean debris from radiator and hydraulic fluid cooler (if equipped). (See Page 81.)
- **Hydraulic Filter and Hydraulic Reservoir Breather Cap** - Replace the hydraulic filter and the reservoir breather cap. (See Page 88.)
- **Alternator and Starter** - Service at first 50 hours, then as scheduled. Check connections.
- **Engine Valves** - Adjust the engine valve clearance.

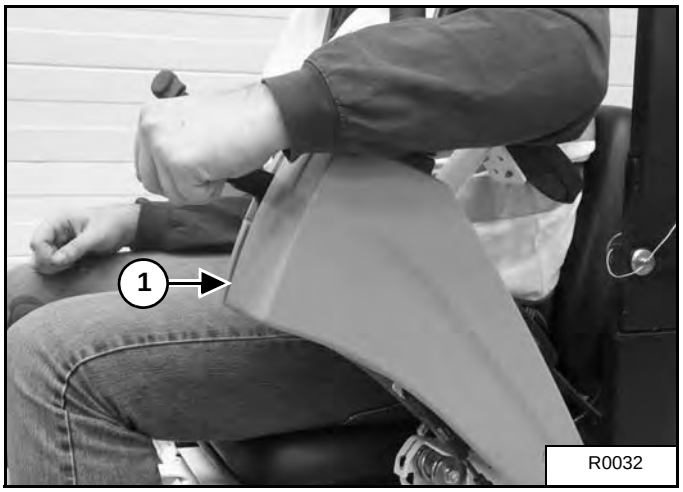
Every 1000 Hours Or Every 12 Months

- **Coolant** - Replace the coolant. (See Page 82.)
- **Hydraulic Fluid and Filters** - Replace hydraulic fluid and filters. Clean reservoir. (See Page 89.)
- **Travel Motors (Final Drive)** - Service at first 100 hours, then as scheduled. Replace fluid. (See Page 93.)

CONTROL CONSOLE LOCKOUTS

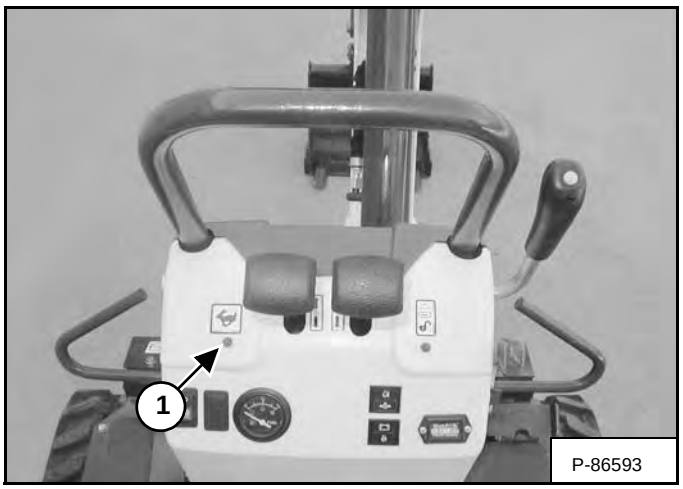
Inspection And Maintenance

Figure 91



When a console(s) is raised (Item 1) **[Figure 91]**, the hydraulic control joysticks and traction system must not function.

Figure 92



Sit in the operator's seat, fasten the seat belt and start the engine.

Raise the left console (Item 1) **[Figure 91]**. The green light (Item 1) **[Figure 92]** on the console will turn OFF.

Move the joystick control levers. There should be no movement of the boom, arm, slew or bucket.

Move the travel control levers. There should be no movement of the excavator tracks.

Lower the left console. Raise the right console and repeat the inspection procedure.

The joystick control levers and traction system must be deactivated when either console is raised.

Service the system if these controls do not deactivate when a control console is raised. (See your Bobcat dealer for service.)

SEAT BELT

Inspection And Maintenance

WARNING

Failure to properly inspect and maintain the seat belt can cause lack of operator restraint resulting in serious injury or death.

W-2466-0703

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.

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discolorations 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.

The items below are referenced in **[Figure 93]**.

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.

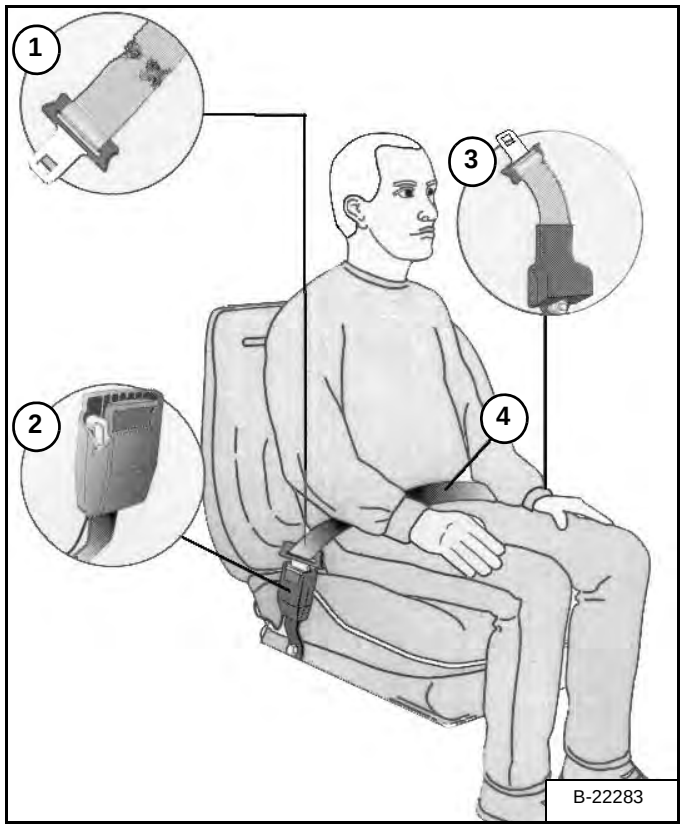
2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn, deformed or buckle is not damaged or casing broken.

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 color of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength may have deteriorated.

See your Bobcat dealer for seat belt system replacement parts for your machine.

Figure 93



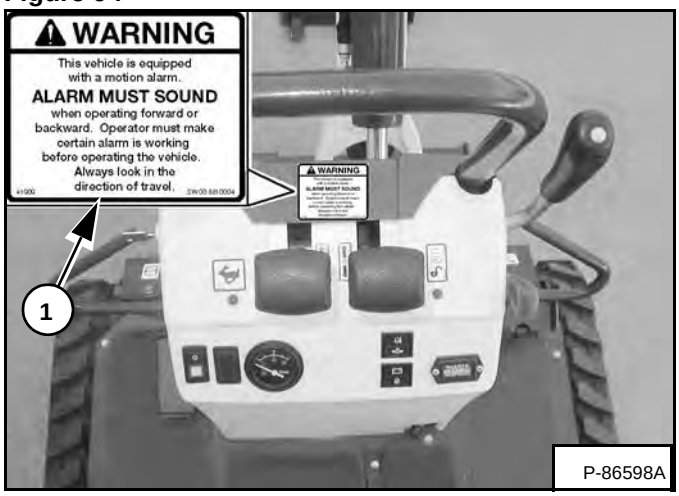
MOTION ALARM SYSTEM

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 directions.

Inspecting

Figure 94



Inspect for damaged or missing motion alarm decal (Item 1) **[Figure 94]**. Replace if damaged.

Sit in the operator's seat. Turn excavator key to ON position but DO NOT start the engine.

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.

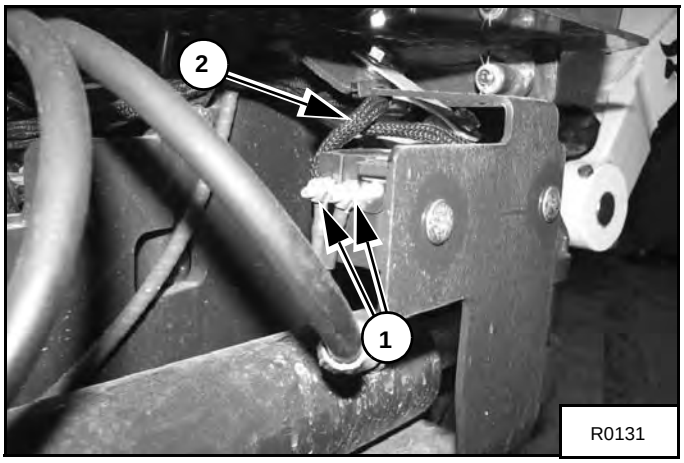
W-2050-0807

Move the travel control levers in the forward direction. The motion alarm must sound. Move the travel control levers in the reverse direction.The motion alarm must sound.

Turn the excavator key to the OFF position.

The motion alarm is located on the lower part of the frame, on top of the swing cylinder.

Figure 95



Inspect the motion alarm electrical connections (Item 1) **[Figure 95]**, wire harness (Item 2) **[Figure 95]** and motion alarm switch (Item 1) **[Figure 96]** for tightness and damage. Repair or replace any damaged components.

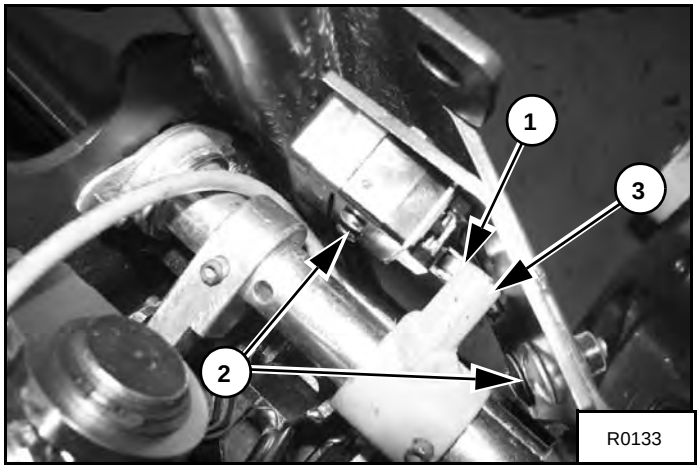
If the motion alarm switch requires adjustment, see information below.

MOTION ALARM SYSTEM (CONT'D)

Adjusting Switch Position

Stop the engine. Remove the floor mat and floorplate.

Figure 96



Place the travel control levers in the neutral position.

Loosen the screws (Item 2) **[Figure 96]** securing the motion alarm switch.

Position the motion alarm switch roller (Item 1) so that it makes contact with bearing (Item 3) until it opens the switch circuit. (Listen for the click of the switch.) Torque the screws (Item 2) **[Figure 96]** securing the switch to the bracket to 1.6 - 2.1 N•m (14 - 19 in-lb).

Inspect the motion alarm system for proper function after adjustment.

⚠ WARNING

This machine is equipped with a motion alarm.
ALARM MUST SOUND!
when operating forward or backward.

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

The operator is responsible for the safe operation of this machine.

W-2786-0309

TAILGATE

Opening and Closing the Tailgate

WARNING

AVOID INJURY OR DEATH

Never service or adjust the machine when the engine is running unless instructed to do so in the manual.

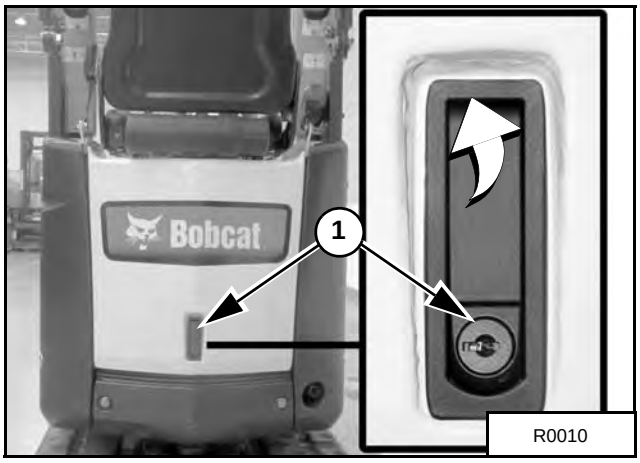
W-2012-0497

WARNING

Keep the rear door closed when operating the machine. Failure to do so could seriously injure a bystander.

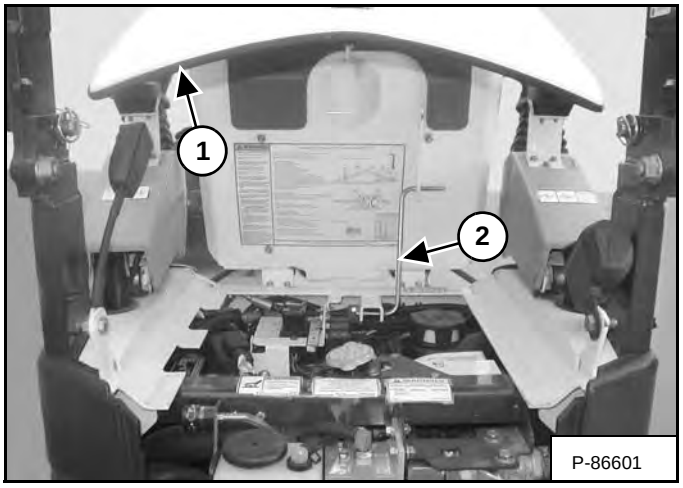
W-2020-1285

Figure 97



Release the latch (Item 1) **[Figure 97]** and pull the tailgate open.

Figure 98



Raise the tailgate (Item 1) until the rod (Item 2) **[Figure 98]** is in the engaged position.

To close the tailgate, lift up slightly on the tailgate (Item 1) until the rod (Item 2) **[Figure 98]** can be moved to the disengaged position. Slowly lower the tailgate until it is completely lowered and in the latched position.

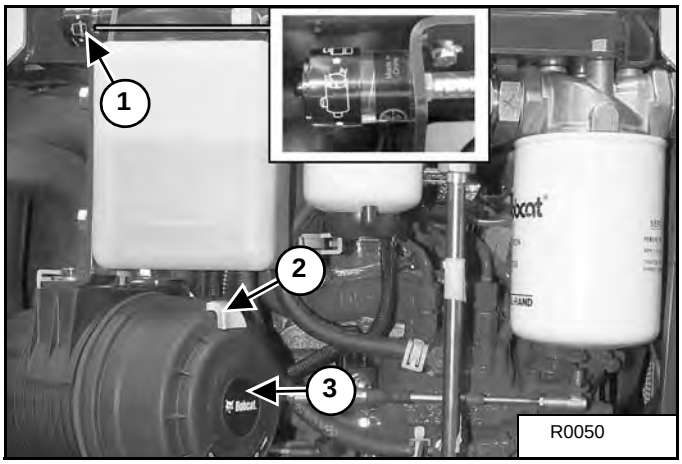
NOTE: The tailgate can be locked using the start key.

AIR CLEANER

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 67.)

Daily Check

Figure 99



Check the condition indicator (Item 1) **[Figure 99]**. If the red ring shows in the condition indicator, the filter needs to be replaced.

Replacing the Filter Elements

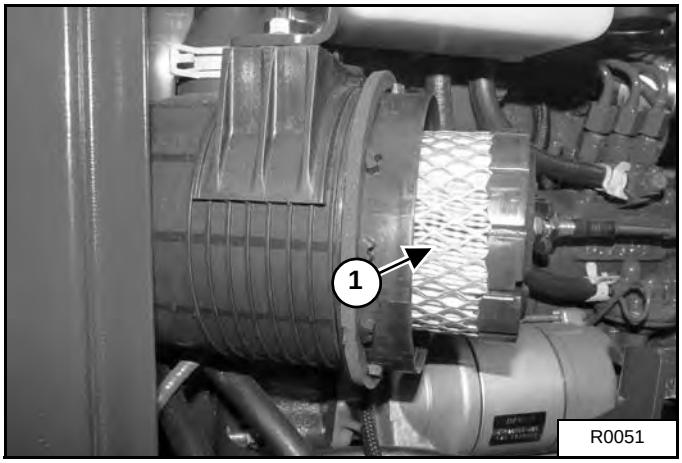
Outer Filter

Pull out the locking tab (Item 2) **[Figure 99]**.

Turn the dust cup (Item 3) **[Figure 99]** counterclockwise about 1/8 turn.

Remove and clean the dust cup.

Figure 100



Pull the outer filter (Item 1) **[Figure 100]** from the air cleaner housing.

Check the housing for damage.

Clean the housing and the seal surface. DO NOT use compressed air.

Install a new outer filter.

Install the dust cup (Item 3) **[Figure 99]** and turn it clockwise about 1/8 turn.

Push the locking tab in (Item 2) **[Figure 99]**.

Check the air intake hose and the air cleaner housing for damage. Make sure all connections are tight.

After the outer filter has been replaced, press the button (Item 1) **[Figure 99]** on the end of the condition indicator and start the engine.

Run at full rpm, then reduce engine speed and stop the engine. If the red ring shows in the condition indicator, replace the inner filter.

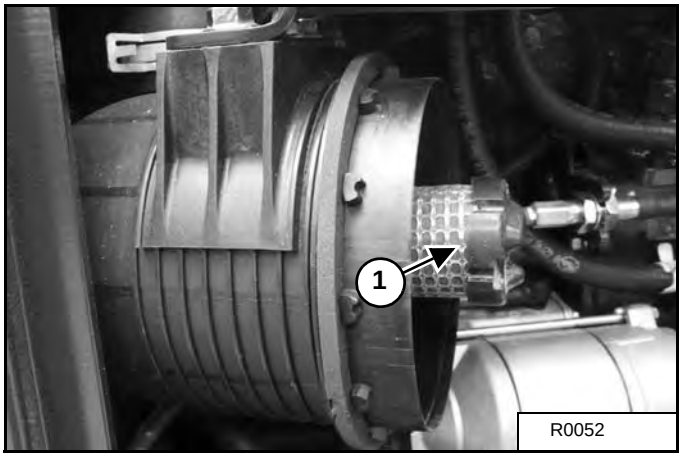
Replacing the Filter Elements (Cont'd)

Inner Filter

Only replace the inner filter under the following conditions:

- Replace the inner filter every third time the outer filter is replaced.
- After the outer filter has been replaced, press the button on the top of the condition indicator (Item 1) **[Figure 99]** and start the engine. Run at full rpm, then reduce engine speed and stop the engine. If the red ring shows in the condition indicator, replace the inner filter.

Figure 101



Remove the dust cup (Item 1) **[Figure 99]**, the outer filter (Item 1) **[Figure 100]** and the inner filter (Item 1) **[Figure 101]**.

NOTE: Make sure all sealing surfaces are free of dirt and debris.

Install the new inner filter.

Install the outer filter and the dust cup.

Press the button on the condition indicator to reset the condition indicator (Item 1) **[Figure 99]** (the red ring will not show anymore).

FUEL SYSTEM

Fuel Specifications

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

The following is one suggested blending guideline which should prevent fuel gelling during cold temperatures:

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

At a minimum, low sulfur diesel fuel must be used in this machine. Low sulfur is defined as 500 mg/kg (500 ppm) sulfur maximum.

The following fuels may also be used in this machine:

- Ultra low sulfur diesel fuel. Ultra low sulfur is defined as 15 mg/kg (15 ppm) sulfur maximum.
- Biodiesel blend fuel - Must contain no more than five percent biodiesel mixed with low sulfur or ultra low sulfur petroleum based diesel. This is commonly marketed as B5 blended diesel fuel. B5 blended diesel fuel must meet ASTM D975 (US Standard) or EN590 (EU Standard) 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. Extended oil change intervals can cause engine damage.
- Before vehicle storage; drain the fuel tank, refill with 100% petroleum diesel fuel, add fuel stabilizer 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

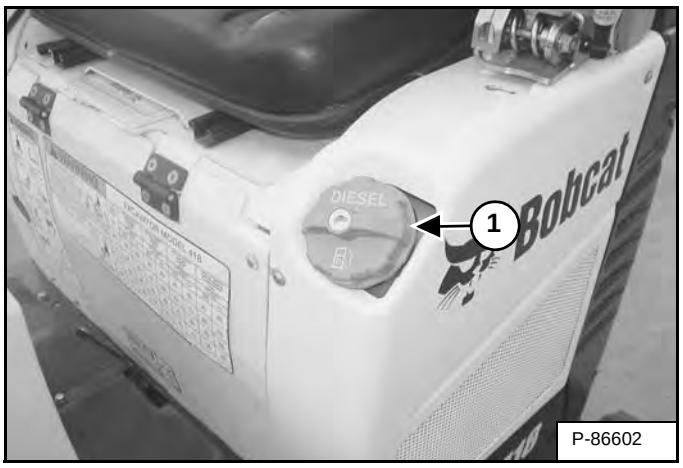
WARNING

AVOID INJURY OR DEATH

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

W-2063-0807

Figure 102



Remove the fuel fill cap (Item 1) using the key **[Figure 102]**.

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.

See the SERVICE SCHEDULE for the service interval when to remove water from or replace the fuel filter. (See SERVICE SCHEDULE on Page 67.)

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.

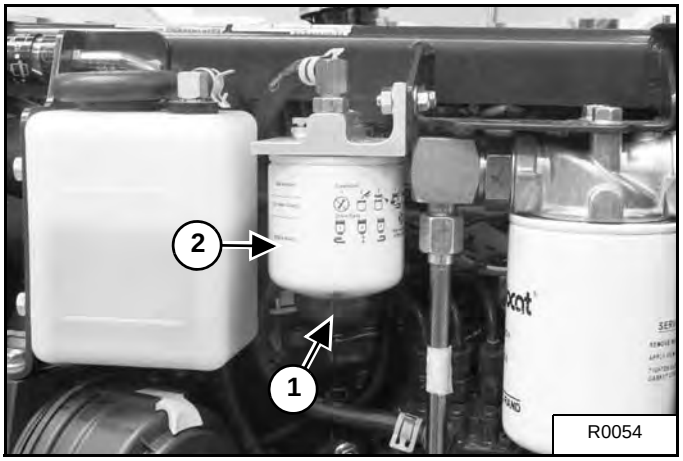
W-2103-0508

Fuel Filters

Removing Water

Open the tailgate.

Figure 103



Loosen the drain (Item 1) **[Figure 103]** at the bottom of the filter to drain water from the filter.

Replacing Elements

Remove the filter (Item 2) **[Figure 103]**.

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

Remove the air from the fuel system. (See Removing Air From the Fuel System on Page 78.)

Draining the Fuel Tank

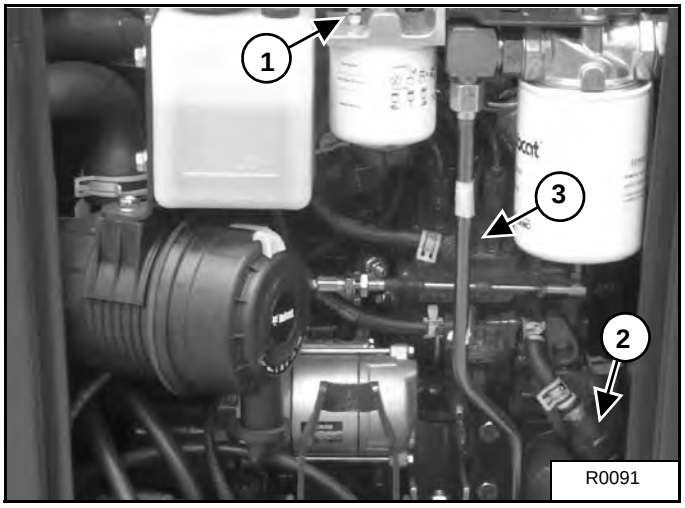
Remove the fuel line at the engine and put the end of the hose in a fuel can, and drain the fuel tank that way (siphon action).

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 67.)

Removing Air From the Fuel System

After replacing the fuel filter or when the fuel tank has run out of fuel, air must be removed from the fuel system before starting the engine.

Figure 104



Open the fuel filter vent (Item 1) **[Figure 104]**.

Operate the hand pump (priming bulb) (Item 2) **[Figure 104]** until the fuel flows from the vent with no air bubbles.

Close the vent (Item 1) **[Figure 104]** on the fuel filter housing.

Start the engine and let it run at low idle. It may be necessary to open the vent at the fuel injection pump (Item 3) **[Figure 104]** briefly until the engine runs smoothly.

⚠ WARNING

AVOID INJURY OR DEATH

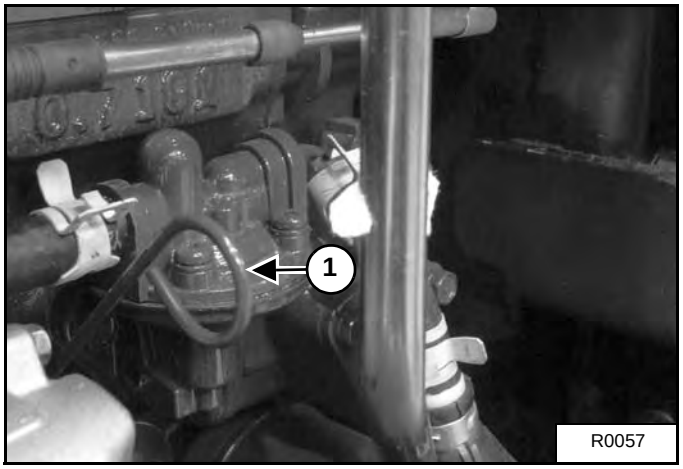
Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a physician familiar with this injury.

W-2072-0807

Checking And Adding Engine Oil

Check the engine oil every day before starting the engine for the work shift.

Figure 105

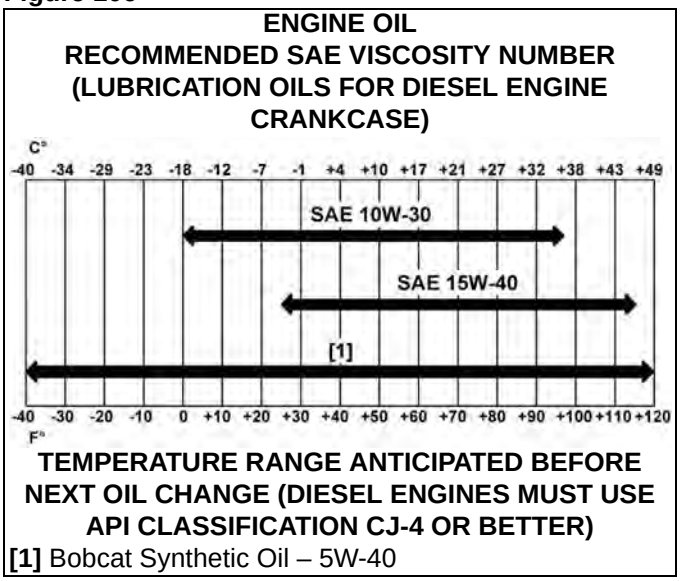


Open the tailgate and remove the dipstick (Item 1) **[Figure 105]**.

Keep the oil level between the marks on the dipstick.

Engine Oil Chart

Figure 106



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 Classification of CJ-4 or better **[Figure 106]**.

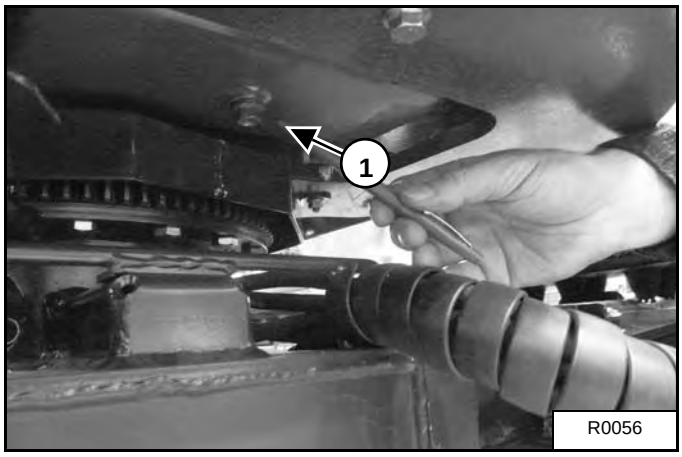
Removing and Replacing Oil and Filter

See the SERVICE SCHEDULE for the service interval for replacing the engine oil and filter. (See SERVICE SCHEDULE on Page 67.)

Run the engine until it is at operating temperature. Stop the engine.

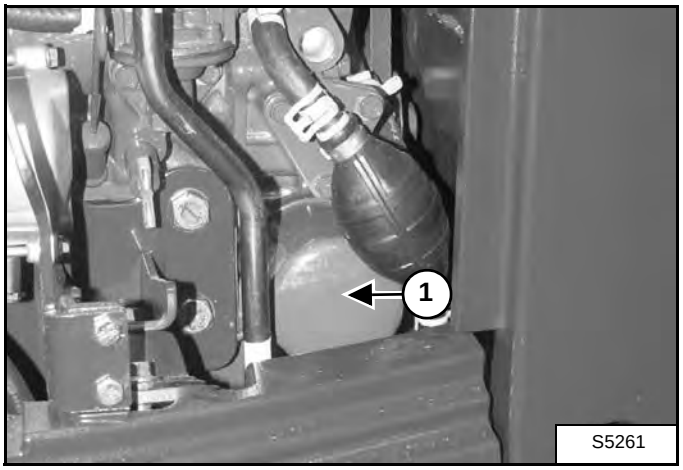
Open the tailgate.

Figure 107



Remove the drain plug (Item 1) **[Figure 107]**. Drain the oil into a container and recycle or dispose of used oil in an environmentally safe manner.

Figure 108



Remove the oil filter (Item 1) **[Figure 108]** and clean the filter housing surface.

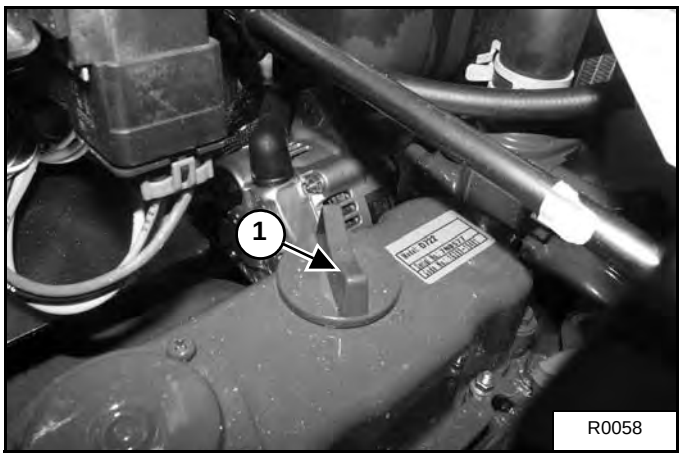
Use a genuine Bobcat filter.

Put clean oil on the filter gasket.

Install the filter and tighten by hand.

Install and tighten the oil drain plug.

Figure 109



Remove the fill cap (Item 1) **[Figure 109]**.

Put 3.5 L (3.7 qt) of oil into the engine.

Use a good quality motor oil that meets the correct API Service Classification **[Figure 108]**. (See Engine Oil Chart on Page 79.)

Install the fill cap.

Start the engine and let it run for several minutes.

Stop the engine. Check for leaks at the oil filter. Check the oil level.

Add oil as needed if it is not at the top mark on the dipstick.

⚠ 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

ENGINE COOLING SYSTEM

Check the cooling system every day to prevent over-heating, loss of performance or engine damage.

Cleaning

Open the tailgate.

Use air pressure or water pressure to clean the radiator and oil cooler (if equipped).

Checking Level

WARNING

AVOID BURNS

Do not remove radiator cap when the engine is hot. You can be seriously burned.

W-2070-1203

WARNING

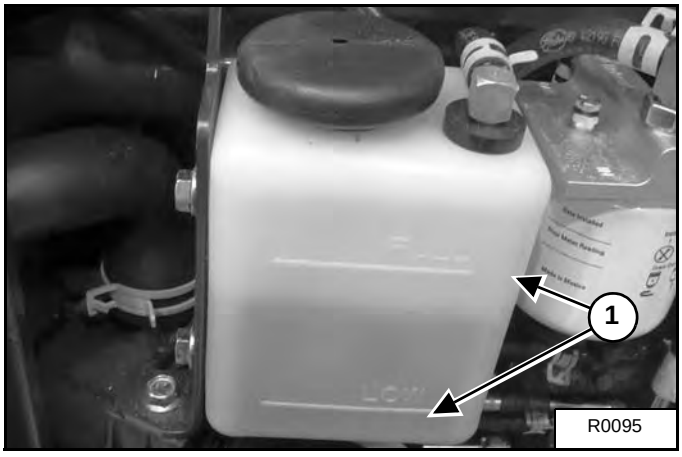
AVOID INJURY OR DEATH

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

- **When fluids are under pressure.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

W-2019-0907

Figure 110



The coolant level must be between the marks (Item 1) **[Figure 110]** on the coolant recovery tank.

IMPORTANT

AVOID ENGINE DAMAGE

Always use the correct ratio of water to antifreeze.

Too much antifreeze reduces cooling system efficiency and may cause serious premature engine damage.

Too little antifreeze reduces the additives which protect the internal engine components; reduces the boiling point and freeze protection of the system.

Always add a premixed solution. Adding full strength concentrated coolant can cause serious premature engine damage.

I-2124-0497

Removing and Replacing the Coolant

See THE SERVICE SCHEDULE for correct service intervals. (See SERVICE SCHEDULE on Page 67.)

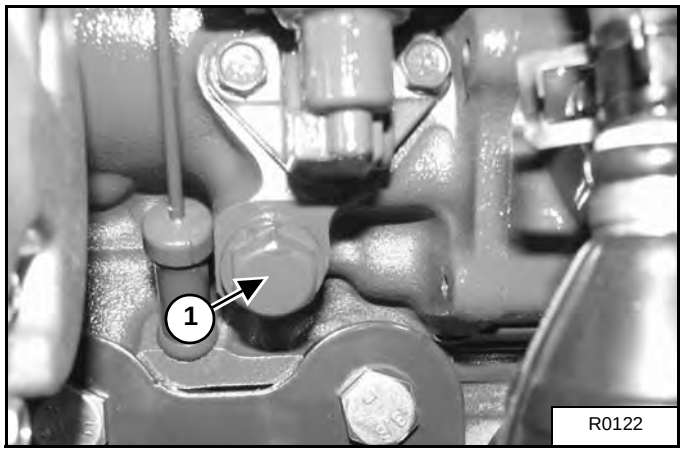
⚠ WARNING

AVOID BURNS

Do not remove radiator cap when the engine is hot. You can be seriously burned.

W-2070-1203

Figure 111



Remove the plug (Item 1) **[Figure 111]** on the engine block and drain the coolant into a container.

After all the coolant is removed, reinstall the plug.

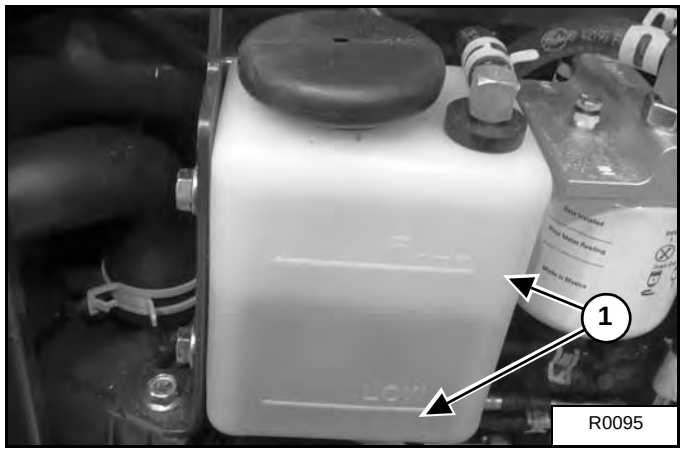
NOTE: Fluids such as engine oil, hydraulic fluid, coolant, etc. must be disposed of in an environmentally safe manner. Some regulations require that certain spills and leaks on the ground must be cleaned in a specific manner. See local, state and federal regulations for correct disposal.

Recycle or dispose of the used coolant in an environmentally safe manner.

Mix the coolant in a separate container. (See on Page 82.)

NOTE: The cooling system is factory filled with propylene glycol (purple color). DO NOT mix propylene glycol with ethylene glycol.

Figure 112



The coolant level must be between the marks (Item 1) **[Figure 112]** on the coolant recovery tank.

Add premixed coolant; 47% water and 53% propylene glycol to the recovery tank if the coolant level is low.

One gallon and one pint of propylene glycol mixed with one gallon of water is the correct mixture of coolant to provide a -37°C (-34°F) freeze protection.

Use a refractometer to check the condition of propylene glycol in your cooling system.

Add premixed coolant until the level is correct.

Run the engine until it is at operating temperature. Stop the engine. Check the coolant level and add as needed. Install the radiator cap and tighten.

Add coolant to the recovery tank as needed.

Close the tailgate.

IMPORTANT

AVOID ENGINE DAMAGE

Always use the correct ratio of water to antifreeze.

Too much antifreeze reduces cooling system efficiency and may cause serious premature engine damage.

Too little antifreeze reduces the additives which protect the internal engine components; reduces the boiling point and freeze protection of the system.

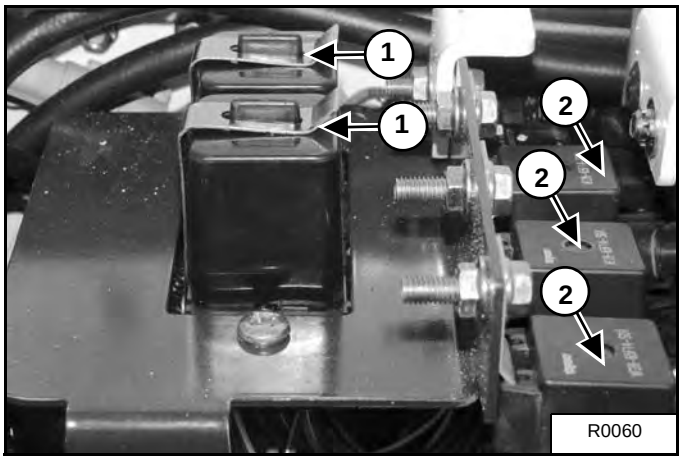
Always add a premixed solution. Adding full strength concentrated coolant can cause serious premature engine damage.

I-2124-0497

ELECTRICAL SYSTEM

Description

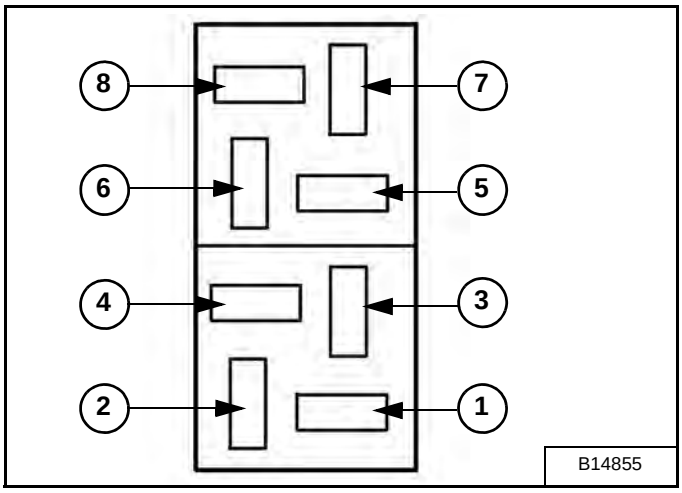
Figure 113



The excavator has a 12 volt, negative ground electrical system. The electrical system is controlled by fuses (Items 1) and relays (Items 2) **[Figure 113]** located on top of the engine compartment. The fuses will protect the electrical system when there is an electrical overload. The reason for the overload must be found before starting the engine again.

Fuses

Figure PM-114

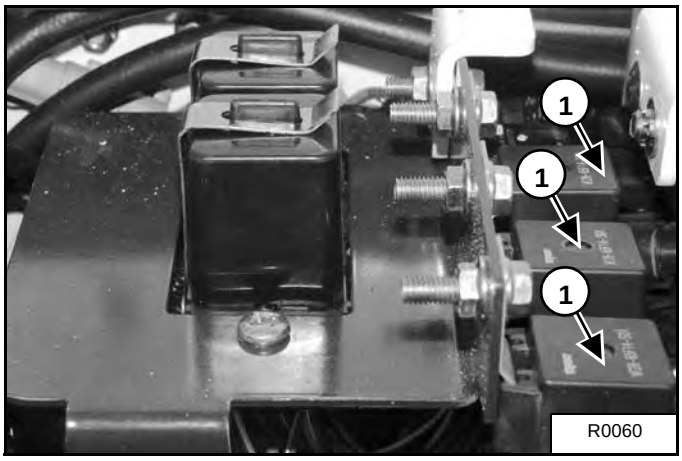


1. **Power Socket** - 15 A
2. **Ignition** - 10 A (SW)
3. **Timer** - 25 A (UNSW)
4. **Beacon** - 10 A
5. **Switch Power** - 10 A
6. **Valves / Horn** - 10 A
7. **Switched Timer** - 10 A
8. **Light** - 10 A

Always replace fuses using the same type and capacity.

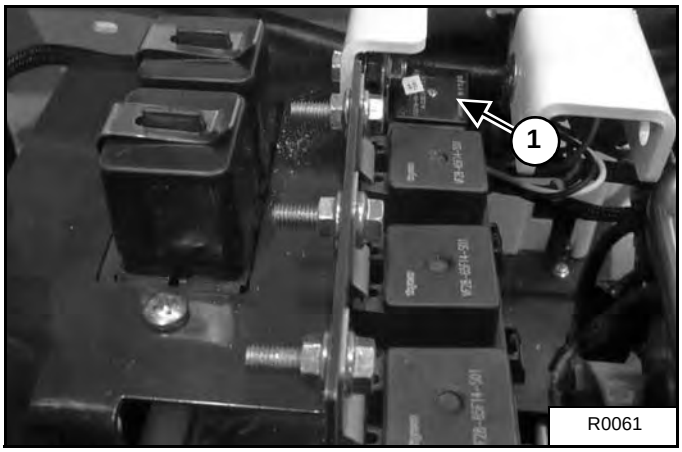
Fuel Timer, Relays and Diode Location / Identification

Figure 115



The three electrical relays (Item 1) **[Figure 115]** are located on top of engine compartment. The three relays control the starter, glow plugs and switched power circuits.

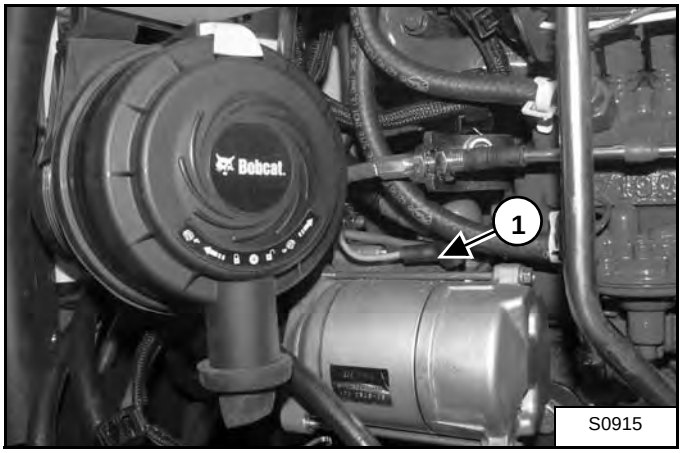
Figure 116



The fuel shut-off timer (Item 1) **[Figure 116]** is located on top of the engine compartment.

Fuel Timer, Relays and Diode Location / Identification (Cont'd)

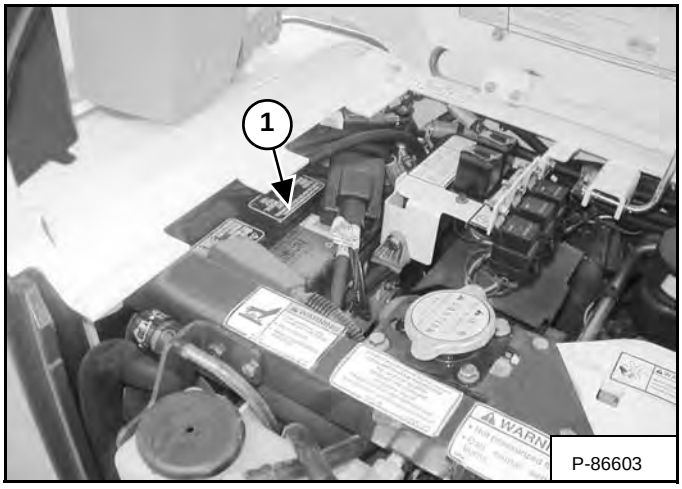
Figure 117



There are 2 diodes in the harness behind the starter (Item 1) **[Figure 117]**. The starter is located next to the cleaner, behind the access panel under the seat. The diodes are for alternator feedback protection and the glow plug during start function.

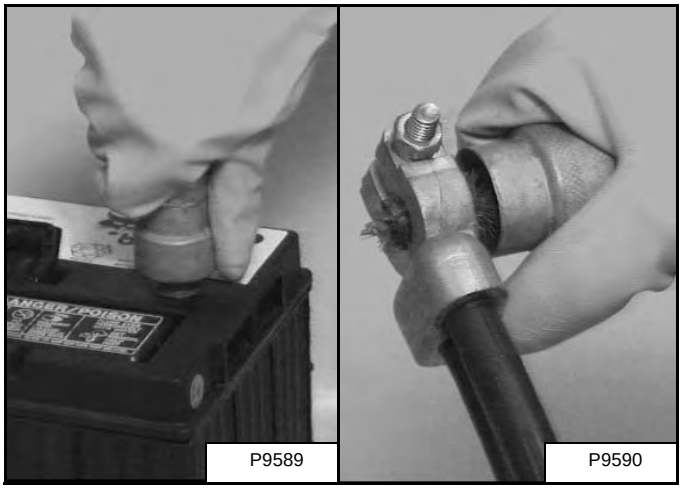
Battery Maintenance

Figure 118



Open the tailgate to access the battery (Item 1) **[Figure 118]**.

Figure 119



The battery cables must be clean and tight **[Figure 119]**. Remove acid or corrosion from the battery and cables using a sodium bicarbonate and water solution. Cover the battery terminals and cable ends with battery saver grease to prevent corrosion.

Check for broken or loose connections.

If the battery cables are removed for any reason, disconnect the negative (-) cable first. When installing the battery cables, make the last connection the negative (-) cable to the battery.

The original equipment battery is maintenance free. If a replacement battery is installed, check the electrolyte level in the battery.

If the electrolyte level is lower than 13 mm above the plates, add distilled water only.

⚠ 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

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

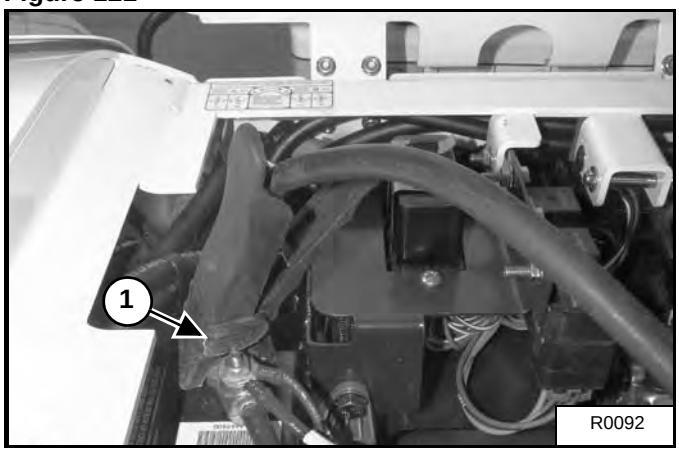
If it is necessary to use a booster battery to start the engine, BE CAREFUL! There must be one person in the operator's seat and one person to connect and disconnect the battery cables.

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

Figure 120

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 120]** of the excavator battery.

Figure 121



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 (-) terminal (Item 1) **[Figure 121]** of the excavator battery.

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

Start the engine. After the engine has started, remove the negative (-) cable first (Item 1) **[Figure 121]**.

Disconnect the cable from the excavator battery (Item 1) **[Figure 120]**.

Removing and Installing the Battery

WARNING

AVOID INJURY OR DEATH

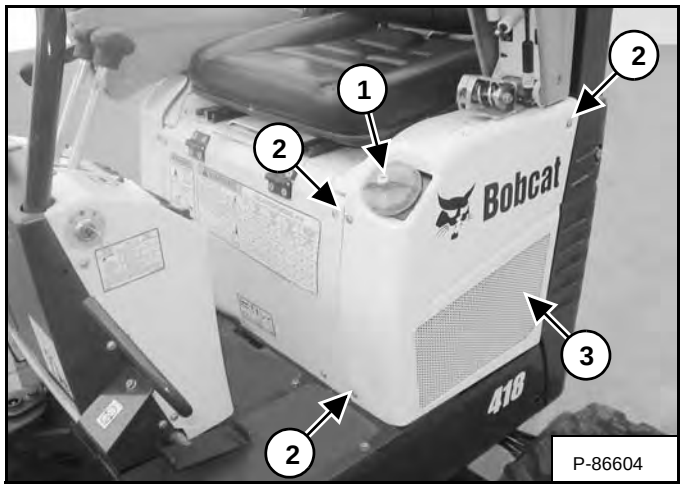
Batteries contain acid which burns eyes and skin on contact. Wear goggles, protective clothing and rubber gloves to keep acid off body.

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

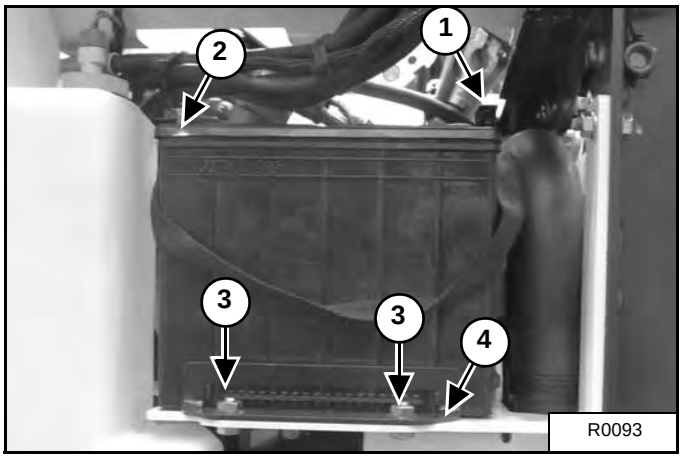
Figure 122



The battery is located to the left of the operator's seat. Remove the fuel cap (Item 1) with the start key and then the 3 bolts (Item 2) to remove the cover (Item 3). **[Figure 122]**

NOTE: Reinstall the fuel cap as soon as the cover is removed to avoid contamination.

Figure 123



Disconnect the negative (-) cable (Item 1) **[Figure 123]** first.

Disconnect the positive (+) cable (Item 2) **[Figure 123]**.

Loosen the bolts (Item 3) **[Figure 123]** and remove the hold-down clamp (Item 4) to remove the battery.

Always clean the terminals and the cable ends, even when installing a new battery.

Install the battery. Install the hold-down clamp and tighten the bolts.

Connect the battery cables. Connect the negative (-) cable (Item 1) **[Figure 123]** last to prevent sparks.

Remove the fuel cap (Item 1). Install the cover (Item 2) and the three bolts (Item 3) and tighten. Install the fuel cap (Item 1) **[Figure 122]**.

HYDRAULIC SYSTEM

Checking and Adding Hydraulic Oil

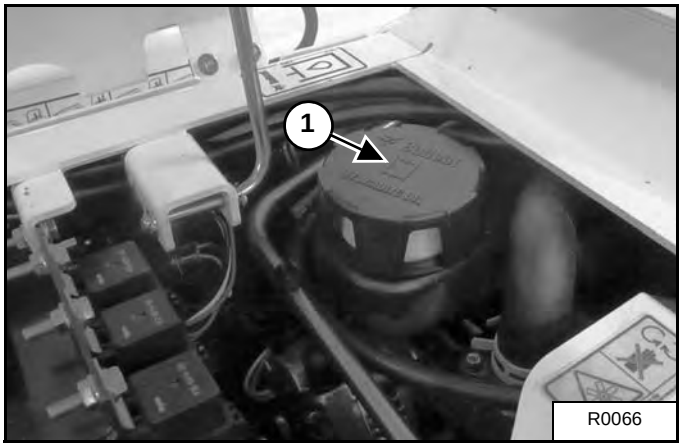
Put the machine on a level surface.

Retract the arm and bucket cylinders, put the bucket on the ground, lower the blade to the ground and retract the tracks. Stop the engine.

Figure 124

The fluid must be at the center of the sight gauge (Item 1) **[Figure 124]**.

Figure 125



Open the tailgate. Remove the oil fill cap (Item 1) **[Figure 125]**. Check the condition of the screen in the fill neck of the reservoir. The screen must be installed in the fill neck when adding oil.

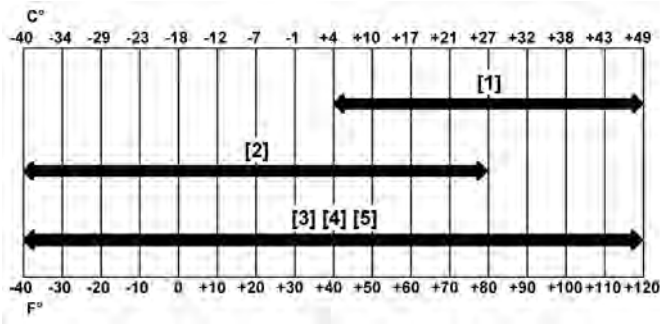
Add the correct fluid to the reservoir until it is at the center of the sight gauge (Item 1) **[Figure 125]**. (See Capacities on Page 126.)

Install the cap. Close the tailgate.

Hydraulic / Hydrostatic Fluid Chart

Figure 126

HYDRAULIC / HYDROSTATIC FLUID RECOMMENDED ISO VISCOSITY GRADE (VG) AND VISCOSITY INDEX (VI)



TEMPERATURE RANGE ANTICIPATED DURING MACHINE USE

[1] VG 100; Minimum VI 130
[2] VG 46; Minimum VI 150
[3] BOBCAT All-Season Fluid
[4] BOBCAT Synthetic Fluid
[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 **[Figure 126]**. (See Hydraulic System on Page 125.)

⚠ 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.

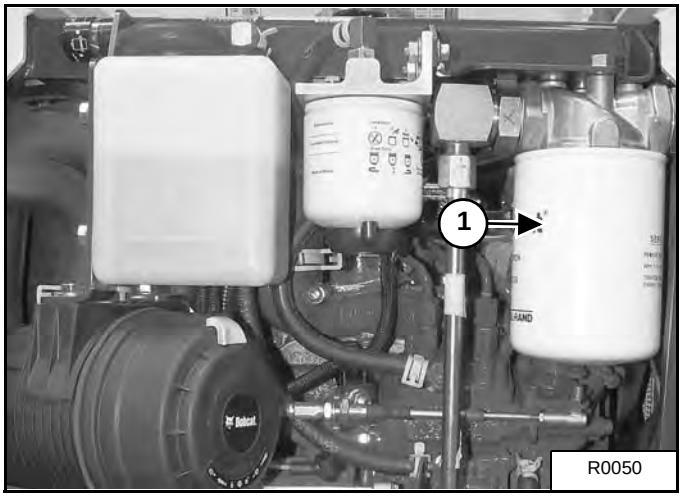
W-2103-0508

Replacing the Hydraulic Filter

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 67.)

Open the tailgate.

Figure 127



Remove the filter (Item 1) **[Figure 127]**.

Clean the housing where the filter gasket makes contact.

Put clean hydraulic fluid on the gasket. Install the new filter and tighten by hand only.

NOTE: Fluids such as engine oil, hydraulic fluid, coolant, 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, state and federal regulations for correct disposal.

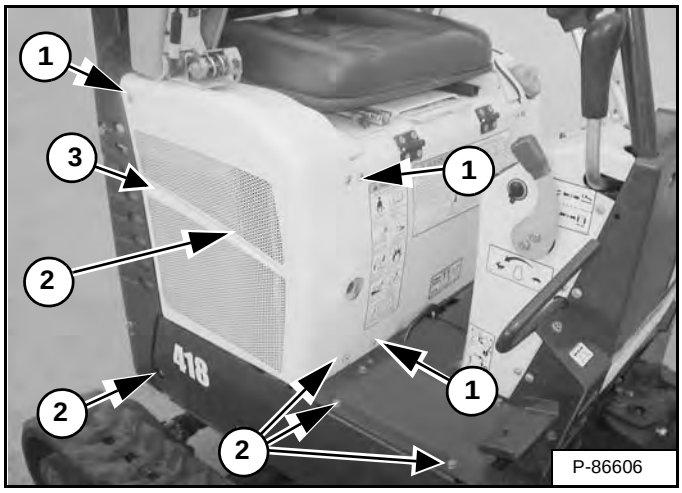
Start the engine. Run the excavator through the hydraulic functions. Stop the engine. Check the fluid level at the sight gauge (Item 1) **[Figure 124]** and add as needed. Check the filter area for leaks.

Draining Hydraulic Oil

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 67.)

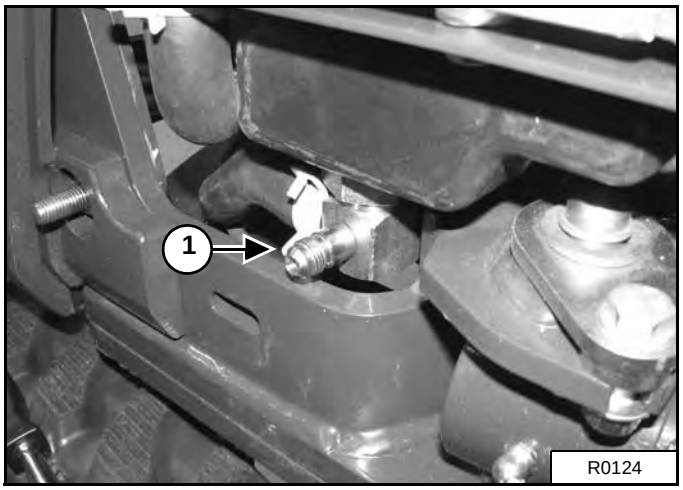
Retract the arm and bucket cylinders, lower the bucket to the ground. Stop the engine.

Figure 128



To gain access to drain the hydraulic oil, loosen the three bolts (Item 1) from the cover. Pivot the cover downward. Remove the bolts (Item 2) and remove the side cover (Item 3) **[Figure 128]**.

Figure 129



Before removing the cap, place a container under the drain plug (Item 1) to collect the oil **[Figure 129]**.

IMPORTANT

Fluid such as engine oil, hydraulic fluid, coolants, grease, 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, state and federal regulations for the correct disposal.

I-2067-0499

IMPORTANT

If the fluid is being drained because of a system failure, remove and clean all hydraulic lines.

I-2045-0788

Install the cap again.

Add fluid to the reservoir until it is at the center of the sight gauge (Item 3) **[Figure 124]**. (See Capacities on Page 126.)

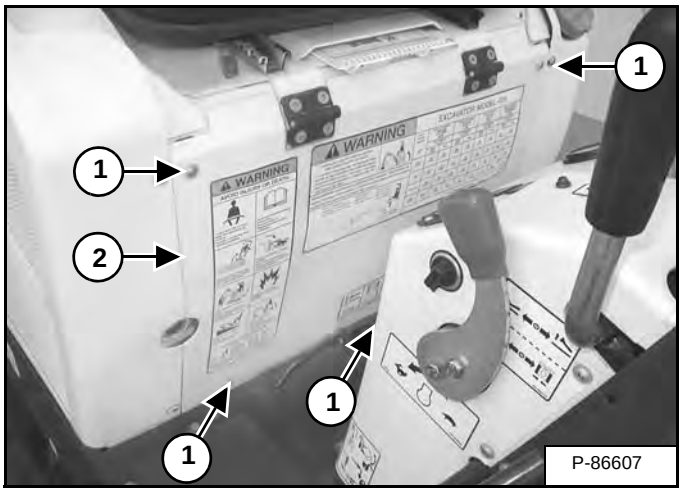
Run the excavator through the hydraulic functions. Stop the engine. Check the fluid level and add as needed.

Replace the black protection and the cover.

SPARK ARRESTOR MUFFLER

Cleaning Procedure

Figure 130



Remove the four bolts (Item 1) **[Figure 130]**.

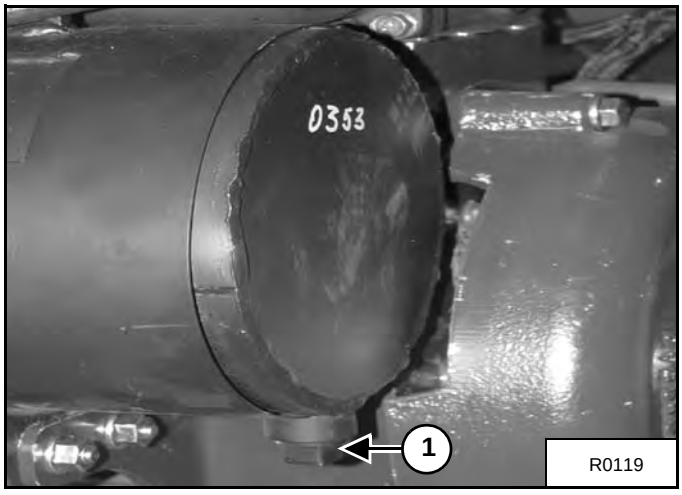
Remove the cover (Item 2) **[Figure 130]**.

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 67.)

Do not operate the excavator with a defective exhaust system.

Stop the engine. Open the tailgate.

Figure 131



Remove the plug (Item 1) **[Figure 131]** from the bottom of the spark arrestor muffler.

Start the engine and run for about ten seconds while a second person, wearing safety glasses, holds a piece of wood over the outlet of the silencer. (The carbon deposits will be forced out of the silencer cleanout hole.)

Stop the engine. Install and tighten the plug (Item 1) **[Figure 131]**.

Tighten the bolts (Item 1) **[Figure 130]**.

Install the cover.

Close the tailgate.

WARNING

Stop engine and allow the muffler to cool before cleaning the spark chamber. Wear safety goggles. Failure to obey can cause serious injury.

W-2011-1285

WARNING

When the engine is running during service, the steering levers must be in neutral.

Failure to do so can cause injury or death.

W-2203-0595

WARNING

Never use machine in atmosphere with explosive dust or gases or where exhaust can contact flammable material. Failure to obey warnings can cause injury or death.

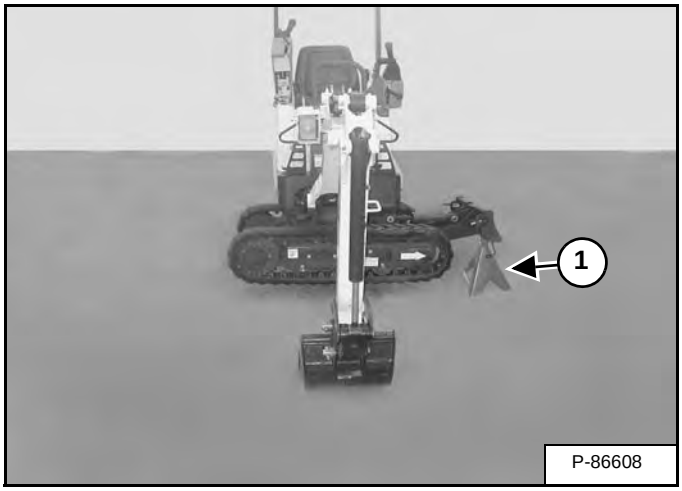
W-2068-1285

TRACK TENSION

NOTE: The wear of undercarriage parts varies with working conditions and types of soil conditions. Maintain the correct track tension by inspecting regularly. See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 67.).

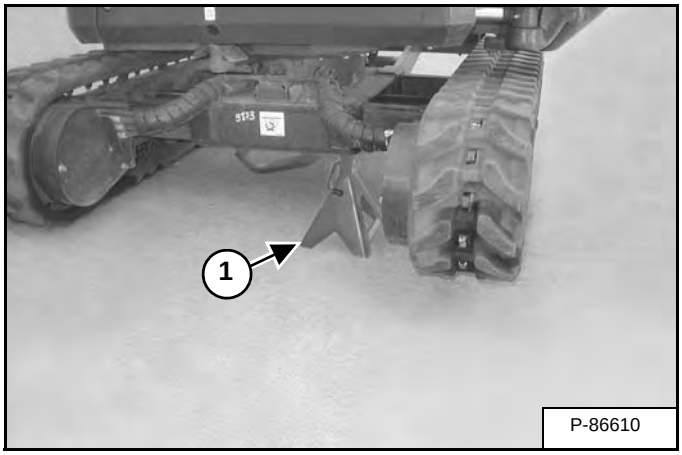
Adjusting

Figure 132



Raise one side of the machine approximately 102 mm (4.0 in) using the boom and arm as shown in **[Figure 132]**.

Figure 133



Raise the blade fully and install a jackstands (Item 1) **[Figure 132]** under the blade and a jackstand (Item 1) **[Figure 133]** under the rear of the track frame. Lower the machine until all machine weight is on the jackstands.

Stop the engine.

WARNING

AVOID INJURY

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

W-2142-0903

Figure 134

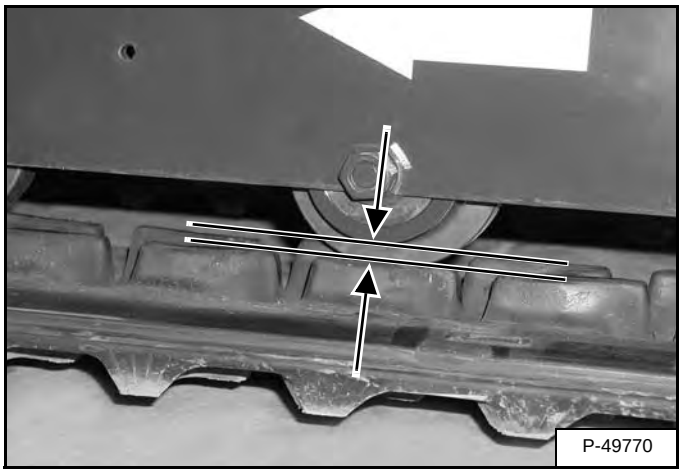
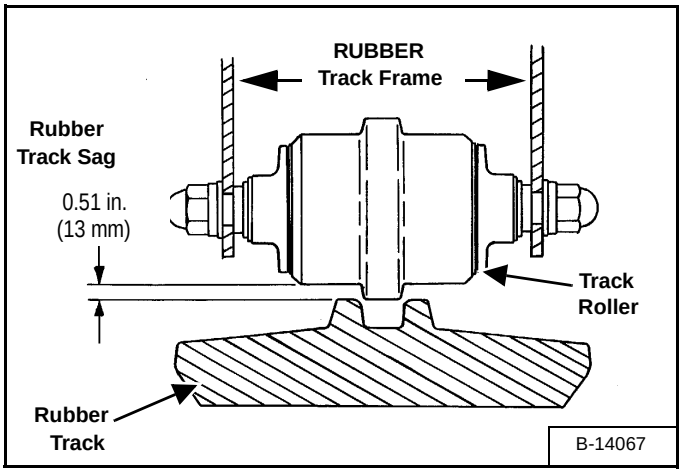
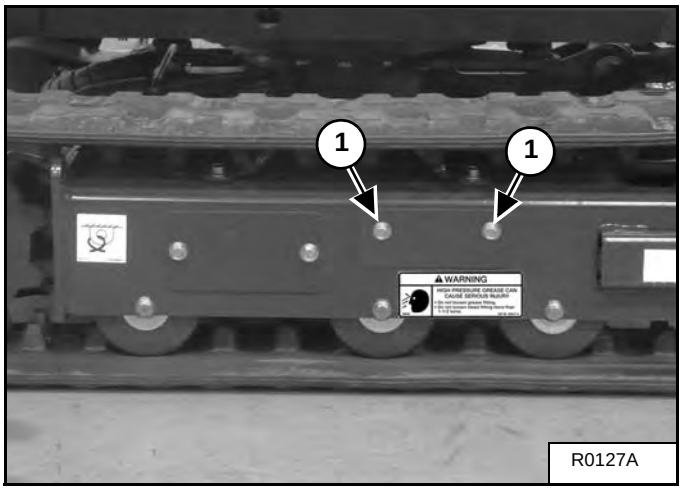


Figure 135



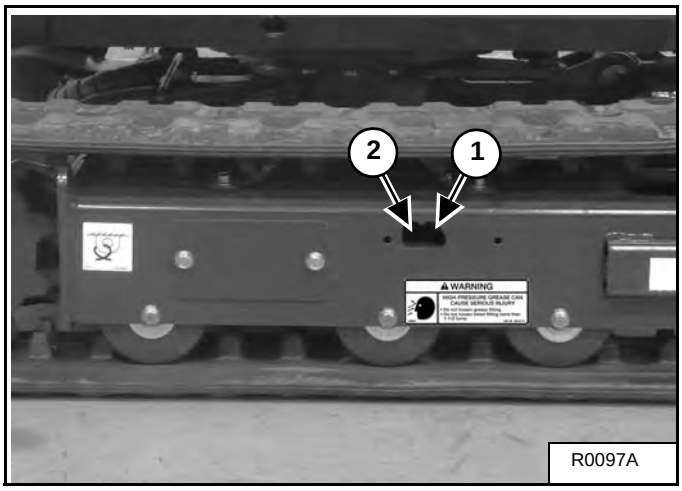
Measure the track sag at the middle track roller **[Figure 134]**. Do not get your fingers into pinch points between the track and the track roller. Use material of appropriate size to check the gap between the contact edge of the roller and top edge of the track guide lug **[Figure 134]** and **[Figure 135]**.

Figure 136



Loosen the two bolts (Item 1) **[Figure 136]** from the cover. Pivot the cover downward.

Figure 137



Add grease to the fitting (Item 1) until the track tension is correct. Use tool MEL1560 to loosen the bleed fitting (Item 2) **[Figure 137]** to release tension from the track.

NOTE: Do not loosen the grease fitting (Item 1) [Figure 137].

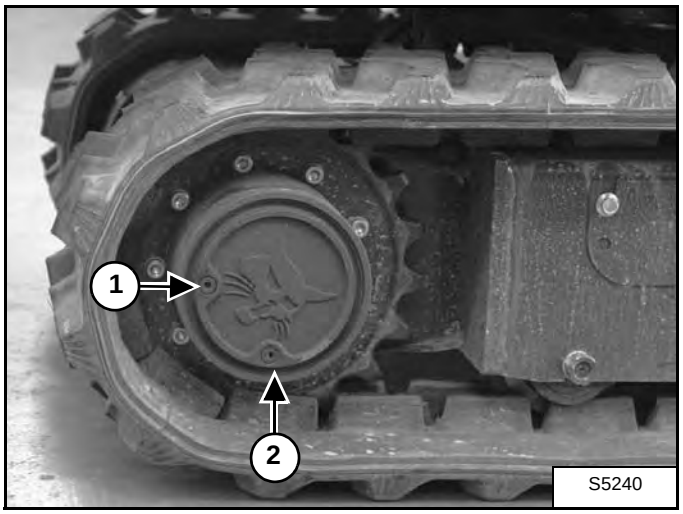
Repeat the procedure for the other side.

If the track tension is still loose after adjusting to the mentioned limit, it indicates the track is worn. See your dealer for repairs.

TRAVEL MOTOR

Checking and Adding Oil

Figure 138



Put the machine on a level surface with the plugs positioned as shown (Items 1 and 2) **[Figure 138]**.

Remove the top plug (Item 1) **[Figure 138]**. The oil level should be at the bottom edge of the plug hole.

Add gear lube through the plug hole if the oil level is below the hole. See Chart for capacity and type. (See Capacities on Page 126.) Install and tighten the top plug.

Repeat the procedure for the other side.

Draining the Travel Motor

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 67.)

Put the machine on a level surface with the plugs positioned as shown (Items 1 and 2) **[Figure 138]**.

Remove the bottom plug (Item 2) and top plug (Item 1) **[Figure 138]** and drain into a container. Recycle or dispose of the used lubricant in an environmentally safe manner.

After all the gear lube is removed, install the bottom plug (Item 2) **[Figure 138]**.

Add gear lube to the top plug hole (Item 1) **[Figure 138]** until the gear lube level is at the bottom edge of the plug hole. See Chart for capacity and type. (See Capacities on Page 126.)

Install and tighten the top plug.

Repeat the procedure for the other side.

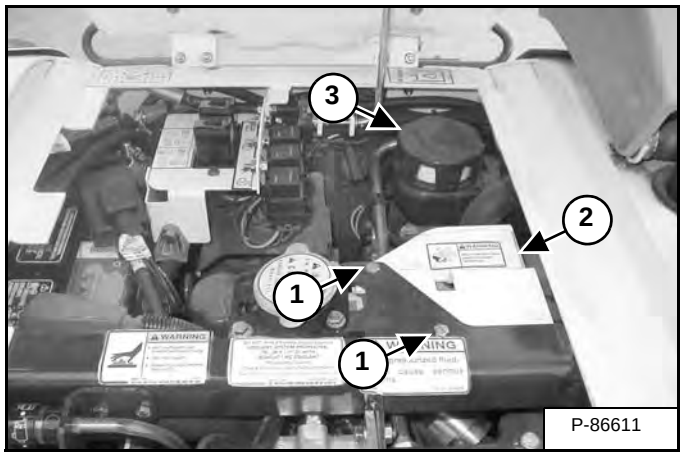
ALTERNATOR BELT

Adjusting the Alternator Belt

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

Stop the engine.

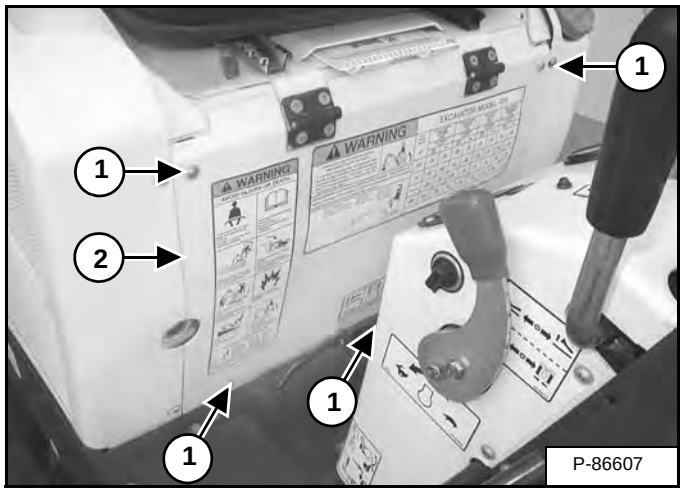
Figure 139



Remove the two bolts (Item 1) and remove the fan guard (Item 2) **[Figure 139]**.

Remove the fill cap (Item 3) **[Figure 139]** from the hydraulic reservoir.

Figure 140



Remove the four bolts (Item 1) **[Figure 140]**.

Remove the cover (Item 2) **[Figure 140]**.

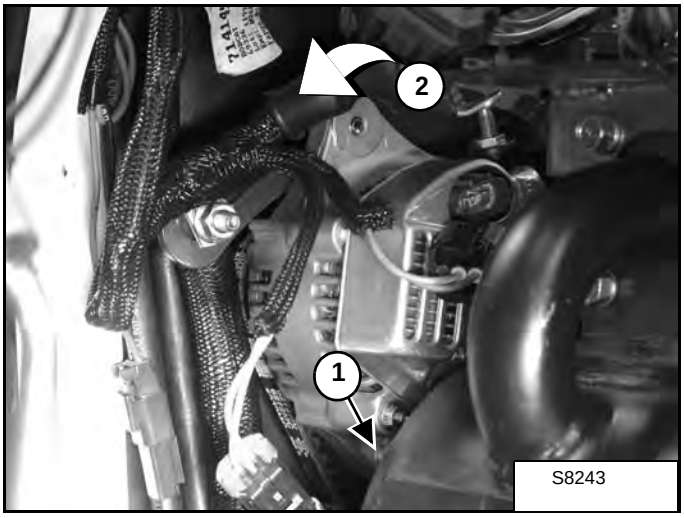
Figure 141

Loosen the upper alternator bolt **[Figure 141]**.

ALTERNATOR BELT (CONT'D)

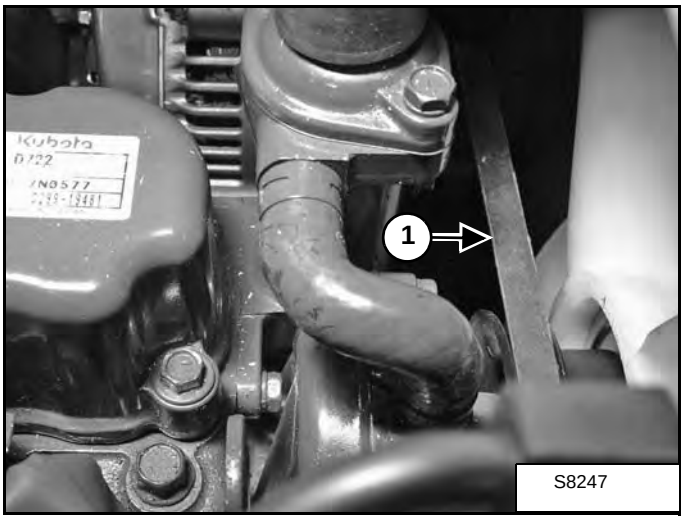
Adjusting The Alternator Belt (Cont'd)

Figure 142



Loosen the lower alternator mounting bolt (Item 1) **[Figure 142]**.

Figure 143



If a belt tension tool is available, move the alternator toward the front of the machine (Item 2) **[Figure 142]** until the belt (Item 1) **[Figure 143]** has (New belt = 56 to 60 lbf or Used belt = 48 to 52 lbf) tension.

If a belt tension tool is not available, move the alternator toward the front of the machine (Item 2) **[Figure 142]** until the belt (Item 1) **[Figure 143]** has 13 mm (0.50 in) movement at the middle of the belt span with 58 N (13 lb) of force.

Tighten the mounting and adjustment bolts.

Install the cover, fill cap and fan guard.

BLADE EXTENSION

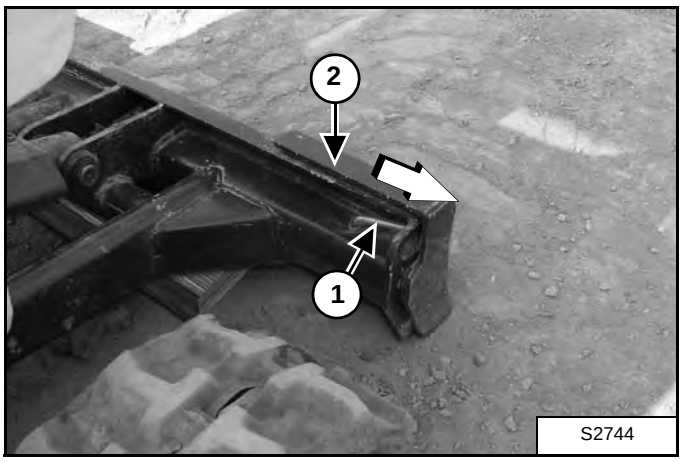
Description

The blade extensions are used to match the blade width to the track width. Secure the blade extensions in the retracted position when transporting the excavator or when a narrow operating width is needed. Under normal operating conditions, the blade width should match the track width.

Extending and Retracting

Extending

Figure 144



Raise the blade and install a block under the blade. Stop the engine.

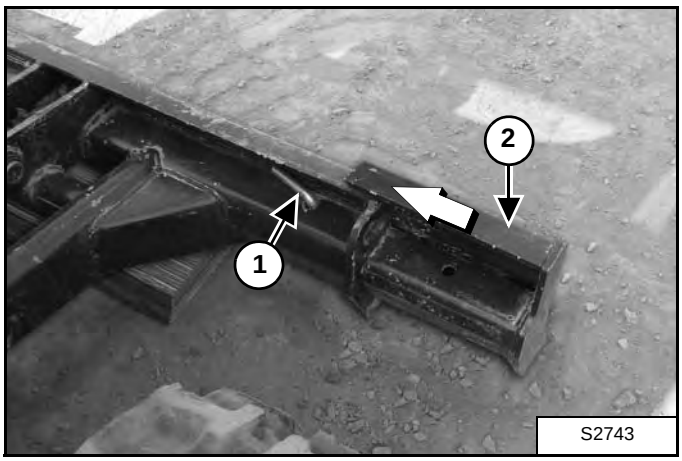
Remove the pin (Item 1) **[Figure 144]** (both sides).

Slide the blade extension (Item 2) **[Figure 144]** away from the blade frame into the extended position.

Reinstall the pin (Item 1) **[Figure 144]** (both sides) to secure the blade in the fully extended position.

Retracting

Figure 145



Raise the blade and install a block under the blade. Stop the engine.

Remove the pin (Item 1) **[Figure 145]** (both sides).

Slide the blade extension (Item 2) **[Figure 145]** toward the blade frame into the retracted position.

Reinstall the pin (Item 1) **[Figure 145]** (both sides) to secure the blade in the retracted position.

TRACK ROLLER AND IDLER LUBRICATION

Procedure

The track rollers and idlers require no maintenance. The bearings are a sealed design.

LUBRICATING THE EXCAVATOR

Lubrication Locations

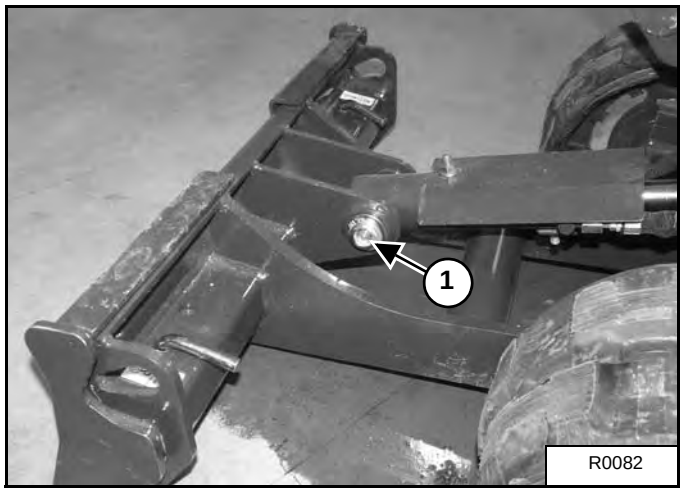
Lubricate the Hydraulic Excavator as specified in the SERVICE SCHEDULE for the best performance of the machine. (See SERVICE SCHEDULE on Page 67.)

Record the operating hours each time you lubricate the Hydraulic Excavator.

Always use a good quality lithium based multi-purpose grease when lubricating the excavator. Apply the lubricant until extra grease shows.

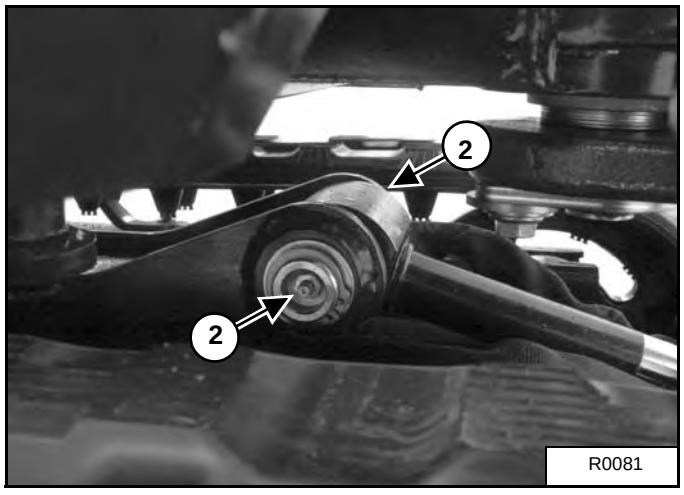
Lubricate the following locations on the hydraulic excavator EVERY 8 - 10 HOURS:

Figure 146



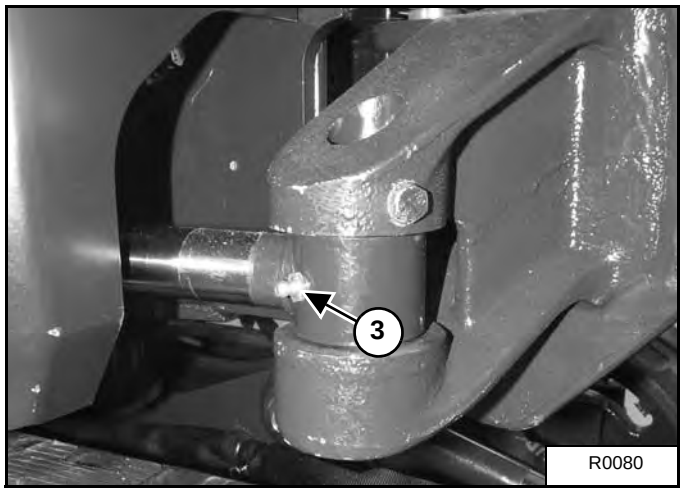
1. Blade Cylinder-Base End (1) **[Figure 146]**

Figure 147



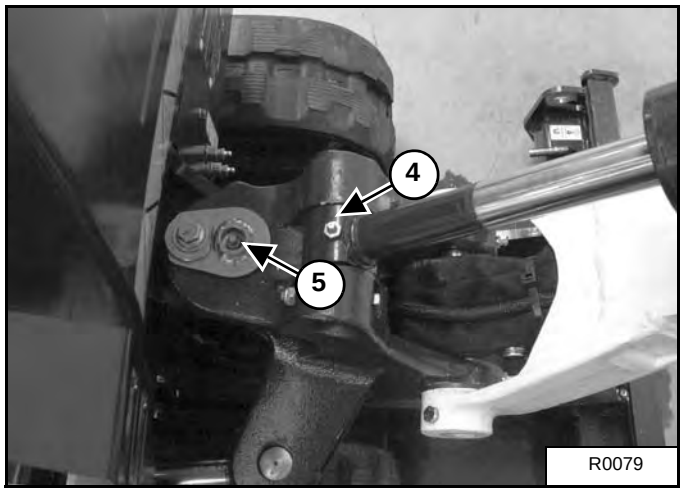
2. Blade Cylinders-Rod End (2) **[Figure 147]**

Figure 148



3. Boom Swing Cylinder, Rod End (1) **[Figure 148]**

Figure 149

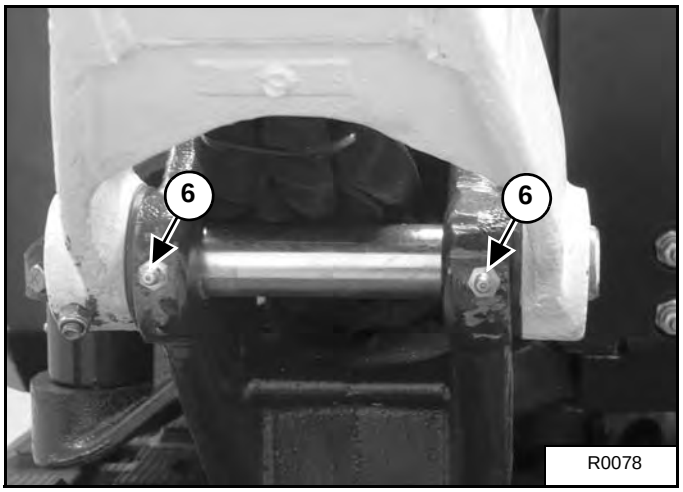


4. Boom Cylinder, Rod End (1) **[Figure 149]**

5. Boom Swing Pivot (1) **[Figure 149]**

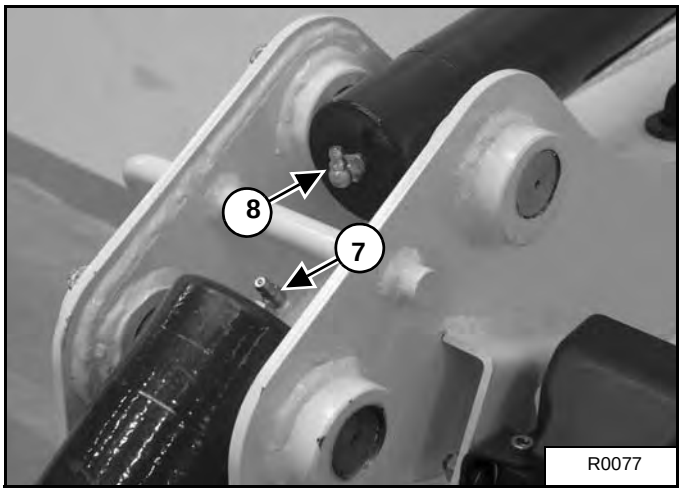
Lubrication Locations (Cont'd)

Figure 150



6. Boom, Base Pivots (2) **[Figure 150]**

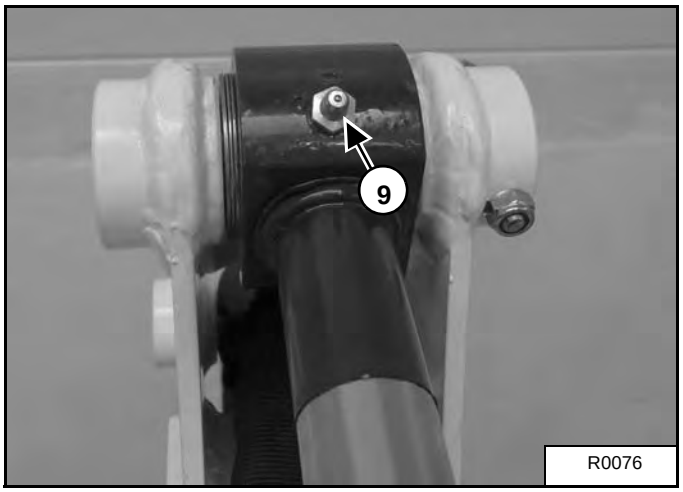
Figure 151



7. Boom Cylinder, Base End (1) **[Figure 151]**

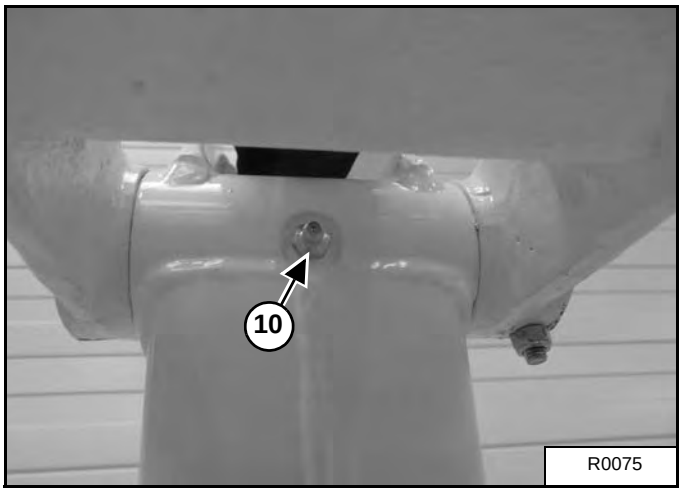
8. Arm Cylinder, Base End (1) **[Figure 151]**

Figure 152



9. Arm Cylinder, Rod End (1) **[Figure 152]**

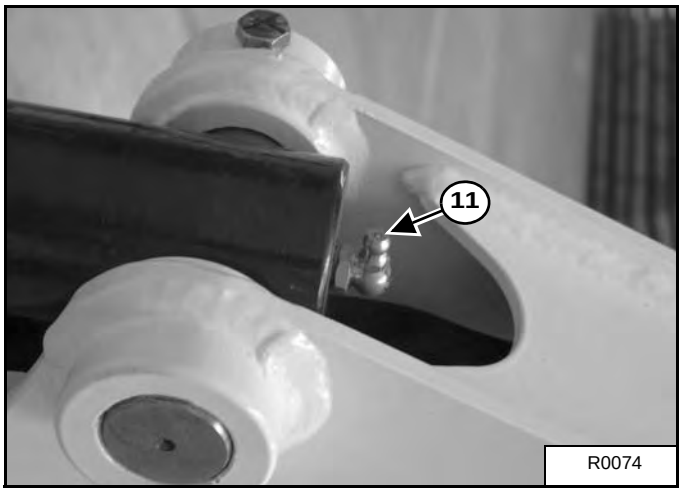
Figure 153



10. Arm Pivot, (1) **[Figure 153]**

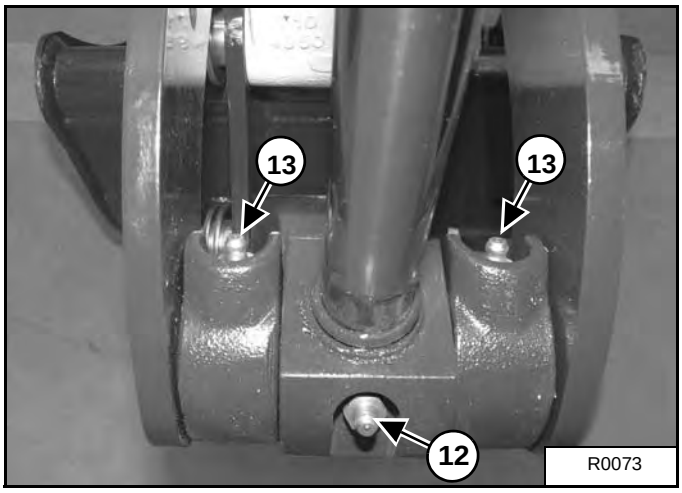
Lubrication Locations (Cont'd)

Figure 154



11. Bucket Cylinder, Base end (1) **[Figure 154]**

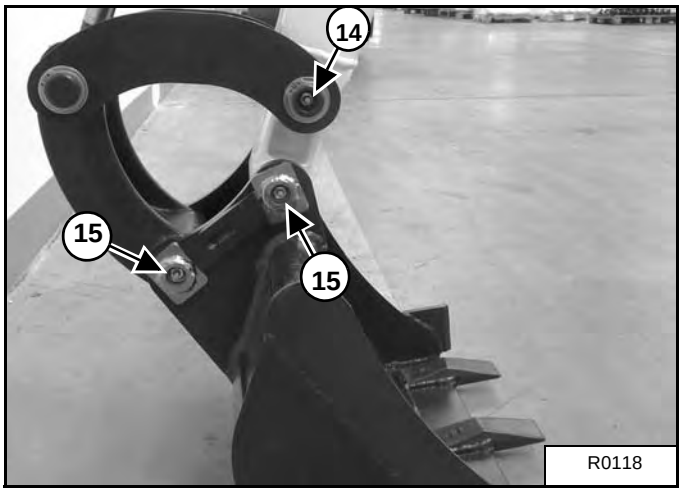
Figure 155



12. Bucket Cylinder, Rod end (1) **[Figure 155]**

13. Bucket Link (2) **[Figure 155]**

Figure 156

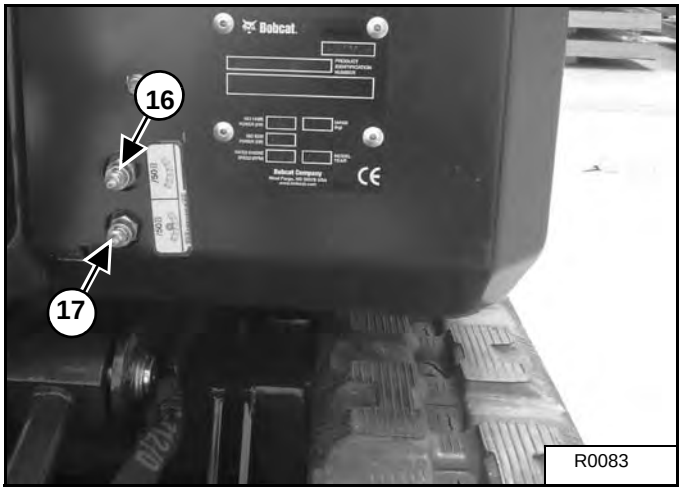


14. Bucket Link Pivot (1) **[Figure 156]**

15. Bucket Pivots (2) **[Figure 156]**

Lubricate the following locations on the hydraulic excavator EVERY 50 HOURS:

Figure 157



16. Swing Circle Bearing (2) **[Figure 157]**

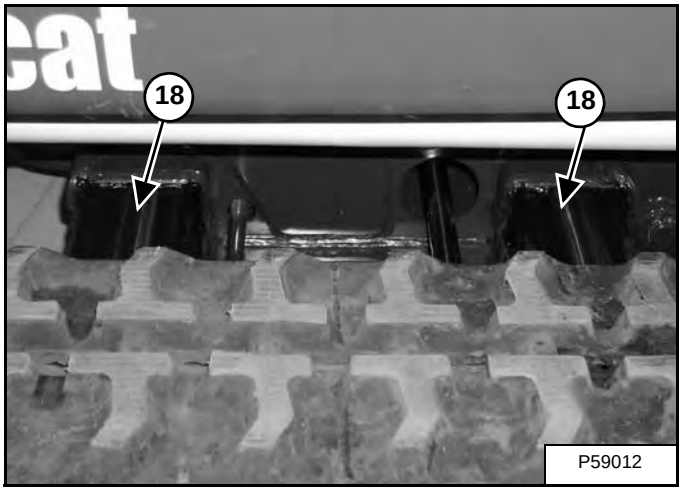
17. Swing Circle Pinion (1) **[Figure 157]**. Pump 4 times with a grease gun. Rotate the upper structure 180° and repeat.

NOTE: Do not over-grease the swing circle; damage to the seal could result. Pump 4 - 5 times with a grease gun. Rotate the upperstructure 90° and repeat three more times.

Lubrication Locations (Cont'd)

Lubricate the following locations on the hydraulic excavator AS REQUIRED:

Figure 158



18. Track Expansion Tube (2) **[Figure 158]** (both sides)

NOTE: Spread lubriplate gearshield extra heavy grease evenly on wear surfaces on both sides of excavator.

EXCAVATOR STORAGE AND RETURN TO SERVICE

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.

MACHINE SIGN TRANSLATIONS

⚠ WARNING

AVOID INJURY OR DEATH

- Keep 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 machine in space with explosive dust or gases or with flammable material near exhaust.
- All exhaust gases can kill. Always ventilate.
- Never use ether or starting fluid on diesel engine. Use only starting aids as approved by engine manufacturer.
- Leaking fluids under pressure can enter skin and cause serious injury. Immediate medical attention is required. Wear goggles. Use cardboard to check for leaks.
- Battery acid causes severe burns. Wear goggles. If acid contacts eyes, skin or clothing, 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 frame last (never at the battery). After jump start, remove negative connections at the frame first.

IMPORTANT

THIS MACHINE IS FACTORY EQUIPPED WITH A U.S.D.A. FORESTRY SERVICE APPROVED SPARK ARRESTOR MUFFLER.

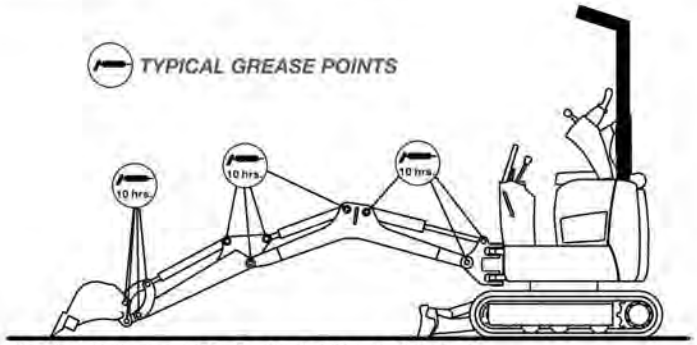
IT IS NECESSARY TO CLEAN THIS SPARK ARRESTOR MUFFLER TO KEEP IT IN WORKING CONDITION. THE SPARK ARRESTOR MUFFLER MUST BE SERVICED BY DUMPING THE SPARK CHAMBER EVERY 100 HOURS OF OPERATION.

ON SOME MODELS, THE TURBOCHARGER FUNCTIONS AS THE SPARK ARRESTOR AND MUST OPERATE CORRECTLY FOR PROPER SPARK ARRESTOR FUNCTION.

IF THIS MACHINE IS OPERATED ON FLAMMABLE FOREST, BRUSH OR GRASS COVERED LAND, IT MUST BE EQUIPPED WITH A SPARK ARRESTOR ATTACHED TO THE EXHAUST SYSTEM AND MAINTAINED IN WORKING ORDER. FAILURE TO DO SO WILL BE IN VIOLATION OF CALIFORNIA STATE LAW, SECTION 4442. PRC. REFER TO LOCAL LAWS AND REGULATIONS FOR SPARK ARRESTOR REQUIREMENTS.

SERVICE CHECKLIST AND SCHEDULE

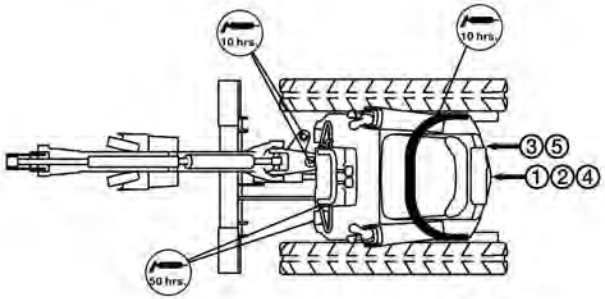
★ Service only when machine is equipped with this item.
■ Service at first 50 hours, then as scheduled.
▲ Service at first 100 hours, then as scheduled.



Machine shown in position to check hydraulic fluid levels.

EVERY 8-10 HOURS
Check engine coolant level.
Check engine oil level.
Check hydraulic fluid level.
Check air cleaner condition indicator
Check and adjust track tension.
Check indicator lights for correct operation.
Check canopy condition and mounting hardware.
Check seat belt condition and mounting hardware.
Check control console(s) lockout for proper operation.
Check for damaged signs (decals) - Replace as needed.
Grease all machinery pivot points. (See illustrations)
*Apply grease to slide on extendable arm.
*Clean cab heater filter

EVERY 50 HOURS
Grease swing pinion and swing circle. (See illustrations)
Drain water and sediment from fuel tank and fuel filter.
Check battery, cables and electrolyte level.



EVERY 100 HOURS
■ Check and adjust belt(s) if required.
Spark Arrestor Muffler - Clean spark chamber.

EVERY 250 HOURS
Replace diesel fuel filter.
Check oil level in both final drive cases.

EVERY 500 HOURS
■ Replace engine oil and filter. Clean radiator, oil cooler and *A/C condenser.
▲ Replace primary hydraulic filter.
▲ Check alternator and starter connections.
Check and adjust engine valve clearance.

EVERY 1000 HOURS OR EVERY 1 YEAR
▲ Replace oil in both final drive cases.
Drain and flush cooling system - Replace coolant.
Replace hydraulic fluid and filter(s) - Clean reservoir.

BE PARTS & SERVICE SMART
Use Genuine Bobcat® Replacement Parts

FILTER CHART

		418
1.	PRIMARY AIR FILTER	6673752
2.	SECONDARY AIR FILTER	6673753
3.	ENGINE OIL FILTER	6671057
4.	FUEL FILTER	6667352
5.	PRIMARY HYDRAULIC FILTER	6653336

• See illustrations above for filter locations.

SEE OPERATION & MAINTENANCE MANUAL FOR MORE INFORMATION AND INSTRUCTIONS.

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⚠ ADVERTENCIA

EVITE LESIONES O FATALIDADES

- Mantenga la cubierta cerrada excepto cuando vaya a dar servicio.
- Mantenga el motor limpio, libre de material inflamable.
- Mantenga el cuerpo, objetos sueltos y ropa alejados de contactos eléctricos, partes que se mueven, partes calientes y el escape.
- No use la máquina en espacios con polvo o gases explosivos, o con material inflamable cerca del escape.
- Los gases del escape pueden matar. Ventile siempre.
- Nunca use éter o líquidos de arranque en motores diesel, sino ayudas de arranque aprobadas por el fabricante del motor.
- Los líquidos que se fugan a presión pueden penetrar la piel y provocar lesiones graves. Se requiere atención médica inmediata. Porte gafas de seguridad. Utilice un cartón para revisar la presencia de fugas.
- El ácido de batería provoca quemaduras graves. Utilice gafas de seguridad. Si el ácido hace contacto con los ojos, piel o ropa, lavar bien y buscar médica.
- La batería arroja gas inflamable y explosivo. Mantener arcos, chispas, llamas y tabaco/cigarrillo encendido alejados.
- Para arranques en puente, conecte primero el cable negativo en el bastidor de la máquina (nunca en la batería). Retire primero las conexiones negativas en el bastidor luego del arranque en puente.

IMPORTANTE

ESTA MÁQUINA ESTÁ EQUIPADA O DOTADA DE FÁBRICA CON UN SISTEMA DE ESCAPE PARA EL PARACHISPAS APROBADO POR EL SERVICIO DE SILVICULTURA DE LA U.S.D.A.

ESTE SILENCIADOR DEL SISTEMA PARACHISPAS SE DEBE LIMPIAR PARA MANTENERSE EN CONDICIONES DE TRABAJO. EL SILENCIADOR SE DEBE MANTENE VACIANDO LA CÁMARA DE CHISPAS CADA 100 HORAS DE OPERACIÓN.

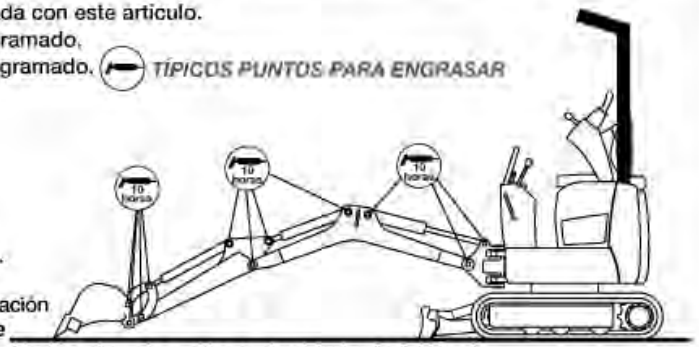
EN ÁLGUNOS MODELOS, EL TURBOCARGADOR FUNCIONA COMO EL PARACHISPAS Y DEBE OPERARSE ADECUADAMENTE PARA QUE EL PARACHISPAS FUNCIONE BIEN.

SI ESTA MÁQUINA ES OPERADA EN UN BOSQUE INFLAMABLE, MATORRAL O TERRENO CUBIERTO DE GRAMA, DEBE DISPONER DE UN PARACHISPAS SUJETO AL SISTEMA DE ESCAPE Y DEBE MANTENERSE EN CONDICIONES DE TRABAJO. NO HACERLO ES UNA INFRACCIÓN DE LEY ESTATAL DE CALIFORNIA, SECCIÓN 4442, PRC. REFIÉRASE A LAS LEYES Y REGLAMENTOS LOCALES PARA CONOCER LOS REQUISITOS DE USAR UN PARACHISPAS.

LISTA DE CHEQUEO Y PROGRAMA DE MANTENIMIENTO

★ Dé servicio solo cuando la máquina está equipada o dotada con este artículo.
■ Dé servicio a las primeras 50 horas. Luego, según lo programado.
▲ Dé servicio a las primeras 100 horas. Luego, según lo programado.

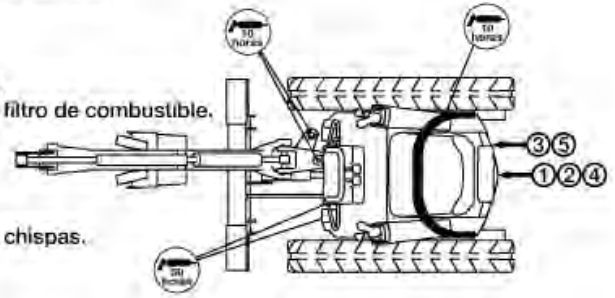
TÍPICOS PUNTOS PARA ENGRASAR



Machine shown in position to check hydraulic fluid levels.

CADA 8-10 HORAS

Revise el nivel del enfriador de motor.
Revise el nivel del aceite de motor.
Revise el nivel del fluido hidráulico.
Revise el indicador de condición del depurador e aire.
Revise y gradúe la tensión de la oruga.
Revise que las luces indicadoras funcionen adecuadamente.
Revise la condición de la cubierta y el herraje de fijación
Revise la condición del cinturón de seguridad y el herraje de fijación
Revise que el bloqueo de la(s) consola(s) de control funcione adecuadamente.
Revise la presencia de avisos (calcomanías) averiados – reponga, si es del caso.
Engrase todos los puntos de pivote de la maquinaria. (Ver ilustraciones)
*Aplique grasa para deslizar el brazo extensible.
*Limpie el filtro del calefactor y de la cabina



CADA 50 HORAS

Engrase el piñón de giro y el tornamesas. (Ver ilustraciones)
Drene el agua y sedimento del tanque de combustible y del filtro de combustible.
Revise la bacteria, cables y nivel electrolítico.

CADA 100 HORAS

■ Revise y gradúe la(s) correa(s), si es del caso.
Silenciador del sistema parachispas – limpie la cámara de chispas.

CADA 250 HORAS

Cambie el filtro de combustible diesel.
Revise el nivel de aceite en ambas cajas de transmisión final.

CADA 500 HORAS

■ Cambie el aceite y filtro de motor. Limpie el radiador, enfriador de aceite y *condensador del aire acondicionado.
▲ Cambie el filtro hidráulico primario.
▲ Revise las conexiones del alternador y arrancador.
Revise y gradúe la holgura de la válvula del motor.

CADA 1000 HORAS O CADA AÑO

▲ Cambie el aceite en ambas cajas de transmisión final.
Drene y purgue el sistema de enfriamiento – cambie el enfriador.
Cambie el fluido y filtro(s) hidráulico(s) – limpie el reservorio.

SEA INTELIGENTE EN CUANTO A PARTES Y SERVICIOS
Utilice repuestos Bobcat® legítimos

TABLA DE FILTROS

		418
1.	FILTRO DE AIRE PRIMARIO	6673752
2.	FILTRO DE AIRE SECUNDARIO	6673753
3.	FILTRO DE ACEITE DE MOTOR	6671057
4.	FILTRO DE COMBUSTIBLE	6667352
5.	FILTRO HIDRÁULICO PRIMARIO	6653336

* Las ilustraciones arriba señalan la ubicación de los filtros.

PARA MAYOR INFORMACIÓN E INSTRUCCIONES CONSULTE EL MANUAL DE OPERACIÓN Y MANTENIMIENTO.

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⚠ AVERTISSEMENT

RISQUE DE BLESSURE OU DE MORT

- Gardez le capot fermé sauf pour l'entretien.
- Maintenez le moteur à l'écart de tout matériau inflammable.
- Maintenez le corps, les objets mobiles et les vêtements à l'écart des contacts électriques, des pièces mobiles, des pièces brûlantes et de l'échappement.
- N'utilisez pas la machine dans des lieux contenant des poussières ou des gaz explosifs ou avec des matériaux inflammables à proximité de l'échappement.
- Tous les gaz d'échappement sont mortels. Veillez à toujours aérer la zone.
- N'utilisez jamais d'éther ou de liquide de démarrage sur un moteur diesel. Utilisez uniquement des aides au démarrage approuvées par le fabricant du moteur.
- En cas de fuite, le liquide sous pression peut pénétrer dans la peau et provoquer des blessures graves. Dans ce cas, consultez immédiatement un médecin. Portez des lunettes de protection. Utilisez un morceau de carton pour repérer les fuites.
- L'acide contenu dans une batterie provoque des brûlures graves. Portez des lunettes de protection. En cas de contact des yeux, de la peau ou des vêtements avec de l'acide, rincez soigneusement et consultez immédiatement un médecin.
- La batterie génère des gaz inflammables et explosifs. Maintenez-la à l'écart des arcs, des étincelles, des flammes et des cigarettes allumées.
- En cas de démarrage forcé, connectez le câble négatif au CADRE de la machine en dernier (jamais à la batterie). Après un démarrage forcé, retirez en premier les connexions négatives au cadre.

IMPORTANT

CETTE MACHINE EST ÉQUIPÉE EN USINE D'UN SILENCIEUX PARE-ÉTINCELLES APPROUVÉ PAR LE SERVICE DES FORÊTS DES ÉTATS-UNIS (U.S.D.A. FORESTRY SERVICE).

IL EST INDISPENSABLE DE NETTOYER CE SILENCIEUX AFIN DE LE MAINTENIR EN BON ÉTAT DE FONCTIONNEMENT. CET ENTRETIEN CONSISTE À VIDER LA CHAMBRE À ÉTINCELLES TOUTES LES 100 HEURES D'UTILISATION.

SUR CERTAINS MODÈLES, LE TURBOCOMPRESSEUR FAIT OFFICE DE PARE-ÉTINCELLES ET DOIT ÊTRE EN BON ÉTAT DE FONCTIONNEMENT POUR ASSURER CETTE FONCTION.

SI CETTE MACHINE EST UTILISÉE EN ZONE DE FORÊTS, DE BROUSSAILLES OU D'HERBAGES PRÉSENTANT DES RISQUES D'INCENDIE, ELLE DOIT ÊTRE ÉQUIPÉE D'UN PARE-ÉTINCELLES AJOUTÉ AU CIRCUIT D'ÉCHAPPEMENT ET MAINTENU EN BON ÉTAT DE MARCHE. LE NON RESPECT DE CETTE OBLIGATION CONTREVIENT À LA LOI DE L'ÉTAT DE CALIFORNIE, SECTION 4442, PRC. REPORTEZ-VOUS AUX RÉGLEMENTATIONS LOCALES POUR LES EXIGENCES APPLICABLES DANS VOTRE CAS EN MATIÈRE DE PARE-ÉTINCELLES.

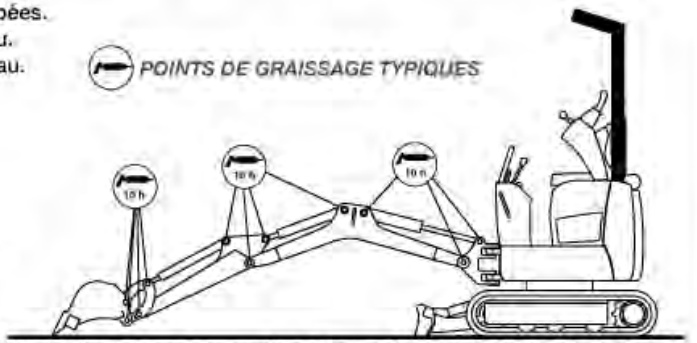
LISTE DE VÉRIFICATION ET PÉRIODICITÉ DES ENTRETIENS

★ Entretien uniquement pour les machines qui en sont équipées.
■ Effectuez l'entretien après 50 heures, puis selon le tableau.
▲ Effectuez l'entretien après 100 heures, puis selon le tableau.

TOUTES LES 8-10 HEURES D'UTILISATION

Vérifiez le niveau du liquide de refroidissement.
Vérifiez le niveau d'huile moteur.
Vérifiez le niveau du fluide hydraulique.
Vérifiez l'indicateur d'état du filtre à air.
Vérifiez et réglez la tension des chenilles.
Vérifiez le bon fonctionnement des témoins lumineux.
Vérifiez l'état du toit de protection et de la visserie de fixation.
Vérifiez l'état de la ceinture de sécurité et de ses fixations.
Vérifiez le bon fonctionnement du verrouillage du ou des tableaux de commande.
Vérifiez que les autocollants ne sont pas abîmés - Remplacez-les au besoin.
Vérifiez tous les points pivots de la machine. (Consultez les illustrations)
*Graissez la partie coulissante du bras extensible.
*Nettoyez le filtre du chauffage de la cabine.

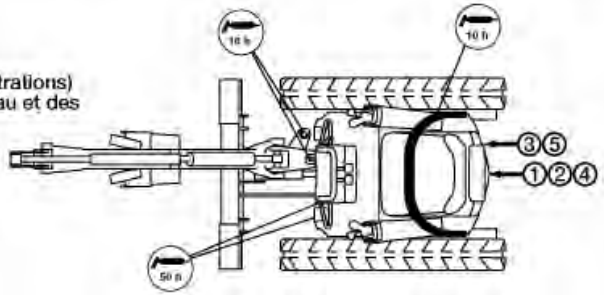
POINTS DE GRAISSAGE TYPIQUES



Disposition de la machine pour la vérification des niveaux de fluide hydraulique.

TOUTES LES 50 HEURES D'UTILISATION

Graissez le pignon et le cercle d'orientation. (Consultez les illustrations)
Purgez le réservoir de carburant et le filtre d'alimentation de l'eau et des sédiments.
Vérifiez la batterie, les câbles et le niveau d'électrolyte.



TOUTES LES 100 HEURES D'UTILISATION

■ Vérifiez et réglez la (les) courroie(s) au besoin.
Silencieux pare-étincelles - Videz la chambre à étincelles.

TOUTES LES 250 HEURES D'UTILISATION

Remplacez le filtre du carburant diesel. Vérifiez le niveau d'huile dans les deux carters de réduction finale.

TOUTES LES 500 HEURES D'UTILISATION

■ Remplacez l'huile et le filtre à huile moteur. Nettoyez le radiateur, le refroidisseur d'huile et le condenseur de la climatisation*.
▲ Remplacez le filtre hydraulique primaire.
▲ Vérifiez les connexions de l'alternateur et du démarreur.
Vérifiez et réglez le jeu des soupapes du moteur.

TOUTES LES 1 000 HEURES D'UTILISATION

▲ Remplacez l'huile dans les deux carters de réduction finale.
Videz et rincez le circuit de refroidissement - Remplacez le liquide de refroidissement.
Remplacez le fluide et le(s) filtre(s) hydrauliques - Nettoyez le réservoir.

BE PARTS & SERVICE SMART
Utilisez des pièces de rechange Bobcat® d'origine

TABLEAU DES FILTRES

		418
1.	FILTRE À AIR PRIMAIRE	6673752
2.	FILTRE À AIR SECONDAIRE	6673753
3.	FILTRE À HUILE MOTEUR	6671057
4.	FILTRE À CARBURANT	6667352
5.	FILTRE HYDRAULIQUE PRIMAIRE	6653336

• Consultez les illustrations ci-dessus pour les emplacements de filtres.

CONSULTEZ LE MANUEL D'UTILISATION ET D'ENTRETIEN POUR DES INSTRUCTIONS ET DES INFORMATIONS SUPPLÉMENTAIRES

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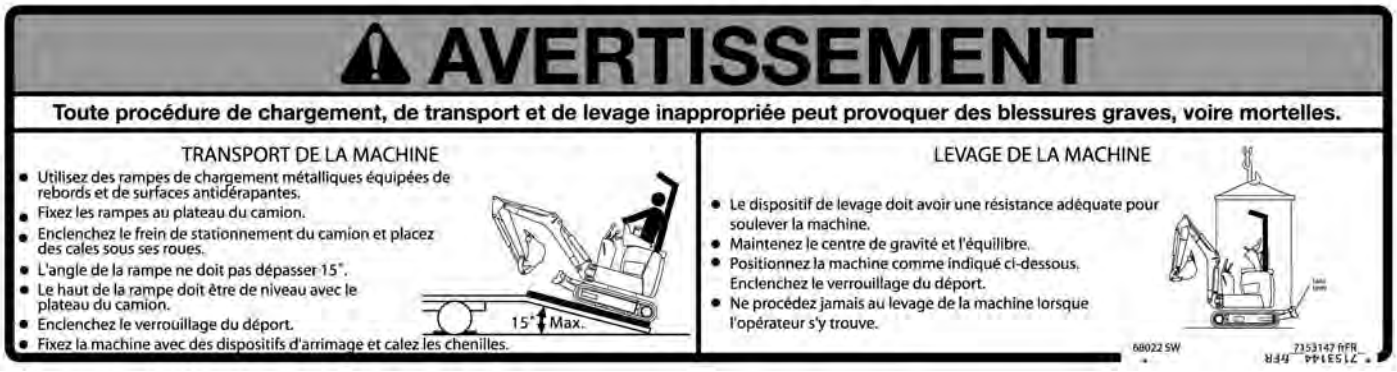
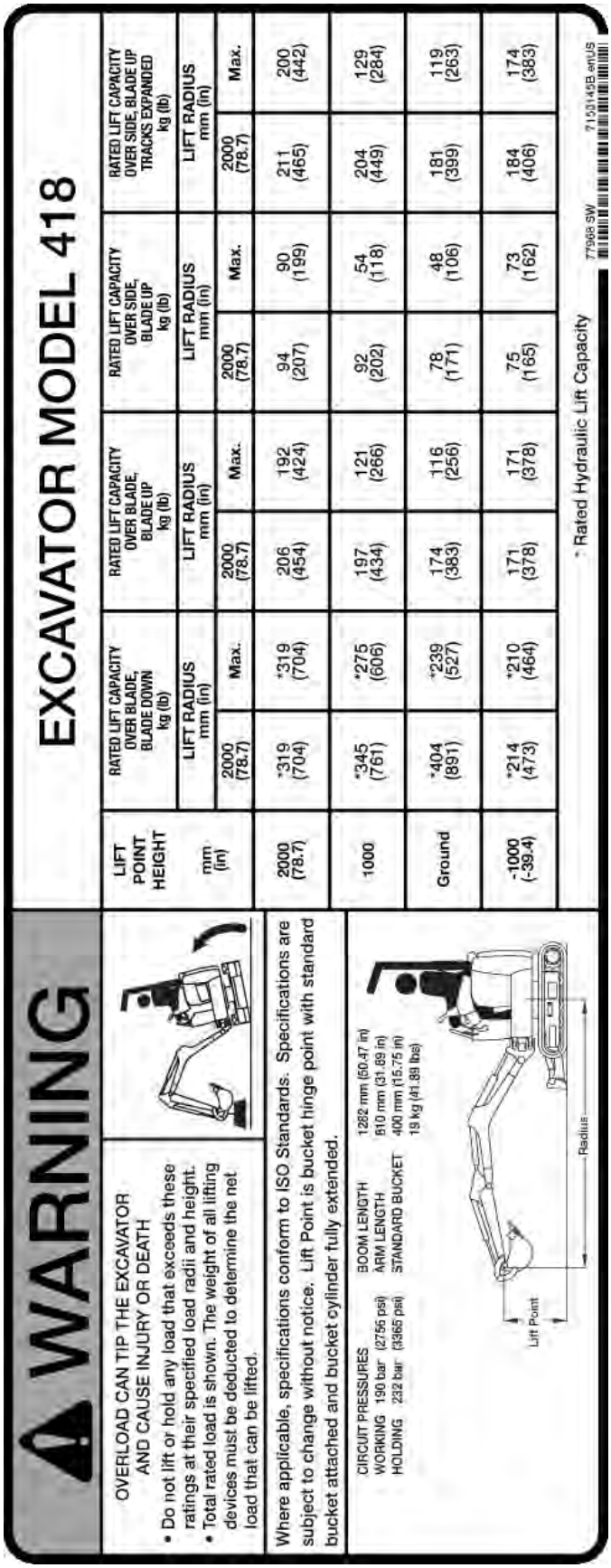
MACHINE SIGN TRANSLATIONS (CONT'D)

Warning (7153147)



Lift Chart (7153145)



⚠ WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

- Do not lift or hold any load that exceeds these ratings at their specified 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.

Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

CIRCUIT PRESSURES
WORKING 190 bar (2756 psi)
HOLDING 232 bar (3365 psi)

BOOM LENGTH 1282 mm (50.47 in)
ARM LENGTH 610 mm (31.89 in)
STANDARD BUCKET 400 mm (15.75 in) 19 kg (41.89 lbs)

Lift Point

Radius

EXCAVATOR MODEL 418

LIFT POINT HEIGHT mm (in)	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN kg (lb)		RATED LIFT CAPACITY OVER BLADE, BLADE UP kg (lb)		RATED LIFT CAPACITY OVER SIDE, BLADE UP kg (lb)		RATED LIFT CAPACITY OVER SIDE, BLADE UP TRACKS EXPANDED kg (lb)	
	LIFT RADIUS mm (in)		LIFT RADIUS mm (in)		LIFT RADIUS mm (in)		LIFT RADIUS mm (in)	
	2000 (78.7)	Max.	2000 (78.7)	Max.	2000 (78.7)	Max.	2000 (78.7)	Max.
2000 (78.7)	*319 (704)	*319 (704)	206 (454)	192 (424)	94 (207)	90 (199)	211 (465)	200 (442)
1000	*345 (761)	*275 (606)	197 (434)	121 (266)	92 (202)	54 (118)	204 (449)	129 (284)
Ground	*404 (891)	*239 (527)	174 (383)	116 (256)	78 (171)	48 (106)	181 (399)	119 (263)
-1000 (-39.4)	*214 (473)	*210 (464)	171 (378)	171 (378)	75 (165)	73 (162)	184 (406)	174 (383)

* Rated Hydraulic Lift Capacity

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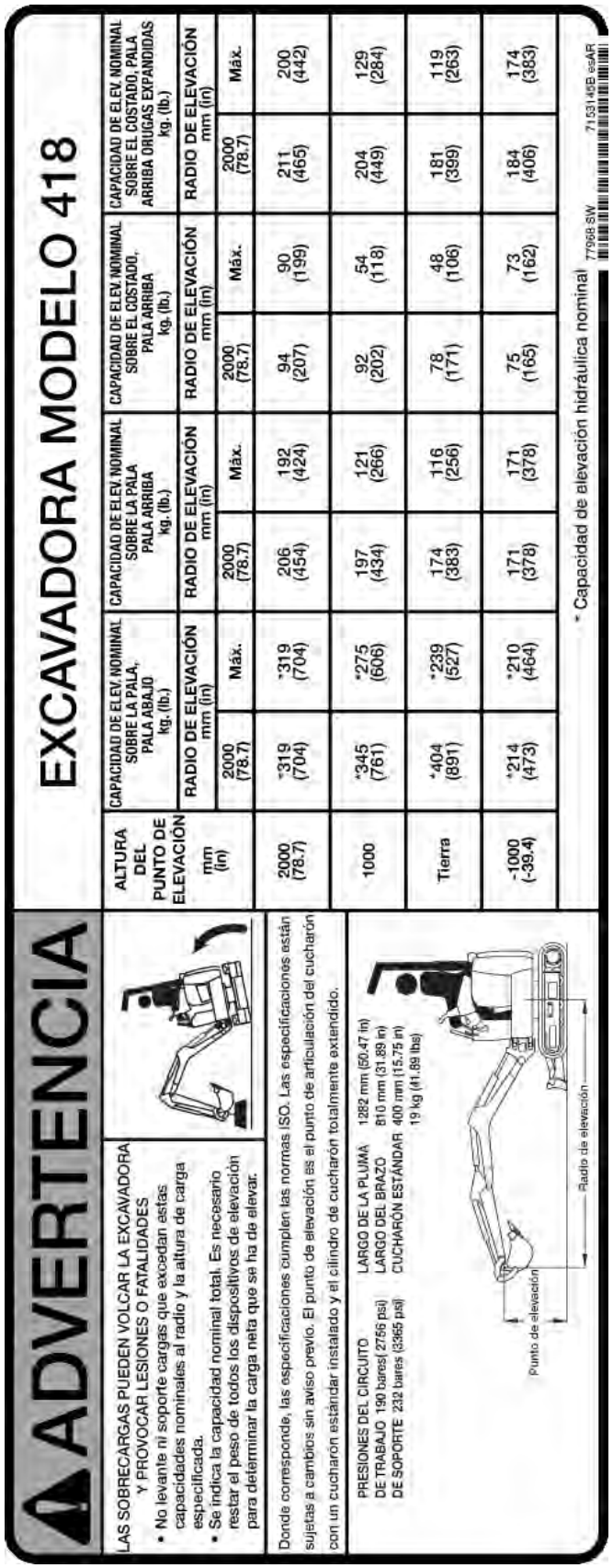
Lift Chart (7153145) (Cont'd)



⚠ ADVERTENCIA

LAS SOBRECARGAS PUEDEN VOLCAR LA EXCAVADORA Y PROVOCAR LESIONES O FATALIDADES

- No levante ni soporte cargas que excedan estas capacidades nominales al radio y la altura de carga especificada.
- Se indica la capacidad nominal total. Es necesario restar el peso de todos los dispositivos de elevación para determinar la carga neta que se ha de elevar.

Donde corresponde, las especificaciones cumplen las normas ISO. Las especificaciones están sujetas a cambios sin aviso previo. El punto de elevación es el punto de articulación del cucharón con un cucharón estándar instalado y el cilindro de cucharón totalmente extendido.

PRESIONES DEL CIRCUITO
DE TRABAJO 190 bares (2756 psi)
DE SOPORTE 232 bares (3365 psi)

LARGO DE LA PLUMA 1282 mm (50.47 in)
LARGO DEL BRAZO 810 mm (31.89 in)
CUCHARÓN ESTÁNDAR 400 mm (15.75 in)
19 kg (41.89 lbs)

Punto de elevación

Radio de elevación

EXCAVADORA MODELO 418

ALTURA DEL PUNTO DE ELEVACIÓN mm (in)	CAPACIDAD DE ELEV. NOMINAL SOBRE LA PALA, PALA ABAJO kg. (lb.)		CAPACIDAD DE ELEV. NOMINAL SOBRE LA PALA PALA ARRIBA kg. (lb.)		CAPACIDAD DE ELEV. NOMINAL SOBRE EL COSTADO, PALA ARRIBA kg. (lb.)		CAPACIDAD DE ELEV. NOMINAL SOBRE EL COSTADO, PALA ARRIBA ORUGAS EXPANDIDAS kg. (lb.)	
	RADIO DE ELEVACIÓN mm (in)		RADIO DE ELEVACIÓN mm (in)		RADIO DE ELEVACIÓN mm (in)		RADIO DE ELEVACIÓN mm (in)	
	2000 (78.7)	Máx.	2000 (78.7)	Máx.	2000 (78.7)	Máx.	2000 (78.7)	Máx.
2000 (78.7)	*319 (704)	*319 (704)	206 (454)	192 (424)	94 (207)	90 (199)	211 (465)	200 (442)
1000	*345 (761)	*275 (606)	197 (434)	121 (266)	92 (202)	54 (118)	204 (449)	129 (284)
Tierra	*404 (891)	*239 (527)	174 (383)	116 (256)	78 (171)	48 (106)	181 (399)	119 (263)
-1000 (-39.4)	*214 (473)	*210 (464)	171 (378)	171 (378)	75 (165)	73 (162)	184 (406)	174 (383)

* Capacidad de elevación hidráulica nominal

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Lift Chart (7153145) (Cont'd)

AVERTISSEMENT

TOUTE SURCHARGE PEUT ENTRAÎNER LE RENVERSEMENT DE L'EXCAVATRICE ET PROVOQUER DES BLESSURES GRAVES, VOIRE MORTELLES.

- Ne levez et ne transportez jamais des charges qui dépassent ces capacités au rayon et à la hauteur spécifiés.
- La charge nominale totale est indiquée. Le poids des équipements de levage doit être déduit pour calculer la charge nette de levage possible.

Le cas échéant, les caractéristiques techniques sont conformes aux normes ISO. Les spécifications peuvent être modifiées sans préavis. Le point de levage s'entend comme le point d'articulation du godet (godet standard) avec le vérin de godet en extension complète.

PRESSIONS DES CIRCUITS
EN SERVICE 150 bars (2 756 lb/po²)
EN MAINTIEN 232 bars (3 365 lb/po²)

LONGUEUR DE LA FLÈCHE 1 282 mm (50,47 po)
LONGUEUR DU BALANCIER 810 mm (31,89 po)
GODET STANDARD 400 mm (15,75 po)
19 kJ (41,69 lb)

Point de levage

Rayon

EXCAVATRICE MODÈLE 418

HAUTEUR DU POINT DE LEVAGE mm (po)	CAPACITÉ DE LEVAGE NOMINALE EXTRÉMITÉ LAME, CELLE-CI ÉTANT BAISSÉE kg (lb)		CAPACITÉ DE LEVAGE NOMINALE EXTRÉMITÉ LAME, CELLE-CI ÉTANT RELEVÉE kg (lb)		CAPACITÉ DE LEVAGE NOMINALE, LATÉRALE, AVEC LAME RELEVÉE kg (lb)		CAPACITÉ DE LEVAGE NOMINALE, LATÉRALE, AVEC LAME RELEVÉE, CHENILLES ÉCARTÉES kg (lb)	
	RAYON DE LEVAGE mm (po)		RAYON DE LEVAGE mm (po)		RAYON DE LEVAGE mm (po)		RAYON DE LEVAGE mm (po)	
	2 000 (78,7)	Max.	2 000 (78,7)	Max.	2 000 (78,7)	Max.	2 000 (78,7)	Max.
2 000 (78,7)	*319 (704)	*319 (704)	206 (454)	192 (424)	94 (207)	90 (199)	211 (465)	200 (442)
1 000	*345 (761)	*275 (606)	197 (434)	121 (266)	92 (202)	54 (118)	204 (449)	129 (284)
Au niveau du sol	*404 (891)	*239 (527)	174 (383)	116 (256)	78 (171)	48 (106)	181 (399)	119 (263)
-1 000 (-39,4)	*214 (473)	*210 (464)	171 (378)	171 (378)	75 (165)	73 (162)	184 (406)	174 (383)

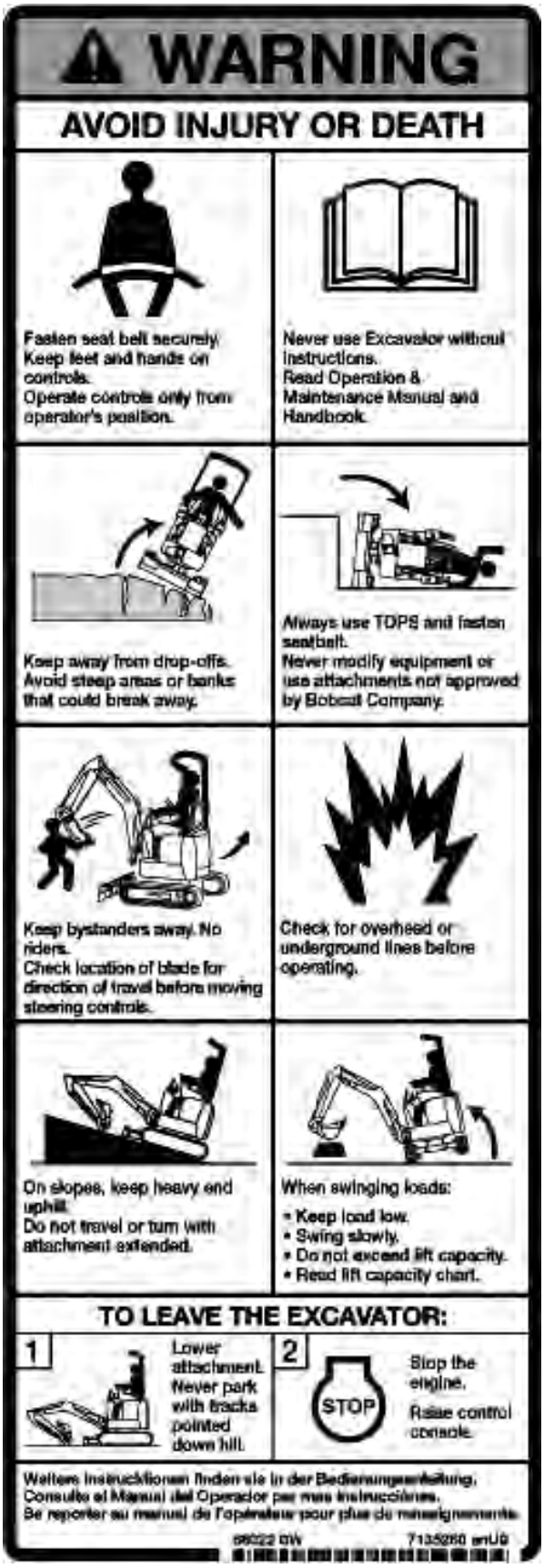
* Capacité de levage hydraulique nominale

77968 SW

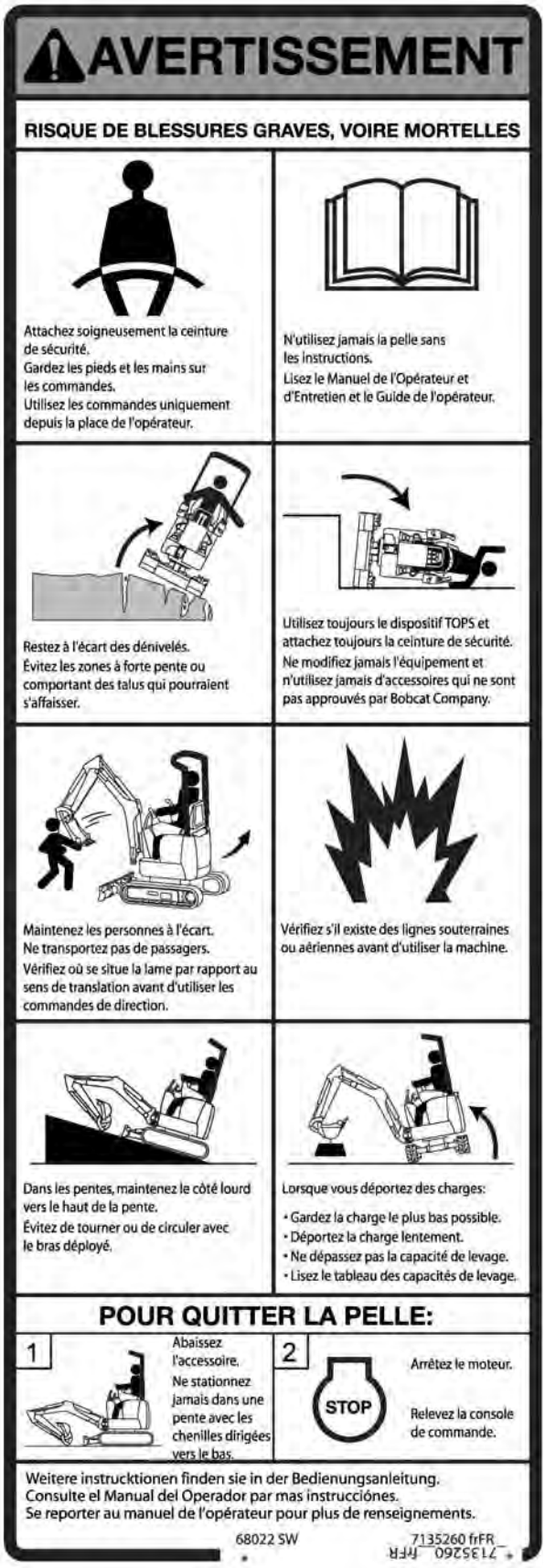
7153145B frCA

MACHINE SIGN TRANSLATIONS (CONT'D)

Warning (7135260)



Warning (7135260) (Cont'd)

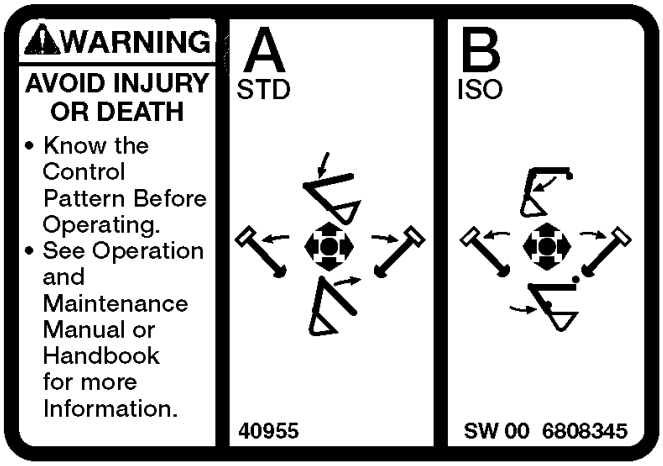


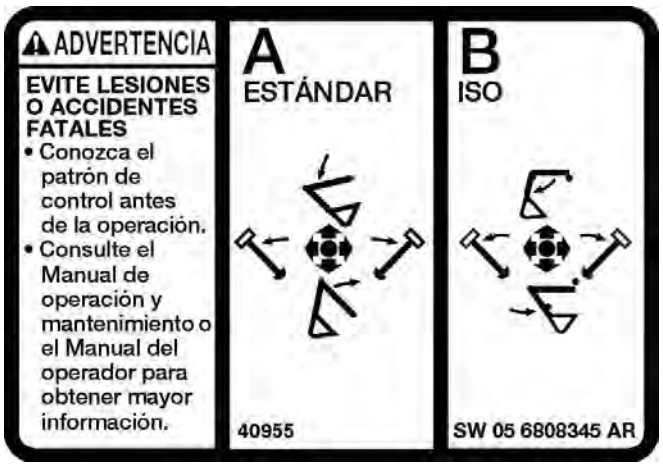
Warning (6708929)

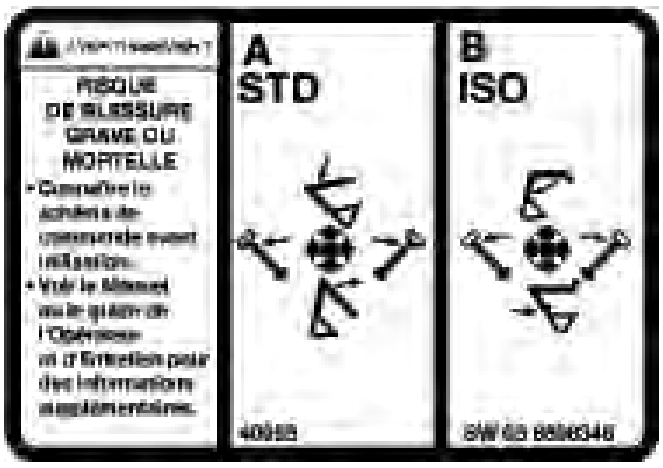
Warning 6576048)

Warning (6804233)

Warning (6808345)







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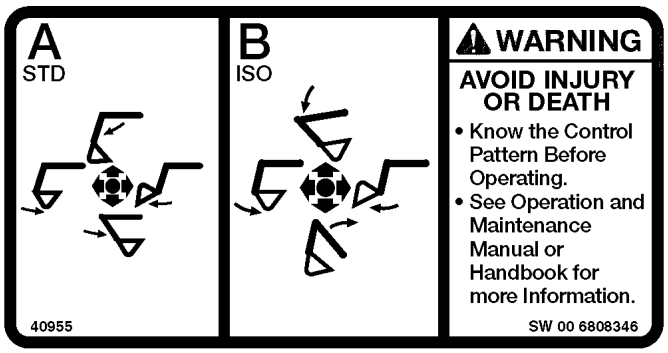
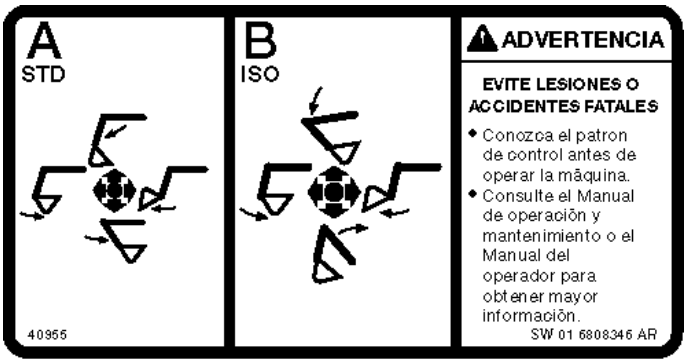
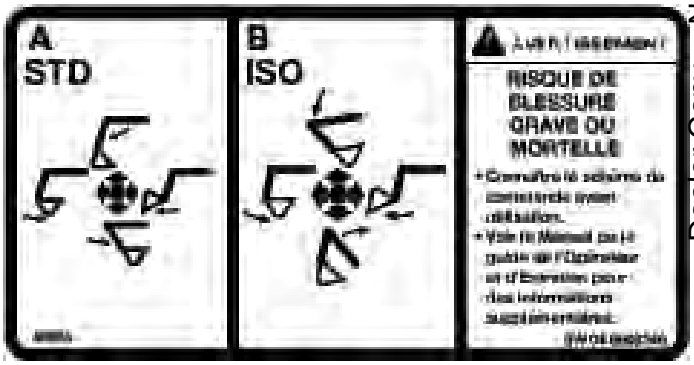
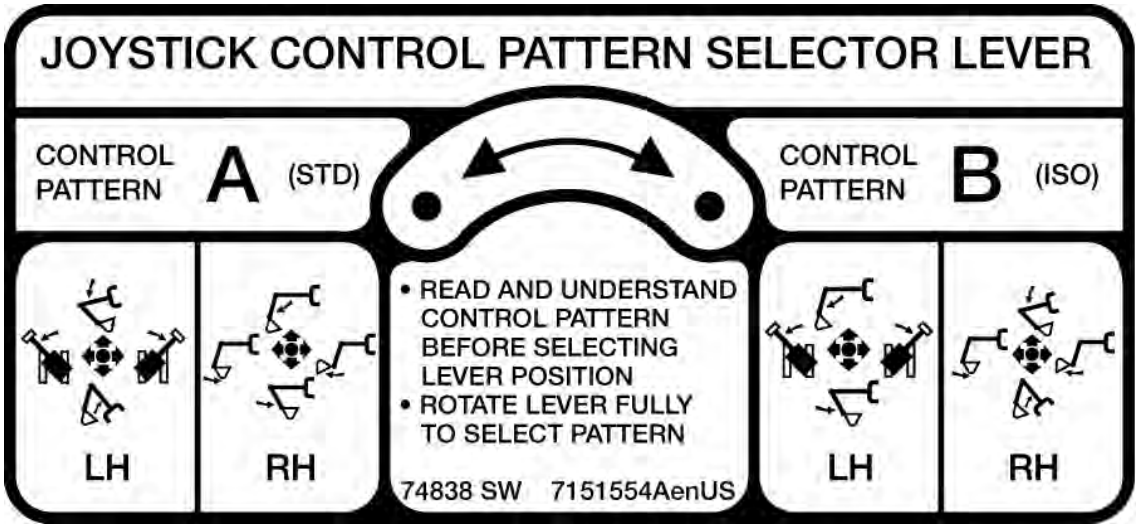






MACHINE SIGN TRANSLATIONS (CONT'D)

Joystick Control Pattern Selector Lever (7151554)

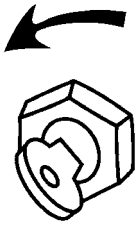


Warning (6810004)

Warning (7169006)

MACHINE SIGN TRANSLATIONS (CONT'D)

Warning (6589058)

KEY SWITCH PRE-HEAT POSITION	AIR TEMP.	PREHEAT TIME (SECONDS)
	41°F (5°C) and Above	0 - 10
	32°F to 41°F (0° to 5°C)	10
	32°F (0°C) and Below	10 - 30 MAX - 45

SEE OPERATOR'S MANUAL FOR MORE INSTRUCTIONS
WEITERE INSTRUKTIGNEN FINDEN SIE IN DER BEDIENUNGSANLEITUNG
CONSULTA EL MANUAL DEL OPERADOR PARA MAS INSTRUCCIONES. SE
REPORTER AU MANUAL DE L'OPERATEUR POUR PLUS ENSEIGNEMENT.

39894 SW 98 6589058

INTERRUPTOR DE LA LLAVE POSICION DE PRECALENTAMINENTO	TEMP. DEL AIRE	TIEMPO DE PRECALENTAMIENTO (SEGUNDOS)
	41°F (5°C) y más	0 - 10
	32° F a 41°F (0° a 5°C)	10
	32°F (0°C) y por abajo	10 - 30 MÁX - 45

CONSULTE EL MANUAL DE OPERACIÓN Y MANTENIMIENTO PARA OBTENER MÁS INSTRUCCIONES.

39894 SW 01 6589058 AR

POSITION PRECHAUFFAGE	TEMPERATURE AIR	TEMPS PRECHAUFFAGE (SECONDES)
	5° C et au-dessus	0 - 10
	0° à 5° C	10
	0° C et en-dessous	10 - 30 Max. 45

SE REPORTER AU MANUEL DE L'OPERATEUR ET D'ENTRETIEN POUR PLUS DE RENSEIGNEMENTS.

39894 DV-99-6589058-FR

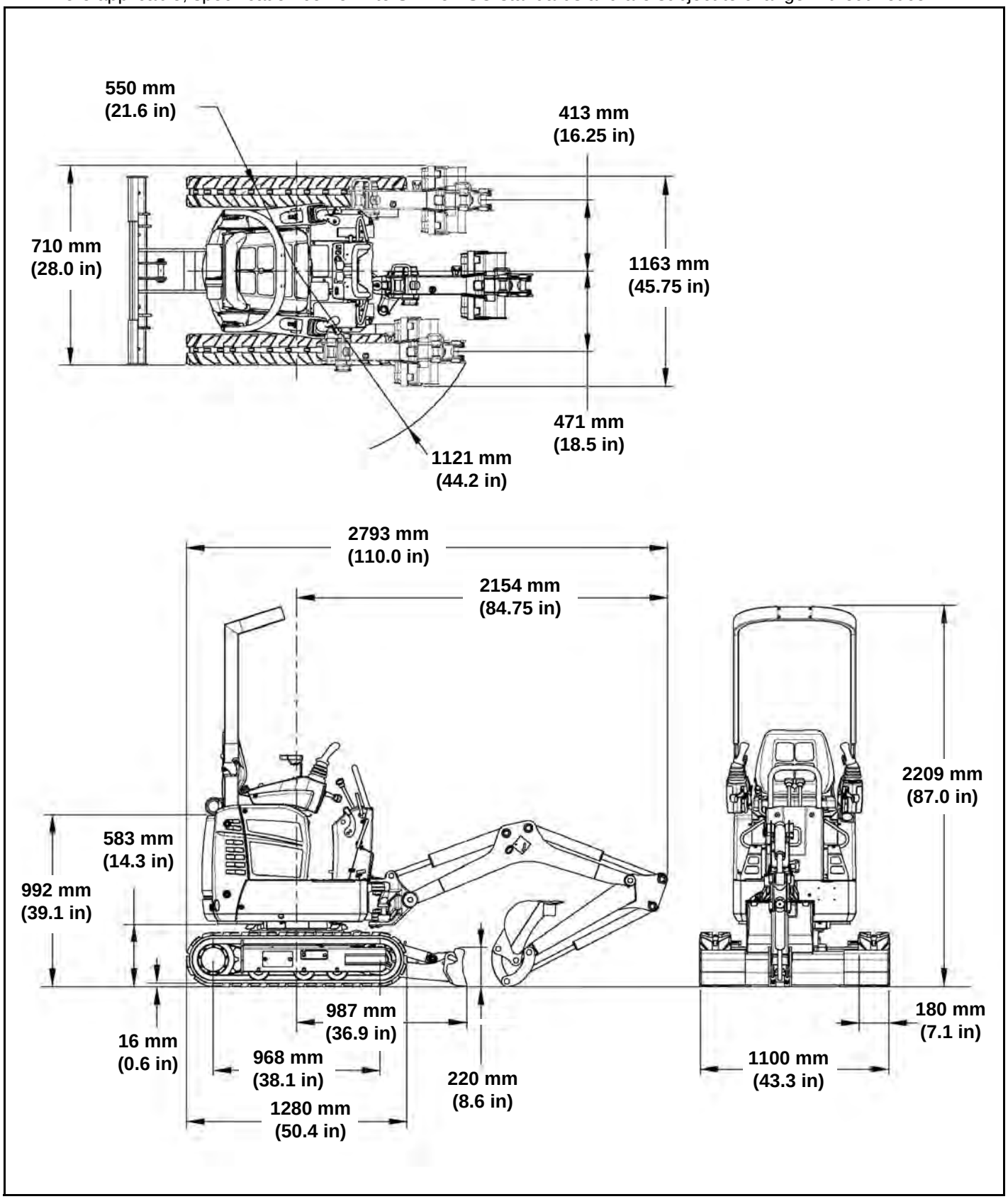
Warning (7161612)

SPECIFICATIONS

EXCAVATOR SPECIFICATIONS

Excavator Machine Dimensions

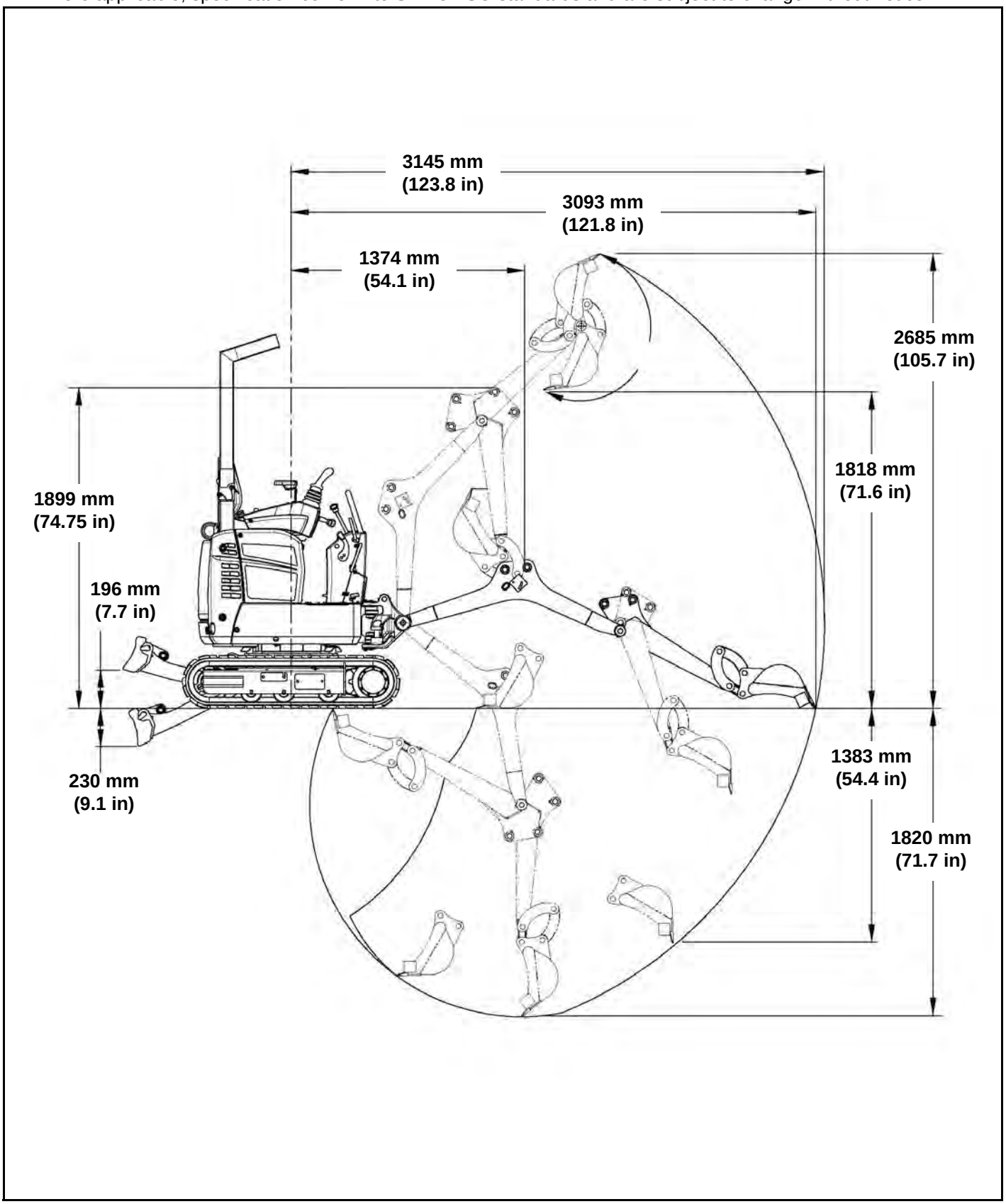
- Where applicable, specification conform to SAE or ISO standards and are subject to change without notice.



EXCAVATOR SPECIFICATIONS (CONT'D)

Excavator Machine Dimensions (Cont'd)

- Where applicable, specification conform to SAE or ISO standards and are subject to change without notice.



EXCAVATOR SPECIFICATIONS (CONT'D)

Performance

418	
418 operating weight w/ canopy, rubber tracks, and standard bucket (without operator)	1176 kg (2593 lb)
Travel Speed (Low / High)	Low Range 2.1 km/h (1.3 mph) High Range 3.1 km/h (2.1mph)
Digging Force (per ISO 6015)	Arm - 5550 N (1248 lbf) Bucket 8294 N (1865 lbf)
Boom Swing (Offset)	Left 67° - Right 64°

Controls

Steering	Two hand levers control speed and direction
Hydraulics	Right and left joysticks control boom, bucket, arm and swing
Auxiliary Hydraulics	Left foot pedal controls auxiliary hyd.
Boom swing	Right foot pedal controls boom swing
Blade	Separate hand lever controls blade
Engine	Hand Lever engine speed
Starting Aid	Glow Plug
Brakes Service Holding Swing Service Holding	 Hydraulic lock in motor circuit Hydraulic lock on motor Locking Pin

EXCAVATOR SPECIFICATIONS (CONT'D)

Engine (418 S/N AB4711001 & Above)

Make / Model	Kubota D722 - E3B - BCZ - 6 (TIER 4)
Fuel / Cooling	Diesel / Liquid, forced circulation
Horsepower (SAE Net)	7.4 kW (9.9 hp) @ 2000 rpm
Torque @ 1600 rpm (SAE Net)	39.1 N•m (28.8 lb-ft)
Number Of Cylinders	3
Displacement	0.719 L (43.9 in^3)
Bore / Stroke	67 mm (2.64 in) x 68 mm (2.68 in)
Lubrication	Forced lubrication / Cartridge type filter
Crankcase Ventilation	Closed Breather
Air Cleaner	Dual dry replacement paper elements
Ignition	Diesel-Compression ignited
Low Idle Speed	1300 - 1400 rpm
High Idle Speed	2370 rpm
Engine Coolant	Propylene Glycol / water mixture (53% PG / 47% water)

Engine (418 S/N B39211001 & Above)

Make / Model	Kubota D722 - E4B - BCZ - 6 (TIER 4 NRTC)
Fuel / Cooling	Diesel / Liquid, forced circulation
Horsepower (SAE Net)	7.4 kW (9.9 hp) @ 2000 rpm
Torque @ 1600 rpm (SAE Net)	39.1 N•m (28.8 lb-ft)
Number Of Cylinders	3
Displacement	0.719 L (43.9 in^3)
Bore / Stroke	67 mm (2.64 in) x 68 mm (2.68 in)
Lubrication	Forced lubrication / Cartridge type filter
Crankcase Ventilation	Closed Breather
Air Cleaner	Dual dry replacement paper elements
Ignition	Diesel-Compression ignited
Low Idle Speed	1300 - 1400 rpm
High Idle Speed	2370 rpm
Engine Coolant	Propylene Glycol / water mixture (53% PG / 47% water)

EXCAVATOR SPECIFICATIONS (CONT'D)

Hydraulic System

Pump - Hydraulic	double gear pump
Pump Capacity	2 @ 10.0 L/min (2.64 U.S. gpm)
Auxiliary Flow	20.0 L/min (5.28 U.S. gpm)
Control Valve	9 spool, parallel type open center
Fluid Type	Bobcat Fluid, Hydraulic / Hydrostatic 6903117 - (2.5 U.S. gal) 6903118 - (5 U.S. gal) 6903119 - (55 U.S. gal)
System Relief Pressure	19000 kPa (190 bar) (2756 psi)
Slew Relief Pressure	8400 kPa (84 bar) (1218 psi)
Joystick Pressure	30000 kPa (300 bar) (4351 psi)
Port Relief Arm Base	22500 kPa (225 bar) (3263 psi)
Port Relief Boom Base	23200 kPa (232 bar) (3365 psi)
Hydraulic Filter Bypass	172 kPa (1,72 bar) (25 psi)

Hydraulic Cylinders

Cylinder	Bore	Rod	Stroke
Boom cushion - boom up	63.5 mm (2.50 in)	31.8 mm (1.25 in)	312.4 mm (12.30 in)
Arm	50.8 mm (2.00 in)	31.8 mm (1.25 in)	325.6 mm (12.82 in)
Bucket	44.5 mm (1.75 in)	25.4 mm (1 in)	385.1 mm (15.16 in)
Boom Swing	57.1 mm (2.25 in)	31.8 mm (1.25 in)	274.6 mm (10.81 in)
Blade	50.8 mm (2.00 in)	31.8 mm (1.25 in)	96.8 mm (3.81 in)
Undercarriage	44.5 mm (1.75 in)	25.4 mm (1.00 in)	400.1 mm (15.75 in)

Hydraulic Cycle Times

Bucket Curl	3.2 seconds
Bucket Dump	2.3 seconds
Arm Retract	3.9 seconds
Arm Extend	2.6 seconds
Boom Raise	4.2 seconds
Boom Lower	4.2 seconds
Boom Swing Left	4.1 seconds
Boom Swing Right	3.2 seconds
Blade Raise	1.7 seconds
Blade Lower	1.2 seconds
Undercarriage expand	5.0 seconds
Undercarriage retract	3.5 seconds

Drive System

Drive Motor	Each track is driven by axial piston motor
Type of Reduction	18.53:1 Two stage planetary

Slew System

Swing Motor	Orbit Motor
Swing Circle	Single row shear type ball bearing with internal gear
Swing Speed	9.0 rpm

Undercarriage

Crawler Track Design	Sealed track rollers with box section track, Roller frame, Grease type track adjusters
Width of crawler	Retracted 710 mm (27.9 in) Extended 1100 mm (43.3 in)

Electrical

Alternator	12 volt, 40 amp open frame w/ internal regulator
Battery	12 volt negative ground, cold cranking current / 530 amp at -18°C (-0.4°F), 75 min. reserve
Starter	12 volt, 1.4 kW reduction drive

Capacities

Fuel Tank	16.0 L (16.9 qt)
Hydraulic Reservoir	2,6 L (2.75 qt)
Cooling System	3.0 L (3.2 qt)
Engine Oil and Filter	3,5 L (3.75 qt)
Final Drive Case (each)	0,5 L (0.53 qt)

Tracks

Type	Rubber
Width	180 mm (7.1 in)
Number Of Shoes	Single Assembly
Number of Track Rollers (per side)	3

Ground Pressure

Ground Pressure	29,7 kPa (0,297 bar) (4.31 psi)

WARRANTY

Bobcat Excavators

Bobcat Company warrants to its authorized dealers and authorized dealers of Bobcat Equipment Ltd., who in turn warrant to the owner, that each new Bobcat Excavator will be free from proven defects in material and workmanship with respect to (i) all components of the product except as otherwise specified herein for twelve (12) months, (ii) tracks for twelve (12) months on a prorated basis based on the remaining depth of the track at the time any defect is discovered, and (iii) Bobcat brand batteries, for an additional twelve (12) months after the initial twelve month warranty period, provided that Bobcat Company shall only reimburse a fixed portion of the cost of replacing the battery during such additional twelve months. The foregoing time periods shall all commence after delivery by the authorized Bobcat dealer to the original buyer.

During the warranty period, the authorized Bobcat dealer shall repair or replace, at Bobcat Company's option, without charge for parts and labor, any part of the Bobcat product except as otherwise specified herein which fails because of defects in material or workmanship. The owner shall provide the authorized Bobcat dealer with prompt written notice of the defect and allow reasonable time for repair or replacement. Bobcat Company may, at its option, require failed parts to be returned to the factory. Travel time of mechanics and transportation of the Bobcat product to the authorized Bobcat dealer for warranty work are the responsibility of the owner. The remedies provided in this warranty are exclusive.

This warranty does not apply to diesel engine fuel injection pumps and injectors. The owner shall rely solely on the warranty, if any, of the respective manufacturers thereof. This warranty does not cover replacement of scheduled service items such as oil, filters, tune-up parts, and other high-wear items. This warranty does not cover damages resulting from abuse, accidents, alterations, use of the Bobcat product with any accessory or attachment not approved by Bobcat Company, air flow obstructions, or failure to maintain or use the Bobcat product according to the instructions applicable to it.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES AND CONDITIONS, EXCEPT THE WARRANTY OF TITLE. BOBCAT COMPANY DISCLAIMS ALL OTHER WARRANTIES AND CONDITIONS, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL BOBCAT COMPANY OR THE AUTHORIZED BOBCAT DEALER BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHATSOEVER, INCLUDING, BUT NOT LIMITED TO, LOSS OR INTERRUPTION OF BUSINESS, LOST PROFITS, OR LOSS OF MACHINE USE, WHETHER BASED ON CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY, STATUTE OR OTHERWISE, EVEN IF BOBCAT COMPANY OR THE AUTHORIZED BOBCAT DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE TOTAL LIABILITY OF BOBCAT COMPANY AND THE AUTHORIZED BOBCAT DEALERS WITH RESPECT TO THE PRODUCT AND SERVICES FURNISHED HEREUNDER SHALL NOT EXCEED THE PURCHASE PRICE OF THE PRODUCT UPON WHICH SUCH LIABILITY IS BASED.

Bobcat®

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In this emissions limited warranty, the term "Manufacturer" means Kubota Corporation as the holder of the U.S. Environmental Protection Agency (U.S. EPA) Certificate of Conformity and California Executive Order for the vehicle. The emission control limited warranty is in addition to the standard limited warranty for your vehicle.

Your Bobcat dealer is authorized to perform all warranty and service repairs on your diesel engine. To locate a Bobcat dealer, visit www.bobcat.com or call 1-800-743-4340.

KUBOTA Corporation

FEDERAL & CALIFORNIA EMISSION CONTROL SYSTEMS LIMITED WARRANTY for NON-ROAD ENGINES (CI)

The U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and KUBOTA Corporation are pleased to explain the Federal and California Emission Control System Warranty on your non-road engine. In California, new heavy duty off-road engines must be designed, built and equipped to meet California's stringent anti-smog standards adopted by the Air Resources Board pursuant to its authority in Chapter 1 and 2, Part 5, Division 26 of the California Health and Safety Code. In other states of the U.S.A., new non-road engines subject to the provisions of 40 CFR 1039 subpart A must be designed, built and equipped, at the time of sale, to meet the U.S. EPA regulations for nonroad engines.

KUBOTA must warrant the emission control system on your Compression Ignition engine for the period of time listed below provided there has been no abuse, vandalism, neglect, improper maintenance or unapproved modifications to your engine. This emission warranty is applicable in all states of the U.S.A., its provinces and territories regardless of whether an individual state, province, or territory has enacted warranty provisions that differ from the Federal warranty provisions. This emission warranty is also applicable in all provinces and territories of CANADA.

Your emission control system may include parts such as the fuel injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, KUBOTA will repair your engine at no cost to you, including diagnosis (if the diagnostic work is performed at an authorized dealer), parts and labor.

EMISSION DESIGN AND DEFECT WARRANTY COVERAGE

The emissions warranty period for the engine begins on the original date of sale to the initial purchaser and continues for each subsequent purchaser for the period mentioned below.

The emissions warranty period for all engines rated under 19kW (25Hp) is 2000 hours of operation or two (2) years of use, whichever first occurs.

The emissions warranty period for constant speed engines rated under 37kW (50Hp) with rated speeds greater than or equal to 3000 rpm is 2000 hours of operation or two (2) years of use, whichever first occurs.

The emissions warranty period for all other engines not already listed is 3000 hours of operation or five (5) years of use, whichever first occurs.

If any emission related part on your engine is defective, the part will be repaired or replaced by KUBOTA free of charge.

OWNER'S WARRANTY RESPONSIBILITIES

(a) As the engine owner, you are responsible for the performance of the required maintenance listed in your KUBOTA operator's manual. KUBOTA recommends that you retain all receipts covering maintenance on your engine, but KUBOTA cannot deny a warranty claim solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

(b) As the engine owner, you should be aware, however, that KUBOTA may deny your warranty coverage if your engine or a part has failed due to abuse, vandalism, neglect, improper maintenance or unapproved modifications.

(c) Your engine is designed to operate on Ultra Low Sulfur Diesel Fuel only. Use of any other fuel may result in your engine no longer operating in compliance with Federal or California's emissions requirements.

(d) You are responsible for presenting your engine to the nearest dealer or service station authorized by KUBOTA when a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

(e) If you have any questions regarding your warranty rights and responsibilities or the location of the nearest authorized dealer or distributor, you should contact: KUBOTA ENGINE AMERICA CORPORATION, Service department at 1-800-532-9808, EEWRI@kubotaengine.com or KUBOTA TRACTOR CORPORATION, National Service Department at 1-800-558-2682, KubotaEmissionsWarranty@kubota.com or KUBOTA CANADA LTD at (905) 294-7477.

COVERAGE

KUBOTA warrants to the initial purchaser and each subsequent purchaser that your engine will be designed, built and equipped, at the time of sale, to meet all applicable regulations. KUBOTA also warrants to the initial purchaser and each subsequent purchaser that your engine shall be free from defects in materials and workmanship which cause the engine to fail to conform to applicable regulations for the period mentioned above from the original date of sale.

KUBOTA shall remedy warranty defects at any authorized KUBOTA engine dealer or warranty station. Any authorized work done at an authorized dealer or warranty station shall be free of charge to the owner if such work determines that a warranted part is defective. Any KUBOTA approved or equivalent replacement part (including any KUBOTA approved aftermarket part) may be used for any warranty maintenance or repairs on emission related parts, and must be provided free of charge to the owner if the part is still under warranty.

KUBOTA is liable for damages to other engine components caused by the failure of a warranted part still under warranty. The use of replacement parts not equivalent to the original parts may impair the effectiveness of your engine emission control system. If such a replacement part is used in the repair or maintenance of your engine, and KUBOTA determines it is defective or causes a failure of a warranted part, your claim for repair of your engine may be denied.

Listed below are the parts covered by the Federal and California Emission Control Systems Warranty. Some parts listed below may require scheduled maintenance and are warranted up to the first scheduled replacement point for that part. The warranted parts are (if applicable):

1) Air-Induction System
   a) Intake Manifold
   b) Turbocharger System
   c) Charge Air Cooling System (Intercooler)
2) Catalyst or Thermal Reactor System
   a) Catalytic converter
   b) Exhaust manifold
3) Fuel Injection System
   a) Fuel Supply Pump
   b) Injector
   c) Injection Pipe
   d) Common Rail
   e) Smoke Puff Limiter
   f) Speed Timer
   g) Cold Advance Timer
   h) Injection Pump
4) Electronic Control System
   a) ECU
   b) Engine Speed / Timing Sensor
   c) Accelerator Position Sensor
   d) Coolant Temperature Sensor
   e) Atmospheric Pressure Sensor
   f) Intake Pressure Sensor
   g) Intake Manifold Temperature Sensor
   h) Intake Air Flow Sensor
   i) Common Rail Pressure Sensor
5) Exhaust Gas Recirculation System
   a) EGR Valve
   b) EGR Cooler
   c) EGR Valve Opening Rate Sensor
6) Particulate Controls
   a) Any device used to capture particulate emissions.
   b) Any device used in the regeneration of the particulate control device.
   c) Control Device Enclosures and Manifolding
   d) Diesel Particulate Filter Temperature Sensor
   e) Differential Pressure Sensor
7) Miscellaneous Items
   a) Closed Breather System
   b) Hoses*, Clamps*, Fittings, Tubing*
   c) Gaskets, Seals
   d) Kubota supplied engine Wiring Harnesses
   e) Kubota supplied engine Elec. Connectors
   f) Air Cleaner Element*, Fuel Filter Element*
   g) Emission Control Information Labels

*Warranty period is equivalent to manufacturer's recommended first replacement interval as stated in the applicable model's operator's manual and/or service (workshop) manual.

MAINTENANCE REQUIREMENTS

The owner is responsible for the performance of the required maintenance as defined by KUBOTA in the operator's manual.

LIMITATIONS

This Emission Control System Warranty shall not cover any of the following;

(a) Repair or replacement required because of misuse or neglect, improper maintenance, repairs improperly performed or replacements not conforming to KUBOTA specifications that adversely affect performance and/or durability, and alteration or modifications not recommended or approved in writing by KUBOTA.

(b) Replacement of parts and other services and adjustments necessary for required maintenance at and after the first scheduled replacement point.

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Bobcat

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ALPHABETICAL INDEX