Bobcat®

Operation & Maintenance Manual

Dealer Copy -- Not for Resale

E50

Compact Excavator

S/N AG3N14000 & Above

6990448enUS (07-18) (F)

Printed in U.S.A.

NA iT4-K

OPERATOR SAFETY WARNING

WARNING

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

W-2001-0502

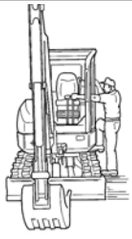
Safety Alert Symbol: **This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.**

CORRECT

P-90216

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

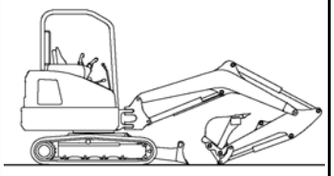
WRONG



NA1418

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

CORRECT



NA1435B

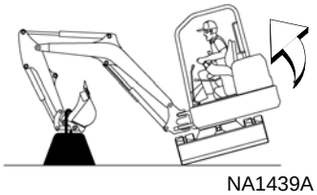
- **Never operate without approved cab / canopy.**
- **Never modify equipment.**
- **Never use attachments not approved by Bobcat Company.**

WRONG

NA1419

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

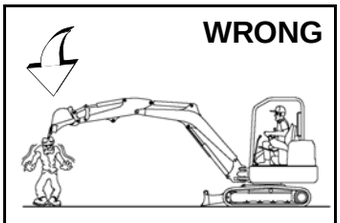
WRONG



NA1439A

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

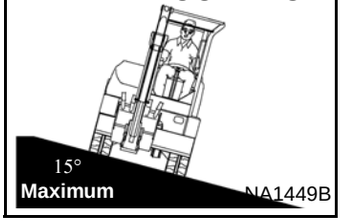
WRONG



NA1445A

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

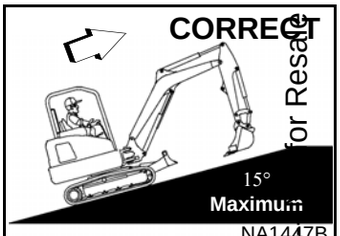
CORRECT



NA1449B

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

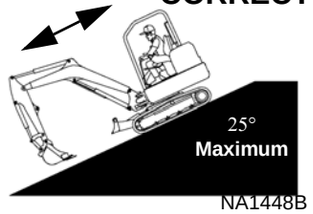
CORRECT



NA1447B

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

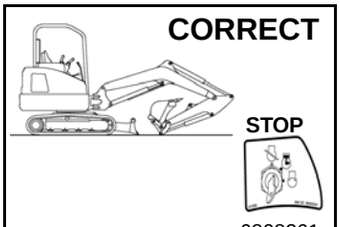
CORRECT



NA1448B

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

CORRECT



NA1435B 6808261

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

CORRECT

B-21928

- **Fasten seat belt securely.**
- **Operate controls only from operator's seat.**

CORRECT

NA1421A

- **Look in the direction of rotation and make sure no bystanders are in the work area.**

SAFETY EQUIPMENT

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

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

OSW66-0117

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
UNITED STATES OF AMERICA

Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
263 12 Dobris
CZECH REPUBLIC

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.

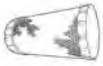
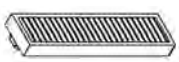
British Standards Institute (**BSI**) is the Certified Registrar Bobcat Company chose to assess the company's compliance with the ISO 9001 at Bobcat's manufacturing facilities in Gwinner, North Dakota (U.S.A.), Pontchâteau (France), and the Bobcat corporate offices (Gwinner, Bismarck, and West Fargo)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

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

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) 6675517		BATTERY 6670251
	FUEL FILTER 6667352		HYDRAULIC FILL / BREATHER CAP 6692836
 	AIR FILTER, Outer 6666375 AIR FILTER, Inner 1 6666376		FLUID, Hydraulic / Hydrostatic 6903117 - (2.5 U.S. gal) 6903118 - (5 U.S. gal) 6903119 - (55 U.S. gal)
	PRIMARY HYDRAULIC FILTER 6670207 CASE DRAIN HYDRAULIC FILTER 6516722		ANTI-FREEZE, Propylene Glycol 6983128 - Premixed 6983129 - Concentrate
	HVAC AIR FILTER (IF EQUIPPED) Fresh Air 7176099 Recirculation 7222791		RADIATOR CAP 6646678
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)	**GEAR LUBE** **ENGINE OIL** 6903106 6903108 6903110	6903121 - HD 80W90 (12 qt) SAE 15W40 CE/SG (1 U.S. gal) SAE 10W30 CE/SG (1 U.S. gal) SAE 30W CE/SG (1 U.S. gal)

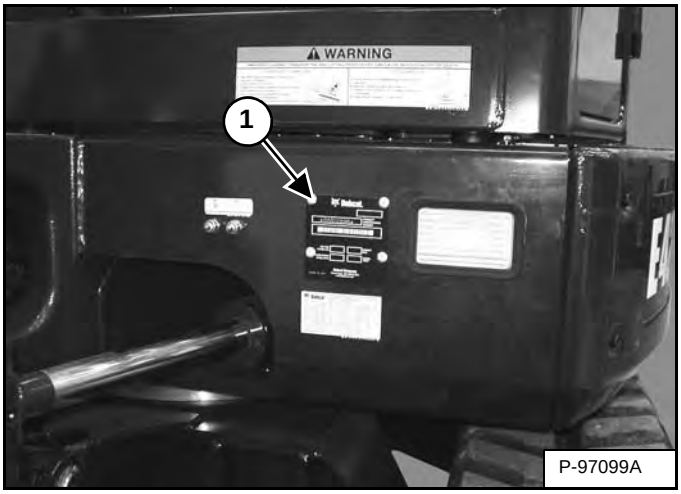
NOTE: Always verify Part Numbers with your Bobcat dealer.

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

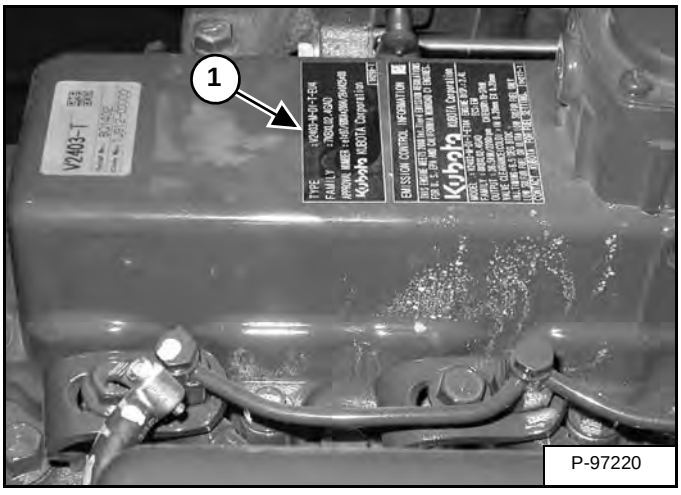
Figure 1



The excavator serial number plate (Item 1) **[Figure 1]** is located on the frame of the machine in the location shown.

Engine Serial Number

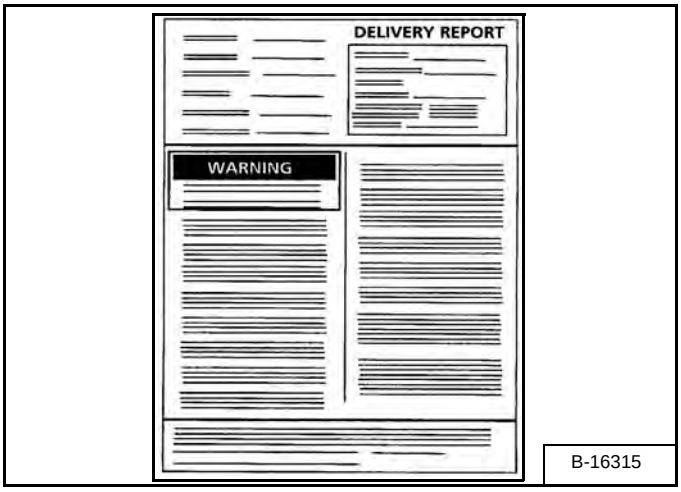
Figure 2



The engine serial number (Item 1) **[Figure 2]** is located on the top cover.

DELIVERY REPORT

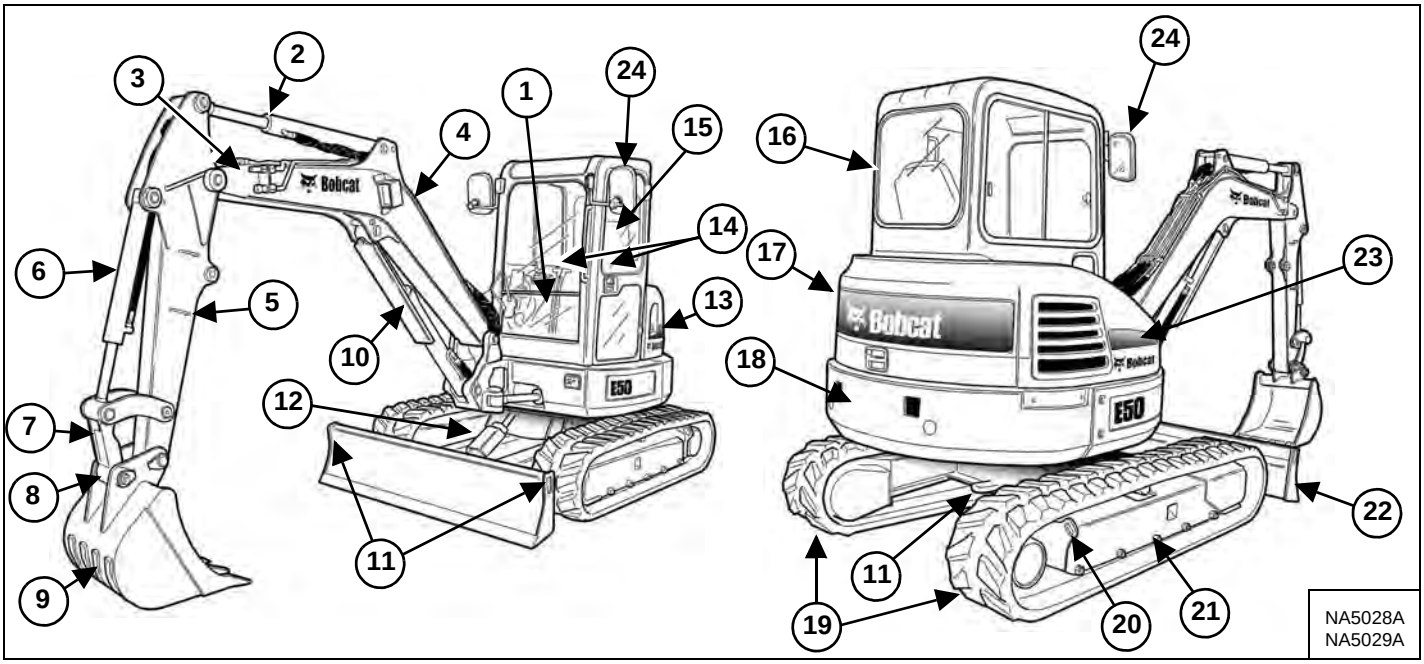
Figure 3



The delivery report **[Figure 3]** 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.

EXCAVATOR IDENTIFICATION



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Operation & Maintenance Manual and Operator's Handbook	**16**	CAB (ROPS / TOPS AND FOPS) **[2]**
2	Arm Cylinder	**17**	Rear Cover
3	Auxiliary Quick Couplers	**18**	Counterweight
4	Boom	**19**	Tracks
5	Arm	**20**	Tie Downs / Lift Points (Both Sides)
6	Bucket Cylinder	**21**	Track Frame
7	Bucket Link	**22**	Blade
8	X-Change™	**23**	Right Side Cover
9	Bucket **[1]**	**24**	Mirrors
10	Boom Cylinder		
11	Tie Downs		
12	Blade Cylinders		
13	Upperstructure		
14	Control Levers (Joysticks)		
15	Operator's Seat with Seat Belt		

[1]BUCKET - Several different buckets and other attachments are available for the Bobcat excavator.

[2] ROPS / TOPS - (Roll-Over Protective Structure / Tip-Over Protective Structure) as standard equipment. The ROPS / TOPS meets ISO 12117-2 and ISO 12117.

FEATURES, ACCESSORIES AND ATTACHMENTS

Standard Items

Model E50 Bobcat excavators are equipped with the following standard items:

- 1960 mm (77.2 in) Dozer Blade
- Canopy with ROPS / TOPS Approval
- 400 mm (15.7 in) Rubber Tracks
- Two-Speed Travel
- Auto-Shift Drive System
- Auxiliary Hydraulics (With Selectable Auxiliary Hydraulic Flow)
- Hydraulic and Travel Control Lockouts
- Engine Speed Control Dial With Auto Idle Feature
- Blade Float
- Work Lights - Boom and Frame Mounted
- Engine and Hydraulic system Monitor with Shut Down
- Horn
- Hydraulic Joystick Controls
- ISO / STD Control Pattern Selection Feature
- Suspension Seat
- Retractable Seat Belt
- Spark Arrester Muffler
- Advanced Diagnostics
- X-Change™
- Counterweight

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.

- Enclosed Cab With Heater and A/C
- Enclosed Cab With Heater
- Deluxe Instrument Panel
- Travel Motion Alarm
- Keyless Start
- Canopy / Cab Mounted Lights
- Catalytic Exhaust Purifier
- Top Guard Kit (FOGS)
- Special Application Kit
- Steel Tracks - 400 mm (15.7 in)
- Long Arm
- Angle Blade
- Direct to Tank Auxiliary Hydraulics
- Counterweight (Additional)
- Hydraulic X-Change
- Pin Grabber Quick Coupler
- Boom Load Hold
- Arm Load Hold
- Overload Warning Alarm
- Second Auxiliary Hydraulics
- Arm Mounted Auxiliary Hydraulic Couplers
- HEPA HVAC Fresh Air Filter

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.

- Auger
- Breaker
- Hydraulic Clamp
- Pro Clamp™ System
- 3-Tined Grapple
- Compactor
- Grading Blade
- Power Tilt
- Ripper
- Hydro tilt
- Packer wheel
- Trencher
- Lazer Receiver

Buckets Available

BUCKET

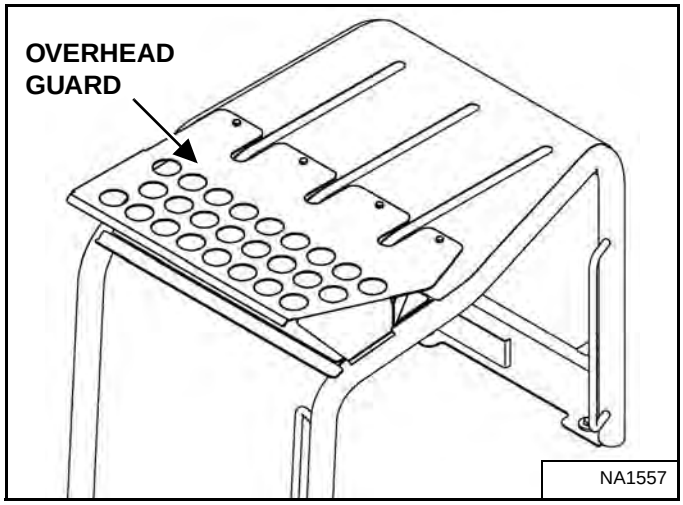
Many bucket styles, widths and different capacities are available for a variety of different applications. See your Bobcat dealer for the correct bucket for your Bobcat excavator and application.

- 305 mm (12 in) Trenching
- 330 mm (13 in) Trenching
- 457 mm (18 in) Trenching
- 610 mm (24 in) Trenching
- 610 mm (24 in) Heavy duty trenching
- 760 mm (30 in) Trenching
- 914 mm (36 in) Trenching
- 914 mm (36 in) Heavy duty trenching
- 1321 mm (52 in) Grading

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

Falling-Object Guards (FOGS)

Figure 4



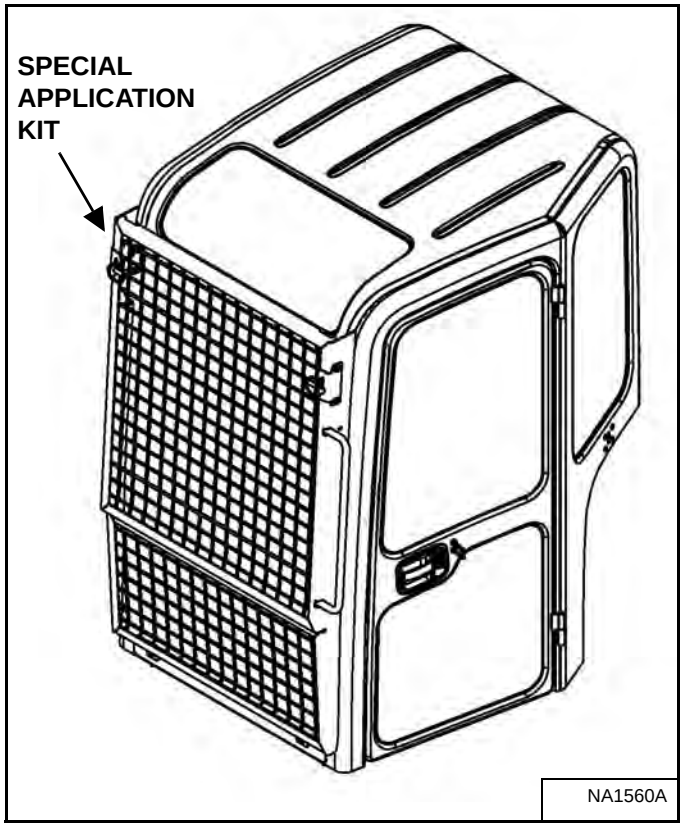
Available for special applications that require protection from smaller objects that can fall on the canopy / cab or restrict material from entering canopy / cab openings **[Figure 4]** and **[Figure 5]**.

The excavator must have the overhead guard **[Figure 4]** installed to meet the top guard requirements in ISO 10262.

See your Bobcat Dealer for more information.

Special Applications Kit

Figure 5



The excavator must have the special applications kit **[Figure 5]** installed to meet the front guard requirements in FOGS ISO 10262 - level 1.

Kit includes an upper and lower screen guard.

See your Bobcat Dealer for more information.

Special Applications Kit Inspection And Maintenance

The Special Applications Kit must be regularly inspected and maintained. Inspect the screen for damage. Replace parts as necessary.

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. Its 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 websites **Bobcat.com/training** or **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-1016

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 that is very dense will be heavier than the same volume of less dense material. Reduce the size of load if handling dense material.
- The operator must know any prohibited uses or work areas, for example, he or she needs to know about excessive slopes.
- Know the location of any underground lines. 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.

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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-1016

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-1016

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 **Bobcat.com/training** or **Bobcat.com**.

OPERATION & MAINTENANCE MANUAL

6990448enUS

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

OPERATOR'S HANDBOOK

6990434enUS

Gives basic operation instructions and safety warnings.

SAFETY MANUAL

6901951 (English and Spanish)

Gives basic safety procedures and warnings for your Bobcat excavator.

OPERATOR SAFETY DVD

6904762 (English and Spanish)

DVD gives basic safety instructions for many Bobcat products including excavators.

COMPACT EXCAVATOR OPERATOR TRAINING COURSE

7249283 (English)
7249286 (Spanish)

Introduces operator to step-by-step basics of skid-steer excavator operation.

EXCAVATOR SERVICE SAFETY TRAINING COURSE

6900916

Introduces service technicians to step-by-step basics of proper and safe skid-steer excavator maintenance and servicing procedures.

SERVICE MANUAL

6989441enUS

Complete maintenance instructions for your Bobcat excavator.

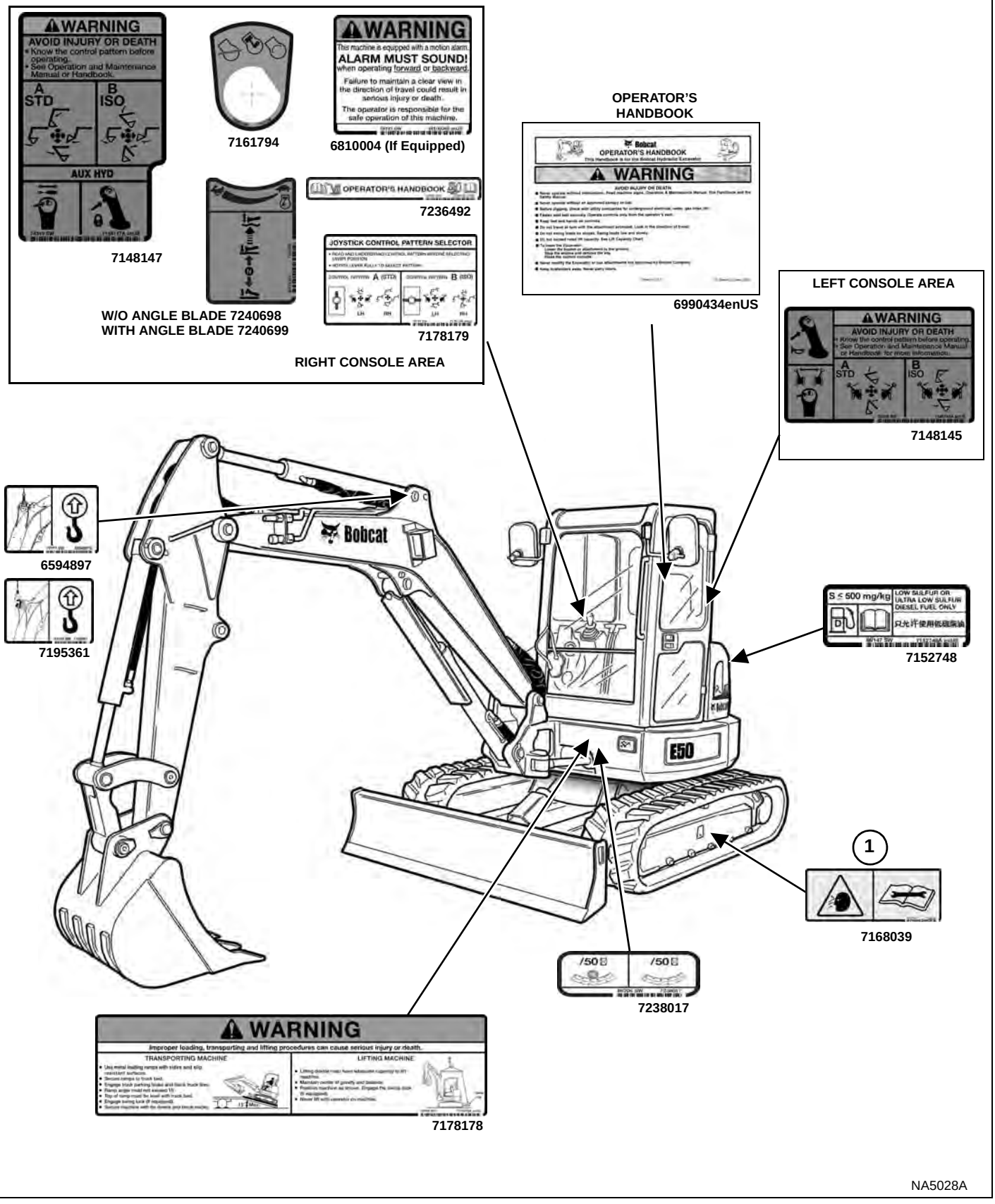
EXCAVATOR SAFETY VIDEO

(Mobile device with quick response code application required)

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

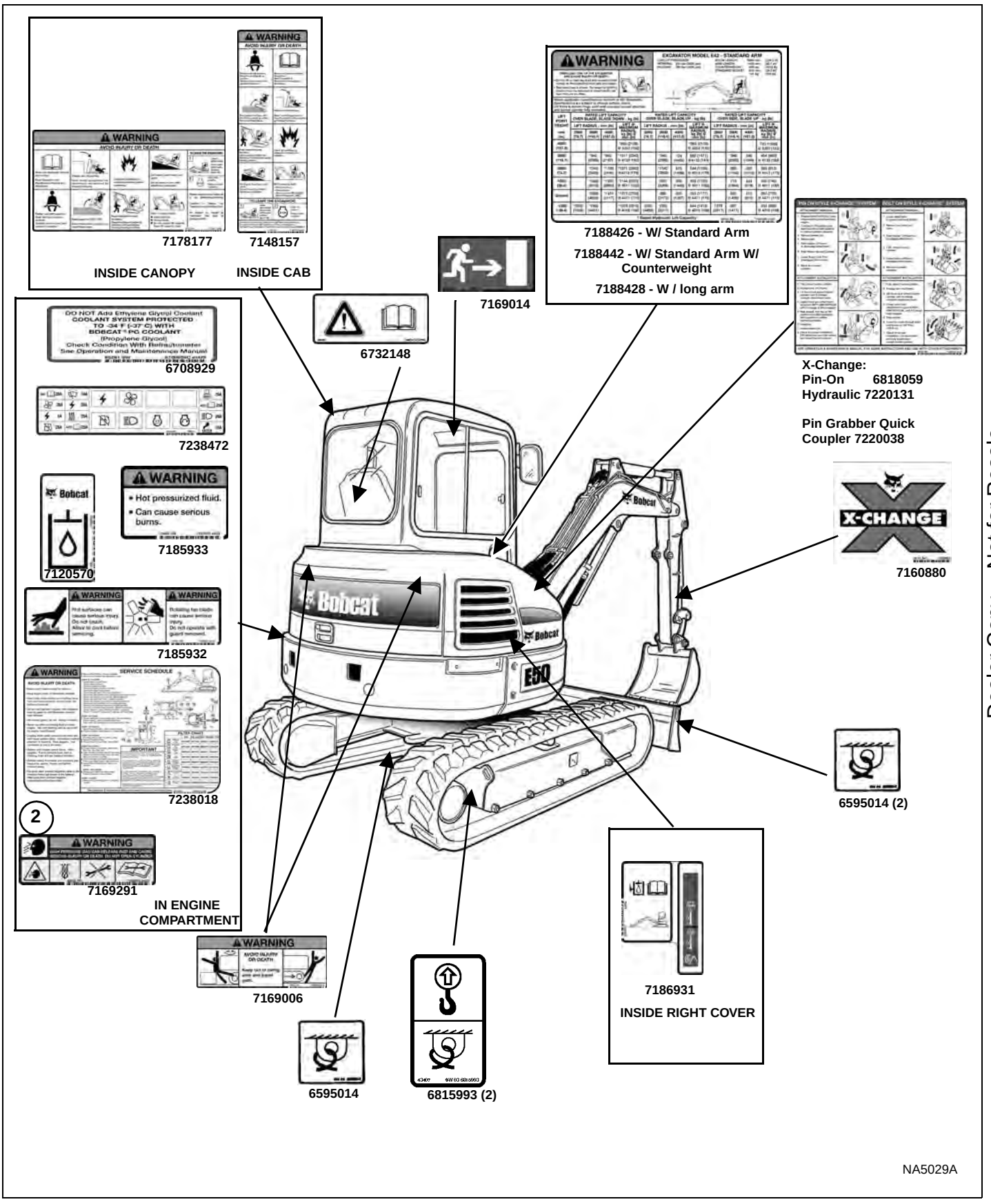
MACHINE SIGNS (DECALS)

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)

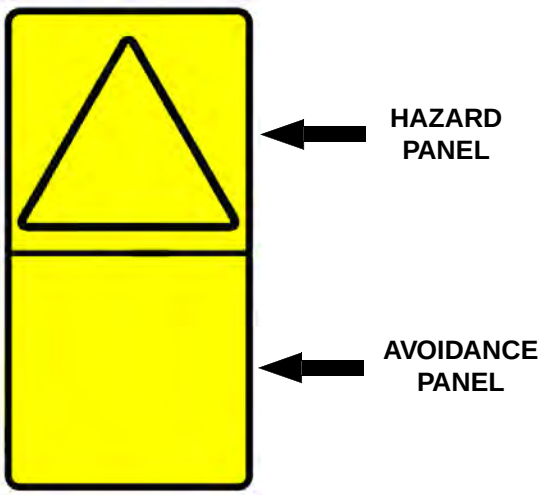
Follow the instructions on all the Machine Signs (Decals) that are on the excavator. Replace any damaged machine signs and be sure they are in the correct locations. Machine signs are available from your Bobcat excavator dealer.



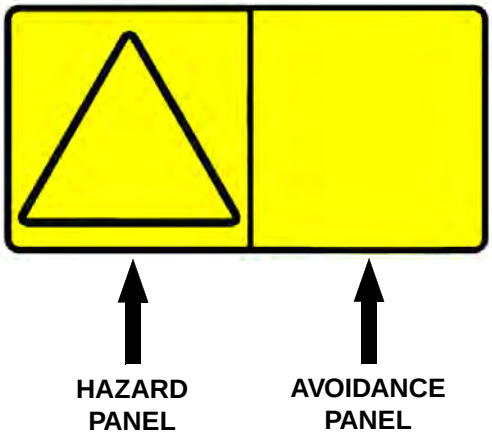
Pictorial Only Safety Signs

Safety signs are used to alert the equipment operator or maintenance person to hazards that may be encountered in the use and maintenance of the equipment. The location and description of the safety signs are detailed in this section. Please become 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 16 and MACHINE SIGNS (DECALS) (Cont'd) on Page 17 for the machine location of each corresponding numbered pictorial only decals as shown below.

1. Thrown Or Flying Objects (7168039)

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

2. **Thrown or Flying Objects (7169291)**

This safety sign is located on the gas spring in the engine compartment.

WARNING

High pressure gas can cause serious injury or death. Do not open. Opening cylinder can release rod.

W-2523-0106

OPERATING INSTRUCTIONS

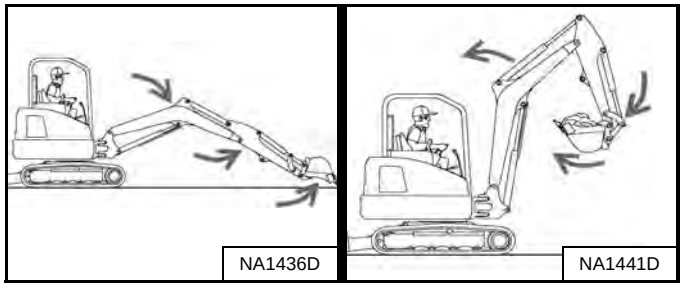
INTENDED USE

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

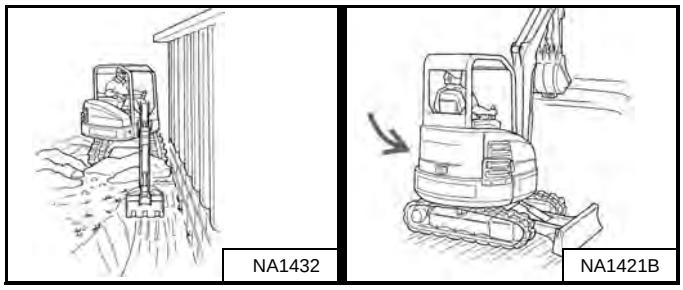
Additional Bobcat approved attachments allow this machine to perform other tasks described in the attachment Operation & Maintenance Manuals.

Examples of intended use include:

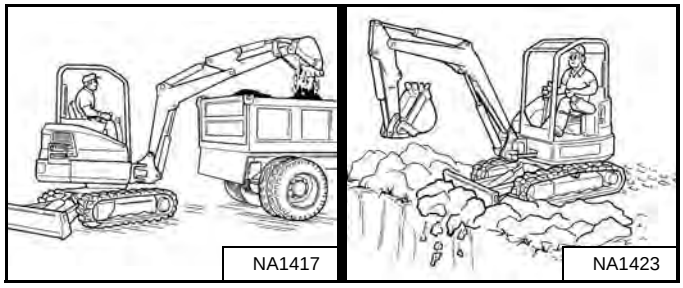
Excavating



Boom Swing ***Rotating the Upperstructure***



Loading Material ***Backfilling***



WARNING

AVOID INJURY OR DEATH

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

W-2374-0500

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

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

IMPORTANT

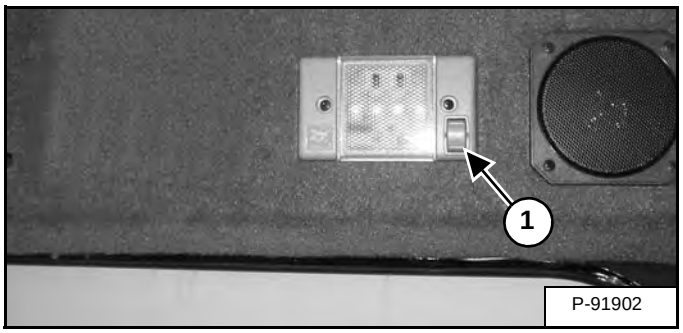
Avoid impacting objects with the blade. Damage to blade and undercarriage components may occur.

I-2256-0507

INSTRUMENTS AND CONSOLES

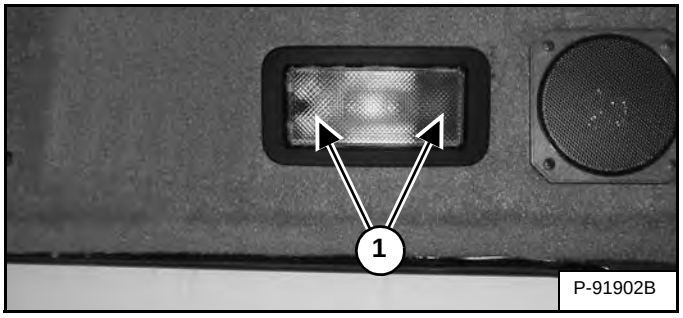
Cab Interior Light

Figure 6



Early Models: Press the top of the switch (Item 1) **[Figure 6]** to turn the light ON. Press the bottom of the switch to turn OFF.

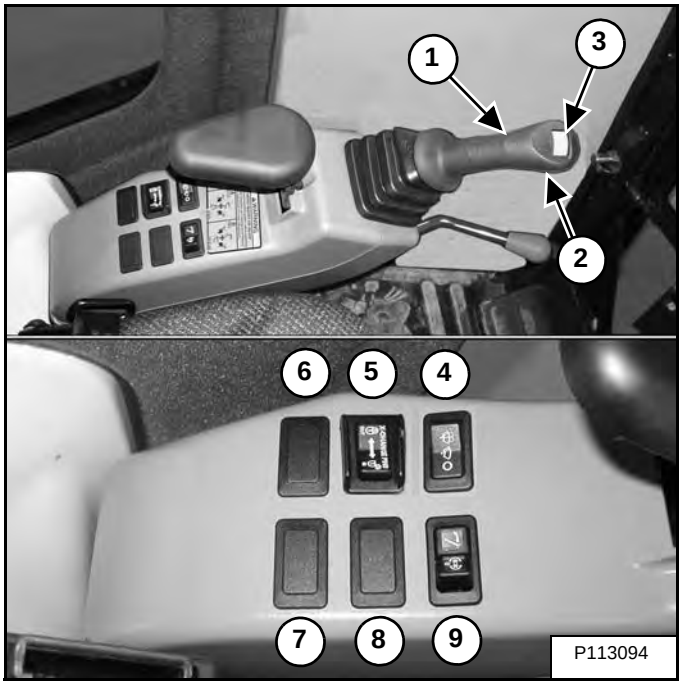
Figure 7



Later Models: Press either side of the lens (Item 1) **[Figure 7]** to turn the light ON. Return the LENS to the center position to turn OFF.

Left Console

Figure 8



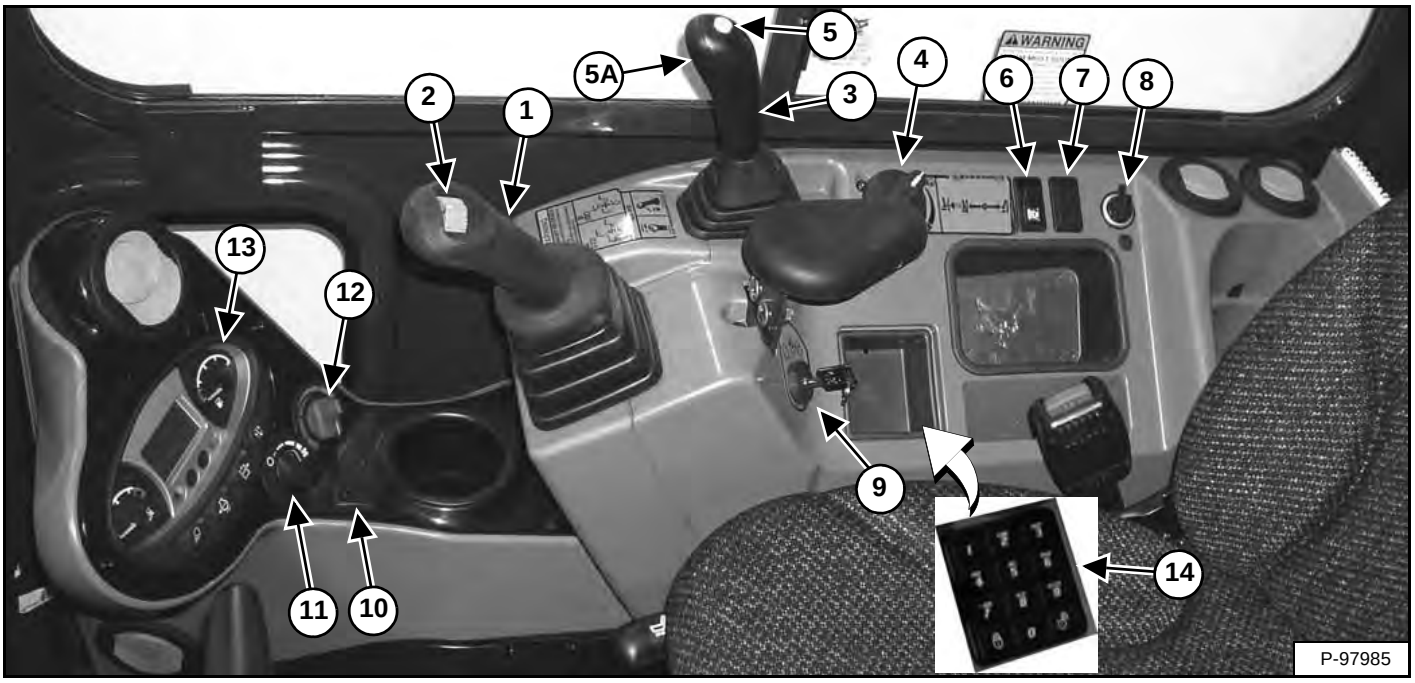
Left Console **[Figure 8]**

REF. NO.	DESCRIPTION	FUNCTION / OPERATION
1	Left Joystick	(See HYDRAULIC CONTROLS on Page 45.)
2	Horn	Press the switch on the bottom of the left joystick to sound horn.
3	Boom Swing Switch / Secondary Auxiliary Hydraulic (If Equipped)	Move the switch to the left to swing the boom to the left. Move the switch to the right to swing the boom to the right. (See Secondary Auxiliary Hydraulics and Boom Swing in this manual.)
4	Wiper / Washer Switch (If Equipped)	Press the switch to the left to turn wiper ON. Press and hold switch to the left to activate window washer. Press the switch to the right to turn wiper OFF.
5	Hydraulic X-Change Switch (If Equipped)	Press and hold the switch to the right to fully retract hydraulic pins. Press and hold the switch to the left to fully extend hydraulic pins.
	Pin Grabber Quick Coupler ON / OFF Switch (If Equipped)	Press switch to the left to turn the pin grabber quick coupler ON. Press the switch to the right to turn OFF.
6	Beacon / Strobe Light (If Equipped)	Press switch to the left to turn ON the beacon / Strobe light. Press the switch to the right to turn OFF.
7	Pin Grabber Quick Coupler INTENT Switch (If Equipped)	Press switch to the left to initiate the quick coupler install or remove mode. (See Installing And Removing The Attachment (Pin Grabber Quick Coupler) in this manual.)
8	OVERLOAD WARNING SWITCH (If Equipped)	Press switch to the right to enable Overload Warning feature. Press to the left to disable. (See Overload Warning in this manual.)
9	Boom Swing Switch / Secondary Auxiliary Hydraulic (If Equipped)	Move the switch to the right to activate the secondary auxiliary hydraulics. Move the switch to the left for boom swing function. (See Secondary Auxiliary Hydraulics and Boom Swing in this manual.)

INSTRUMENTS AND CONSOLES (CONT'D)

Right Console

Figure 9



REF	DESCRIPTION	FUNCTION / OPERATION
1	Right Joystick	(See HYDRAULIC CONTROLS in this manual.)
2	Auxiliary Hydraulic Switch	Controls the fluid flow to the auxiliary quick couplers (attachment). (See Auxiliary Hydraulics in this manual.)
3	Blade Control Lever	Controls raising and lowering the blade. Pushed all the way forward puts blade in float position. (See BLADE LEVER CONTROL in this manual).
4	Engine Speed Control Dial	Controls rpm of the engine. (See ENGINE SPEED CONTROL DIAL in this manual).
5	Two-Speed Button (Without Angle Blade Option)	Engages and disengages High Range Travel Speed. (See Two-Speed Travel in this manual).
5A	Two-Speed Button (With Angle Blade Option)	Engages and disengages High Range Travel Speed. (See Two-Speed Travel in this manual). (Also see Angle Blade in this manual.)
6	Motion Alarm Cancel Switch	This switch temporarily disables the motion alarm. (See MOTION ALARM SYSTEM on Page 42.)
7	Not Used	---
8	Auxiliary Power Outlet	12 volt receptacle for accessories.
9	Key Switch	Always perform the PRE-STARTING PROCEDURE. (See PRE-STARTING PROCEDURE in this manual), before starting the engine. (See STARTING THE ENGINE in this manual).
10	Air Conditioning Switch (If Equipped)	Press top of switch to turn air conditioner ON (light in switch will be ON), Press bottom of switch to turn OFF.
11	Fan Motor Switch (If Equipped)	Turn clockwise to increase fan speed; counterclockwise to decrease.
12	Temperature Control (If Equipped)	Turn clockwise to increase temperature; counterclockwise to decrease.
13	Instrument Panel	See Standard or Deluxe Instrument Panel
14	Keyless (If Equipped)	(Always perform the PRE-STARTING PROCEDURE, (See PRE-STARTING PROCEDURE in this manual), before starting the engine. (See STARTING THE ENGINE in this manual).

NOTE: Always turn key switch and all accessories to OFF position when the engine is stopped, the battery will discharge if the key is left ON.

Instrument Panel - Standard

Figure 10

REF. NO.	DESCRIPTION	FUNCTION / OPERATION
1	LIGHTS	Press once for work lights. (Left green LED illuminates.) Press again to turn all lights off. (Left green LED off.)
		Press and hold 5 seconds to display software version in display screen.
2	Auto Idle Feature	Press once to turn Auto Idle Feature ON. (Left green LED illuminates.) Press a second time to turn OFF. (Left and right green LEDs off.) (See Auto Idle Feature in this manual).
3	Auxiliary Hydraulic Button	Press once to enable auxiliary hydraulic function. (Left green LED illuminates.) Continue to press and release to scroll through the selectable auxiliary hydraulic setting (3-2-1-OFF). Press and hold (minimum of one second) to enable the continuous flow auxiliary hydraulic feature. (Right green LED illuminates.) Continue to press and release to scroll through the continuous flow selectable auxiliary hydraulic settings (3-2-1-OFF). (See Auxiliary Hydraulics in this manual).
4	Information	Cycles through (after each button press) (The following information is displayed in the Data Display Screen, Item 6): • Hourmeter (On startup) • Job Clock (1 and 2) • Engine rpm • Battery voltage • Maintenance clock (Press and hold 7 seconds when displayed to reset the maintenance clock.) • Service codes*
5	Engine Temperature Gauge	Shows the engine coolant temperature.

Instrument Panel - Standard (Cont'd)

REF. NO.	DESCRIPTION	FUNCTION / OPERATION
6	Data Display Screen	The data display screen shows the Hourmeter at start up and then changes to engine rpm during normal operation of the excavator. When preheat is activated, the display screen will show the remaining preheat time. Can also be used to display Job Clock, Engine rpm, and Selectable Auxiliary Hydraulic Flow. (See Job Clock in this manual).
7	Fuel Gauge	Shows the amount of fuel in the tank.
8	Seat Belt	Fasten Seat Belt Reminder - Light stays on for 45 seconds to remind operator to fasten seat belt.
9		Not used for this model.
10		Not used for this model.
11	Left Console Lockout	Icon ON when left console is raised. Icon OFF when left console is lowered.
12	General Warning **	Malfunction with one or more machine functions. (See Service Codes in this manual.)
13	High Range Engaged ***	Icon is illuminated when two-speed travel is enabled.
14	Engine Coolant Temperature **	Engine coolant temperature high or sensor error.
15	Engine Malfunction **	Engine malfunction or failure.
16	Hydraulic System Malfunction **	Hydraulic system malfunction or failure.
17	Fuel	Fuel level low or sensor error. (Icon is ON when fuel level is low, Icon flashes when fuel sensor fault is activated.)
18		Not used for this model.
19		Not used for this model.
20		Not used for this model.
21		Not used for this model.

* See SYSTEM SETUP AND ANALYSIS for Service Code Description. (See DIAGNOSTIC SERVICE CODES on Page 184.)

** Icons will be ON or flashing when diagnostic system indicates a problem. (See DIAGNOSTIC SERVICE CODES on Page 184.)

*** Icons will be flashing when diagnostic system indicates a problem. (See DIAGNOSTIC SERVICE CODES on Page 184.)

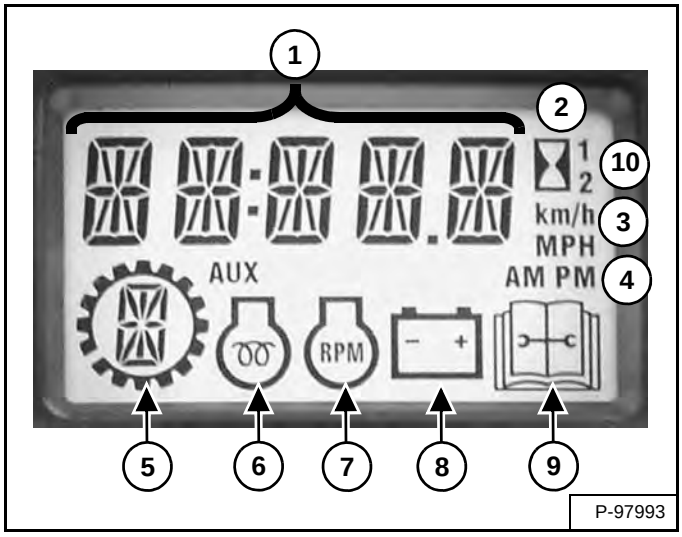
Instrument Panel - Standard (Cont'd)

Indicator Icons

The display screen can display the following information:

- Operating hours
- Job Clock (1 and 2)
- Engine rpm
- Battery voltage
- Maintenance clock countdown
- Service codes

Figure 11

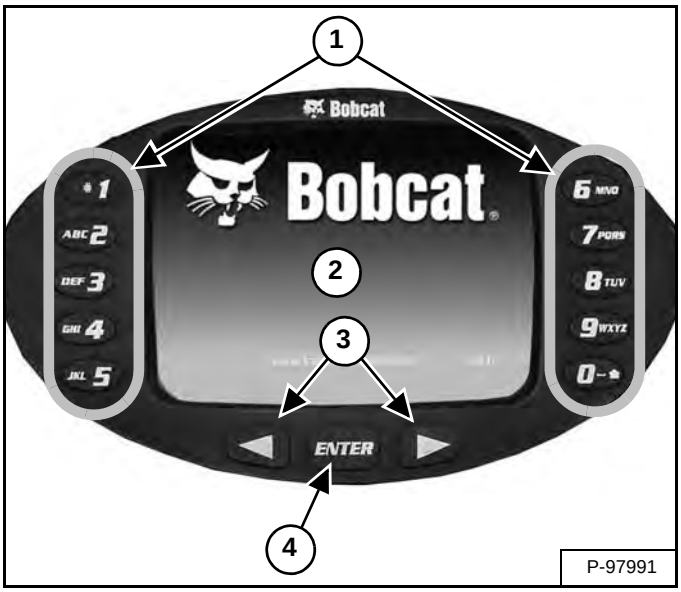


The display screen is shown in **[Figure 11]**. The data display will show operating hours upon startup.

1. **Data Display**
2. **Hourmeter**
3. **Metric / English (Not Used For This Model)**
4. **Clock (Not Used For This Model)**
5. **Selectable Auxiliary Flow (3 - 2 - 1)**
6. **Engine Preheat**
7. **Engine RPM**
8. **Battery / Charging Voltage**
9. **Service**
10. **Job Clock (1 and 2)**

Instrument Panel - Deluxe

Figure 12



This machine may be equipped with a Deluxe Instrument Panel **[Figure 12]**.

1. **Keypad (1 through 0):** The keypad has two functions:

   - To enter a number code (password) to allow starting the engine.

   - To enter a number as directed for further use of the display screen.

2. **Display Screen:** The display screen is where all system setup, monitoring, and error conditions are displayed.

3. **Scroll Buttons:** Used to scroll through display screen choices.

4. **ENTER Button:** Used to make selections on the display screen.

Figure 13

Turn the start key to the ON position.

When this screen is on the display you can enter the password and start the engine **[Figure 13]**.

NOTE: Your excavator (with Deluxe Instrument Panel) will have an Owner Password. Your dealer will provide you with this password. Change the password to one that you will easily remember to prevent unauthorized use of your excavator. (See Changing The Owner Password on Page 195.) Keep your password in a safe location for future needs.

Enter The Password:

Use the numbers on the keypad to enter the password, then press the **[ENTER]** button. A symbol will appear on the display screen for each number entered. The left scroll button can be used to backspace if an incorrect number is entered.

If the correct password is not entered, **[INVALID PASSWORD]** will appear on the display screen and the password will have to be reentered.

See CONTROL PANEL SETUP for further description of screens to set up the system for your use. (See CONTROL PANEL SETUP on Page 188.)

Lights

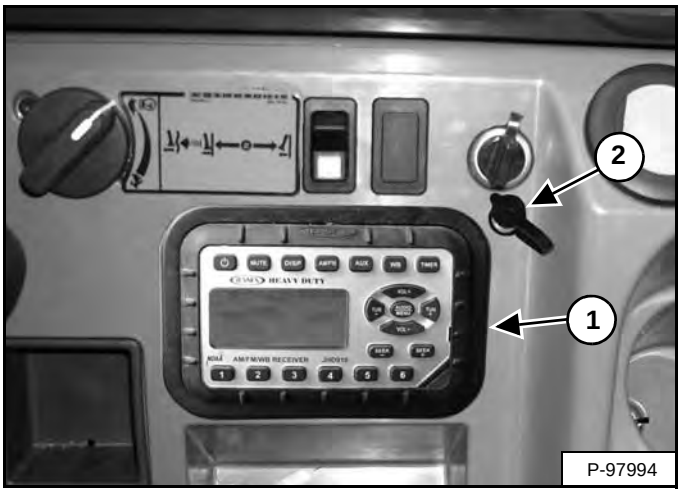
Press key pad [1] **[Figure 13]** once for FRONT work lights. Press a second time to turn all lights off.

Change Language:

The language can be changed at any time. (See CONTROL PANEL SETUP on Page 188.)

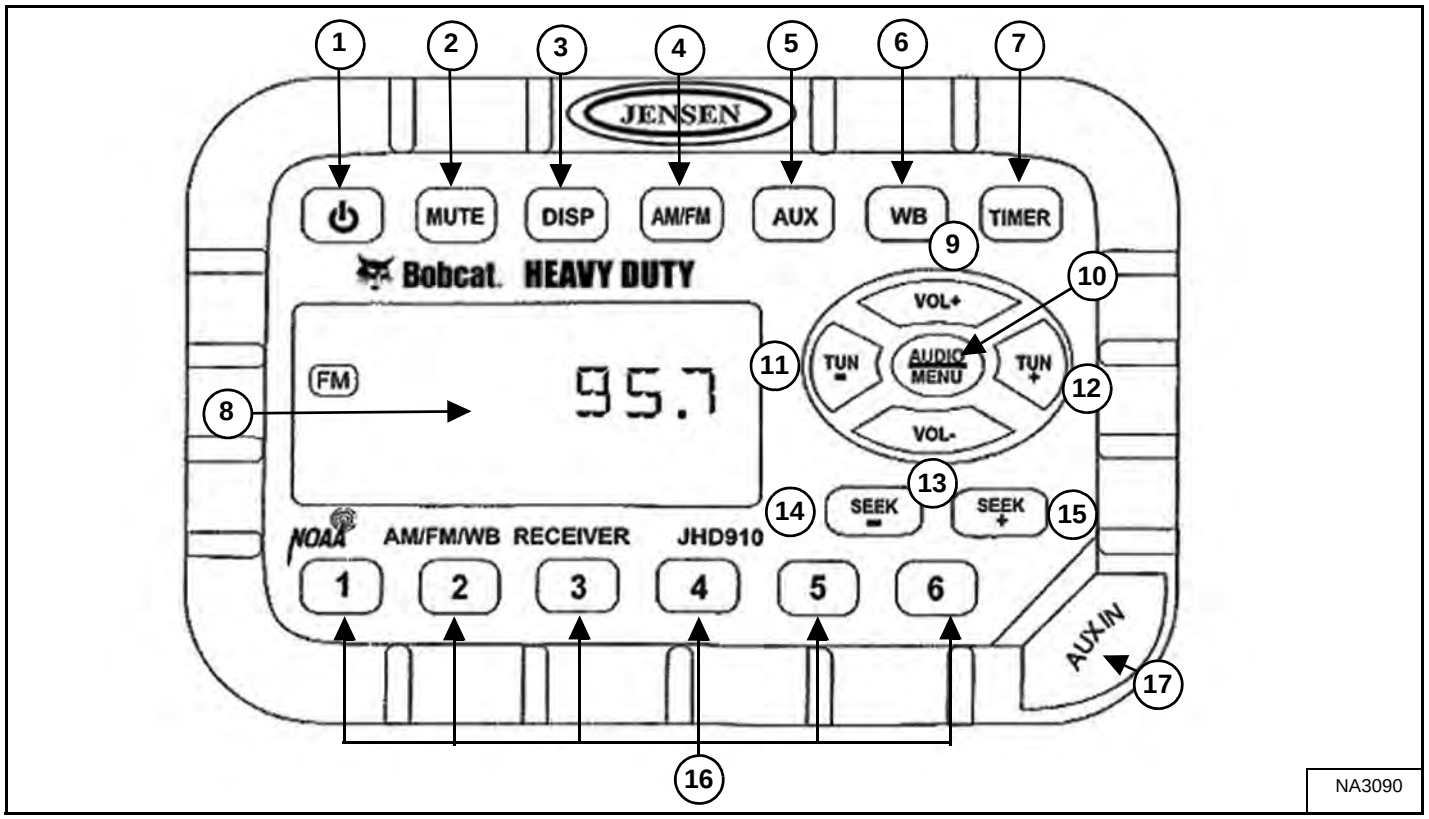
Radio Option

Figure 14



This excavator may be equipped with a radio (Item 1) and the headphone jack (Item 2) **[Figure 14]**.

Figure 15



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

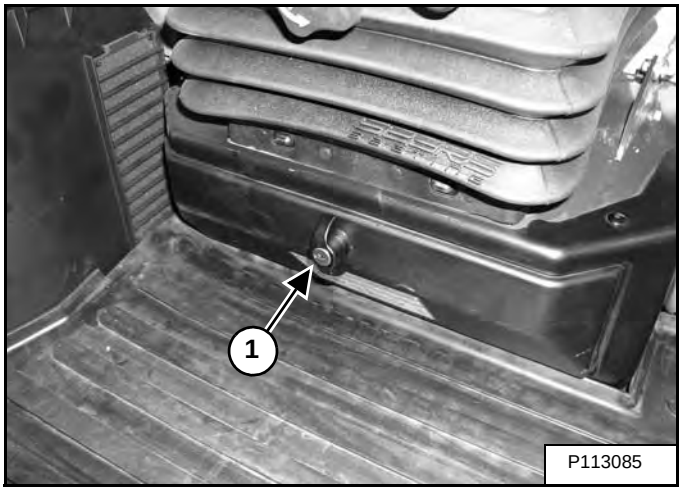
Radio (Cont'd)

REF. NO.	DESCRIPTION	FUNCTION / OPERATION
1	POWER	Press to turn ON; press again to turn OFF.
2	MUTE	Press to mute audio output; **[MUTE]** will appear in display screen; press again to turn OFF.
3	DISPLAY	Press to toggle between function mode (showing tuner frequency, auxiliary input, weather band information, or timer) and clock mode.
		Press and hold to enter clock setting mode; use FREQUENCY DOWN (TUN -) button to adjust hours and FREQUENCY UP (TUN +) button to adjust minutes; normal operation will resume automatically.
4	BAND	Press to select tuner mode. Press to cycle through 2 AM (MW) bands and 3 FM bands.
5	AUXILIARY	Press to select Auxiliary Input mode. Portable audio device (MP3 player) must be attached to auxiliary input jack.
6	WEATHER BAND	Press to select weather band; use FREQUENCY UP (TUN +) and FREQUENCY DOWN (TUN -) buttons to adjust to the clearest station. The weather alert feature, if activated, will automatically switch from the current function to the weather band if a weather warning is received. See AUDIO / MENU ADJUSTMENT in this table.
7	TIMER	Press to access timer mode. Press to start the timer function; press again to stop timer; press again to resume timer or press and hold to reset timer and exit from timer mode.
8	DISPLAY SCREEN	Displays the time, frequency, and activated functions.
9	VOLUME UP	Adjusts volume up; current volume (0 - 40) will appear briefly in display screen.
10	AUDIO / MENU ADJUSTMENT	AUDIO ADJUSTMENT: Press to cycle through bass, treble, and balance settings; use VOLUME UP (VOL +) and VOLUME DOWN (VOL -) buttons to adjust when desired option is displayed; normal operation will resume automatically. MENU ADJUSTMENT: Press and hold for 3 seconds to enter menu adjustment settings; press to cycle through the following settings; use VOLUME UP (VOL +) and VOLUME DOWN (VOL -) buttons to adjust when desired option is displayed; normal operation will resume automatically. • Beep Confirm (On or Off) - Determines if beep will sound with each button press. • Operation Region (USA or Europe) - Selects the appropriate region. • Clock Display (12 or 24) - Selects a 12-hour or 24-hour clock display. • Display Brightness (Low, Medium, or High) - Determines brightness level of display screen. • Backlight Color (Amber or Green) - Determines backlight color of display screen. • Power On Volume (0 - 40) - Selects default volume setting when radio is turned on. • WB Alert (On or Off) - Determines if weather band alert feature is activated.
11	FREQUENCY DOWN	Press to manually tune the radio frequency down.
12	FREQUENCY UP	Press to manually tune the radio frequency up.
13	VOLUME DOWN	Adjusts volume down; current volume (0 - 40) will appear briefly in display screen.
14	SEEK FREQUENCY DOWN	Press to automatically tune frequency down to next strong station.
15	SEEK FREQUENCY UP	Press to automatically tune frequency up to next strong station.
16	PRESET STATIONS	Used to store and recall stations for each AM and FM band. Press and hold to store current station; press button to recall station.
17	AUXILIARY INPUT JACK	Connect line output of portable audio device (MP3 player) to 3,5 mm (1/8 in) jack and press AUXILIARY button.

STD / ISO Selector Valve

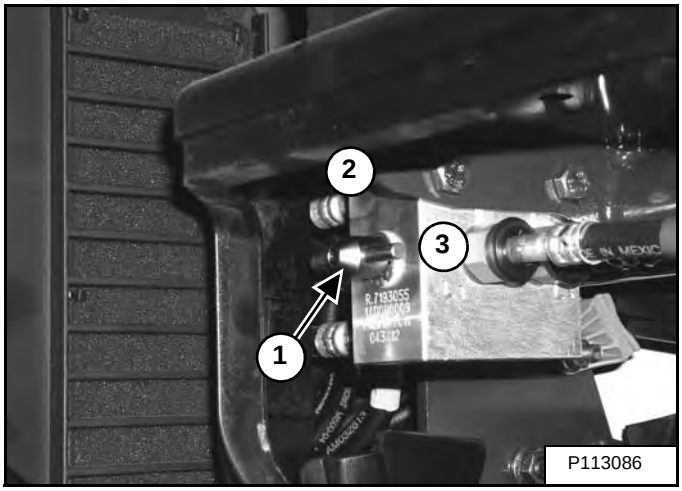
The STD / ISO selector valve is located below the operator's seat, inside the tool box.

Figure 16



From below the operator's seat, open the tool box cover (Item 1) **[Figure 16]**.

Figure 17



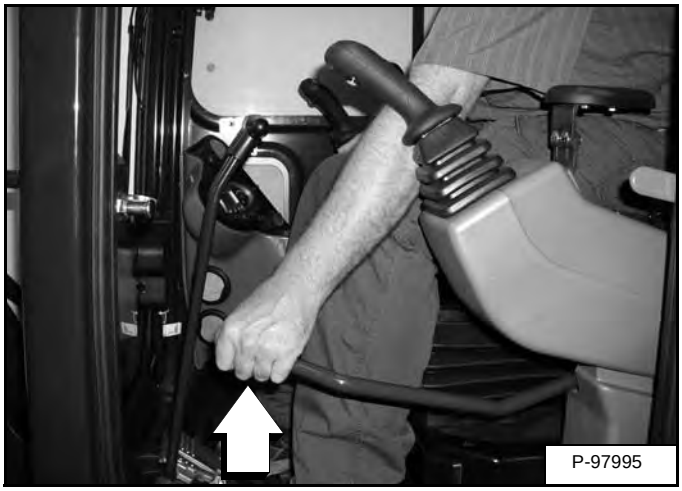
The joystick hydraulic function can be switched from Standard control pattern to ISO control pattern.

Rotate the lever (Item 1) counterclockwise (Item 2) to select STANDARD Control Pattern. Rotate the lever clockwise (Item 3) to select ISO Control Pattern **[Figure 17]**.

Raising And Lowering The Console

Raise the console before exiting the cab.

Figure 18



Pull up on the release handle **[Figure 18]**. The lift spring will assist in raising the console.

Lower the console before operating the excavator.

Push down on the lever **[Figure 18]** until the latch is engaged.

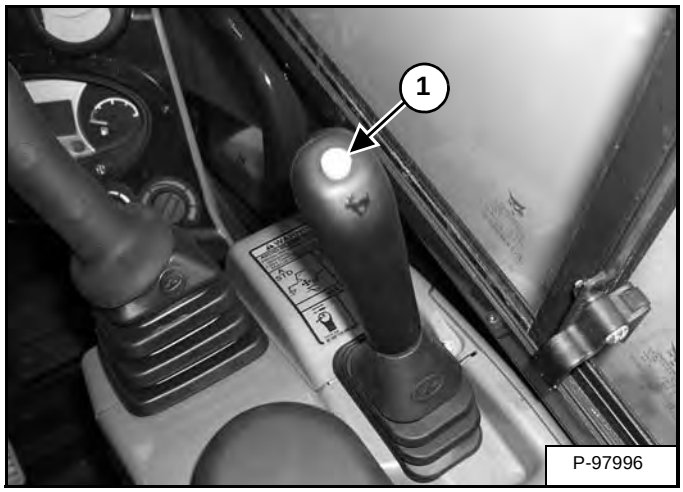
NOTE: When the console is raised, the hydraulic and traction system functions are locked and will not operate.

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

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

Two-Speed Travel (Without Angle Blade Option)

Figure 19



Press the button (Item 1) **[Figure 19]** to engage the high range. Press a second time to disengage.

NOTE: When engaging high range, two audible beeps will be heard. When engaging low range, one audible beep will be heard.

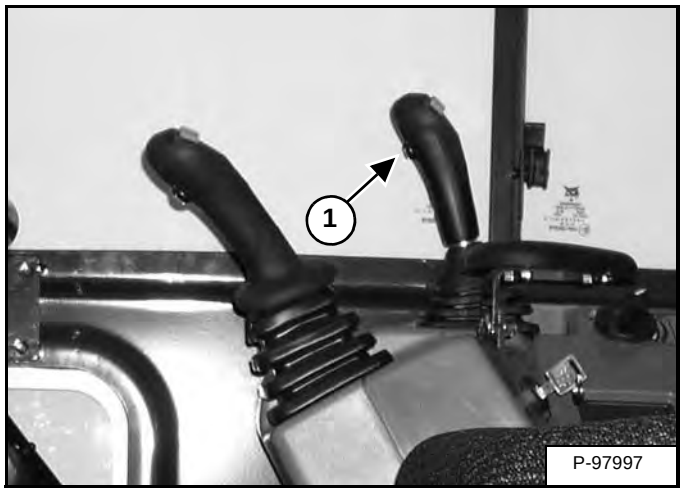
Figure 20

When high range is engaged, the two-speed travel icon (Item 1) **[Figure 20]** will illuminate.

Press the button (Item 1) **[Figure 19]** again to disengage.

Two-Speed Travel (With Angle Blade Option)

Figure 21



Press the button (Item 1) **[Figure 21]** to engage the high range. Press a second time to disengage.

Figure 22

When high range is engaged, the two-speed travel icon (Item 1) **[Figure 22]** will illuminate.

Press the button (Item 1) **[Figure 21]** again to disengage.

Auto-Shift Drive System

When in high range, the travel motors will automatically shift to low range when more torque is required and return to high range when hydraulic pressure decreases.

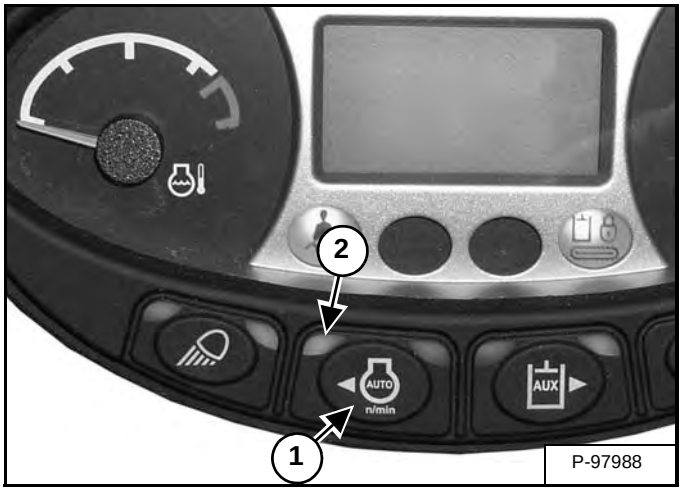
NOTE: Always set the travel speed to low range when loading or unloading the excavator onto a transport vehicle.

Auto Idle Feature

The auto idle feature (when engaged) will reduce the engine speed to low idle when the control levers (joystick, blade, travel, etc.) are in NEUTRAL and not used for approximately four seconds. The engine rpm will return to the set position as soon as any control lever is activated.

Standard Panel

Figure 23



The automatic idle switch (Item 1) **[Figure 23]** is used to engage or disengage the automatic idle feature.

Press the switch (Item 1) once to engage automatic idle and the LED (Item 2) will illuminate. Press the switch (Item 1) a second time to disengage automatic idle, the LED (Item 2) **[Figure 23]** will be OFF.

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

Deluxe Panel

Figure 24

Press **[ENTER]** (Item 1) once to engage automatic idle. Press **[ENTER]** (Item 1) **[Figure 24]** again and auto idle will be OFF.

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

NOTE: When equipped with the deluxe instrument panel, the time delay for auto idle to activate can be adjusted. (See Auto Idle Time Delay on Page 190.)

OPERATOR CANOPY (ROPS / TOPS)

Description

The Bobcat excavator has an operator canopy (ROPS / TOPS) as standard equipment to protect the operator if the excavator is tipped over. The seat belt must be worn for ROPS / TOPS protection.

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

ROPS / TOPS - Roll-Over Protective Structure per ISO 12117-2, and Tip-Over Protective Structure per ISO 12117.

⚠ WARNING

Never modify operator cab by welding, grinding, drilling holes or adding attachments unless instructed to do so by Bobcat Company. Changes to the cab can cause loss of operator protection from rollover and falling objects, and result in injury or death.

W-2069-0200

OPERATOR CAB (ROPS / TOPS)

Description

The Bobcat excavator has an optional operator cab (ROPS / TOPS) as standard equipment to protect the operator if the excavator is tipped over. The seat belt must be worn for ROPS / TOPS protection.

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

ROPS / TOPS - Roll-Over Protective Structure per ISO 12117-2, and Tip-Over Protective Structure per ISO 12117.

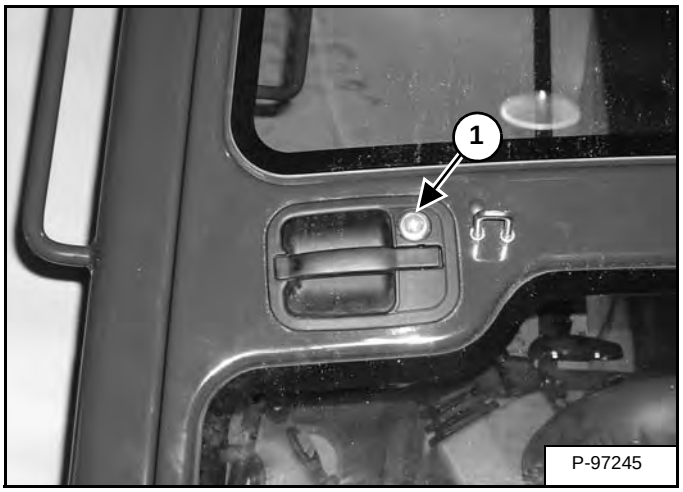
⚠ WARNING

Never modify operator cab by welding, grinding, drilling holes or adding attachments unless instructed to do so by Bobcat Company. Changes to the cab can cause loss of operator protection from rollover and falling objects, and result in injury or death.

W-2069-0200

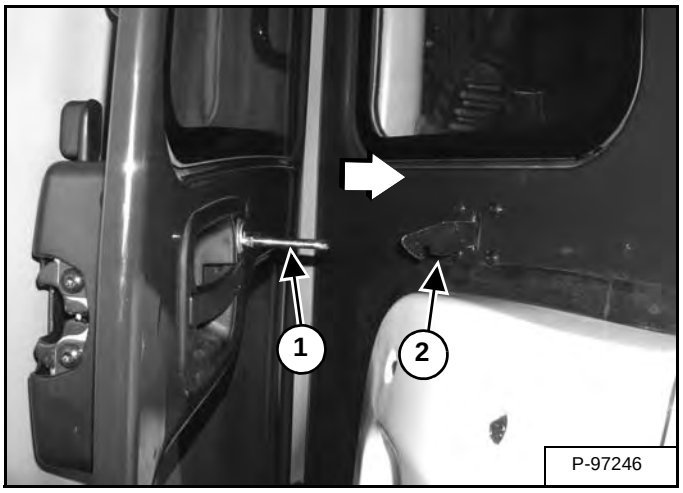
Cab Door

Figure 25



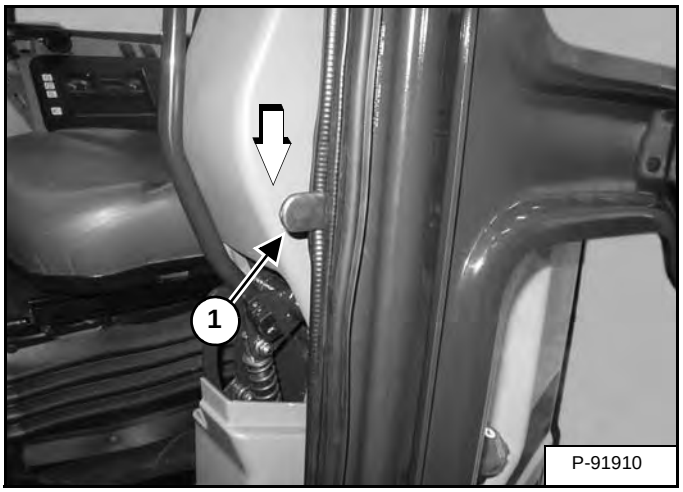
The cab door can be locked (Item 1) **[Figure 25]** with the same key as the starter switch.

Figure 26



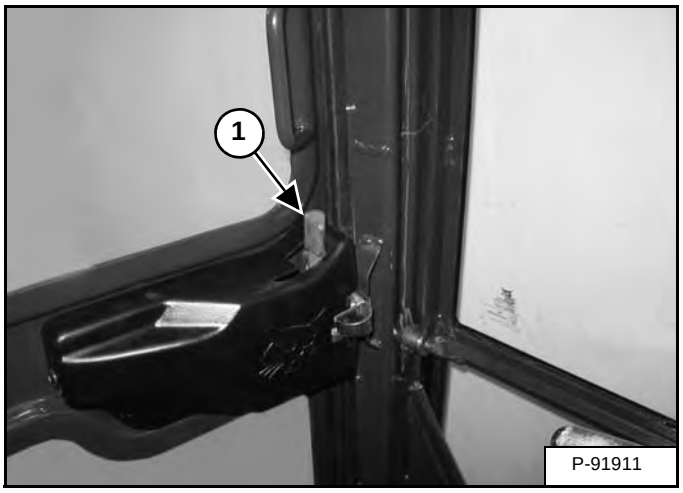
Push the door all the way open until the latch post (Item 1) engages in the latch (Item 2) **[Figure 26]** to hold the door in the open position.

Figure 27



When the door is in the open position, push down on the latch (Item 1) **[Figure 27]** and close the door.

Figure 28

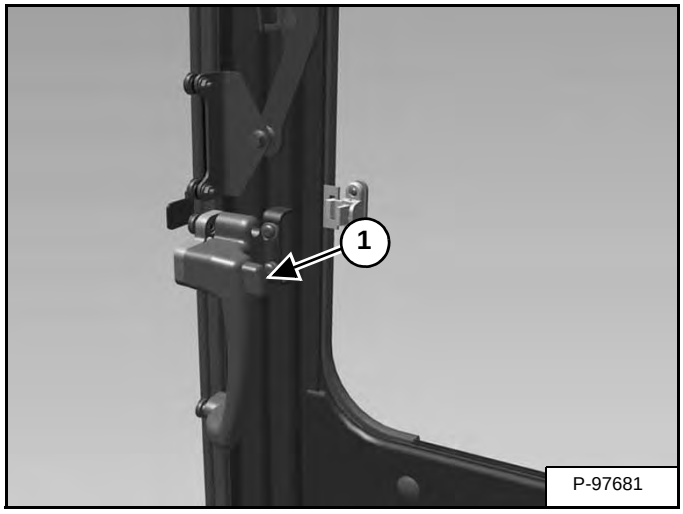


From inside the cab, open the door using handle (Item 1) **[Figure 28]**.

Front Window

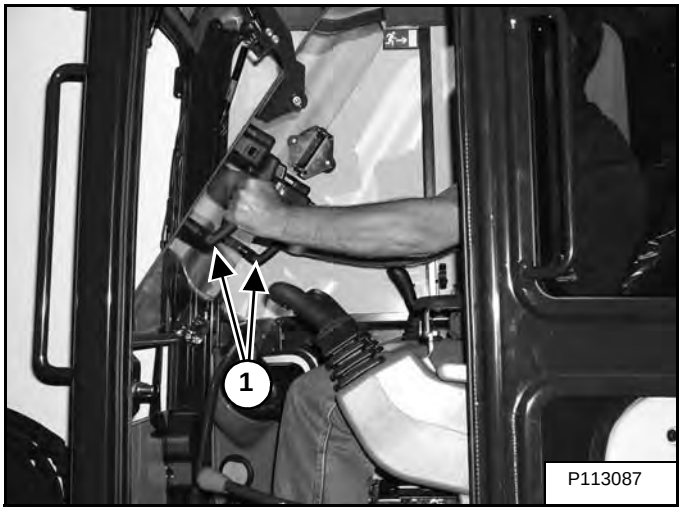
Opening The Front Window

Figure 29



Press the window latch button (Item 1) **[Figure 29]** (both sides).

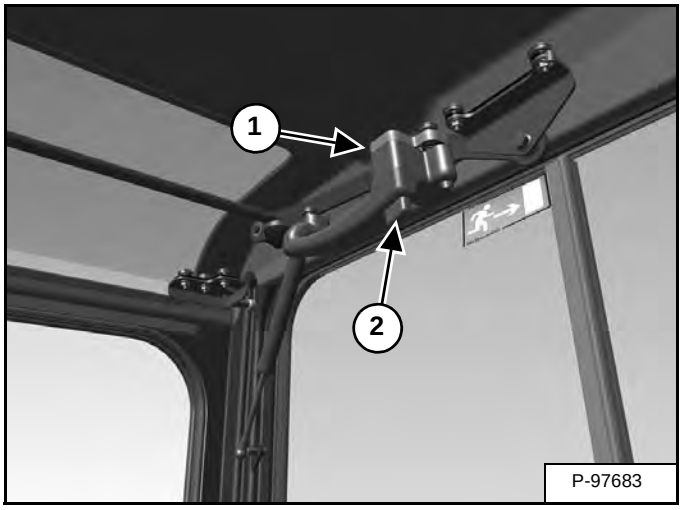
Figure 30



Use both window grab handles (Item 1) **[Figure 30]** to pull the top of the window in.

Continue moving the window in and up over the operator's head until the window is fully raised.

Figure 31



When the window is fully raised, the latch (Item 1) **[Figure 31]** (both sides) will close on the bracket in the latched position.

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

Closing The Front Window

Use both window grab handles to support the window while pressing the window latch button (Item 2) **[Figure 31]** (both sides).

Use both window grab handles (Item 1) **[Figure 30]** to pull the window down fully.

Press the top of the window in until the latch locks into the latched position (both sides) **[Figure 29]**.

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

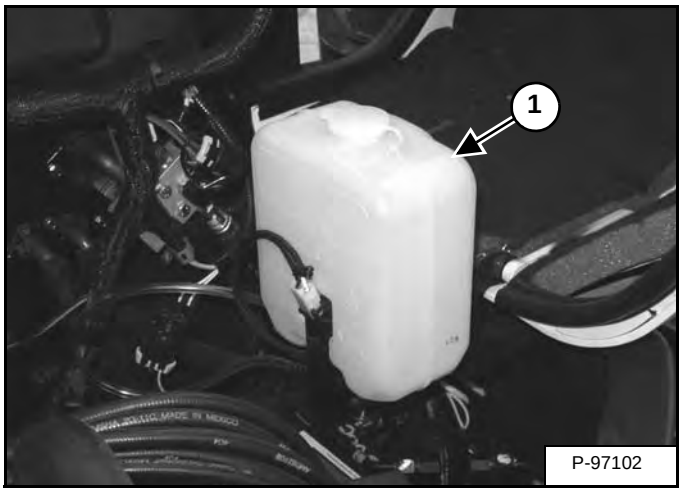
Front Wiper

Figure 32

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

Window Washer Reservoir

Figure 33

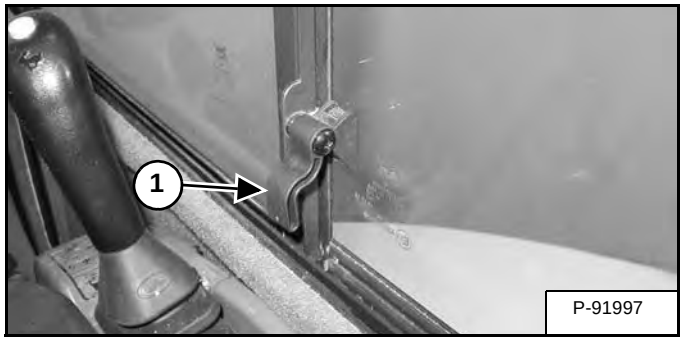


The window washer reservoir (Item 1) **[Figure 33]** is located under the right side cover.

Right Side Windows

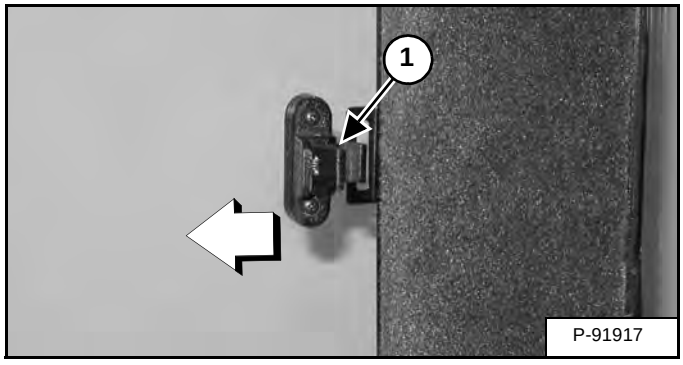
Opening The Right Rear Window

Figure 34



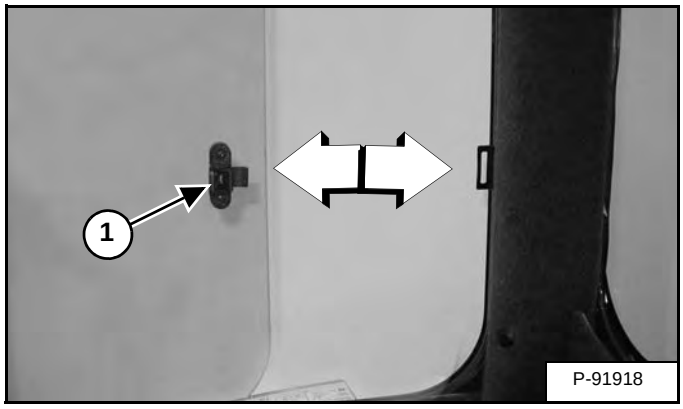
Raise the latch (Item 1) **[Figure 34]** located at the rear of the front window.

Figure 35



Pull out on the latch (Item 1) **[Figure 35]**.

Figure 36



Pull the latch (Item 1) **[Figure 36]** forward to open the window. When the window is in the open position, push down on the latch (Item 1) **[Figure 34]**.

Closing The Right Rear Window

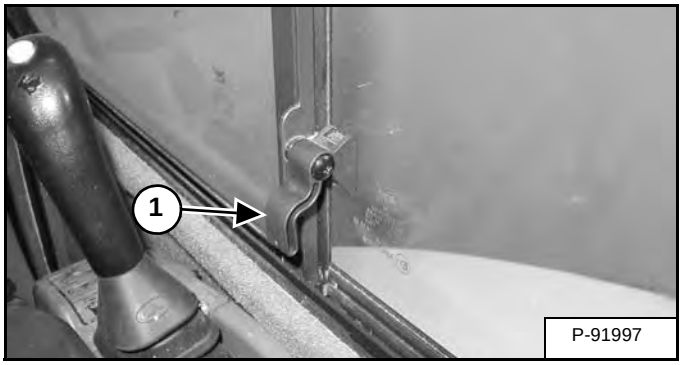
Raise the latch (Item 1) **[Figure 37]**.

Push the latch (Item 1) **[Figure 36]** back to close the window. Rotate the latch (Item 1) **[Figure 34]** down.

Right Side Windows (Cont'd)

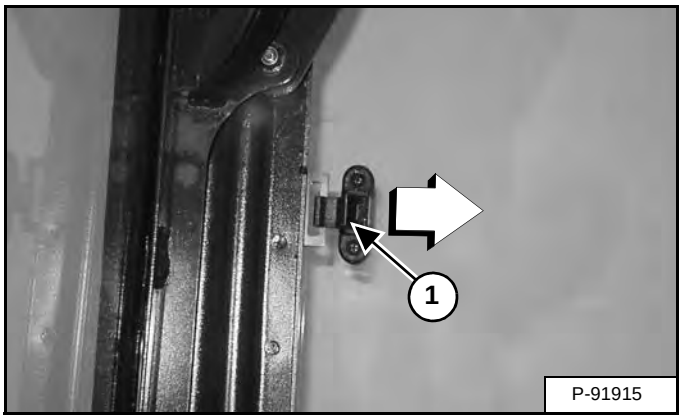
Opening The Right Front Window

Figure 37



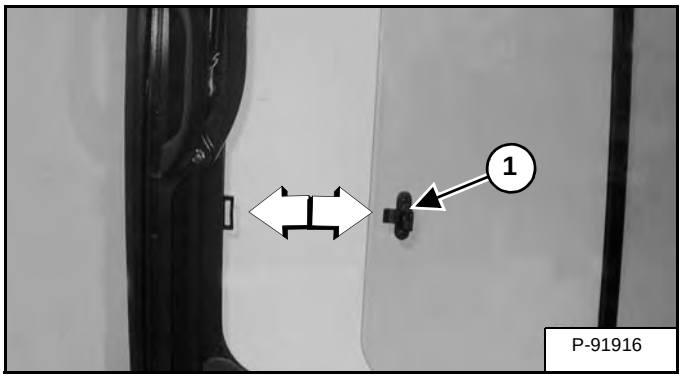
Raise the latch (Item 1) **[Figure 37]** located at the rear of the front window.

Figure 38



Pull back on the latch (Item 1) **[Figure 38]**.

Figure 39



Pull the latch (Item 1) **[Figure 39]** back to open the window.

When the window is in the open position, push down on the latch (Item 1) **[Figure 37]**.

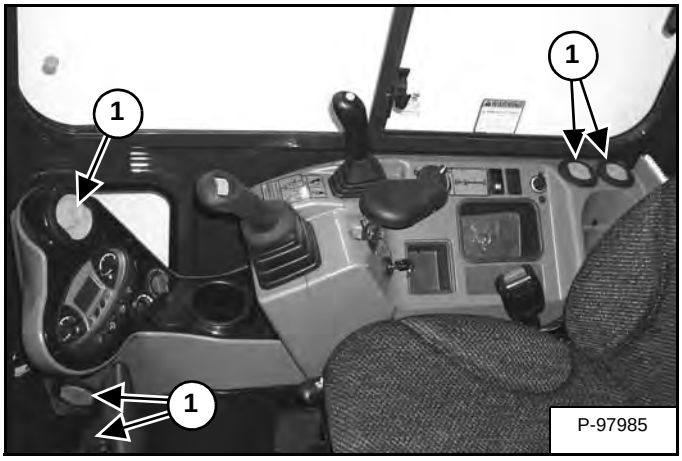
Closing The Right Front Window

Raise the latch (Item 1) **[Figure 37]**.

Push the handle (Item 1) **[Figure 39]** forward to close the window. Rotate the latch (Item 1) **[Figure 37]** down.

Heating, Ventilation, And Air Conditioning Ducting

Figure 40



The HVAC louvers (Item 1) **[Figure 40]** can be positioned as needed to direct the air flow to various areas in the cab.

EMERGENCY EXIT

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

Right Side Rear Window

Figure 41

Exit through the window **[Figure 41]**.

Front Window

Figure 42

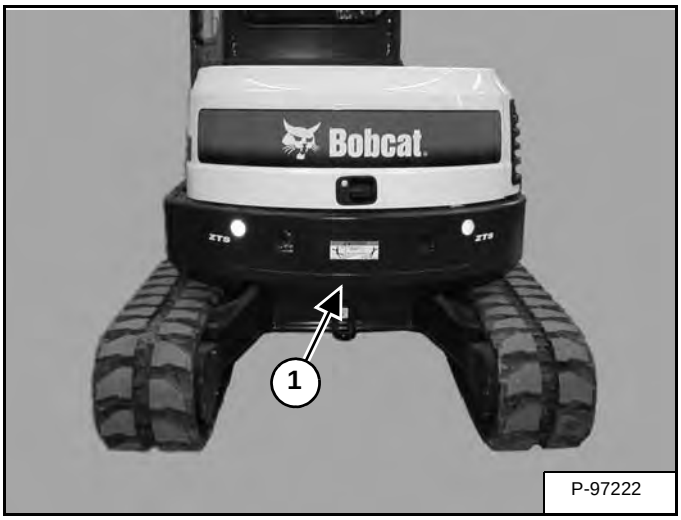
Open the front window and exit **[Figure 42]**.

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

MOTION ALARM SYSTEM

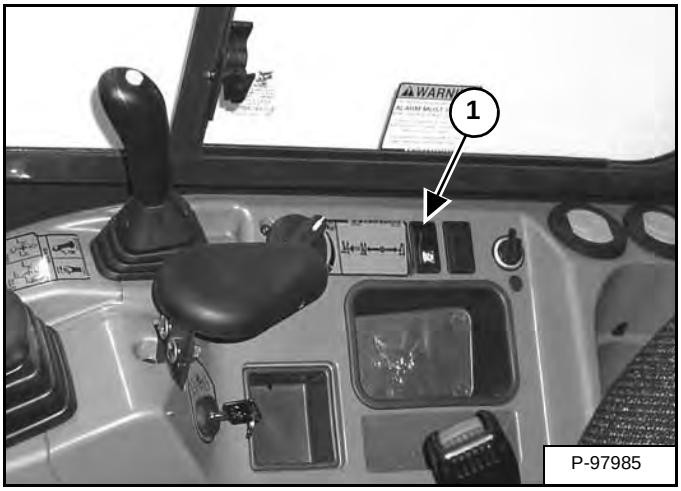
Operation

Figure 43



This excavator may be equipped with a motion alarm system. The motion alarm (Item 1) **[Figure 43]** is located inside the rear of the excavator.

Figure 44



The motion alarm can be temporarily disabled by pressing the motion alarm switch (Item 1) **[Figure 44]** while the machine is moving. As soon as the travel levers are returned to the NEUTRAL position, the motion alarm will be enabled.

⚠ 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 (Item 1) **[Figure 45]** in either the forward or reverse direction.

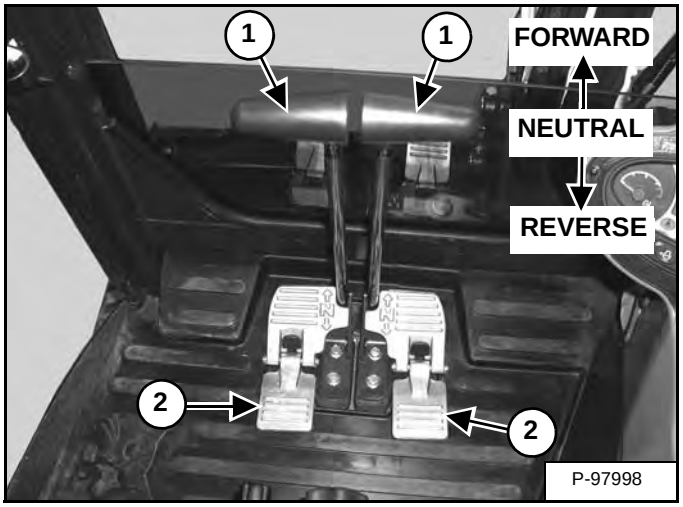
If alarm does not sound or for adjustment instructions, see inspection and maintenance instructions for the motion alarm system in the preventive maintenance section of this manual. (See MOTION ALARM SYSTEM on Page 140.)

TRAVEL CONTROLS

Forward And Reverse Travel

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

Figure 45



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 45]** forward for forward travel; backward for reverse travel.

* Travel can also be controlled with foot pedals (Item 2) **[Figure 45]**. Pivot the heel of the pedals forward for additional space on the floor.

⚠ WARNING

AVOID INJURY OR DEATH

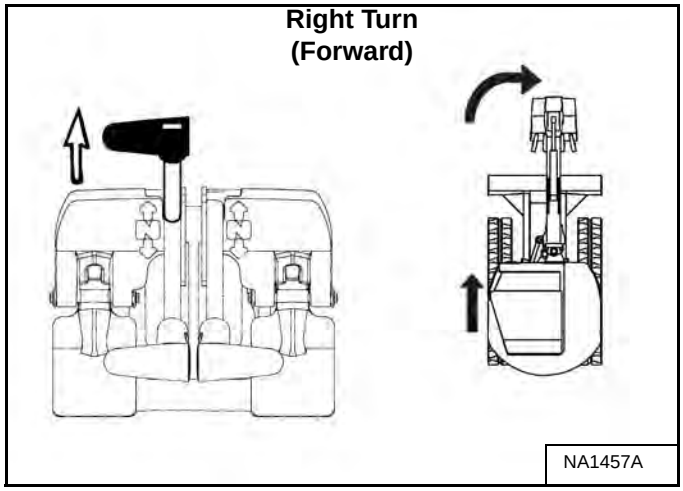
- **Check the blade location before traveling. When the blade is to the rear, operate the steering levers / foot pedals in the opposite direction to when the blade is in the front.**
- **Move the steering levers / foot pedals slowly. Abrupt lever motion will cause the machine to jerk.**

W-2235-0396

Turning

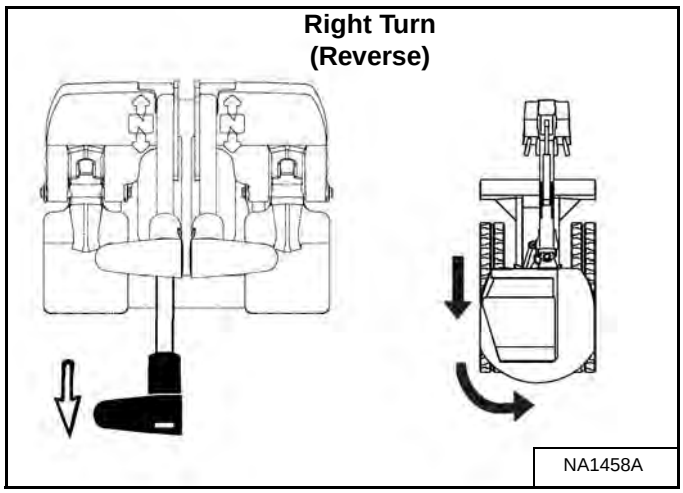
Right Turn

Figure 46



Push the left steering lever forward to turn right **[Figure 46]** while traveling forward.

Figure 47

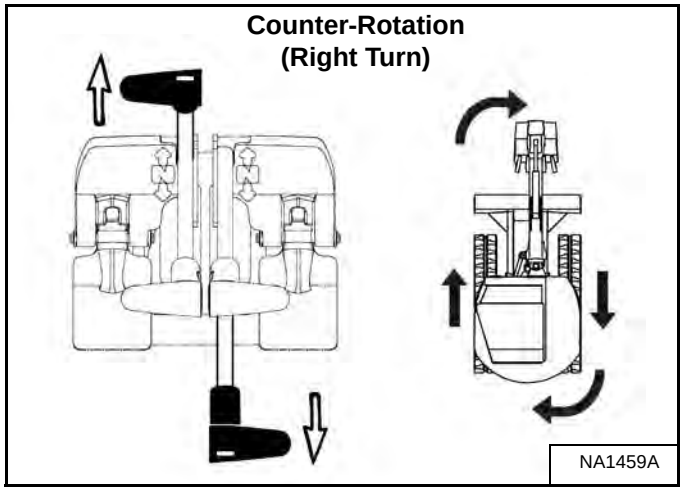


Pull the left steering lever backward to turn right while traveling backward **[Figure 47]**.

Turning (Cont'd)

Counter-Rotation Right Turn

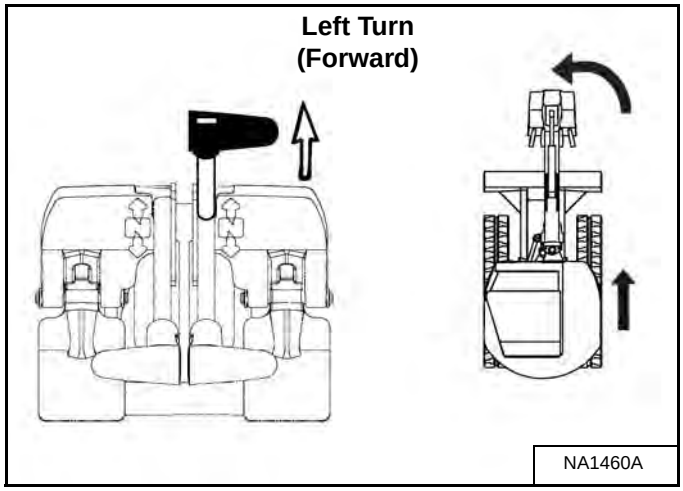
Figure 48



Push the left steering lever forward and pull the right steering lever backward **[Figure 48]**.

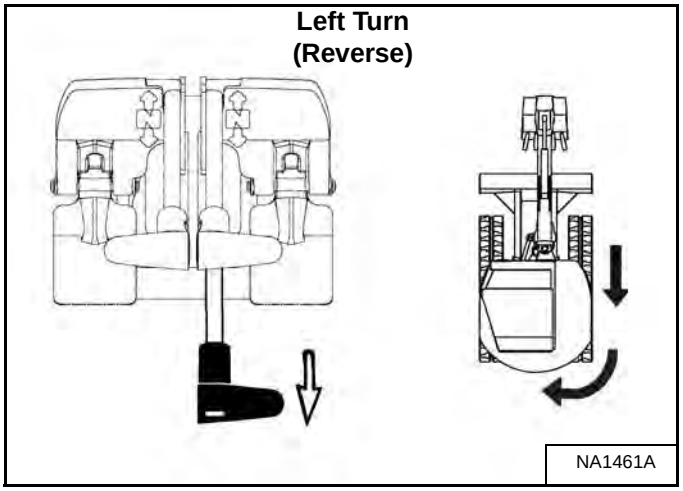
Left Turn

Figure 49



Push the right steering lever forward to turn left while traveling forward **[Figure 49]**.

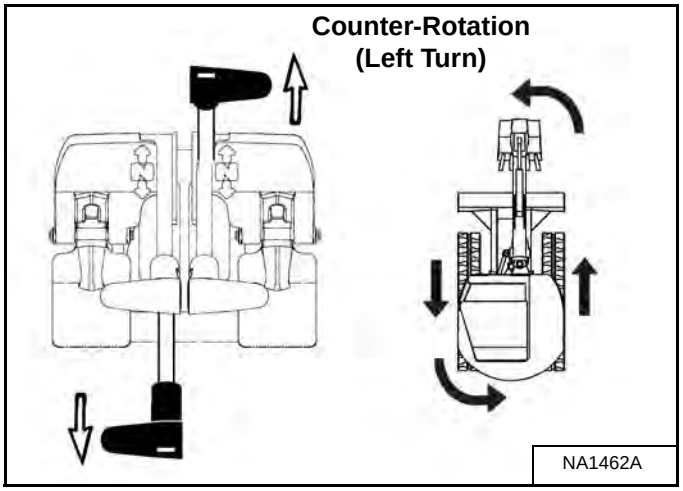
Figure 50



Pull the right steering lever backward to turn left while traveling backward **[Figure 50]**.

Counter-Rotation Left Turn

Figure 51



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

HYDRAULIC CONTROLS

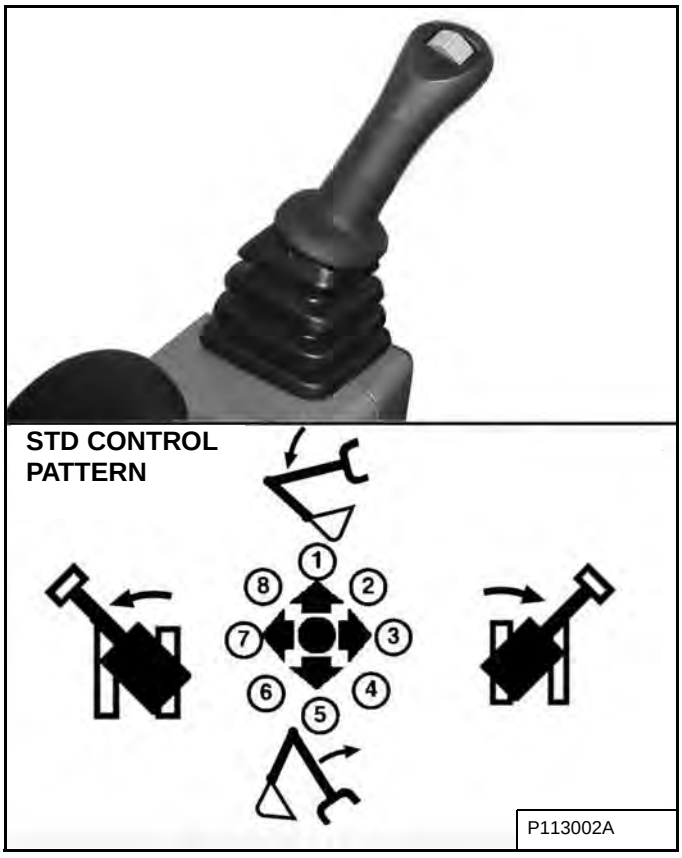
Description

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 52]** and **[Figure 53]** or in the ISO Control Pattern **[Figure 54]** and **[Figure 55]**.

STANDARD Control Pattern

Left Control Lever (Joystick)

Figure 52

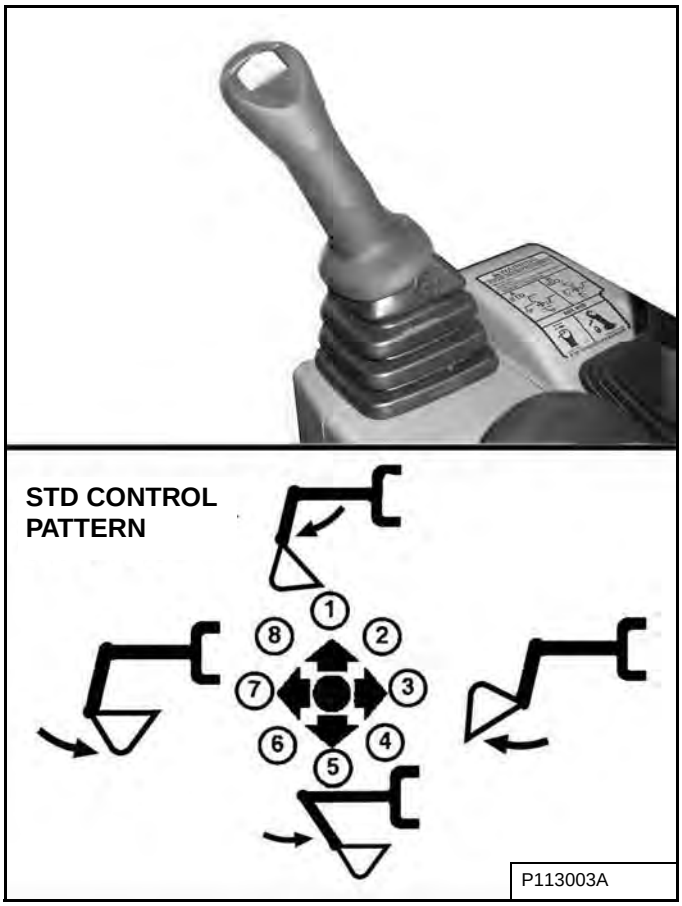


The left lever (joystick) is used to operate the boom and slew the upperstructure **[Figure 52]**.

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.

Right Control Lever (Joystick)

Figure 53



The right lever (joystick) is used to operate the arm and bucket **[Figure 53]**.

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:

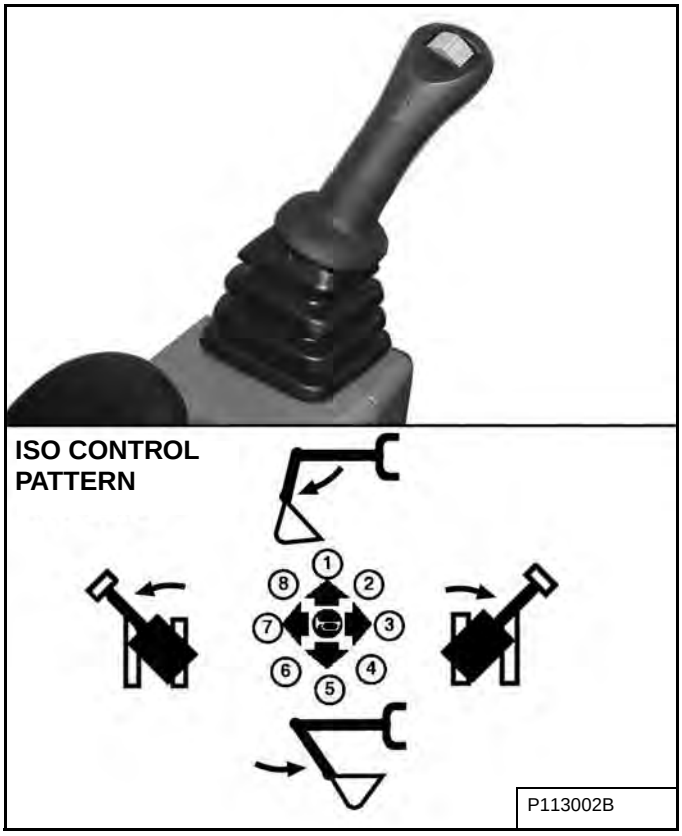
- **Lower the work equipment to the ground.**
- **Lower the blade to the ground.**
- **Stop the engine and remove the key.**
- **Raise the control console.**

W-2780-0109

ISO Control Pattern

Left Control Lever (Joystick)

Figure 54

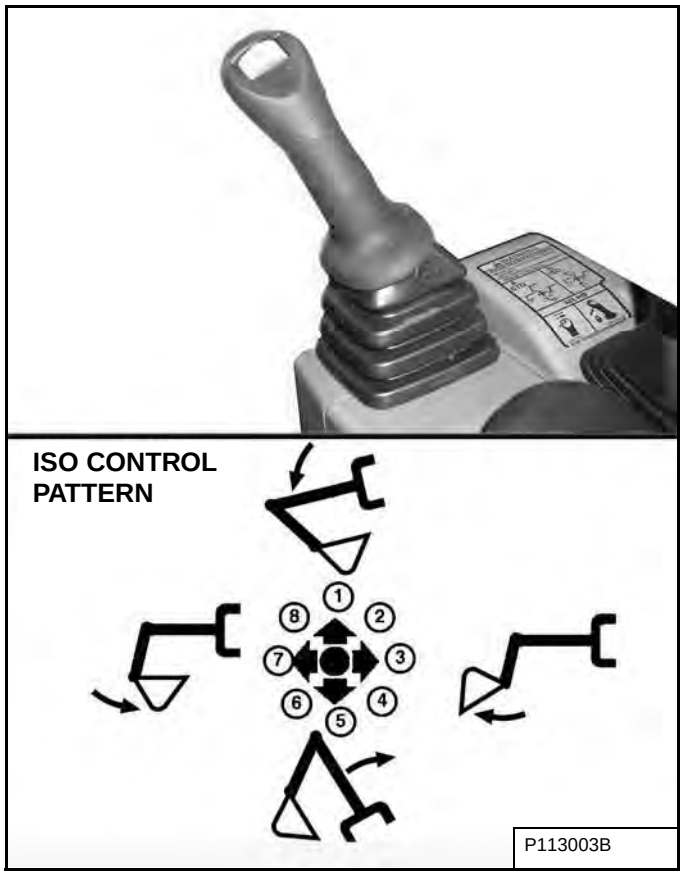


The left lever (joystick) is used to operate the arm and slew the upperstructure **[Figure 54]**.

1. Arm out.
2. Arm out and slew right.
3. Slew right.
4. Arm in and slew right.
5. Arm in.
6. Arm in and slew left.
7. Slew left.
8. Arm out and slew left.

Right Control Lever (Joystick)

Figure 55



The right lever (joystick) is used to operate the boom and bucket **[Figure 55]**.

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 and remove the key.**
- **Raise the control console.**

W-2780-0109

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

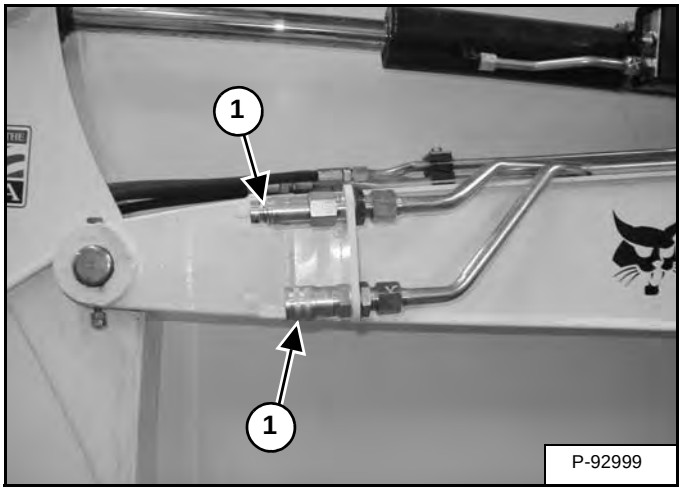
⚠ WARNING

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

Figure 56



Excavators and attachments are supplied with flush faced couplers (Item 1) **[Figure 56]**.

Auxiliary Hydraulics - Standard Instrument Panel

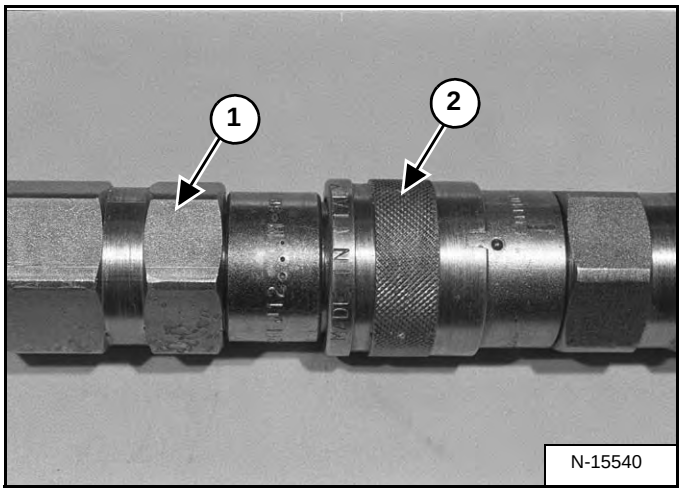
To Connect:

Remove any dirt or debris from the surface of both the male and female couplers, and from the outside diameter of the male coupler. Visually check the couplers for corroding, cracking, damage, or excessive wear, if any of these conditions exist, the coupler(s) (Item 1) **[Figure 56]** must be replaced.

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

To Disconnect:

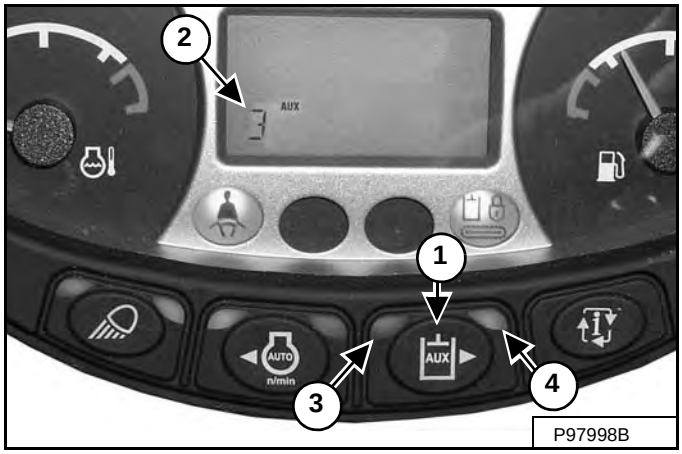
Figure 57



Hold the male coupler (Item 1). Retract the sleeve (Item 2) **[Figure 57]** on the female coupler until the couplers disconnect.

The primary auxiliary hydraulics has Selectable Auxiliary Hydraulic Flow or Continuous Auxiliary Hydraulic Flow. This allows the operator to select a hydraulic flow that matches the attachment hydraulic requirements. The auxiliary hydraulics can be set to Aux3, Aux2, Aux1 or OFF. Aux3 allows maximum hydraulic flow, Aux2 allows medium hydraulic flow and Aux1 allows low hydraulic flow.

Figure 58



NOTE: If the auxiliary hydraulics are enabled when the engine is turned OFF, they will stay enabled when the engine is restarted. If Continuous Flow was enabled at engine OFF, it will reset to selectable flow mode.

Selectable Auxiliary Hydraulics Flow - Press the Auxiliary Hydraulics button (Item 1) (an audible beep will sound each time the auxiliary button is pressed). The last selected auxiliary hydraulic flow (Aux3, Aux2 or Aux1) will appear in the data display (Item 2). The LED (Item 3) **[Figure 58]** will be illuminated.

To change the auxiliary flow, press the Auxiliary Hydraulics button (Item 1) to toggle through the settings, each time the button is pressed, the next setting will appear in the data display (Item 2) **[Figure 58]**. Once the desired setting is selected, it will stay at that setting until a different auxiliary flow is selected by the operator. (Example: Even if the engine was STOPPED, if Aux2 has been selected, after key OFF and engine restart, the Aux2 setting will still be the active hydraulic flow when the machine is started.)

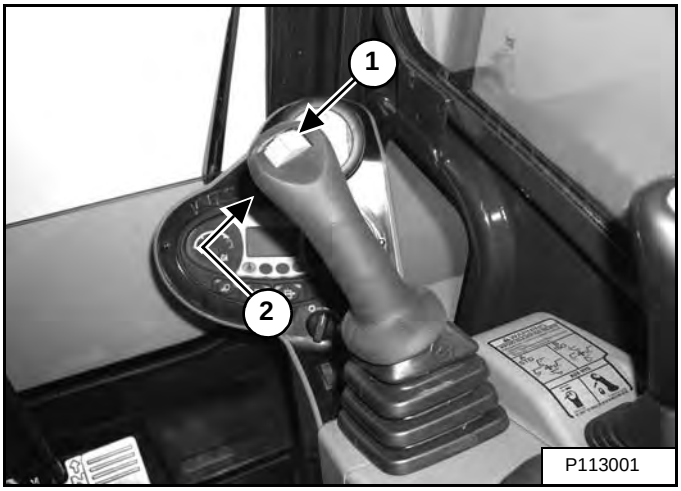
Continuous Flow Auxiliary Hydraulics - Press and hold the Auxiliary Hydraulics button (Item 1) for more than one second. The LED (Item 4) will illuminate. Press the Auxiliary Hydraulics button (Item 1) **[Figure 58]** again to scroll through the various continuous flow auxiliary hydraulic settings (3, 2, 1).

Examples For Setting Selectable Auxiliary Hydraulic Flow And The Attachment Used:

AUX FLOW SETTING	FLOW	ATTACHMENTS
Aux3	Maximum	Breaker, Vibratory Plate Compactor, Auger
Aux2	Medium	Clamp, Grapple
Aux1	Low	Power Tilt, Hydra Tilt

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

Figure 59



Move the switch (Item 1) **[Figure 59]** on the right control lever to the right to supply hydraulic flow to the female coupler. Move the switch to the left to supply hydraulic flow to the male coupler. If you move the switch halfway, the auxiliary functions move at approximately one-half speed.

Press the button (Item 2) **[Figure 59]** on the front of the handle to provide continuous flow to the female coupler.

NOTE: Pressing the switch (Item 1) to the left <u>while</u> pressing the button (Item 2) [Figure 59] on the front of the handle will provide continuous flow to the male coupler.

Press the button (Item 2) **[Figure 59]** a second time to stop auxiliary flow to the quick couplers.

NOTE: Reverse flow can cause damage to some attachments. Use reverse flow with your attachment only if approved. See your attachment Operation & Maintenance Manual for detailed information.

HYDRAULIC CONTROLS (CONT'D)

Auxiliary Hydraulics - Deluxe Instrument Panel

The primary auxiliary hydraulics has Selectable Auxiliary Hydraulic Flow or Continuous Auxiliary Hydraulic Flow. This allows the operator to select a hydraulic flow that matches the attachment hydraulic requirements. The auxiliary hydraulics can be set to Aux3, Aux2, Aux1 or OFF. Aux3 allows maximum hydraulic flow, Aux2 allows medium hydraulic flow and Aux1 allows low hydraulic flow.

Figure 60

NOTE: If the auxiliary hydraulics are enabled when the engine is turned OFF, they will stay enabled when the engine is restarted. If Continuous Flow was enabled at engine OFF, it will reset to selectable flow mode.

Selectable Flow Auxiliary Hydraulics - Press key pad **[6] [Figure 60]** to scroll through the various front auxiliary hydraulic settings (3, 2, 1).

Continuous Flow Auxiliary Hydraulics - Press and hold the key pad **[6] [Figure 60]** for more than one second. The continuous flow icons below will illuminate. Press the key pad **[6]** to scroll through the various continuous flow auxiliary hydraulic settings (3, 2, 1).

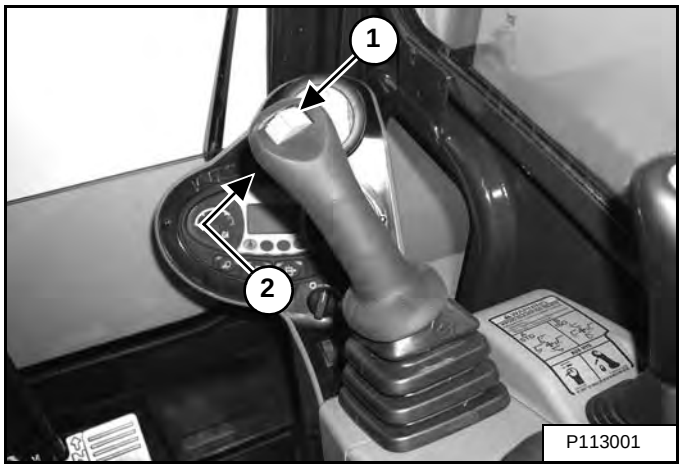
ICON	DESCRIPTION
	Engine OFF - Auxiliary Hydraulics Pressure Relieve
	Engine Running - Auxiliary Hydraulics OFF
	Auxiliary Hydraulics - Maximum Flow - Continuous Flow Disabled
	Auxiliary Hydraulics - Medium Flow - Continuous Flow Disabled
	Auxiliary Hydraulics - Low Flow - Continuous Flow Disabled
	Auxiliary Hydraulics - Maximum Flow - Continuous Flow Enabled
	Auxiliary Hydraulics - Medium Flow - Continuous Flow Enabled
	Auxiliary Hydraulics - Low Flow - Continuous Flow Enabled

Examples For Setting Selectable Auxiliary Hydraulic Flow And The Attachment Used:

AUX FLOW SETTING	FLOW	ATTACHMENTS
Aux3	Maximum	Breaker, Vibratory Plate Compactor, Auger
Aux2	Medium	Clamp, Grapple
Aux1	Low	Power Tilt, Hydra Tilt

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

Figure 61



Move the switch (Item 1) **[Figure 61]** on the right control lever to the right to supply hydraulic flow to the female coupler. Move the switch to the left to supply hydraulic flow to the male coupler. If you move the switch halfway, the auxiliary functions move at approximately one-half speed.

Press the button (Item 2) **[Figure 61]** on the front of the handle to provide continuous flow to the female coupler.

NOTE: Pressing the switch (Item 1) to the left <u>while</u> pressing the button (Item 2) [Figure 61] on the front of the handle will provide continuous flow to the male coupler.

Press the button (Item 2) **[Figure 61]** a second time to stop auxiliary flow to the quick couplers.

NOTE: Reverse flow can cause damage to some attachments. Use reverse flow with your attachment only if approved. See your attachment Operation & Maintenance Manual for detailed information.

Relieve Hydraulic Pressure With Standard Instrument Panel (Excavator And Attachment)

Excavator:

Put the attachment flat on the ground.

Stop the engine and turn the key switch to ON.

NOTE: The left console must be fully lowered for relieving hydraulic pressure.

NOTE: Excavator engine must have recently been started to relieve hydraulic pressure.

Figure 62

If the auxiliary hydraulics are disabled, press AUX HYD button (Item 1) **[Figure 62]** and then move the switch (Item 1) **[Figure 61]** to the right and left several times.

If the auxiliary hydraulics are enabled, then move the switch (Item 1) **[Figure 61]** to the right and left several times.

Attachments:

- Follow procedure above to relieve hydraulic pressure in excavator.
- Connect male coupler from attachment to female coupler of excavator then repeat procedure above. This will relieve 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.

Relieve Hydraulic Pressure With Deluxe Instrument Panel (Excavator And Attachment)

Excavator:

Put the attachment flat on the ground.

NOTE: Excavator engine must have recently been started to relieve hydraulic pressure.

Figure 63

Stop the engine and turn the start switch to ON. Press either scroll button (Item 1) **[Figure 63]** (Deluxe Panel) until the above screen is visible.

Press button **[6] [Figure 63]** and the **[AUX PRESSURE RELEASE]** screen **[Figure 64]** will be visible.

Figure 64

Press the **[ENTER]** button (Item 1) **[Figure 64]** to relieve auxiliary pressure in the excavator. An hour glass symbol will appear and when pressure is relieve, the screen will show *Auxiliary Hydraulic Pressure Release*.

Attachments:

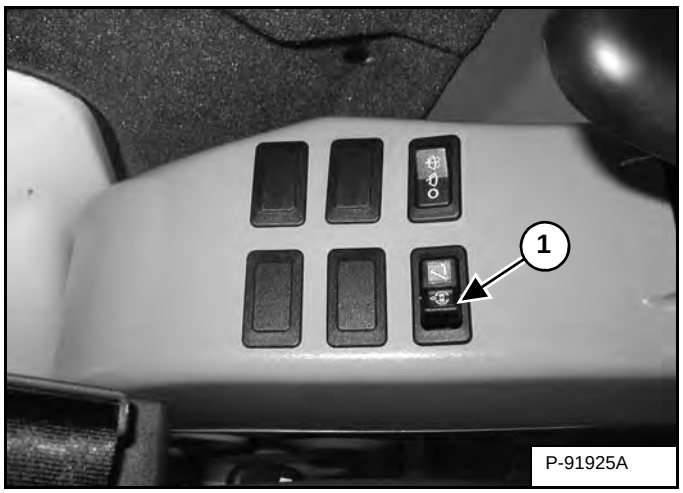
- Follow procedure above to relieve hydraulic pressure in excavator.
- Connect male coupler from attachment to female coupler of excavator then repeat procedure above. This will relieve pressure in the attachment.
- Connect the female coupler from the attachment.

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

Secondary Auxiliary Hydraulics

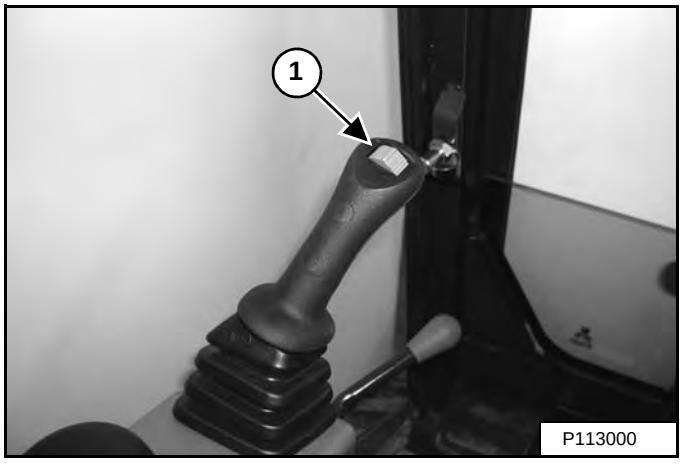
When equipped with secondary auxiliary hydraulics, the second set of hydraulic couplers will be mounted on the right side of the arm.

Figure 65



Press AUX HYD button (Item 1) **[Figure 65]** (if equipped) to the right, secondary auxiliary hydraulic position.

Figure 66



Move the switch (Item 1) **[Figure 66]** on the left control lever to the left to supply hydraulic flow to the female coupler. Move the switch to the right to supply hydraulic flow to the male coupler. If you move the switch halfway, the auxiliary functions move at approximately one-half speed.

HYDRAULIC CONTROLS (CONT'D)

Return To Tank Valve

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

Relieve Secondary Auxiliary Hydraulic Pressure (Excavator And Attachment)

Excavator:

Put the attachment flat on the ground.

Stop the engine and turn the key to ON.

NOTE: The left console must be fully lowered for relieving hydraulic pressure.

NOTE: Excavator engine must have recently been started to relieve hydraulic pressure.

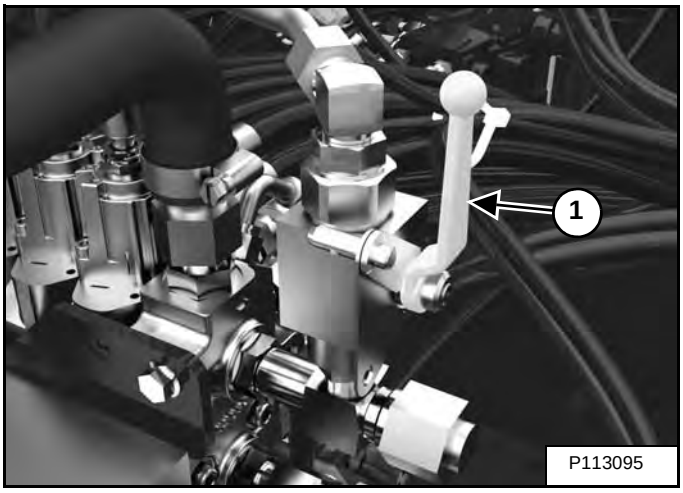
Press AUX HYD button (Item 1) **[Figure 65]** and then move the switch (Item 1) **[Figure 66]** to the right and left several times.

Attachments:

- Follow procedure above to relieve pressure in excavator.
- Connect male coupler from attachment to female coupler of excavator then repeat procedure above. This will relieve 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.

Figure 67



Rotate the lever (Item 1) **[Figure 67]** clockwise to direct auxiliary return hydraulic fluid to the reservoir.

Rotate the lever (Item 1) **[Figure 67]** counterclockwise for two way hydraulic auxiliary flow operation.

OVERLOAD WARNING

Description

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

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

Operation

Figure 68

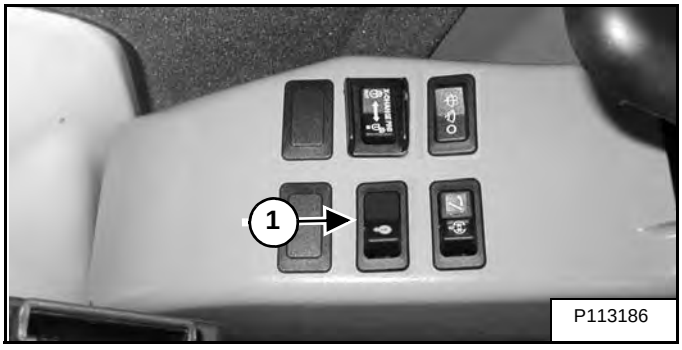
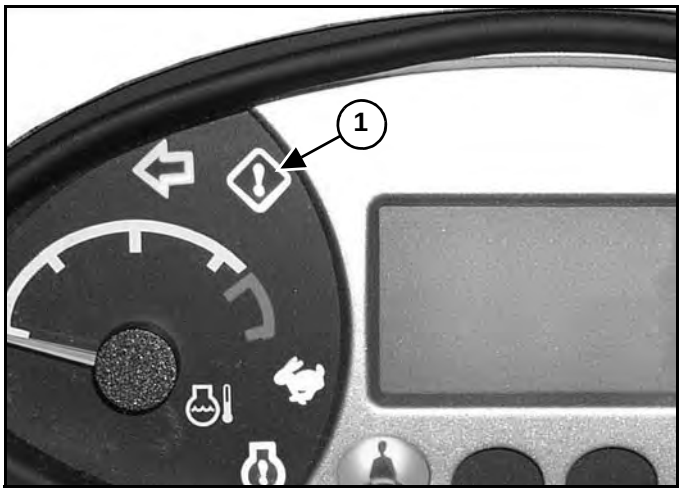


Figure 69



Press the switch (Item 1) **[Figure 68]** to the right to enable the Overload Warning Feature.

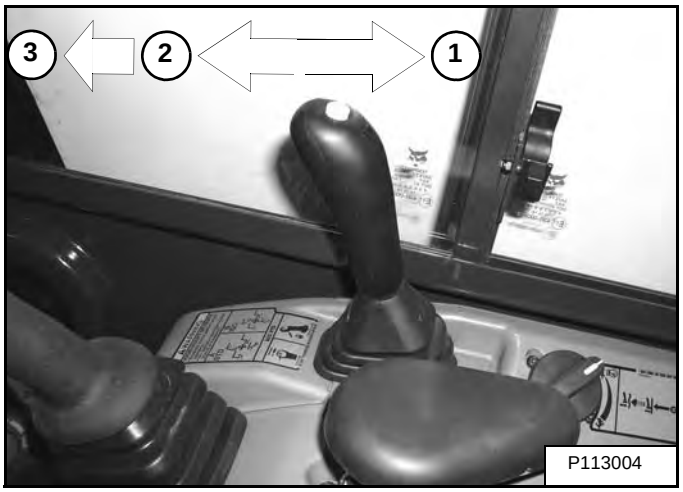
A buzzer will sound and the general warning icon (Item 1) **[Figure 69]** will illuminate when the boom is overloaded.

To disengage the overload warning feature, press the switch (Item 1) **[Figure 68]** to the left. The icon (Item 1) **[Figure 69]** will turn off when the overload warning feature is disabled.

BLADE CONTROL LEVER

Raising And Lowering Blade

Figure 70



NOTE: The blade lever shown in [Figure 70] is for machines without angle blade. For machines with angle blade, the blade lever is shown in [Figure 71].

Pull the lever backward to raise the blade (Item 1) **[Figure 70]**.

Push the lever forward to lower the blade (Item 2) **[Figure 70]**.

Push the lever (Item 3) **[Figure 70]** forward until the lever is in the locked position to put the blade in the *float* position.

Pull the lever backward to unlock from the *float* position.

NOTE: Keep blade lowered for increased digging performance.

Angling Blade (If Equipped)

Figure 71

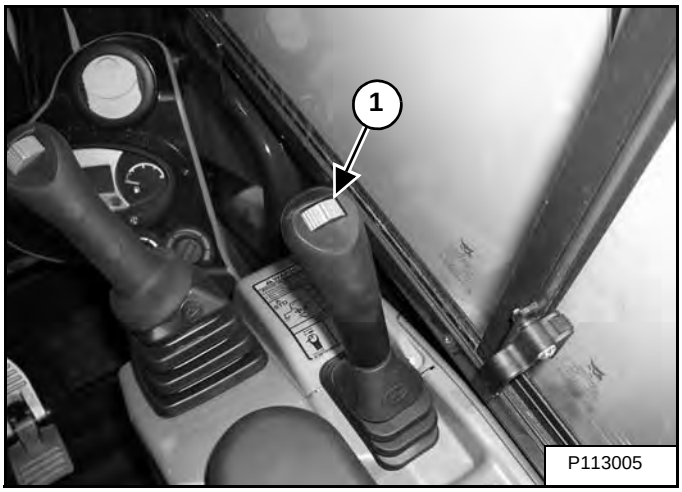
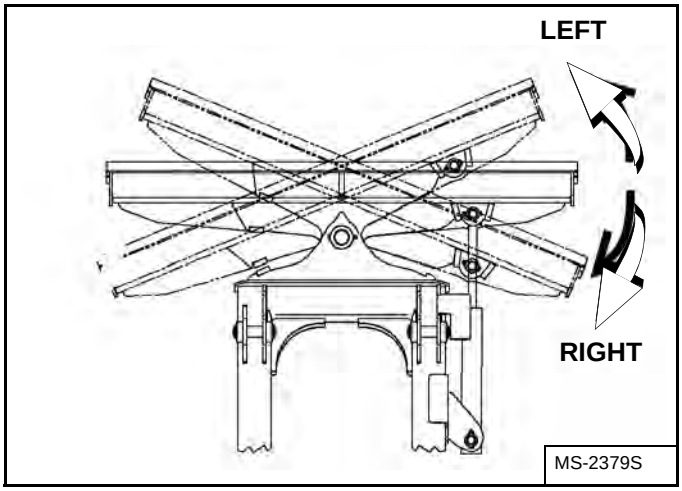


Figure 72



Move the switch (Item 1) **[Figure 71]** to the left to angle the blade to the left **[Figure 72]**.

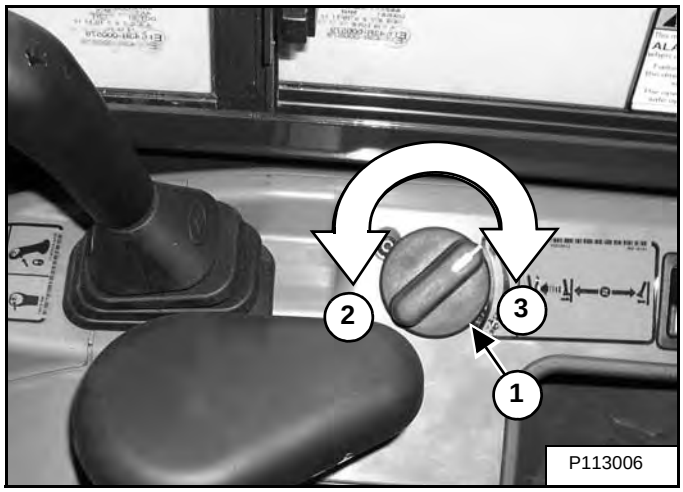
Move the switch (Item 1) **[Figure 71]** to the right to angle the blade to the right **[Figure 72]**.

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

ENGINE SPEED CONTROL DIAL

Setting Engine Speed (RPM)

Figure 73



The engine speed control dial (Item 1) **[Figure 73]** controls engine rpm.

Rotate the engine speed control dial counterclockwise (Item 2) to reduce engine rpm. Rotate the engine speed control dial clockwise (Item 3) **[Figure 73]** to increase engine rpm.

ECO Mode (With Deluxe Instrument Panel Only)

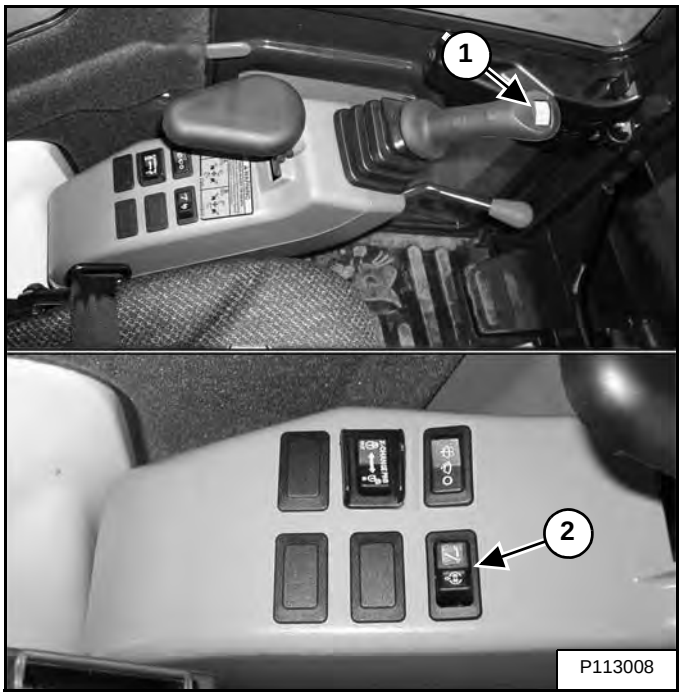
If equipped with the Deluxe Instrument Panel, ECO mode is available.

To enable ECO mode: (See ECO MODE on Page 191.)

BOOM SWING

Operation

Figure 74



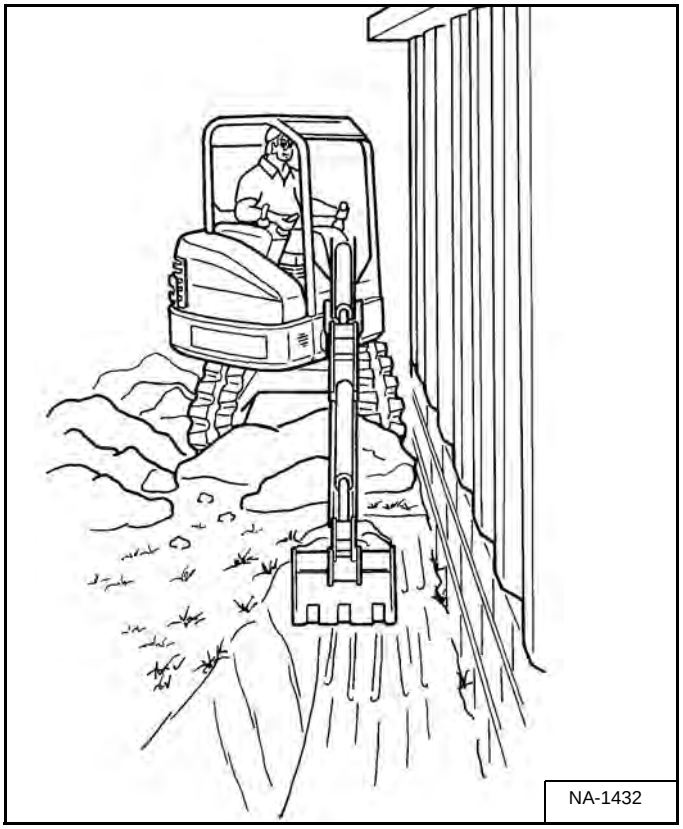
The switch (Item 1) **[Figure 74]** on the left control lever (joystick) controls boom swing. Move the switch to the left to swing the boom to the left. Move the switch to the right to swing the boom to the right.

Secondary Auxiliary Hydraulics:

If the machine is equipped with secondary auxiliary hydraulic couplers, the switch (Item 2) **[Figure 74]** is used to select either the boom swing function or the secondary auxiliary hydraulic function.

Move the switch (Item 2) **[Figure 74]** to the left to select boom swing function, move the switch to the right to select secondary auxiliary hydraulic function.

Figure 75



NOTE: The purpose of the boom swing is to offset the boom with respect to the upperstructure for digging close to a structure [Figure 75].

BOOM LOAD HOLDING VALVE

Description

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

⚠ WARNING

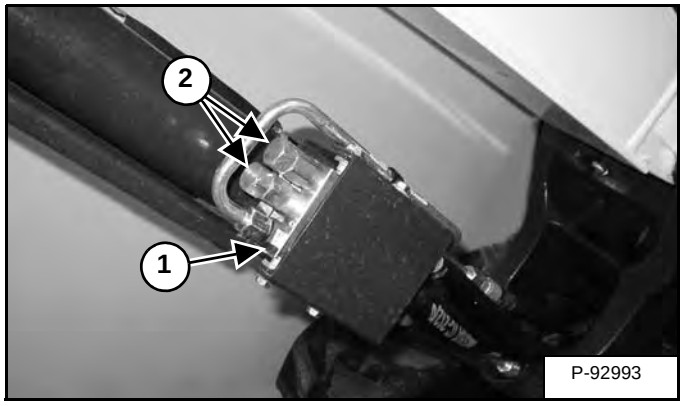
AVOID INJURY OR DEATH

Do Not work or stand under raised work equipment or attachment.

W-2793-0409

Lowering Boom With Load Holding Valve

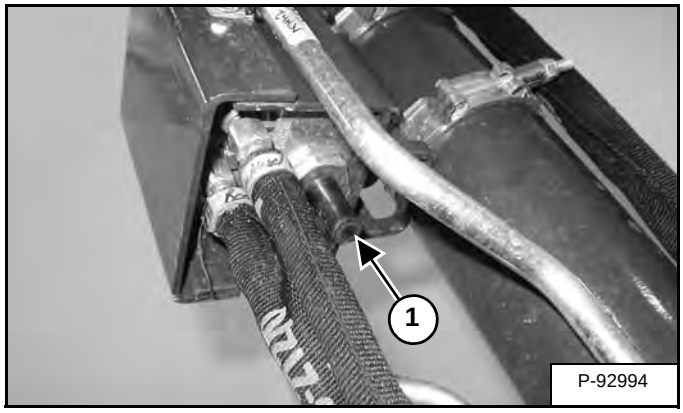
Figure 76



If the excavator is equipped with a boom load holding valve (Item 1) **[Figure 76]**, it will be attached to the boom cylinder at the base end.

NOTE: DO NOT remove or adjust the two port relief valves (Item 2) [Figure 76]. If the port relief valves have been tampered with, see your Bobcat dealer for service.

Figure 77



Remove the plastic protective cap (Item 1) **[Figure 77]** from the valve.

⚠ WARNING

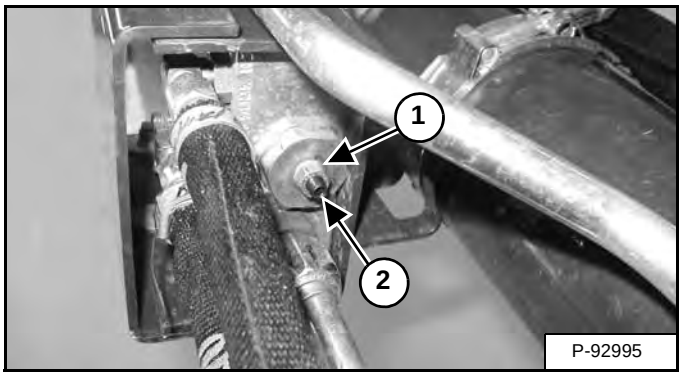
AVOID BURNS

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

Lowering Boom With Load Holding Valve (Cont'd)

Figure 78



Lowering procedures:

With base end hose failure:

Loosen the jam nut (Item 1). Install a hex wrench into the valve screw (Item 2) **[Figure 78]** and slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the boom to lower to the ground.

After the boom is fully lowered, rotate the screw counterclockwise (Item 2) 1/8 to 1/4 turn and tighten the lock nut (Item 1) **[Figure 78]**.

With rod end hose failure - with accumulator pressure:

Place a container under the valve and hose end to contain hydraulic fluid. Enter the excavator and turn the key to the ON position or press the ENTER CODE Button (Keyless Panel), but do not start the engine. Slowly move the joystick boom lower function and allow the boom to lower to the ground.

With rod end hose failure and NO accumulator pressure:

Remove the boom base end hose from the boom load holding valve. Place a container under the valve and base end hose to contain hydraulic fluid.

Loosen the jam nut (Item 1). Install a hex wrench into the valve screw (Item 2) **[Figure 78]** and slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the boom to lower to the ground.

After the boom is fully lowered, rotate the screw (Item 2) counterclockwise 1/8 to 1/4 turn and tighten the lock nut (Item 1) **[Figure 78]**. Reinstall the base end hose.

Loss of hydraulic pressure:

Use the same procedure as: **With rod end hose failure and NO accumulator pressure**.

ARM LOAD HOLDING VALVE

Description

The arm load holding valve (if equipped) will hold the arm in it's current position in the event of hydraulic pressure loss.

⚠ WARNING

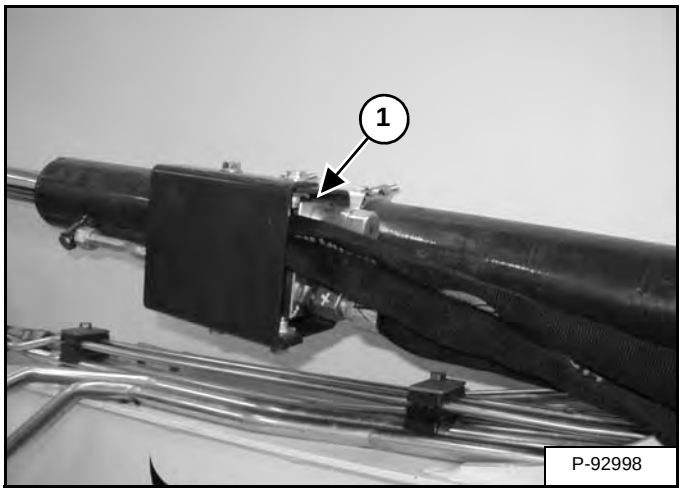
AVOID INJURY OR DEATH

Do Not work or stand under raised work equipment or attachment.

W-2793-0409

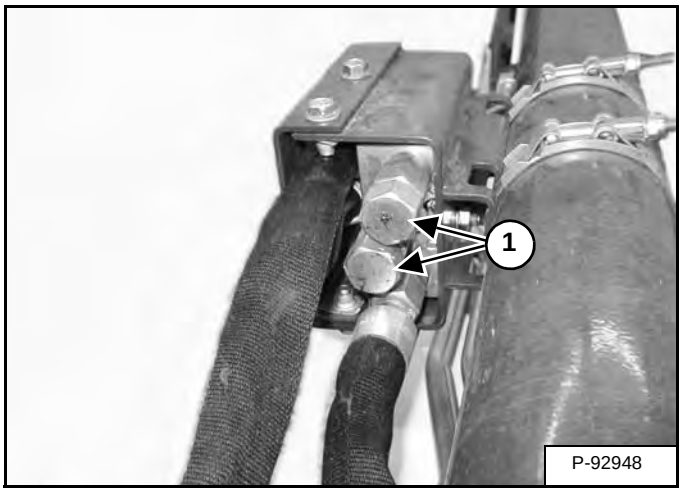
Lowering Arm With Load Holding Valve

Figure 79



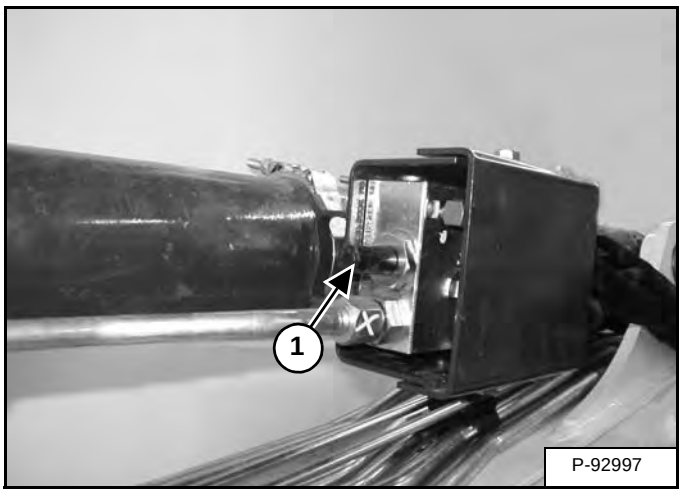
If the excavator is equipped with arm load holding valve (Item 1) **[Figure 79]**, it will be attached to the arm cylinder base end as shown.

Figure 80



NOTE: DO NOT remove or adjust the two port relief valves (Item 1) [Figure 80]. If the port relief valves have been tampered with, see your Bobcat dealer for service.

Figure 81



Remove the plastic protective cap (Item 1) **[Figure 81]** from the valve.

⚠ WARNING

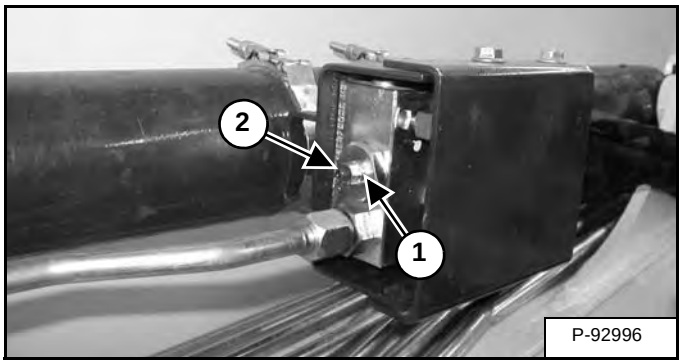
AVOID BURNS

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

Lowering Arm With Load Holding Valve (Cont'd)

Figure 82



Lowering procedures:

With base end hose failure:

Loosen the jam nut (Item 1). Install a hex wrench into the valve screw (Item 2) **[Figure 82]** and slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the arm to lower.

After the arm is lowered, rotate the screw counterclockwise (Item 2) the same 1/8 to 1/4 turn and tighten the lock nut (Item 1) **[Figure 82]**.

With rod end hose failure - with accumulator pressure:

Place a container under the valve and hose end to contain hydraulic fluid. Enter the excavator and turn the key to the ON position or press the **[ENTER CODE]** Button (Keyless Panel), but do not start the engine. Move the joystick arm retract function to slowly lower the arm.

With rod end hose failure and NO accumulator pressure:

Remove the arm base end hose from the arm load holding valve. Place a container under the valve and base end hose to contain hydraulic fluid.

Loosen the jam nut (Item 1). Install a hex wrench into the valve screw (Item 2) **[Figure 82]** and slowly rotate the screw clockwise 1/8 to 1/4 turn and allow the arm to lower.

After the arm is lowered, rotate the screw (Item 2) counterclockwise 1/8 to 1/4 turn and tighten the lock nut (Item 1) **[Figure 82]**. Reinstall the base end hose.

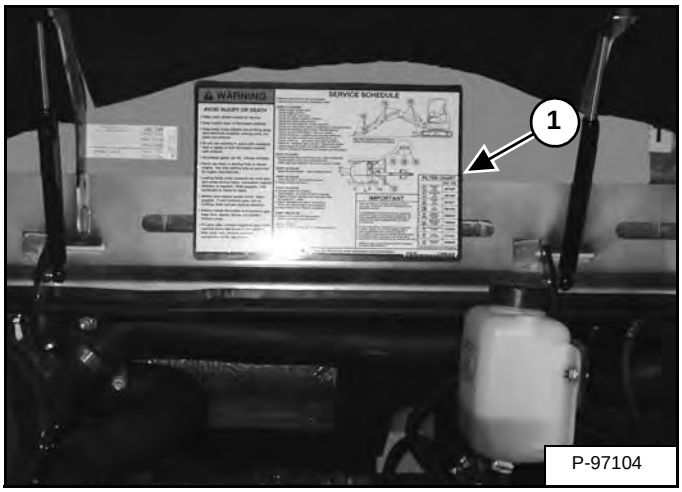
Loss of hydraulic pressure:

Use the same procedure as: **With rod end hose failure - with NO accumulator pressure** above.

DAILY INSPECTION

Daily Inspection And Maintenance

Figure 83



Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The Service Schedule is a guide for correct maintenance of the Bobcat excavator. The decal (Item 1) **[Figure 83]** is located inside the rear door. (See SERVICE SCHEDULE on Page 136.)

Check the following items before each day of operation:

- Operator Canopy or Cab (ROPS / TOPS) and mounting hardware.
- Seat belt and mounting hardware. Replace seat belt if damaged.
- Check for damaged decals, replace as needed.
- Check control console lockout.
- Check X-Change System (if equipped) for damage or loose parts.
- Air cleaner and intake hoses / clamps.
- Engine oil level and engine for leaks.
- Engine coolant level and engine for leaks.
- Check engine area for flammable materials.
- Check hydraulic fluid level and system for leaks.
- Check indicator lights for correct operation.
- Grease all pivot points.
- Check cylinder and attachment pivot points.
- Check the track tension.
- Repair broken and loose parts.
- Check or clean cab heater filters (if equipped).
- Check front horn and motion alarm (if equipped) for proper function.

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 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

IMPORTANT

This machine is factory equipped with a U.S.D.A. Forestry Service approved spark arrester exhaust system.

The spark arrester muffler, if equipped, must be cleaned to keep it in working condition. The spark arrester muffler must be serviced by dumping the spark chamber every 100 hours of operation.

On some models, the turbocharger functions as the spark arrester and must operate correctly for proper spark arrester function.

If this machine is operated on flammable forest, brush, or grass covered land, it must be equipped with a spark arrester 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 arrester requirements.

I-2284-0111

Operation & Maintenance Manual And Operator's Handbook Locations

Figure 84

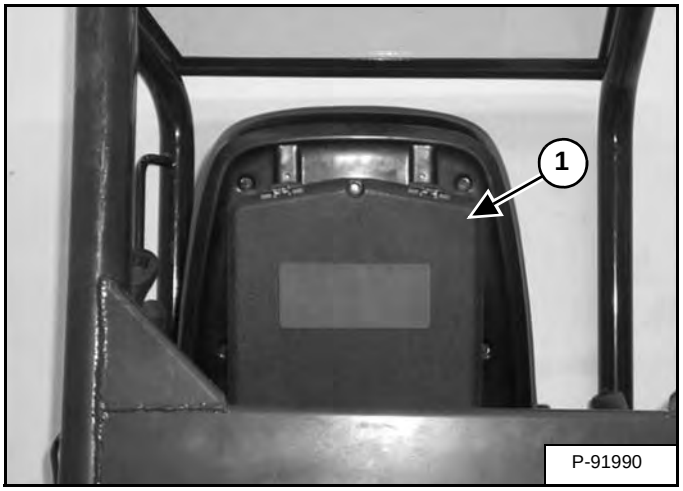
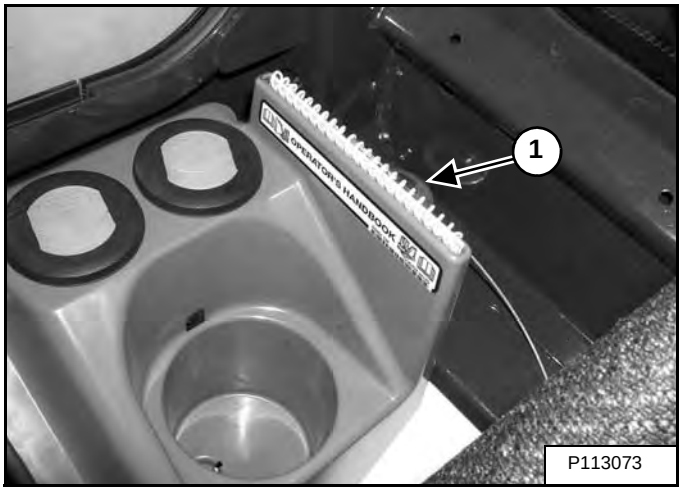


Figure 85



Read and understand the Operation & Maintenance Manual (Item 1) **[Figure 84]** (located inside the storage box on the back of the operator's seat) and the Operator's Handbook (Item 1) **[Figure 85]** before operating.

Entering The Excavator

Figure 86

Use the grab handles and tracks to enter the canopy / cab **[Figure 86]**.

⚠ WARNING

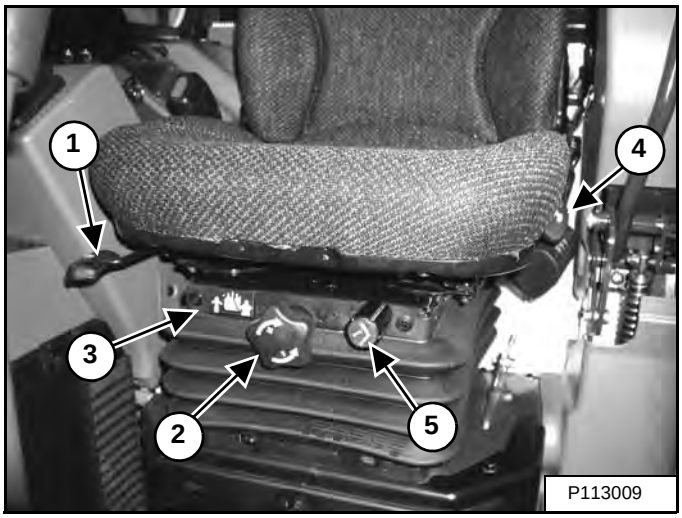
AVOID INJURY OR DEATH

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

Seat Adjustment

Figure 87



Release the seat lever (Item 1) **[Figure 87]** to adjust the seat forward or back.

Turn the handle (Item 2) to change the adjustment for operator weight. Turn the handle until the operator's weight is shown in the window (Item 3) **[Figure 87]**.

Release the lever (Item 4) **[Figure 87]** to change the incline of the seat back.

Sit in the seat and turn the knob (Item 5) **[Figure 87]** to adjust the height of the seat.

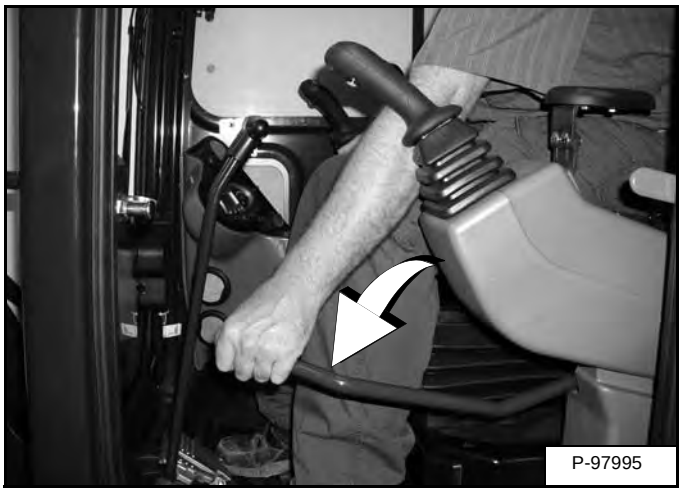
Seat Belt

Figure 88

Fasten the seat belt **[Figure 88]**.

Control Console

Figure 89



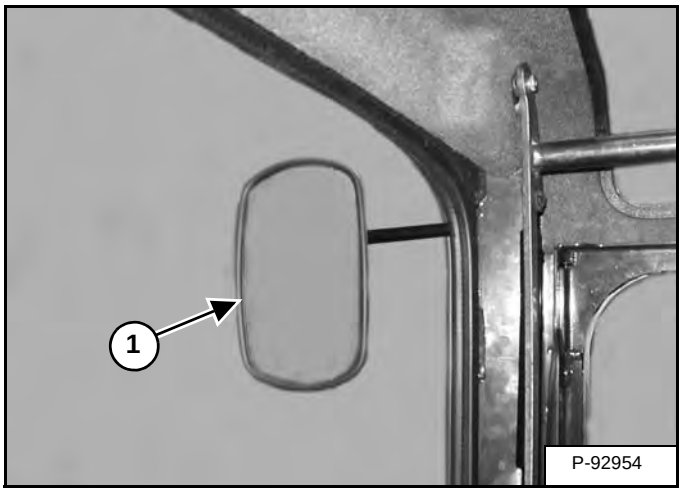
Lower the control console **[Figure 89]**.

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

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

Mirror Adjustment

Figure 90



Adjust mirrors (Item 1) **[Figure 90]** (if equipped).

STARTING THE ENGINE

Key Switch

WARNING

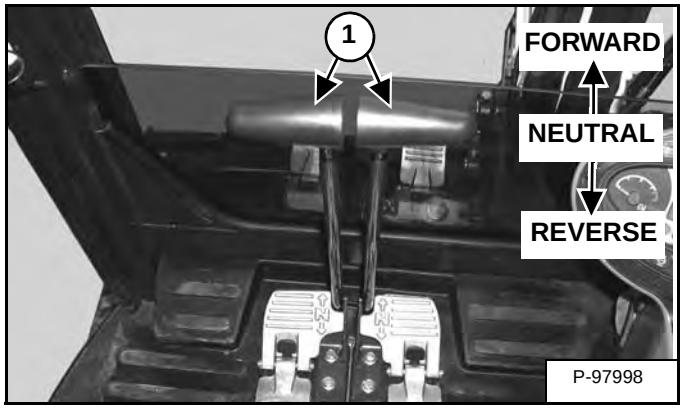
AVOID INJURY OR DEATH

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

W-2135-1108

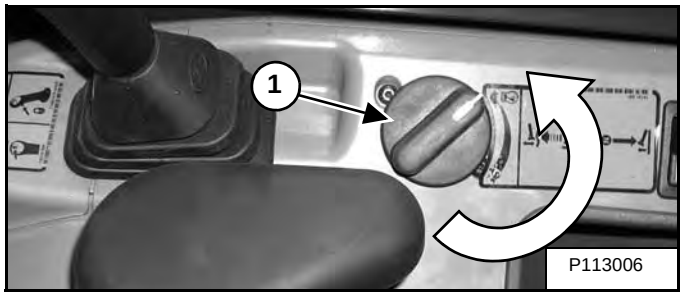
Perform the PRE-STARTING PROCEDURE. (See PRE-STARTING PROCEDURE on Page 61.)

Figure 91



Put control levers (Item 1) **[Figure 91]** in the NEUTRAL position.

Figure 92



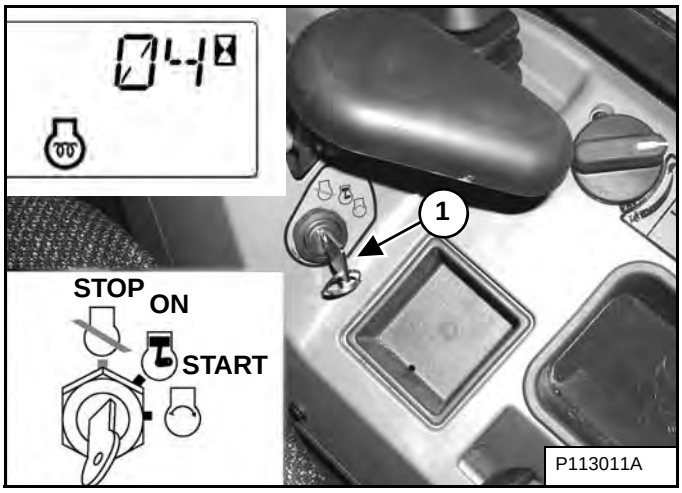
Turn the engine speed control dial (Item 1) **[Figure 92]** counterclockwise to low idle

IMPORTANT

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

I-2034-0700

Figure 93



Turn the key (Item 1) **[Figure 93]** to the ON position. If preheating is required, the glow plugs will automatically cycle and the remaining preheat time (in seconds) will show in the data display screen (see inset). (Preheat icon will be ON).

Turn the key to START and release the key when the engine starts. It will return to the ON position **[Figure 93]**.

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.

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

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

Keyless

⚠ WARNING

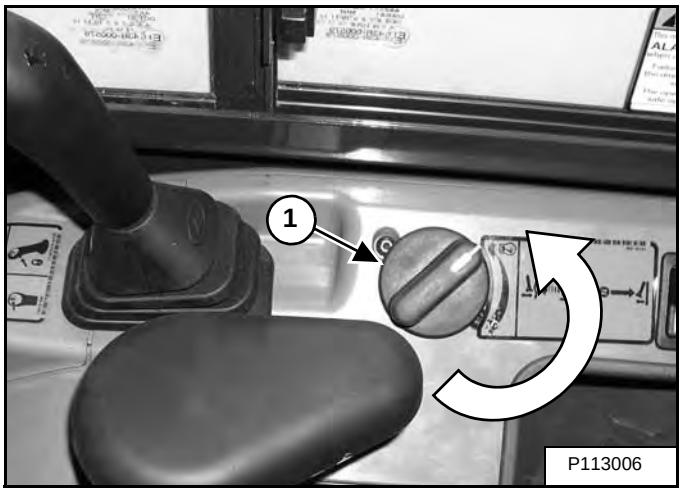
AVOID INJURY OR DEATH

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

W-2135-1108

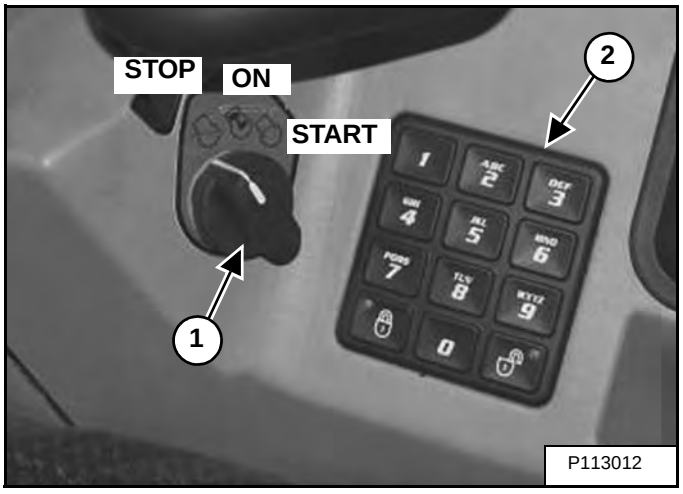
Perform the PRE-STARTING PROCEDURE. (See PRE-STARTING PROCEDURE on Page 61.)

Figure 94



Rotate the engine speed control dial (Item 1) **[Figure 94]** to low idle.

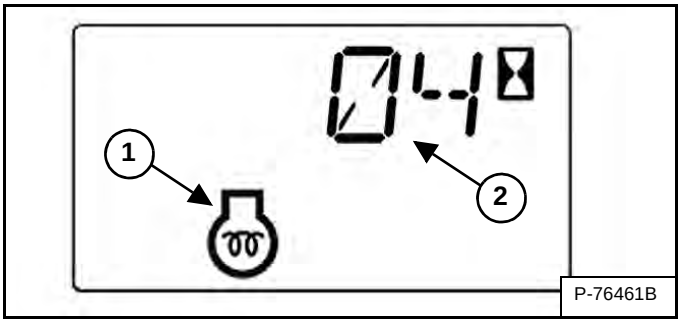
Figure 95



Turn the start switch (Item 1) **[Figure 95]** to ON. The indicator lights on the instrument panel will come ON briefly and the Instrument Panel / monitoring system will do a self test.

Use the keypad (Item 2) **[Figure 95]** to enter the password.

Figure 96



If preheating is required, the glow plugs will automatically cycle based on temperature. The engine preheat icon (Item 1) will be ON and the cycle time remaining (Item 2) **[Figure 96]** will be shown on the data display.

When the engine preheat icon goes OFF, turn the start switch (Item 1) **[Figure 95]** to START position and hold it until the engine starts. Release the switch and it will return to the ON position.

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

Turn the start switch (Item 1) **[Figure 95]** to the STOP position to stop the engine.

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

Check for the cause before starting the engine again.

Password Lockout Feature

See Password Lockout Feature. (See Password Lockout Feature on Page 194.)

Deluxe Instrument Panel

WARNING

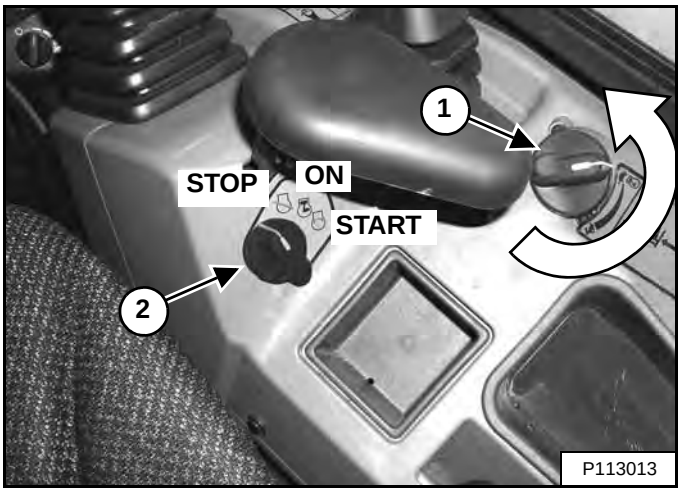
AVOID SERIOUS INJURY OR DEATH

- **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

Perform the PRE-STARTING PROCEDURE. (See PRE-STARTING PROCEDURE on Page 61.)

Figure 97

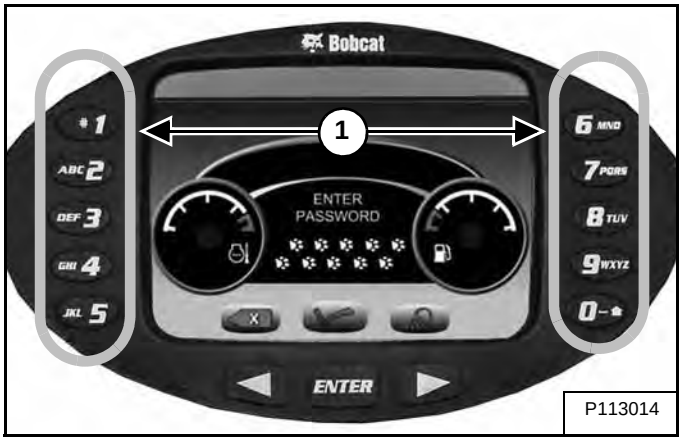


Set the engine speed control (Item 1) **[Figure 97]** to the low idle position.

NOTE: Excavators with a Deluxe Instrument Panel have a permanent, randomly generated Master Password set at the factory. Your excavator will also be assigned an Owner Password. Your dealer will provide you with this password. Change the owner password to one that you will easily remember to prevent unauthorized use of your excavator. (See Changing The Owner Password on Page 195.) Keep your password in a safe location for future needs.

NOTE: The Password Lockout feature can be used to allow starting of the excavator without a password. If unlocked, the start switch will start the machine without using a password. (See Password Lockout Feature on Page 194.)

Figure 98



Turn the start switch (Item 2) **[Figure 97]** to ON. The message **[ENTER PASSWORD]** will appear on the display screen if the deluxe instrument panel is locked. (If not locked, use the start switch without a password to start the engine.)

Use the numeric keypad (Item 1) **[Figure 98]** to enter the password.

Figure 99

If preheating is required, the glow plugs will automatically cycle and the engine preheat icon (Item 1) **[Figure 99]** and will be shown in the data display.

When the engine preheat icon goes OFF, turn the start switch to START (Item 3). Release the switch when the engine starts and allow it to return to the ON position (Item 2) **[Figure 98]**.

Turn the start button (Item 2) **[Figure 97]** to the STOP position to stop the engine.

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

Check for the cause before starting the engine again.

Password Lockout Feature

See Password Lockout Feature. (See Password Lockout Feature on Page 194.)

Warming The Hydraulic System

IMPORTANT

When the temperature is below -30°C (-20°F), hydrostatic oil must be warmed before starting. The hydrostatic system will not get enough oil at low temperatures and will be damaged. Park the machine in an area where the temperature will be above -18°C (0°F) if possible.

I-2007-0910

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

Cold Temperature Starting

⚠ WARNING

EXPLOSION CAN CAUSE SERIOUS INJURY, DEATH OR SEVERE ENGINE DAMAGE

DO NOT use ether or starting fluid with glow plug or air intake heater systems.

W-2071-0415

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

- Replace the engine oil with the correct type and viscosity for the anticipated starting temperature. (See Engine Oil Chart on Page 152.)
- Make sure the battery is fully charged.
- Install an engine heater.

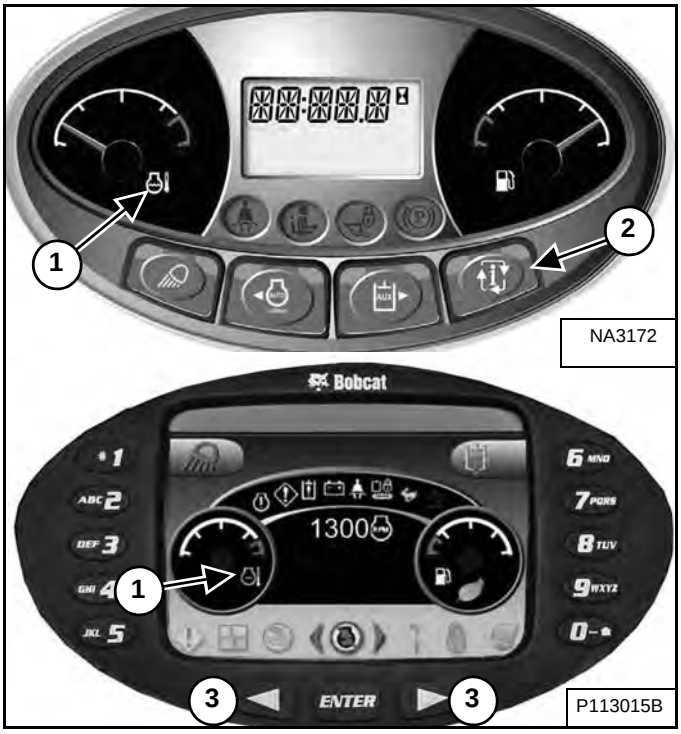
NOTE: If the battery is discharged (but not frozen) a booster battery can be used to jump start the excavator. (See Using A Booster Battery (Jump Starting) on Page 161.)

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

MONITORING THE DISPLAY PANELS

Instrument Panel

Figure 100



Frequently monitor the temperature and fuel gauges **[Figure 100]**.

After the engine is running, frequently monitor the instrument panel **[Figure 100]** for machine condition.

The associated icon is displayed if there is an error condition.

EXAMPLE: Engine Coolant Temperature is High.

The Engine Coolant Temperature icon (Item 1) **[Figure 100]** is ON.

Press the Information button (Item 2) (Standard Panel) or press a scroll button (Item 3) **[Figure 100]** (Deluxe Panel) repeatedly to cycle the data display until the service code screen is displayed. One of the following SERVICE CODES is displayed.

- **[M0810]** Engine Coolant Temperature Too High
- **[M0811]** Engine Coolant Temperature Extremely High

Find the cause of the service code and correct before operating the excavator again. (See DIAGNOSTIC SERVICE CODES on Page 184.)

NOTE: The optional Deluxe Instrumentation Panel offers an additional view of service codes that includes a brief description. (See DIAGNOSTIC SERVICE CODES on Page 184.)

Warning And Shutdown

When a WARNING condition exists; the associated icon light is ON and the alarm sounds 3 beeps. If this condition is allowed to continue, there may be damage to the engine or hydraulic systems.

When a SHUTDOWN condition exists; the associated icon light is ON and the alarm sounds continuously. The monitoring system will automatically stop the engine in 15 seconds. The engine can be restarted to move or relocate the excavator.

The SHUTDOWN feature is associated with the following icons:

General Warning
Engine Malfunction
Engine Coolant Temperature
Hydraulic Fluid Temperature

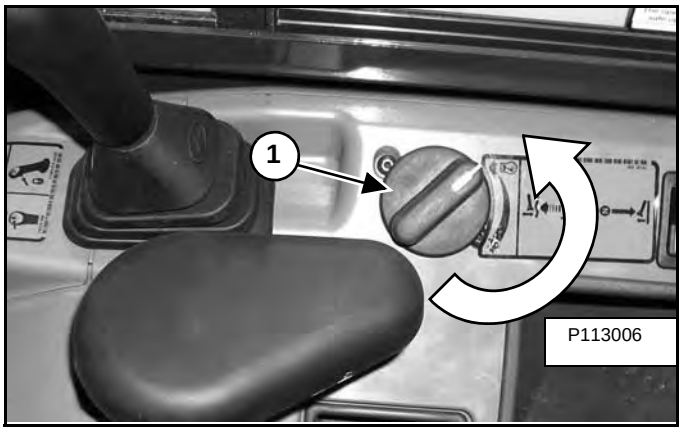
STOPPING THE ENGINE AND LEAVING THE EXCAVATOR

Procedure

Figure 101

Stop the machine on level ground. Lower the work equipment and the blade to the ground **[Figure 101]**.

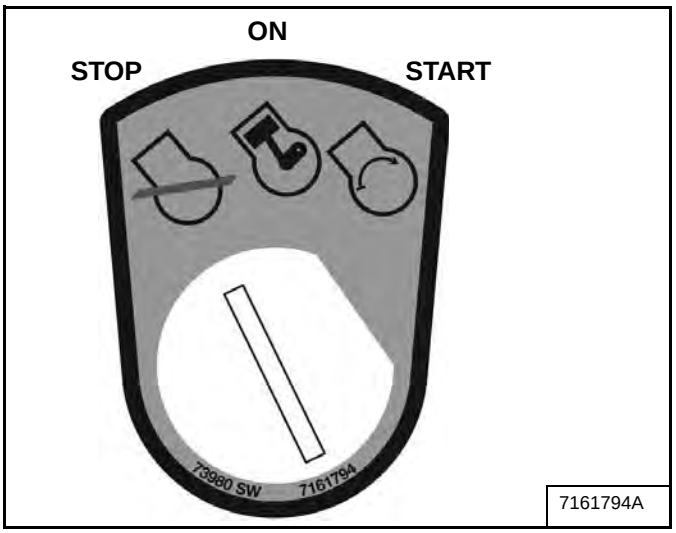
Figure 102



Rotate the engine speed control dial (Item 1) **[Figure 102]** counterclockwise to low idle.

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

Figure 103



Turn the switch to STOP **[Figure 103]**.

Disconnect the seat belt. Remove the key from the switch (If Equipped) to prevent operation of machine by unauthorized personnel. Raise the control console and exit the machine.

Installing And Removing The Attachment (Hydraulic X-Change)

Installation

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

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2052-0907

⚠ WARNING

AVOID INJURY OR DEATH

Both hydraulic pins must be fully extended through the attachment mounting holes. Failure to fully engage the hydraulic pins can allow attachment to come off.

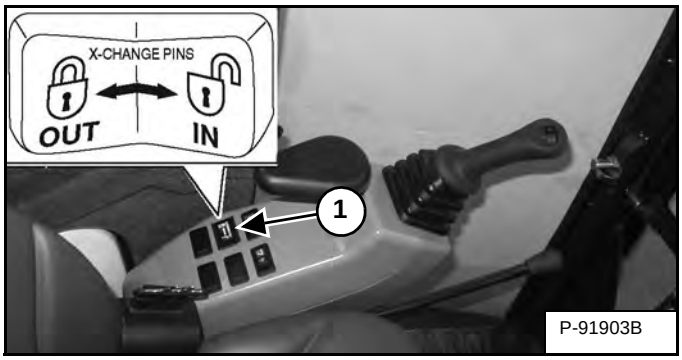
W-2935-0512

Figure 104

Start the engine.

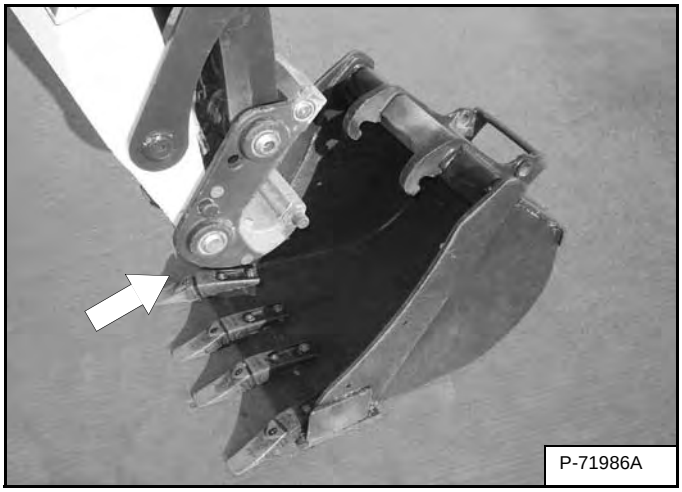
Swing the excavator arm fully to the left **[Figure 104]** (for better operator visibility when connecting attachments).

Figure 105



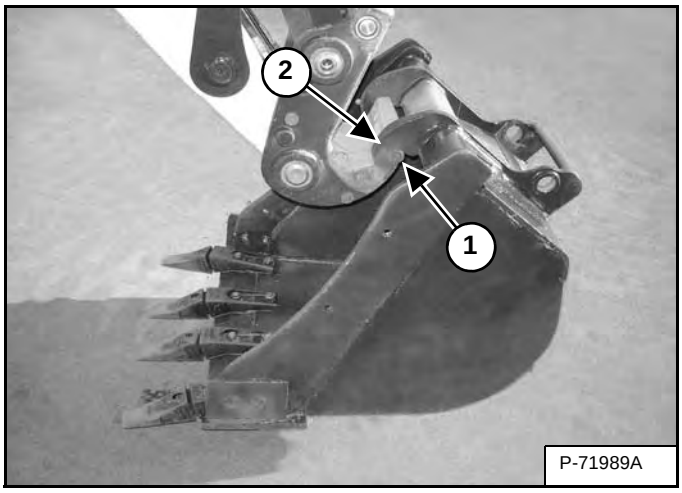
Press and hold the X-Change switch (Item 1) **[Figure 105]** to the right (IN) to fully retract the hydraulic pins.

Figure 106



Move the arm toward the attachment **[Figure 106]**.

Figure 107

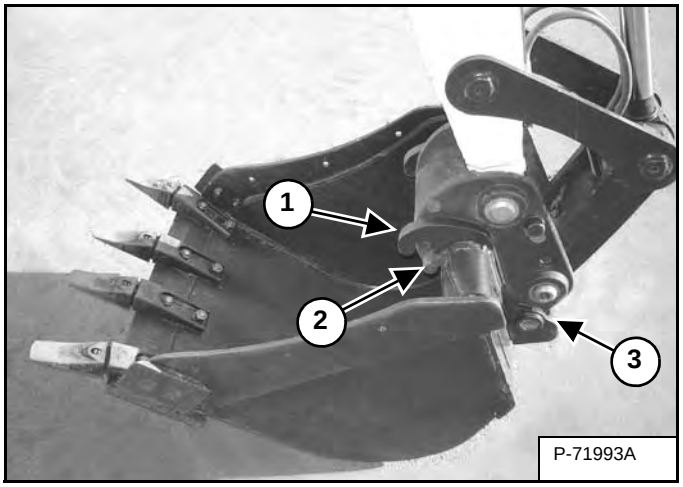


Raise the boom until the X-Change pins (Item 1) engage the attachment hooks (Item 2) **[Figure 107]** on the bucket.

Installing And Removing The Attachment (Hydraulic X-Change) (Cont'd)

Installation (Cont'd)

Figure 108



Raise the boom and extend (curl in) the bucket cylinder until the X-Change contacts the back of the attachment **[Figure 108]**.

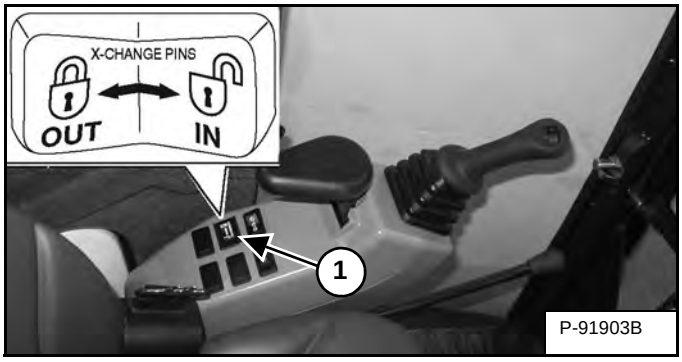
With the arm vertical, lower the boom until the hooks (Item 1) of the bucket disengage the X-Change pins (Item 2) and the plate (Item 3) **[Figure 108]** fully engages into the bucket crossmember.

⚠ WARNING

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

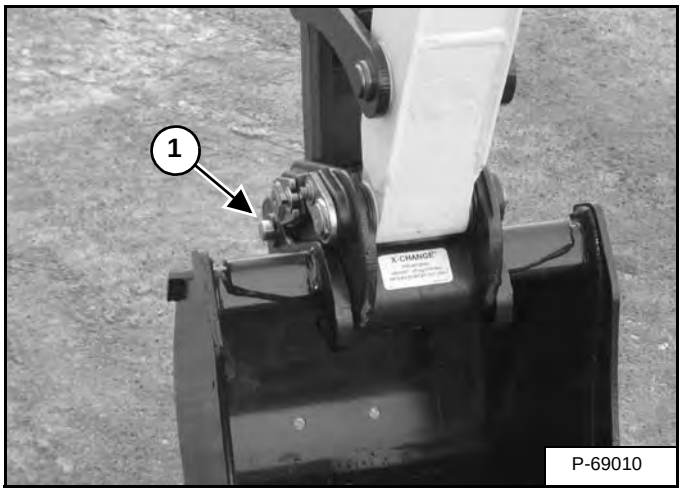
W-2119-0910

Figure 109



Press and hold the X-Change switch (Item 1) **[Figure 109]** to the left (OUT) and **FULLY EXTEND** the hydraulic pins.

Figure 110



Check that both hydraulic pins (Item 1) **[Figure 110]** are fully engaged to secure the attachment.

⚠ WARNING

AVOID INJURY OR DEATH

Both hydraulic pins must be fully extended through the attachment mounting holes. Failure to fully engage the hydraulic pins can allow attachment to come off.

W-2935-0512

Installing And Removing The Attachment (Hydraulic X-Change) (Cont'd)

Removal

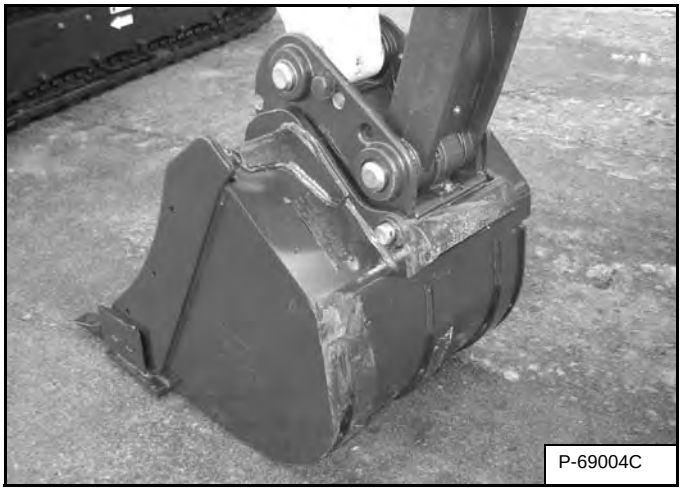
NOTE: Removal and installation of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic lines that are operated by hydraulic power before removing any attachments (breaker, auger, etc.).

⚠ WARNING

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

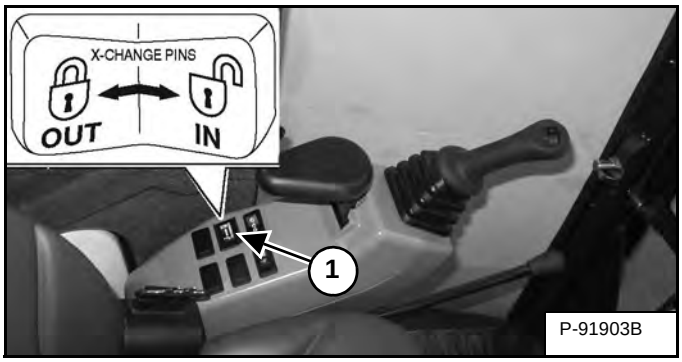
W-2119-0910

Figure 111



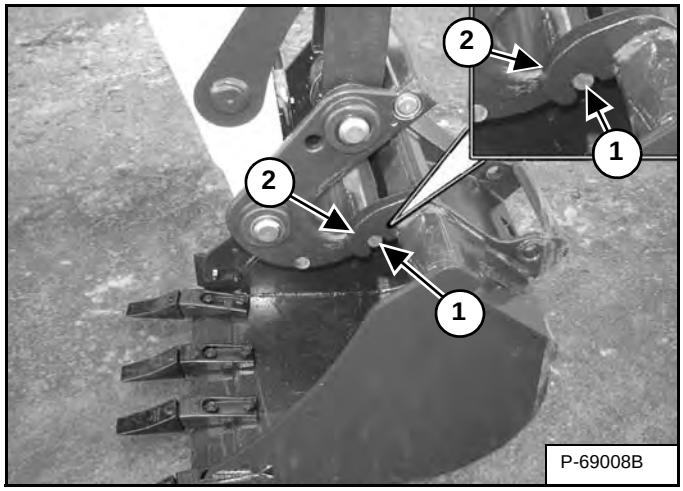
Park the excavator on a flat level surface. Put the attachment on the ground **[Figure 111]**.

Figure 112



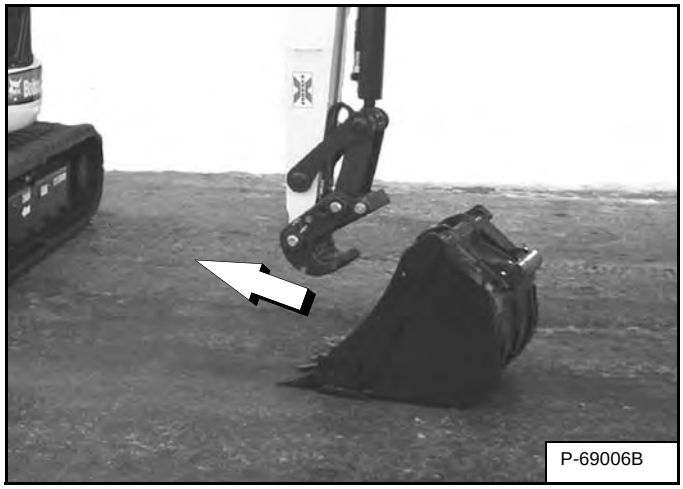
Press and hold the X-Change switch (Item 1) **[Figure 112]** on the left console to the right (IN) to **FULLY RETRACT** the hydraulic pins.

Figure 113



Raise the boom and retract the bucket cylinder until the X-Change pins (Item 1) engage the attachment hooks (Item 2) **[Figure 113]** on the bucket.

Figure 114



Fully retract the bucket cylinder (bucket dump).

Lower the boom and arm until the attachment is on the ground and the X-Change pins are disengaged from the attachment hooks.

Move the arm toward the excavator until the X-Change pins are clear of the attachment **[Figure 114]**.

Installing And Removing The Attachment (Pin Grabber Quick Coupler)

Installation

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

⚠ WARNING

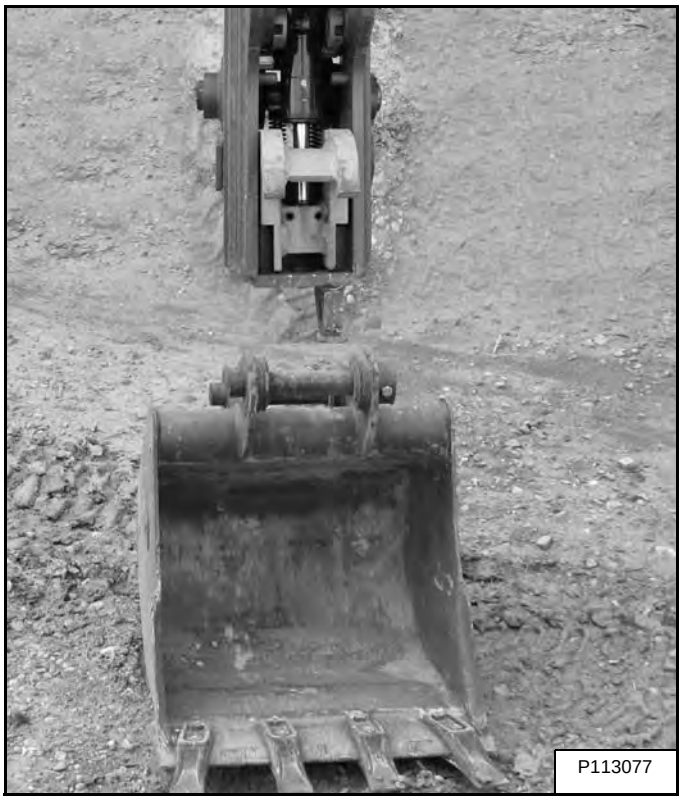
AVOID INJURY OR DEATH

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

W-2052-0907

Start the engine. (See PRE-STARTING PROCEDURE on Page 61.)

Figure 115



Position the arm and coupler to the attachment **[Figure 115]**.

⚠ WARNING

AVOID INJURY OR DEATH

The quick coupler locking clasps must be fully engaged and locked to the attachment pins. Failure to fully engage the locking clasps can allow attachment to come off.

W-2978-0317

Figure 116

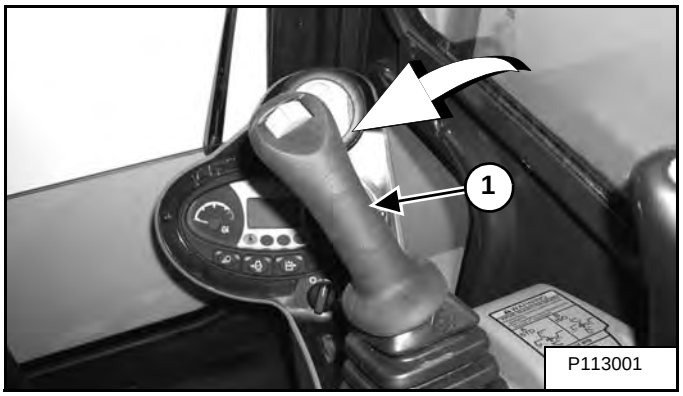
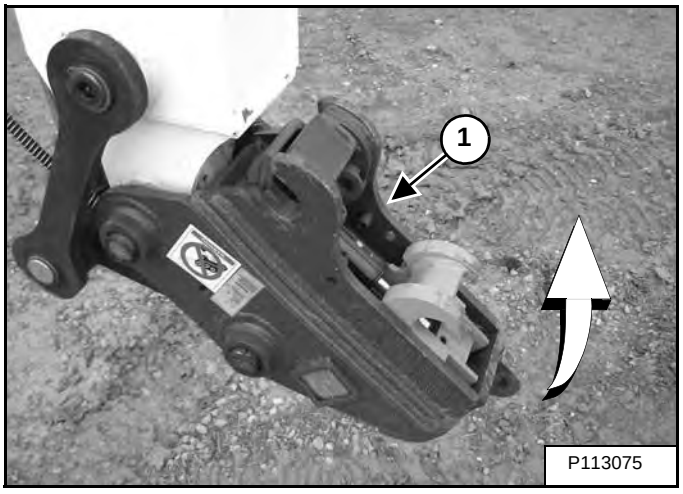


Figure 117

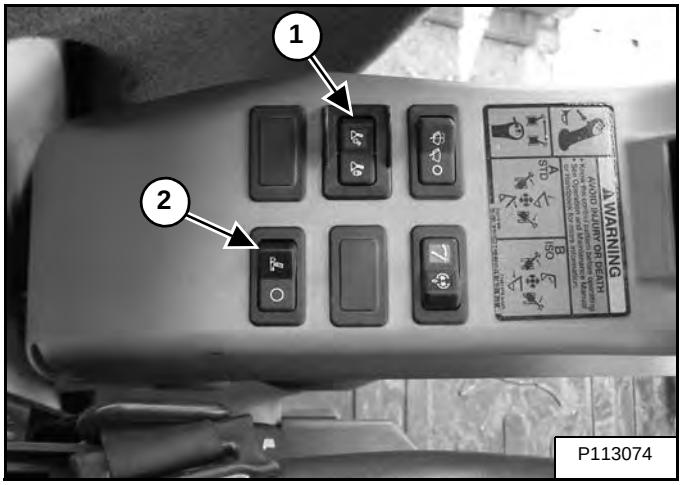


Move the right joystick (Item 1) **[Figure 116]** to the left (IN) and curl the coupler (Item 1) **[Figure 117]** toward the cab fully.

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

Installation (Cont'd)

Figure 118

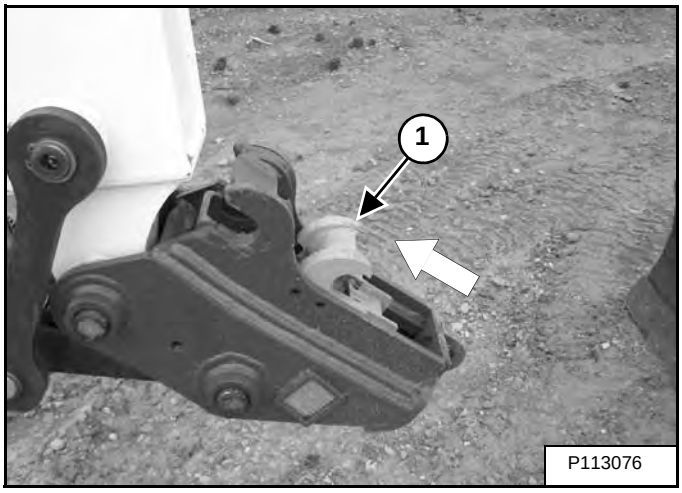


Press the coupler ON / OFF switch (Item 1) **[Figure 118]** to the left (ON) position to enable the pin grabber quick coupler feature. The switch will illuminate when in the ON position and a buzzer will sound.

Press and release the INTENT switch (Item 2) within five seconds. (The buzzer will continue to sound and the light (Item 1) **[Figure 118]** will stay ON.)

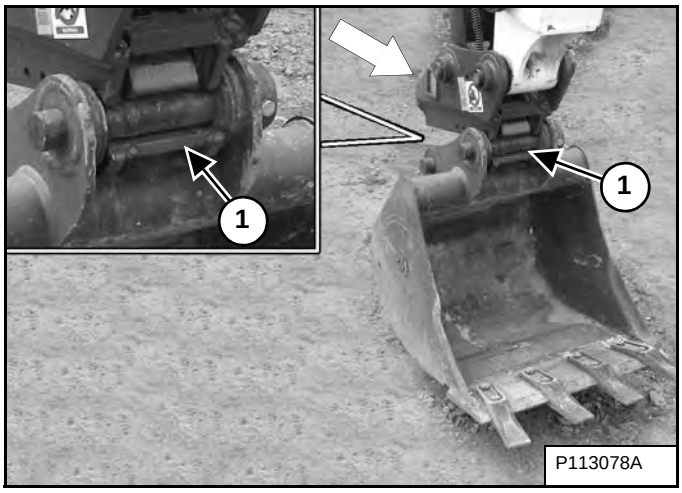
NOTE: If pin grabber quick coupler, the switch and / or the buzzer do not operate correctly, see troubleshooting chart. (See Pin Grabber Quick Coupler Troubleshooting on Page 175.)

Figure 119



Continue to curl the quick coupler until the locking clasp (Item 1) **[Figure 119]** moves in fully.

Figure 120



Roll the coupler out. Move the arm toward the attachment. Reposition the boom, arm and coupler until the coupler (Item 1) **[Figure 120]** is position over the attachment pin. Raise the attachment up slightly.

Figure 121

Curl the quick coupler in fully **[Figure 121]**.

Press the coupler ON / OFF switch (Item 1) **[Figure 118]** to the right, (OFF) position. The switch light and buzzer will turn OFF.

Continue to curl the attachment in for an additional ten seconds to allow the locking clasp to move and lock to the attachment pins.

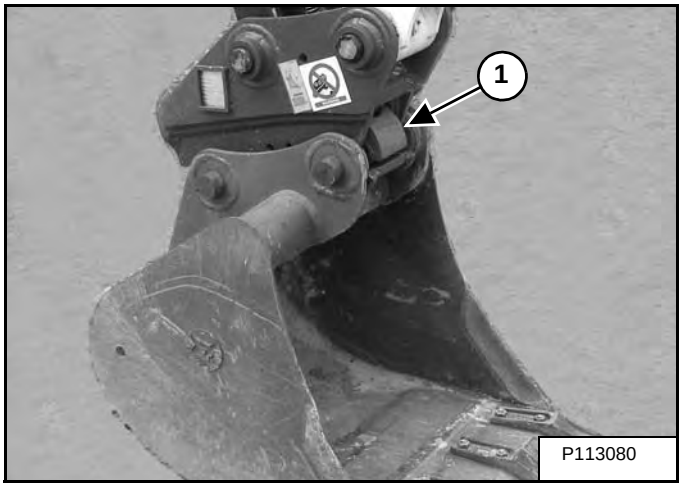
With the attachment as low to the ground as possible, curl the attachment out and in several times to ensure the attachment is secured to the coupler.

Lower the attachment flat to the ground.

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

Installation (Cont'd)

Figure 122



Visually check that the green locking clasp (Item 1) **[Figure 122]** is FULLY ENGAGED AND LOCKED.

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

The quick coupler locking clasps must be fully engaged and locked to the attachment pins. Failure to fully engage the locking clasps can allow attachment to come off.

W-2978-0317

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

Removal

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

⚠ WARNING

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

W-2119-0910

Figure 123

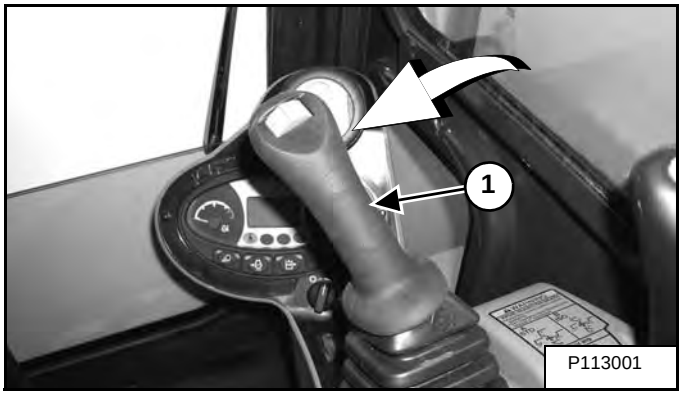
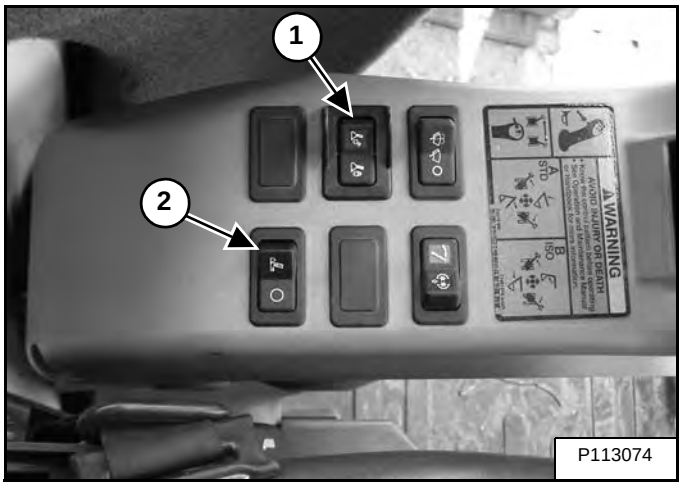


Figure 124

Move the right joystick (Item 1) **[Figure 123]** to the left (IN) and curl the quick coupler (Item 1) **[Figure 124]** fully.

Figure 125

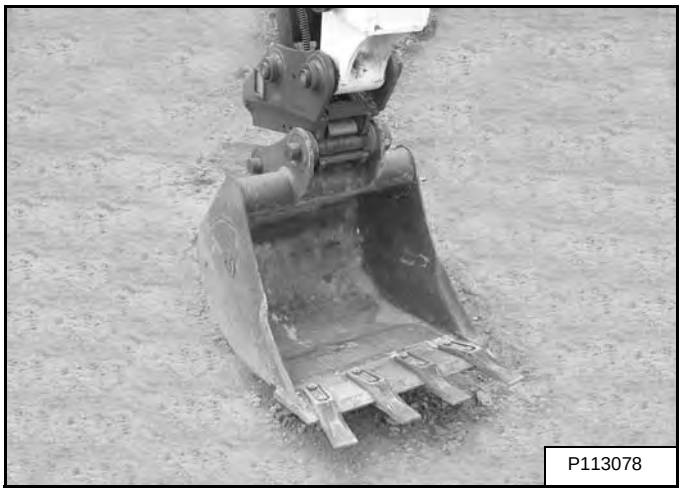


Press the coupler ON / OFF switch (Item 1) **[Figure 125]** to the left (ON) position to enable the pin grabber quick coupler feature. The switch will illuminate when in the ON position and a buzzer will sound.

Press and release the INTENT switch (Item 2) within five seconds. (The buzzer will continue to sound and the light (Item 1) **[Figure 125]** will stay ON.)

Move the right joystick (Item 1) **[Figure 123]** to the left (IN) and continue to curl the quick coupler **[Figure 124]**. The coupler locking clasps will lift fully to unlock the attachment from the quick coupler.

Figure 126

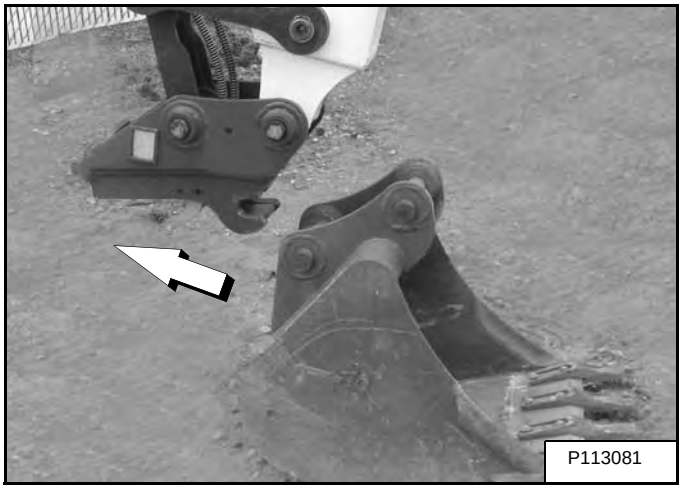


With the attachment slightly off of the ground, roll the quick coupler back until the coupler starts to disengage from the attachment **[Figure 126]**.

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

Removal (Cont'd)

Figure 127

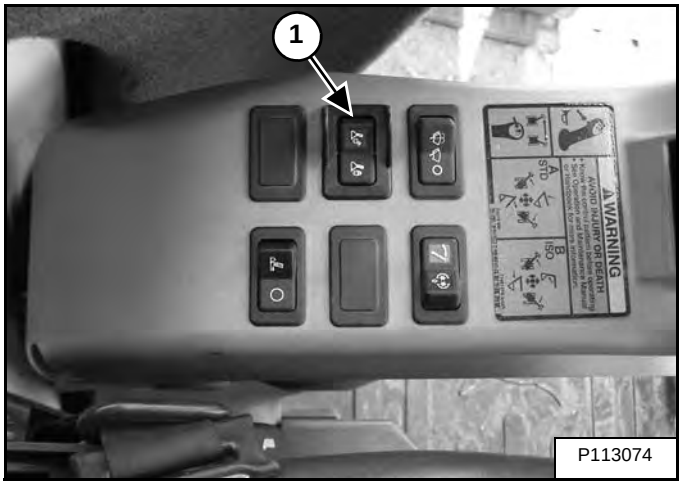


Roll the quick coupler back fully.

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

Move the arm away the excavator until the quick coupler is clear of the attachment **[Figure 127]**.

Figure 128



Press the coupler ON / OFF switch (Item 1) **[Figure 128]** to the right, (OFF) position. The switch light and buzzer will turn OFF.

Installing And Removing The Attachment (Pin-On X-Change)

Installation

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

⚠ WARNING

AVOID INJURY OR DEATH

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

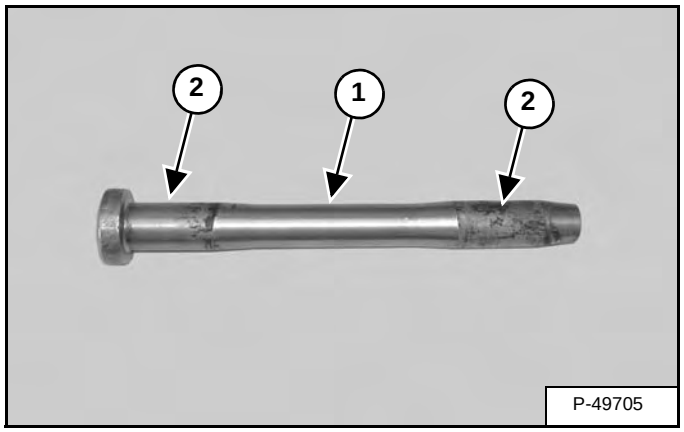
W-2052-0907

⚠ WARNING

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

W-2507-0706

Figure 129



Inspect the pin (Item 1) **[Figure 129]** for wear or damage. Replace the pin as needed.

Apply a light coat of grease to the ends of the pin (Item 2) **[Figure 129]**.

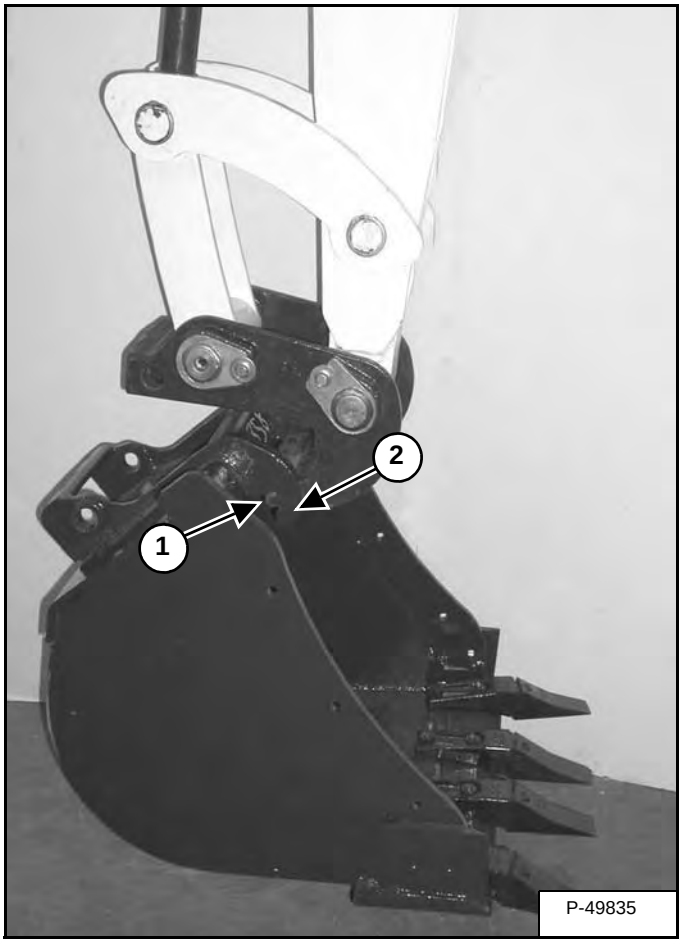
Figure 130

Start the engine and move the arm toward the bucket **[Figure 130]**.

Installing And Removing The Attachment (Pin-On X-Change) (Cont'd)

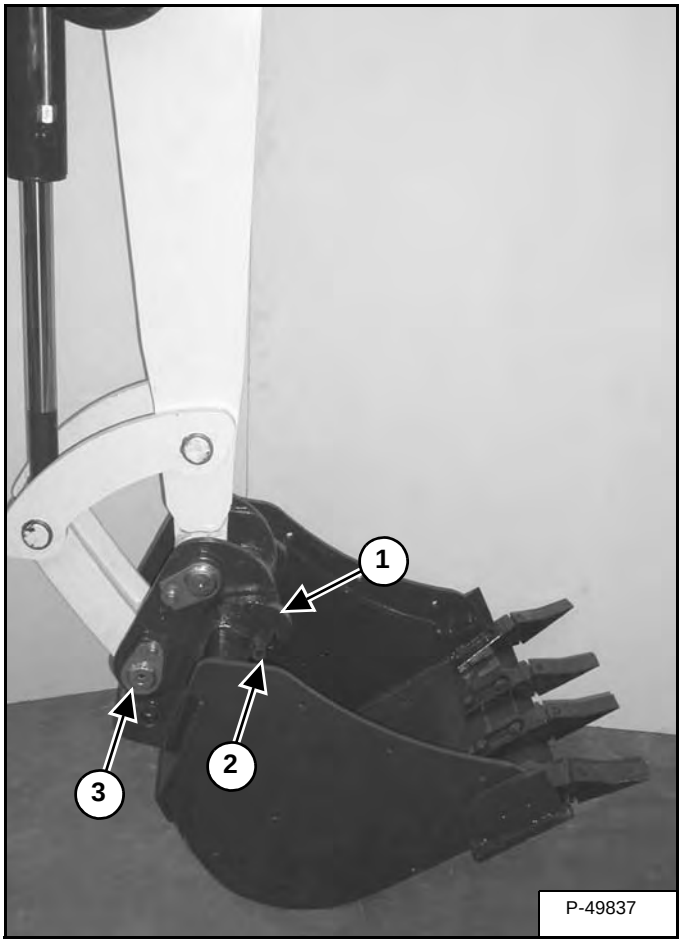
Installation (Cont'd)

Figure 131



Raise the boom until the pins (Item 1) engage the hooks (Item 2) **[Figure 131]** on the bucket.

Figure 132



Raise the boom and extend the bucket cylinder until the X-Change contacts the attachment back **[Figure 132]**.

With the arm vertical, lower the boom until the hooks (Item 1) of the bucket disengage the pins (Item 2) of the X-Change and the plate (Item 3) **[Figure 132]** fully engages in the bucket crossmember.

⚠ WARNING

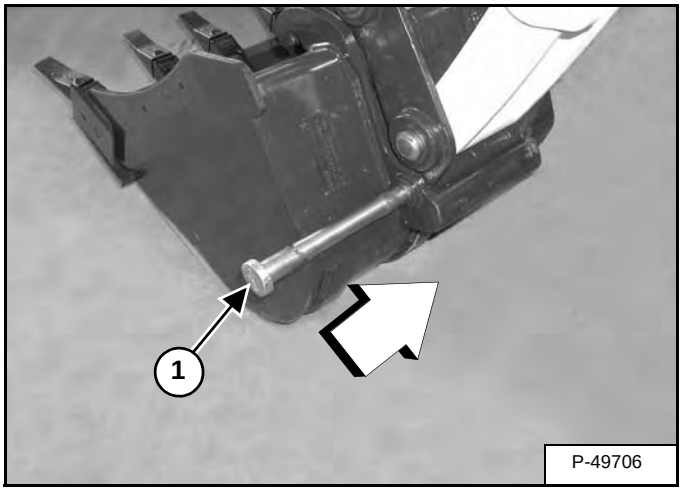
Keep all bystanders 6 m (20 ft) away from equipment when operating. Contact with moving parts, a trench cave-in or flying objects can cause injury or death.

W-2119-0910

Installing And Removing The Attachment (Pin-On X-Change) (Cont'd)

Installation (Cont'd)

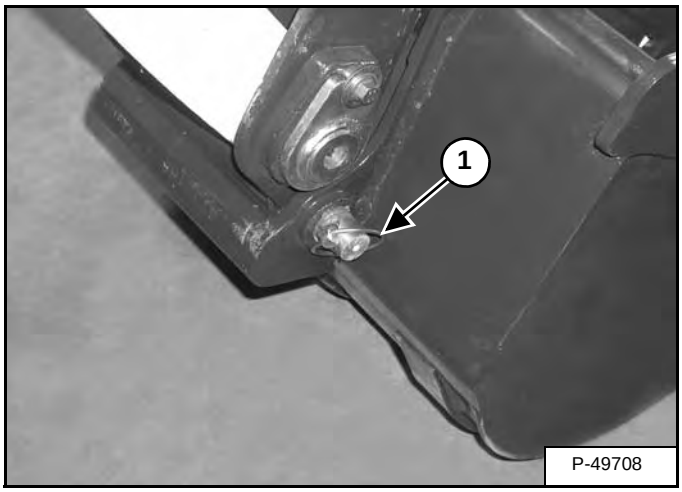
Figure 133



Stop the engine. Turn the start key to the ON position and move both hydraulic control levers to relieve hydraulic pressure.

Drive the pin (Item 1) **[Figure 133]** through the bucket mount and X-Change.

Figure 134



Install the retainer pin (Item 1) **[Figure 134]**.

Check for proper installation.

Lift the attachment and fully extend and retract the bucket cylinder.

Installing And Removing The Attachment (Pin-On X-Change) (Cont'd)

Removal

Use the pin on X-Change when installing new attachments that are equipped with the pin on X-Change bracket.

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

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2052-0907

Figure 135

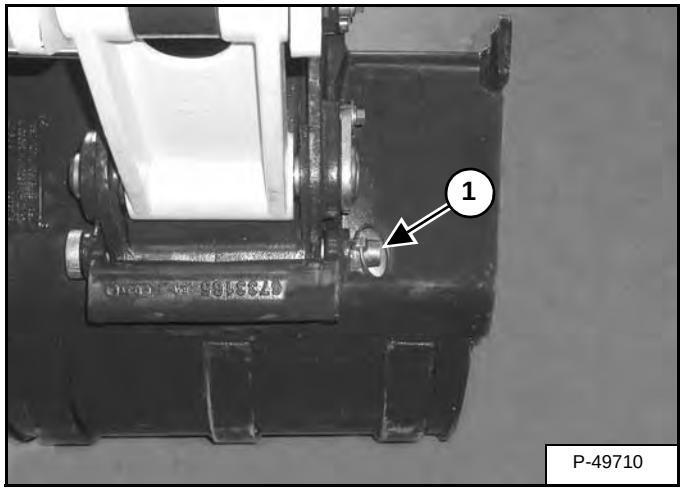
Park the excavator on a flat level surface. Put the bucket on the ground **[Figure 135]**.

With the engine off, turn the start key to the ON position and move both hydraulic control levers to relieve hydraulic pressure.

Installing And Removing The Attachment (Pin-On X-Change) (Cont'd)

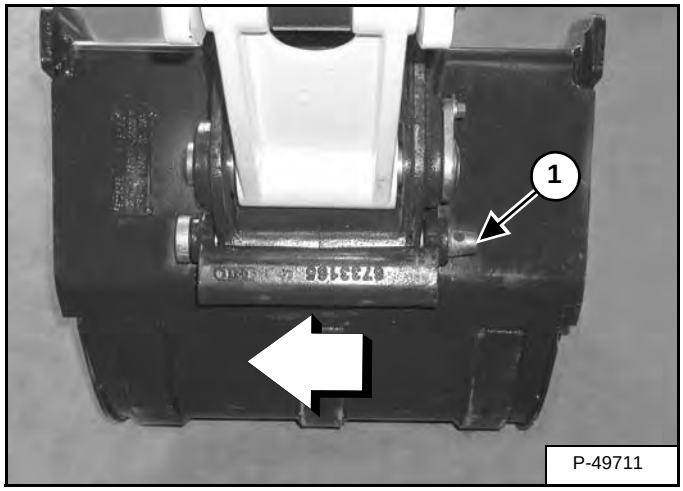
Removal (Cont'd)

Figure 136



Remove the retainer pin (Item 1) **[Figure 136]**.

Figure 137



Drive the pin (Item 1) **[Figure 137]** out of the bucket and X-Change mount.

⚠ WARNING

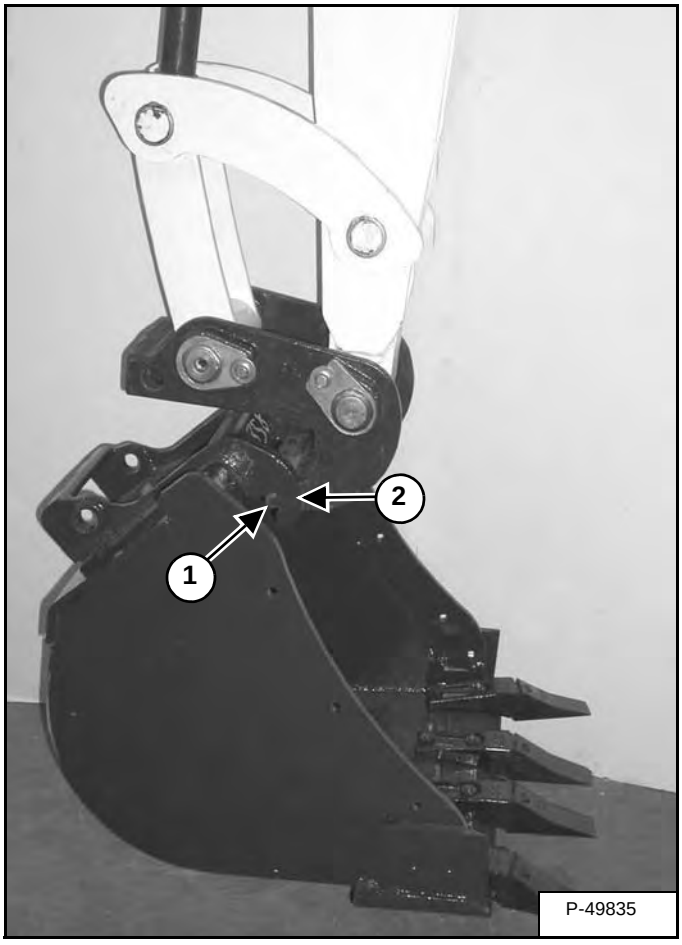
AVOID INJURY OR DEATH

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 138

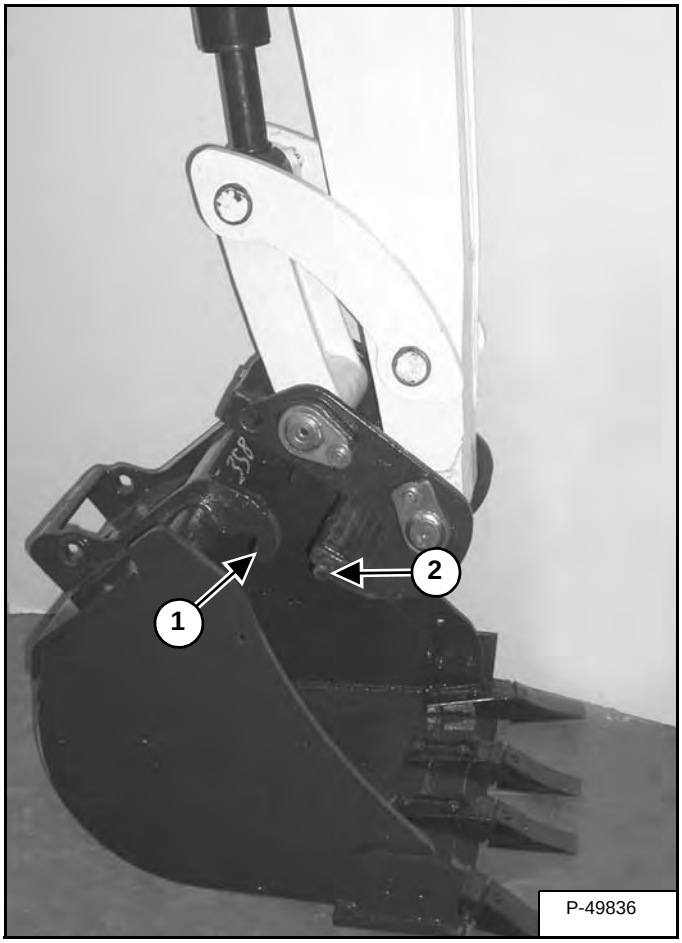


Start the engine, raise the boom approximately one foot and retract the bucket cylinder until the X-Change pins (Item 1) engage the hooks (Item 2) **[Figure 138]** on the bucket.

Installing And Removing The Attachment (Pin-On X-Change) (Cont'd)

Removal (Cont'd)

Figure 139



Fully retract the bucket cylinder and lower the boom and arm until the bucket is on the ground, and the X-Change pins (Item 1) are disengaged from the hooks (Item 2) **[Figure 139]**.

Move the arm toward the excavator until the X-Change pins are clear of the bucket.

Installing And Removing The Attachment (Pin-On Attachment)

Installation

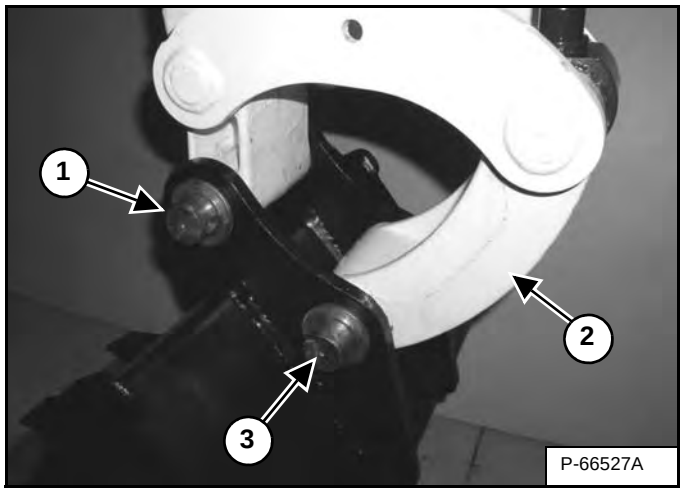
WARNING

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 140

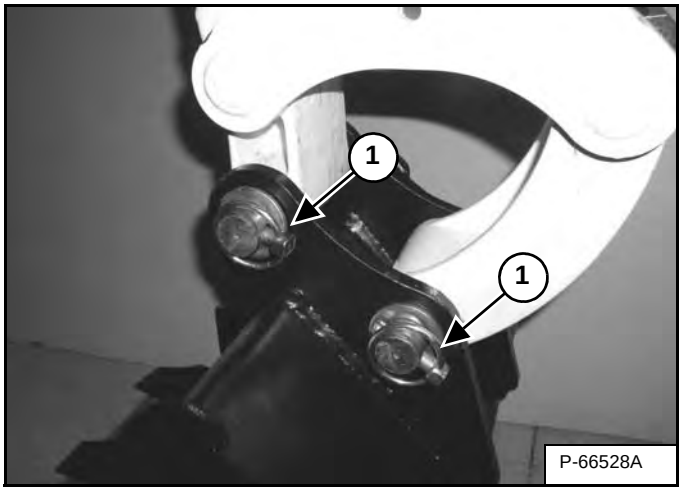


Install the arm into the bucket and align the mounting hole.

Install the pin (Item 1) **[Figure 140]** and washers.

Install the link (Item 2) in the bucket and align the mounting hole. Install the pin (Item 3) **[Figure 140]** and washers.

Figure 141



Install the two retainer pins (Item 1) **[Figure 141]**. Install grease in the grease fittings.

Removal

Park the excavator on a flat surface and lower the bucket fully.

Remove the two retainer pins (Item 1) **[Figure 141]**.

Remove the washers and pins (Items 1 and 3) **[Figure 140]**.

Do not damage the dust seals in the arm.

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

Installing And Removing The Pro Clamp System Tool

Installation

⚠ WARNING

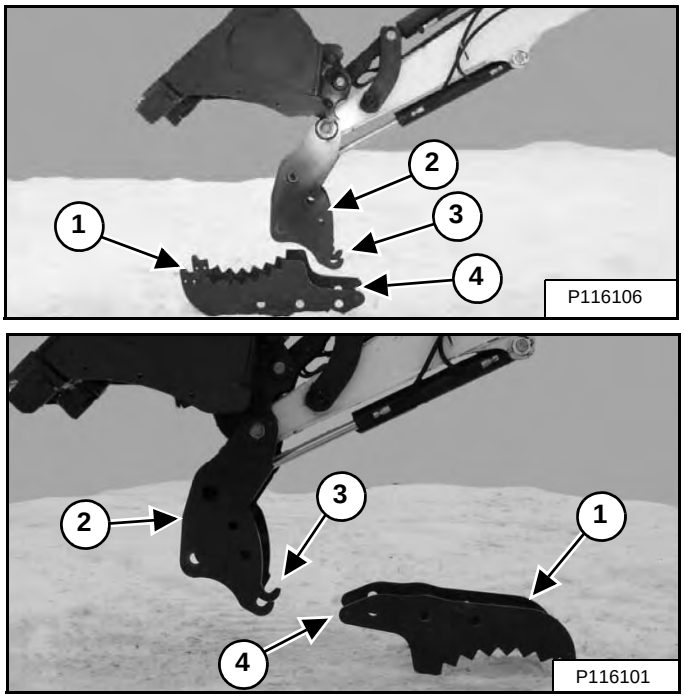
AVOID INJURY OR DEATH
Keep fingers and hands out of pinch points when installing and removing implement or attachment.
W-2571-1212

⚠ 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

Enter the excavator and start the engine. (See PRE-STARTING PROCEDURE on Page 61.)

Figure 142

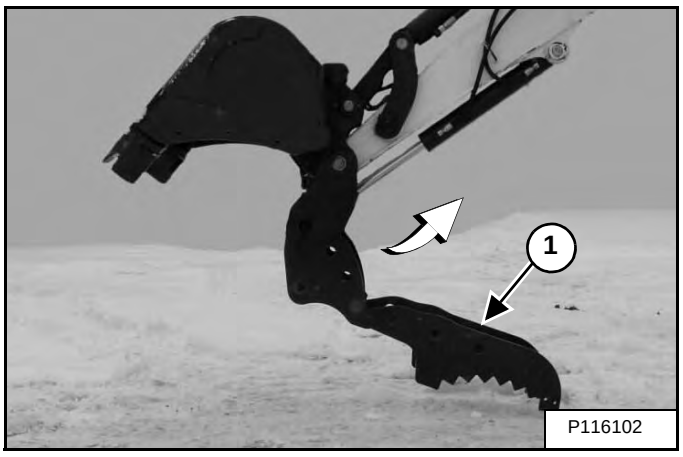


NOTE: To install the clamp tool (Item 1) onto the clamp base (Item 2), the clamp tool (Item 1) can be positioned in either configuration as shown in [Figure 142].

Move the arm toward the clamp tool.

Engage the clamp base hooks (Item 3) onto the clamp anchors (Item 4) **[Figure 142]**.

Figure 143

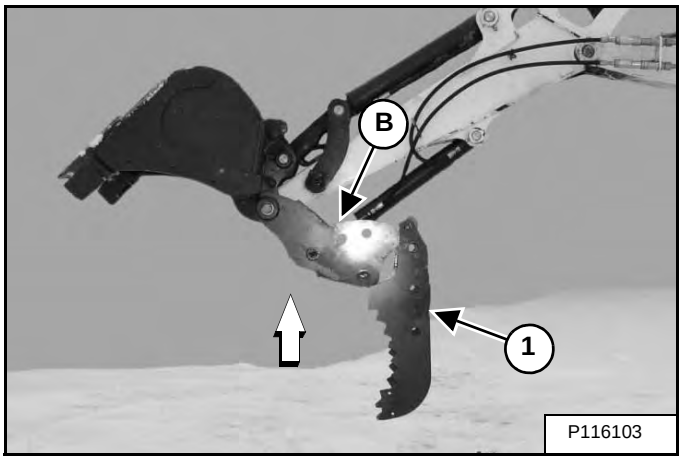


Retract the bucket cylinder (Item 1) **[Figure 143]** until the clamp tool is supported by the clamp hooks and the tool anchors.

Installing And Removing The Pro Clamp System Tool (Cont'd)

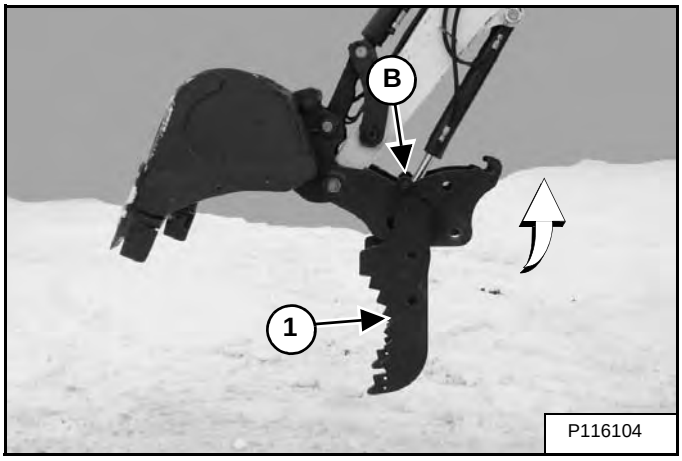
Installation (Cont'd)

Figure 144



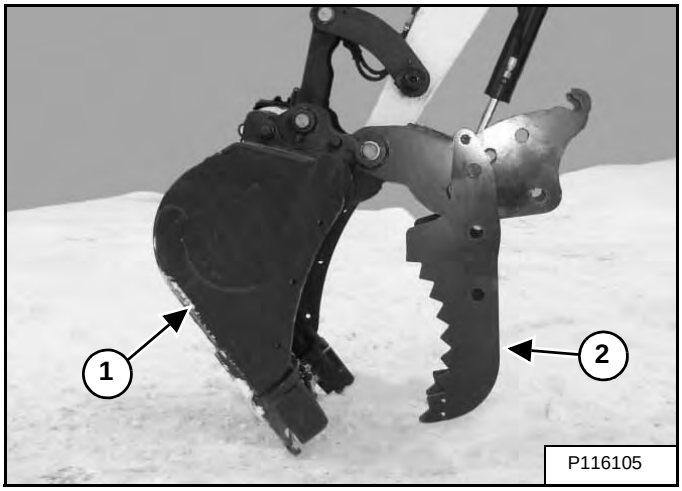
Raise the boom until the clamp tool (Item 1) **[Figure 144]** is slightly off the ground.

Figure 145



Continue to retract the bucket cylinder until the clamp tool (Item 1) **[Figure 145]** slides into the (index point B) **[Figure 144]** and **[Figure 145]**.

Figure 146



Rotate the bucket (Item 1) **[Figure 146]** down until it is in the position shown. Lower the boom until the bucket is fully on the ground.

The bottom of the clamp tool (Item 2) **[Figure 146]** must be slightly off the ground when the bucket is resting on the ground in order to rotate the tool to install the pins.

NOTE: The clamp tool can become unstable and fall off the clamp mount if the clamp tool (Item 2) [Figure 146] is allowed to contact the ground.

NOTE: The clamp tool (Item 2) can be positioned in multiple arrangements depending on which mounting holes are used. See [Figure 147] and [Figure 148] for the approved positions for the clamp tool.

Stop the engine and exit the excavator. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 69.)

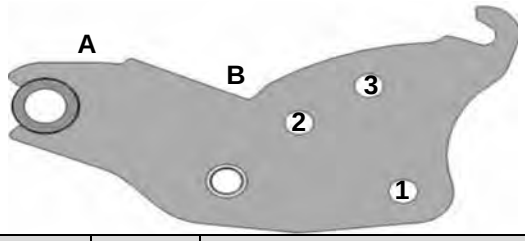
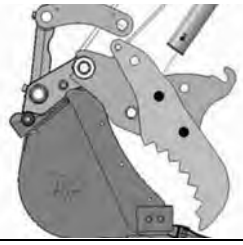
ATTACHMENTS (CONT'D)

Installing And Removing The Pro Clamp System Tool (Cont'd)

Installation (Cont'd)

Material Tool Arrangements

Figure 147

PRO CLAMP SYSTEM 4 APPROVED TOOL ARRANGEMENTS								
USE CHECKED INDEX POINT WHEN INSTALLING TOOL. **INSTALL MOUNTING PINS IN CHECKED MOUNTING HOLES.**	BASE ASSEMBLY INDEX  					**MATERIAL CLAMP TOOL INDEX***  		
APPROVED	**INDEX**	**POINT**	**MOUNTING HOLE**			**MOUNTING HOLE**		
TOOL POSITIONS	**A**	**B**	**1**	**2**	**3**	**1**	**2**	**3**
TOOTHED DIRT BUCKET 	X		X	X			X	X
TOOTHED DIRT BUCKET 		X	X		X	X	X	
TOOTHLESS DIRT BUCKET 	X		X	X			X	X
TOOTHLESS DIRT BUCKET 		X	X		X	X	X	

* Material Tool Weight: 27 kg (60 lb)

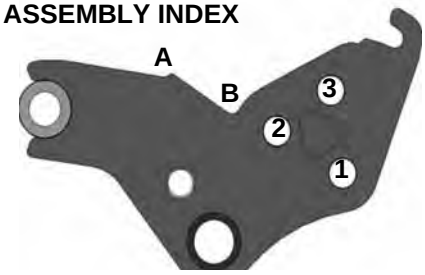
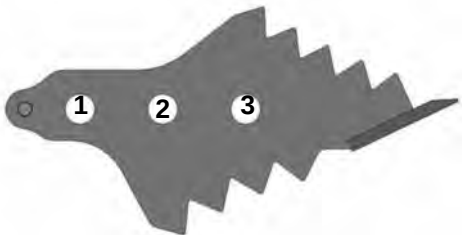
ATTACHMENTS (CONT'D)

Installing And Removing The Pro Clamp System Tool (Cont'd)

Installation (Cont'd)

Grading And Clam Tool Arrangements

Figure 148

PRO CLAMP SYSTEM 3 APPROVED TOOL ARRANGEMENTS								
USE CHECKED INDEX POINT WHEN INSTALLING TOOL. **INSTALL MOUNTING PINS IN CHECKED MOUNTING HOLES.**	**BASE ASSEMBLY INDEX** 					**GRADING & CLAM TOOL INDEX*** 		
APPROVED TOOL POSITIONS	**INDEX**	**POINT**	**MOUNTING HOLE**			**MOUNTING HOLE**		
	A	**B**	**1**	**2**	**3**	**1**	**2**	**3**
TOOTHED DIRT BUCKET ** 		X	X	X		X	X	
TOOTHLESS DIRT BUCKET 		X	X		X	X	X	
GRADING BUCKET 	X		X		X		X	X

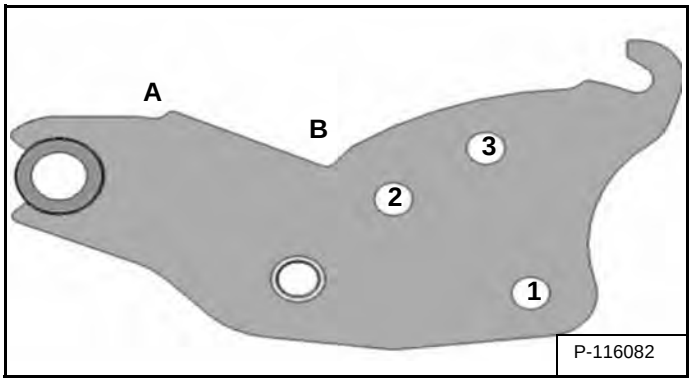
* Grading And Clam Tool Weight: 30 kg (65 lb)

**** Note: See the correct operating procedure when using the grading tool for grading. (See Using The Pro Clamp System on Page 99.)**

Installing And Removing The Pro Clamp System Tool (Cont'd)

Installation (Cont'd)

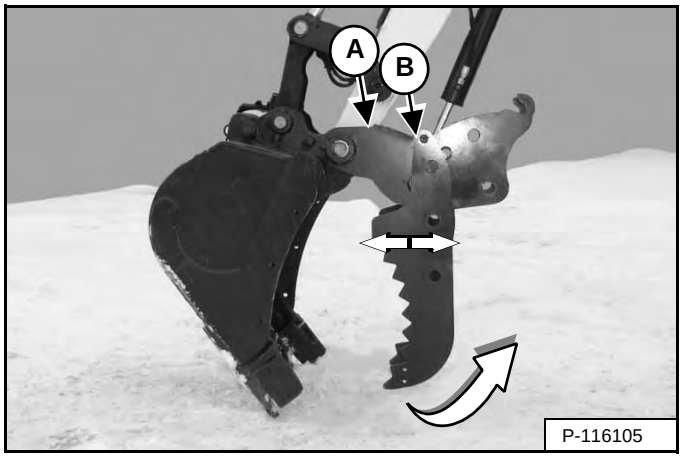
Figure 149



For aligning the clamp tool and base assembly, there are three mounting holes (Item 1, 2 and 3). For indexing the clamp tool, there are two indexing points on the base assembly (Item A and B) **[Figure 149]**.

Use **[Figure 147]** and **[Figure 148]** to determine which index point is used for the desired tool position.

Figure 150



Move the clamp tool along the base assembly to the desired indexing point (A or B) **[Figure 150]**.

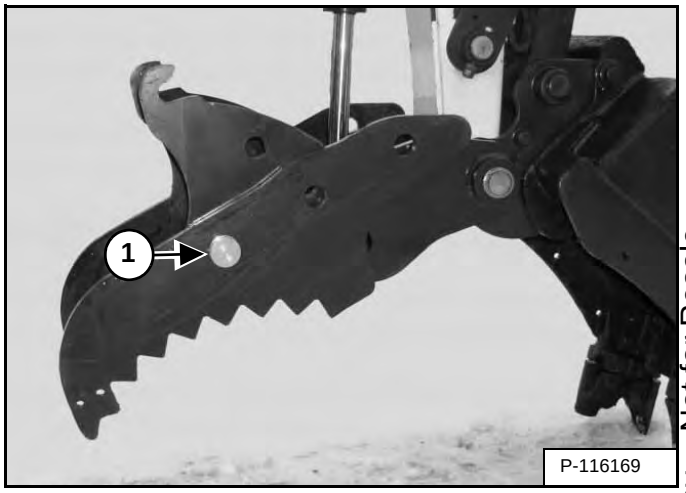
NOTE: The clamp tool anchors must be located in one of the indexing points on the base assembly for the mounting holes to align. The base assembly hooks are for lifting the clamp tool only. The hooks cannot be used as an indexing point for mounting hole alignment.

Lifting the bottom of the clamp tool, use the anchors and indexing point as a hinge to align the mounting holes (Item 1) **[Figure 150]**.

⚠ WARNING

AVOID INJURY OR DEATH
Keep fingers and hands out of pinch points when installing and removing implement or attachment.
W-2571-1212

Figure 151



Install a pin (Item 1) **[Figure 151]** in the mounting hole on each side. Install the lock pins (Item 1) **[Figure 154]**.

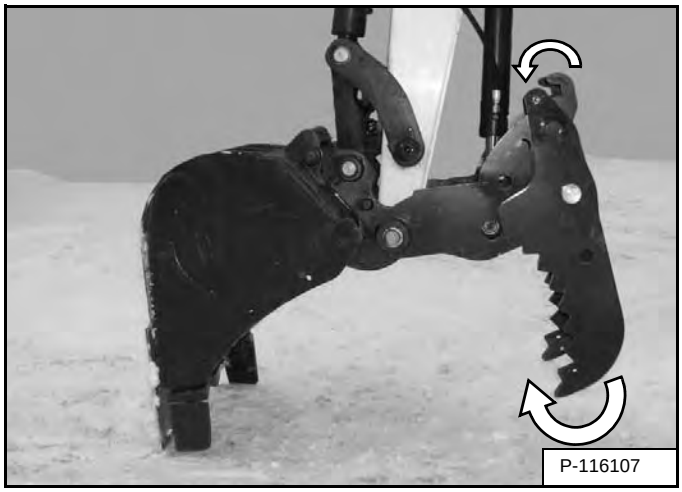
NOTE: When installing the clamp tool, always install the pins in the hole 1 [Figure 149] first. Hole 1 [Figure 149] will always be used for mounting the tools.

NOTE: When repositioning or removing the Pro Clamp system tool, remove the pins from positions 2 or 3 first. The pin in location 1 should always be the last pin removed or the first pin installed [Figure 149].

Installing And Removing The Pro Clamp System Tool (Cont'd)

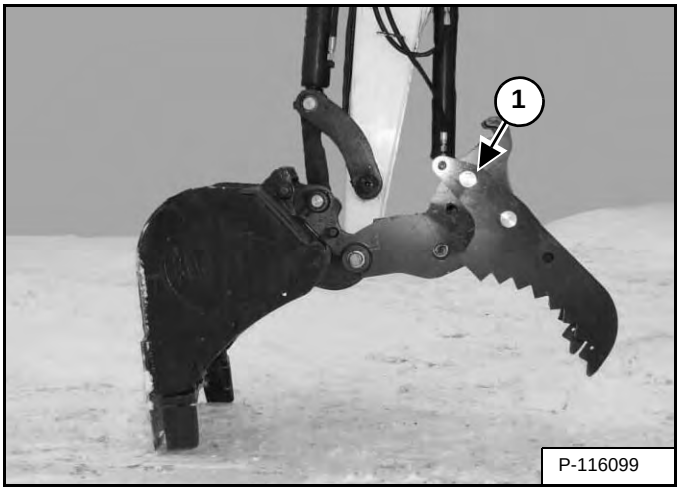
Installation (Cont'd)

Figure 152



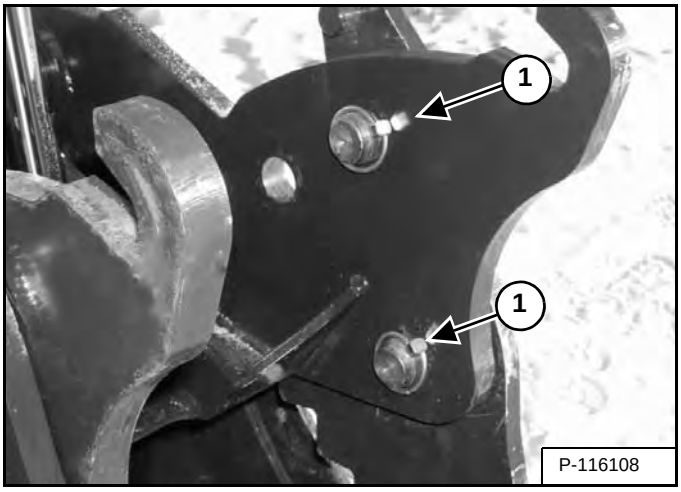
Rotate the clamp tool to the desired angle, aligning the other mounting holes **[Figure 152]**.

Figure 153



Install the pins (Item 1) **[Figure 153]**.

Figure 154



Install the retaining pins (Item 1) **[Figure 154]**.

Note: Always install ALL of the mounting pins and the retaining pins.

IMPORTANT

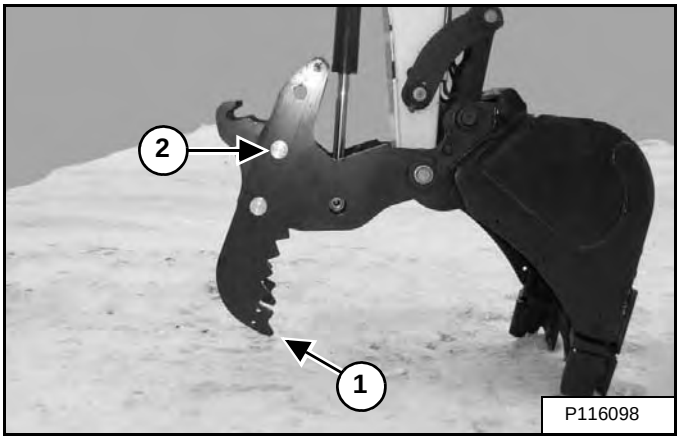
Always install all of the mounting pins and retainer pins. Failure to do so will cause structural damage.

I-2380-0314

Installing And Removing The Pro Clamp System Tool (Cont'd)

Removal

Figure 155



Park the excavator on a flat and level surface. Position the bucket as shown in **[Figure 155]** and lower the boom until the bucket is fully on the ground.

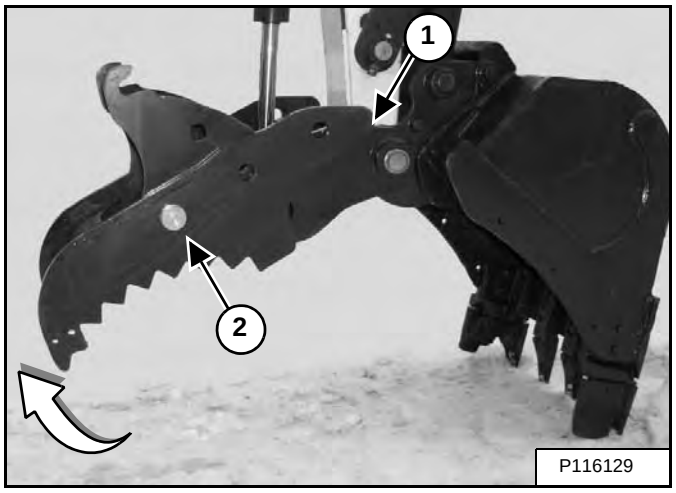
Stop the engine and exit the excavator.

Remove the retainer pins (Item 1) **[Figure 154]**.

NOTE: When repositioning or removing the Pro Clamp system tool, remove the pins from positions 2 or 3 first. The pin in location 1 should always be the last pin removed or the first pin installed [Figure 149].

Hold the bottom of the clamp tool (Item 1) and remove the pin (Item 2) **[Figure 155]** from each side.

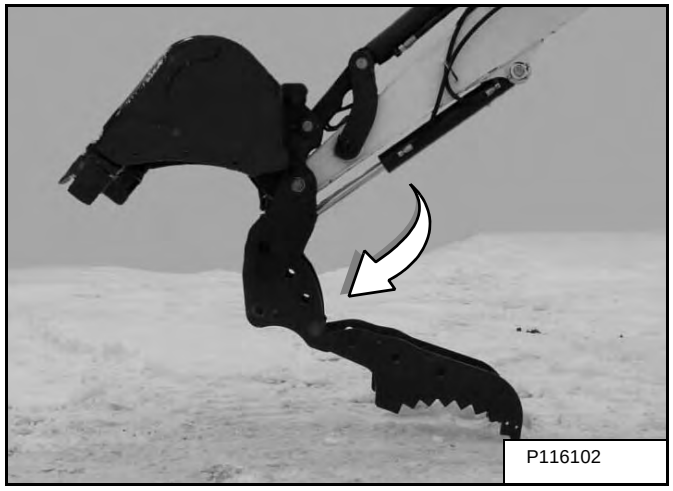
Figure 156



Rotate the clamp tool until the anchors (Item 1) **[Figure 156]** are contacting the indexing point.

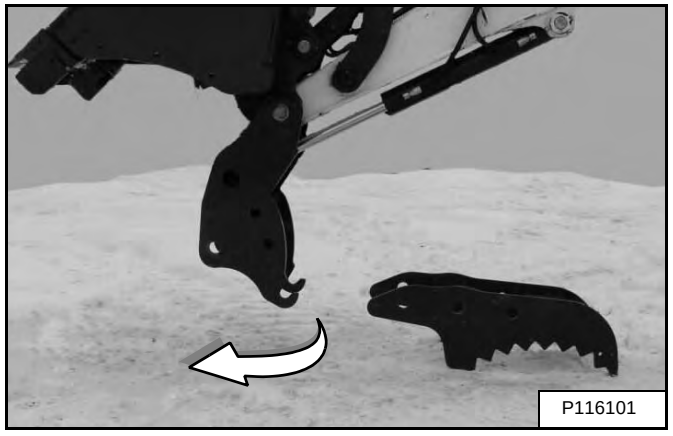
Lift on the bottom of the clamp tool using the anchors as a fulcrum to take pressure off of the pins (Item 2) and remove pins (Item 2) **[Figure 156]** (both sides). Rotate the tool down until it hangs freely straight down.

Figure 157



Slightly raise the boom and retract the bucket cylinder fully. Lower the boom until the tip of the clamp tool is touching the ground. Extend the clamp cylinder and slightly lower the boom and rotate the clamp tool forward until the clamp tool is fully on the ground **[Figure 157]**.

Figure 158



Lower the boom and move the arm forward until the hooks of the clamp mount (Item 1) are disengaged from the clamp tool anchors (Item 2) **[Figure 158]**.

Inspect 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.

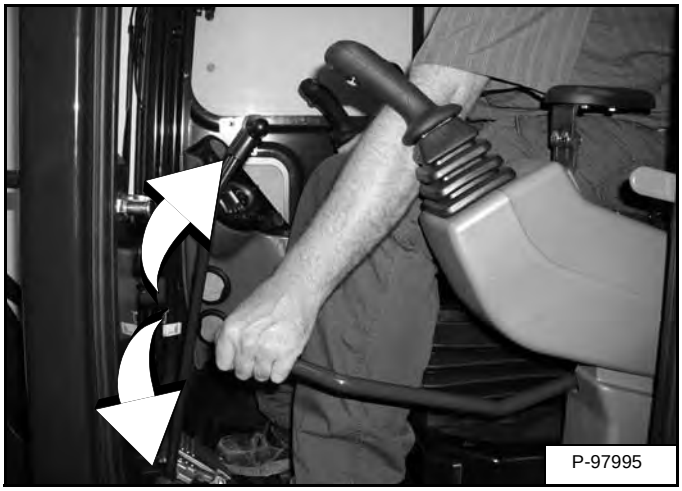
Lowering The Work Equipment (Engine STOPPED)

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

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.

Figure 159



The joystick lock switch disengages the hydraulic control functions from the joysticks when the console are raised **[Figure 159]**.

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

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

Use the control lever to lower the boom.

Lower the control console to engage the hydraulic control functions of the joysticks **[Figure 159]**.

Object Handling

Do not exceed the Rated Lift Capacity. (See Lift Chart (7188434) With Standard Arm on Page 204.) or (See Lift Chart (7188436) With Long Arm on Page 210.)

⚠ WARNING

AVOID INJURY OR DEATH

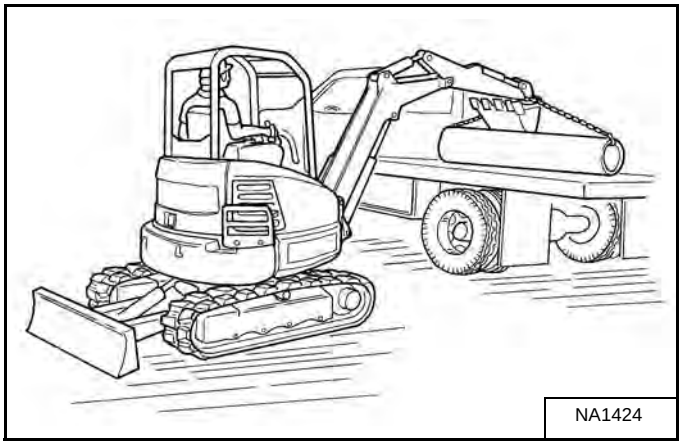
Do not exceed rated lift capacity. Excessive load can cause tipping or loss of control.

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 160



Make sure the load is evenly weighted and centered on the lifting chain, and is secured to prevent the load from shifting **[Figure 160]**.

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.

Object Handling With The Lifting Device

The excavator must be equipped with the optional lift eye link (Item 1) **[Figure 162]**, the boom and arm load hold valves and the overload warning device option. See your Bobcat dealer for available Kits.

⚠ WARNING

AVOID INJURY OR DEATH

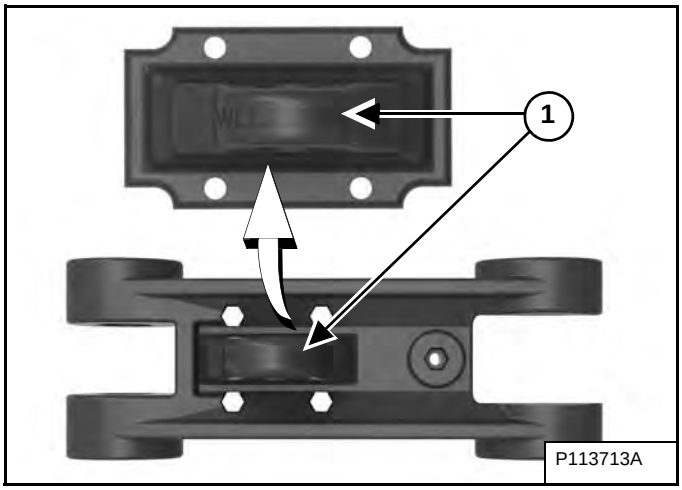
- **Do not exceed rated lift capacity.**
- **Excessive load can cause tipping or loss of control.**
- **Excessive load can cause failure of the lift eye and cause the load to drop.**

W-2991-0714

Do not exceed the machine's Rated Lift Capacity or the Rated Lift Load (RLL) of the lifting device (lift eye). (See Lift Chart (7188434) With Standard Arm on Page 204.), (See Lift Chart (7188442) With Standard Arm W/ Counterweight on Page 207.) or (See Lift Chart (7188436) With Long Arm on Page 210.)

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

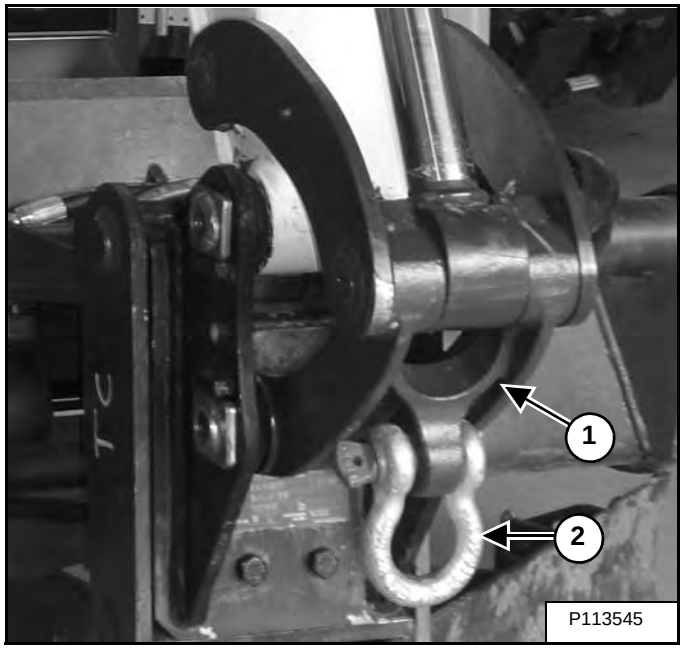
Figure 161



The maximum RLL (Item 1) **[Figure 161]** is shown on the lifting device.

Extend the bucket cylinder completely and lower the boom to the ground. Stop the engine. Exit the excavator. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 69.)

Figure 162

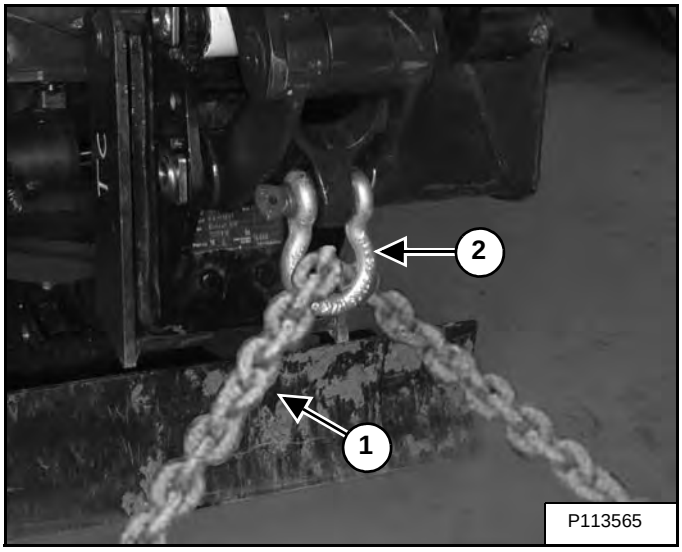


Install the clevis (Item 2) through the lift eye (Item 1) **[Figure 162]**.

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

Object Handling With The Lifting Device

Figure 163



Install a lift chain (Item 1) (or other type of lifting device) through the clevis (Item 2) **[Figure 163]** and connect to the object to be lifted.

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

Enter the excavator, fasten the seat belt and start the engine. (See PRE-STARTING PROCEDURE on Page 61.)

Figure 164

Press the switch (Item 1) **[Figure 164]** to the left to activate the overload warning device.

Figure 165

Make sure the load is evenly weighted and centered on the lifting chain (or other type of lifting device), and is secured to prevent the load from shifting **[Figure 165]**.

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

Lift and position the load. When the load is placed in a secured position and tension is removed from the lift chain, remove the chain from the load and from the lift eye.

Lift Capacity

The lifting capacities were calculated with a machine that was equipped with a standard bucket and the pin-on X-change. The difference between the weight of the attachment and the standard bucket, the pin-on X-change and the quick coupler (if equipped), and the hydraulic clamp (if equipped) must be subtracted.

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2374-0500

Figure 166

EXAMPLE OF LIFT CAPACITY CHART

*** 1246 kg (2746 lb)**

⚠ WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

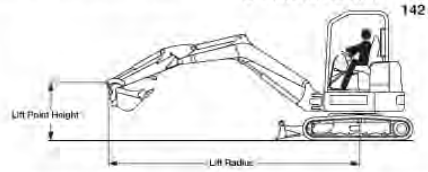
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

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.

EXCAVATOR MODEL

CIRCUIT PRESSURES
WORKING 250 bar (3625 psi)
HOLDING 290 bar (4206 psi)

BOOM LENGTH	2775 mm	(109.3 in)
ARM LENGTH	1525 mm	(60.0 in)
COUNTERWEIGHT	750 kg	(1653 lb)
STANDARD BUCKET	610 mm	(24.0 in)
	142 kg	(313 lb)



LIFT POINT HEIGHT	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)			
	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)
mm (in.)	2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)	
4000 (157.5)			*967 (2131)	*1013 (2234) @ 4075 (160)			*967 (2131)	719 (1585) @ 4075 (160)			562 (1239)	522 (1151) @ 4075 (160)
3000 (118.1)			*979 (2158)	*1065 (2347) @ 4850 (191)			749 (1652)	512 (1130) @ 4850 (191)			560 (1235)	369 (814) @ 4850 (191)
(78.7)		(3534)	*1246 (2746)	*1117 (2462) @ 5250 (207)		1181 (2605)	708 (1561)	428 (944) @ 5250 (207)		886 (1954)	537 (1185)	295 (652) @ 5250 (207)
1000 (39.4)		*2454 (5411)	*1559 (3438)	*1184 (2611) @ 5325 (210)		1028 (2268)	658 (1450)	398 (877) @ 5325 (210)		794 (1750)	485 (1071)	280 (617) @ 5325 (210)
Ground		*2737 (6034)	*1760 (3880)	*1259 (2775) @ 5175 (204)		1013 (2234)	635 (1399)	413 (911) @ 5175 (204)		730 (1610)	451 (995)	289 (637) @ 5175 (204)
-1000 (-39.4)	*4023 (8870)	*2652 (5847)	*1717 (3785)	*1341(2956) @ 4705 (185)	1988 (4384)	944 (2082)	627 (1382)	490 (1081) @ 4705 (185)	1378 (3039)	734 (1620)	454 (1002)	343 (757) @ 4705 (185)

* Rated Hydraulic Lift Capacity

B2630 SW 7188434

The following example will show how to calculate the lift capacity differences between the lift capacity charts with standard equipment and when using optional equipment.

The standard equipment weights used when determining lift capacity are as follows:
Standard Bucket = 142 kg (313 lb)
Pin-On X-Change = 28 Kg (62 lb)

The following lists the weight of the optional quick couplers and hydraulic clamp:

- Pin-on X-Change = 28 kg (62 lb)
- Hydraulic X-Change = 40 kg (87 lb)
- Pin Grabber Quick Coupler = 65 kg (143 lb)
- Lehnhoff Quick Coupler = 30 kg (66 lb)
- Klac Quick Coupler = 43 kg (95 lb)
- TAG Quick Coupler = 26 kg (58 lb)
- Hydraulic Clamp And Cylinder = 86 kg (190 lb)
- Hydraulic Pro-Clamp, Clamp Tool And Cylinder = 144 kg (317 lb)
- Optional Buckets And Attachments (See **NOTE** below)

NOTE: For bucket weights, see your Bobcat dealer. For attachment weights, see the attachment Operation & Maintenance Manual.

Lift Capacity (Cont'd)

The following is an example for determining the lift capacity using the sample chart shown above **[Figure 166]**.

- Machine Position: Over Blade, Blade Down
- Lift Radius: 4000 mm (125.5 in)
- Lift Point Height: 2000 mm (78.7 in)
- Hydraulic X-Change
- Hydraulic Clamp and Cylinder
- Standard Bucket

1. Obtain Lift Capacity from Chart: 1246 kg (2746 lb)

2. Subtract the difference between the weight of the standard configuration (Pin-On X-change and Standard Bucket) and optional equipment which in this case is the Hydraulic X-Change and the Hydraulic Clamp.

Quick Coupler (Pin-On X-Change minus Hydraulic X-change): 28 kg (62 lb) - 40 kg (87 lb) = minus 12 kg (25 lb)
Hydraulic Clamp and Cylinder: 86 kg (190 lb)

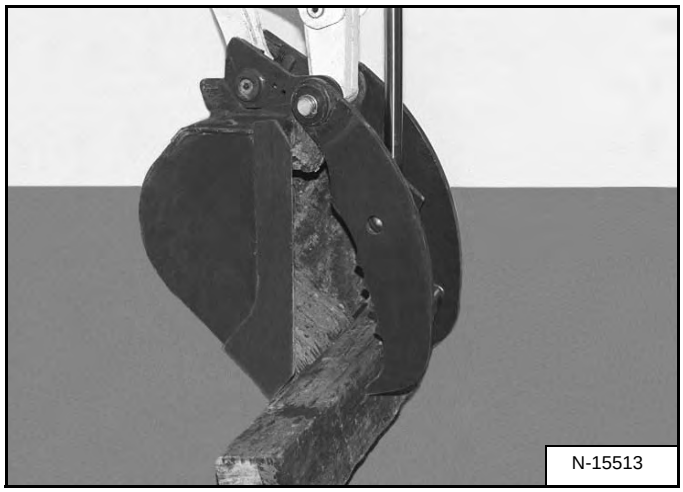
3. Calculate actual Lift Capacity for machine as configured:

1246 kg (2746 lb) - 12 kg (25 lb) (coupler difference) - 86 kg (190 lb) (hydraulic clamp and cylinder) = 1148 kg (2531 lb)

** The lift capacity charts (decals) are based off of ISO 10567: 2007. The lifting capacities are defined as the lower value of 75% of tipping load or 87% of the hydraulic lift capacity.*

Using The Clamp

Figure 167



The optional lifting clamp attachment gives the excavator a wider range of use and mobility for debris removal **[Figure 167]**.

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

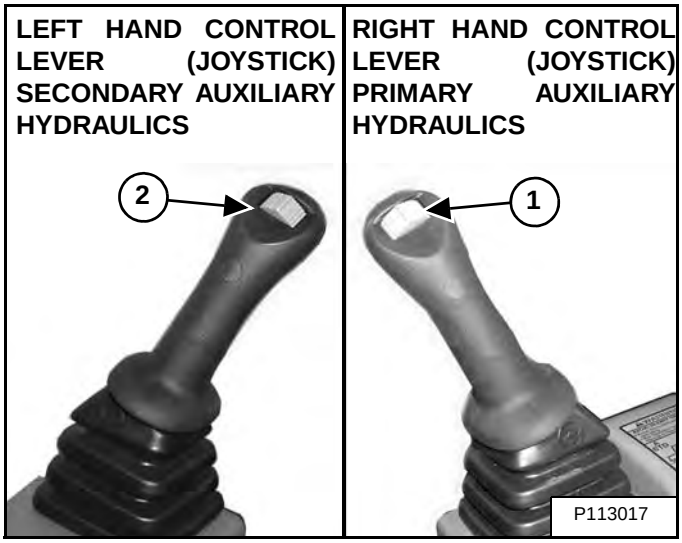
The lift capacities are reduced by 99 kg (218 lb) if the excavator is equipped with the optional lifting clamp.

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

When Using Primary Auxiliary Hydraulics To Activate Clamp

Engage the auxiliary hydraulics and toggle to the Aux2 setting. (See Auxiliary Hydraulics - Standard Instrument Panel on Page 47.)

Figure 168



Move the switch (Item 1) **[Figure 168]** on the right control lever to the right to open the clamp. Move the switch to the left to close the clamp.

When Using Secondary Auxiliary Hydraulics To Activate Clamp

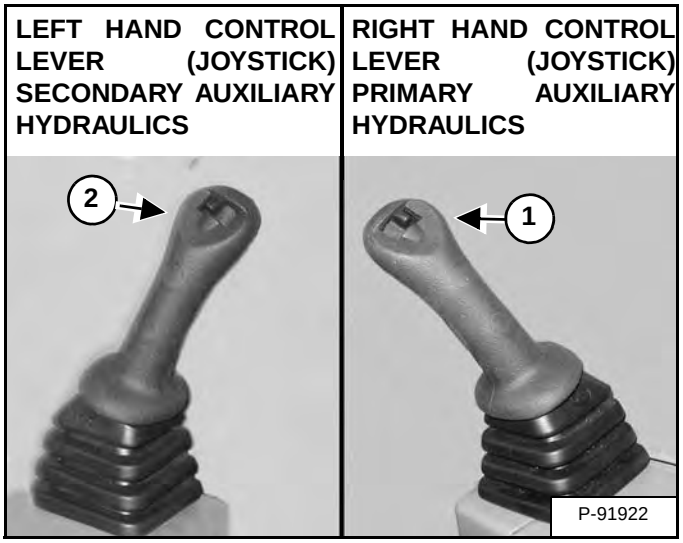
Move the switch (Item 2) **[Figure 168]** on the left control lever to the left open the clamp. Move the switch to the right to close the clamp.

Using The Pro Clamp System

The lift capacities of the excavator will be reduced by 144 kg (317 lb) with the optional Pro Clamp system installed. (See Lift Capacity on Page 96.)

Engage the auxiliary hydraulics and toggle to the Aux2 setting. (See Auxiliary Hydraulics - Standard Instrument Panel on Page 47.) or (See Auxiliary Hydraulics - Deluxe Instrument Panel on Page 49.)

Figure 169



Move the switch (Item 1) **[Figure 169]** on the right control lever to the right to open the clamp. Move the switch to the left to close the clamp.

Using Secondary Auxiliary Hydraulics To Activate Clamp

Move the switch (Item 2) **[Figure 169]** on the left control lever to the left open the clamp. Move the switch to the right to close the clamp.

Before connecting and disconnecting auxiliary hydraulic quick couplers, relieve hydraulic pressure. (See Relieve Hydraulic Pressure With Standard Instrument Panel (Excavator And Attachment) on Page 50.), (See Relieve Hydraulic Pressure With Deluxe Instrument Panel (Excavator And Attachment) on Page 50.) or (See Relieve Secondary Auxiliary Hydraulic Pressure (Excavator And Attachment) on Page 51.)

For installing and removing the Pro Clamp system tools, (See Installing And Removing The Pro Clamp System Tool on Page 85.)

Operating With The Grading Tool

IMPORTANT

When using the Pro Clamp System with the Grading Tool, the Grading Tool must not be used with the cylinder fully extended and unsupported. It is necessary to support the Grading Tool with the bucket to avoid damaging the clamp cylinder.

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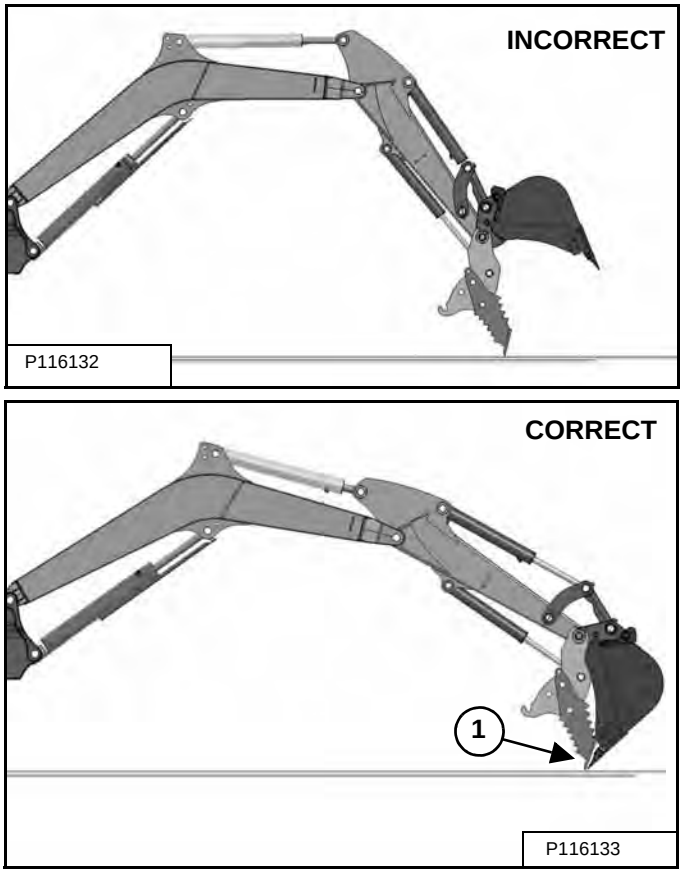
Figure 170



When using the Pro Clamp with the Grading Tool, the Grading Tool must not be used with the cylinder fully extended and unsupported. It is necessary to support the Grading Tool with the bucket to avoid damaging the clamp cylinder. Position the bucket to the clamp grading tool as shown **[Figure 170]**.

NOTE: The clamp grading tool plate (Item 1) [Figure 170] must be in contact with the bucket or bucket teeth when using the tool for grading.

Boom Swing

Figure 171

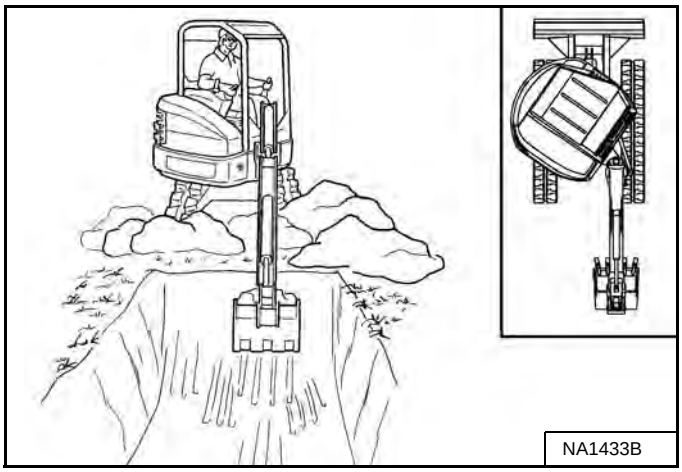


Figure 172

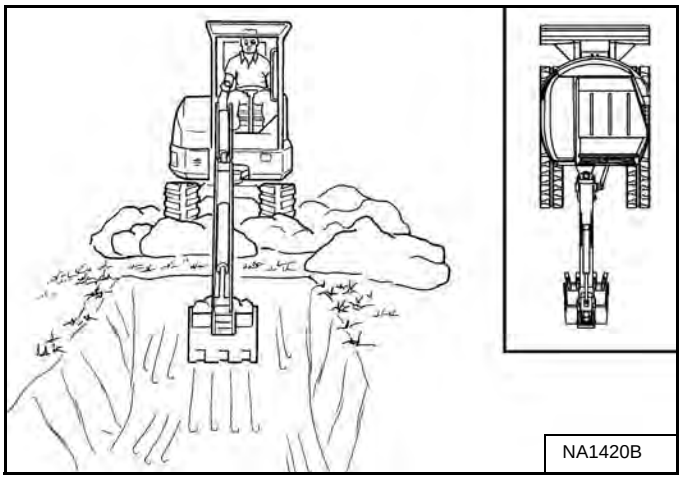
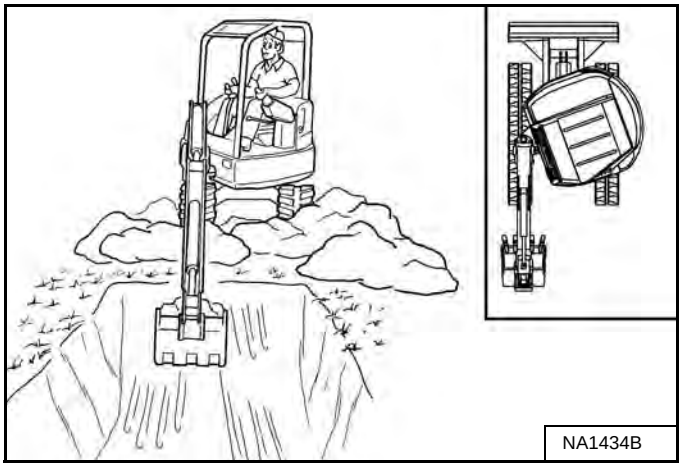


Figure 173



Slew the upperstructure, swing the boom to the right **[Figure 171]**, center **[Figure 172]** and left **[Figure 173]** to dig a square hole the width of the machine without repositioning the excavator.

Figure 174

The boom swing allows the operator to offset the boom and dig close to buildings and other structures **[Figure 174]**.

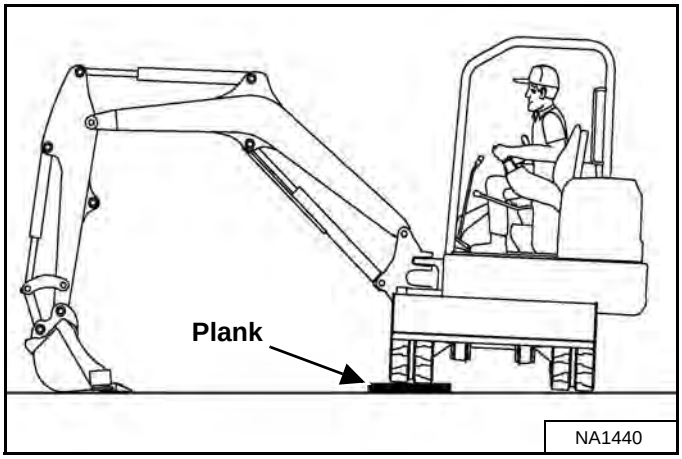
Driving The Excavator

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

Avoid traveling 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 travel on and prevent the excavator from getting stuck.

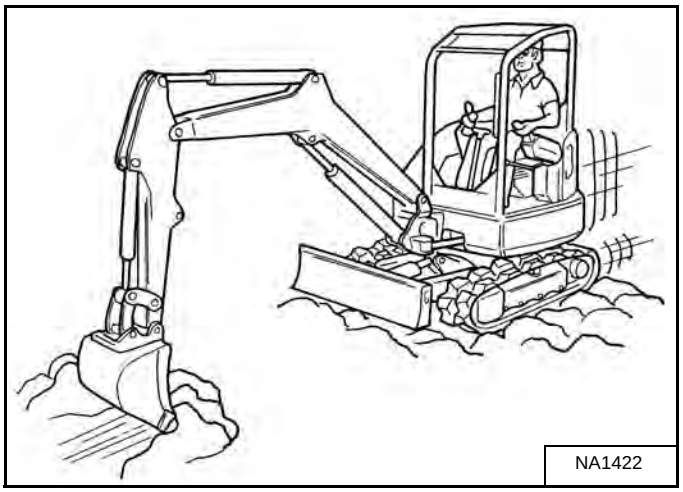
Figure 175



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 175]**.

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

Figure 176



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 176]**.

Operating On Slopes

⚠ WARNING

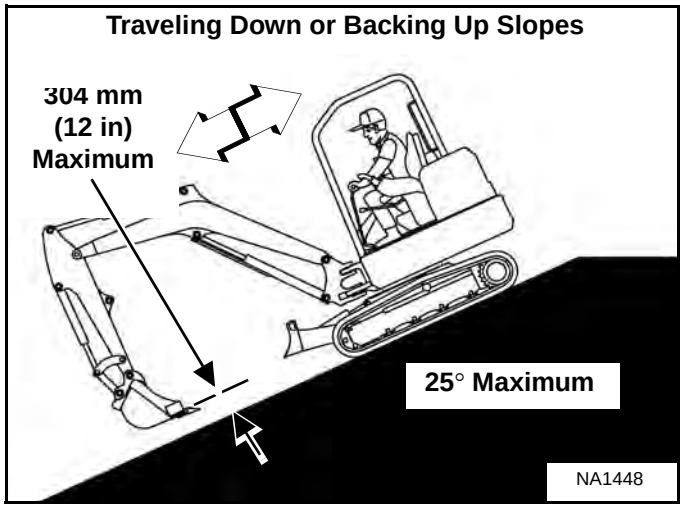
AVOID INJURY OR DEATH

- **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 speed control lever.

Figure 177



When going down grades that exceed 15 degrees, put the machine in the position shown, and run the engine slowly **[Figure 177]**.

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

Avoid traveling 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 178

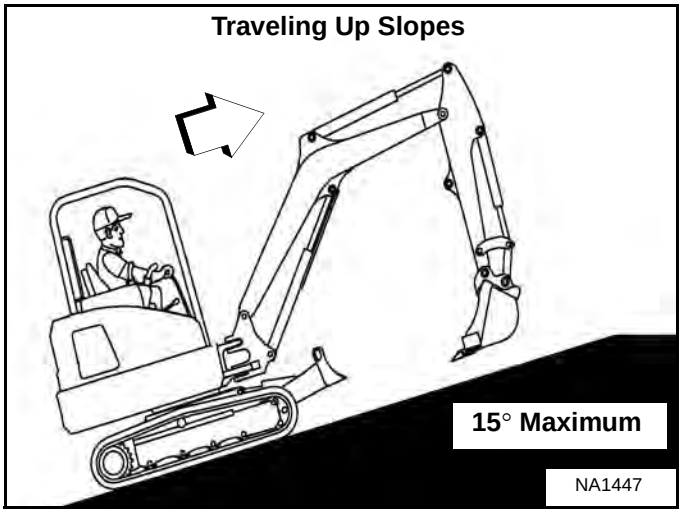
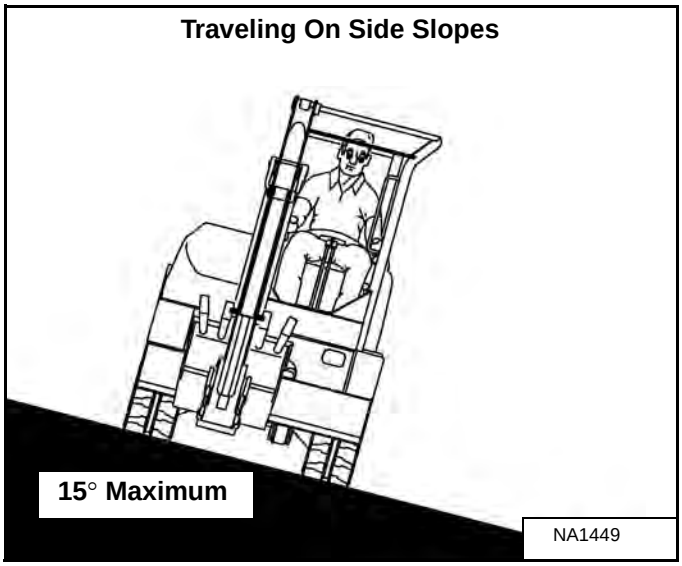


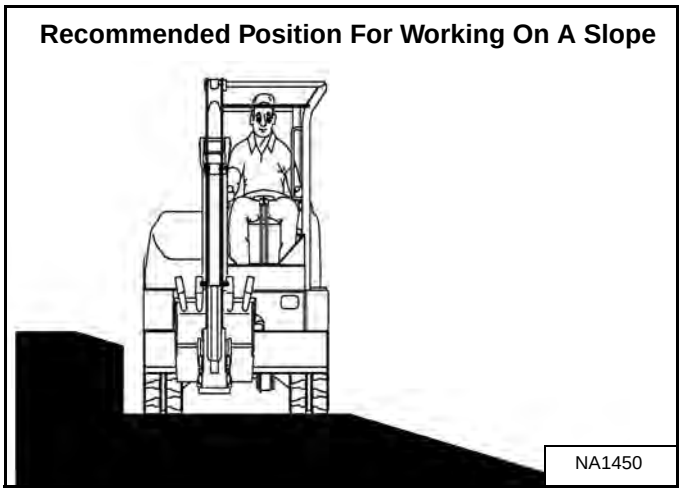
Figure 179



When traveling up slopes or on side slopes that are 15 degrees or less, position the machine as shown and run the engine slow **[Figure 178]** and **[Figure 179]**.

Operating On Slopes (Cont'd)

Figure 180



When operating on a slope, level the work area before beginning **[Figure 180]**.

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.

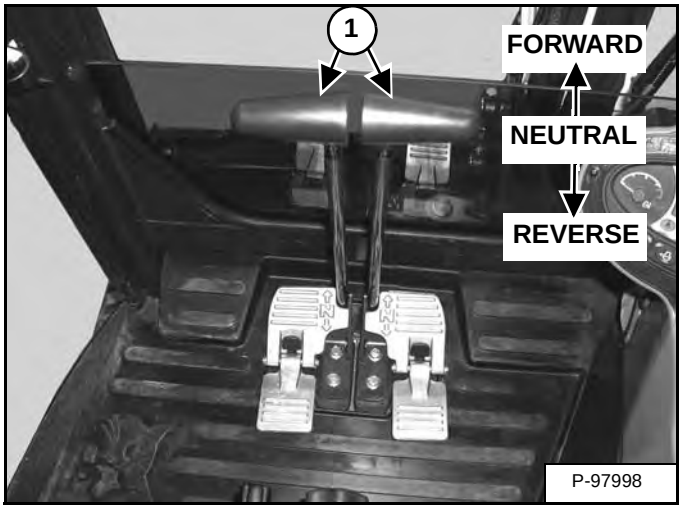
When working with the bucket on the uphill side, keep the bucket as close to the ground as possible. Dump the spoil far enough away from the trench or hole to prevent the possibility of a cave in.

OPERATING PROCEDURE (CONT'D)

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 181



To brake the machine when going down a slope, move the steering levers (Item 1) **[Figure 181]** to the NEUTRAL position. This will engage the hydrostatic braking.

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

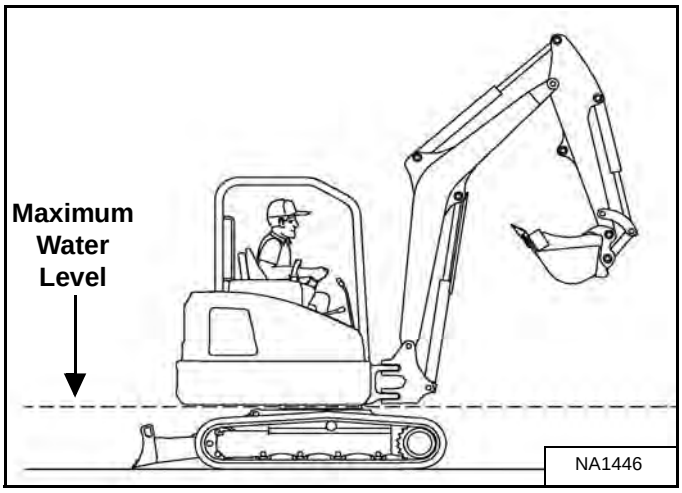
NOTE: If the engine stops, the boom / bucket (attachments) can be lowered to the ground using hydraulic pressure which is stored in the accumulator.

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

Use the control lever to lower the boom.

Start the engine and resume operation.

Figure 182



Do not operate or immerse the excavator in water higher than the bottom of the swing bearing **[Figure 182]**.

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.

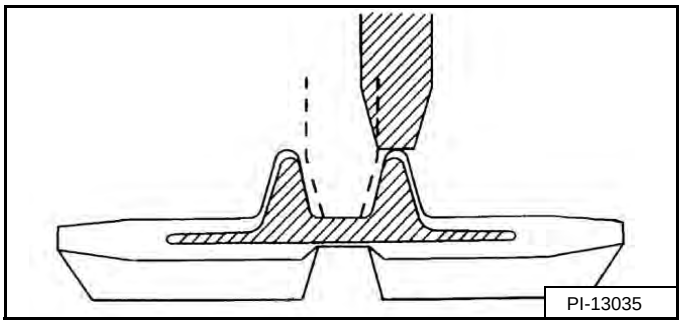
Water must be removed from the cylinder rods. If water freezes to the cylinder rod, the cylinder seals can be damaged when the rod is retracted.

Avoiding Track Damage

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.

Some Cause Of Track Damage:

Figure 183

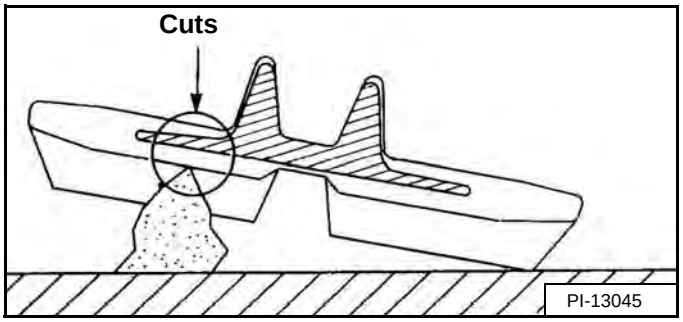


Incorrect track tension: When the rubber track is detracting, the idler or sprocket rides on the projections of the embedded metal **[Figure 183]** causing the embedded metal to be exposed to corrosion. (See TRACK TENSION on Page 168.)

If rubber track is clogged with stones or foreign objects, these can get wedged between the sprocket / rollers and cause detracting and track stress.

When moisture invades through cuts on the track, the embedded steel cords will corrode. The deterioration of the design strength may lead to the breaking of the steel cords.

Figure 184

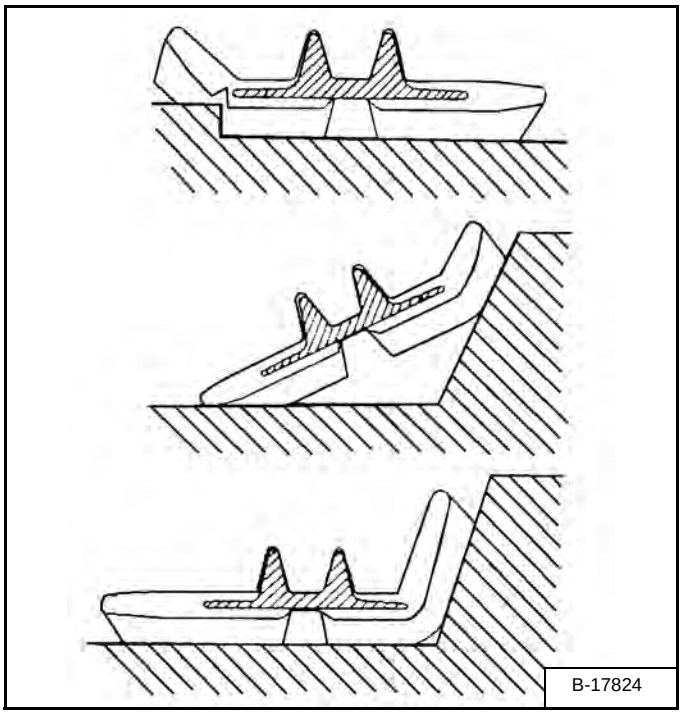


When rubber tracks drive over projections or sharp objects in the field, the concentrated forces applied cause cuts on the lug side rubber surface **[Figure 184]**. In case of making turns on projections, the lug side rubber surface will have an even higher chance to be cut. If the cuts run through the embedded steel cords, it might result in the steel cords' breakage due to their corrosion.

Avoid quick turns on bumpy and rocky fields.

Driving over sharp objects should be avoided. If this is impossible, do not make turns while driving over sharp objects.

Figure 185



When rubber tracks drive over sharp projections, intensive stress is applied to the lug side rubber surface, especially at the edges of embedded metals, causing cracks and cuts in the area around the embedded metals **[Figure 185]**.

Avoid extensive stress applied to the lug root where metals are embedded. Operators should try to avoid driving over stumps and ridges.

DEPTH CHECK

Setup / Calibration

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

⚠ WARNING

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

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

Move the machine to an open area where the boom and arm can be repositioned and there is fresh air as the engine will need to be operating during this procedure.

Park the machine on a flat level surface.

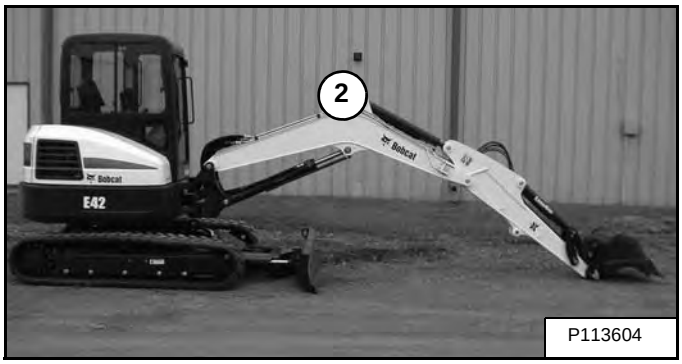
The calibration procedure is a two person operation. One person must remain in the cab to enter data into the deluxe display panel while a second person takes measurements from outside the machine. Make sure the second person is away from the machine when moving any of the work group components (boom,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

⚠ WARNING

Keep all bystanders 6 m (20 ft) away from equipment when operating.

W-2268-0910

Figure 186

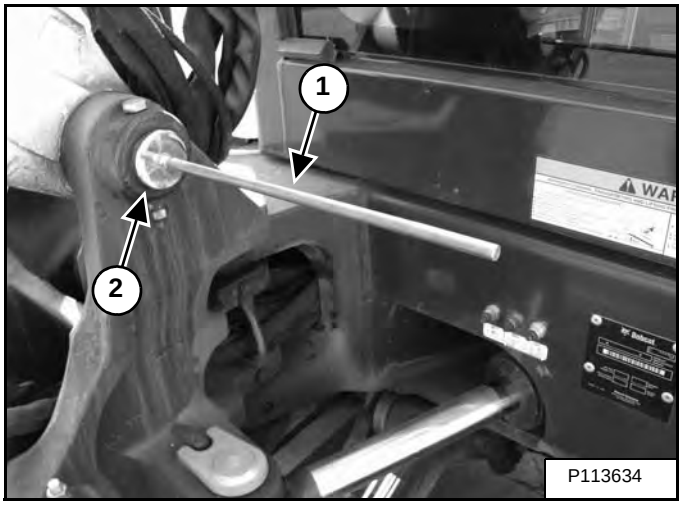


Position the excavator **[Figure 186]** as shown so the second person can install the magnetic tools, the plumb bob and do measurements for calibrating the system.

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

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

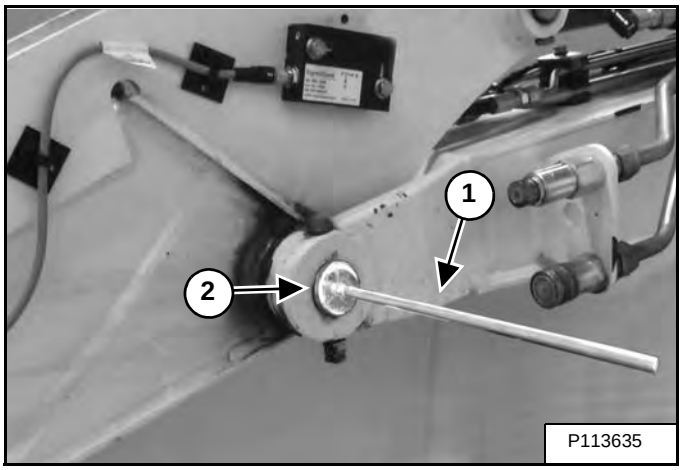
Figure 187



Install one of the magnetic tools (Item 1) on the boom pivot pin (Item 2) **[Figure 187]**. Center the magnetic tool as close as possible to the center of the boom pin.

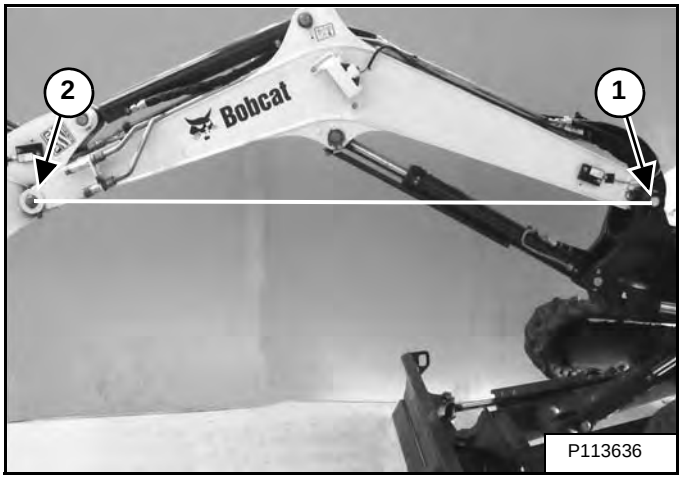
Setup / Calibration (Cont'd)

Figure 188



Install the second magnetic tool (Item 1) on the arm pivot pin (Item 2) **[Figure 188]**. Center the magnetic tool as close as possible to the center of the arm pin.

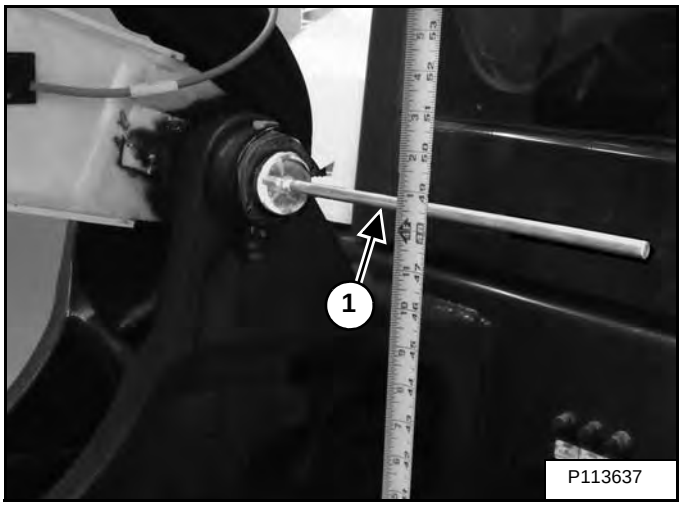
Figure 189



Position the excavator with the bucket fully rolled out and the arm fully extended. Position the workgroup so the distance from the ground to the two magnetic sensors (Item 1 and 2) **[Figure 189]** is identical.

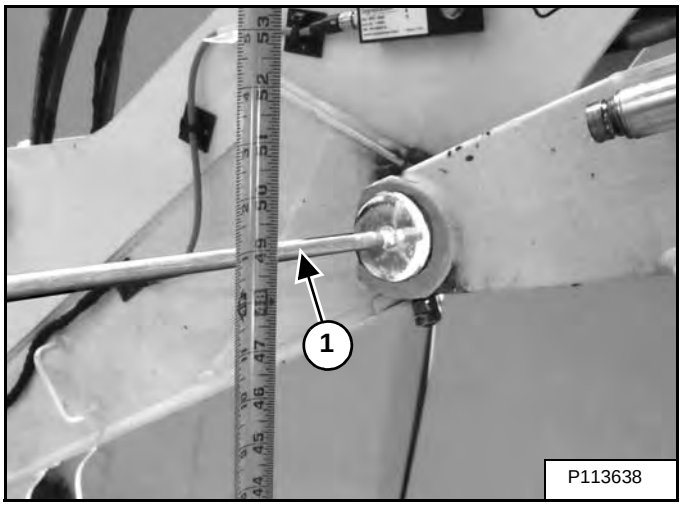
NOTE: It may be necessary on some machines to lower the blade to raise the front of the excavator up slightly to position the boom pivot pin so that the boom and arm pivot points will be parallel to the ground when calibrating.

Figure 190



Measure the distance from the center of the boom magnetic tool (Item 1) **[Figure 190]** to the ground. Measure as close to the boom as possible without interference from components between the boom and the ground. The closer to the boom the measurement is taken, the more accurate the measurement should be. (A laser level can also be used for locating the centerlines of the magnetic tools as this will eliminate any possible variation in the measurements to the ground.)

Figure 191

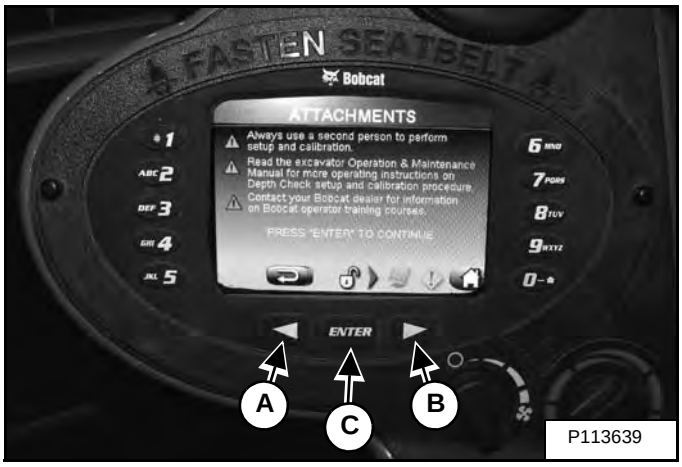


Measure the distance from the center of the arm magnetic tool (Item 1) **[Figure 191]** to the ground and make sure both measurements are the same. Adjust the boom up or down as needed and remeasure until both dimensions are the same between **[Figure 190]** and **[Figure 191]**.

Once the dimensions are identical, the second person in the cab will need to enter the setup / calibration information into the dash panel. *(The accuracy of these dimensions affect the accuracy of the Depth Check.)*

NOTE: Make sure there is no cylinder drift that could affect the calibration accuracy. The second person needs to enter the information into the display panel in a timely manor.

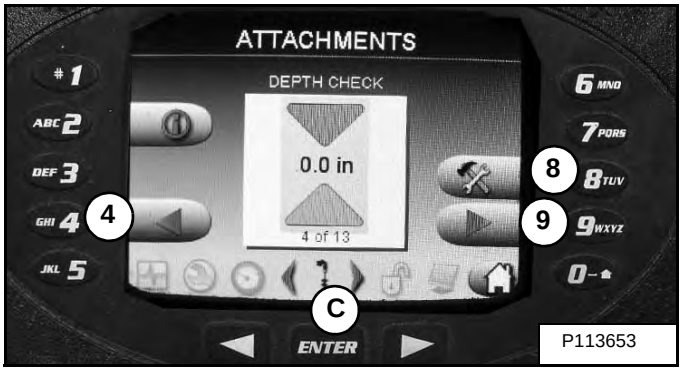
Figure 192



Scroll through the dash panel by pressing the left arrow (Item A) or the right arrow (Item B) until the **[ATTACHMENTS]** screen is displayed. Press the **[ENTER]** button (Item C) **[Figure 192]**

NOTE: If the Depth Check settings have been locked, enter the owner password to access the setup / calibration procedure.

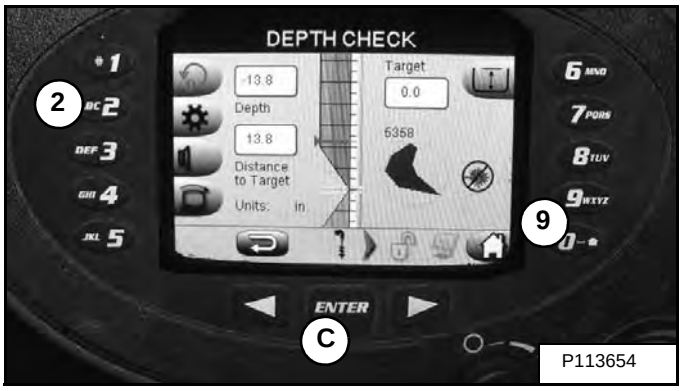
Figure 193



On the **[ATTACHMENTS]** screen, use the left arrow button (Item 4) or the right arrow button (Item 9) and scroll to the **[ATTACHMENT DEPTH CHECK]** screen shown here. Press the **[ENTER]** button (Item C) or button (Item 8) **[Figure 193]** to access the **[DEPTH CHECK SETUP]** screen.

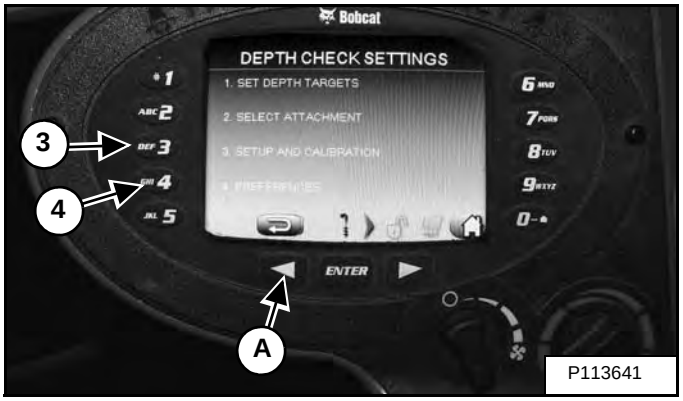
Setup / Calibration (Cont'd)

Figure 194



One of three different screens can appear. Which ever screen appears, press button (Item 2) **[Figure 194]** to access the **[DEPTH CHECK SETUP]** screen.

Figure 195

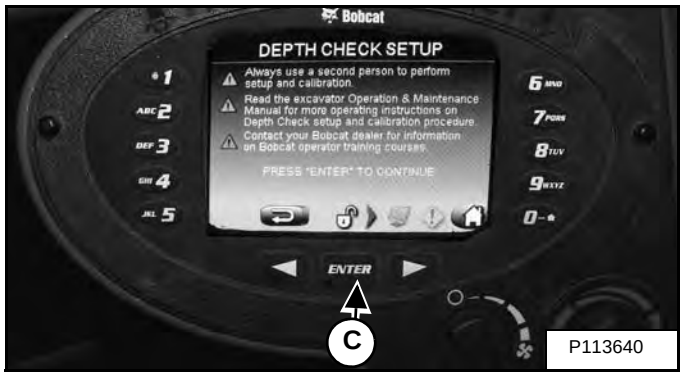


NOTE: The units of measure can be set in either millimeters or inches. Press button (Item 4) to enter the Preferences screen and select meters, millimeters, feet or inches, then press the arrow button (Item A) [Figure 195] to go back to the above screen.

NOTE: If the Depth Check settings have been locked, enter the owner password to access the setup / calibration procedure.

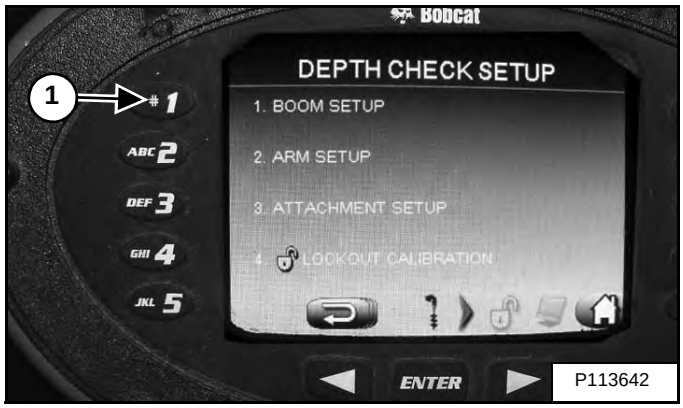
Press the button (Item 3) **[Figure 195]** for setup / calibration mode.

Figure 196



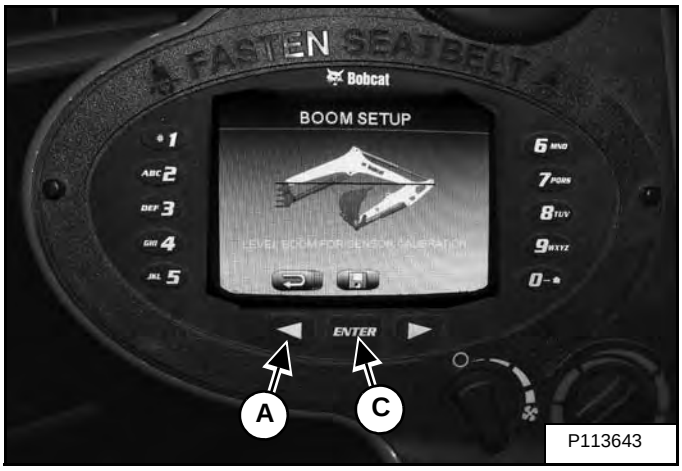
Read the message on the screen and press the **[ENTER]** button (Item C) **[Figure 196]** to continue.

Figure 197



Press **[1. BOOM SETUP]** (Item 1) **[Figure 197]**.

Figure 198



With the boom leveled **[Figure 190]** and **[Figure 191]**, press the **[ENTER]** button (Item C) **[Figure 198]** to store this information into the setup / calibration settings.

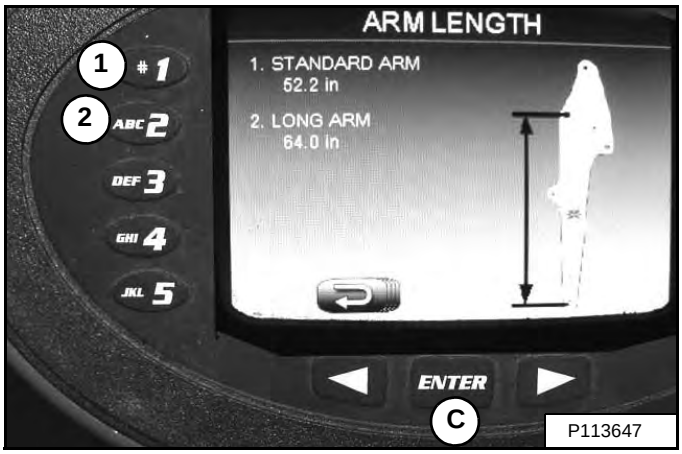
The next setup / calibration step will be for Arm Setup. This will require a plumb bob to make sure the arm is in the correct vertical position.

NOTE: If a plumb bob is not available, fishing line or a string with a heavy nut or two tied on one end of the string can be used in place of a plumb bob.

Figure 199

Have the second person in the cab and press the **[2. ARM SETUP]** (Item 2) **[Figure 199]**.

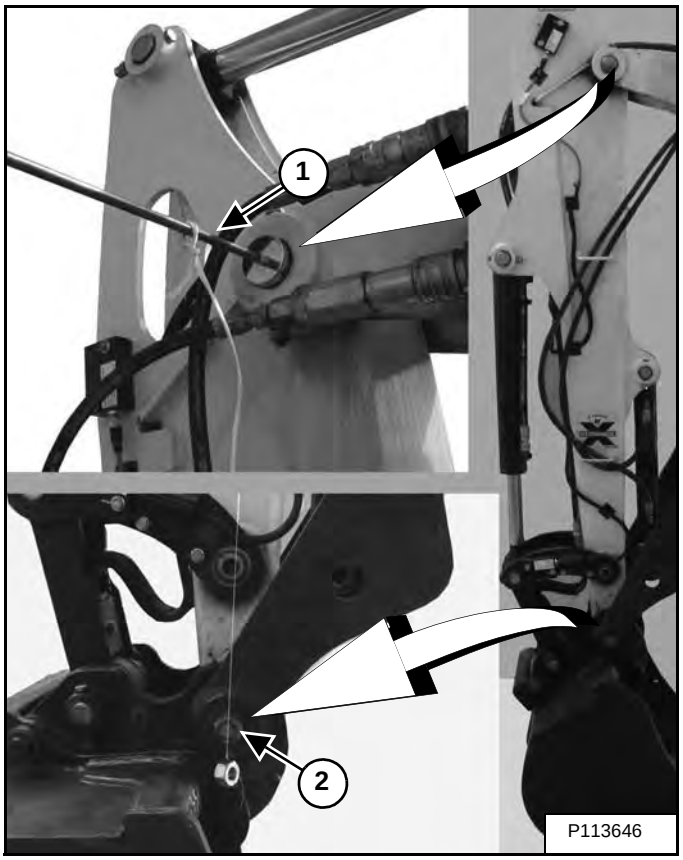
Figure 200



The system needs to know if the machine is equipped with a standard arm or the long arm option. The excavator ECU knows the machine model so the dimensions for the two arms is shown on the screen. For the Standard Arm, press (Item 1), for Long Arm, press (Item 2). Press the **[ENTER]** button (Item C) **[Figure 200]** to store this information into the setup / calibration settings.

Setup / Calibration (Cont'd)

Figure 201



Place the plumb bob (Item 1) **[Figure 201]** on the magnetic tool that is installed on the arm pin. Raise the boom and move the arm until the arm is vertical.

Move the arm until the plumb bob line is centered on the bucket pivot pin (Item 2) **[Figure 201]**. *(The accuracy of the arm being vertical affects the accuracy of the Depth Check.)*

Figure 202

With the arm vertical **[Figure 201]**, press the **[ENTER]** button (Item C) **[Figure 202]** to store this information into the setup / calibration settings.

Figure 203

Press the **[ATTACHMENT SETUP]** button (Item 3) **[Figure 203]**.

Figure 204

Select one of the attachments (Item 1 - 5) **[Figure 204]** from the list.

NOTE: Up to five different attachments can be named, setup / calibrated and stored or removed to make room for a new attachment. When switching between attachments, just select the desired attachment and as long as it was correctly setup, the Depth Check system will have the information needed for that attachment.

Figure 205

On the **[ATTACHMENT SETUP]** screen, you can select **[1. CHANGE NAME]** (Item 1), **[2. SETUP AND CALIBRATION]** (Item 2) or **[3. REMOVE]** (Item 3) **[Figure 205]** the attachment from the saved list.

Select **[1. CHANGE NAME]** (Item 1) **[Figure 205]** to open the attachment name screen.

Name Examples: 24" bucket, 30" bucket, Auger, etc.

Figure 206

Use the key pads (Item 1 through 0) and enter a name or number for the attachment being setup. Press the **[ENTER]** button (Item C) **[Figure 206]** to save the name. (To add the name, press the key pad multiple times until the correct letter or number appears on the screen for the attachment name.)

If setting up additional attachments, select (Items 2 through Item 5) **[Figure 204]** and add the additional attachment names.

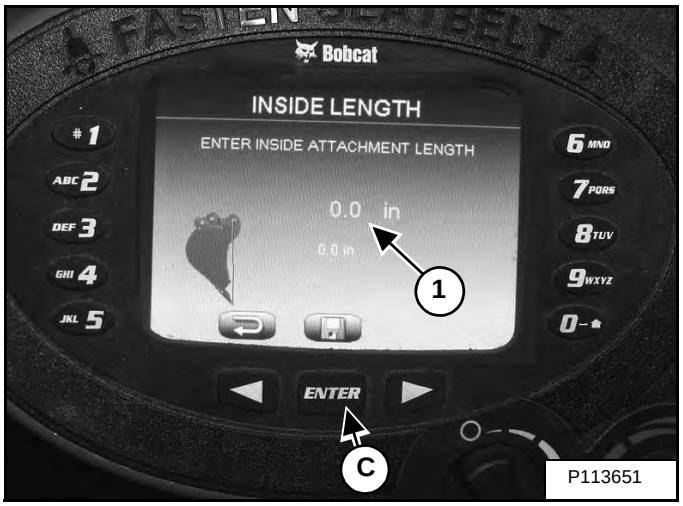
If setting up and calibrating multiple attachments at the same time, add all the attachment names into the system before doing the measurements. It will be more convenient when it comes time to add the dimensions.

Press the arrow button (Item A) **[Figure 205]** and go back to the **[ATTACHEMENT SETUP]** screen.

Press the **[2. SETUP AND CALIBRATION]** button (Item 2) **[Figure 205]**.

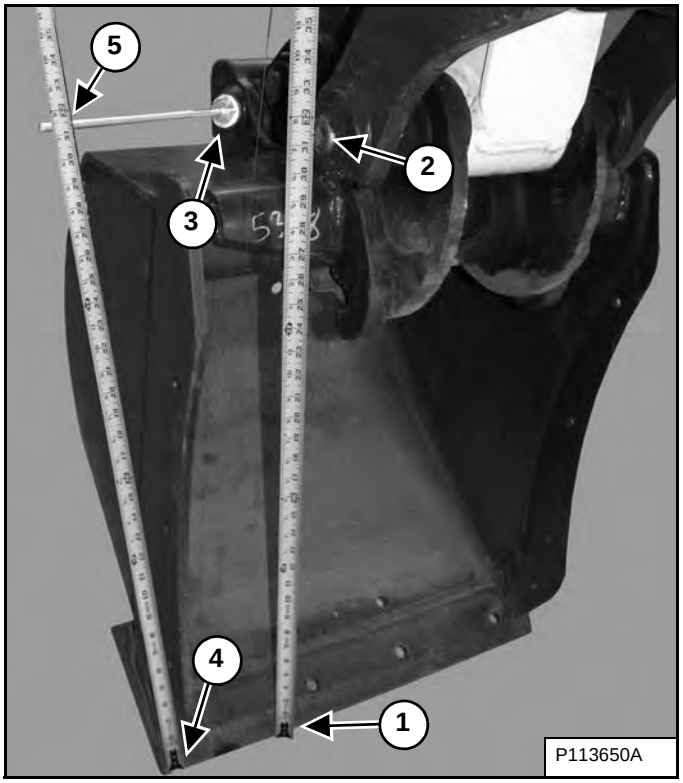
Setup / Calibration (Cont'd)

Figure 207



The inside length screen **[Figure 207]** is where the first attachment dimensions will be added from the information determined in step **[Figure 208]**.

Figure 208



This two part step will measure the distance between the bucket pin (Item 2) **[Figure 208]** or the furthest point away from the bucket pin on any attachment used with the Depth Check system. We will be using a bucket as an example, but all attachments will be similar for this setup. (*The accuracy of these dimensions affect the accuracy of the Depth Check.)*

Position the bucket vertical. Use the plumb bob to locate the furtherest vertical cutting point (Item 1) from the center of the bucket pin (Item 2) **[Figure 208]**.

Set the tip of the bucket (Item 1) on the ground ensuring that everything is still vertical. Using a tape measure, measure the distance between the cutting edge (Item 1) and the center of the bucket pin (Item 2) **[Figure 208]**.

NOTE: With usage of any attachment, the cutting surfaces wear. Example: The cutting edge (Item 1) [Figure 208] wears with the use of the bucket. The accuracy of the Depth Check system is affected by the wear of these components. If loss of accuracy is noticed, re-calibrate the attachment to reset the dimensions needed for the Depth Check system to operate correctly.

The **[INSIDE LENGTH]** screen **[Figure 207]** is where the attachment dimensions will be added from the information determined in **[Figure 208]**.

Using the key pad (Item 1 through 0) **[Figure 207]**, enter this dimension. After the measurement is entered and verified, press the **[ENTER]** button (Item C) **[Figure 207]**. As soon as the **[ENTER]** button is pressed, the **[OUTSIDE LENGTH] [Figure 209]** screen will be activated.

Setup / Calibration (Cont'd)

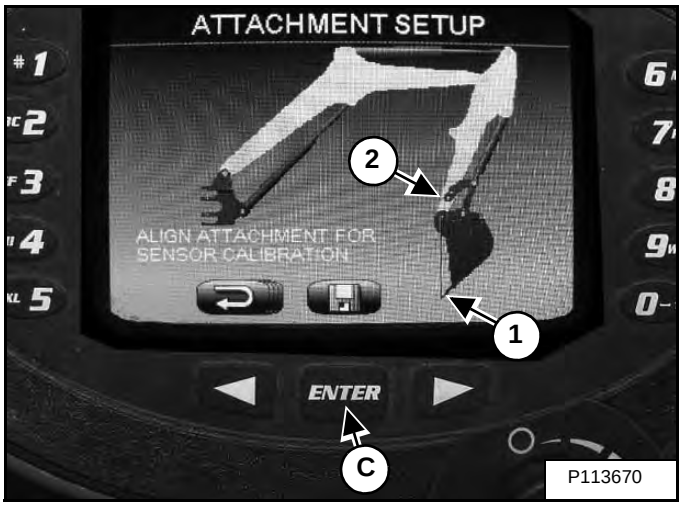
Figure 209

Install a magnetic pin on the second bucket pin (Item 3) **[Figure 208]**.

The next measurement is from the cutting edge (Item 4) to the center of the magnetic pin (Item 5) **[Figure 208]** for the outside length dimension.

Using the key pad (Item 1 through 0) **[Figure 209]** enter this dimension. After the measurement is entered and verified, press the **[ENTER]** button (Item C) **[Figure 209]**. As soon as the **[ENTER]** button is pressed, the screen will change to the **[ATTACHMENT SETUP]** screen **[Figure 210]**.

Figure 210



Make sure the bucket is still vertical to the bucket pin (Item 2) and the cutting edge (or bucket teeth) (Item 1), and press the **[ENTER]** button (Item C) **[Figure 210]** to store the calibration information.

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

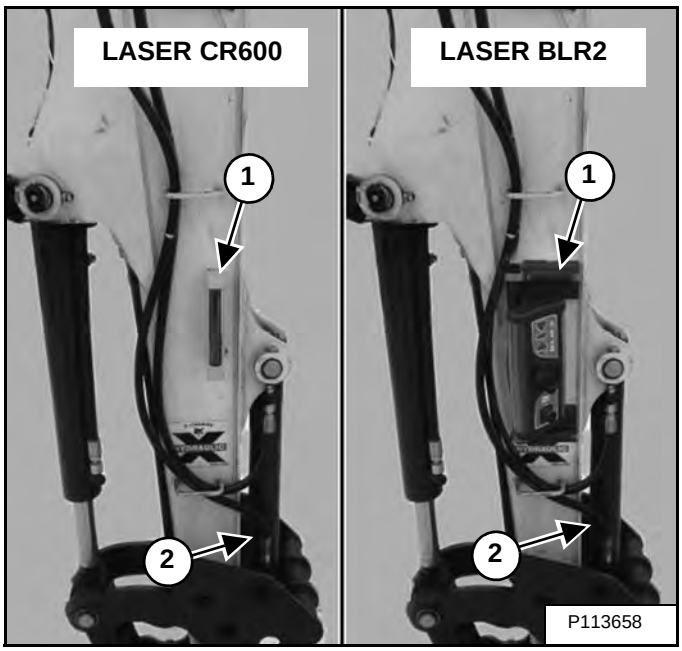
NOTE: When using an auger, it will not be as accurate as solid mounted attachments because all components are not rigidly mounted (auger bit has extra movement and rotation where the system is designed for fixed positions). When using the auger with the Depth Check system, enter zero for both attachment dimensions. When using the auger, try to keep the X-change horizontal to the ground during the dig cycle and monitor the screen depth. Using this setup should give fairly accurate Depth Check information for auger applications.

This finishes the SETUP / CALIBRATION procedure except if also installing a laser. (See If Using A Laser With Depth Check on Page 115.)

Setup / Calibration (Cont'd)

If Using A Laser With Depth Check

Figure 211



FOR model E50 with the standard arm ONLY; If using either of the laser receivers (Item 1) on machines that have the standard arm and a hydraulic clamp installed, you will need to check the length of the hydraulic clamp rod end hose (Item 2) **[Figure 211]** to make sure the existing hose does not interfere with the laser.

Measure the length of the hose (Item 2) **[Figure 211]**.

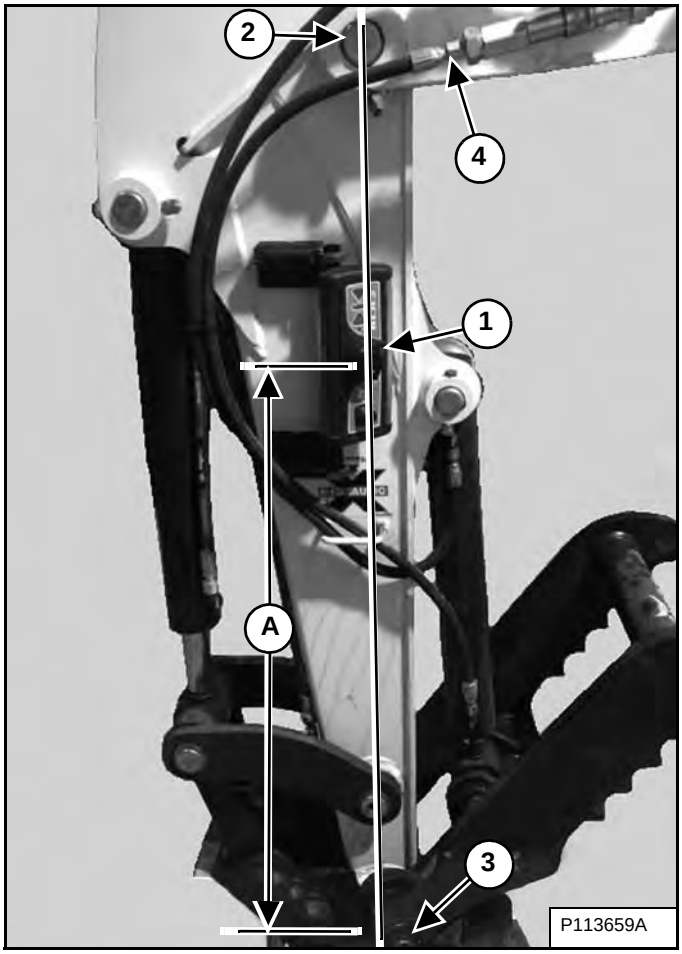
Measure the hose from the rod end of the clamp cylinder (Item 2) **[Figure 211]** to the end of the hose at the coupler (Item 4) **[Figure 212]**

The hose length must be 1245 mm (49.0 in) or a new hose (P/N 7250478) must be ordered and installed.

If the hose is incorrect, it may interfere with the laser when the hydraulic clamp is operated and possibly knock the laser receiver off of the arm. OR, the laser can be mounted on the opposite side of the arm, then the hose will not interfere with the laser.

NOTE: For excavator equipped with a clamp, (or other options or configurations added to the arm that may interfere with the laser), make sure there is no hose to laser interference. Fully curl the arm and bucket and make sure the hoses do not interfere with the laser receiver during any arm and bucket movement. Adjust the position of the laser receiver if necessary to avoid any contact with the hoses.

Figure 212



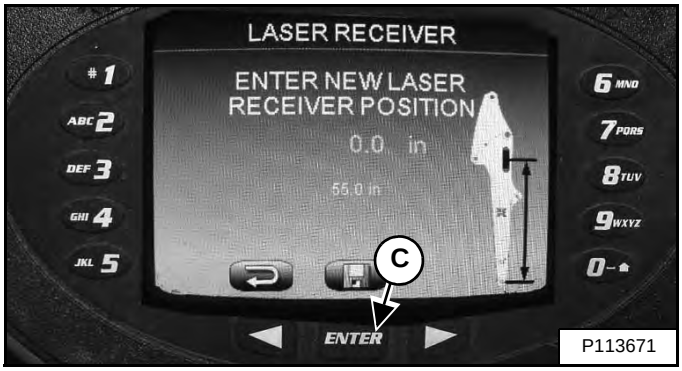
For both standard and long arm models; When installing the laser receiver (Item 1), it should be installed as close as possible in line with the arm pin (Item 2) and the bucket pivot pin (Item 3) **[Figure 212]**.

Position the laser (Item 1) approximately as shown. The dimension (Item A) will need to be added to the display screen. Measure from the center of the bucket pin (Item 3) up to the center of the laser receiver (Item 1) **[Figure 212]**

Setup / Calibration (Cont'd)

If Using A Laser With Depth Check (Cont'd)

Figure 213



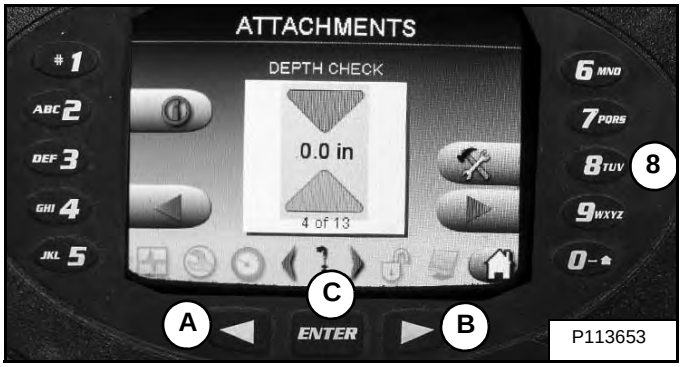
Initial Setup

The initial setup will describe adding and changing the Depth Check target settings, grade zone setting, warning zone setting, laser receiver, preferences (changing unit of measurement settings), and describe how the Depth Check system functions.

NOTE: The laser feature must be activated before you can enter the laser receiver position into the dash panel. See [Figure 227] for turning the laser ON and OFF.

Depth Check Settings

Figure 214



Using the left / right arrow buttons (Item A and B), toggle to the Attachment Depth Check screen **[Figure 214]**.

Press the tool button (Item 8) or the **[ENTER]** button (Item C) **[Figure 214]** to go to the **[DEPTH CHECK]** screen **[Figure 215]** and **[Figure 216]**.

Figure 215

The **[DEPTH CHECK]** screen **[Figure 215]** shows the following information. Press the numbered key pad to access each screen for setting the system:

(1) Re-bench: Used for setting the attachment start point to zero. (Example: Use surveyors elevation pin for the known depth to set zero.)

(2) Setup: Opens screen for selecting the following screens; Set Target Depth, Select Attachment, Setup and Calibration, and Preferences.

(3) Alarm: Sets the depth alarm to ON or OFF.

(4) Change Screens: Toggles through various depth screens; Depth Check, distance to target or grade check.

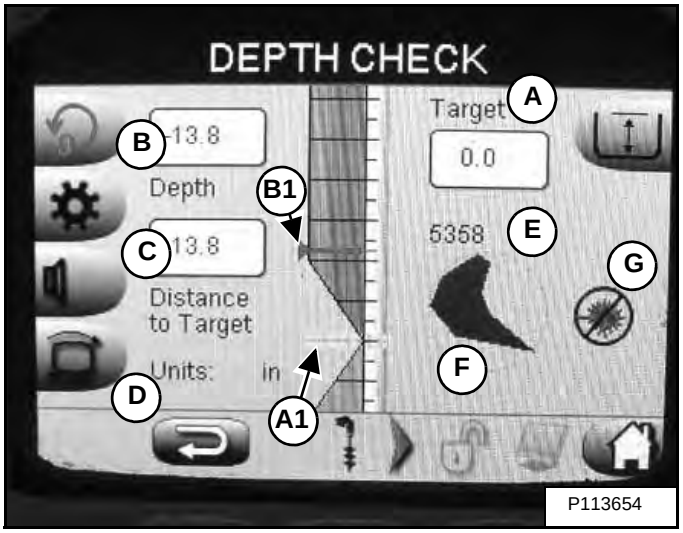
(6) Target Depth: Shows the depths for up to five pre-set depth settings.

(0) Home Screen: Press 0 to go back to the home screen on the display panel.

Initial Setup (Cont'd)

Depth Check Settings (Cont'd)

Figure 216



The **[DEPTH CHECK]** screen **[Figure 216]** shows the following information:

(A) Target (Dimension): The target is the depth to dig from an established starting point set by the operator. (Example: Desired dig depth from a surveyors elevation pin.)

(A1) Target (Bar Graph): The bar graph line shows where the target is at in relationship to the attachment position (Item B1).

(B) Depth (Dimension): This is the current depth of the attachment cutting edge.

(B1) Depth (Bar Graph): The bar graph line moves up and down and shows the position of attachment to the target (Item A1). (When the attachment gets close to the selected target depth, an audible alarm will start beeping. The closer the attachment gets to the target, the faster the beeps. When the alarm is continuous, you have reached the target depth. The alarm can be set ON or OFF by pressing the key pad number 3 **[Figure 215]**).

(C) Distance To Target (Dimension): The distance the attachment needs to travel to reach the selected target depth.

(D) Units: Shows the current selected unit of measure. (The units of measure can be set to meters, millimeters, feet or inches.)

(E) Name of attachment selected: Shows the name or the number of the selected attachment. (The attachment must be selected so that the Depth Check system knows what attachment is currently used for proper depth calculations.)

(F) Attachment: The screen uses a bucket to represent the attachment. The bucket will rotate to represent the position of the bucket (attachment) as the attachment is curled out or curled in. When the attachment is calibrated, it sets the position of bucket icon (F).

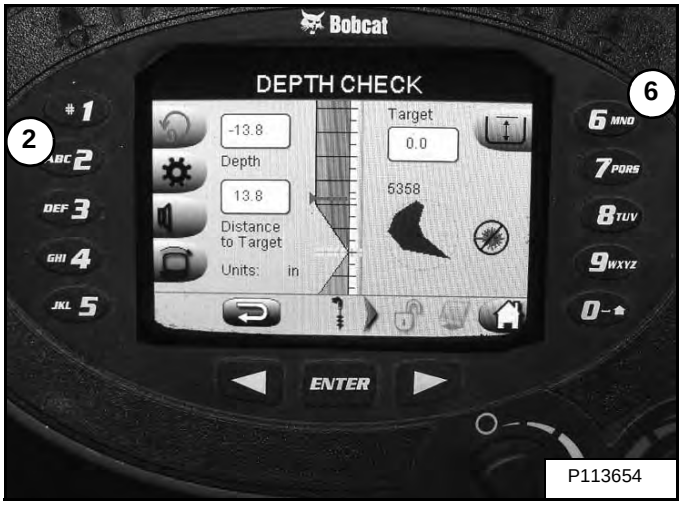
(G) Laser: The laser icon (Item G) will show if the laser is set to ON or OFF. (The laser as shown in **[Figure 216]** with the circle with the line through it represents the OFF position.)

DEPTH CHECK (CONT'D)

Initial Setup (Cont'd)

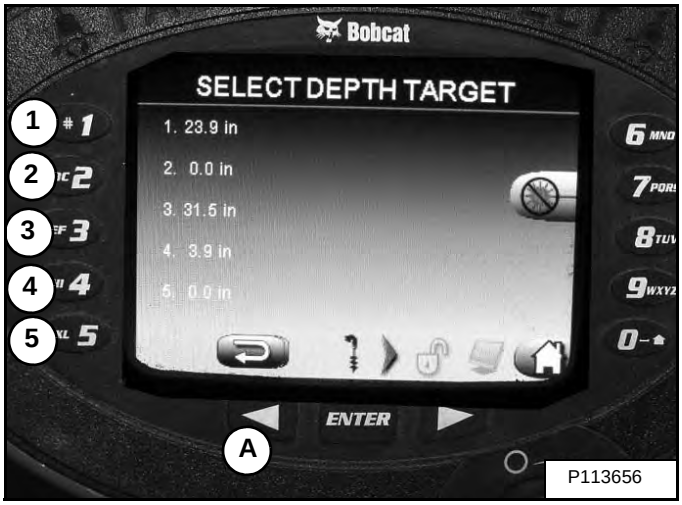
Depth Check Settings (Cont'd)

Figure 217



Press button (Item 6) **[Figure 217]** to go to the **[SELECT DEPTH TARGET]** screen **[Figure 218]**.

Figure 218



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

Select (Item 1 through Item 5) **[Figure 218]** to select one of the existing depths.

Or, if a different depth is needed, press the return button (Item A) **[Figure 218]** to go back one screen, then press button (Item 2) **[Figure 217]** to go to the **[DEPTH CHECK SETTINGS]** screen **[Figure 219]**.

Figure 219

Press (Item 1) **[Figure 219]** to Set Depth Targets.

Figure 220

Press (Item 1) **[Figure 220]** to select Depth Target.

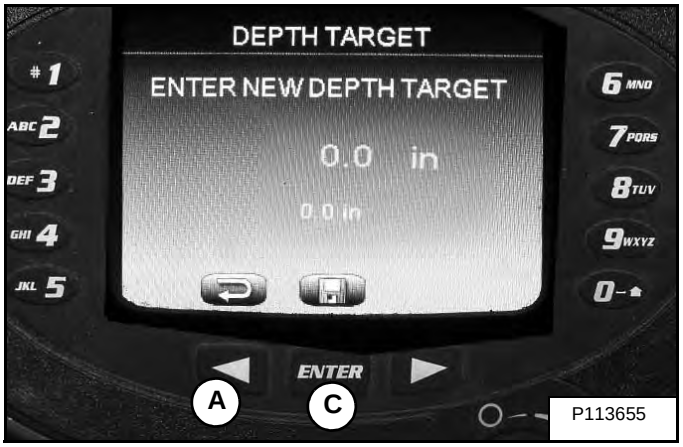
Figure 221

Select (Item 1 through 5) **[Figure 221]** to select one of the five possible stored depth settings.

Initial Setup (Cont'd)

Depth Check Settings (Cont'd)

Figure 222



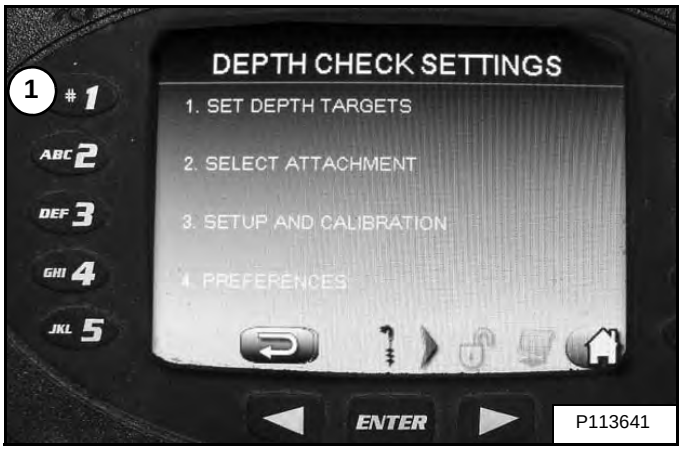
Use the key pads (Item 1 through 0) and enter the new target dimension. If the dimension entered is incorrect, press the arrow button (Item A) **[Figure 222]** to backspace the dimension.

Press the **[ENTER]** button (Item C) **[Figure 222]** to save the depth dimension. (Dimensions shown in inches but can be set to feet, meters or millimeters. See **[Figure 234]**.)

Grade Zone

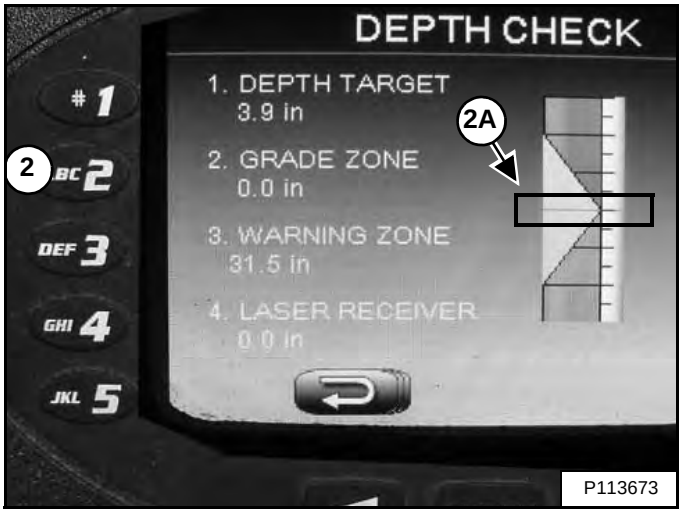
The Grade Zone sets the distance up or down from the target depth for when the warning alarm will start to be a continuous alarm. This will also increase the YELLOW highlighted area on the screen where the target zone is shown.

Figure 223



Press **[1. SET DEPTH TARGETS]** (Item 1) **[Figure 223]** to change to the next screen **[Figure 224]**.

Figure 224



Press Grade Zone (Item 2) **[Figure 224]**.

Grade zone area (Item 2A) **[Figure 224]** (in yellow on the display screen) is the area that will change with the dimensions as set in **[Figure 225]**.

Figure 225

Use the key pads (Item 1 through 0) and enter the new grade zone dimension. If the dimension entered is incorrect, press the arrow button (Item A) **[Figure 225]** to backspace the dimension.

Press the **[ENTER]** button (Item C) **[Figure 225]** to save the grade zone dimension. (Dimensions shown in inches but can be set to feet, meters or millimeters. See **[Figure 234]**.)

Initial Setup (Cont'd)

Warning Zone

The Warning Zone sets the upper distance from the target depth when the warning alarm will start to beep. (The alarm will start beeping when getting close to the selected target depth. The closer to the target, the faster beeps until you reach the target depth, then it will be a continuous sound. If the bucket goes below the selected target depth, the beeps will be very fast until the bucket is raised above the target depth.)

Figure 226

Press **[1. SET DEPTH TARGETS]** (Item 1) **[Figure 226]** to change to the next screen **[Figure 227]**.

Figure 227

Press **[3. WARNING ZONE]** (Item 3) **[Figure 227]**.

Press (Item 6) **[Figure 227]** to turn the laser ON or OFF.

Figure 228

Use the key pads (Item 1 through 0) and enter the new warning zone dimension. If the dimension entered is incorrect, press the arrow button (Item A) **[Figure 228]** to backspace the dimension.

Press the **[ENTER]** button (Item C) **[Figure 228]** to save the warning zone dimension. (Dimensions shown in inches but can be set to feet, meters or millimeters. See **[Figure 234]**.)

DEPTH CHECK (CONT'D)

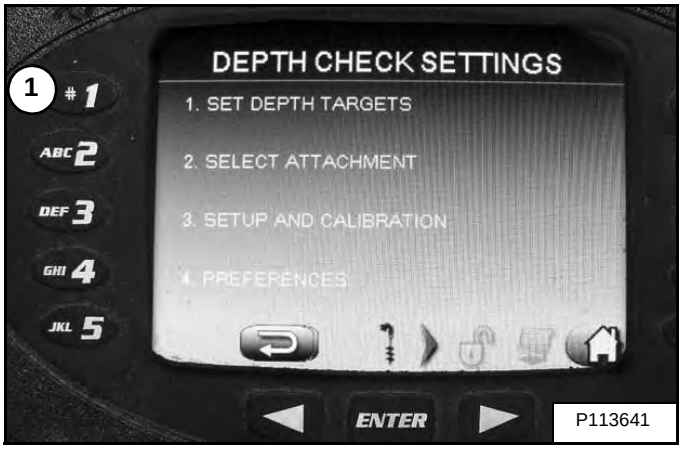
Initial Setup (Cont'd)

Laser Receiver Position On Arm

The Depth Check system needs to know the location of laser receiver mounted on the arm. This dimension is used along with the target depth to set the Depth Check position.

Activate the laser on the dash panel by pressing button (Item 6) **[Figure 230]**. Press once, laser ON. Press a second time, laser OFF.

Figure 229

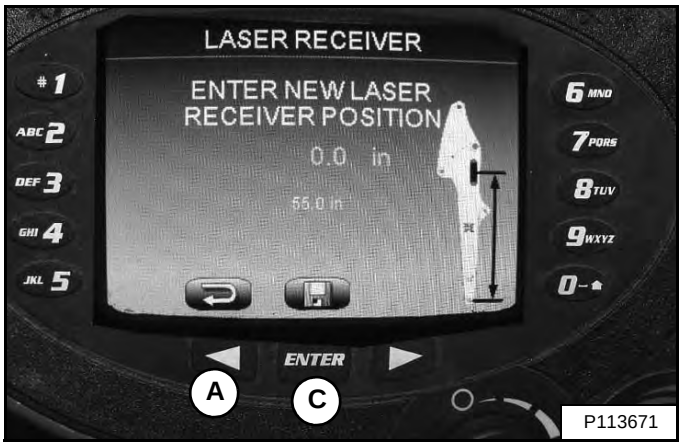


Press **[1. SET DEPTH TARGETS]** (Item 1) **[Figure 229]** to change to the next screen **[Figure 230]**.

Figure 230

Press **[4. LASER RECEIVER]** (Item 4) **[Figure 230]**.

Figure 231

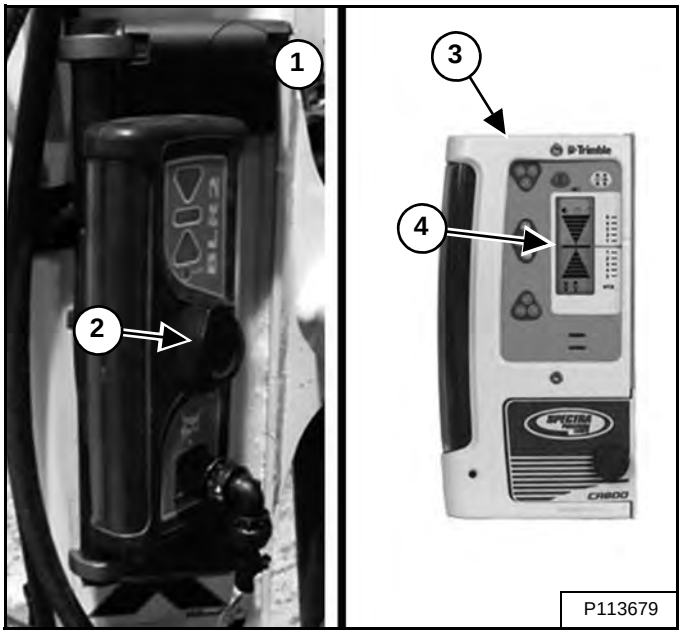


Use the key pads (Item 1 through 0) and enter the new laser receive position on the arm dimension. If the dimension entered is incorrect, press the arrow button (Item A) **[Figure 231]** to backspace the dimension. See **[Figure 213]** for additional information of the laser receiver.

Press the **[ENTER]** button (Item C) **[Figure 231]** to save the warning zone dimension. (Dimensions shown in inches but can be set to feet, meters or millimeters. See **[Figure 234]**.)

Measuring The Laser Location

Figure 232



For the model BLR2 (Item 1), measure to the center of the knob (Item 2) **[Figure 232]**.

For the model CR600 (Item 3), measure to the center of the red line (Item 4) **[Figure 232]**.

DEPTH CHECK (CONT'D)

Initial Setup (Cont'd)

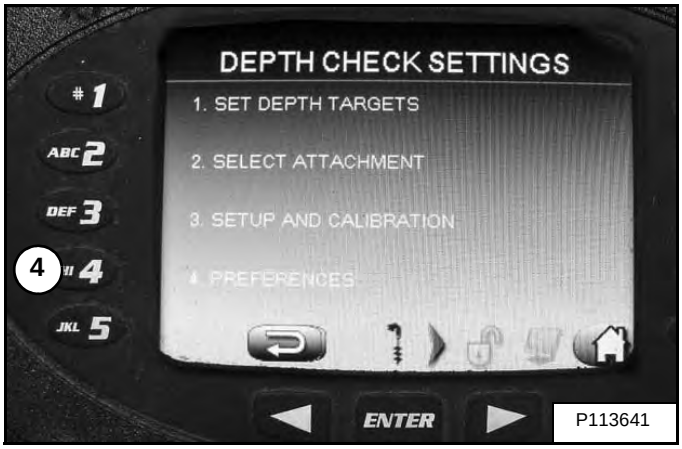
Preferences

The Preferences screen is used to set two features;

1. To set the screen preference for; Distance to Target, Depth Check or Grade Check.

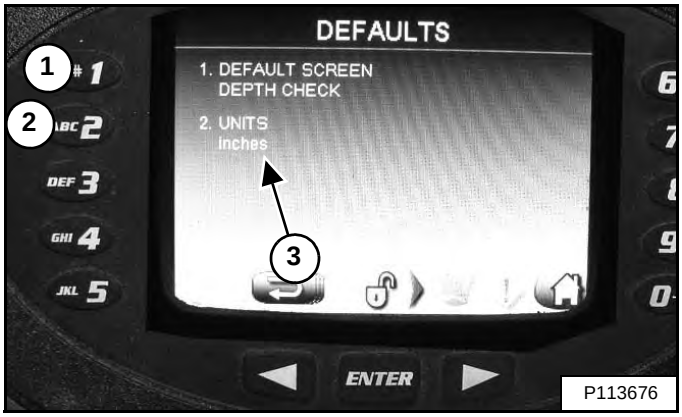
2. To set units of measure (screen can be set to display; millimeters, meters, feet or inches).

Figure 233



Press **[4. PREFERENCES]** (Item 4) **[Figure 233]** to change to the Defaults screen **[Figure 234]**.

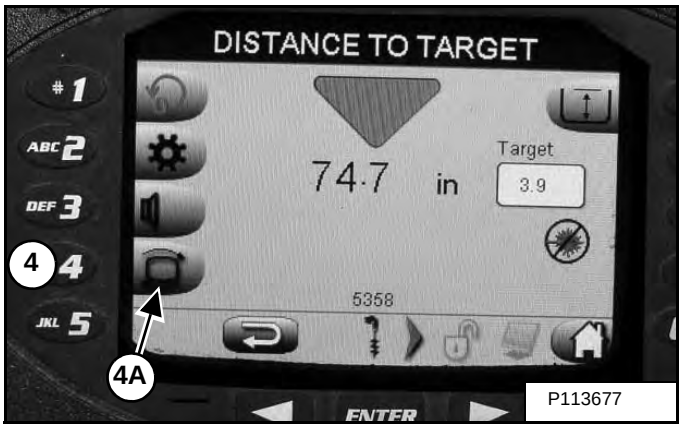
Figure 234



Press **[DEFAULT SCREEN]** button (Item 1) **[Figure 234]** to toggle the Preference screen between the following screens; Distance to Target **[Figure 235]**, Depth Check **[Figure 236]** or Grade Check **[Figure 237]**.

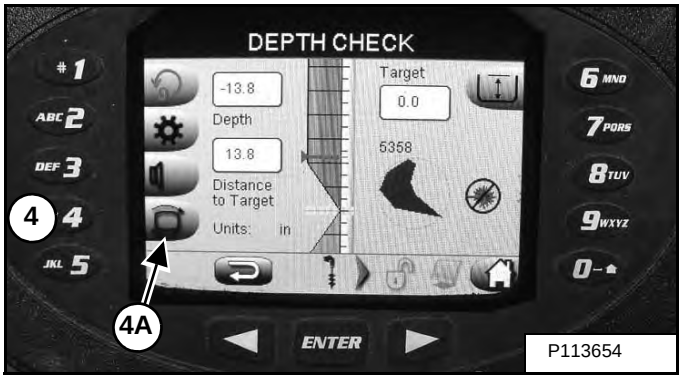
Press the **[UNITS]** button (Item 2) to toggle between meters, millimeters, feet or inches. This sets how you will record and enter ALL dimensions into the Depth Check system. The selected units will be displayed under the word **[UNITS]** (Item 3) **[Figure 234]** and will be visible on all Depth Check screens that show dimensions.

Figure 235



Distance to Target **[Figure 235]** screen.

Figure 236

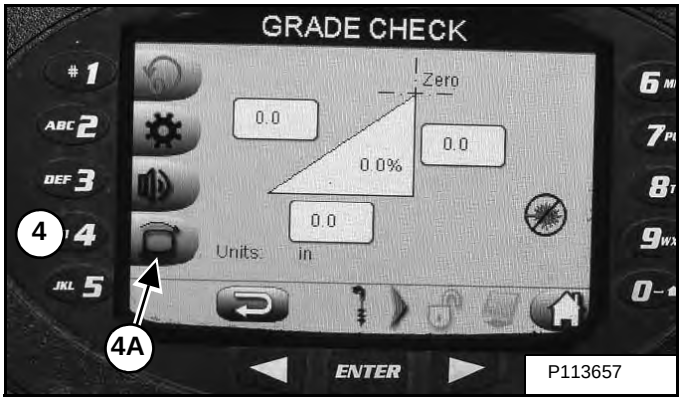


Depth Check **[Figure 236]** screen.

Initial Setup (Cont'd)

Preferences (Cont'd)

Figure 237



Grade Check **[Figure 237]** screen.

NOTE: You can also press button (Item 4) [Figure 235], [Figure 236] or [Figure 237] to toggle between these three screens any time that the icon (Item 4A) is visible on any Depth Check screen.

Operation

The following will give some basic operation information for:

WARNING

AVOID INJURY OR DEATH

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

W-2116-0903

IMPORTANT

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

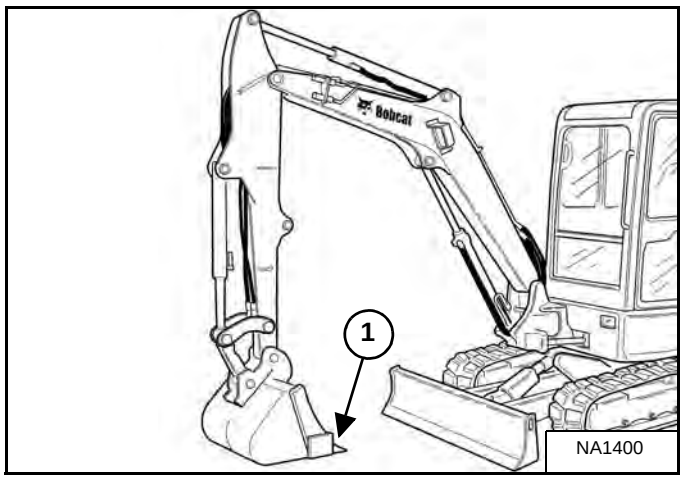
I-2383-1214

DEPTH CHECK (CONT'D)

Operation (Cont'd)

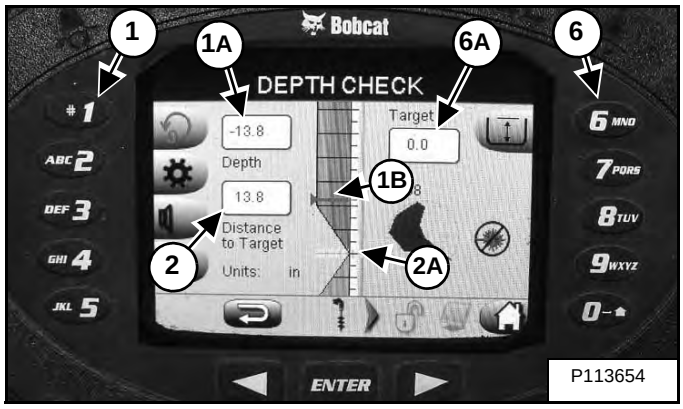
Digging A Hole To A Predetermined Depth (Re-benching Without A Laser Reference)

Figure 238



The first step is to set the position of the bucket (Item 1) **[Figure 238]** at the ground surface you are going to start the dig or on the surveyor mark to establish the starting ground position. Lower the bucket until it is on the ground or on the surveyor mark. This is called re-benching.

Figure 239



To set the cutting edge position (re-benching) to zero, access the Depth Check screen, and press the re-benching button (Item 1). After the button is pressed, the dimensions on the screen for depth (Item 1A) will be set to 0.0. (As the bucket is raised or lowered, the screen at (Item 1A) **[Figure 239]** will show the bucket position dimension moving.)

Press button (Item 6) **[Figure 239]** to change to the **[SELECT DEPTH TARGET]** screen **[Figure 240]**.

Figure 240

Select the target depth by pressing button (Item 1 through Item 5) **[Figure 240]** for selecting an existing depth. (To add a new target depth or to change an existing target depth, see information shown with steps **[Figure 217]** through **[Figure 222]**.)

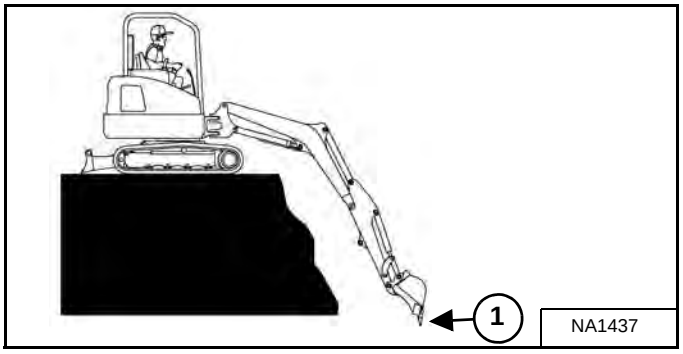
The selected target depth will now appear on the screen at (Item 6A) **[Figure 239]**.

NOTE: If the excavator is at an angle (side slope) when re-benching, the system will only be accurate on the same plane (location) that it was re-benched at.

Operation (Cont'd)

Digging A Hole To A Predetermined Depth (Re-benching Without A Laser Reference) (Cont'd)

Figure 241



As the hole is being dug, the position of the bucket (Item 1) **[Figure 241]** is dimensionally shown (Item 1A) **[Figure 239]** and shown on the bar graph at (Item 1B) **[Figure 239]**. The distance to target depth is dimensionally shown in (Item 2) **[Figure 239]** and shown on the bar graph (Item 2A) **[Figure 239]**.

When the bucket is getting close to the target depth, a warning buzzer (if activated) will start to slowly beep. The beeps will increase in frequency the closer the bucket gets to the target depth. When the target depth is reached, the buzzer will sound continuously.

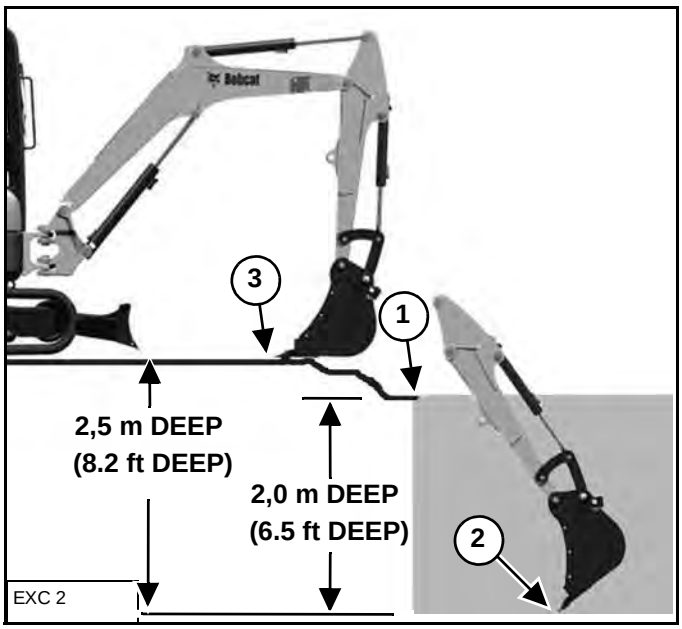
EXAMPLE: The target depth is 2 meters (6.5 ft) (Item 6A) and the position of the bucket (Item 1A) is at 1.5 meter (4.9 ft), the distance to target (Item 2) **[Figure 239]** will be 0.5 m (1.6 ft). [2 m - 1.5 m = 0.5 m (6.5 ft - 4.9 ft = 1.6 ft).]

NOTE:

The distance from the target depth to when the when the alarm starts to beep can be set using the *Warning Zone* information. (See Warning Zone on Page 120.).

To reposition the excavator to continue digging the hole at the original depth;

Figure 242



If possible, reposition the excavator so the bucket can be re-benched off of the original starting point (Item 1) **[Figure 242]**.

Or, If that is not possible, position the excavator so the bucket will reach to the bottom of the hole (Item 2) **[Figure 242]** at an area that is know to be the correct depth. (When re-benched at the bottom of the trench, set the target depth to zero to continue digging at the original depth.)

Or, With the bucket on the ground next to the excavator (Item 3) **[Figure 242]**, re-bench the bucket to zero. Now reach into the existing hole until the bucket is touching the bottom of the hole (Item 2) **[Figure 242]** in an area you know is the correct depth. Example: The dimension shown in (Item 1A) **[Figure 239]** is now 2.5 m (8.2 ft). You now need to reset the target depth to 2.5 m (8.2 ft) to continue digging the hole at the original target depth.

Or, If you want to just continue digging with the hole parallel to the ground, no re-benching is necessary but the hole will not be horizontal, it will be at the same plane as the ground surface the machine is on.

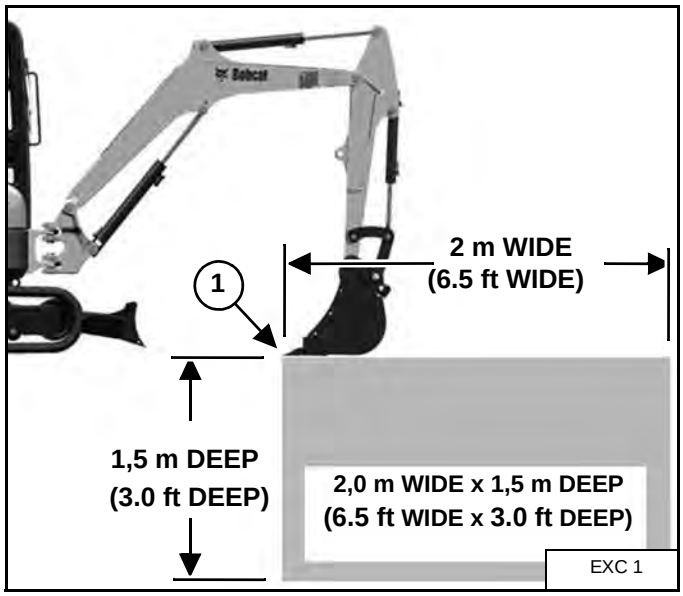
DEPTH CHECK (CONT'D)

Operation (Cont'd)

Digging A Hole To A Predetermined Width And Depth (Re-benching Without A Laser)

EXAMPLE: Digging a 2.0 meter wide x 1.5 meter deep (6.5 ft wide x 3 ft deep) hole.

Figure 243

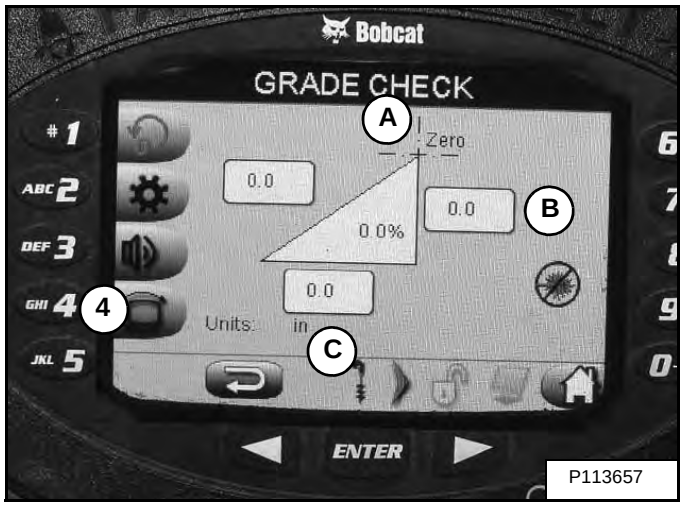


Follow the same procedure as for digging a hole except as follows. (See Digging A Hole To A Predetermined Depth (Re-benching Without A Laser Reference) on Page 124.)

When re-benching the bucket for setting to 0.0., position the bucket (Item 1) **[Figure 243]** at the starting point of the side of the hole that the excavator is positioned on.

This will allow the Depth Check to know the starting position of the hole for the depth and width of the hole.

Figure 244



Press (Item 4) **[Figure 244]** to scroll to the **[GRADE CHECK]** screen on the display panel. For additional information. (See Preferences on Page 122.)

The **[ZERO]** (Item A) is the re-benching starting point. (Item B) shows the target depth. (Item C) **[Figure 244]** shows the reach (distance away from the zero mark starting point (Item 1) **[Figure 243]**.

NOTE: The warning buzzer (if activated) will start to beep when getting close to the target depth and progressively beeps faster until the target depth is reach and then the buzzer will sound continuously. The buzzer only activates on the depth, not for the reach (width of hole). That will need to be monitored visually using (Item C) [Figure 244].

WARNING

AVOID INJURY OR DEATH

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

W-2116-0903

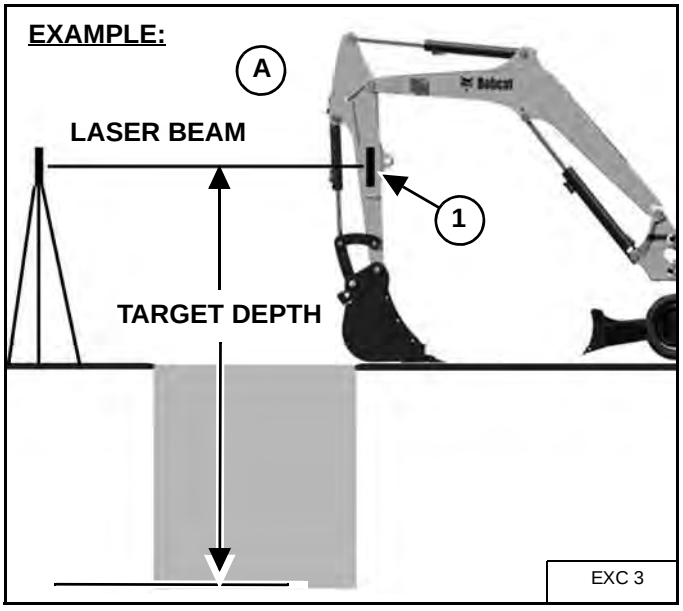
DEPTH CHECK (CONT'D)

Operation (Cont'd)

Digging A Hole Using A Laser

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

Figure 245

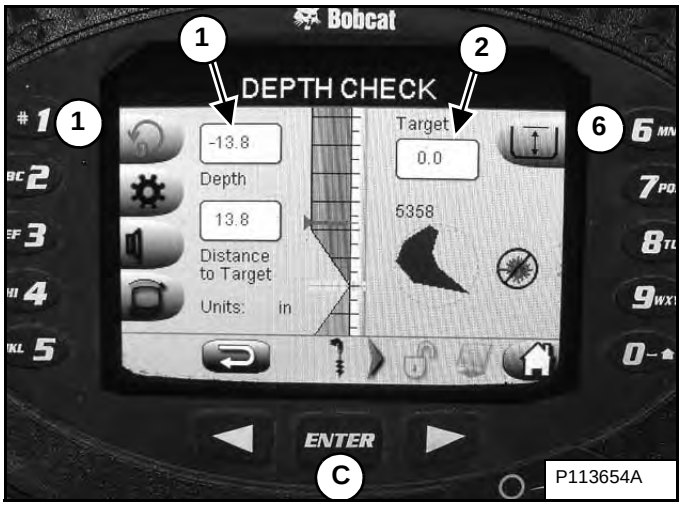


NOTE: Make sure the laser receiver dimensional location on the arm has been added into the Depth Check. For additional information. (See Laser Receiver Position On Arm on Page 121.)

With the arm vertical, raise or lower the boom and arm as needed until the laser (Item 1) strikes the receiver (Item 2) **[Figure 245]**. (If needed, curl the bucket fully for increased bucket ground clearance or a hole may need to be dug so that the bucket can be lowered to allow the laser to strike the receiver with the arm vertical.)

NOTE: If the arm is not vertical and you try to re-bench, a screen will tell you to make the arm vertical before it will allow the re-bench.

Figure 246



With the laser striking the receiver, press (Item 1) **[Figure 246]** to set the laser position.

Press (Item 6) to access the pre-set Target Depth screen or go to figure **[Figure 218]** to add or change the target depth. When the correct target depth is entered, press the **[ENTER]** button (Item C) **[Figure 246]** to save the setting.

With the Depth Check system set-up, the excavator can now be repositioned anywhere in the laser range and the dig depth will stay consistent to the set target depth.

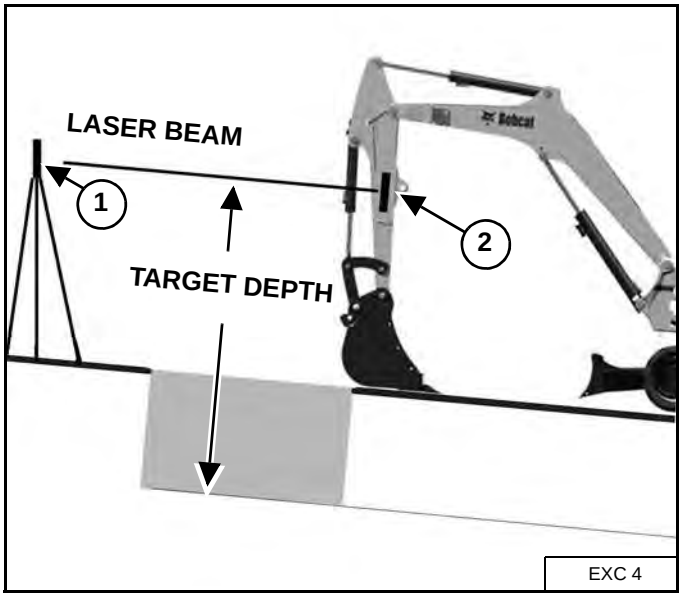
Operation (Cont'd)

Digging A Trench With Slope Using A Laser (Re-benching Using A Laser Reference)

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

NOTE: Digging a slope with a laser requires a laser that has slope capability. The laser must be positioned square with the desired direction of the slope.

Figure 247

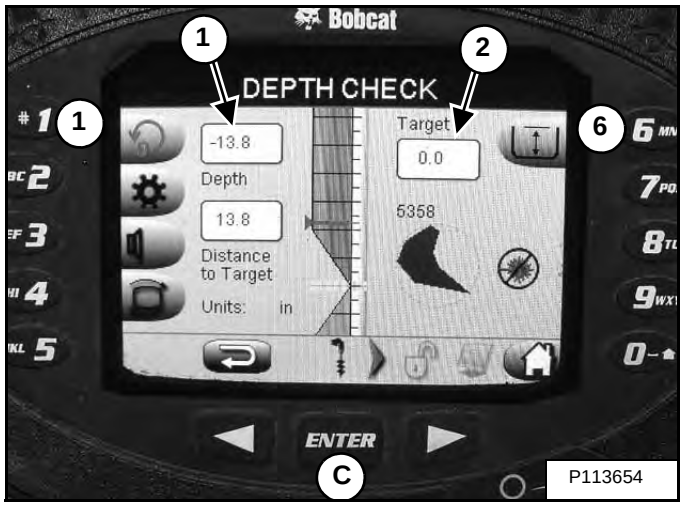


NOTE: Make sure the laser receiver dimensional location on the arm has been added into the Depth Check. For additional information. (See Laser Receiver Position On Arm on Page 121.)

With the arm vertical, raise or lower the boom and arm as needed until the laser (Item 1) strikes the receiver (Item 2) **[Figure 247]**. (If needed, curl the bucket fully for increased bucket ground clearance or a hole may need to be dug so that the bucket can be lowered to allow the laser to strike the receiver with the arm vertical.)

NOTE: If the arm is not vertical and you try to re-bench, a screen will tell you to make the arm vertical before it will allow the re-bench.

Figure 248



With the laser striking the receiver, press (Item 1) **[Figure 248]** to set the laser position.

Press (Item 6) to access the pre-set target depth screen or go to figure **[Figure 218]** to add or change the target depth. When the correct target depth is entered, press the enter button (Item C) **[Figure 248]** to save the setting.

With the Depth Check system set-up, the excavator can now be repositioned anywhere in the laser range and the dig depth will stay consistent to the set target depth and to the slope set with the laser.

TOWING THE EXCAVATOR

Procedure

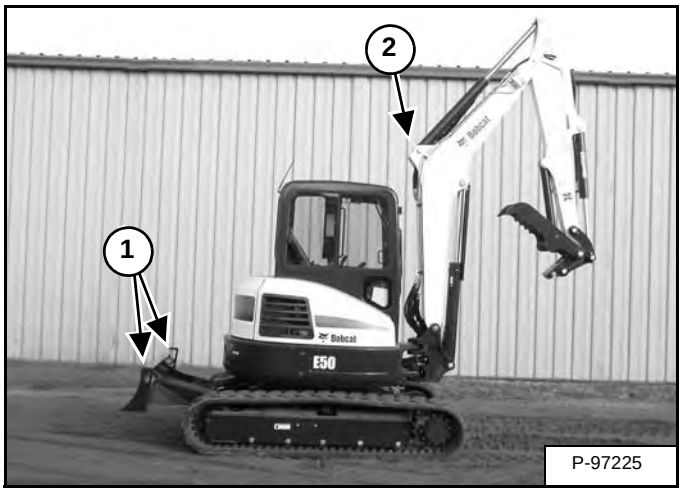
There is not a recommended towing procedure for the excavators.

- 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 236.)

LIFTING THE EXCAVATOR

Procedure

Figure 249



Fully extend the cylinders of the bucket, arm, and boom so that the excavator is in the position as shown **[Figure 249]**.

Raise the blade all the way.

Put all the control levers in NEUTRAL.

NOTE: For machines equipped with the angle blade feature, make sure the blade is in the straight position prior to lifting.

⚠ WARNING

AVOID INJURY OR DEATH

- **Use chains and lifting equipment 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.**
- **Never lift with the blade angled (if equipped).**

W-2580-0607

Figure 250

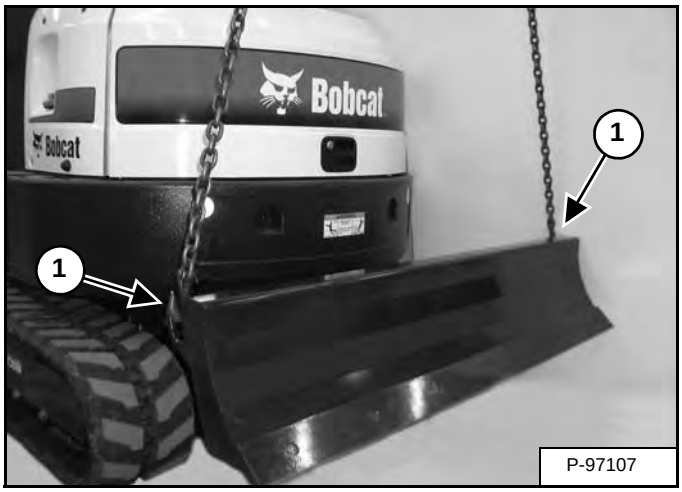
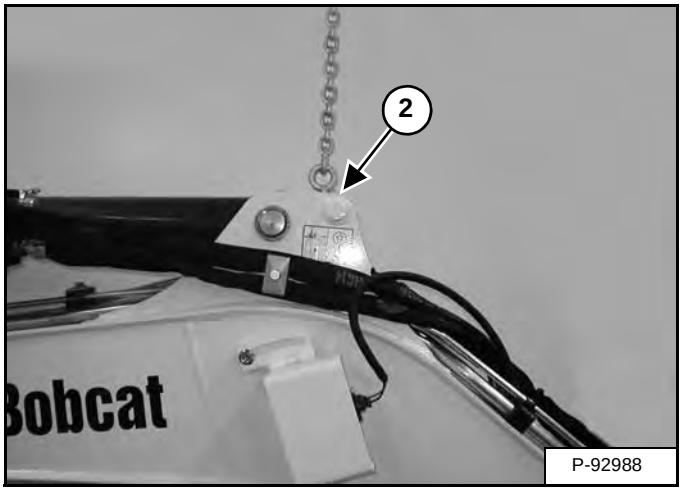


Figure 251



Fasten chains to the ends of the blade (Item 1) **[Figure 249]** and **[Figure 250]** and up to a lifting fixture above the canopy / cab. The lifting fixture must extend over the sides of the canopy / cab to prevent the chains from hitting the ROPS / TOPS.

Fasten a chain (Item 2) **[Figure 249]** and **[Figure 251]** from the rod to the lift fixture.

TRANSPORTING THE EXCAVATOR ON A TRAILER

Loading And Unloading

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 parking 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 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 the machine to prevent the front of the transport vehicle from raising.

Determine the direction of the track movement before moving the machine (blade forward).

Disengage the auto idle feature and move the two-speed travel to the low range position.

Figure 252

Move the machine forward onto the transport vehicle **[Figure 252]**.

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 (if equipped).

Put blocks at the front and rear of the tracks.

Fastening

Figure 253

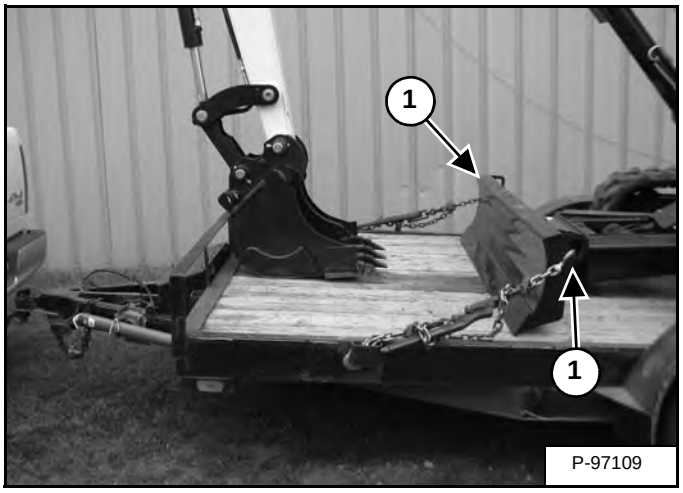
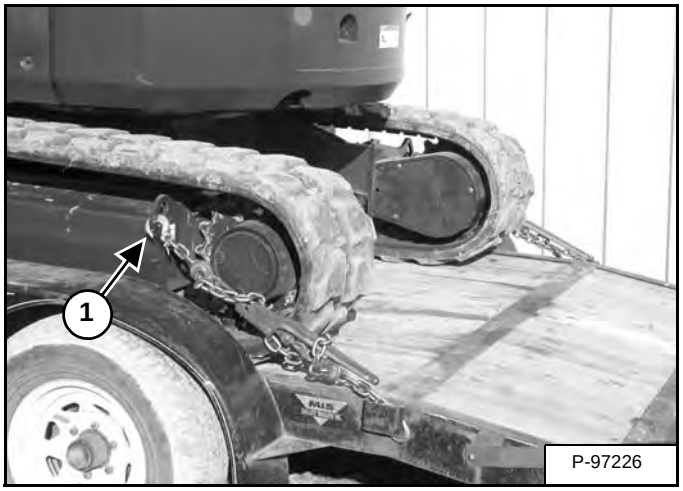


Figure 254



Fasten chains to the front corners of the blade (Item 1) **[Figure 253]** and to the tie down loop at both sides of the track frame (Item 1) **[Figure 254]** to prevent it from moving when going up or down slopes or during sudden stops.

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

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

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

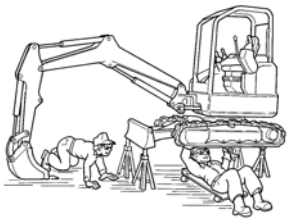
Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

CORRECT

P-90216

Never service the Bobcat Compact Excavator without instructions.

CORRECT



NA1428

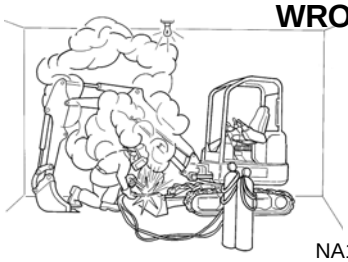
Use the correct procedure to lift and support the excavator.

CORRECT

NA1425

Cleaning and maintenance are required daily.

WRONG



NA1427

Have good ventilation when welding or grinding painted parts.

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

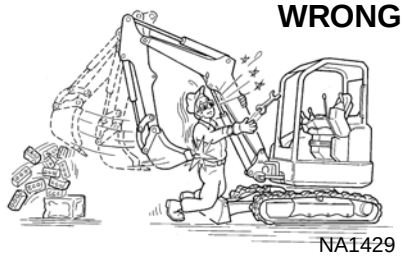
WRONG

NA1426

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

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

WRONG

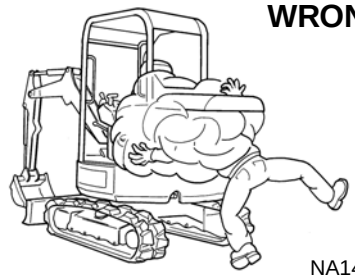


NA1429

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



NA1430

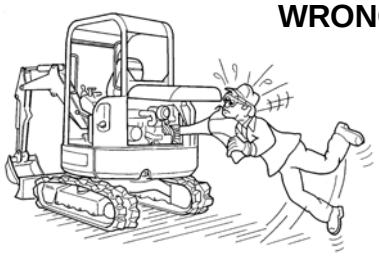
Stop, cool and clean engine of flammable materials before checking fluids.

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



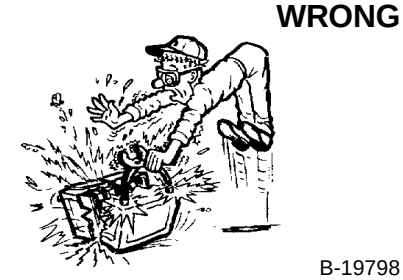
NA1431

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 & Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedures which are **not** in the Operation & Maintenance Manual must be performed **ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL. Always use genuine Bobcat replacement parts.** The Service Safety Training Course is available from your Bobcat dealer.

MSW38-0409

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 152.)
- **Engine Air Filters and Air System** - Check display panel. Service only when required. Check for leaks and damaged components. (See Page 146.)
- **Engine Cooling System** - Check coolant level COLD and add premixed coolant as needed. (See Page 155.)
- **Hydraulic Fluid** - Check fluid level and add as needed. (See Page 163.)
- **Fuel Filter** - Drain water and sediment from filter. (See Page 150.)
- **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.
- **Motion Alarm** - Check for proper function. (See Page 140.)
- **Operator Canopy / Cab** - Check the canopy / cab condition and mounting hardware.
- **Operator Cab and HVAC Filters** - Clean filters as needed. (See Page 144.)
- **Indicators and Lights** - Check for correct operation of all indicators and lights.
- **Safety Signs** - Check for damaged signs (decals). Replace any signs that are damaged. (See Page 16.)
- **Track Tension** - Check tension and adjust as needed. (See Page 168.)
- **Pivot Points** - Grease all machinery pivot points. Grease clamp and angle blade (if equipped). (See Page 178.)
- **X-Change / Attachment Coupler** - Check for damage or loose parts (if equipped). (See Page 175.)

First 50 Hours

- **Engine Oil and Filter** - Replace oil and filter. (See Page 152.)
- **Drive Belts (Alternator) (Air Conditioning - If Equipped)** - Check condition. Replace as needed. (See Page 172.)
- **Alternator and Starter** - Check connections.
- **Fuel Filter** – Replace filter element. (See Page 150.)
- **Travel Motors (Final Drive)** - Replace fluid. (See Page 171.)
- **Hydraulic Filter, and Case Drain Filter** - Replace the hydraulic filter and case drain filter. (See Page 166.)

Every 50 Hours

- **Swing Bearing** - Grease swing bearing and swing pinion. Service every 10 hours when operating in water. (See Page 178.)
- **Battery** - Check cables, and connections. (See Page 162.)
- **Fuel Tank** - Drain water and sediment from fuel tank and fuel filter. (See Page 150.)

SS EXC E32 - E55 iT4 T4-K-0418

Maintenance Intervals (Cont'd)

Every 100 Hours

- **Spark Arrestor Muffler** (If Equipped) - Clean spark chamber. (See Page 167.)

Every 250 Hours Or Every 12 Months

- **Travel Motors (Final Drive)** - Check fluid level and add as needed. (See Page 171.)

Every 500 Hours Or Every 12 Months

- **Engine Oil and Filter** - Replace oil and filter. (See Page 152.)
- **Cooling System** - Clean debris from radiator, fuel cooler, hydraulic fluid cooler, air conditioning condenser (if equipped). (See Page 155.)
- **Hydraulic Filter, Case Drain Filter and Hydraulic Reservoir Breather Cap** - Replace the hydraulic filter, case drain filter and the reservoir breather cap. (See Page 166.)
- **Drive Belts (Alternator) (Air Conditioning - If Equipped)** - Check condition. Replace as needed. (See Page 172.)
- **Alternator and Starter** - Check connections. (See Page 172.)
- **HVAC** - Clean housing and coils. (See Page 154.)

Every 1000 Hours Or Every 12 Months

- **Swing Cylinder Base End** - Grease swing cylinder base end grease fitting. (See Page 178.)
- **Hydraulic Fluid and Filters** - Replace hydraulic fluid and filters. (See Page 166.)
- **Travel Motors (Final Drive)** - Replace fluid. (See Page 171.)
- **Engine Valves** - Adjust the engine valve clearance.

Every 24 Months

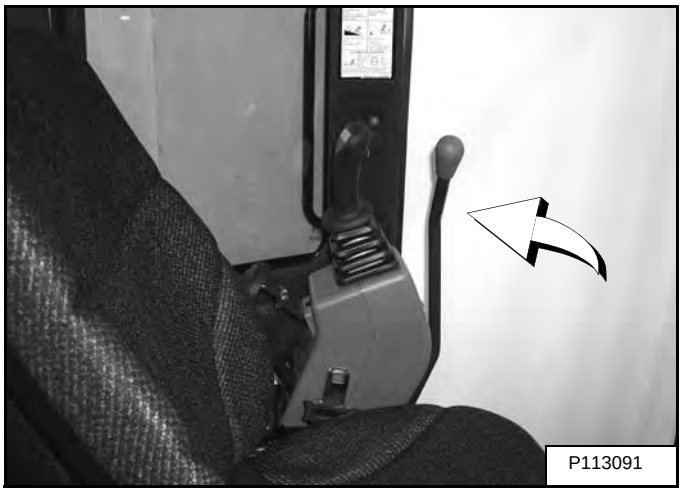
- **Coolant** - Replace the coolant. (See Page 166.)

SS EXC E32 - E55 iT4 T4-K-0418

CONTROL CONSOLE LOCKOUTS

Inspection And Maintenance

Figure 255



When the left console is raised **[Figure 255]**, the hydraulic control levers (joysticks) and traction system must not function.

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

Raise the left console **[Figure 255]**.

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

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

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

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 256]**.

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.

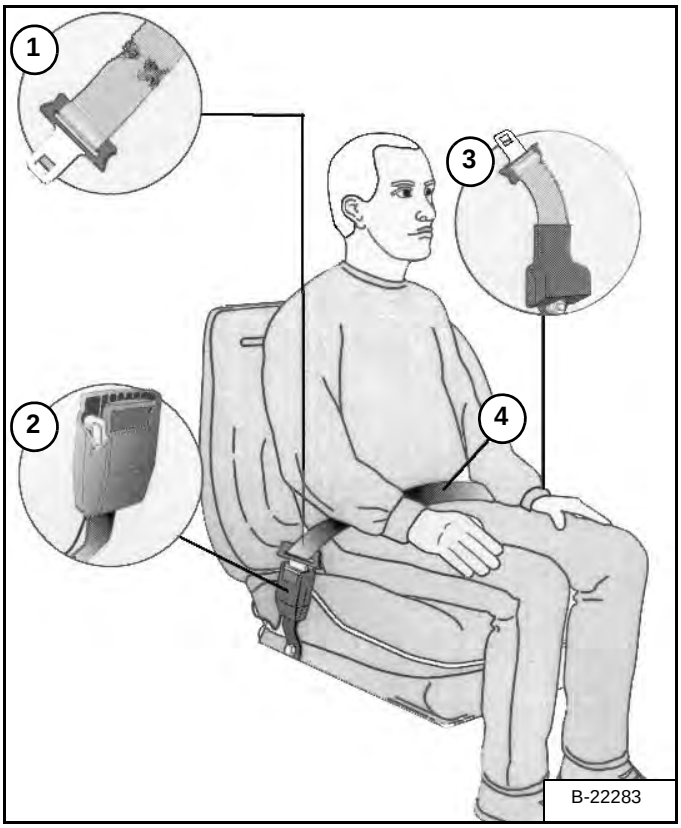
2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn, deformed or buckle is not damaged or casing broken.

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 256



MOTION ALARM SYSTEM

Description

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

Inspecting

Figure 257

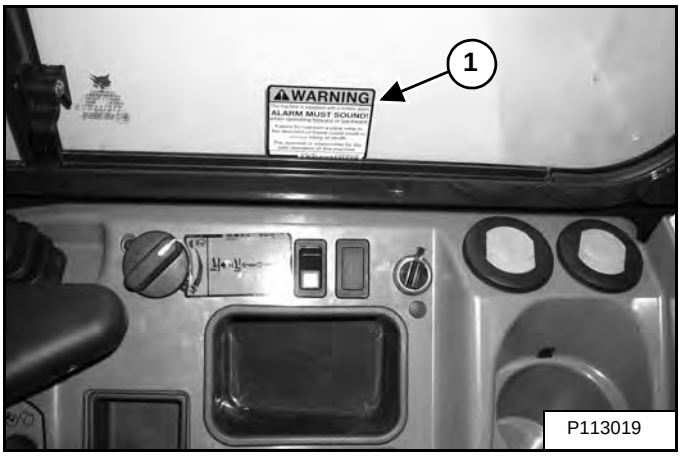
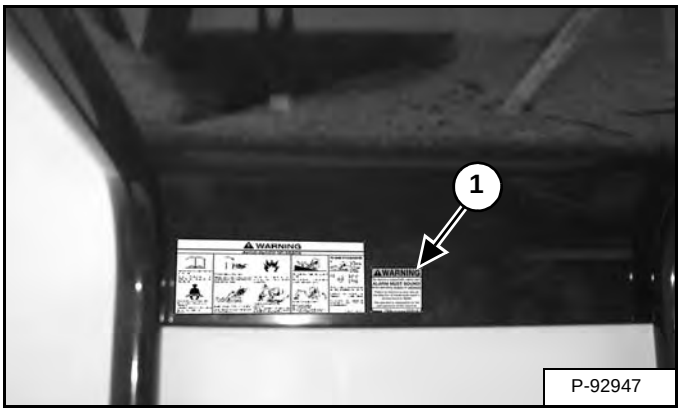


Figure 258



Inspect for damaged or missing motion alarm decal (Item 1) **[Figure 257]** (cab machine) or (Item 1) **[Figure 258]** (canopy machine). Replace if required.

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

WARNING

AVOID INJURY OR DEATH

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

W-2050-0807

Sit in the operator's seat and fasten the seat belt. Start the engine. (See PRE-STARTING PROCEDURE on Page 61.)

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

Figure 259

Slightly move both travel control levers in the forward direction (until the machine is slowly moving forward) and then press the motion alarm cancel switch (Item 1) **[Figure 259]**. The motion alarm will shut off. With the machine still moving forward, move one of the levers to the NEUTRAL position, the motion alarm must sound.

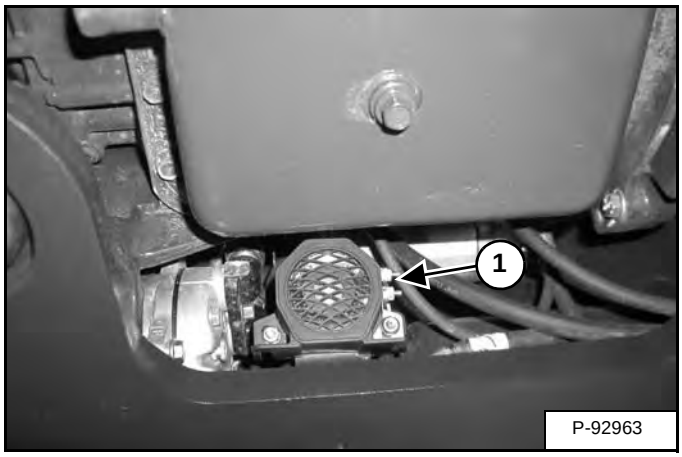
Slightly move both travel control levers in the reverse direction (until the machine is slowly moving backward) and then press the motion alarm cancel switch (Item 1) **[Figure 259]** (the switch icon will be illuminated when the motion alarm is deactivated). The motion alarm will shut off. With the machine still moving backward, move one of the levers to the NEUTRAL position, the motion alarm must sound.

Return both levers to NEUTRAL and turn excavator key to OFF position. Exit the excavator. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 69.)

Inspecting (Cont'd)

The motion alarm is mounted to the bottom rear of the excavator. (To the front of the engine oil pan.)

Figure 260

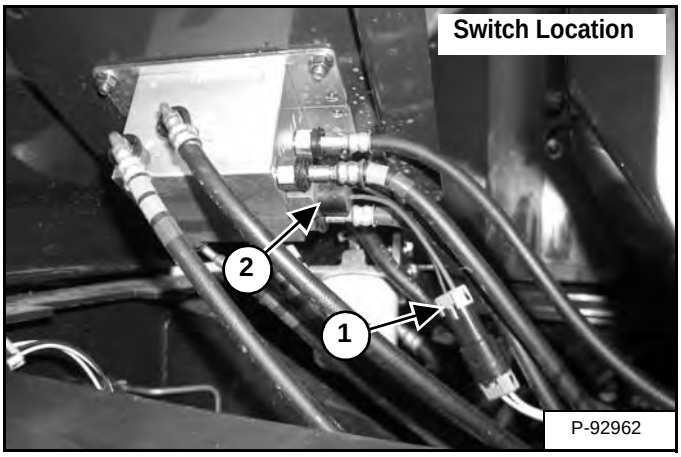


Inspect the motion alarm electrical connections and wire harness (Item 1) **[Figure 260]**, wire harness (Item 1) **[Figure 261]** and motion alarm switch (Item 2) **[Figure 261]** for tightness and damage. Repair or replace any damaged components.

If the motion alarm switch requires service, see the following information.

Adjusting Switch Position

Figure 261



The motion alarm switch (Item 2) **[Figure 261]** is located in the travel control valve located under the floorplate. Remove the floor mat and the floorplate to access the switch.

The switch (Item 2) **[Figure 261]** is non-adjustable. It must be fully installed into the travel control valve housings and tightened. Tighten the switch to 18 - 20 N•m (13 - 15 ft-lb).

Inspect the motion alarm system for proper function after switch replacement.

⚠ 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

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 262

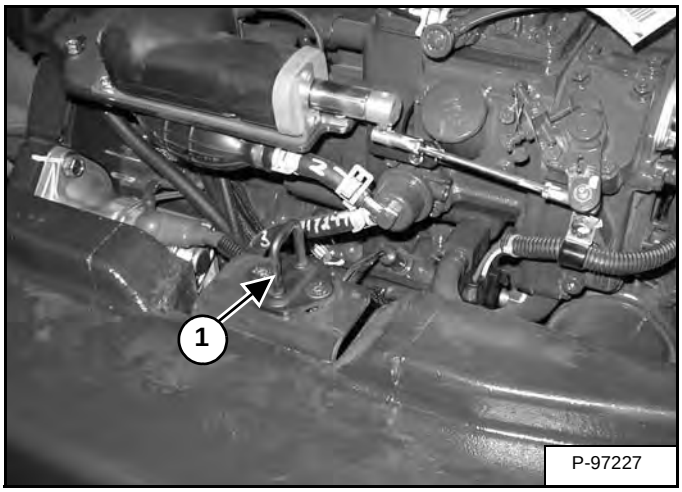
Pull the latch (Item 1) **[Figure 262]** and open the tailgate.

Push firmly to close the tailgate.

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

Adjusting The Latch

Figure 263



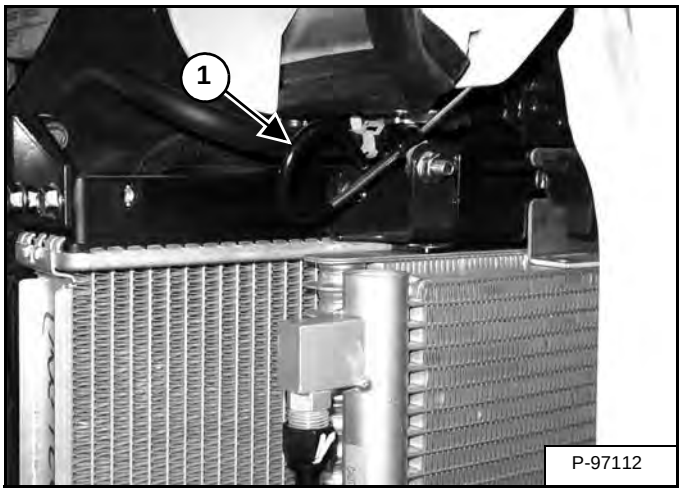
The tailgate latch (Item 1) **[Figure 263]** can be adjusted by loosening the two bolts, moving the latch, and tightening the two bolts.

Close the tailgate before operating the excavator.

RIGHT SIDE COVER

Opening And Closing

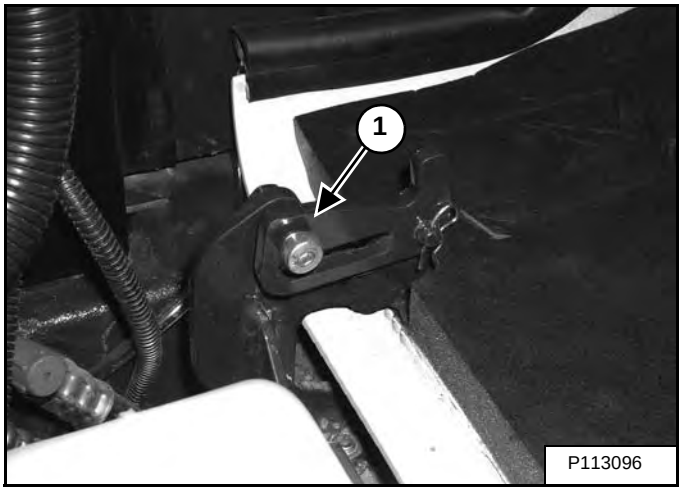
Figure 264



Open the tailgate to access the right side cover latch (Item 1) **[Figure 264]**.

Pull the latch handle (Item 1) **[Figure 264]** out until the right side cover is unlatched.

Figure 265



Raise the right side cover and rotate forward until it is held open by the retainer (Item 1) **[Figure 265]**.

To close the right side cover, lift up on the retainer (Item 1) **[Figure 265]** while raising the right side cover. Rotate the cover back until it is in the fully closed position. Secure the right side cover with the latch (Item 1) **[Figure 264]**.

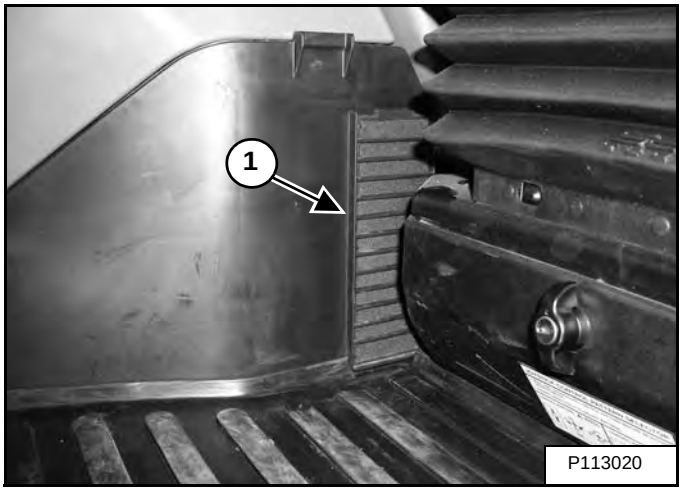
CAB FILTERS

Cleaning And Maintenance

The recirculation filter and the fresh air filter must be cleaned regularly. (See SERVICE SCHEDULE on Page 136.)

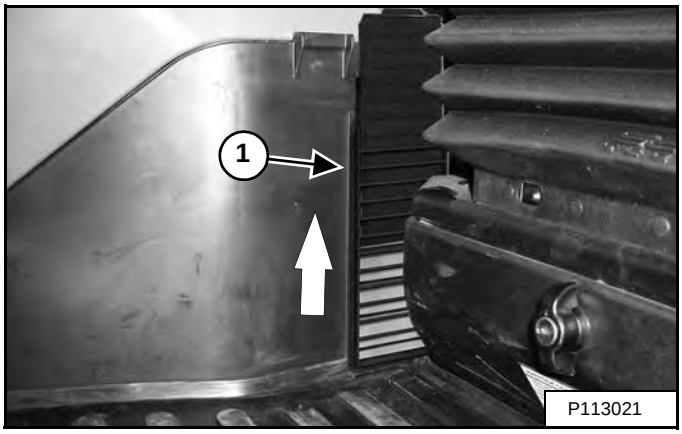
Recirculation Filter

Figure 266



The recirculation filter (Item 1) **[Figure 266]** is located to the right of the operator's seat.

Figure 267



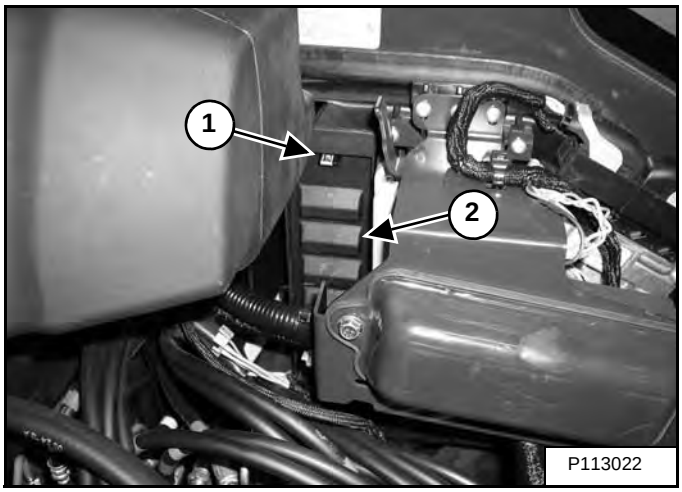
Pull up on the filter (Item 1) **[Figure 267]** until removed from the housing.

Shake the filter or use low pressure air to clean the filter. Replace the filter when very dirty or if damaged.

Installation: Position the bottom of the filter (Item 1) **[Figure 267]** into the housing and slowly push the filter down fully.

Fresh Air Filter

Figure 268

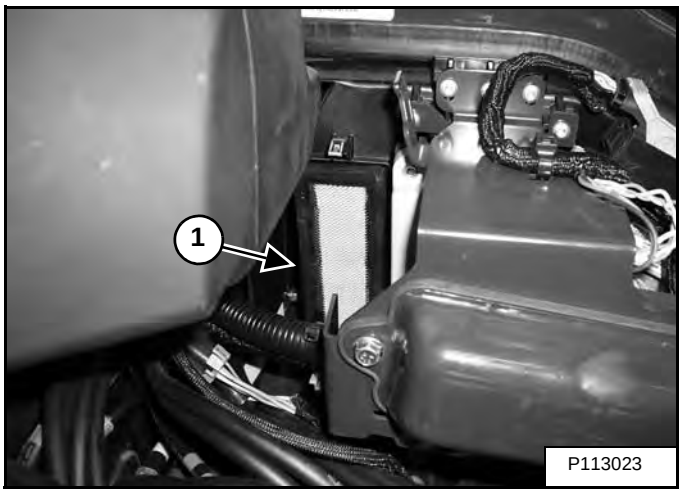


The fresh air filter is located under the right side cover.

Open the right side cover. (See RIGHT SIDE COVER on Page 143.)

Pull out on the tab (Item 1) and remove the cover (Item 2) **[Figure 268]**.

Figure 269



Pull the filter (Item 1) **[Figure 269]** out of the housing.

Shake the filter or use low pressure air to clean the filter. Do not use solvents. Replace the filter when very dirty or damaged.

Installation: Position the filter (Item 1) **[Figure 267]** into the housing and slowly push the filter in fully.

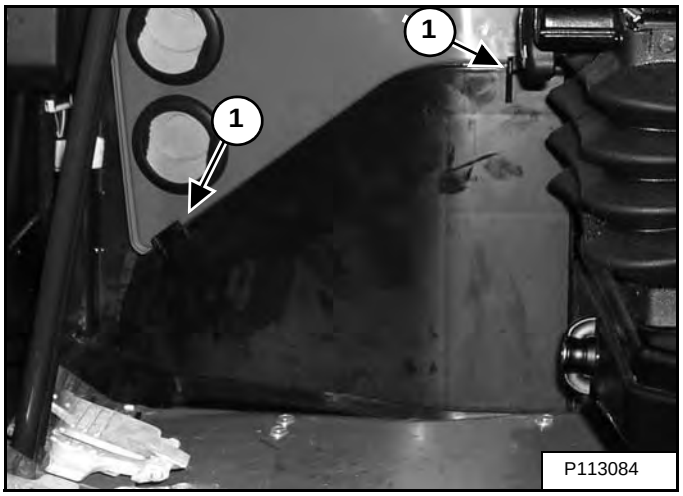
Place the bottom tabs of the filter cover (Item 2) into the frame and push the top in until the tab (Item 1) **[Figure 268]** locks to the frame.

Cleaning And Maintenance

The inside of the HVAC housing needs to be cleaned regularly. Dust will accumulate over time inside the housing. A dusty heater and evaporator coil will reduce heating and cooling efficiency. (See SERVICE SCHEDULE on Page 136.)

The HVAC housing is located to the right of the operator seat.

Figure 270

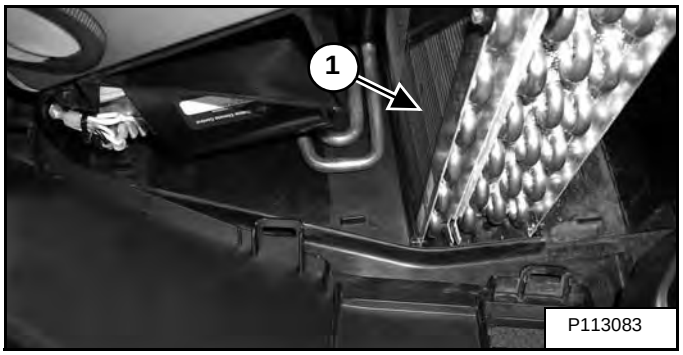


Remove the floor mat.

Pull back on the two latches (Item 1) **[Figure 270]** and remove the HVAC side cover.

To allow water to drain from the HVAC housing during the cleaning process, it is recommended to rotate the upperstructure 90° to the right. Then using the blade, raise the front of the excavator to allow water to run out of the housing. Use jackstands to support the front of the undercarriage.

Figure 271



Use a lower pressure air or a low pressure water stream to remove debris and to clean the coils (Item 1) **[Figure 271]**.

After the housing has been cleaned and flushed, remove the jackstands and raise the blade so the front of the excavator is flat on the ground. Stop the engine.

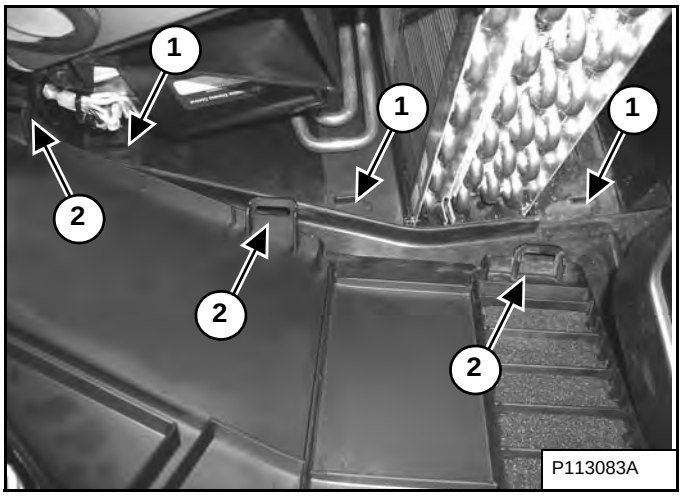
There are three rubber drain valves that allow condensation to drain from the housing during normal air conditioning usage. These drain valve can get clogged with dirt and should be cleaned at the same time the housing is cleaned.

Two of the drain valve can be accessed from the right side cover (the drain valves are located below the HVAC housing on the right side) and one of the valves is located below the left rear corner of the HVAC housing and will be accessed by removing the center floorplate.

Pinch the three rubber drain valves on the flat sides to open the valves and allow dirt and moisture to exit from the end of the valves.

Reinstall the center floorplate and close the right side cover.

Figure 272



NOTE: The floor mat needs to be removed to allow easier access for installing the HVAC side cover.

Three tabs (Item 1) are on the bottom of the HVAC housing that the side cover retainers (Item 2) **[Figure 272]** fit into.

Position the side cover on the tabs and starting with the front edge of the side cover, position it into the front of the HVAC housing. Press on the front of the cover to secure the front latch (Item 1) **[Figure 270]**. Then press in on the top edge of the side cover and work back to the rear of the cover and secure the rear latch.

Reinstall the floor mat.

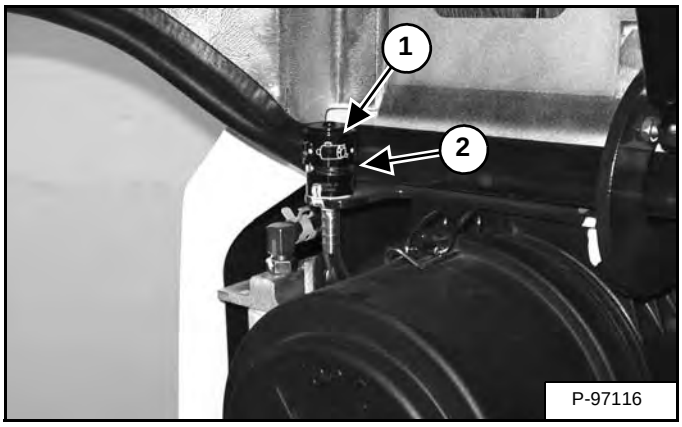
AIR CLEANER SERVICE

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 136.)

Daily Check

The air cleaner is located in the engine compartment. Open the tailgate to access the air cleaner for service. (See TAILGATE on Page 142.)

Figure 273



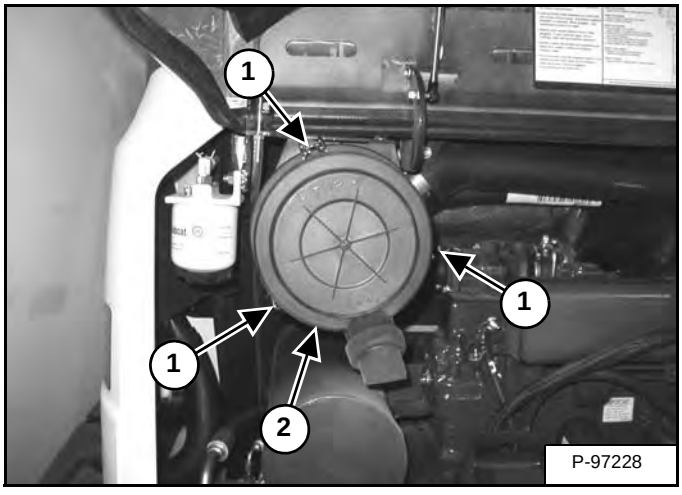
Check the condition indicator (Item 1) **[Figure 273]**. If the red ring shows in the condition indicator, the filter needs to be replaced.

Replace the inner filter every third time the outer filter is replaced or as indicated.

Replacing The Filter Elements

Outer Filter

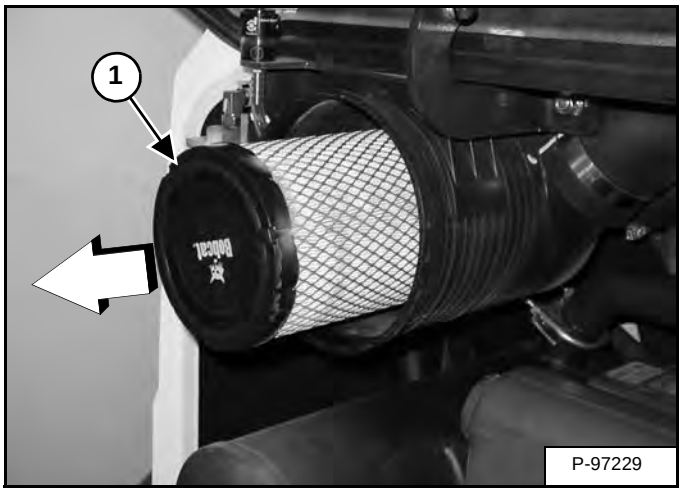
Figure 274



Release the three fasteners (Item 1) **[Figure 274]**.

Remove and clean the dust cup (Item 2) **[Figure 274]**.

Figure 275



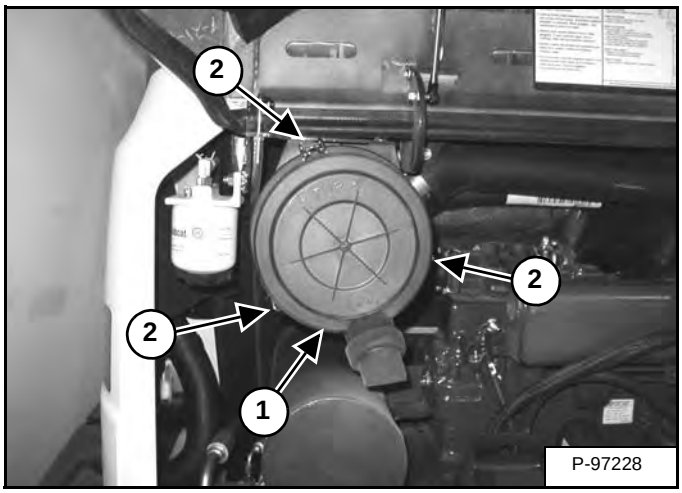
Pull the outer filter (Item 1) **[Figure 275]** from the air cleaner housing.

Check the housing for damage.

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

Install a new filter.

Figure 276



Install the dust cup (Item 1) and engage the three fasteners (Item 2) **[Figure 276]**.

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 273]** 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 (Item 2) **[Figure 273]** shows in the condition indicator, replace the inner filter.

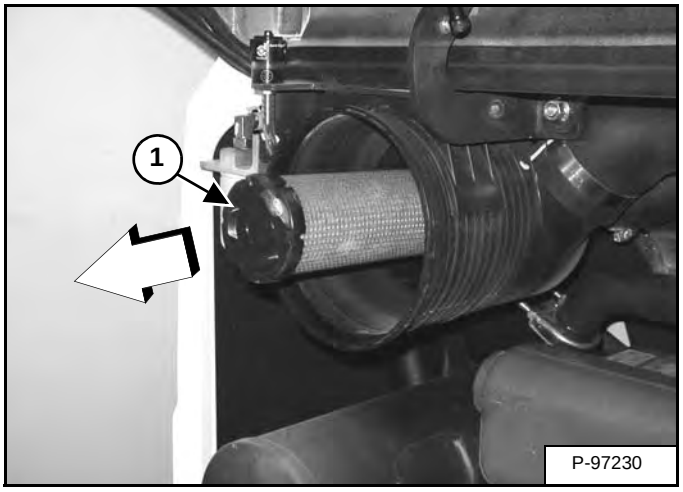
Replacing The Filter Elements (Cont'd)

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 (Item 2) **[Figure 273]** on the end of the condition indicator. Start the engine. Run the engine at full rpm, then reduce engine speed. Stop the engine. If the red ring shows in the condition indicator, replace the inner filter.

Figure 277



Remove the dust cup, outer filter and inner filter (Item 1) **[Figure 277]**.

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 remove the red ring.

Close the tailgate.

FUEL SYSTEM

Fuel Specifications

NOTE: Contact your local fuel supplier to receive recommendations for your region.

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.

Ultra low sulfur diesel fuel may also be used in this machine. Ultra low sulfur is defined as 15 mg/kg (15 ppm) sulfur maximum.

U.S. Standard (ASTM D975)

Use only clean, high quality diesel fuel, Grade Number 2-D or Grade Number 1-D.

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

TEMPERATURE	GRADE 2-D	GRADE 1-D
Above -9°C (+15°F)	100%	0%
Down to -21°C (-5°F)	50%	50%
Below -21°C (-5°F)	0%	100%

NOTE: Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than five percent biodiesel mixed with ultra low sulfur petroleum based diesel. This biodiesel blend fuel is commonly marketed as B5 blended diesel fuel. B5 blended diesel fuel must meet ASTM specifications.

E.U. Standard (EN590)

Use only clean, high quality diesel fuel that meets the specifications listed below:

- Low sulfur diesel fuel defined as 500 mg/kg (500 ppm) sulfur maximum
- Diesel fuel with cetane number of 51.0 and above.

Clean, high quality diesel fuel that meets the EN590 specification may also be used.

NOTE: Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than seven percent biodiesel mixed with ultra low sulfur petroleum based diesel. This biodiesel blend fuel is commonly marketed as B7 blended diesel fuel. B7 blended diesel fuel must meet EN590 specifications.

Biodiesel Blend Fuel

Biodiesel blend fuel has unique qualities that should be considered before using in this machine:

- Cold weather conditions can lead to plugged fuel system components and hard starting.
- Biodiesel blend fuel is an excellent medium for microbial growth and contamination which can cause corrosion and plugging of fuel system components.
- Use of biodiesel blend fuel may result in premature failure of fuel system components, such as plugged fuel filters and deteriorated fuel lines.
- Shorter maintenance intervals may be required, such as cleaning the fuel system and replacing fuel filters and fuel lines.
- Using biodiesel blended fuels containing more than five percent biodiesel can affect engine life and cause deterioration of hoses, tubelines, injectors, injector pump and seals.

Apply the following guidelines if biodiesel blend fuel is used:

- Ensure the fuel tank is as full as possible at all times to prevent moisture from collecting in the fuel tank.
- Ensure that the fuel tank cap is securely tightened.
- Biodiesel blend fuel can damage painted surfaces, remove all spilled fuel from painted surfaces immediately.
- Drain all water from the fuel filter daily before operating the machine.
- Do not exceed engine oil change interval. 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

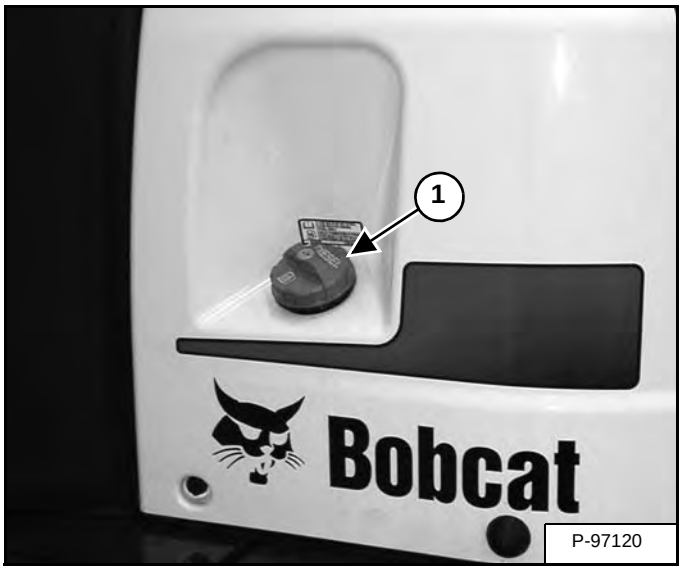
⚠ WARNING

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

Figure 278



The fuel cap uses the start key to unlock the fuel cap.

Remove the fuel fill cap (Item 1) **[Figure 278]**.

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.

Clean up any spilled fuel.

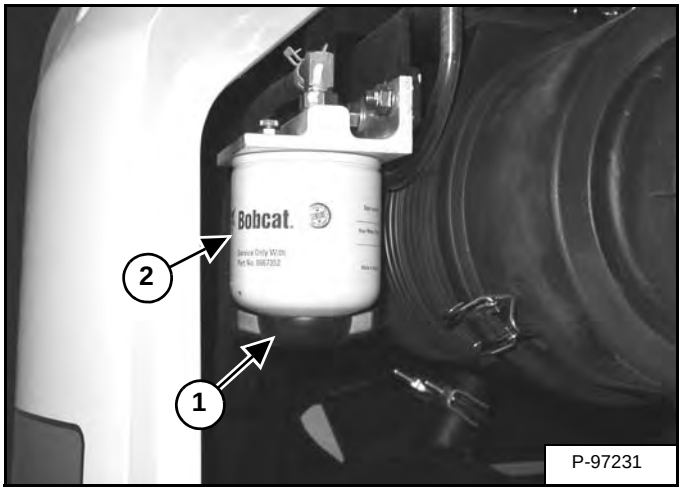
See the SERVICE SCHEDULE for the service interval when to remove water from or replace the fuel filter. (See SERVICE SCHEDULE on Page 136.)

Fuel Filters

Removing Water

Open the tailgate. (See TAILGATE on Page 142.)

Figure 279



Loosen the drain (Item 1) **[Figure 279]** at the bottom of the filter to drain water from the filter into a container.

Clean up any spilled fuel.

Replacing Elements

Remove the filter (Item 2) **[Figure 279]**.

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

Remove the air from the fuel system. (See Removing Air From The Fuel System on Page 151.)

⚠ 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

Draining The Fuel Tank

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 136.)

Figure 280

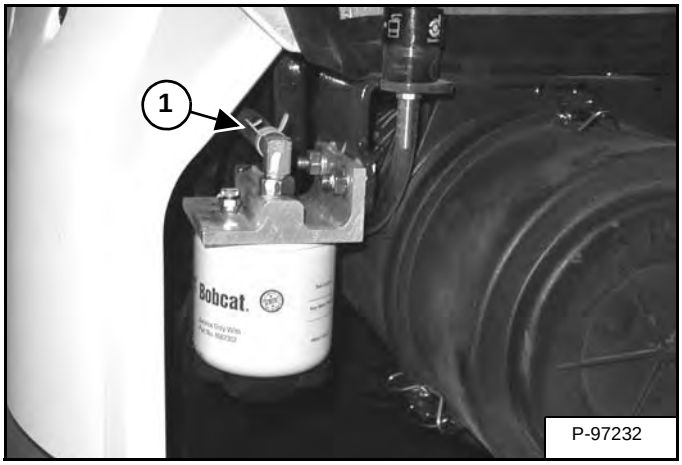
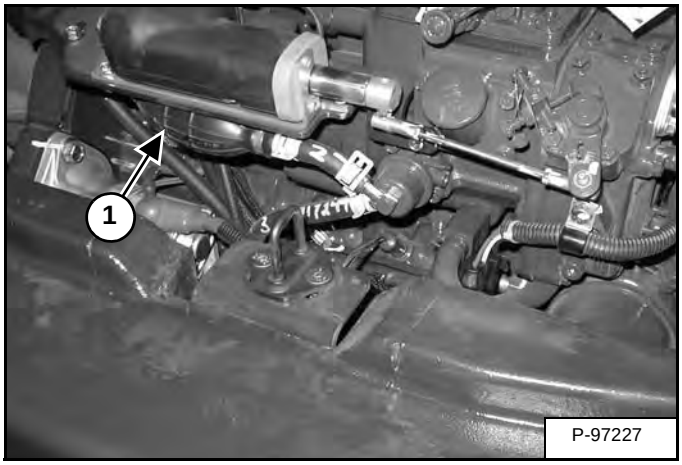


Figure 281



Remove the hose (Item 1) **[Figure 280]** from the fuel filter. Route the hose to a container.

Squeeze the hand pump (priming bulb) (Item 1) **[Figure 281]** to start the fuel siphoning from the fuel tank.

Drain the fuel into the container.

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

Reinstall the hose (Item 1) **[Figure 280]** after the fuel is removed from fuel tank.

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 282

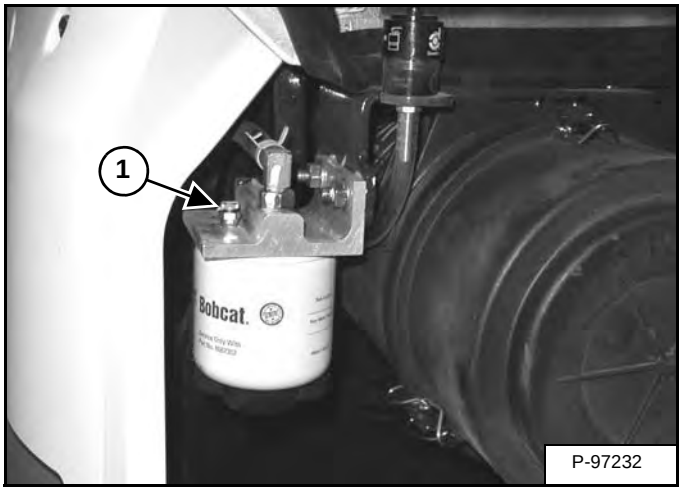
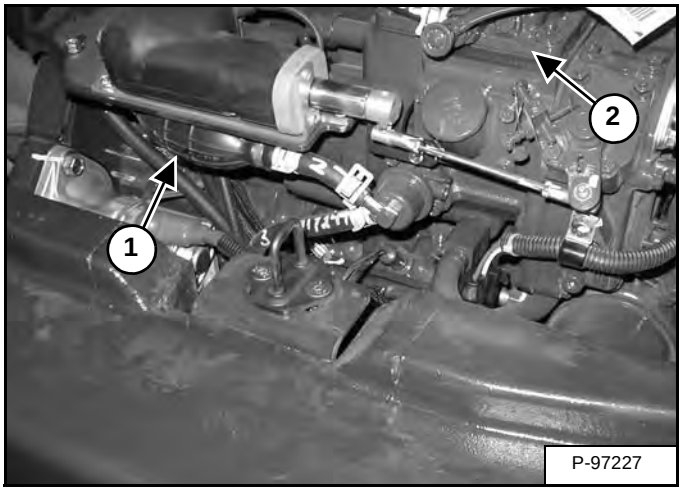


Figure 283



Open the tailgate. (See TAILGATE on Page 142.)

Open the fuel filter vent (Item 1) **[Figure 282]** and operate the hand pump (priming bulb) (Item 1) **[Figure 283]** until the fuel flows from the vent with no air bubbles.

Close the vent (Item 1) **[Figure 282]**.

Clean up any spilled fuel.

Start the engine. It may be necessary to open the vent (Item 2) **[Figure 283]** (at the fuel injection pump) briefly until the engine runs smoothly.

⚠ WARNING

AVOID INJURY OR DEATH

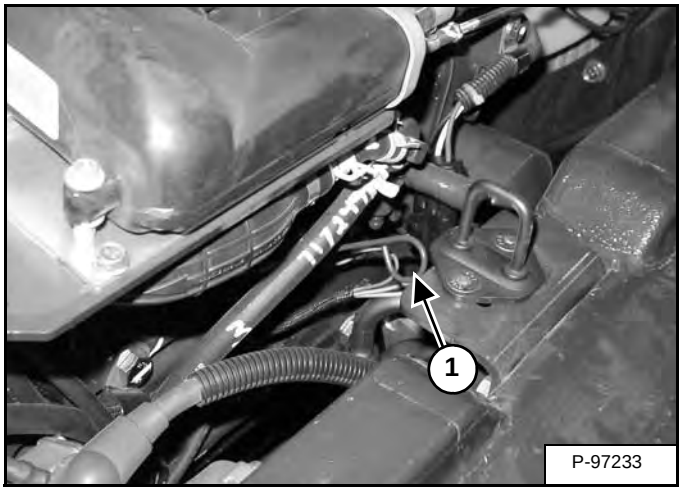
Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical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

W-2072-0807

Checking And Adding Engine Oil

Check the engine oil after every 8 - 10 hours of operation and before starting the engine. (See SERVICE SCHEDULE on Page 136.)

Figure 284



Open the tailgate. (See TAILGATE on Page 142.)

Remove the dipstick (Item 1) **[Figure 284]**.

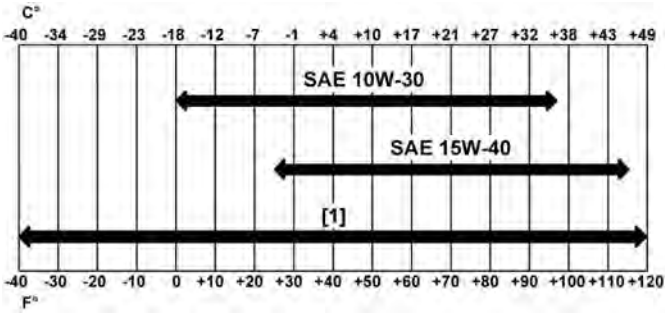
Keep the oil level between the marks on the dipstick.

Use a good quality motor oil that meets the correct API Service Classification.

Engine Oil Chart

Figure 285

ENGINE OIL
RECOMMENDED SAE VISCOSITY NUMBER (LUBRICATION OILS FOR DIESEL ENGINE CRANKCASE)



TEMPERATURE RANGE ANTICIPATED BEFORE NEXT OIL CHANGE (DIESEL ENGINES MUST USE API CLASSIFICATION CJ-4 OR BETTER, OR ACEA E9 OR BETTER)

[1] Bobcat Synthetic Oil – 5W-40

Bobcat engine oils are recommended for use in this machine. If Bobcat engine oil is not available, use a good quality engine oil that meets API Service Classification of CJ-4 or better, or ACEA E9 or better **[Figure 285]**.

⚠ 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

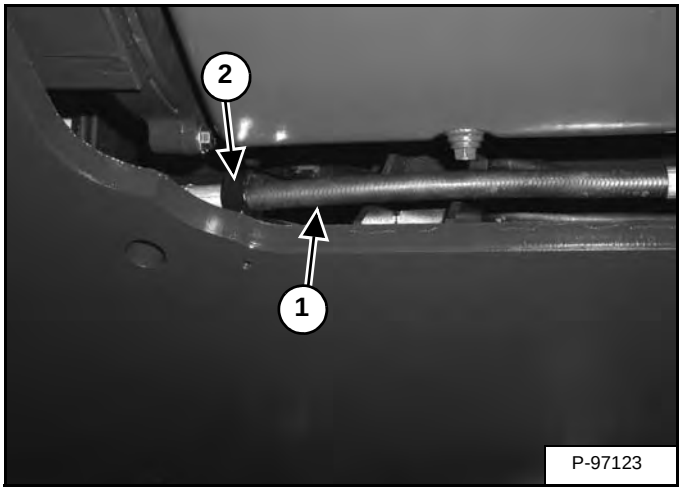
Removing And Replacing Oil And Filter

See the SERVICE SCHEDULE for the service interval for replacing the engine oil and filter. (See SERVICE SCHEDULE on Page 136.)

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

Open the tailgate. (See TAILGATE on Page 142.)

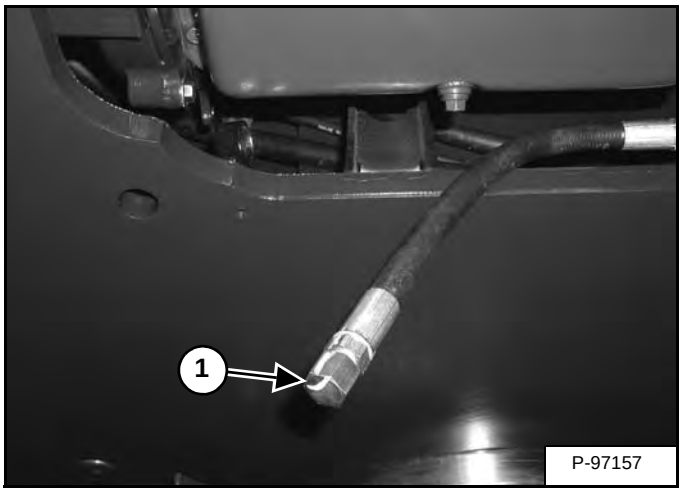
Figure 286



If equipped with the optional air deflector, remove the four bolts and the air deflector to access the drain hose (Item 1) **[Figure 286]**.

Remove the drain hose (Item 1) from the storage clamp (Item 2) **[Figure 286]**.

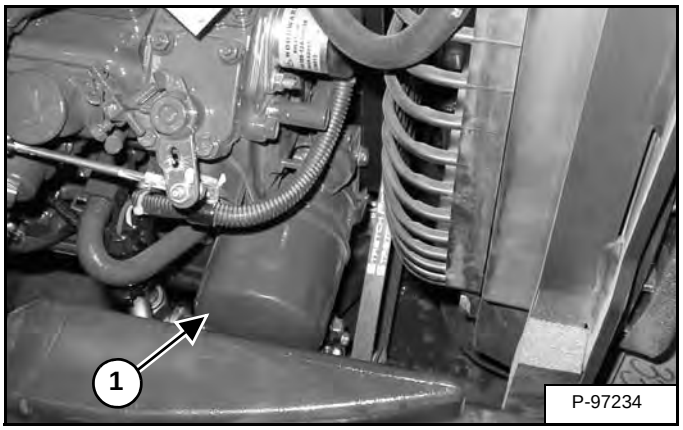
Figure 287



Place a container under the excavator. Remove the drain plug (Item 1) **[Figure 287]** from the drain hose.

Recycle or dispose of used oil in an environmentally safe manner.

Figure 288



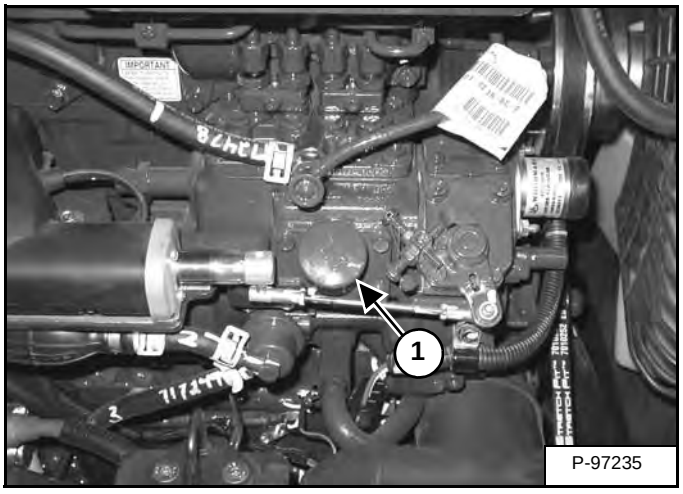
Remove the oil filter (Item 1) **[Figure 288]** and clean the filter housing surface.

Use a genuine Bobcat replacement filter. Put clean oil on the filter gasket. Install the filter and hand tighten.

Install and tighten the drain plug (Item 1) **[Figure 287]**.

Put the drain hose (Item 1) back into the storage clamp (Item 2) **[Figure 286]**.

Figure 289



Remove the fill cap (Item 1) **[Figure 289]**.

Put oil in the engine. (See ENGINE LUBRICATION SYSTEM on Page 152.) and (See Capacities on Page 240.)

Install the fill cap (Item 1) **[Figure 289]**.

Start the engine and let it run for several minutes.

Stop the engine. Check for leaks at the oil drain plug and the oil filter. Check the oil level.

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

ENGINE COOLING SYSTEM

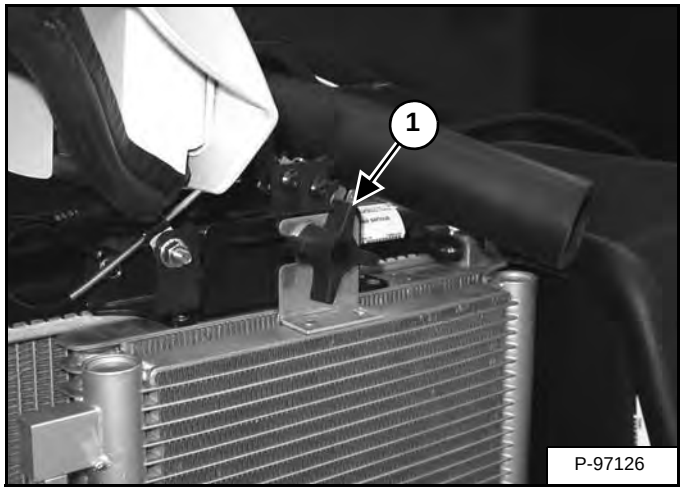
Check the cooling system every day to prevent over-heating, loss of performance or engine damage. (See SERVICE SCHEDULE on Page 136.)

Cleaning

Open the right side cover. (See RIGHT SIDE COVER on Page 143.)

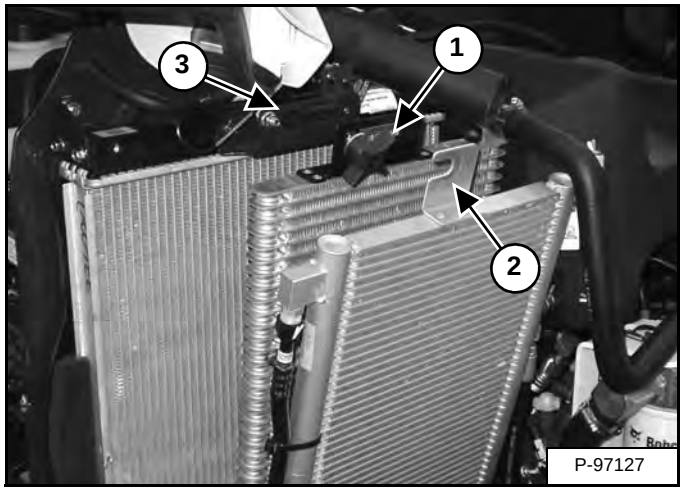
NOTE: Allow the cooling system and engine to cool before servicing or cleaning the cooling system.

Figure 290



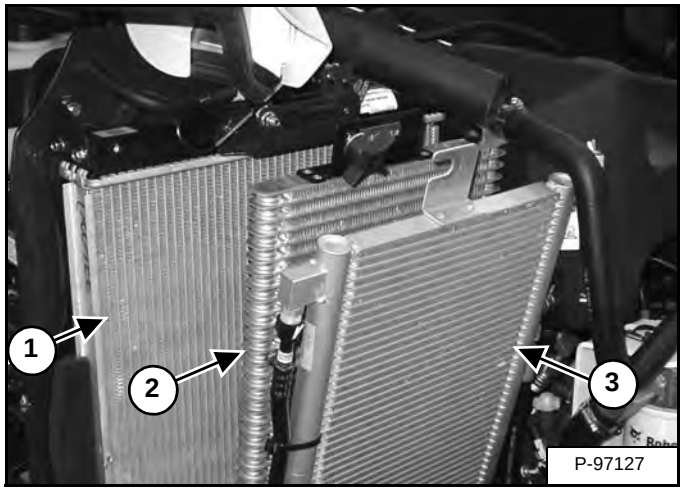
Loosen the knob (Item 1) **[Figure 290]**. Slide the knob toward the rear of the machine.

Figure 291



Slide the knob (Item 1) out of the condenser mount (Item 2) (if equipped) and the radiator mounting bracket (Item 3) **[Figure 291]**. Be careful not to damage fins.

Figure 292



Use air pressure or water pressure to clean the radiator (Item 1), oil cooler (Item 2) and condenser (Item 3) **[Figure 292]** (if equipped). Be careful not to damage fins when cleaning.

Position the knob (Item 1) so it fits into the radiator mount (Item 3) and the condenser mount (Item 2) **[Figure 291]** (if equipped).

Slide the knob (Item 1) **[Figure 290]** toward the front of the machine until it is fully seated in the slots of the mounting brackets. Tighten the knob (Item 1) **[Figure 290]**. Be careful not to damage fins.

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

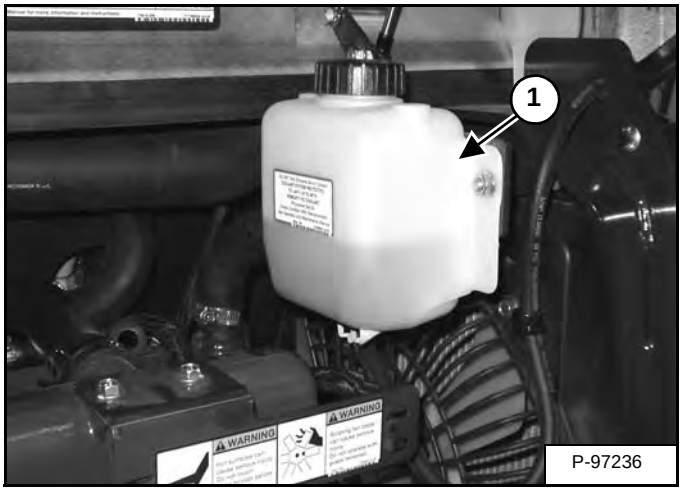
Wear safety glasses to prevent eye injury when any of the following conditions exist:

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

W-2019-0907

Open the tailgate. (See TAILGATE on Page 142.)

Figure 293



Check the coolant level in the coolant recovery tank (Item 1) **[Figure 293]**.

The coolant level must be between the MIN and MAX marks on the coolant recovery tank when the engine is cold.

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

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 Coolant

See the SERVICE SCHEDULE for correct service intervals. (See SERVICE SCHEDULE on Page 136.)

Stop the engine. Open the tailgate. (See TAILGATE on Page 142.)

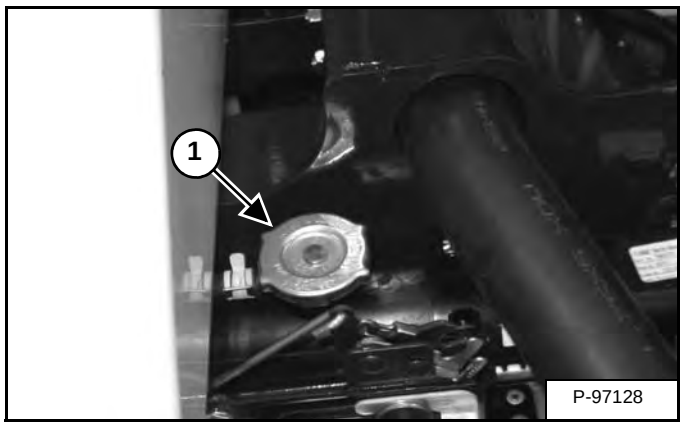
⚠ WARNING

AVOID BURNS

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

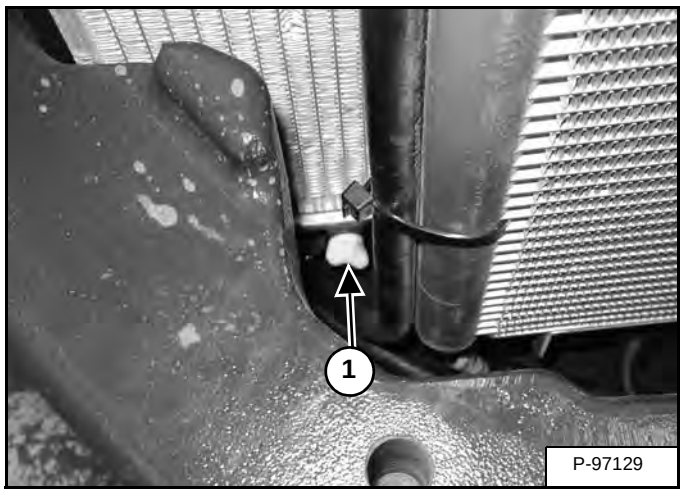
W-2070-1203

Figure 294



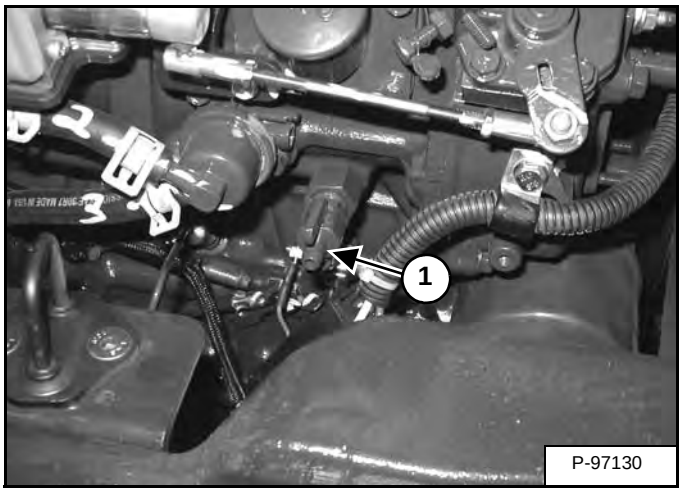
When the engine is cool, loosen and remove the radiator cap (Item 1) **[Figure 294]**.

Figure 295



Put a hose on the drain valve at the bottom of the radiator. Open the drain valve (Item 1) **[Figure 295]** and drain the coolant into a container.

Figure 296



Put a hose on the drain valve on the engine block. Open the drain valve (Item 1) **[Figure 296]** and drain the coolant into a container.

After all the coolant is removed, close both drain valves.

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

Mix the coolant in a separate container. (See ENGINE COOLING SYSTEM on Page 154.) and (See Capacities on Page 240.)

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

The correct mixture of coolant to provide a -37°C (-34°F) freeze protection is 5 L propylene glycol mixed with 4,4 L of water **OR** 1 U.S. gal propylene glycol mixed with 3.5 qt of water.

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

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

Add premixed coolant until the level is correct.

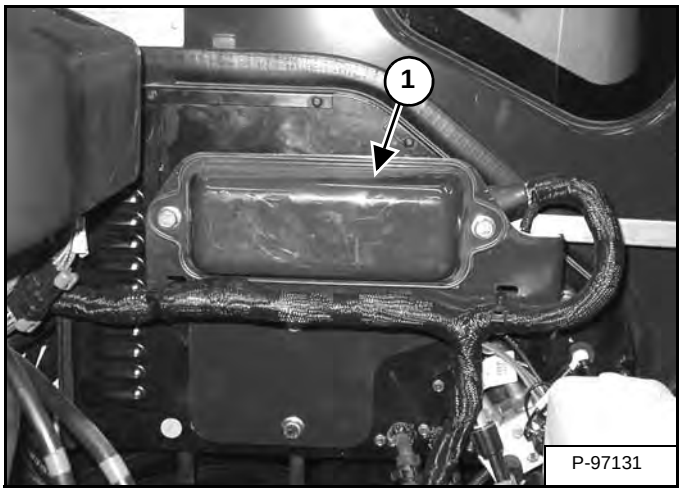
Run the engine until it is at operating temperature. Stop the engine. Check the coolant level and add as needed. Be sure the radiator cap is tight.

Add coolant to the recovery tank as needed.

Close the tailgate.

Description

Figure 297



The excavator has a 12 volt, negative ground electrical system. The electrical system is protected by fuses (Item 1) **[Figure 297]** located under the right side cover of the excavator. The fuses will protect the electrical system when there is an electrical overload. The reason for the overload must be found and corrected before starting the engine again.

The battery cables must be clean and tight. Check the electrolyte level in the battery. Add distilled water as needed. Remove acid or corrosion from the battery and cables with a sodium bicarbonate and water solution.

Put Battery Saver P/N 6664458 or grease on the battery terminals and cable ends to prevent corrosion.

⚠ 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

Fuse And Relay Location / Identification

A decal is inside the fuse cover to show location and amp ratings.

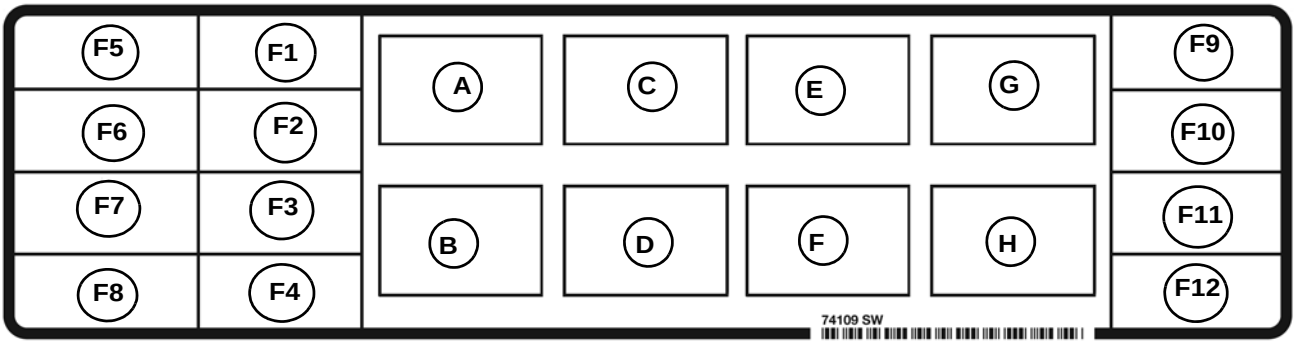
Remove the cover to check or replace the fuses and relays.

The location and sizes are shown in **[Figure 298]**.

Always replace fuses using the same type and capacity.

Fuse And Relay Location / Identification (Cont'd)

Figure 298



The location and sizes are shown in the table below and on the decal **[Figure 298]**. Relays are identified by the letter "R" in the AMP column.

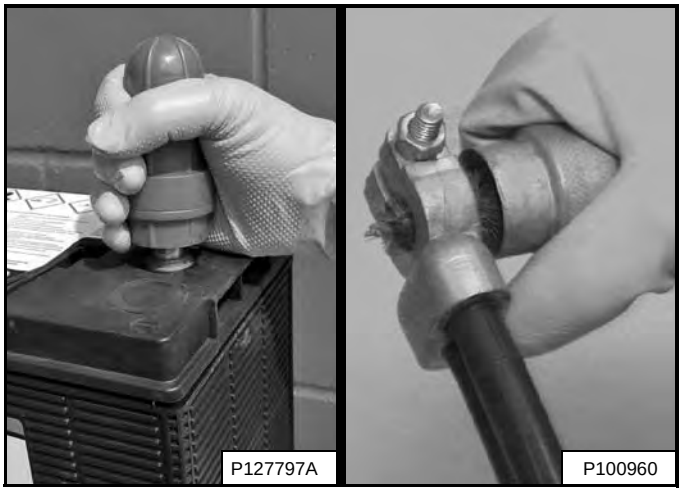
REF	ICON	DESCRIPTION	AMP	REF	ICON	DESCRIPTION	AMP	REF	ICON	DESCRIPTION	AMP
F1		Wiper / Washer	10	**F9**		Controller	25	**A**		Switched Power	R
F2		Switched Power	20	**F10**		ACD	25	**B**		Fuel Shutoff	R
F3		Alternator Excite / Heater	25	**F11**		Lights	20	**C**		HVAC	R
F4		ACD	25	**F12**		Power Port	15	**D**		Lights	R
F5		Controller	20					**E**		NOT USED	R
F6		HVAC	35					**F**		Glow Plugs	R
F7		Start Key	5					**G**		NOT USED	R
F8		Fuel Pull	25					**H**		Starter	R

Battery Maintenance

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 136.)

The Bobcat brand battery supplied with your machine is sealed and does not require watering. Proper charging and storage are important to maximize the life of all batteries.

Figure 299



Simple steps for reliability and long battery life:

- Keep battery posts and terminals clean **[Figure 299]**.
- Keep terminals tight.
- Remove corrosion from battery and terminals with sodium bicarbonate (baking soda) and water solution.
- Put Bobcat Battery Saver or grease on the battery terminals and cable ends to prevent corrosion.
- Operate the machine for at least 15 minutes to recover from the battery drain caused by engine start up whenever practical.
- Maintain the battery charge level. This is a key factor for long battery life.
- Charge a severely discharged battery with a battery charger instead of relying on the machine charging system. (See Battery Charging on Page 160.)
- Check the battery state of charge every 30 days on machines that are not frequently used. (See Battery Testing on Page 160.)

⚠ 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

Maintaining Battery Charge Level

All batteries will self-discharge over time. This machine has features that require battery power even when the machine is not being used. Use of a quality battery maintainer is highly recommended to ensure that your machine is ready to start when you need it and avoid costly battery replacement.

Battery Maintainers

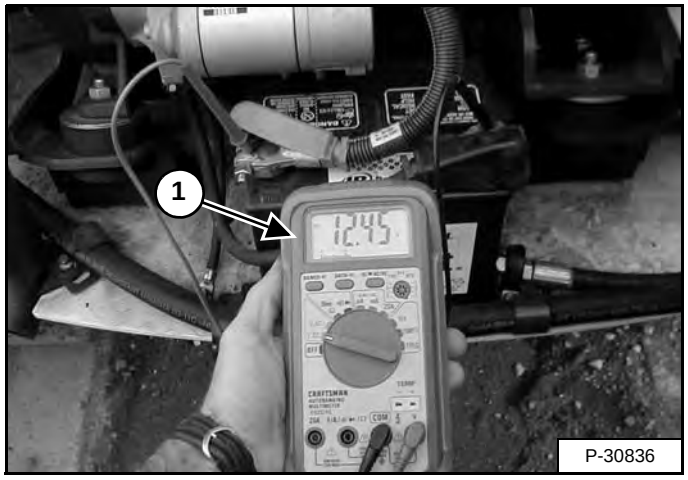
Use a good quality battery maintainer to keep the battery above 12.4 volts for machines that are not frequently used. Batteries below 12.4 volts must first be charged using a battery charger. Solar maintainers should have a minimum capacity of 10 watts to be effective.

Battery Service During Machine Storage

Remove the battery if storing the machine for an extended period of time. Fully charge the battery. Store the battery in a cool dry place above freezing and boost charge periodically. If battery removal is not desired, a good quality battery maintainer must be used to compensate for battery self-discharge and parasitic loads from machine controllers, accessories, and features such as connected machine intelligence.

Battery Testing

Figure 300



The simplest and most common check to determine battery state of charge is to use a digital multimeter or voltmeter (Item 1) **[Figure 300]**.

A battery found below 12.4 volts must be charged to 100% charge per the battery charger's recommendation. **Allow at least 60 minutes after operating the machine or charging the battery to get an accurate reading.**

If the reading is less than 12.4 volts after the battery has been charged for several hours, see your Bobcat dealer to have a more thorough battery test performed.

The freezing point of battery electrolyte is dependent on the battery state of charge. Keeping the battery voltage above 12.4 volts will help prevent batteries from freezing, even at extremely low temperatures.

If the battery freezes, the internal grid may be damaged and the case will be distorted or cracked. If this happens, dispose of the battery according to local regulations.

Battery Charging

A battery charger designed for 12 volt charging systems is recommended. Follow the battery charger manufacturer's instructions to charge the battery to 12.6 volts (100% charge). Batteries should be charged at room temperature to avoid an undercharge or overcharge condition. Never attempt to charge a frozen battery.

The following table can be used to identify the approximate amount of time required to charge a discharged battery. Allow at least 60 minutes after operating the machine or charging the battery to get an accurate reading.

BATTERY VOLTAGE	STATE OF CHARGE	CHARGER MAXIMUM RATE		
		30 Amps	20 Amps	10 Amps
12.6 V	100%	READY TO USE		
12.4 V	75%	0.9 hr.	1.3 hr.	2.5 hr.
12.2 V	50%	1.9 hr.	2.7 hr.	5.1hr.
12.0 V	25%	2.9 hr.	4.3 hr.	7.8 hr.
11.8 V	0%	4.0 hr.	5.7 hr.	10.7 hr.

NOTE: Use a good quality automatic charger to avoid battery damage from overcharging.

⚠ WARNING

BATTERY GAS CAN EXPLODE AND CAUSE SERIOUS INJURY OR DEATH

Keep arcs, sparks, flames and lighted tobacco away from batteries. When *jumping* from booster battery make final connection (negative) at machine frame.

Do not jump start or charge a frozen or damaged battery. Warm battery to 16°C (60°F) before connecting to a charger. Unplug charger before connecting or disconnecting cables to battery. Never lean over battery while boosting, testing or charging.

W-2066-0910

Using A Booster Battery (Jump Starting)

IMPORTANT

If jump starting the excavator from a second machine:

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

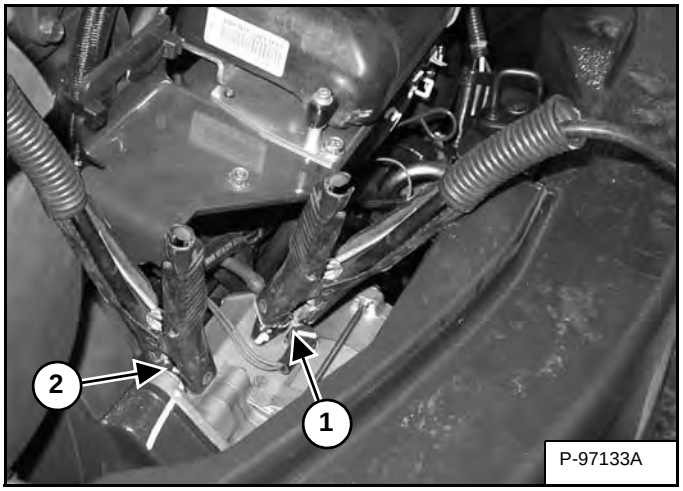
I-2060-0906

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

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

Open the tailgate. (See TAILGATE on Page 142.)

Figure 301



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 301]** of the excavator starter.

Connect one end of the second cable to the negative (-) terminal of the booster battery. Connect the other end of the same cable to the starter mounting bolt (Item 2) **[Figure 301]**.

Start the engine. After the engine has started, remove the ground (-) cable first (Item 2) **[Figure 301]**.

Disconnect the cable from the excavator starter (Item 1) **[Figure 301]**.

NOTE: (See Cold Temperature Starting on Page 67.)

IMPORTANT

Damage to the alternator can occur if:

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

I-2223-0903

⚠ WARNING

AVOID INJURY OR DEATH

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

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

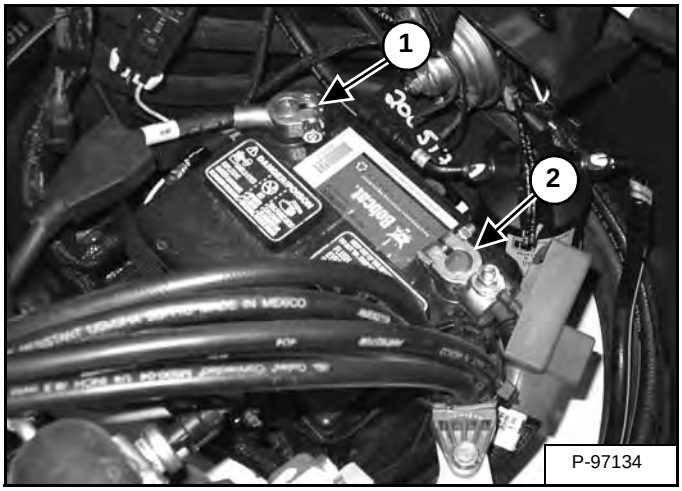
If electrolyte is taken internally drink large quantities of water or milk! DO NOT induce vomiting. Get prompt medical attention.

W-2065-0807

Removing And Installing The Battery

Open the right side cover. (See RIGHT SIDE COVER on Page 143.)

Figure 302

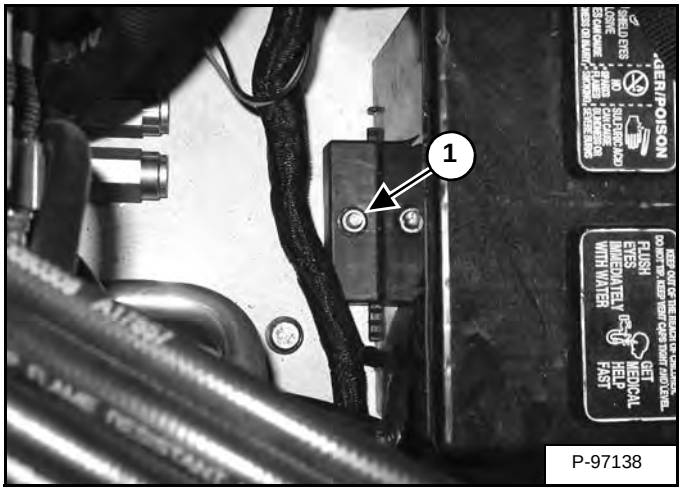


NOTE: For easier access for removing the battery, remove the lower right cover. To remove side cover, see information in [Figure 307].

Disconnect the negative (-) cable (Item 1) **[Figure 302]** first.

Disconnect the positive (+) cable (Item 2) **[Figure 302]**.

Figure 303



Remove the bolt (Item 1) **[Figure 303]** and remove the hold-down clamp.

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 302]** last to prevent sparks.

⚠ 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

HYDRAULIC SYSTEM

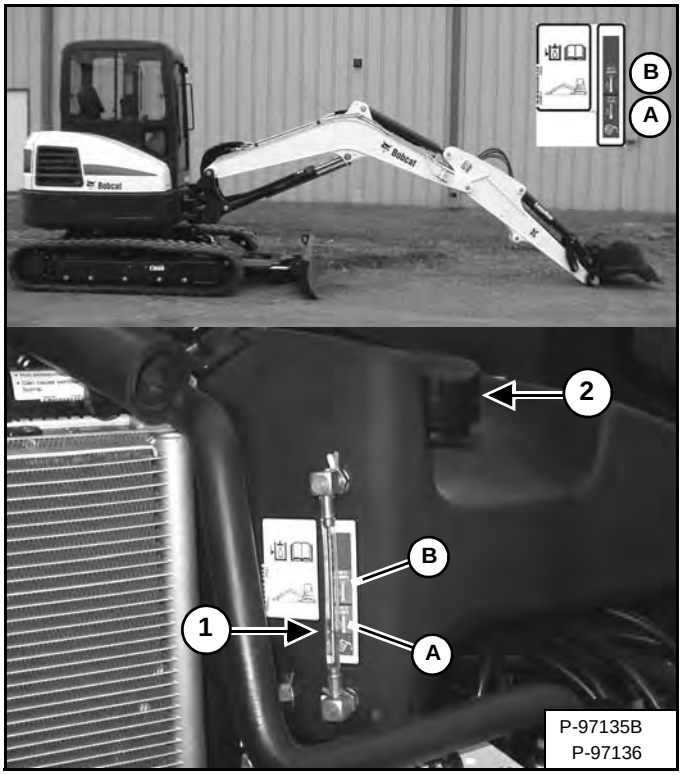
Checking And Adding Hydraulic Oil

Put the machine on a flat level surface.

Retract the arm and bucket cylinders, extend the boom cylinder, put the bucket on the ground and lower the blade. Stop the engine.

Open the right side cover. (See RIGHT SIDE COVER on Page 143.)

Figure 304



Park the machine in the position shown **[Figure 304]**. (The preferred method is to check the hydraulic oil when it is cold.)

Check the hydraulic oil level, it must be visible in the sight gauge (Item 1) **[Figure 304]**. The decal on the hydraulic tank shows the correct fill level.

A - Correct Oil Level COLD (Preferred)
B - Correct Oil Level HOT (Optional)

Clean the surface around the reservoir cap and remove the cap from the reservoir (Item 2) **[Figure 304]**.

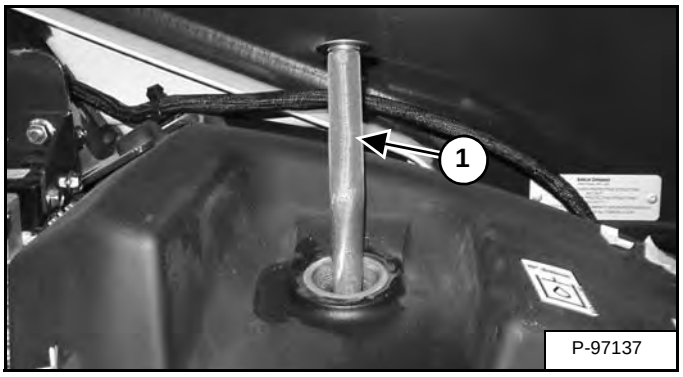
⚠ WARNING

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

Figure 305



Check the condition of the fill strainer screen (Item 1) **[Figure 305]**. Clean or replace as necessary.

Be sure the screen is installed before adding fluid.

Add the correct fluid (See **[Figure 306]**) to the reservoir until it is visible in the sight gauge. (See Capacities on Page 240.)

Check the cap and clean as necessary. Replace the cap if damaged.

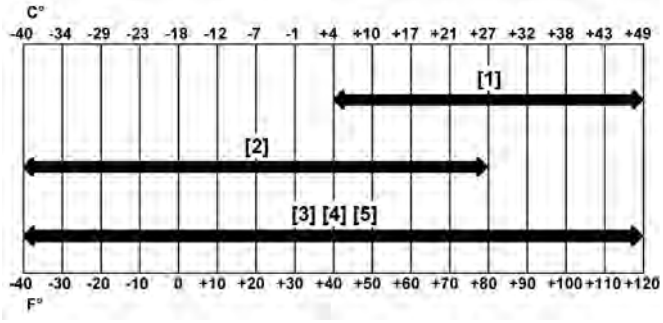
Install the cap.

Close the right side cover and tailgate.

Hydraulic / Hydrostatic Fluid Chart

Figure 306

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 306]**.

Removing And Replacing The Hydraulic Filters

Hydraulic Filter

⚠ WARNING

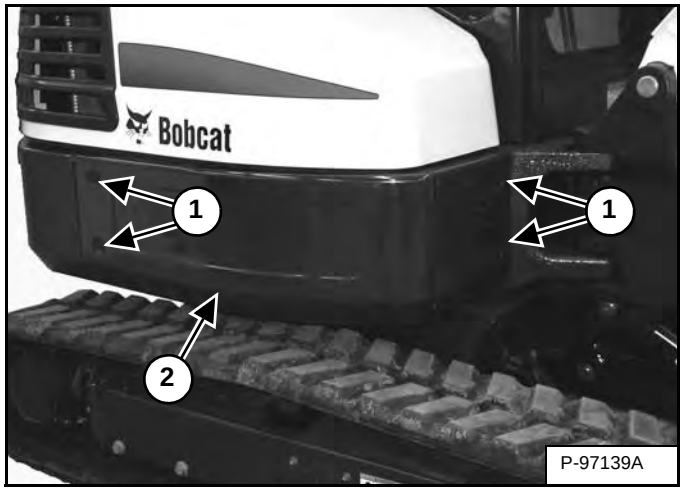
AVOID INJURY OR DEATH

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

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 136.)

Figure 307

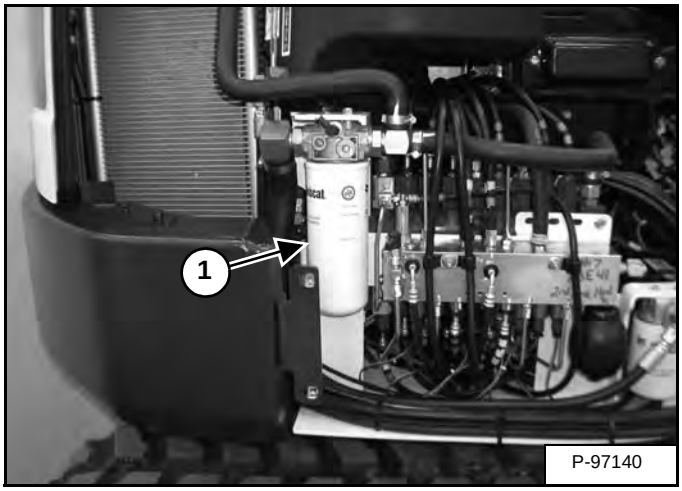


Open the right side cover. (See RIGHT SIDE COVER on Page 143.)

For easier access to change the hydraulic filter, remove the lower right side panel.

Remove the four bolts (Item 1) from the side panel (Item 2) **[Figure 307]**. Remove the side panel.

Figure 308



Remove the hydraulic filter (Item 1) **[Figure 308]**.

Clean the housing where the filter gasket makes contact.

Put clean hydraulic fluid on the gasket. Install the new filter and hand tighten only. Use a genuine Bobcat replacement filter.

Removing And Replacing The Hydraulic Filters (Cont'd)

Case Drain Filter

⚠ 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

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 136.)

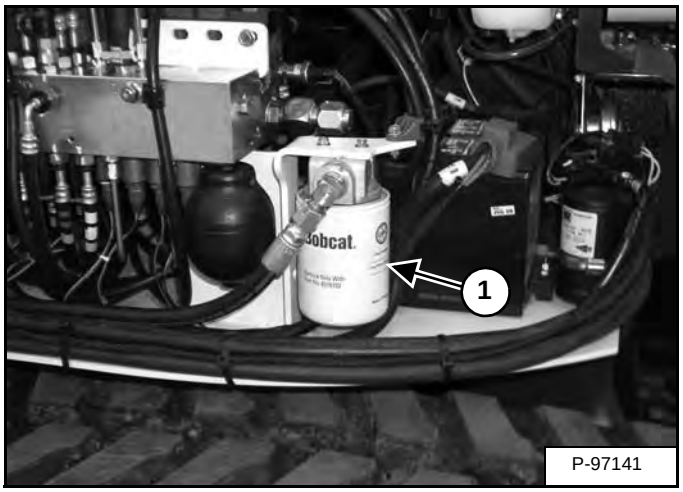
The case drain filter is located in the right front corner of the excavator.

Open the right side cover. (See RIGHT SIDE COVER on Page 143.)

For easier access to change the case drain filter, remove the lower right side panel.

Remove the four bolts (Item 1) from the side panel (Item 2) **[Figure 307]**. Remove the side panel.

Figure 309



Remove the case drain filter (Item 1) **[Figure 309]**.

Clean the housing where the filter gasket makes contact.

Put clean hydraulic fluid on the gasket. Install the new filter and hand tighten only.(See SERVICE SCHEDULE on Page 136.)

Removing And Replacing The Hydraulic Fluid

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 136.)

⚠ WARNING

AVOID INJURY OR DEATH

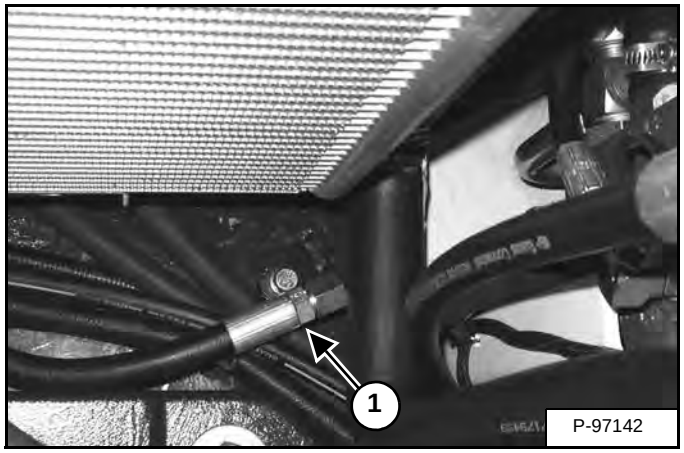
Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical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

W-2072-0807

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

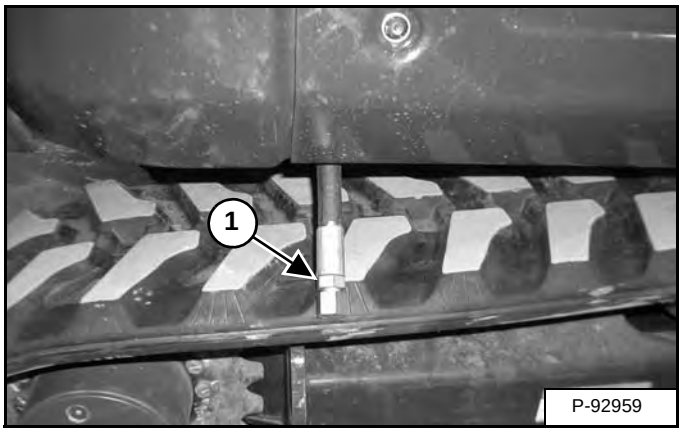
Open the tailgate. (See TAILGATE on Page 142.)

Figure 310



The hydraulic oil drain hose (Item 1) **[Figure 310]** is located below the oil cooler in the right rear corner of the upperstructure.

Figure 311



Reposition the drain hose out the bottom of the upperstructure and remove the cap (Item 1) **[Figure 311]**.

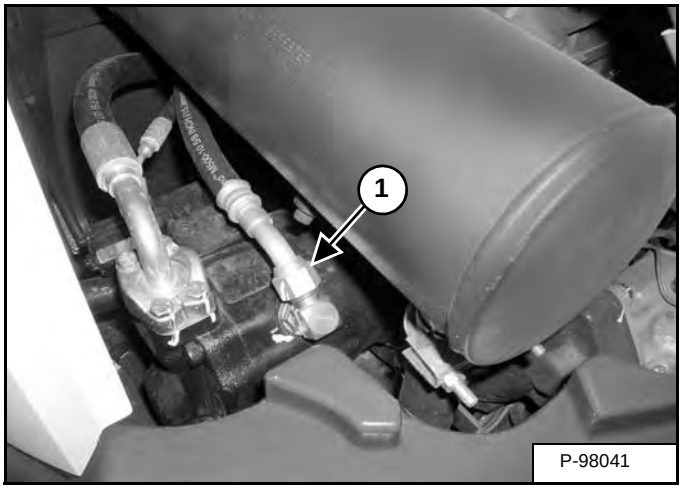
Drain the fluid into a container.

Recycle or dispose of the fluid in an environmentally safe manner.

Install the cap (Item 1) **[Figure 311]** and position the drain hose back to the storage position (Item 1) **[Figure 310]**.

Add fluid to the reservoir. (See HYDRAULIC SYSTEM on Page 163.)

Figure 312



With the engine OFF, loosen the hose (Item 1) **[Figure 312]** on the hydraulic pump until all air is purge from the system. Tighten the hose after a steady stream of hydraulic fluid, free of any air bubbles, drains from the hose. **DO NOT RUN THE MACHINE WITH THE HOSE LOOSE.**

Start the engine and operate the machine through the hydraulic functions. Stop the engine. Check the fluid level and add as needed.

SPARK ARRESTER MUFFLER

Cleaning Procedure

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 136.)

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

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

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

WARNING

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

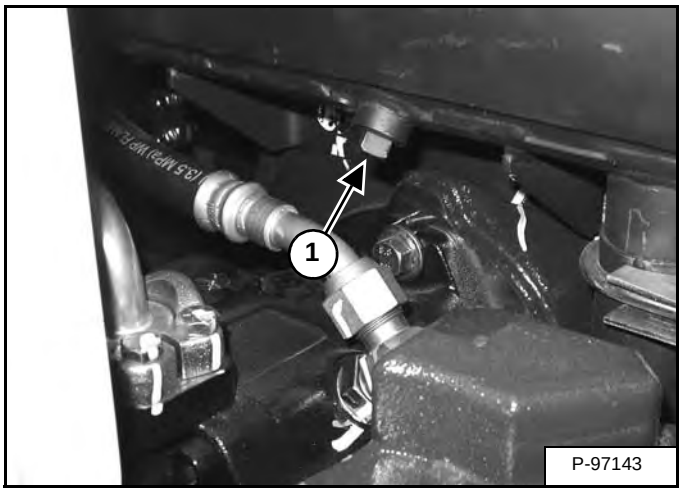
Failure to do so can cause injury or death.

W-2203-0595

Do not operate the excavator with a defective exhaust system.

Stop the engine. Open the tailgate. (See TAILGATE on Page 142.)

Figure 313



Remove the plug (Item 1) **[Figure 313]** from the bottom of the muffler.

Start the engine and run for about 10 seconds while a second person, wearing safety glasses, holds a piece of wood over the outlet of the muffler. The carbon deposits will be forced out of the muffler plug hole (Item 1) **[Figure 313]**.

Stop the engine. Install and tighten the plug.

Close the tailgate.

IMPORTANT

This machine is factory equipped with a U.S.D.A. Forestry Service approved spark arrester exhaust system.

The spark arrester muffler, if equipped, must be cleaned to keep it in working condition. The spark arrester muffler must be serviced by dumping the spark chamber every 100 hours of operation.

On some models, the turbocharger functions as the spark arrester and must operate correctly for proper spark arrester function.

If this machine is operated on flammable forest, brush, or grass covered land, it must be equipped with a spark arrester 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 arrester requirements.

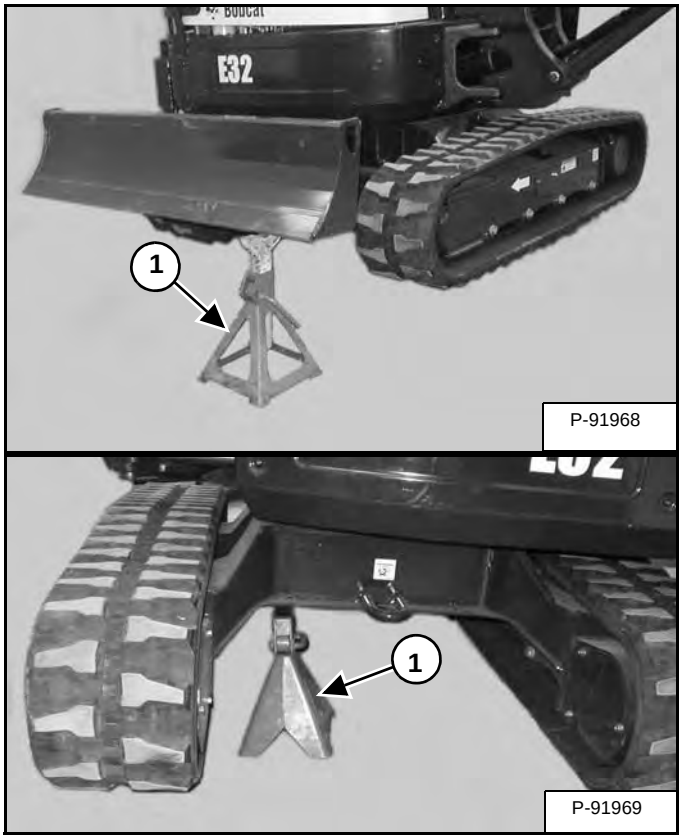
I-2284-0111

TRACK TENSION

NOTE: The wear of the pins and bushings on the undercarriage vary with the working conditions and the different types of soil conditions. It is necessary to inspect track tension and maintain the correct tension. See SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 136.)

Adjusting

Figure 314



Raise one side of the machine (Approximately four inches) using the boom and arm.

Raise the blade fully and install jackstands under the blade and track frame (Item 1) **[Figure 314]**. Lower the boom 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

Adjusting (Cont'd)

Rubber Track Clearance

Figure 315

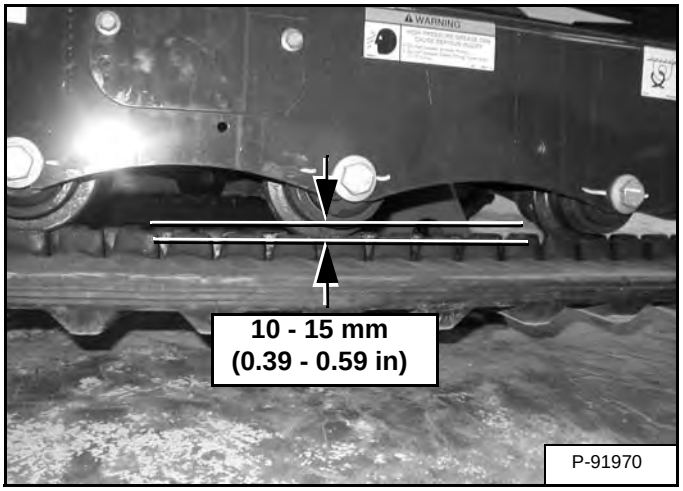
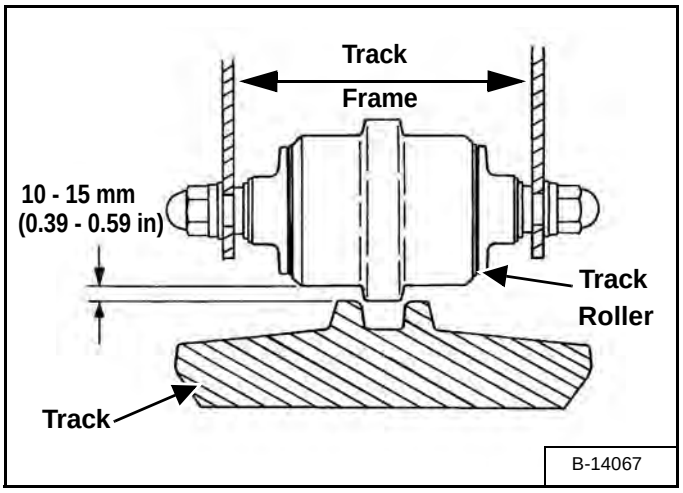


Figure 316

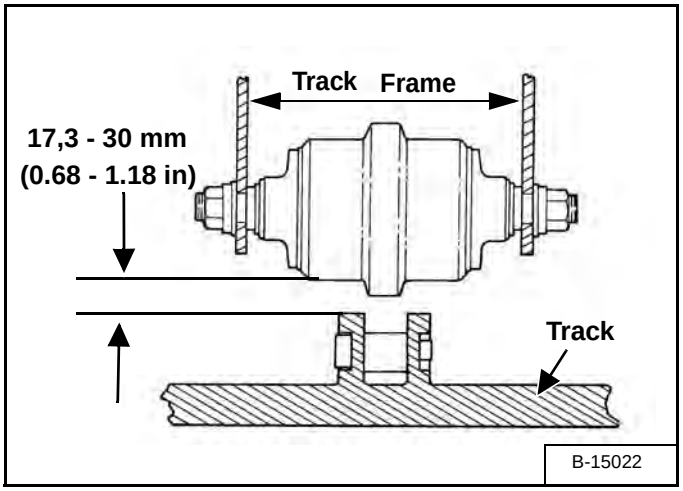


Measure the clearance at the middle track roller. Do not get fingers into pinch points between the track and the track roller. Use a bolt or a dowel of the appropriate size to check the gap between the contact edge of the roller and the top edge of the track guide **[Figure 315]** and **[Figure 316]**.

Rubber Track Clearance - 10 - 15 mm (0.39 - 0.59 in).

Steel Track Clearance

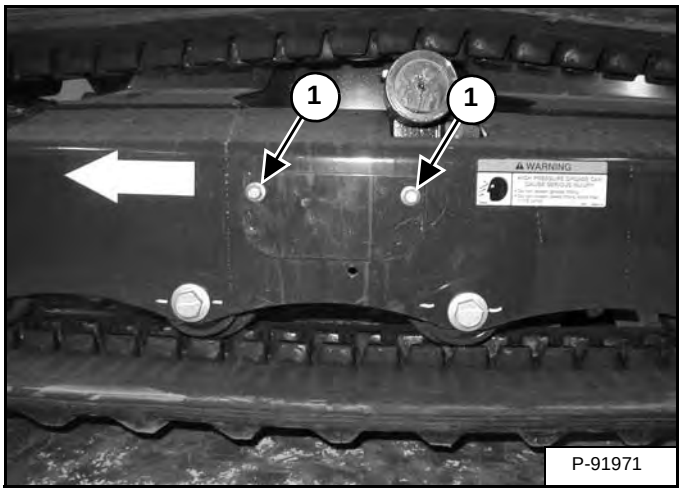
Figure 317



Measure the track clearance at the middle track roller. Do not get fingers into pinch points between the track and the track roller. Us a bolt or dowel of the appropriate size to check the gap between the contact edge of the roller and the top edge of the track guide **[Figure 317]**.

Steel Track Clearance - 17,3 - 30 mm (0.68 - 1.18 in).

Figure 318



Loosen the two bolts from the cover (Item 1) **[Figure 318]**. Pivot the cover downward.

TRACK TENSION (CONT'D)

Adjusting (Cont'd)

⚠ WARNING

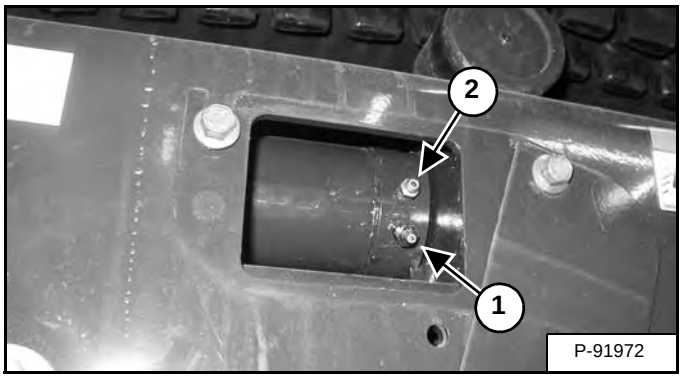
HIGH PRESSURE GREASE CAN CAUSE SERIOUS INJURY

- **Do not loosen the track tension fitting more than 1 - 1/2 turns.**

W-2994-0515

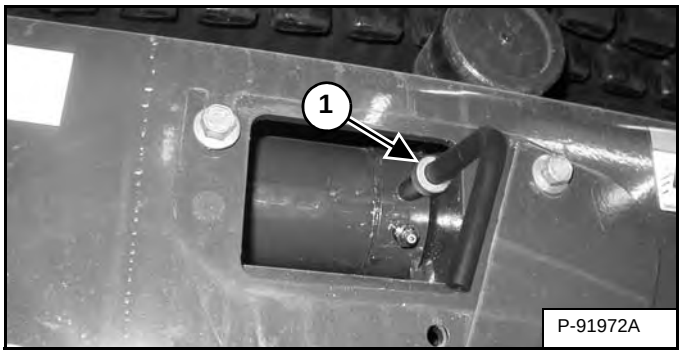
With Bleed Screw and Track Tension Fitting

Figure 319



Add grease to the track tension fitting (Item 1) **[Figure 319]** until the track tension is correct.

Figure 320



The tension removal tool (P/N 6675936) is available and recommended to direct the flow of grease to aid in cleanup. Always dispose of the grease in an environmentally friendly manor.

Use tool 6675936 (Item 1) **[Figure 320]** to loosen the bleed fitting (Item 2) **[Figure 319]** to release tension from the track. Do not loosen the bleed fitting more than 1-1/2 turns.

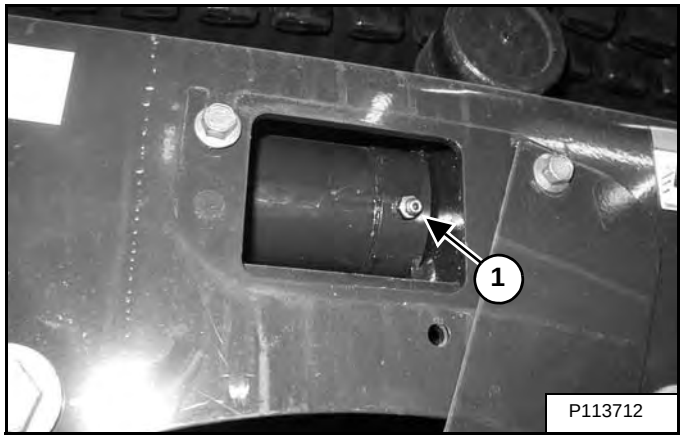
The tool is sized to fit the bleed fitting (Item 2) **[Figure 319]**.

NOTE: Do not loosen the track tension fitting (Item 1) [Figure 319].

Repeat the procedure for the opposite side.

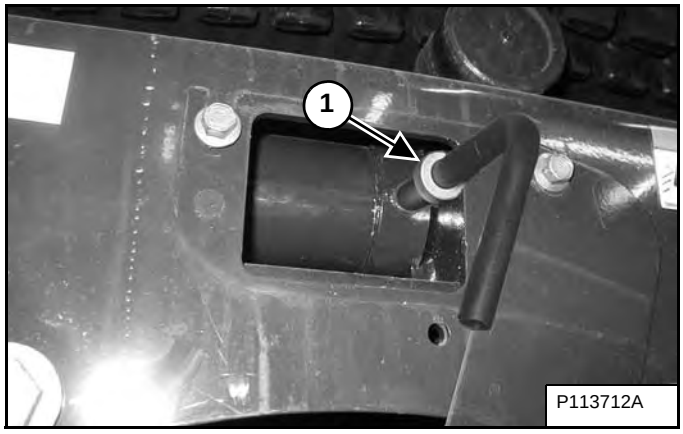
With One Piece - Track Tension Fitting

Figure 321



Add grease to the track tension fitting (Item 1) **[Figure 321]** until the track tension is correct.

Figure 322



The tension removal tool (P/N 7277225) is available and recommended to direct the flow of grease to aid in cleanup. Always dispose of the grease in an environmentally friendly manor.

Use tool 7277225 (Item 1) **[Figure 322]** to loosen the track tension fitting (Item 1) **[Figure 321]** to release tension from the track.

The tool is sized to fit the one piece track tension fitting (Item 1) **[Figure 321]**.

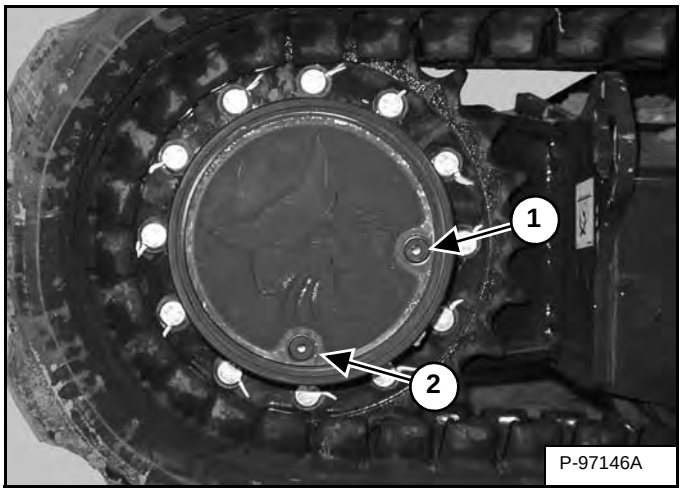
NOTE: Do not loosen the track tension fitting (Item 1) [Figure 321] more than 1-1/2 turns.

Installation: Tighten the track tension fitting to 24 - 30 N•m (18 - 22 ft-lb) torque.

Repeat the procedure for the opposite side.

Checking And Adding Oil

Figure 323



Park the excavator on a level surface with the plugs (Items 1 and 2) **[Figure 323]** positioned as shown.

Remove the plug (Item 1) **[Figure 323]**. The lube level must be at the bottom edge of the hole.

Add lubricant (SAE 90W) through the hole (Item 1) **[Figure 323]** if the lube level is low.

Repeat the procedure for the opposite travel motor.

Removing And Replacing Oil

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 136.)

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2103-0508

Park the excavator on a level surface with plugs (Items 1 and 2) **[Figure 323]** positioned as shown. Remove both plugs and drain the lubricant into a container.

Install the bottom plug (Item 2). Add lubricant (SAE 90W) through the plug hole (Item 1) **[Figure 323]** until the lube level is at the bottom edge of the hole. (See Capacities on Page 240.)

Install the plug (Item 1) **[Figure 323]**.

Repeat the procedure for the opposite travel motor.

ALTERNATOR BELT

Belt Adjustment

The alternator belt is a special maintenance free type that is pretensioned over the pulleys. This belt eliminates the need for a tensioning device and does not require periodic adjustment. Contact your Bobcat dealer for replacement parts.

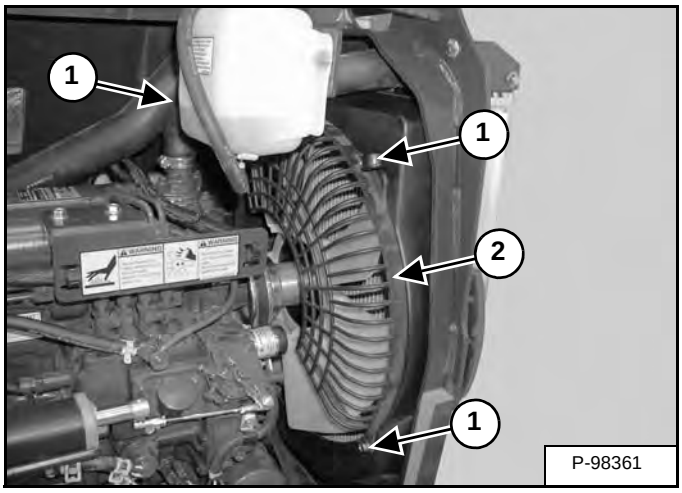
Belt Replacement

Stop the engine and open the tailgate. (See TAILGATE on Page 142.)

NOTE: If the machine is equipped with air conditioning, the compressor belt will need to be removed before the alternator belt can be removed.

Removal

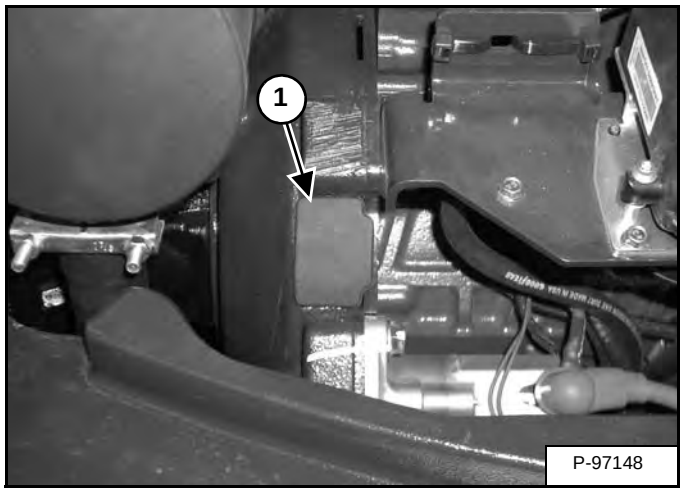
Figure 324



Remove the air conditioning compressor belt (if equipped). (See AIR CONDITIONING COMPRESSOR BELT on Page 174.)

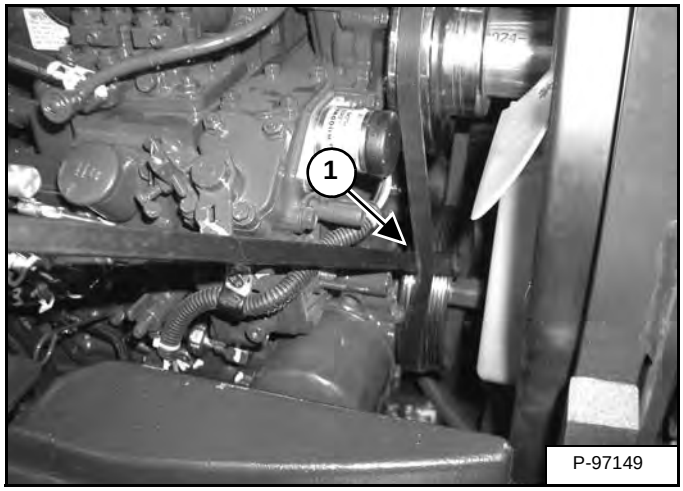
Remove the three bolts (Item1) and remove the fan guard (Item 2) **[Figure 324]**.

Figure 325



The engine will need to be rotated by hand to remove the belt. To access the flywheel, remove the plug (Item 1) **[Figure 325]** from the flywheel housing. (A pry bar will be needed to rotate the flywheel to assist in belt removal and installation.)

Figure 326

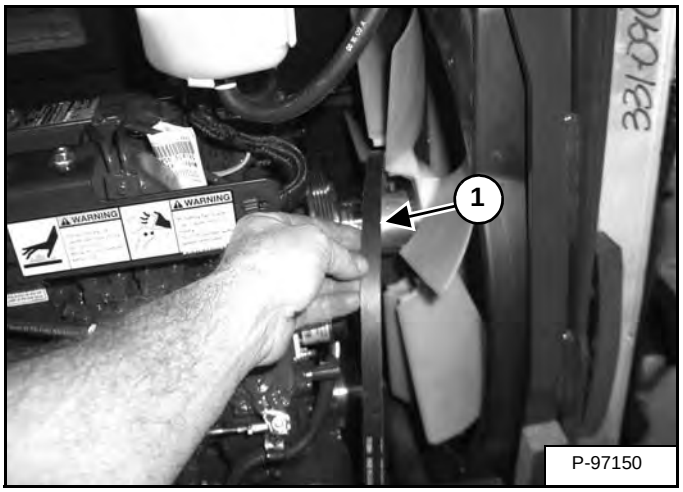


Use a pry bar between the belt and the crankshaft pulley (Item 1) **[Figure 326]**.

Using a pry bar on the flywheel, rotate the engine by hand to push the belt off the crankshaft pulley. Continue to rotate the flywheel until the belt is loose.

Belt Replacement (Cont'd)

Figure 327

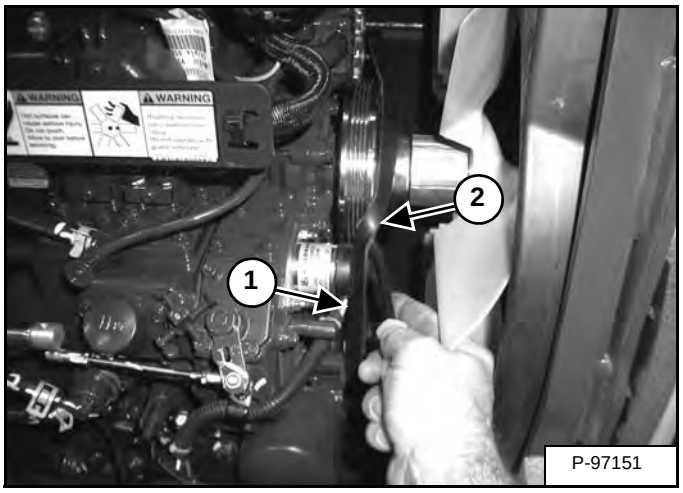


Remove the belt (Item 1) **[Figure 327]** by sliding it over the fan blades.

Installation

Position the belt (Item 1) **[Figure 327]** over the fan blades.

Figure 328



Install the belt (Item 1) **[Figure 328]** over the alternator pulley, the crankshaft pulley and over the fan spacer.

Use a pry bar (Item 2) **[Figure 328]** to position the belt onto the fan pulley.

Using a pry bar, rotate the flywheel by hand while using the second pry bar to install the belt over the fan pulley.

Continue to rotate the engine by hand until the belt is fully on the pulleys.

Reinstall the rubber plug (Item 1) **[Figure 325]**.

Install the fan guard (Item 2) with the three bolts (Item1) **[Figure 324]**.

Close the tailgate.

AIR CONDITIONING COMPRESSOR BELT

Belt Adjustment

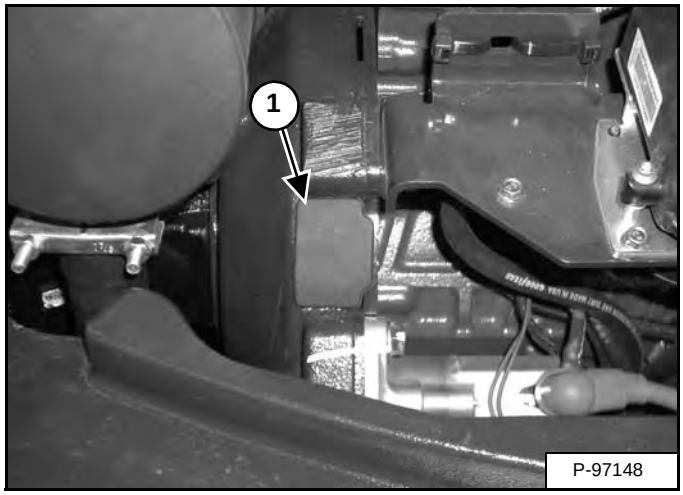
The fan belt is a special maintenance free type that is pretensioned over the pulleys. This belt eliminates the need for a tensioning device and does not require periodic adjustment. Contact your Bobcat dealer for replacement parts.

Belt Replacement

Stop the engine and open the tailgate. (See TAILGATE on Page 142.)

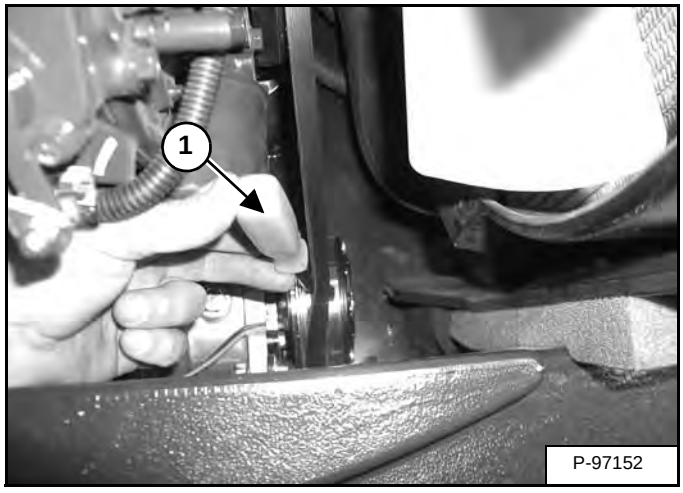
Removal

Figure 329



The engine will need to be rotated by hand to remove the belt. To access the flywheel, remove the plug (Item 1) **[Figure 329]** from the flywheel housing.

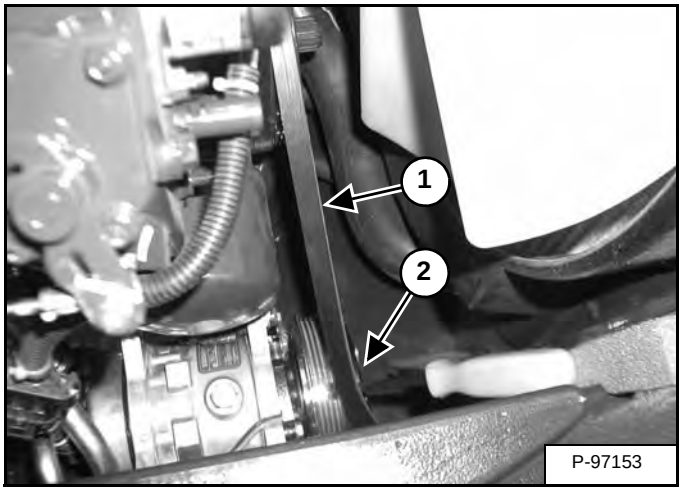
Figure 330



Use a pry bar (Item 1) **[Figure 330]** to push the belt off of the pulley. Using a pry bar on the flywheel, rotate the engine by hand to push the belt off the crankshaft pulley. Continue to rotate the flywheel until the belt is loose. Remove the belt.

Installation

Figure 331



Position the belt (Item 1) **[Figure 331]** over the crankshaft pulley and to the compressor pulley.

Use a pry bar (Item 2) **[Figure 331]** to position the belt on the pulley while using the second pry bar at the flywheel to rotate the engine by hand.

Continue to rotate the engine by hand until the belt is fully on the pulleys.

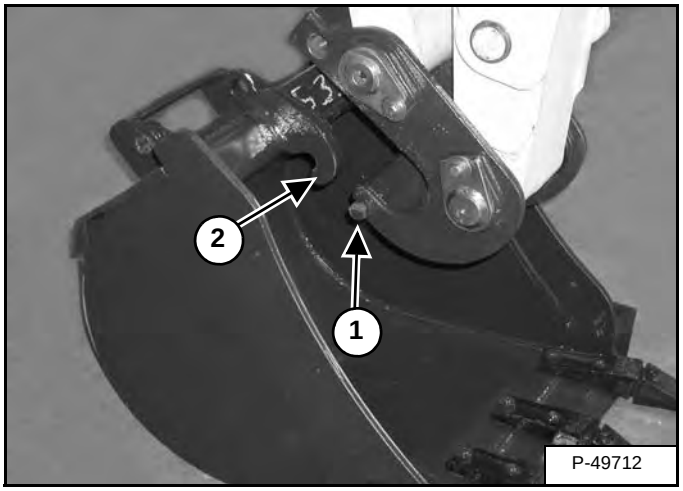
Reinstall the rubber plug (Item 1) **[Figure 329]**.

Close the tailgate.

X-CHANGE

Inspection And Maintenance

Figure 332



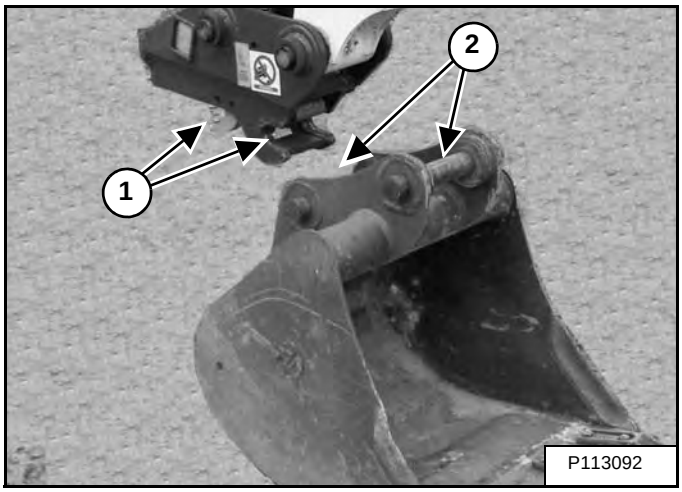
Inspect the X-Change for wear or damage. Inspect the X-Change pins (Item 1) and hooks (Item 2) **[Figure 332]** (on the attachment) for wear or damage.

Repair or replace damaged parts.

PIN GRABBER QUICK COUPLER

Inspection And Maintenance

Figure 333



Inspect the pin grabber clasps (Item 1) and the pins (Item 2) **[Figure 333]** (on the attachment) for wear or damage.

Repair or replace damaged parts.

Pin Grabber Quick Coupler Troubleshooting

If the Pin Grabber Quick Coupler does not function correctly, the following components may need servicing. See your Bobcat dealer for service.

BUZZER / BLINK CODES	COMPONENT
1 beep / 1 blink (repeating)	Solenoid
2 beep / 2 blink (repeating)	Pressure Sender
3 blink (repeating)	Buzzer
Buzzer sounds / LED not lit	Switch LED

TRACK ROLLER AND IDLER LUBRICATION

Procedure

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

Bucket Teeth Removal And Installation

⚠ WARNING

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

- **Pressurized fluids and springs or other stored energy components.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

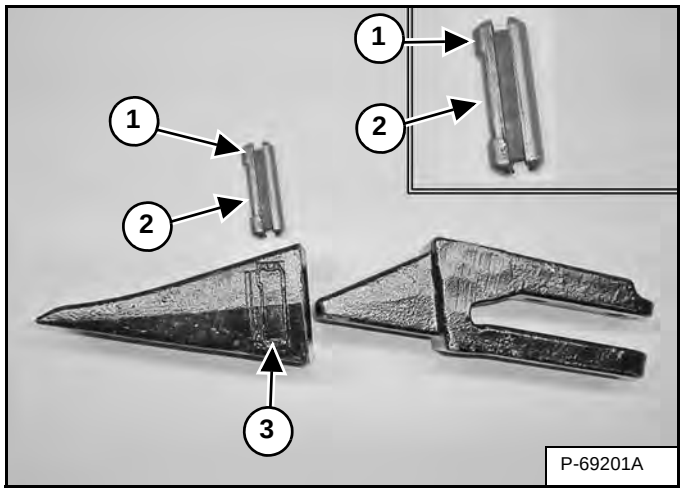
W-2505-0604

Position the bucket so the bucket teeth are at a 30° angle up from the ground for accessibility to the teeth.

Lower the boom until the bucket is fully on the ground.

Stop the engine and exit the excavator.

Figure 334



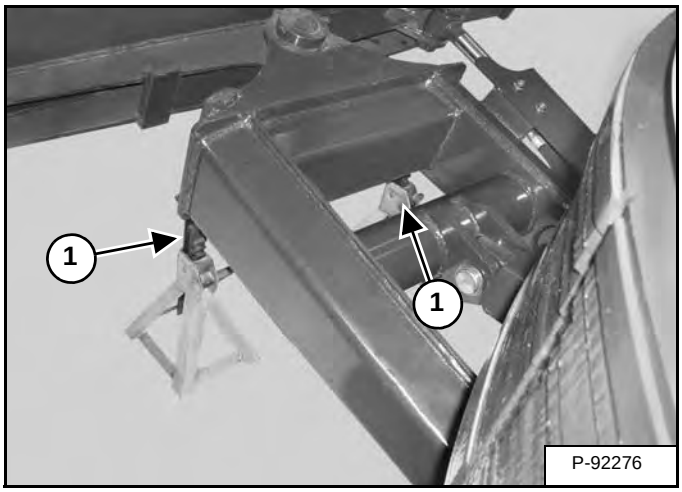
The retaining pin (Item 1) must be installed as shown [notch (Item 2) to the front] for proper fit and tooth retention. The side of the tooth point (Item 3) **[Figure 334]** also shows the correct orientation of the retaining pin.

Installation: Position the new tooth point on the shank and install a new retaining pin. Install the retaining pin until it is flush with the top of the point.

CUTTING EDGE (ANGLE BLADE ONLY)

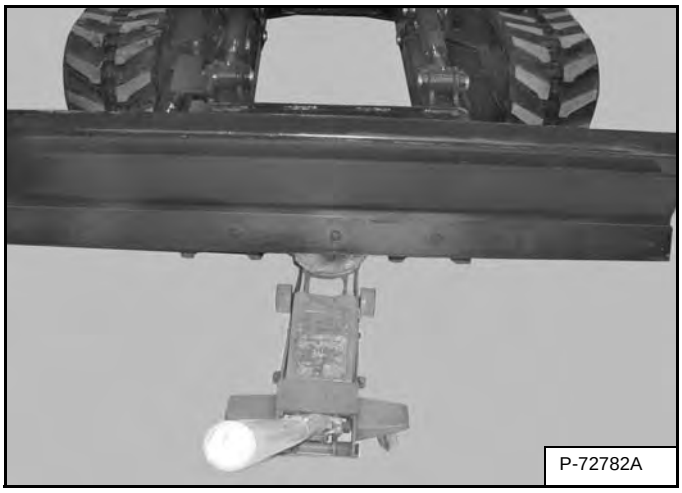
Removal And Installation

Figure 335



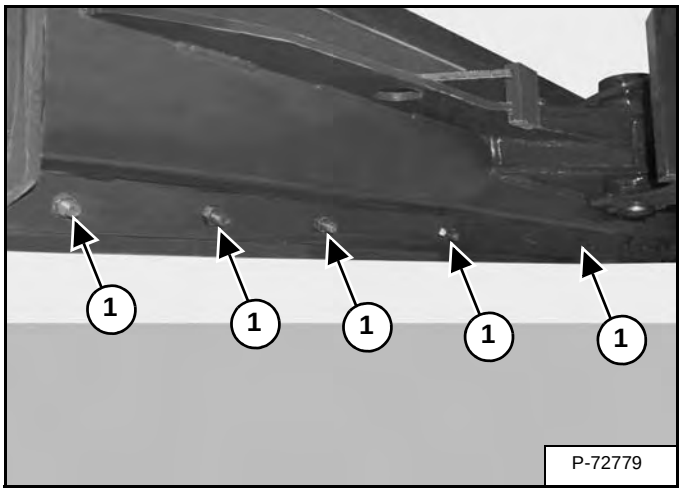
Raise the blade fully and install jackstands (Item 1) **[Figure 335]** under the blade arms.

Figure 336



Place a jack under the cutting edge **[Figure 336]**.

Figure 337



Remove the seven nuts (Item 1) **[Figure 337]** and bolts from the cutting edge.

Lower the jack and remove the cutting edge.

Installation: Tighten nuts to 125 N•m (90 ft-lb) torque.

NOTE: Cutting edge is reversible and replaceable.

LUBRICATION OF THE HYDRAULIC EXCAVATOR

Lubrication Locations

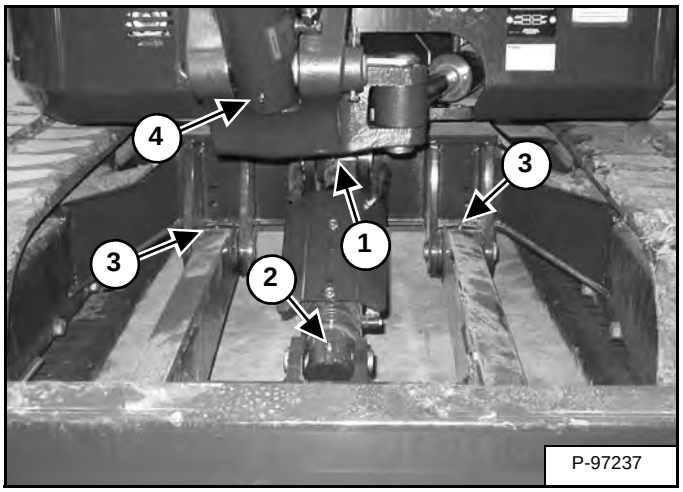
Lubricate the excavator as specified in the SERVICE SCHEDULE for the best performance of the machine. (See SERVICE SCHEDULE on Page 136.)

Always use a good quality lithium based multipurpose grease when lubricating the machine. Apply the lubricant until extra grease shows.

NOTE: Use Extra Heavy Gear Shield grease for grease fittings (Item 20, 21 and 22).

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

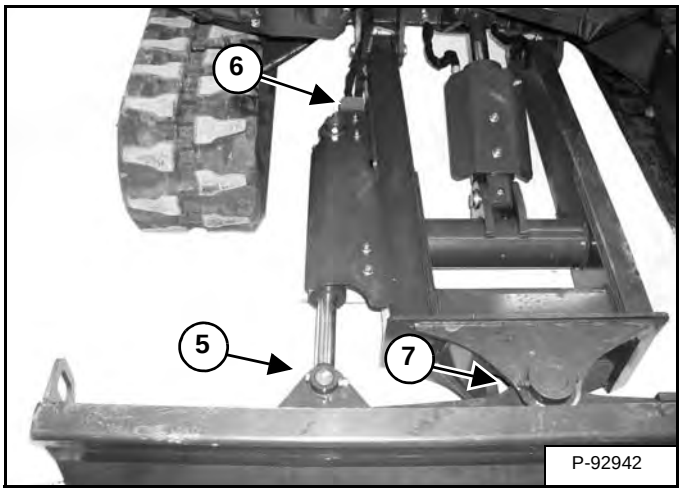
Figure 338



Ref Description (# of Fittings)

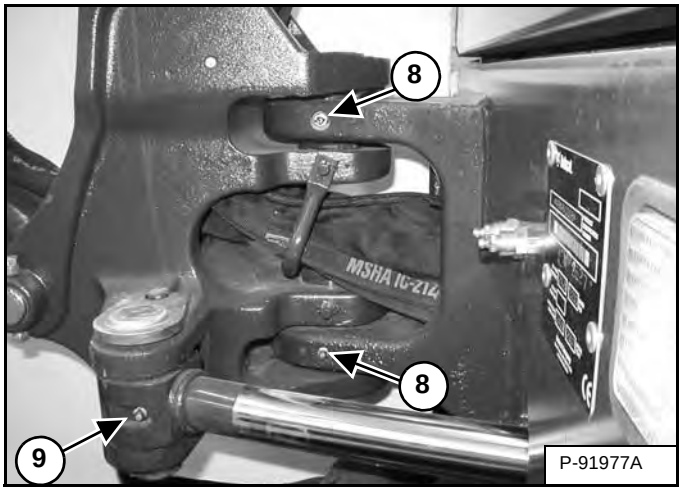
1. Blade Cylinder Rod End (1) **[Figure 338]**
2. Blade Cylinder Base End (1) **[Figure 338]**
3. Blade Pivots (2) **[Figure 338]**
4. Boom Cylinder Base End (1) **[Figure 338]**

Figure 339



5. Angle Blade Cylinder Rod End (1) **[Figure 339]** (If Equipped)
6. Angle Blade Cylinder Base End (1) **[Figure 339]** (If Equipped)
7. Angle Blade Pivot (1) **[Figure 339]** (If Equipped)

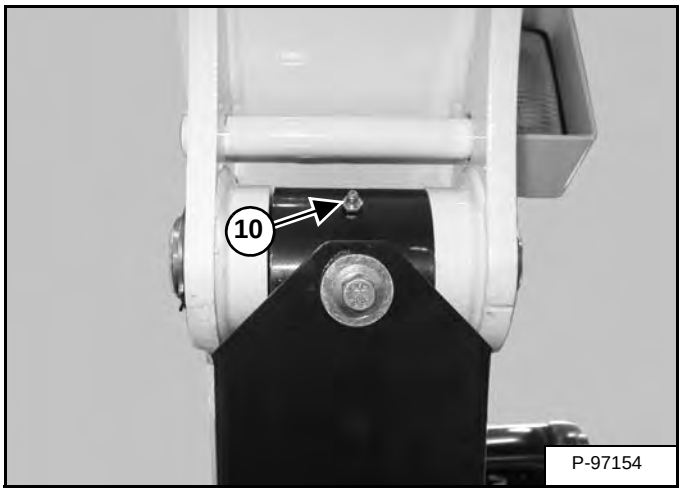
Figure 340



8. Boom Swing Pivot (2) **[Figure 340]**
9. Boom Swing Cylinder Rod End (1) **[Figure 340]**

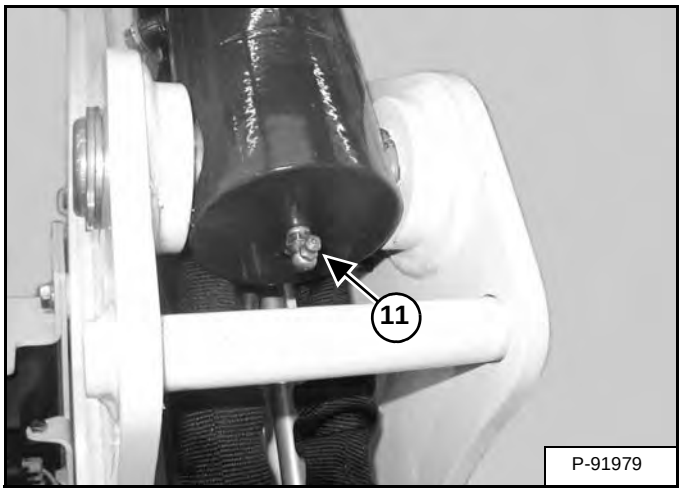
Lubrication Locations (Cont'd)

Figure 341



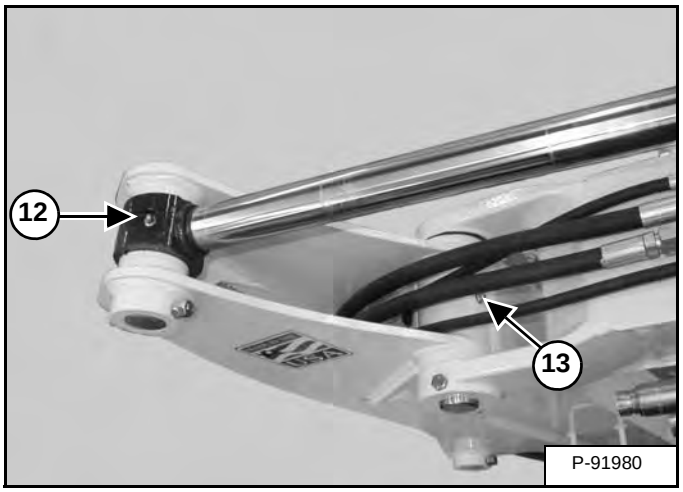
10. Boom Cylinder Rod End (1) **[Figure 341]**

Figure 342



11. Arm Cylinder Base End (1) **[Figure 342]**

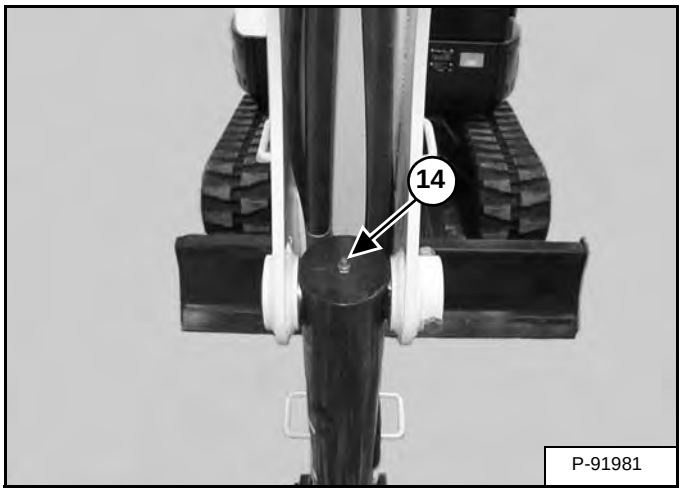
Figure 343



12. Arm Cylinder Rod End (1) **[Figure 343]**

13. Arm Pivot (1) **[Figure 343]**

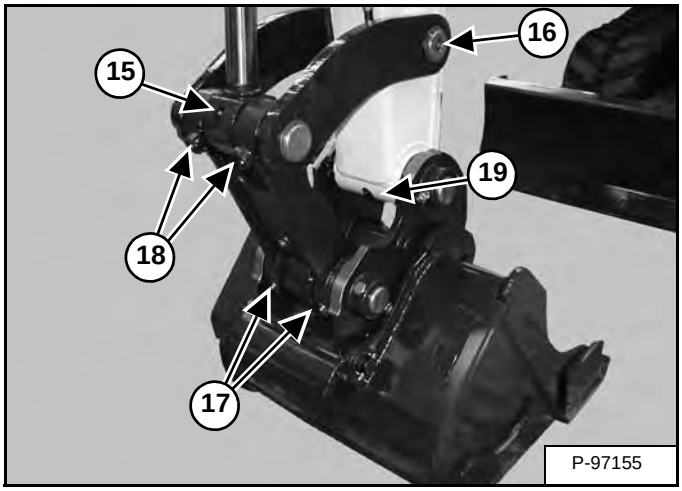
Figure 344



14. Bucket Cylinder Base End (1) **[Figure 344]**

Lubrication Locations (Cont'd)

Figure 345



15. Bucket Cylinder Rod End (1) **[Figure 345]**

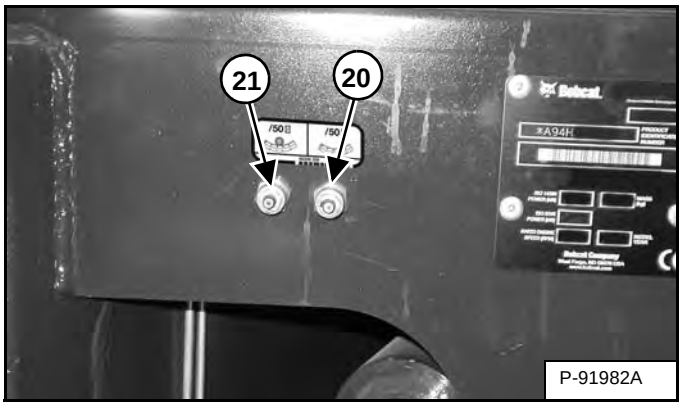
16. Bucket Link Pin (1) **[Figure 345]**

17. Bucket Pivot (3) **[Figure 345]**

18. Bucket Link (2) **[Figure 345]**

19. Arm (1) **[Figure 345]**

Figure 346



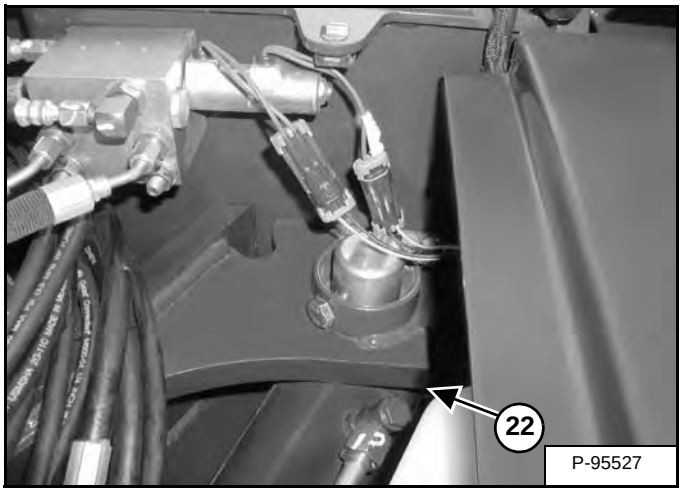
Lubricate the following locations on the hydraulic excavator **EVERY 50 HOURS**:

NOTE: Use Extra Heavy Gear Shield grease for grease fittings (Item 20, 21 and 22).

20. Swing Circle (1) **[Figure 346]**

21. Swing Pinion (1) **[Figure 346]** (Install 3 to 4 pumps of grease then rotate the upperstructure 90°. Install 3 to 4 pumps of grease and again rotate the upperstructure 90°. Repeat this until the slew pinion has been greased at four positions.)

Figure 347



Lubricate the following location on the hydraulic excavator **EVERY 1000 HOURS**:

NOTE: Use Extra Heavy Gear Shield grease for grease fittings (Item 20, 21 and 22).

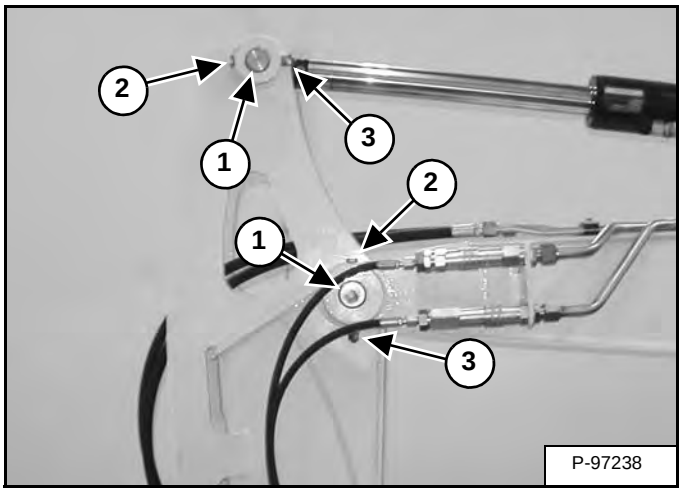
22. Boom Swing Cylinder Base (1) **[Figure 347]**

NOTE: The boom swing grease fitting is located on the side of base end of the cylinder.

PIVOT PINS

Inspection And Maintenance

Figure 348



The pivots and cylinders (Item 1) have a large pin held in position with a bolt (Item 2) and double nuts (Item 3) **[Figure 348]** securing the pin.

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

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.
- Clean the three HVAC drain valves.

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.

DIAGNOSTIC SERVICE CODES

Viewing Service Codes

The Service Codes will aid your dealer in diagnosing conditions that can damage your machine.

Standard Instrument Panel

Figure 349

Press the Information button (Item 2) to cycle the data display (Item 1) **[Figure 349]** until the service code screen is displayed. If more than one service code is present, the codes will scroll on the data display.

When no service code is present, **[NONE]** is displayed **[Figure 349]**.

NOTE: Corroded or loose grounds can cause multiple service codes and / or abnormal symptoms. All instrument panel lights flashing, alarm sounding, headlights and taillights flashing, can indicate a bad ground. The same symptoms can apply if the voltage is low, such as loose or corroded battery cables. If you observe these symptoms, check grounds and positive leads first.

Deluxe Instrument Panel

The last 40 codes stored in history can also be viewed using the Deluxe Instrument Panel.

	Press a scroll button (Item 1) repeatedly until the Active Warnings screen icon (Inset) is highlighted.
	The ACTIVE WARNINGS screen displays active service codes. Press **[9]** to view the next service code if more than one is present. Press **[4]** to display a history of service codes.
	The WARNINGS HISTORY screen will list the Service Code Number **(CODE)**, Hourmeter reading when the error occurred **(HOUR)**, and the User **(USER)** who was logged in to operate the machine when the error occurred.
Press **[9]** to view the next eight service codes. A total of 40 codes can be stored. When more than 40 codes occur, the oldest code will disappear and the newest code will be in the number 1 position.	
	Press the list number next to the service code for more detail. Press the left scroll button to back up one screen.

Number Codes List

CODE		CODE	
E0105	Throttle actuator short to battery	L0102	Lights Button Error On
E0106	Throttle actuator short to ground	L0202	High Flow Button Error On
E0107	Throttle actuator open circuit	L0302	Auxiliary Button Error On
		L0402	Information Button Error On
E0123	Throttle actuator not calibrated		
		L7404	Gateway Controller No Communication
E0321	5 volt supply out of range high		
E0322	5 volt supply out of range low	L7672	Left Hand Panel Programming Error
E0421	Throttle sensor out of range high		
E0422	Throttle sensor out of range low	M0216	Hydraulic Filter Not Connected
		M0217	Hydraulic Filter Plugged
E0521	Throttle actuator feedback out of range high		
E0522	Throttle actuator feedback out of range low	M0309	Battery Voltage Low
		M0310	Battery Voltage High
E3128	Interrupted power failure log only	M0311	Battery Voltage Extremely High
		M0314	Battery Voltage Extremely Low
E3297	Controller programmed log only	M0322	Battery Voltage Out of Range Low
		M0414	Engine Oil Pressure Extremely Low
		M0415	Engine Oil Pressure Shutdown
H2521	Angle Blade Control Switch Out of Range High		
H2522	Angle Blade Control Switch Out of Range Low		
H2524	Angle Blade Control Switch Out of NEUTRAL	M0610	Engine Speed High
		M0611	Engine Speed Extremely High
H2605	Angle Blade Base Solenoid Short to Battery	M0613	Engine Speed No Signal
H2606	Angle Blade base Solenoid Short to Ground	M0615	Engine Speed Shutdown
H2607	Angle Blade Base Solenoid Open Circuit	M0618	Engine Speed Out of Range
H2632	Angle Blade Base Solenoid Overcurrent		
H2705	Angle Blade Rod Solenoid Short to Battery	M0710	Hydraulic Oil Temperature High
H2706	Angle Blade Rod Solenoid Short to Ground	M0711	Hydraulic Oil Temperature Extremely High
H2707	Angle Blade Rod Solenoid Open Circuit	M0715	Hydraulic Oil Temperature Shutdown
H2732	Angle Blade Rod Solenoid Overcurrent	M0721	Hydraulic Oil Temperature Out of Range High
		M0722	Hydraulic Oil Temperature Out of Range Low
H3128	Interrupted Power Failure		
		M0810	Engine Coolant Temperature High
H4423	Secondary Controller Not Programmed	M0811	Engine Coolant Temperature Extremely High
H4497	Secondary Controller Programmed	M0815	Engine Coolant Temperature Shutdown
		M0821	Engine Coolant Temperature Out of Range High
H4621	5V Sensor Supply Out of Range High	M0822	Engine Coolant Temperature Out of Range Low
H4622	5V Sensor Supply Out of Range Low	M0216	Hydraulic Filter Not Connected
H7404	Main Controller No Communication		
H7604	Display No Communication		

DIAGNOSTICS SERVICE CODE (CONT'D)

Number Codes List (Cont'd)

CODE		CODE	
M0909	Fuel Level Low	M2721	Throttle Sensor Out of Range High
M0921	Fuel Level Out of Range High	M2722	Throttle Sensor Out of Range Low
M0922	Fuel Level Out of Range Low		
		M3128	Interrupted Power Failure
M1121	Console Sensor Out of Range High		
M1122	Console Sensor Out of Range Low	M3204	Throttle Controller No Communication
M1128	Console Sensor Failure		
		M3304	Deluxe Panel No Communication
M1305	Fuel Hold Solenoid Short to Battery		
M1306	Fuel Hold Solenoid Short to Ground	M3404	RFID Key Controller No Communication
M1307	Fuel Hold Solenoid Open Circuit		
		M3702	Hyd Exchange Output Error On
M1402	Fuel Pull Output Error On	M3703	Hyd Exchange Output Error Off
M1403	Fuel Pull Output Error Off		
M1407	Fuel Pull Output Open Circuit		
M1428	Fuel Pull Output Failure		
		M4109	Alternator Low
M1705	Hydraulics Enable Solenoid Short to Battery	M4110	Alternator High
M1706	Hydraulics Enable Solenoid Short to Ground		
M1707	Hydraulics Enable Solenoid Open Circuit	M4304	Keyless Start Panel No Communication
M1732	Hydraulics Enable Solenoid Overcurrent		
		M4404	Secondary Controller No Communication
M2005	Two-Speed Solenoid Short to Battery		
M2006	Two-Speed Solenoid Short to Ground	M4621	5V Sensor Supply Out of Range High
M2007	Two-Speed Solenoid Open Circuit	M4622	5V Sensor Supply Out of Range Low
M2102	Glow Plug Output Error On	M4721	8V Sensor Supply Out of Range High
M2103	Glow Plug Output Error Off	M4722	8V Sensor Supply Out of Range Low
M2107	Glow Plug Output Open Circuit		
M2128	Glow Plug Output Failure	M5002	Light Output Error On
		M5003	Light Output Error Off
M2202	Starter Output Error On		
M2203	Starter Output Error Off	M5205	Offset Base Solenoid Short to Battery
M2207	Starter Output Open Circuit	M5206	Offset Base Solenoid Short to Ground
M2228	Starter Output Failure	M5207	Offset Base Solenoid Open Circuit
		M5232	Offset Base Solenoid Overcurrent
M2302	Starter Relay Error On		
M2303	Starter Relay Error Off	M5305	Offset Rod Solenoid Error On
		M5306	Offset Rod Solenoid Short to Ground
M2402	Fuel Pull Relay Error On	M5307	Offset Rod Solenoid Open Circuit
M2403	Fuel Pull Relay Error Off	M5332	Offset Rod Solenoid Overcurrent
M2521	Load Sense Sensor Out of Range High	M5421	Offset Control Switch Out of Range High
M2522	Load Sense Sensor Out of Range Low	M5422	Offset Control Switch Out of Range Low
		M5424	Offset Control Switch Out of NEUTRAL
M2602	Glow Plug Relay Error On		
M2603	Glow Plug Relay Error Off		

DIAGNOSTICS SERVICE CODE (CONT'D)

Number Codes List (Cont'd)

CODE		CODE	
M5505	Auxiliary Base Solenoid Short to Battery	M7423	Main Controller Not Programmed
M5506	Auxiliary Base Solenoid Short to Ground	M7497	Main Controller Software Updated
M5507	Auxiliary Base Solenoid Open Circuit		
M5532	Auxiliary Base Solenoid Overcurrent	M7604	Standard Display Panel No Communication
M5605	Auxiliary Rod Solenoid Short to Battery	M7748	Key Switch Multiple
M5606	Auxiliary Rod Solenoid Short to Ground		
M5607	Auxiliary Rod Solenoid Open Circuit	M7839	Hourmeter Changed
M5632	Auxiliary Rod Solenoid Overcurrent		
M5721	Auxiliary Control Switch Out of Range High		
M5722	Auxiliary Control Switch Out of Range Low		
M5724	Auxiliary Control Switch Out of NEUTRAL		
M6204	Load Moment Sensor In Error	R7404	No Communication To Main Controller
M6402	Switched Power Relay Error On		
M6403	Switched Power Relay Error Off		
M6702	HVAC Output Error On		
M6703	HVAC Output Error Off		
M6905	Hydraulic Throttle Solenoid Short to Battery		
M6906	Hydraulic Throttle Solenoid Short to Battery		
M6907	Hydraulic Throttle Solenoid Open Circuit		
M6923	Hydraulic Throttle Solenoid Not Calibrated		
M6932	Hydraulic Throttle Solenoid Overcurrent		
M7002	Switched Power Output Error On		
M7003	Switched Power Output Error Off		
M7007	Switched Power Output Open Circuit		
M7028	Switched Power Output Failure		

CONTROL PANEL SETUP

Panel Setup (Deluxe Instrument Panel)

Icon Identification

Figure 350

ICON	DESCRIPTION
Mon, 17 Mar 3:45 PM	DATE / TIME
MINNY 234.5	USER / USER HOURS
Machine 353.5	MACHINE HOURS (HOURMETER)
	ACTIVE WARNINGS screen icon
	VITALS screen icon
	SERVICE screen icon
	AUTO IDLE Status icon
	ATTACHMENTS screen icon
	MACHINE SETTINGS screen icon
	DISPLAY screen icon
	HOME icon (Return to MAIN screen)
	LEFT SCROLL button RIGHT SCROLL button
ENTER	ENTER button

Vitals

	Press a scroll button (Item 1) repeatedly until the Vitals screen icon (Inset) is highlighted.
	Displays select system operating levels.
You can monitor real-time displays of: **Engine Speed (RPM)** **Engine Coolant Temperature** **System Voltage** **Hydraulic Fluid Temperature**	

The Deluxe Instrument Panel is easy to use. Continue to set your own preferences for operating / monitoring your Bobcat excavator.

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

Date And Time

	Press a scroll button (Item 1) repeatedly until the Display screen icon (Inset) is highlighted.
	Select **[1. CLOCKS]**.
	Select **[1. TIME]**.
	Use the keypad to enter time. Select AM / PM / 24hr. Press **[ENTER]** to continue.
	Select **[2. DATE]**.
	Use the keypad to enter date. Press **[ENTER]** to continue.

Languages

	Press a scroll button (Item 1) repeatedly until the Display screen icon (Inset) is highlighted.
	Select **[2. LANGUAGES]**.
	Select the desired language.

English / Metric Display

	Press a scroll button (Item 1) repeatedly until the Display screen icon (Inset) is highlighted.
	Select **[4. DISPLAY SETTINGS]**. Press **[1]** to cycle between ENGLISH and METRIC.

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

Auto Idle Time Delay

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

Job Clock Reset

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

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

Alarm Clock Reset

	Press a scroll button (Item 1) repeatedly until the Display screen icon (Inset) is highlighted.
	Select **[3. ALARM CLOCK]**.
	Select **[1. OFF ONCE]**, Select **[2. ON Daily]** or Select **[3. ON WEEKLY]**.
	Select **[1. OFF / ON]**, Select **[2. TIME]** or Select **[3. DAILY]**.
	Use key pad numbers to set time. Select **[7. AM]**, Select **[8. PM]** or Select **[9. 24 hr clock]**. Select **[ENTER]** to save. Press left scroll to back space numbers.
	Press **[4]** to set alarm to sleep. (When pressed, display will return to main screen.) Press **[9]** to shut off alarm. Alarm will still be active for the next day alarm setting. (When pressed, display will return to main screen.)

ECO MODE

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[3. MACHINE PERFORMANCE]**.
	Select **[2. ECO MODE]**. ECO Mode will set the maximum engine rpm to be at 85% of the high idle setting. Example: If the machine maximum engine speed is 2450 rpm, when ECO Mode is enabled, the maximum engine speed will be approximately 2080 rpm.

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

Machine History - Log In Information

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	**MACHINE SETTINGS** is visible on screen. Select **[2. MACHINE HISTORY]**.
	Select **[1. LOG-IN INFORMATION]**.
	View User Log hours and last time / dated used. Individual information can be viewed and reset back to zero. Select user **[KEY PAD 1 - 9]** to access individual user.

Machine History - User Job Statistics

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	**MACHINE SETTINGS** is visible on screen. Select **[2. MACHINE HISTORY]**.
	Select **[2. USER JOB STATISTICS]**.
	View Job Statistics (Job Hours / Idle Time . Information can be viewed and reset back to zero.

PASSWORD SETUP (KEYLESS START PANEL)

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

Machine History - Overall Job Statistics

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	**MACHINE SETTINGS** is visible on screen. Select **[2. MACHINE HISTORY]**.
	Select **[3. OVERALL JOB STATISTICS]**.

Attachments

	Press a scroll button (Item 1) repeatedly until the Attachment screen icon (Inset) is highlighted.
	**ATTACHMENTS** is visible on screen. Press **[ENTER]**.
	Press **[4]** or **[9]** repeatedly until the desired Attachment is visible in the display screen.
	Information about the attachment, recommended auxiliary hydraulic flow and tips about attachment operation will be displayed.

PASSWORD SETUP (KEYLESS START PANEL) (CONT'D)

Password Description

Master Password:

A permanent, randomly selected password set at the factory that cannot be changed. This password is used for service by the Bobcat dealer if the owner password is not known or to change the owner password.

Owner Password:

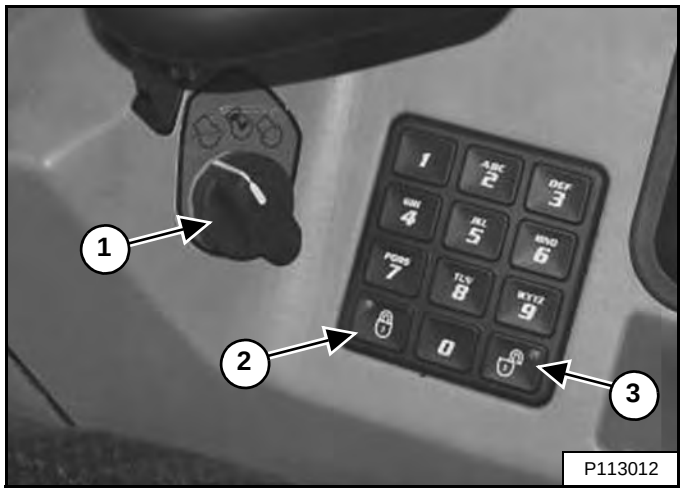
Allows for full use of the excavator. Must be used to change the owner password.

Changing The Owner Password

Turn the start switch (Item 1) **[Figure 351]** to the ON position to turn on the excavators electrical system.

Enter the five digit owner password using the number keys (1 through 0) if locked.

Figure 351



Press and hold the lock (Item 2) and unlock (Item 3) **[Figure 351]** keys for 2 seconds.

The lock key red light will flash and the instrument panel display screen will show **[ENTER]**.

Enter a new five digit owner password using the number keys (1 through 0). An asterisk will show in the left panel display screen for each key press.

The instrument panel display screen will show **[AGAIN]**.

Enter the new five digit owner password again.

The lock key red light will become solid.

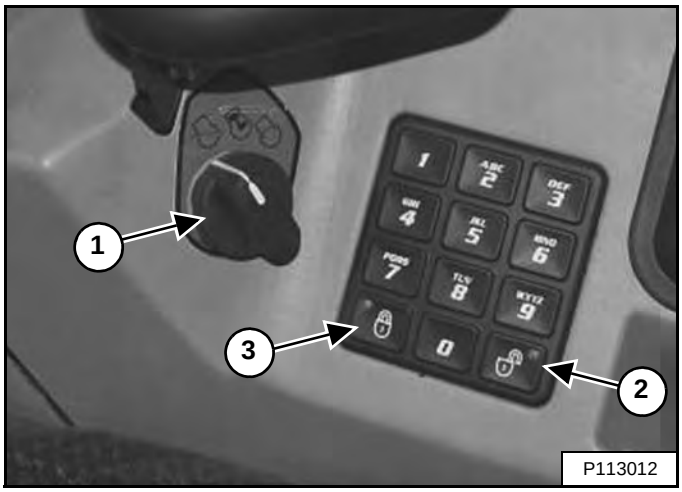
Password Lockout Feature

This feature allows the owner to unlock the password feature so that a password does not need to be used every time the engine is started.

Turn the start switch (Item 1) **[Figure 352]** to the ON position to turn on the excavators electrical system.

Enter the five digit owner password using the number keys (1 through 0).

Figure 352



Press the unlock key (Item 2) **[Figure 352]**.

The left panel display screen will show **[CODE]**.

Enter the five digit owner password using the number keys (1 through 0). The unlock key green light will flash, then become solid.

The excavator can now be started without using a password.

NOTE: Use the following procedure to reset the machine lock so that the excavator requires a password to start the engine.

Turn the start switch to the ON position to turn on the excavators electrical system.

Press the lock key (Item 3) **[Figure 352]**.

The lock key red light will flash and the left panel display screen will show **[CODE]**.

Enter the five digit owner password using the number keys (1 through 0). The unlock key green light will flash, then the lock key red light will become solid.

You must now enter the password every time to start the excavator.

PASSWORD SETUP (DELUXE INSTRUMENT PANEL)

Password Setup is available on machines with a Deluxe Instrument Panel.

Password Description

All new machines with a Deluxe Instrument Panel arrive at Bobcat dealerships with the keypad in locked mode. Locked mode means that a password must be used to start the engine.

For security purposes, your dealer may change the password and set the keypad in the locked mode. Your dealer will provide you with the password.

Master Password:

A permanent, randomly selected password set at the factory that cannot be changed. This password is used for service by the Bobcat dealer if the owner password is not known or to change the owner password.

Owner Password:

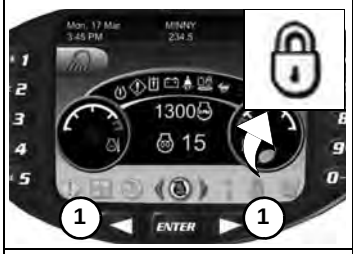
Allows for full use of the excavator and to set up the Deluxe Instrument Panel. There is only one owner password. The owner password must be used to change the owner or user passwords. Owner should change the password as soon as possible for security of the excavator.

User Password:

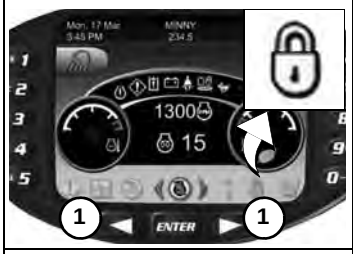
Allows starting and operating the excavator; cannot change password or any of the other setup features.

For the procedures to change passwords: (See Changing The Owner Password on Page 195.) and (See Changing The User Passwords on Page 196.)

Changing The Owner Password

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[1. USER SETTINGS]**.
	Select **[1. OWNER]**.
	Select **[2. CHANGE PASSWORD]**.
	Enter new owner password and press **[ENTER]**. You will be prompted to reenter the new owner password.

Changing The User Passwords

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[1. USER SETTINGS]**.
	Select user.
	Select **[2. CHANGE PASSWORD]**.
	Enter new user password and press **[ENTER]**.

Password Lockout Feature

This feature allows the owner to unlock the password feature so that a password does not need to be used every time the engine is started.

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[2. MACHINE LOCK]**.

NOTE: The procedure above can be followed to reset the machine lock so that the machine requires a password to start the engine.

NOTE: When the password is in UNLOCKED, no password is needed. The start switch is used to start the machine.

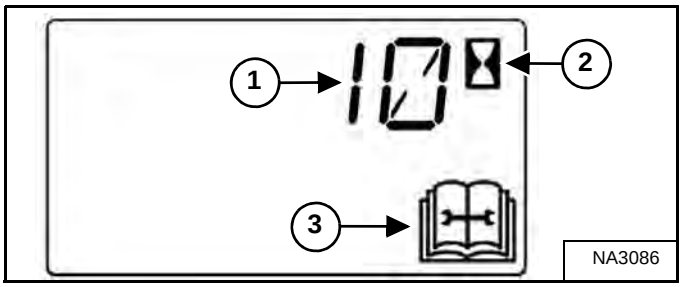
MAINTENANCE CLOCK

Description

The Maintenance Clock alerts the operator when the next service interval is due. *EXAMPLE:* The maintenance clock can be set to a 500 hour interval as a reminder for the next 500 hour planned maintenance.

Standard Instrument Panel

Figure 353



During machine operation, a 2 beep alarm will sound when there are less than 10 hours until the next planned maintenance.

The remaining hours before maintenance is required (Item 1) will appear in the data display for 5 seconds while the service icon (Item 3) and the hourmeter icon (Item 2) **[Figure 353]** flash.

NOTE: The display will show negative numbers after counting down to zero.

The display will revert to the previous display and will appear for 5 seconds every time the machine is started until the maintenance clock is reset.

Setup

See your Bobcat dealer about installation of this feature.

Reset

Figure 354

Press the Information button (Item 2) **[Figure 354]** until the display screen shows the maintenance clock.

Press and hold the Information button (Item 2) for 7 seconds until **[RESET]** (Item 1) **[Figure 354]** appears in the display screen.

Deluxe Instrument Panel

Figure 355

The Deluxe Instrument Panel (if equipped) will display a message (Item 1) **[Figure 355]** alerting the operator to service the machine.

This message will remain for 10 seconds and will appear for 10 seconds every time the machine is started until the maintenance clock is reset.

Figure 356

The Deluxe Instrument Panel (if equipped) will display a bar (Item 1) **[Figure 356]** showing the time remaining until next service. This bar will turn red when service is past due. NEXT MAINTENANCE DUE will change to MAINTENANCE PAST DUE and display the number of hours past due.

Keys **[4]** and **[9]** can be used to adjust the service interval when the owner is logged in **[Figure 356]**.

To reset the service clock after servicing the machine, press and hold key [1] **[Figure 356]** (when the owner is logged in) until the bar graph resets to 0. **[Figure 356]**

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.

SERVICE SCHEDULE

■ Service at first 50 hours, then as scheduled.
♦ Service every 10 hours when operating in water.

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 horn and motion alarm (if equipped) for proper function.
Grease all machinery pivot points. (See illustations)
Check cab and HVAC filters - clean as needed.
Check cab/canopy condition and mounting hardware.
Check seat belt condition and mounting hardware.
Check control console lockout for proper operation.
Check for damaged signs (decals) - Replace as needed.
Grease Hydraulic clamp and Angle blade if equipped.
Check X-Change (if equipped) for damage and loose parts.

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

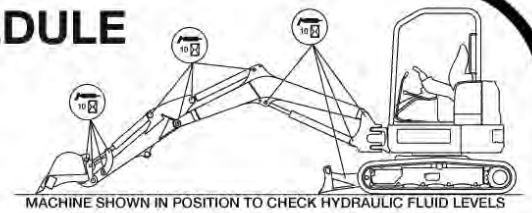
EVERY 100 HOURS
Spark Arrestor Muffler - Clean spark chamber.
■ Check and adjust V-Belt. Replace as needed. (E26)

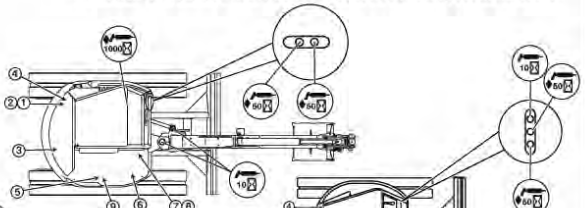
EVERY 250 HOURS
Check oil level in both final drive cases.
■ Replace Diesel fuel filter.
■ Change engine oil and filter. (Model E26)

EVERY 500 HOURS
■ Change engine oil and filter. (Model E32, E35, E42, E45, E50, E55)
Clean radiator, oil cooler and A/C condenser.
■ Replace primary hydraulic and case drain filter and reservoir breather.
■ Check alternator and starter connections. Check and adjust engine valve clearance.
■ Inspect ribbed belt(s) wear. Replace as needed.

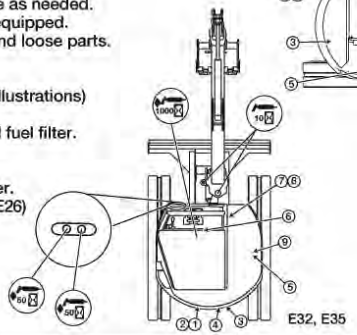
EVERY 1000 HOURS
■ Replace oil in both final drive cases. Replace hydraulic fluid and filters.
♦ Grease offset cylinder base pivot point (See illustrations)

EVERY 2 YEARS
Drain and flush cooling system - Replace coolant.


MACHINE SHOWN IN POSITION TO CHECK HYDRAULIC FLUID LEVELS


E42, E45, E50, E55

E26


E32, E35

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.

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.

FILTER CHART

		E26	E32 / E35	E42 / E45	E50 / E55
1.	PRIMARY AIR FILTER	6672467	6672467	6666375	6666375
2.	SECONDARY AIR FILTER	6672468	6672468	6666376	6666376
3.	ENGINE OIL FILTER	6657635	6675517	6675517	6675517
4.	FUEL FILTER	6667352	6667352	6667352	6667352
5.	PRIMARY HYDRAULIC FILTER	6661248	6668819	6668819	6670207
6.	CASE DRAIN HYDRAULIC FILTER	7009365	7009365	6516722	6516722
7.	RECIRLCUATION FILTER	7010332	7010332	7010332	7010332
8.	FRESH AIR FILTER	7010331	7010331	7010331	7010331
9.	BREATHER FILTER	6692836	6692836	6692836	6692836

- See illustrations above for filter locations.

See Operation & Maintenance Manual for more information and instructions.

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Service Schedule (7238018) (Cont'd)

ADVERTENCIA

EVITE LESIONES O FATALIDADES

- Mantenga la cubierta cerrada salvo para dar servicio.
- Mantenga el motor libre de material inflamable.
- Mantenga el cuerpo, objetos y ropa holgada alejados de contactos eléctricos, partes que se mueven, partes calientes y el escape.
- No utilice la máquina en un espacio con polvo o gases explosivos, o con material inflamable cerca del escape.
- Todos los gases de escape pueden matar. Ventile siempre.
- Nunca utilice éter o líquidos de arranque en motores diésel con bujías precalentadoras. Use solo 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. Use gafas de seguridad. Use cartón para revisar la presencia de fugas.
- El ácido de la batería provoca quemaduras graves. Use gafas de seguridad. Si el ácido hace contacto con los ojos, piel o ropa, lave bien y busque atención médica.
- La batería crea gases inflamables y explosivos. Mantener arcos, chispas, llamas y tabaco/cigarrillo encendido alejados.
- Para arranques en puente, conecte de último el cable negativo en el motor de la máquina (nunca en la batería). Después del arranque en puente, retire primero la conexión negativa del motor.

PROGRAMA DE MANTENIMIENTO

■ Dé servicio a las primeras 50 horas, luego según lo programado.
♦ Dé servicio cada 10 horas cuando opere en agua.

CADA 8-10 HORAS
Revise el nivel del enfriador del motor.
Revise el nivel del aceite de motor.
Revise el nivel del fluido hidráulico.
Revise el indicador de condición del depurador de aire.
Revise y ajuste la tensión de la oruga.
Revise que las luces indicadoras funcionen adecuadamente.
Revise que la bocina y la alarma de movimiento (si están equipadas) funcionan adecuadamente.
Engrase todos los puntos de pivote de la maquinaria. (Ver ilustraciones)
Revise la cabina y filtro de HVAC – limpiar si es del caso.
Revise la condición de la cabina/cubierta y el herraje de fijación.
Revise la condición del cinturón de seguridad y el herraje de fijación.
Revise que el seguro de la consola de control funcione adecuadamente.
Revise la presencia de calcomanías averiadas – reponer si es del caso.
Engrase la mordaza hidráulica y la pala de ángulo, si están equipadas.
Revise que el sistema X-Change (si está equipado) no esté averiado y tenga partes flojas.

CADA 50 HORAS
♦ Engrase el piñón de la cremallera y del tornamesa. (Ver ilustraciones)
Revise la batería, cables y nivel electrolítico.
Drene el agua y sedimento del tanque de combustible y el filtro de combustible.

CADA 100 HORAS
Silenciador del sistema parachispas – limpie la cámara de chispas.
■ Revise y ajuste la correa en V. Sustituya, si es del caso. (E26)

CADA 250 HORAS
Revise el nivel de aceite en ambas cajas de transmisión final.
■ Cambie el filtro de combustible diésel.
■ Cambie el aceite y filtro de motor. (Modelo E26)

CADA 500 HORAS
■ Cambie el aceite y filtro de motor. (Modelo E32, E35, E42, E45, E50, E55)
Limpie el radiador, enfriador de aceite y condensador del aire acondicionado.
■ Sustituya el filtro hidráulico primario y de la caja de drenaje, y el respiradero del reservorio.
■ Revise las conexiones del alternador y arrancador.
■ Revise y ajuste la holgura de la válvula del motor. Inspeccione el desgaste de la(s) correa(s). Sustituya, si es del caso.

CADA 1000 HORAS
■ Cambie el aceite en ambas cajas de transmisión final.
♦ Cambie el fluido y filtro hidráulico.
Engrase el punto de pivote en la base del cilindro. (Ver ilustraciones)

CADA 2 AÑOS
Drene y purgue el sistema de enfriamiento – cambie el enfriador.

SE MUESTRA LA MÁQUINA EN POSICIÓN PARA REVISAR LOS NIVELES DEL FLUIDO HIDRÁULICO

E42, E45, E50, E55

E26

E32, E35

IMPORTANTE

ESTA MÁQUINA ESTÁ EQUIPADA DE FÁBRICA CON UN SILENCIADOR PARACHISPAS APROBADO POR EL SERVICIO DE SILVICULTURA DE LA U.S.D.A.

ESTE SILENCIADOR PARACHISPAS DEBE LIMPIARSE PARA MANTENERS EN CONDICIÓN DE TRABAJO. ADEMÁS, DEBE VACIAR LA CÁMARA DE CHISPAS CADA 100 HORAS DE OPERACIÓN.

SI ESTÁ MÁQUINA SE USA EN BOSQUES INFLAMABLES, MATORRALES O SUELOS CUBIERTOS DE GRAMA, DEBE DISPONER DE UN PARACHISPAS SUJETO AL SISTEMA DE ESCAPE, Y MANTENERSE EN CONDICIONES DE TRABAJO. DE LO CONTRARIO, REPRESENTA UNA VIOLACIÓN DE LA LEY ESTATAL DE CALIFORNIA, SECCIÓN 4422 PRC.

REFIÉRASE A LAS LEYES Y REGLAMENTOS LOCALES PARA CONOCER LOS REQUISITOS DE PARACHISPAS.

TABLA DE FILTROS

		E26	E32 / E35	E42 / E45	E50 / E55
1.	FILTRO DE AIRE PRIMARIO	6672467	6672467	6663375	6663375
2.	FILTRO DE AIRE SECUNDARIO	6672468	6672468	6663376	6663376
3.	FILTRO DE ACEITE DEL MOTOR	6657635	6675517	6675517	6675517
4.	FILTRO DE COMBUSTIBLE	6667352	6667352	6667352	6667352
5.	FILTRO HIDRÁULICO PRIMARIO	6661248	6668819	6668819	6670207
6.	FILTRO HIDRÁULICO DE CAJA DE DRENAJE	7009365	7009365	6516722	6516722
7.	FILTRO DE RECIRCULACIÓN	7010332	7010332	7010332	7010332
8.	FILTRO DE AIRE FRESCO	7010331	7010331	7010331	7010331
9.	FILTRO DE RESPIRADERO	6692836	6692836	6692836	6692836

- Ver las ubicaciones de los filtros en las ilustraciones arriba.

Consulte más información e instrucciones en el Manual de operación y mantenimiento. 86206 SW 7238018 esAR

Service Schedule (7238018) (Cont'd)

AVERTISSEMENT

RISQUE DE BLESSURES OU DE MORT

- Gardez le capot fermé sauf pour l'entretien.
- Maintenez le moteur propre et exempt de tout matériau inflammable.
- Maintenez le corps, les objets non fixés 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, les liquides sous pression peuvent 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. Si de l'acide entre en contact avec les yeux, la peau ou les vêtements, rincez-les à l'eau et consultez immédiatement un médecin.
- La batterie dégage des gaz inflammables et explosifs. Maintenez-la à l'écart des arcs, des étincelles, des flammes et des cigarettes allumées.
- Pour un démarrage forcé, branchez le câble négatif au châssis de la machine en dernier (jamais à la batterie). Après un démarrage forcé, retirez en premier les connexions négatives au châssis.

TABLEAU DES ENTRETIENS

- Effectuez l'entretien après les 50 premières heures, puis selon le tableau.
- Effectuez l'entretien toutes les 10 heures lorsqu'elle est utilisée dans l'eau.

TOUTES LES 8 À 10 HEURES

Vérifiez le niveau du liquide de refroidissement.
Vérifiez le niveau de l'huile moteur.
Vérifiez le niveau du fluide hydraulique.
Vérifiez l'indicateur de l'état du filtre à air.
Vérifiez la tension des chenilles et ajustez-la.
Vérifiez que les témoins fonctionnent correctement.
Vérifiez le bon fonctionnement de l'avertisseur sonore et celui de l'alarme de translation (le cas échéant).
Graissez tous les points pivots de la machinerie. (Voir les illustrations)
Vérifiez les filtres CVC et ceux de la cabine – au besoin, nettoyez-les.
Vérifiez l'état de la cabine/du cadre de protection et de leurs fixations.
Vérifiez l'état de la ceinture de sécurité et de ses fixations.
Vérifiez le bon fonctionnement du verrouillage de la console de commande.
Vérifiez la présence d'autocollants endommagés – Remplacez-les selon le besoin.
Graissez la pince hydraulique et la lame orientable, le cas échéant.
Vérifiez l'X-Change (le cas échéant) pour toute présence de dommages et de pièces desserrées.

TOUTES LES 50 HEURES

- Graissez le pignon et la couronne de giration. (Voir les illustrations)
- Vérifiez la batterie, les câbles et le niveau d'électrolyte.
- Vidangez l'eau et les sédiments du réservoir de carburant et du filtre à carburant.

TOUTES LES 100 HEURES

Silencieux pare-étincelles – Nettoyez la cuve à étincelles.
- Vérifiez la courroie en V et ajustez-la. Remplacez-la au besoin. (E26)

TOUTES LES 250 HEURES

Vérifiez le niveau d'huile des deux carters de réducteur final.
- Remplacez le filtre à carburant diesel.
- Changez le filtre et l'huile moteur. (Modèle E26)

TOUTES LES 500 HEURES

- Changez le filtre et l'huile moteur. (Modèles E32, E35, E42, E45, E50, E55)

Nettoyez le radiateur, le refroidisseur d'huile et le condenseur du climatiseur.
- Remplacez le filtre de retour de carter et hydraulique primaire, et le reniflard du réservoir.
- Vérifiez les connexions de l'alternateur et du démarreur.
- Vérifiez et réglez le jeu des soupapes du moteur. Inspectez l'usure de la cu des courroies nervurées. Remplacez-les selon le besoin.

TOUTES LES 1 000 HEURES

- Remplacez l'huile des deux carters de réducteur final.

Remplacez le fluide hydraulique et les filtres.
- Graissez le point de pivotement de la base du vérin de déport (voir les illustrations)

TOUS LES 2 ANS

Vidangez et rincez le système de refroidissement – Remplacez le liquide de refroidissement.

DISPOSITION DE LA MACHINE POUR VÉRIFIER LES NIVEAUX DE FLUIDE HYDRAULIQUE

E42, E45, E50, E55

E26

E32, E35

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. L'ENTRETIEN DU SILENCIEUX PARE-ÉTINCELLES DOIT S'EFFECTUER EN VIDANT LA CHAMBRE À ÉTINCELLES TOUTES LES 100 HEURES D'UTILISATION.

SI CETTE MACHINE EST UTILISÉE EN FORÊT, DANS DES TAILLIS OU SUR TERRAINS HERBEUX, ELLE DOIT ÊTRE ÉQUIPÉE D'UN PARE-ÉTINCELLES FIXÉ AU SYSTÈME 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.

TABLEAU DES FILTRES

		E26	E32 / E35	E42 / E45	E50 / E55
1.	FILTRE À AIR PRIMAIRE	6672467	6672467	6666375	6666375
2.	FILTRE À AIR SECONDAIRE	6672468	6672468	6666376	6666376
3.	FILTRE À HUILE MOTEUR	6657635	6675517	6675517	6675517
4.	FILTRE À CARBURANT	6667352	6667352	6667352	6667352
5.	FILTRE HYDRAULIQUE PRIMAIRE	6661248	6668819	6668819	6670207
6.	FILTRE HYDRAULIQUE DE RETOUR DE CARTER	7009365	7009365	6516722	6516722
7.	FILTRE DE RECIRCULATION	7010332	7010332	7010332	7010332
8.	FILTRE À AIR FRAIS	7010331	7010331	7010331	7010331
9.	FILTRE RENIFLARD	6692836	6692836	6692836	6692836

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

Consultez le manuel & d'utilisation et d'entretien pour des instructions et informations supplémentaires.

86206 SW 7238018 IrCA

MACHINE SIGN TRANSLATIONS (CONT'D)

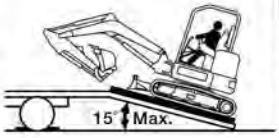
Warning (7178178)

WARNING

Improper loading, transporting and lifting procedures can cause serious injury or death.

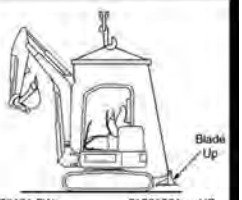
TRANSPORTING MACHINE

- Use metal loading ramps with sides and slip resistant surfaces.
- Secure ramps to truck bed.
- Engage truck parking brake and block truck tires.
- Ramp angle must not exceed 15°.
- Top of ramp must be level with truck bed.
- Engage swing lock (If equipped).
- Secure machine with tie downs and block tracks.



LIFTING MACHINE

- Lifting device must have adequate capacity to lift machine.
- Maintain center of gravity and balance.
- Position machine as shown. Engage the swing lock (If equipped).
- Never lift with operator on machine.



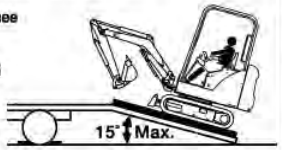
76464 SW 7178178A enUS

ADVERTENCIA

Los procedimientos inadecuados de carga, transporte y elevación pueden causar lesiones graves o accidentes fatales

TRANSPORTE DE LA MÁQUINA

- Utilice rampas de carga metálicas con costados y superficies antideslizantes.
- Asegure las rampas al lecho del camión.
- Coloque el freno de estacionamiento del camión y bloquee las ruedas del camión.
- El ángulo de la rampa no debe exceder 15°.
- La parte superior de la rampa debe estar nivelada con el lecho del camión.
- Enganche el bloqueo de giro (si viene equipado).
- Asegure la máquina con ganchos de amarre y bloquee las orugas.



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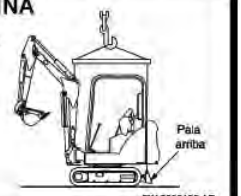
ELEVACIÓN DE LA MÁQUINA

- El dispositivo de elevación debe tener la capacidad adecuada para elevar la máquina.
- Mantenga el centro de gravedad y el equilibrio.
- Posicione la máquina como se muestra abajo. Enganche el bloqueo de giro (si viene equipado)
- Jamás eleve con el operador en la máquina.



SW 6806185 AR

AVERTISSEMENT

Le non respect des procédures de chargement, de transport et de levage peut causer des blessures graves, voire mortelles.

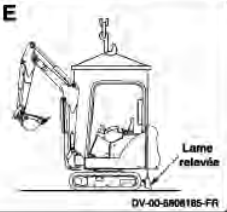
TRANSPORT DE LA MACHINE

Utilisez des rampes en acier avec rebords et revêtements anti-dérapants.
Attachez les rampes au plancher de la remorque.
Serrez le frein de stationnement et bloquez les roues du camion.
L'inclinaison de la rampe ne doit pas dépasser 15°.
L'extrémité de la rampe doit se trouver dans l'alignement du plancher de la remorque.
Engagez l'axe de verrouillage de l'orientation.
Attachez la machine avec des chaînes et bloquez les chenilles.

41742

LEVAGE DE LA MACHINE

- Le dispositif de levage doit être capable de supporter le poids de la machine.
- Maintenez le centre de gravité et l'équilibre pendant l'opération.
- Positionnez la machine comme indiqué. Engagez l'axe de verrouillage de l'orientation.
- Ne levez jamais la pelle quand l'opérateur s'y trouve.



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⚠ WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

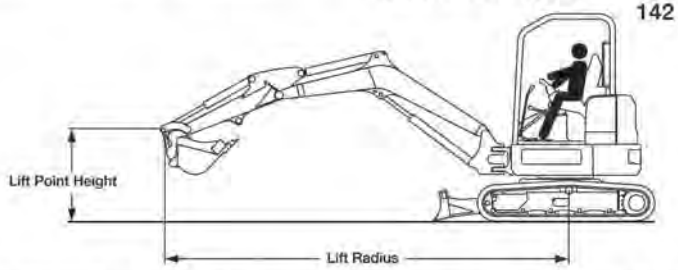
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

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.

EXCAVATOR MODEL E50 - STANDARD ARM

CIRCUIT PRESSURES
WORKING 250 bar (3625 psi)
HOLDING 290 bar (4206 psi)

BOOM LENGTH	2775 mm	(109.3 in)
ARM LENGTH	1525 mm	(60.0 in)
COUNTERWEIGHT	750 kg	(1653 lb)
STANDARD BUCKET	610 mm	(24.0 in)
	142 kg	(313 lb)



LIFT POINT HEIGHT	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)			
	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)
mm (in.)	2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)	
4000 (157.5)			*967 (2131)	*1013 (2234) @ 4075 (160)			*967 (2131)	719 (1585) @ 4075 (160)			562 (1239)	522 (1151) @ 4075 (160)
3000 (118.1)			*979 (2158)	*1065 (2347) @ 4850 (191)			749 (1652)	512 (1130) @ 4850 (191)			560 (1235)	369 (814) @ 4850 (191)
2000 (78.7)		*1603 (3534)	*1246 (2746)	*1117 (2462) @ 5250 (207)		1181 (2605)	708 (1561)	428 (944) @ 5250 (207)		886 (1954)	537 (1185)	295 (652) @ 5250 (207)
1000 (39.4)		*2454 (5411)	*1559 (3438)	*1184 (2611) @ 5325 (210)		1028 (2268)	658 (1450)	398 (877) @ 5325 (210)		794 (1750)	485 (1071)	280 (617) @ 5325 (210)
Ground		*2737 (6034)	*1760 (3880)	*1259 (2775) @ 5175 (204)		1013 (2234)	635 (1399)	413 (911) @ 5175 (204)		730 (1610)	451 (995)	289 (637) @ 5175 (204)
-1000 (-39.4)	*4023 (8870)	*2652 (5847)	*1717 (3785)	*1341(2956) @ 4705 (185)	1988 (4384)	944 (2082)	627 (1382)	490 (1081) @ 4705 (185)	1378 (3039)	734 (1620)	454 (1002)	343 (757) @ 4705 (185)

* Rated Hydraulic Lift Capacity

82630 SW 7188434A enUS

⚠ ADVERTENCIA

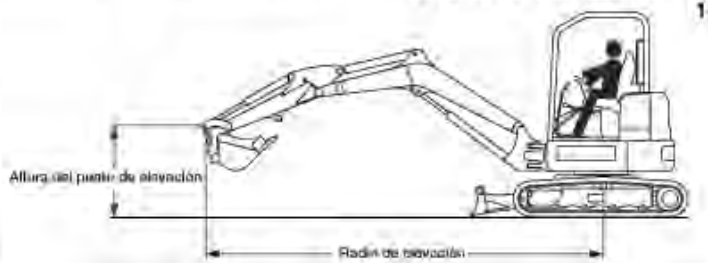
UNA CARGA EXCESIVA PUEDE LADEAR LA EXCAVADORA Y PROVOCAR LESIONES O FATALIDADES

- No levante o sostenga una carga que supere estos límites a sus radios de carga especificados y altura.
- Se muestra la carga nominal total. Reste el peso de todos los dispositivos elevadores para determinar la carga neta que se puede levantar.

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

EXCAVADORA MODELO E50 – BRAZO ESTÁNDAR

PRESIONES DEL CIRCUITO		LARGO DE LA PLUMA	2775 mm (109.3 in)
TRABAJO	250 bar (3625 psi)	LARGO DEL BRAZO	1525 mm (60.0 in)
SUJECIÓN	290 bar (4206 psi)	CONTRAPESO	750 kg (1653 lb)
		CUCHARÓN ESTÁNDAR	610 mm (24.0 in)
			142 kg (313 lb)



ALTURA DEL PUNTO DE ELEVACIÓN mm (in.)	CAPACIDAD DE ELEV. NOMINAL SOBRE PALA, PALA ABAJO – kg (lb)				CAPACIDAD DE ELEV. NOMINAL SOBRE PALA, PALA ARRIBA – kg (lb)				CAPACIDAD DE ELEV. NOMINAL SOBRE LADO, PALA ARRIBA – kg (lb)			
	RADIO DE ELEVACIÓN – mm (in)			ELEVACIÓN A MÁX. RADIO, kg (lb) a mm (in)	RADIO DE ELEVACIÓN – mm (in)			ELEVACIÓN A MÁX. RADIO, kg (lb) a mm (in)	RADIO DE ELEVACIÓN – mm (in)			ELEVACIÓN A MÁX. RADIO, kg (lb) a mm (in)
	2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)	
4000 (157.5)			*967 (2131)	*1013 (2234) á 4075 (160)			*967 (2131)	719 (1585) á 4075 (160)			562 (1239)	522 (1151) á 4075 (160)
3000 (118.1)			*979 (2158)	*1065 (2347) á 4850 (191)			749 (1652)	512 (1130) á 4850 (191)			560 (1235)	369 (814) á 4850 (191)
2000 (78.7)		*1603 (3534)	*1246 (2746)	*1117 (2462) á 5250 (207)		1181 (2605)	708 (1561)	428 (944) á 5250 (207)		886 (1954)	537 (1185)	295 (652) á 5250 (207)
1000 (39.4)		*2454 (5411)	*1559 (3438)	*1184 (2611) á 5325 (210)		1028 (2268)	658 (1450)	398 (877) á 5325 (210)		794 (1750)	485 (1071)	280 (617) á 5325 (210)
Suelo		*2737 (6034)	*1760 (3880)	*1259 (2775) á 5175 (204)		1013 (2234)	635 (1399)	413 (911) á 5175 (204)		730 (1610)	451 (995)	289 (637) á 5175 (204)
-1000 (-39.4)	*4023 (8870)	*2652 (5847)	*1717 (3785)	*1341(2956) á 4705 (185)	1988 (4384)	944 (2082)	627 (1382)	490 (1081) á 4705 (185)	1378 (3039)	734 (1620)	454 (1002)	343 (757) á 4705 (185)

*Capacidad de elevación hidráulica nominal

82630 SW 7188434A esAR

AVERTISSEMENT

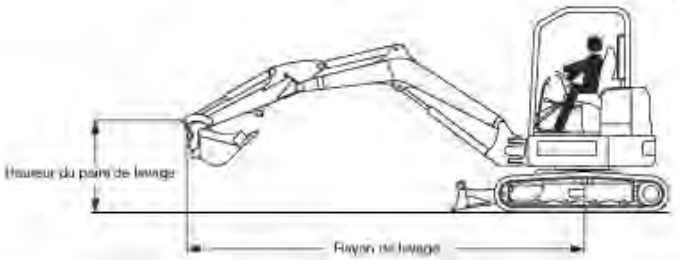
TOUTE SURCHARGE PEUT ENTRAÎNER LE RENVERSEMENT DE L'EXCAVATRICE ET PROVOQUER DES BLESSURES GRAVES, VOIRE MORTELLES

- Ne jamais lever ni porter de 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.

Lorsqu'il y a lieu, les spécifications sont conformes aux normes ISO.
Les spécifications sont sujettes à modifications sans préavis.
Le point de levage est le point d'articulation du godet, le godet standard attaché et le vérin du godet en pleine extension.

EXCAVATRICE MODÈLE E50 - BALANCIER STANDARD

PRESSION DES CIRCUITS		LONGUEUR DE FLÈCHE	2 775 mm (109,3 po)
EN EFFORT	250 bars (3 625 lb/po²)	LONGUEUR DE BALANCIER	1 525 mm (60,0 po)
EN MAINTIEN	290 bars (4 206 lb/po²)	CONTREPOIDS	750 kg (1 653 lb)
		GODET STANDARD	610 mm (24,0 po)
			142 kg (313 lb)



HAUTEUR DU POINT DE LEVAGE	CAPACITÉ DE LEVAGE EXTRÉMITÉ LAME, CELLE-CI ÉTANT BAISSÉE - kg (lb)				CAPACITÉ DE LEVAGE EXTRÉMITÉ LAME, CELLE-CI ÉTANT RELEVÉE - kg (lb)				CAPACITÉ DE LEVAGE LATÉRAL, AVEC LA LAME RELEVÉE - kg (lb)			
	RAYON DE LEVAGE - mm (po)			LEVAGE à RAYON MAX., kg (lb) à mm (po)	RAYON DE LEVAGE - mm (po)			LEVAGE à RAYON MAX., kg (lb) à mm (po)	RAYON DE LEVAGE - mm (po)			LEVAGE à RAYON MAX., kg (lb) à mm (po)
mm (po)	2 000 (78,7)	3 000 (118,1)	4 000 (157,5)		2 000 (78,7)	3 000 (118,1)	4 000 (157,5)		2 000 (78,7)	3 000 (118,1)	4 000 (157,5)	
4 000 (157,5)			*967 (2 131)	*1 013 (2 234) à 4 075 (160)			*967 (2 131)	719 (1 585) à 4 075 (160)			562 (1 239)	522 (1 151) à 4 075 (160)
3 000 (118,1)			*979 (2 158)	*1 065 (2 347) à 4 850 (191)			749 (1 652)	512 (1 130) à 4 850 (191)			560 (1 235)	369 (814) à 4 850 (191)
2 000 (78,7)		*1 603 (3 534)	*1 246 (2 746)	*1 117 (2 462) à 5 250 (207)		1 181 (2 605)	708 (1 561)	428 (944) à 5 250 (207)		886 (1 954)	537 (1 185)	295 (652) à 5 250 (207)
1 000 (39,4)		*2 454 (5 411)	*1 559 (3 438)	*1 184 (2 611) à 5 325 (210)		1 028 (2 268)	658 (1 450)	398 (877) à 5 325 (210)		794 (1 750)	485 (1 071)	280 (617) à 5 325 (210)
Au niveau du sol		*2 737 (6 034)	*1 760 (3 880)	*1 259 (2 775) à 5 175 (204)		1 013 (2 234)	635 (1 399)	413 (911) à 5 175 (204)		730 (1 610)	451 (995)	289 (637) à 5 175 (204)
-1 000 (-39,4)	*4 023 (8 870)	*2 652 (5 847)	*1 717 (3 785)	*1 341 (2 956) à 4 705 (185)	1 988 (4 384)	944 (2 082)	627 (1 382)	490 (1 081) à 4 705 (185)	1 378 (3 039)	734 (1 620)	454 (1 002)	343 (757) à 4 705 (185)

* Capacité de levage hydraulique nominale

82630 SW 7188434A frCA

⚠WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

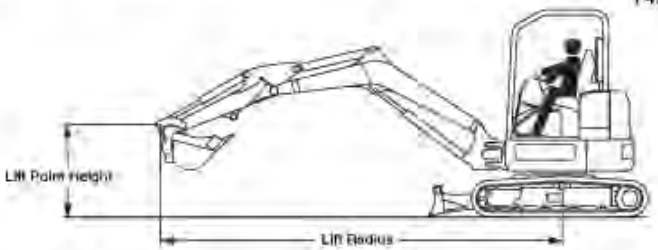
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

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.

EXCAVATOR MODEL E50

CIRCUIT PRESSURES
WORKING 250 bar (3625 psi)
HOLDING 290 bar (4206 psi)

BOOM LENGTH	2775 mm	(109.3 in)
ARM LENGTH	1525 mm	(60.0 in)
COUNTERWEIGHT	970 kg	(2138 lb)
STANDARD BUCKET	610 mm	(24.0 in)
	142 kg	(313 lb)



LIFT POINT HEIGHT	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)			
	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)
mm (in.)	2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)	
4000 (157.5)			*967 (2131)	*1013 (2234) @ 4075 (160)			*967 (2131)	*1013 (2234) @ 4075 (160)			635 (1399)	615 (1359) @ 4075 (160)
3000 (118.1)			*979 (2158)	*1065 (2347) @ 4850 (191)			*979 (2158)	593 (1307) @ 4850 (191)			654 (1442)	417 (919) @ 4850 (191)
2000 (78.7)		*1603 (3534)	*1246 (2746)	*1117 (2462) @ 5250 (207)		*1603 (3534)	818 (1804)	497 (1096) @ 5250 (207)		918 (2023)	577 (1273)	348 (767) @ 5250 (207)
1000 (39.4)		*2454 (5411)	*1559 (3438)	*1184 (2611) @ 5325 (210)		1158 (2554)	765 (1686)	467 (1030) @ 5325 (210)		822 (1813)	531 (1172)	321 (708) @ 5325 (210)
Ground		*2737 (6034)	*1760 (3880)	*1259 (2775) @ 5175 (204)		1082 (2386)	721 (1591)	482 (1062) @ 5175 (204)		746 (1644)	520 (1147)	317 (700) @ 5175 (204)
-1000 (-39.4)	*4023 (8870)	*2652 (5847)	*1717 (3785)	*1341 (2956) @ 4705 (185)	2329 (5134)	1090 (2403)	723 (1593)	566 (1248) @ 4705 (185)	1438 (3170)	768 (1695)	512 (1130)	401 (885) @ 4705 (185)

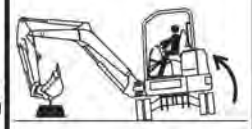
* Rated Hydraulic Lift Capacity

77741 SW 7188442A enUS

⚠ 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.

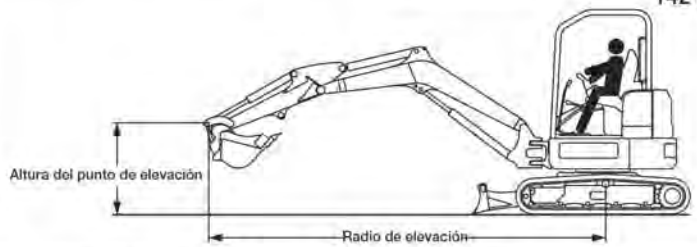


Donde corresponda, las especificaciones cumplen con las normas ISO.
Las especificaciones están sujetas a cambios sin aviso previo.
El punto de elevación es el punto de articulación del cucharón con un cucharón estándar instalado y el cilindro de cucharón totalmente extendido.

EXCAVADORA MODELO E50

PRESIONES DEL CIRCUITO
DE TRABAJO 250 bares (3625 psi)
DE SOPORTE 290 bares (4206 psi)

LARGO DE LA PLUMA	2775 mm	(109.3 in.)
LARGO DEL BRAZO	1525 mm	(60.0 in.)
CONTRAPESO	970 kg.	(2138 lb.)
CUCHARÓN ESTÁNDAR	610 mm	(24.0 in.)
	142 kg.	(313 lbs.)



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.)			
	RADIO DE ELEVACIÓN - mm (in.)			ELEV. A MÁX. RADIO, kg. (lb.) a mm (in.)	RADIO DE ELEVACIÓN - mm (in.)			ELEV. A MÁX. RADIO, kg. (lb.) a mm (in.)	RADIO DE ELEVACIÓN - mm (in.)			ELEV. A MÁX. RADIO, kg. (lb.) a mm (in.)
	2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)		2000 (78.7)	3000 (118.1)	4000 (157.5)	
4000 (157.5)			*967 (2131)	*1013 (2234) á 4075 (160)			*967 (2131)	*1013 (2234) á 4075 (160)			635 (1399)	615 (1359) á 4075 (160)
3000 (118.1)			*979 (2158)	*1065 (2347) á 4850 (191)			*979 (2158)	593 (1307) á 4850 (191)			654 (1442)	417 (919) á 4850 (191)
2000 (78.7)		*1603 (3534)	*1246 (2746)	*1117 (2462) á 5250 (207)		*1603 (3534)	818 (1804)	497 (1096) á 5250 (207)		918 (2023)	577 (1273)	348 (767) á 5250 (207)
1000 (39.4)		*2454 (5411)	*1559 (3438)	*1184 (2611) á 5325 (210)		1158 (2554)	765 (1686)	467 (1030) á 5325 (210)		822 (1813)	531 (1172)	321 (708) á 5325 (210)
Tierra		*2737 (6034)	*1760 (3880)	*1259 (2775) á 5175 (204)		1082 (2386)	721 (1591)	482 (1062) á 5175 (204)		746 (1644)	520 (1147)	317 (700) á 5175 (204)
-1000 (-39.4)	*4023 (8870)	*2652 (5847)	*1717 (3785)	*1341 (2956) á 4705 (185)	2329 (5134)	1090 (2403)	723 (1593)	566 (1248) á 4705 (185)	1438 (3170)	768 (1695)	512 (1130)	401 (885) á 4705 (185)

*Capacidad de elevación hidráulica nominal

77741 SW 7188442A esAR

AVERTISSEMENT

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

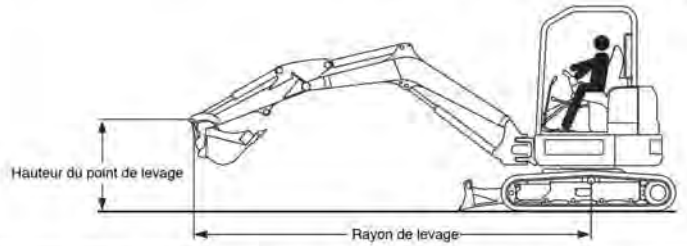
- Ne levez et ne transportez jamais des charges qui dépassent ces capacités au rayon et à la hauteur spécifiés.
- Le chiffre indiqué représente la charge nominale totale. Le poids des équipements de levage doit être déduit pour calculer la charge nette de levage possible.

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 complètement déployé.

EXCAVATRICE MODÈLE E50

PRESSION DES CIRCUITS
EN SERVICE 250 bars (3 625 lb/po²)
EN MAINTIEN 290 bars (4 206 lb/po²)

LONGUEUR DE FLÈCHE	2 775 mm	(109,3 po)
LONGUEUR DE BALANCIER	1 525 mm	(60,0 po)
CONTREPOIDS	970 kg	(2 138 lb)
GODET STANDARD	610 mm	(24,0 po)
	142 kg	(313 lb)



HAUTEUR DU POINT DE LEVAGE	CAPACITÉ DE LEVAGE EXTRÉMITÉ LAME, CELLE-CI ÉTANT BAISSÉE - kg (lb)				CAPACITÉ DE LEVAGE EXTRÉMITÉ LAME, CELLE-CI ÉTANT RELEVÉE - kg (lb)				CAPACITÉ DE LEVAGE LATÉRAL, AVEC LA LAME RELEVÉE - kg (lb)			
	RAYON DE LEVAGE - mm (po)			LEVAGE à RAYON MAX., kg (lb) à mm (po)	RAYON DE LEVAGE - mm (po)			LEVAGE à RAYON MAX., kg (lb) à mm (po)	RAYON DE LEVAGE - mm (po)			LEVAGE à RAYON MAX., kg (lb) à mm (po)
mm (po)	2 000 (78,7)	3 000 (118,1)	4 000 (157,5)		2 000 (78,7)	3 000 (118,1)	4 000 (157,5)		2 000 (78,7)	3 000 (118,1)	4 000 (157,5)	
4 000 (157,5)			*967 (2 131)	*1 013 (2 234) à 4 075 (160)			*967 (2 131)	*1 013 (2 234) à 4 075 (160)			635 (1 399)	615 (1 359) à 4 075 (160)
3 000 (118,1)			*979 (2 158)	*1 065 (2 347) à 4 850 (191)			*979 (2 158)	593 (1307) à 4 850 (191)			654 (1 442)	417 (919) à 4 850 (191)
2 000 (78,7)		*1 603 (3 534)	*1 246 (2 746)	*1 117 (2 462) à 5 250 (207)		*1 603 (3 534)	818 (1 804)	497 (1 096) à 5 250 (207)		918 (2 023)	577 (1 273)	348 (767) à 5 250 (207)
1 000 (39,4)		*2 454 (5 411)	*1 559 (3 438)	*1 184 (2 611) à 5 325 (210)		1 158 (2 554)	765 (1 686)	467 (1 030) à 5 325 (210)		822 (1 813)	531 (1 172)	321 (708) à 5 325 (210)
Au niveau du sol		*2 737 (6 034)	*1 760 (3 880)	*1 259 (2 775) à 5 175 (204)		1 082 (2 386)	721 (1 591)	482 (1 062) à 5 175 (204)		746 (1 644)	520 (1 147)	317 (700) à 5 175 (204)
-1 000 (-39,4)	*4 023 (8 870)	*2 652 (5 847)	*1 717 (3 785)	*1 341 (2 956) à 4 705 (185)	2 329 (5 134)	1 090 (2 403)	723 (1 593)	566 (1 248) à 4 705 (185)	1 438 (3 170)	768 (1 695)	512 (1 130)	401 (885) à 4 705 (185)

*** Capacité de levage hydraulique nominale**

77741 SW 7188442A frCA

⚠WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

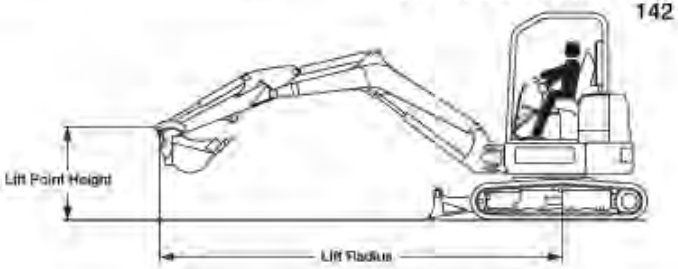
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

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.

EXCAVATOR MODEL E50 - LONG ARM

CIRCUIT PRESSURES
WORKING 250 bar (3625 psi)
HOLDING 290 bar (4206 psi)

BOOM LENGTH	2775 mm	(109.3 in)
ARM LENGTH	1925 mm	(75.8 in)
COUNTER WEIGHT	970 kg	(2138 lb)
STANDARD BUCKET	610 mm	(24.0 in)
	142 kg	(313 lb)



LIFT POINT HEIGHT	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)			
	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)	LIFT RADIUS - mm (in)			LIFT @ MAXIMUM RADIUS, kg (lb) @ mm (in)
mm (in.)	3000 (118.1)	4000 (157.5)	5000 (196.9)		3000 (118.1)	4000 (157.5)	5000 (196.9)		3000 (118.1)	4000 (157.5)	5000 (196.9)	
4000 (157.5)		*683 (1505)		*554 (1221) @ 4600 (181)		*683 (1505)		470 (1037) @ 4600 (181)		*683 (1505)		482 (1062) @ 4600 (181)
3000 (118.1)		*759 (1673)	*729 (1608)	*575 (1268) @ 5150 (203)		*759 (1673)	550 (1214)	498 (1099) @ 5150 (203)		692 (1526)	432 (953)	371 (818) @ 5150 (203)
2000 (78.7)	*1202 (2649)	*996 (2196)	*973 (2146)	*759 (1673) @ 5480 (216)	*1202 (2649)	*996 (2196)	507 (1117)	424 (936) @ 5480 (216)	1090 (2403)	661 (1459)	420 (926)	302 (666) @ 5480 (216)
1000 (39.4)	*2152 (4743)	*1406 (3100)	*1131 (2494)	*932 (2054) @ 5570 (219)	1178 (2597)	730 (1610)	482 (1062)	394 (868) @ 5570 (219)	929 (2049)	602 (1329)	386 (852)	275 (607) @ 5570 (219)
Ground	*2688 (5926)	*1686 (3716)	*1268 (2795)	*1126 (2482) @ 5400 (213)	1124 (2479)	700 (1543)	478 (1054)	415 (915) @ 5400 (213)	906 (1998)	558 (1231)	366 (808)	289 (637) @ 5400 (213)
-1000 (-39.4)	*2777 (6122)	*1770 (3902)	*1238 (2729)	*1215 (2678) @ 5050 (199)	1139 (2512)	696 (1534)	476 (1049)	481 (1061) @ 5050 (199)	876 (1931)	570 (1256)	367 (809)	340 (750) @ 5050 (199)

*** Rated Hydraulic Lift Capacity**

82630 SW 7188436A enUS

⚠ ADVERTENCIA

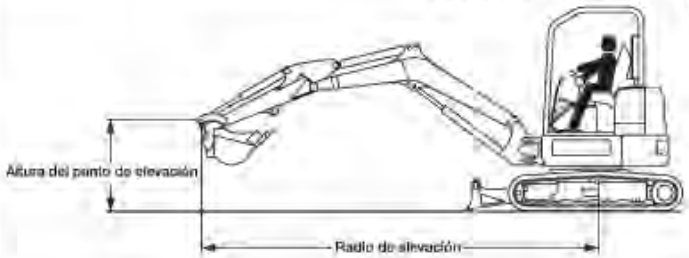
UNA CARGA EXCESIVA PUEDE LADEAR LA EXCAVADORA Y PROVOCAR LESIONES O FATALIDADES

- No levante o sostenga una carga que supere estos límites a sus radios de carga especificados y altura.
- Se muestra la carga nominal total. Reste el peso de todos los dispositivos elevadores para determinar la carga neta que se puede levantar.

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

EXCAVADORA MODELO E50 – BRAZO ESTÁNDAR

PRESIONES DEL CIRCUITO		LARGO DE LA PLUMA	2775 mm (109.3 in)
TRABAJO	250 bar (3625 psi)	LARGO DEL BRAZO	1925 mm (75.8 in)
SUJECIÓN	290 bar (4206 psi)	CONTRAPESO	970 kg (2138 lb)
		CUCHARÓN ESTÁNDAR	610 mm (24.0 in)
			142 kg (313 lb)



ALTURA DEL PUNTO DE ELEVACIÓN mm (in.)	CAPACIDAD DE ELEV. NOMINAL SOBRE PALA, PALA ABAJO – kg (lb)				CAPACIDAD DE ELEV. NOMINAL SOBRE PALA, PALA ARRIBA – kg (lb)				CAPACIDAD DE ELEV. NOMINAL SOBRE LADO, PALA ARRIBA – kg (lb)			
	RADIO DE ELEVACIÓN – mm (in)			ELEVACIÓN A MÁX. RADIO, kg (lb) a mm (in)	RADIO DE ELEVACIÓN – mm (in)			ELEVACIÓN A MÁX. RADIO, kg (lb) a mm (in)	RADIO DE ELEVACIÓN – mm (in)			ELEVACIÓN A MÁX. RADIO, kg (lb) a mm (in)
	3000 (118.1)	4000 (157.5)	5000 (196.9)		3000 (118.1)	4000 (157.5)	5000 (196.9)		3000 (118.1)	4000 (157.5)	5000 (196.9)	
4000 (157.5)		*683 (1505)		*554 (1221) á 4600 (181)		*683 (1505)		470 (1037) á 4600 (181)		*683 (1505)		482 (1062) á 4600 (181)
3000 (118.1)		*759 (1673)	*729 (1608)	*575 (1268) á 5150 (203)		*759 (1673)	550 (1214)	498 (1099) á 5150 (203)		692 (1526)	432 (953)	371 (818) á 5150 (203)
2000 (78.7)	*1202 (2649)	*996 (2196)	*973 (2146)	*759 (1673) á 5480 (216)	*1202 (2649)	*996 (2196)	507 (1117)	424 (936) á 5480 (216)	1090 (2403)	661 (1459)	420 (926)	302 (666) á 5480 (216)
1000 (39.4)	*2152 (4743)	*1406 (3100)	*1131 (2494)	*932 (2054) á 5570 (219)	1178 (2597)	730 (1610)	482 (1062)	394 (868) á 5570 (219)	929 (2049)	602 (1329)	386 (852)	275 (607) á 5570 (219)
Suelo	*2688 (5926)	*1686 (3716)	*1268 (2795)	*1126 (2482) á 5400 (213)	1124 (2479)	700 (1543)	478 (1054)	415 (915) á 5400 (213)	906 (1998)	558 (1231)	366 (808)	289 (637) á 5400 (213)
-1000 (-39.4)	*2777 (6122)	*1770 (3902)	*1238 (2729)	*1215 (2678) á 5050 (199)	1139 (2512)	696 (1534)	476 (1049)	481 (1061) á 5050 (199)	876 (1931)	570 (1256)	367 (809)	340 (750) á 5050 (199)

*Capacidad de elevación hidráulica nominal

82630 SW 7188436A esAR

AVERTISSEMENT

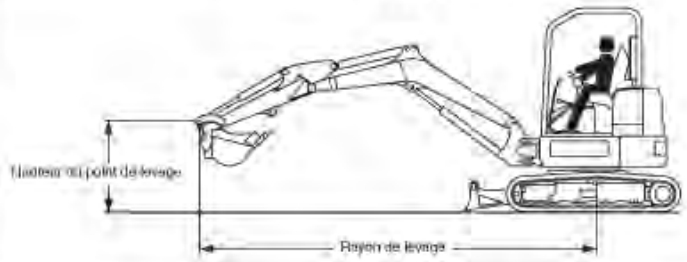
TOUTE SURCHARGE PEUT ENTRAÎNER LE RENVERSEMENT DE L'EXCAVATRICE ET PROVOQUER DES BLESSURES GRAVES, VOIRE MORTELLES

- Ne jamais lever ni porter de 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.

Lorsqu'il y a lieu, les spécifications sont conformes aux normes ISO.
Les spécifications sont sujettes à modifications sans préavis.
Le point de levage est le point d'articulation du godet, le godet standard attaché et le vérin du godet en pleine extension.

EXCAVATRICE MODÈLE E50 - BALANCIER LONG

PRESSION DES CIRCUITS		LONGUEUR DE FLÈCHE	2 775 mm (109,3 po)
EN EFFORT	250 bars (3 625 lb/po²)	LONGUEUR DE BALANCIER	1 925 mm (75,8 po)
EN MAINTIEN	290 bars (4 206 lb/po²)	CONTREPOIDS	970 kg (2 138 lb)
		GODET STANDARD	610 mm (24,0 po)
			142 kg (313 lb)

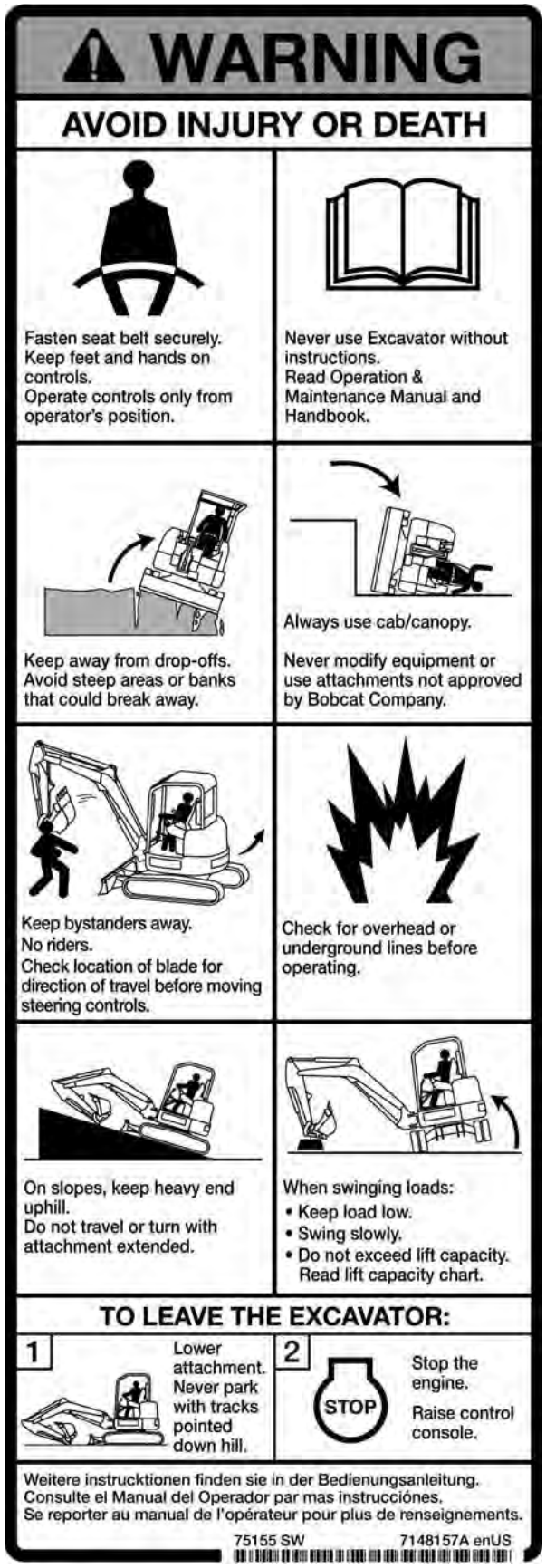


HAUTEUR DU POINT DE LEVAGE	CAPACITÉ DE LEVAGE EXTRÉMITÉ LAME, CELLE-CI ÉTANT BAISSÉE - kg (lb)				CAPACITÉ DE LEVAGE EXTRÉMITÉ LAME, CELLE-CI ÉTANT RELEVÉE - kg (lb)				CAPACITÉ DE LEVAGE LATÉRAL, AVEC LA LAME RELEVÉE - kg (lb)			
	RAYON DE LEVAGE - mm (po)			LEVAGE à RAYON MAX., kg (lb) à mm (po)	RAYON DE LEVAGE - mm (po)			LEVAGE à RAYON MAX., kg (lb) à mm (po)	RAYON DE LEVAGE - mm (po)			LEVAGE à RAYON MAX., kg (lb) à mm (po)
mm (po)	2 000 (78,7)	3 000 (118,1)	4 000 (157,5)		2 000 (78,7)	3 000 (118,1)	4 000 (157,5)		2 000 (78,7)	3 000 (118,1)	4 000 (157,5)	
4 000 (157,5)		*683 (1 505)		*554 (1 221) à 4 600 (181)		*683 (1 505)		470 (1 037) à 4 600 (181)		*683 (1 505)		482 (1 062) à 4 600 (181)
3 000 (118,1)		*759 (1 673)	*729 (1 608)	*575 (1 268) à 5 150 (203)		*759 (1 673)	550 (1 214)	498 (1 099) à 5 150 (203)		692 (1 526)	432 (953)	371 (818) à 5 150 (203)
2 000 (78,7)	*1 202 (2 649)	*996 (2 196)	*973 (2 146)	*759 (1 673) à 5480 (216)	*1 202 (2 649)	*996 (2 196)	507 (1 117)	424 (936) à 5 480 (216)	1 090 (2 403)	661 (1 459)	420 (926)	302 (666) à 5 480 (216)
1 000 (39,4)	*2 152 (4 743)	*1 406 (3 100)	*1 131 (2494)	*932 (2 054) à 5 570 (219)	1 178 (2 597)	730 (1 610)	482 (1 062)	394 (868) à 5 570 (219)	929 (2 049)	602 (1 329)	386 (852)	275 (607) à 5 570 (219)
Au niveau du sol	*2 688 (5 926)	*1 686 (3 716)	*1 268 (2 795)	*1 126 (2 482) à 5 400 (213)	1 124 (2 479)	700 (1 543)	478 (1 054)	415 (915) à 5 400 (213)	906 (1 998)	558 (1 231)	366 (808)	289 (637) à 5 400 (213)
-1 000 (-39,4)	*2 777 (6 122)	*1 770 (3 902)	*1 238 (2 729)	*1 215 (2 678) à 5 050 (199)	1 139 (2 512)	696 (1 534)	476 (1 049)	481 (1 061) à 5 050 (199)	876 (1 931)	570 (1 256)	367 (809)	340 (750) à 5 050 (199)

*** Capacité de levage hydraulique nominale**

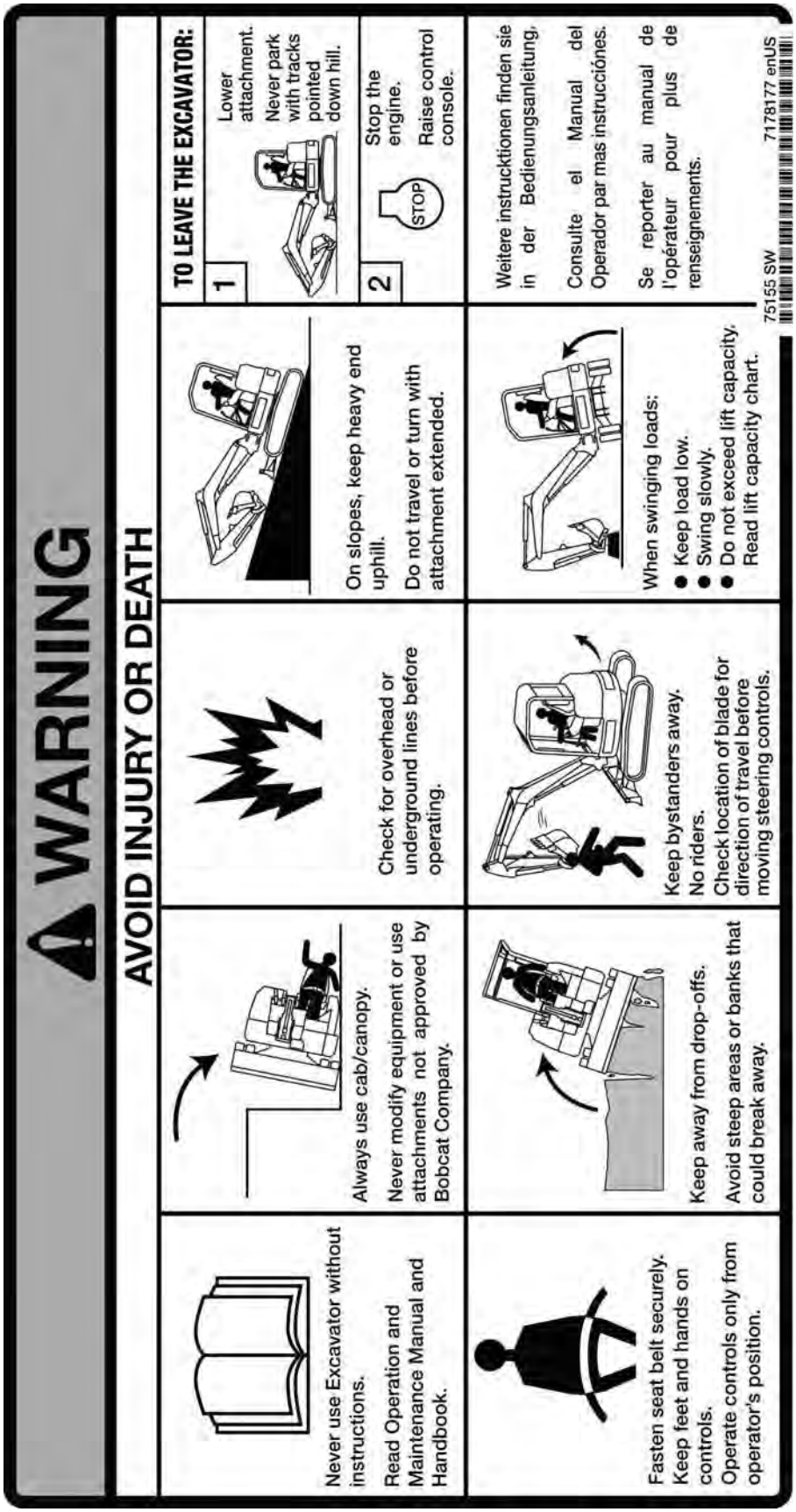
82630 SW 7188436A frCA

Warning (7148157)

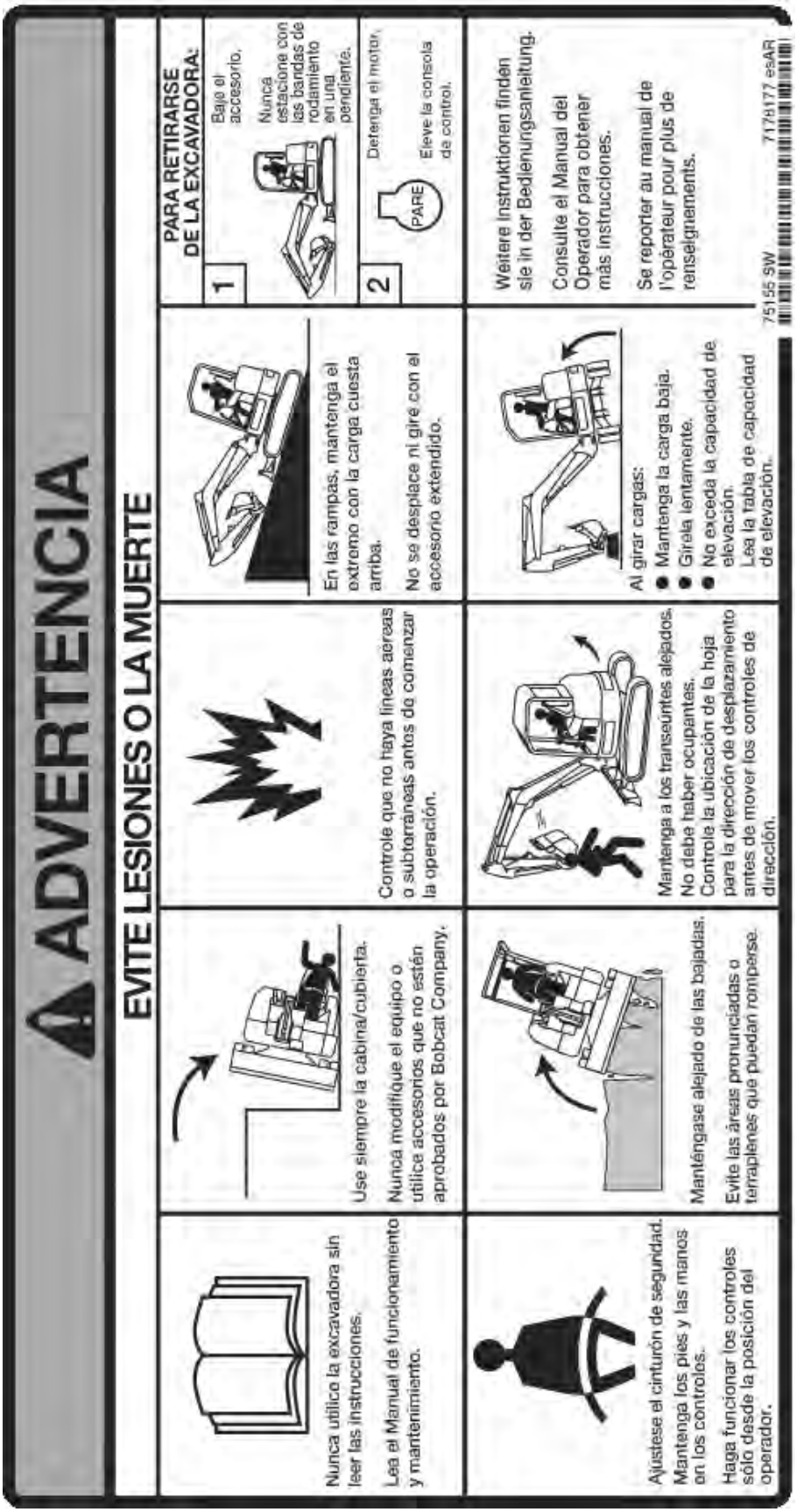


Warning (7148157) (Cont'd)

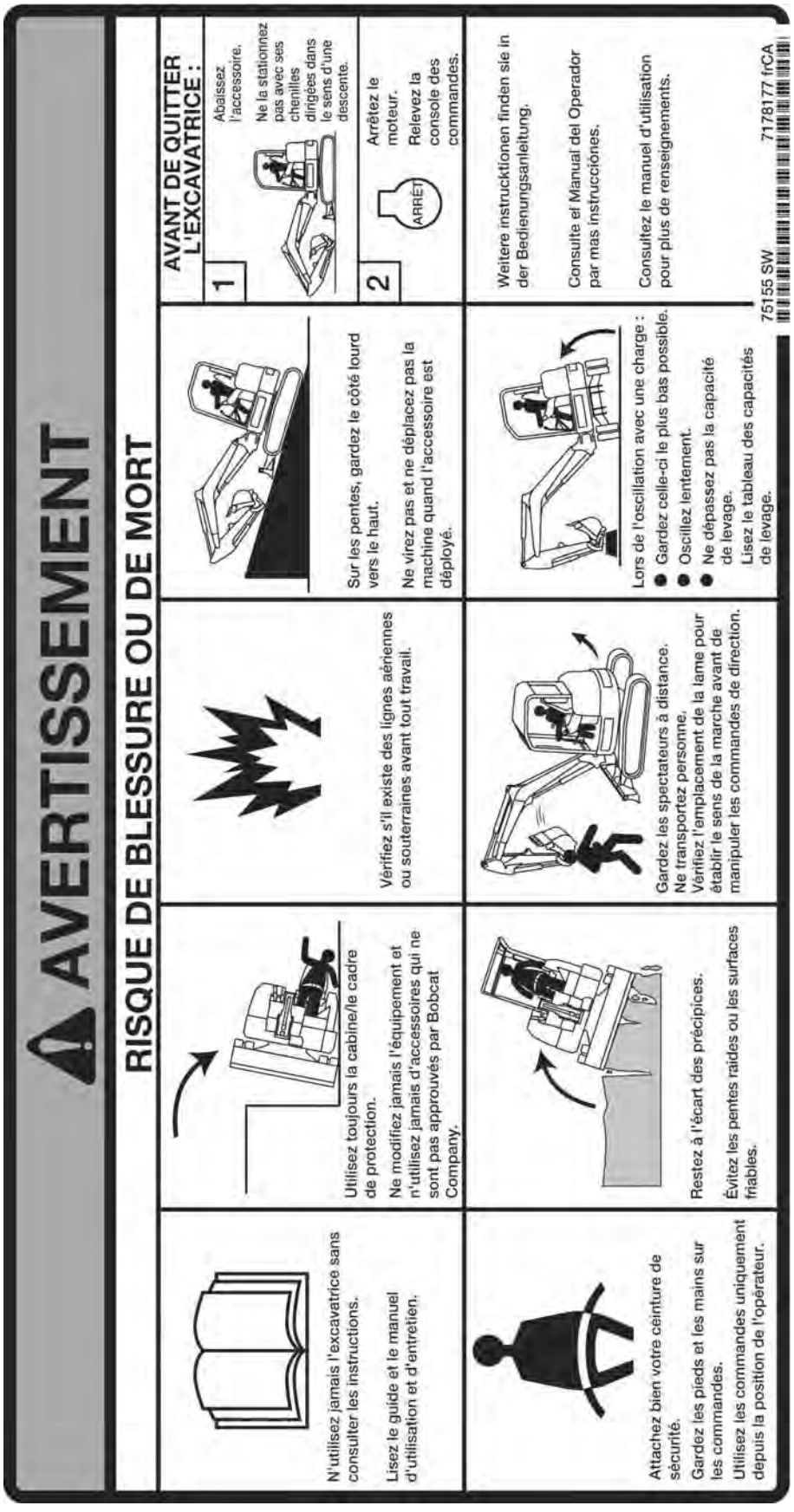
Warning (7178177)



Warning (7178177) (Cont'd)



Warning (7178177) (Cont'd)



MACHINE SIGN TRANSLATIONS (CONT'D)

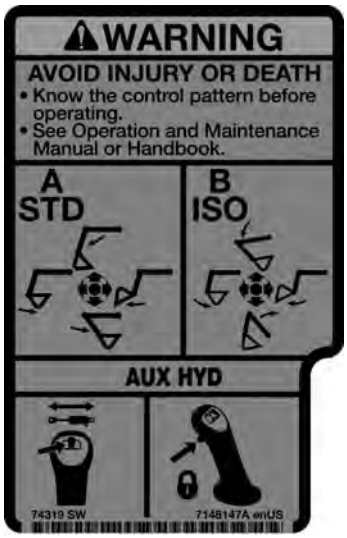
Warning (6708929)

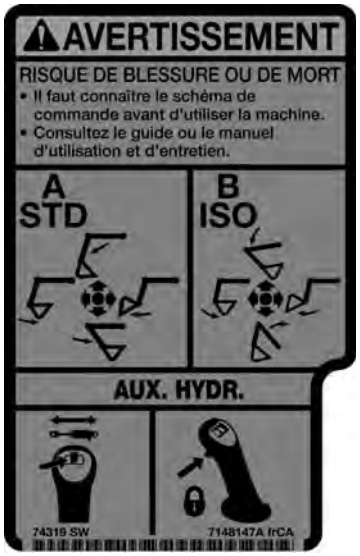
Warning (7185933)

Warning (7189532)

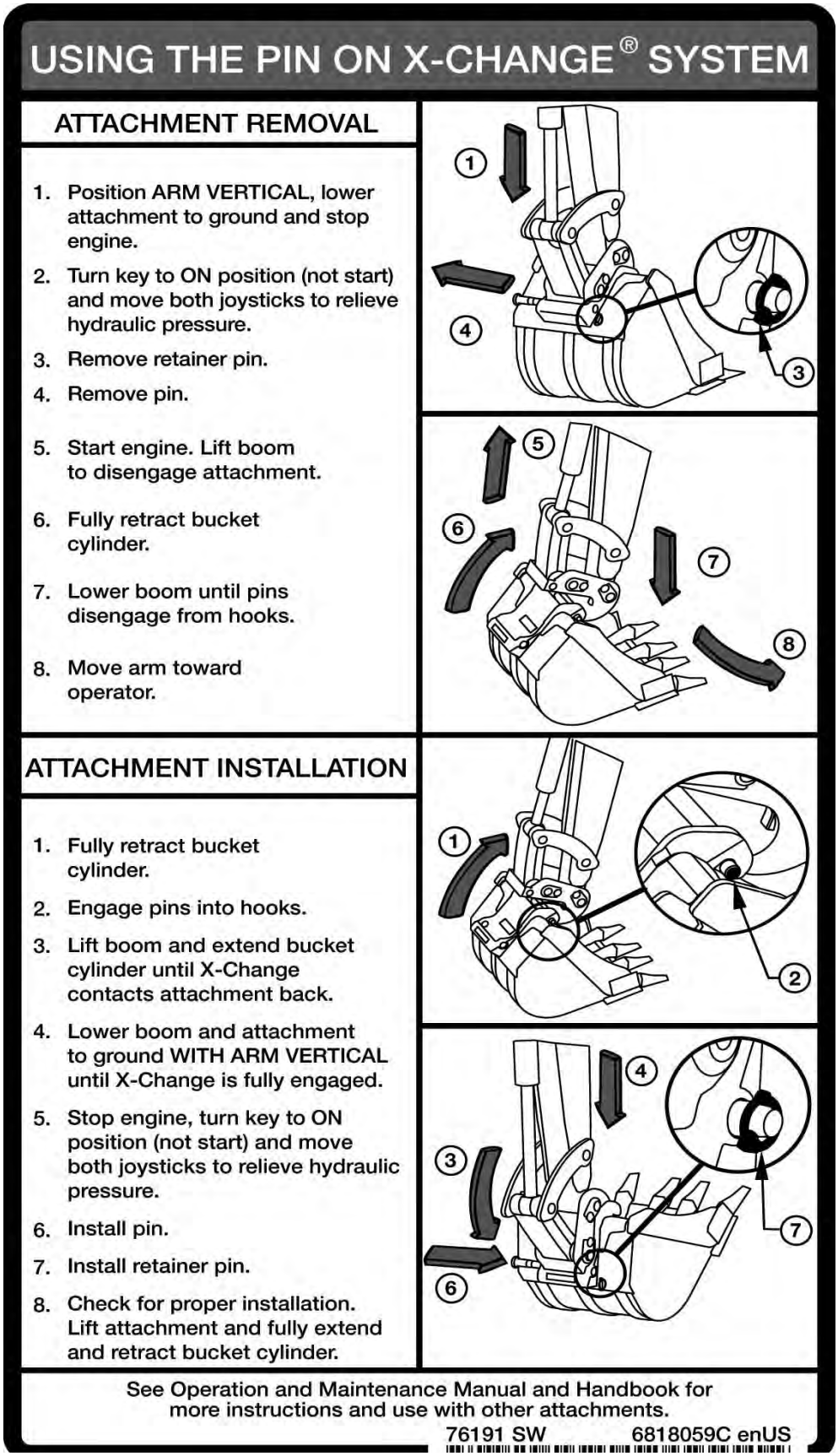
Warning (7148145)

Warning (7148147)





Using the X-Change (6818059)

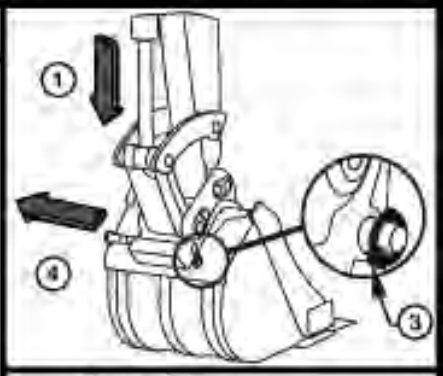


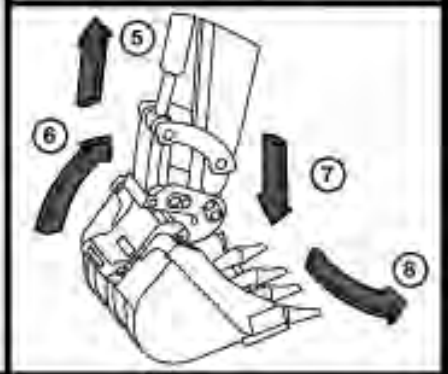
Using the X-Change (6818059) (Cont'd)

MODO DE USAR EL SISTEMA X-CHANGE® COLOCADO CON PASADORES

DESINSTALACIÓN DEL IMPLEMENTO

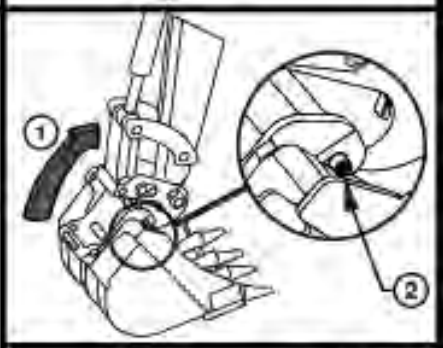
1. Coloque en BRAZO en posición VERTICAL, descienda el implemento hasta el suelo y detenga el motor.
2. Gire la llave a la posición ON (no encienda el motor) y mueva ambos joysticks para liberar la presión hidráulica.
3. Retire el pasador retenedor.
4. Retire el pasador.
5. Encienda el motor. Eleve el boom/pluma y libere el implemento.
6. Retraiga del todo el cilindro del cucharón.
7. Descienda el boom/pluma hasta que los pasadores se liberen de los ganchos.
8. Mueva el brazo hacia usted.

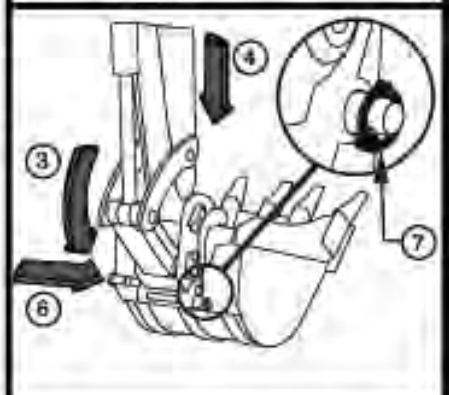




INSTALACIÓN DEL IMPLEMENTO

1. Retraiga del todo el cilindro del cucharón.
2. Coloque los pasadores dentro de los ganchos.
3. Eleve el boom/pluma y extienda el cilindro del cucharón hasta que el X-Change haga contacto con el espaldar del implemento.
4. Descienda el boom/pluma e implemento hasta el suelo CON EL BRAZO EN POSICIÓN VERTICAL hasta que el X-Change quede totalmente enganchado.
5. Detenga el motor, gire la llave a la posición ON (no encienda el motor) y mueva ambos joysticks para liberar la presión hidráulica.
6. Instale el pasador.
7. Instale el pasador retenedor.
8. Revise que la instalación haya quedado correcta. Eleve el implemento y extienda y retraiga del todo el cilindro del cucharón.





Consulte el Manual de Operación y Mantenimiento y el Manual del Operador para más instrucciones y uso con otros implementos.

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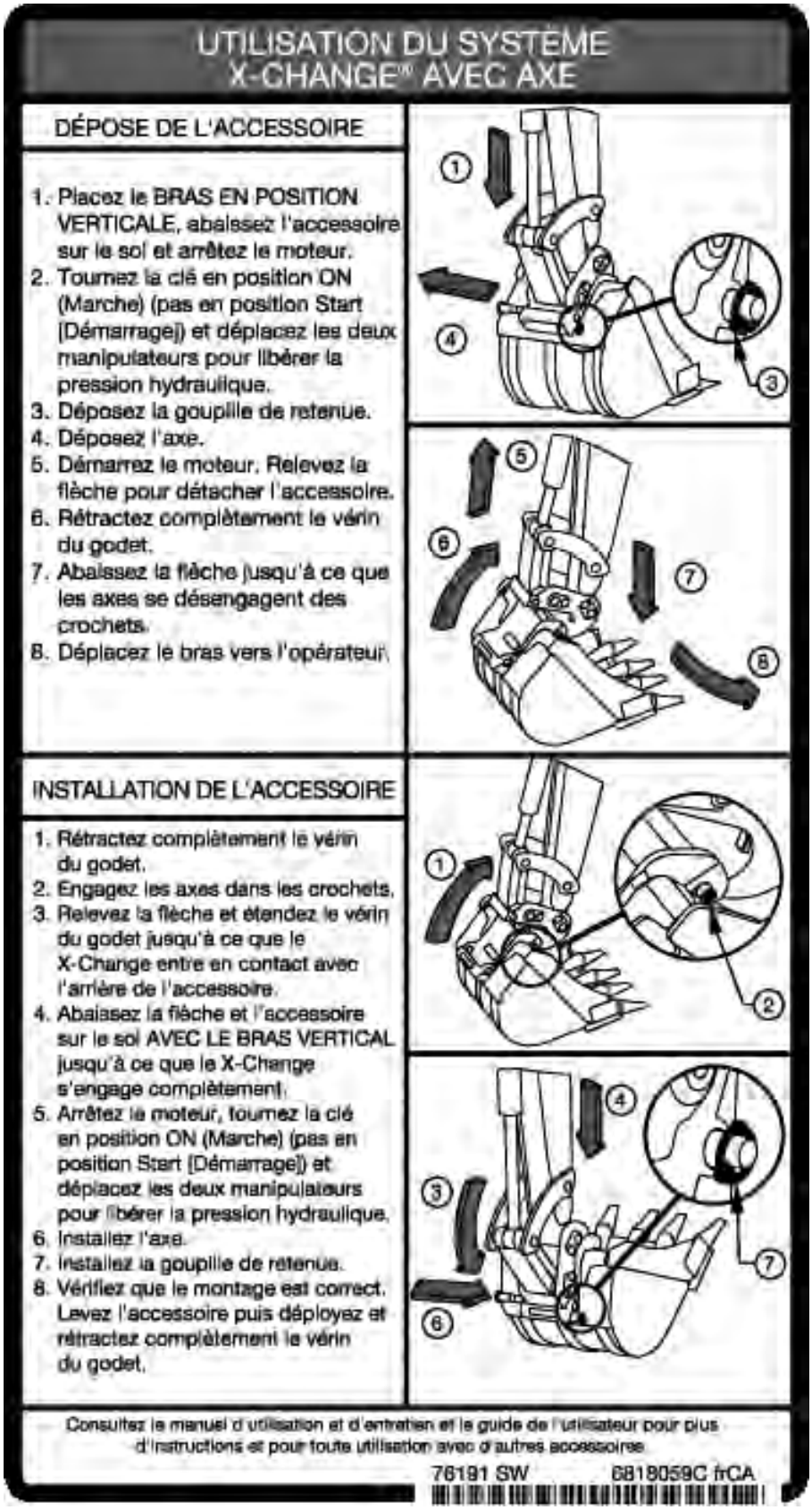
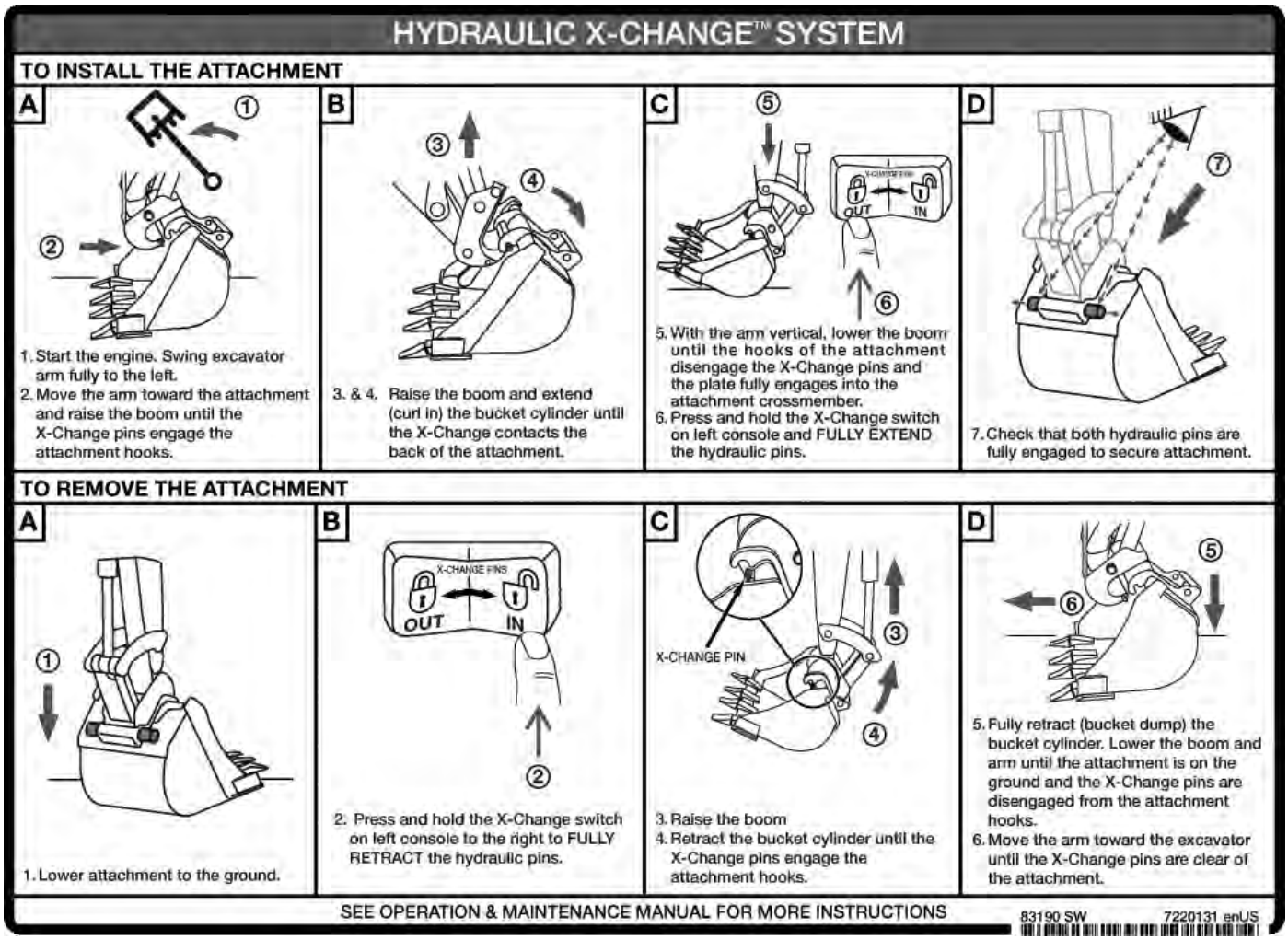
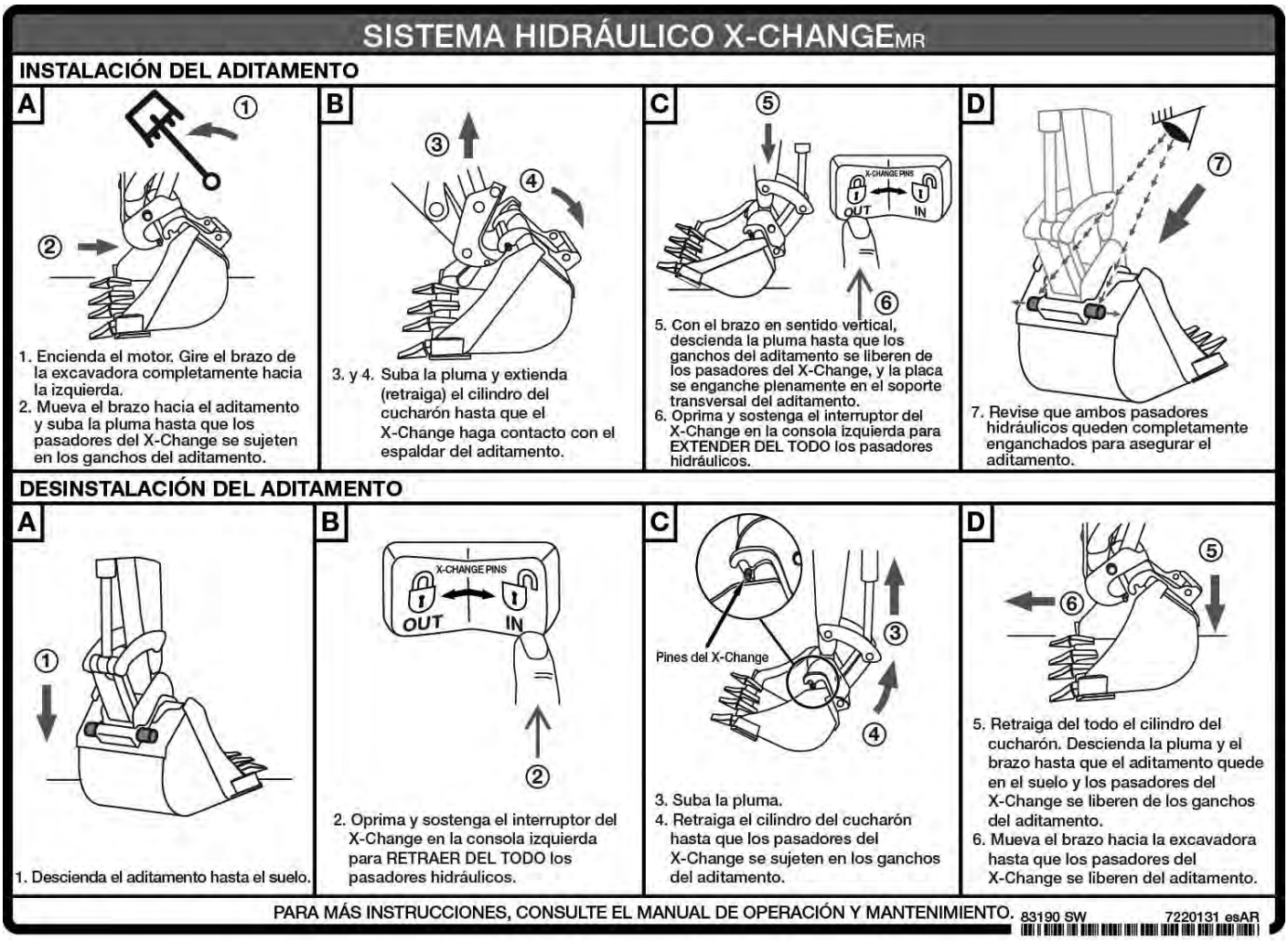
Using the X-Change (6818059) (Cont'd)



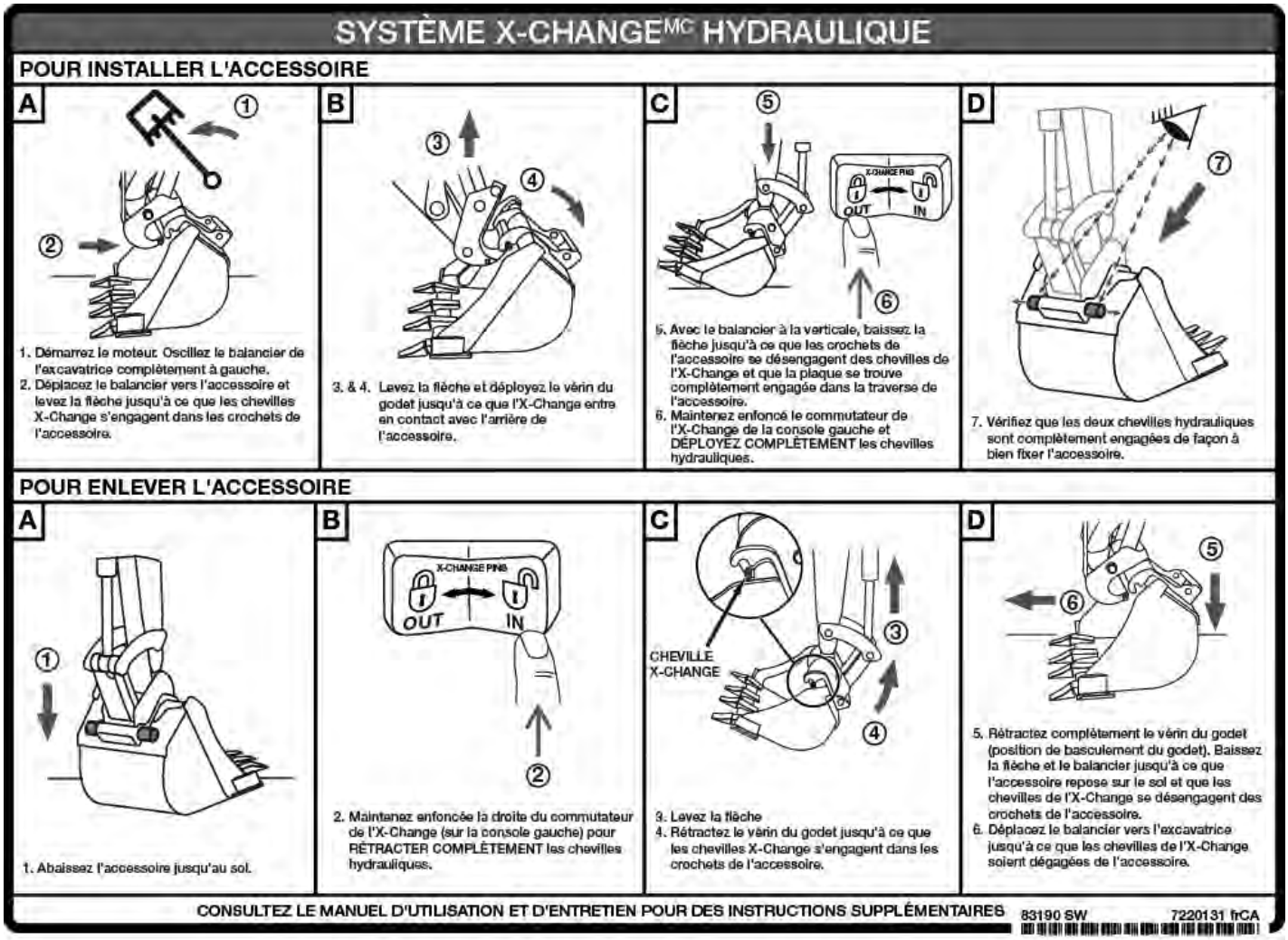
Using the X-Change System (7220131)



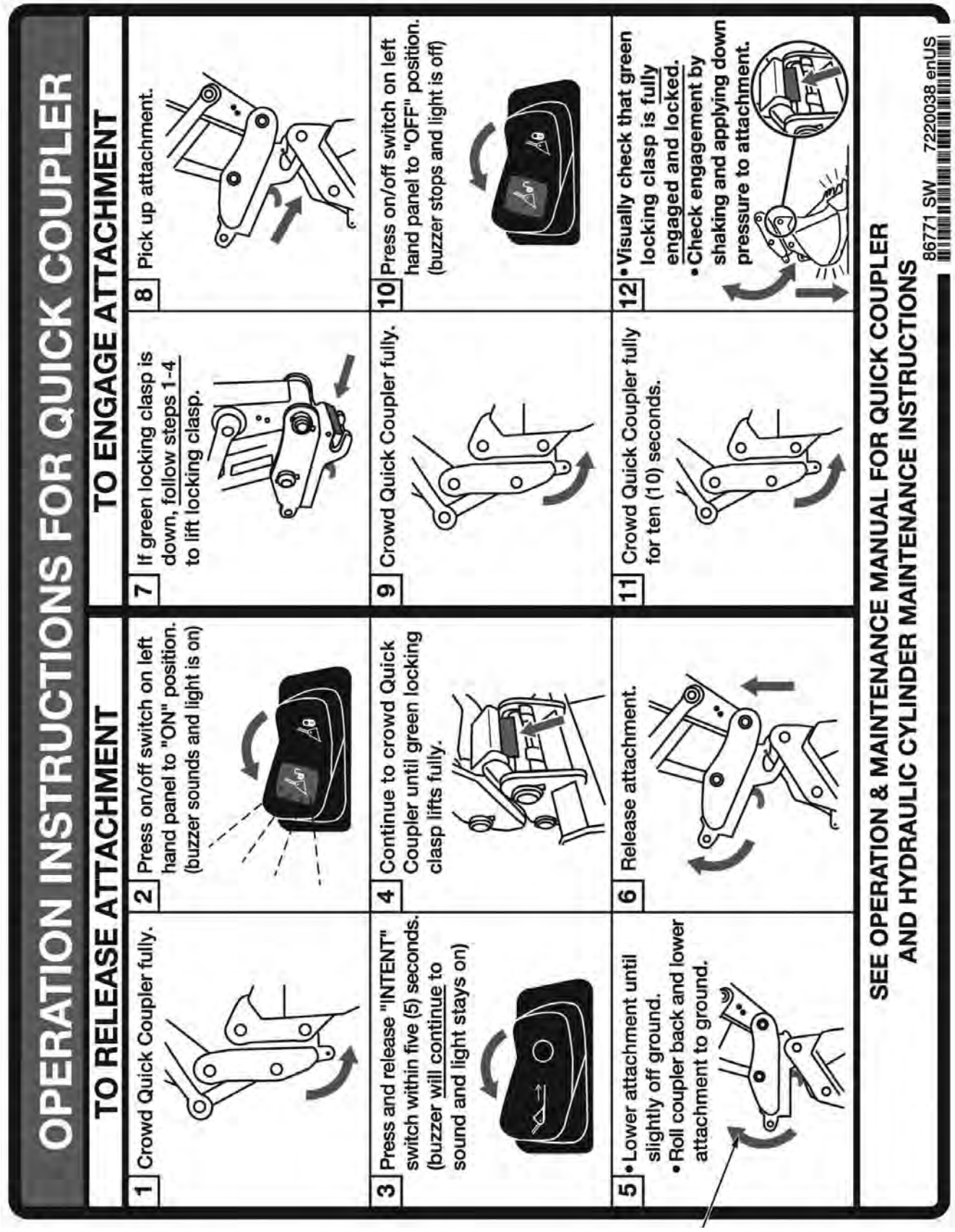
Using the X-Change System (7220131) (Cont'd)



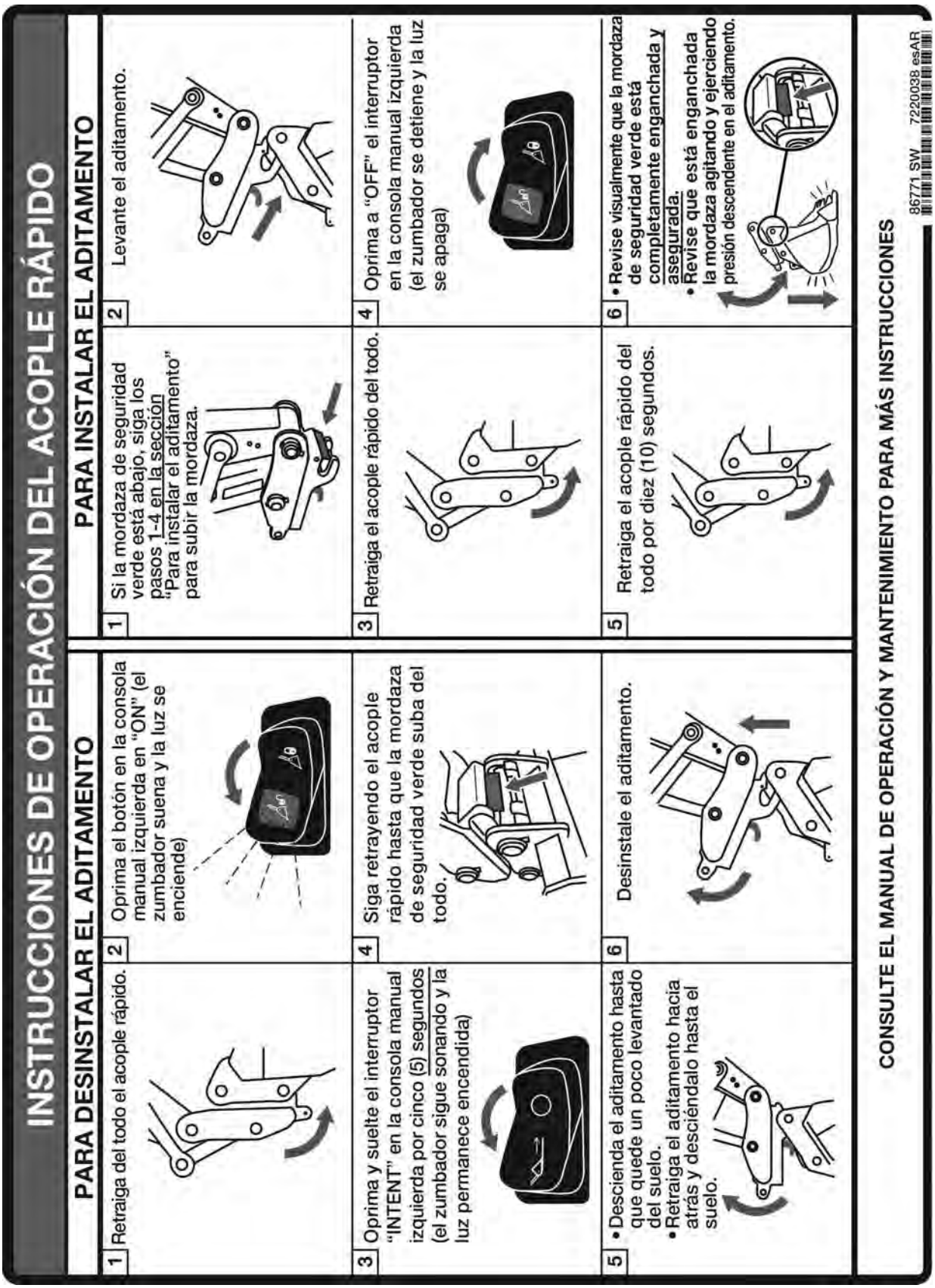
Using the X-Change System (7220131) (Cont'd)



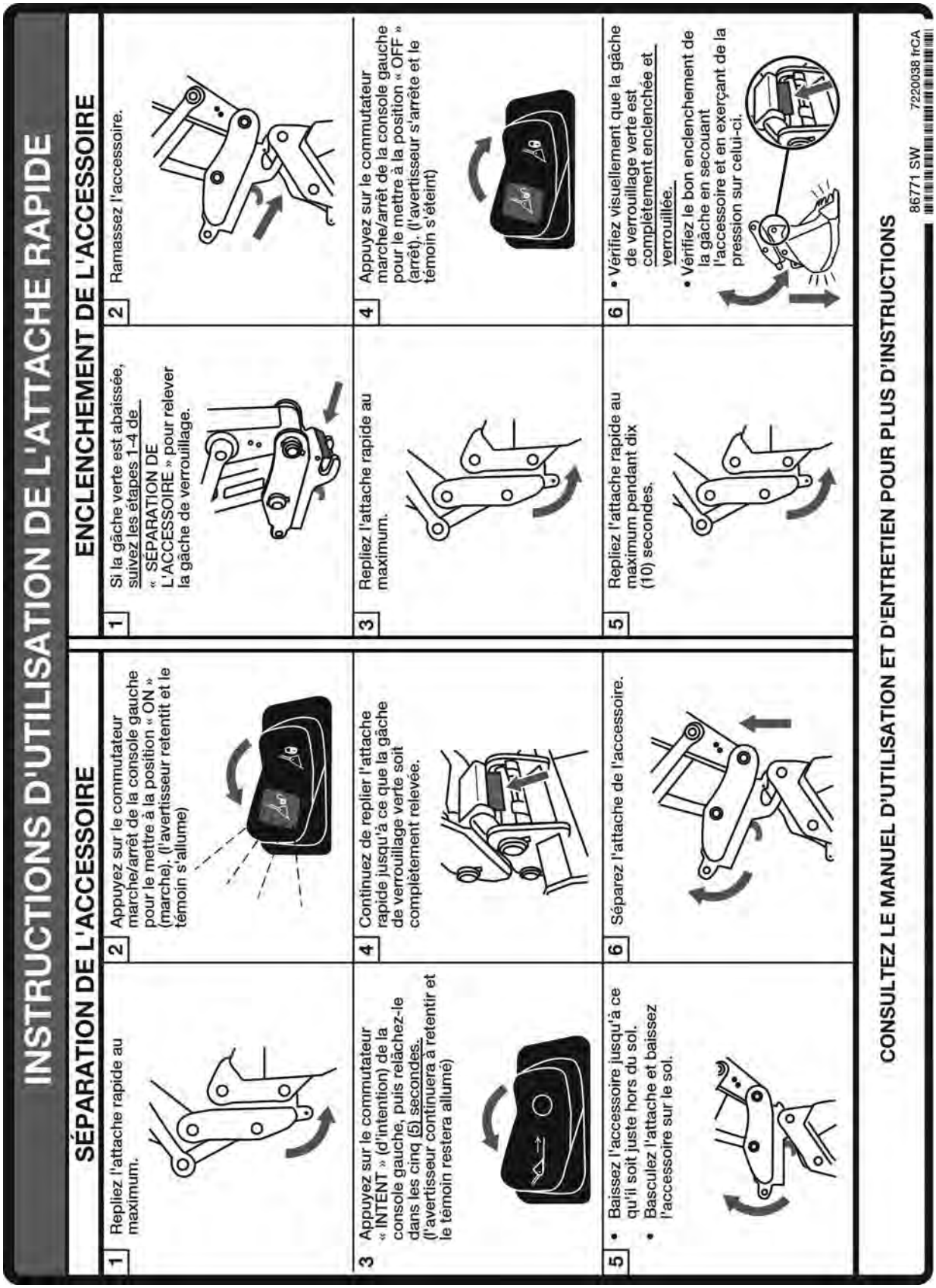
Using the Pin Grabber Attachment Coupler System (7220038)



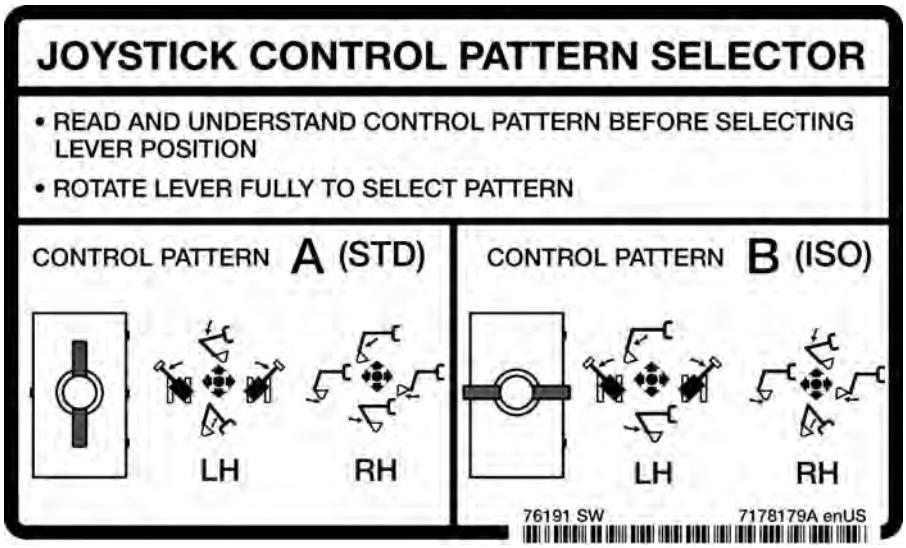
Using the Pin Grabber Attachment Coupler System (7220038) (Cont'd)

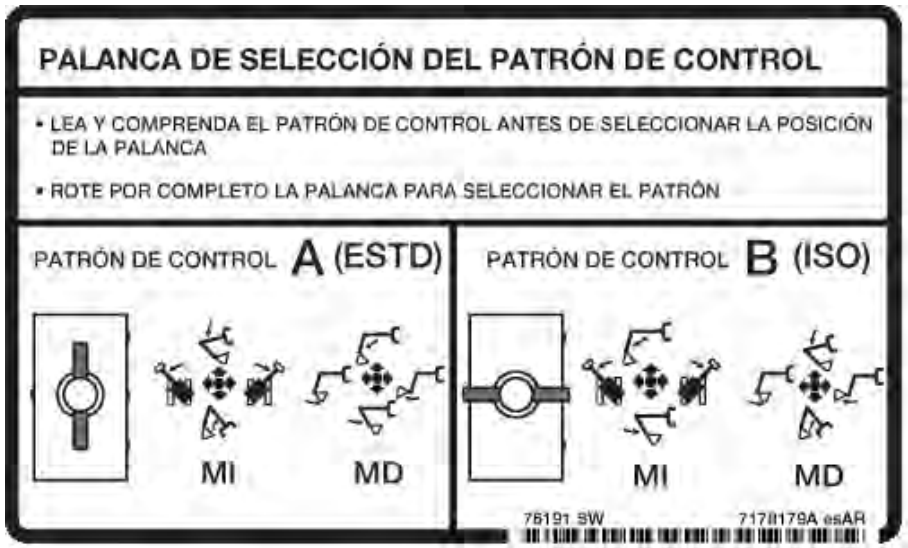


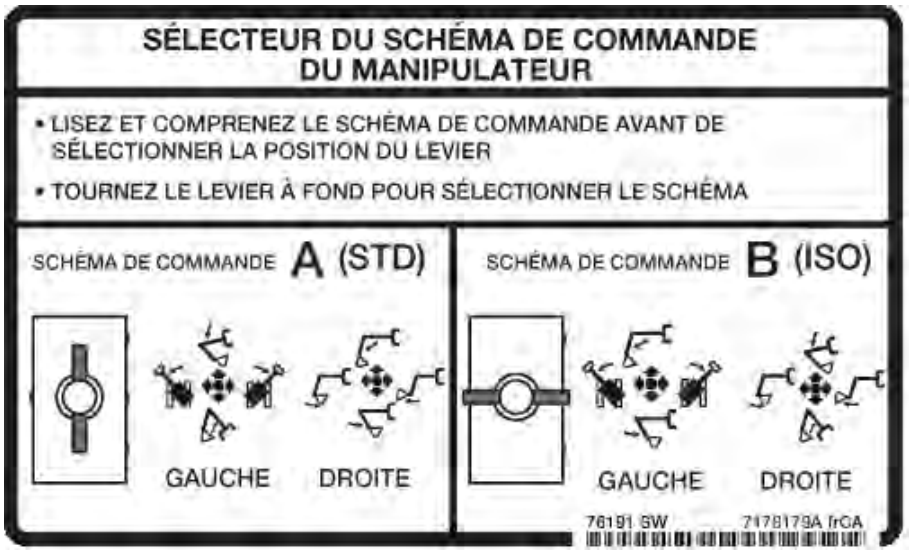
Using the Pin Grabber Attachment Coupler System (7220038) (Cont'd)



Joystick Control Pattern Selector Lever (7178179)







Warning (6810004)

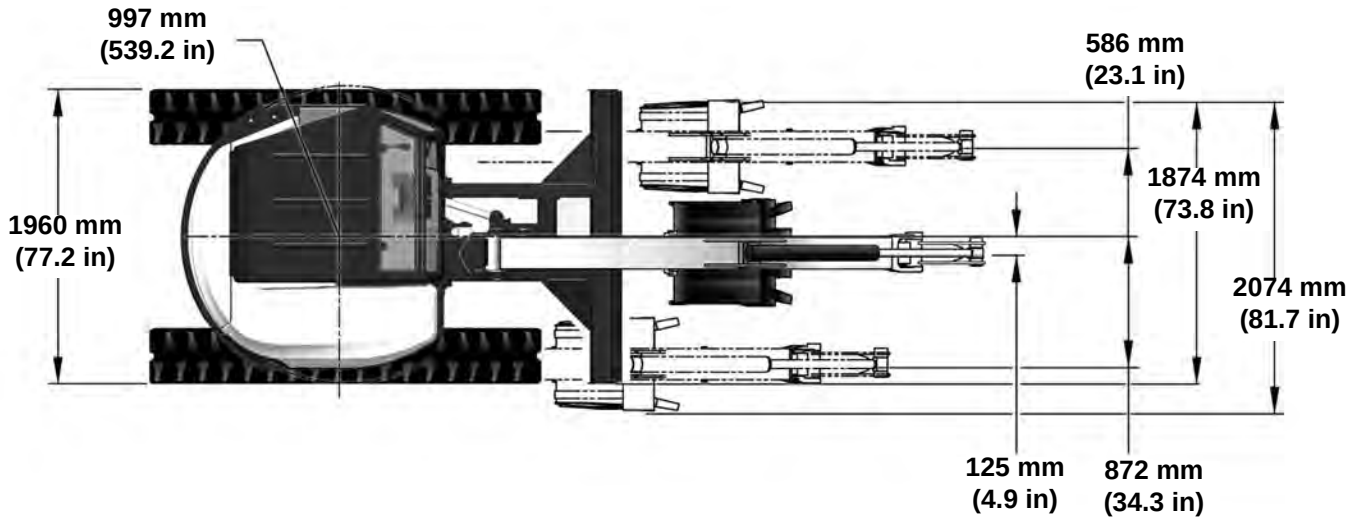
Warning (7169006)

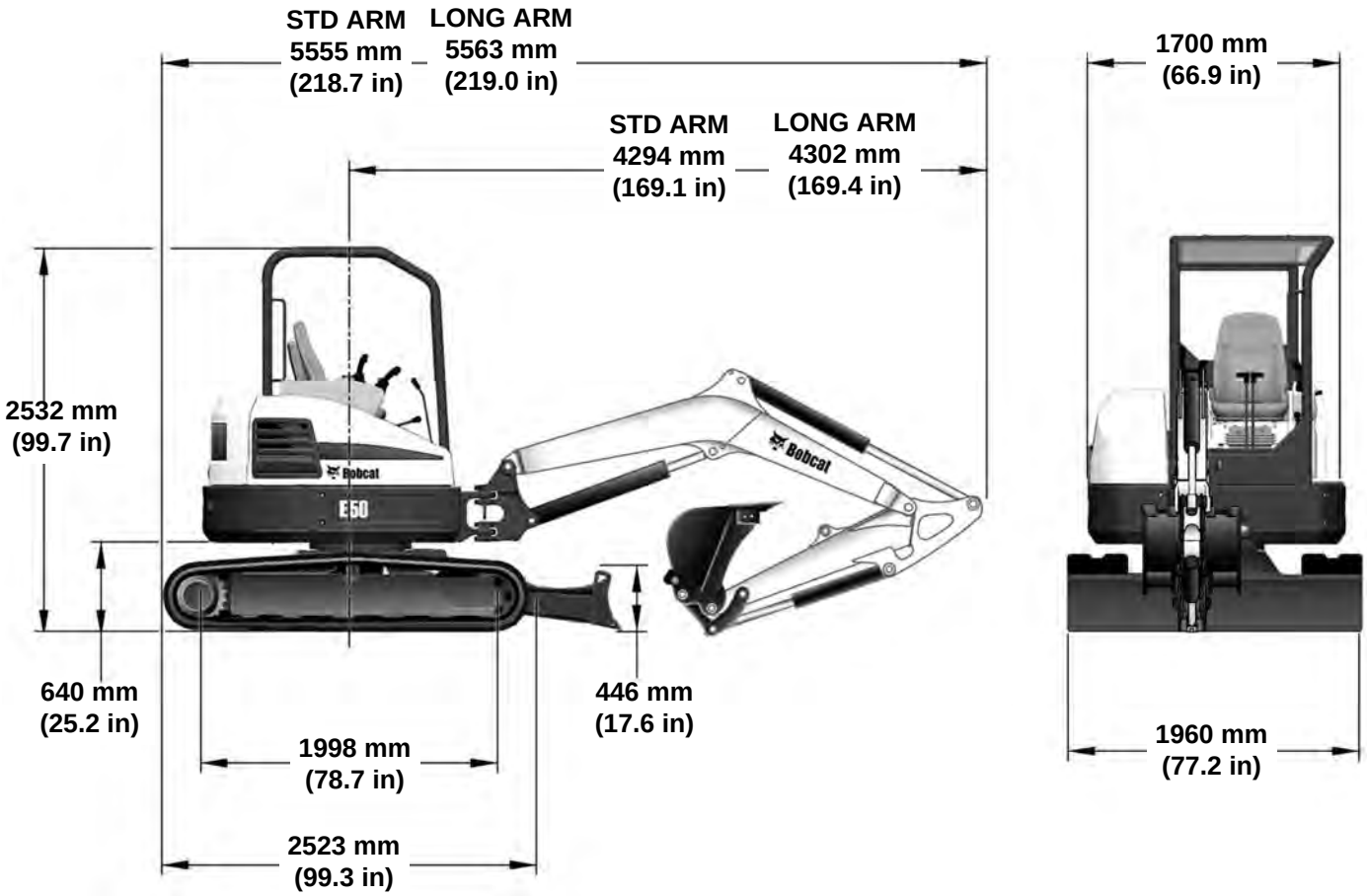
SPECIFICATIONS

EXCAVATOR SPECIFICATIONS

E50 Excavator Machine Dimensions

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

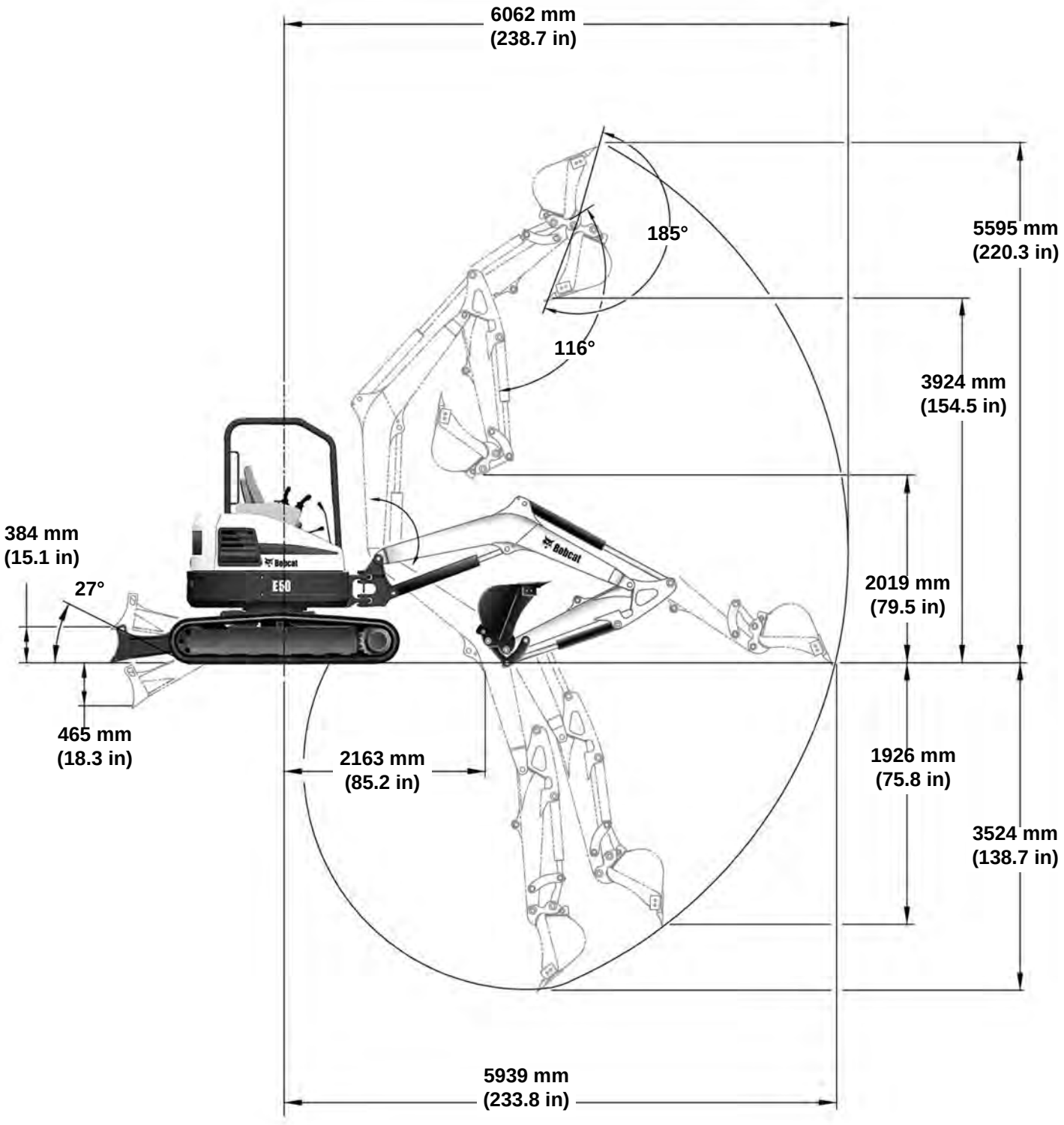




NA5066

E50 Excavator Machine Dimensions - Standard Arm

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

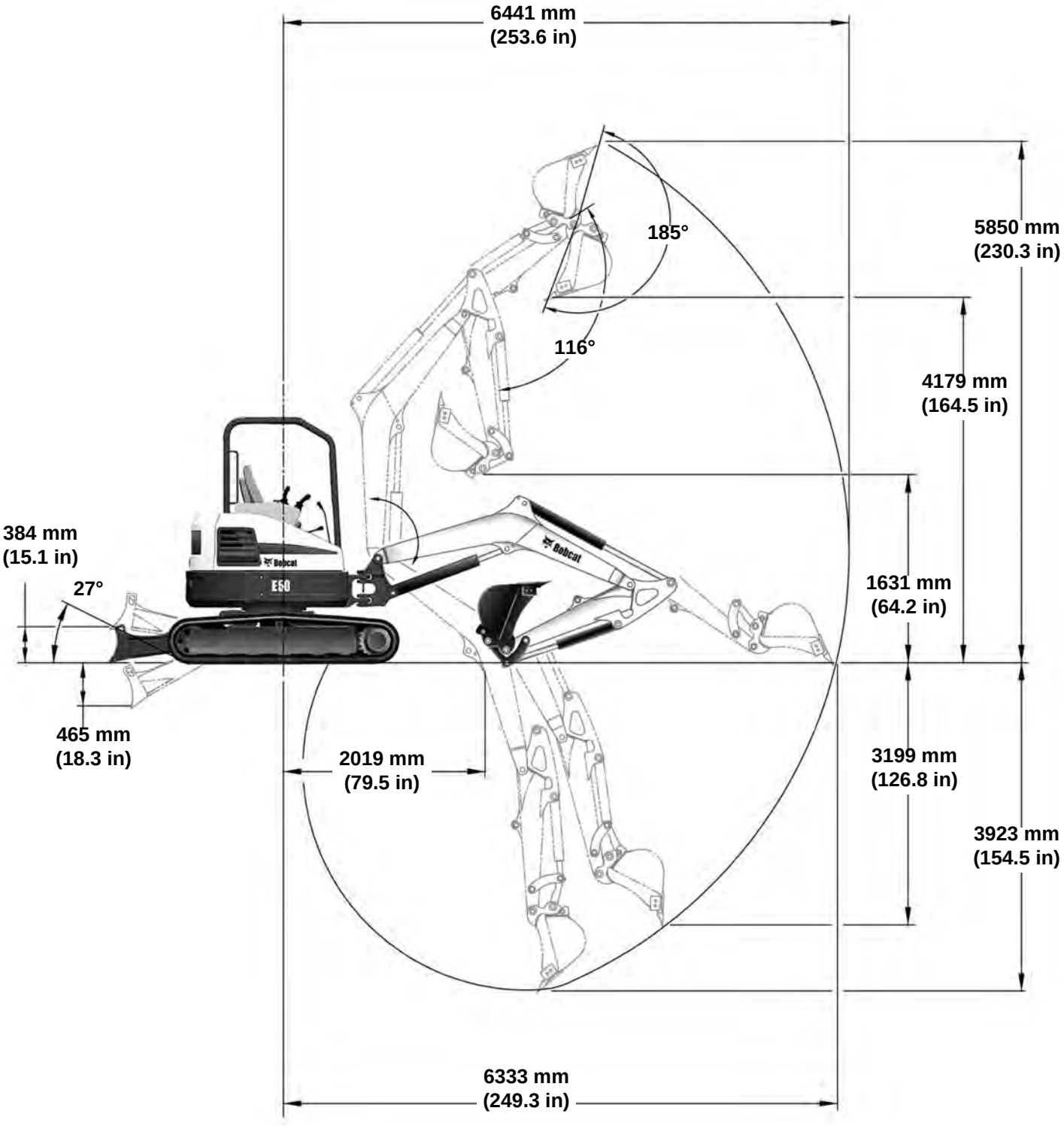


NA5067

EXCAVATOR SPECIFICATIONS (CONT'D)

E50 Excavator Machine Dimensions - Long Arm

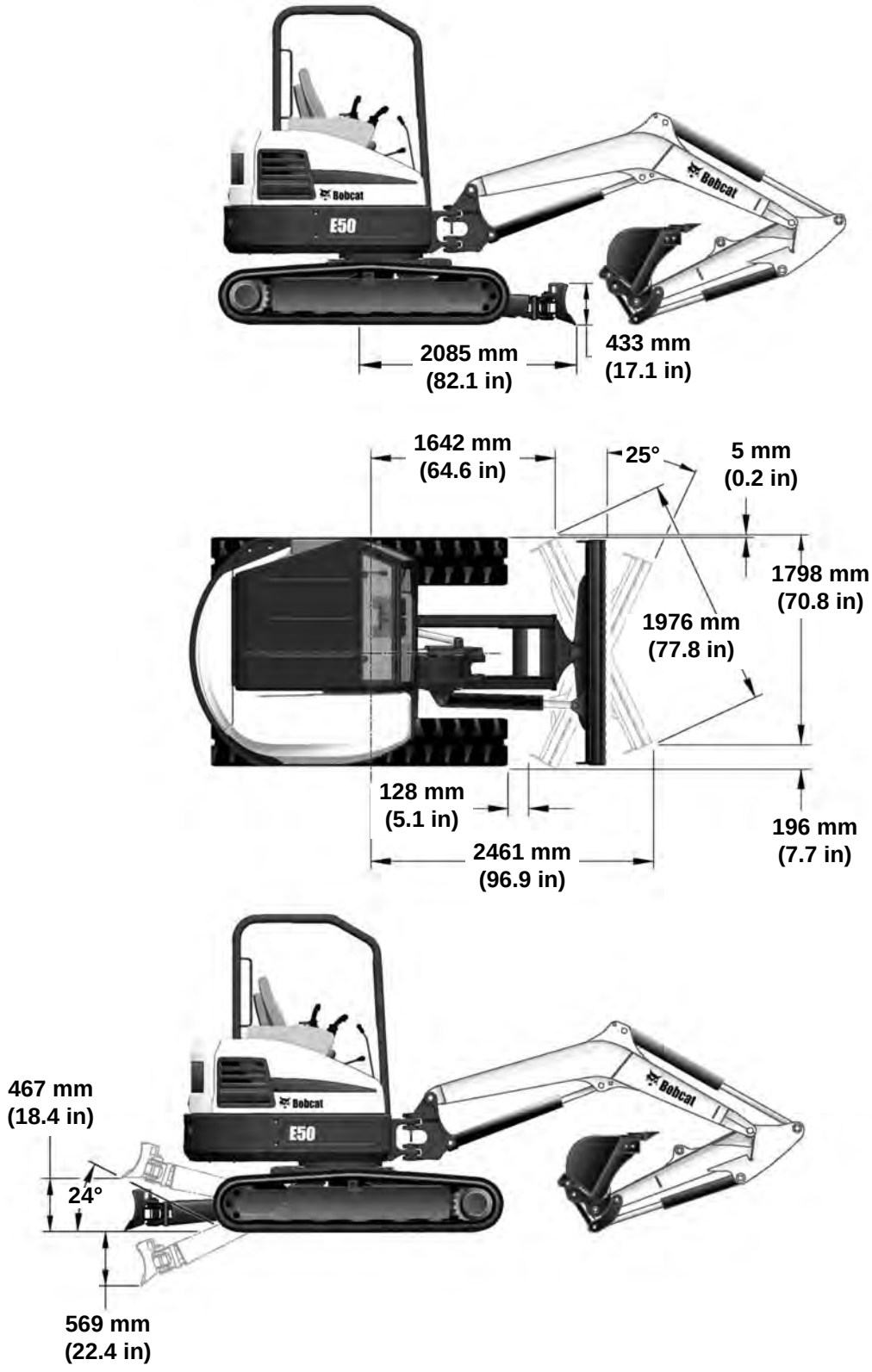
- Where applicable, specification conform to SAE or ISO standards and are subject to change without notice.



NA5067

E50 Excavator Machine Dimensions - Angle Blade

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



NA5030A

Performance

E50		
Operating weight (canopy w/ rubber tracks, and 610 mm (24 in) bucket)	4843 kg (10677 lb)	
If equipped with the following, add:	Steel tracks, add 131kg (289 lb); Cab w/ Heater, add 121 kg (267 lb); Cab w/ HVAC, add 140 kg (309 lb); Long Arm (with additional counterweight), add 235 kg (518 lb); Additional Counterweight 204 kg (450 lb); Angle Blade, add 157 kg (346 lb) Hydraulic Clamp, add 99 kg (218 lb) Pro Clamp System, Add 144 kg (317 lb)	
Travel Speed (Low / High)	3,1 kph (1.9 mph) / 5,0 kph (3.1 mph)	
Digging Force (per ISO 6015)		
With Standard Arm	Arm - 29997 N (6744 lbf) Bucket - 39930 N (8977 lbf)	
With Long Arm	Arm - 25580 N (5751 lbf) Bucket - 39930 N (8977 lbf)	
Boom Swing	Left 75°	Right 50°

Controls

Steering	Two hand levers (optional foot pedals)
Hydraulics	Two hand operated levers (joysticks) control boom, bucket, arm and upperstructure slew
Blade	Hand lever
Angle Blade (If Equipped)	Switch on blade lever
Two-Speed	Switch on blade lever
Boom Switch	Electric switch in left joystick
Auxiliary Hydraulics	Electric switch in right joystick
Auxiliary Pressure Release	Electric switch in right joystick - Standard Instrument Panel Display Panel Button - Deluxe Instrument panel
Engine	Engine speed control dial with auto idle feature, key type start switch
Starting Aid	Glow Plugs - activated by key switch
Brakes Travel Service & Parking Swing Service Holding	 Hydraulic lock in motor circuit Hydraulic lock on motor Spring applied - hydraulic release

Engine

Make / Model	Kubota V2403-M-DI-TE3B-BC-4
Fuel / Cooling	Diesel / Liquid
Horsepower (SAE Net) @ 2200 RPM	35,4 kW (47.5 hp)
Torque @ 1200 RPM (SAE Net)	179,5 N•m (132.4 ft-lb)
Number Of Cylinders	4
Displacement	2,433 L (148.5 in^3)
Bore / Stroke	87,1 x 102,4 mm (3.43 x 4.03 in)
Lubrication	Pressure System with Filter
Crankcase Ventilation	Closed Breathing
Air Cleaner	Dry replaceable paper dual cartridge
Ignition	Diesel-Compression
Low Idle Speed	1200 rpm +/- 75 rpm
High Idle Speed	2450 rpm
Engine Coolant	Propylene Glycol / water mixture (53% PG / 47% water)

EXCAVATOR SPECIFICATIONS (CONT'D)

Hydraulic System

Pump Type	Engine driven, single outlet, variable displacement, load sensing, torque limited, piston pump
Pump Capacity Piston Pump	138,5 Lpm (36.6 gpm)
Auxiliary Flow (Aux3)	75,7 Lpm (20.0 gpm)
Auxiliary Flow - 2nd Aux S/N: AHHE14000 - AHHE14775 Equipped with non-angle blade (Female Coupler) (Male Coupler)	 26,4 L/min (7.0 US gpm) 21,0 L/min (5.5 US gpm)
Auxiliary Flow - 2nd Aux S/N: AHHE1400 - AHHE14771 Equipped with angle blade (Female Coupler) (Male Coupler)	 26,4 L/min (7.0 US gpm) 21,0 L/min (5.5 US gpm)
Auxiliary Flow - 2nd Aux S/N: AHHE14776 & Above Equipped with non-angle blade (Female Coupler) (Male Coupler)	 45,4 L/min (12.0 US gpm) 34,1 L/min (9.0 US gpm)
Auxiliary Flow - 2nd Aux S/N: AHHE14772 & Above Equipped with angle blade (Female Coupler) (Male Coupler)	 45,4 L/min (12.0 US gpm) 34,1 L/min (9.0 US gpm)
Hydraulic Filter	Full flow replaceable, 3 micron synthetic media element
Control Valve	closed center, individually compensated
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 Slew Circuit Boom, Blade, Arm, Bucket, Boom Swing, Auxiliary Joystick Control Pressure	 24097 kPa (241 bar) (3495 psi) 25580 kPa (256 bar) (3710 psi) 2999 kPa (30 bar) (435 psi)
Auxiliary Port Relief, Male And Female Couplers	20995 kPa (210 bar) (3045 psi)
Arm Port Relief, Base End And Rod End	28999 kPa (290 bar) (4206 psi)
Boom Port Relief, Base End And Rod End	28999 kPa (290 bar) (4206 psi)
Bucket Port Relief Base End And Rod End	28999 kPa (290 bar) (4206 psi)
Blade Port Relief Base End And Rod End	26000 kPa (260 bar) (3771 psi)
Angle Blade (If Equipped) Port Relief Base End And Rod End	27000 kPa (270 bar) (3916 psi)
Main Hydraulic Filter Bypass	345 kPa (3,5 bar) (50 psi)
Case Drain	172 kPa (1,7 bar) (25 psi)

Hydraulic Cylinders

Cylinder	Bore	Rod	Stroke
Boom (cushion up)	101,6 mm (4.00 in)	57,1 mm (2.25 in)	697 mm (27.45 in)
Arm (cushion retract / extend)	88,9 mm (3.50 in)	57,1 mm (2.25 in)	757 mm (29.82 in)
Bucket	82,6 mm (3.25 in)	50,8 mm (2.00 in)	524 mm (20.63 in)
Boom Swing	95,2 mm (3.75 in)	50,8 mm (2.00 in)	491 mm (19.32 in)
Blade	101,6 mm (4.00 in)	50,8 mm (2.00 in)	195 mm (7.68 in)
Angle Blade (If equipped)	63,5 mm (2.50 in)	38,1 mm (1.50 in)	423 mm (16.65 in)

Hydraulic Cycle Times

Bucket Curl	2.6 Seconds	
Bucket Dump	1.8 Seconds	
Arm Retract	3.1 Seconds	
Arm Extend	3.1 Seconds	
Boom Raise	4.8 Seconds	
Boom Lower	4.6 Seconds	
Boom Swing Left	AG3N14000 - AG3N14520 8.8 Seconds	AG3N14521 AND ABOVE 4.4 Seconds
Boom Swing Right	AG3N14000 - AG3N14520 8.1 Seconds	AG3N14521 AND ABOVE 4.6 Seconds
Blade Raise	3.1 Seconds	
Blade Lower	2.7 Seconds	
Angle Blade Left (If equipped)	1.8 Seconds	
Angle Blade Right (If equipped)	1.8 Seconds	

Drive System

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

Slew System

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

Undercarriage

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

Electrical

Starting Aid	Glow Plugs
Alternator	12 volt, 90 Amp open frame w / internal regulator
Battery	12 volt - 540 CCA @ -18°C (0°F)
Starter	12 volt; gear reduction 2.0 kW (2.7 hp)
Lights	37.5 watt (2)
Instrumentation	**Gauges:** Engine Coolant Temperature, Fuel Level. **Warning lights:** Fuel Level, Seat Belt, Engine Coolant Temperature, Engine Malfunction, Hydraulic System Malfunction, General Warning. **Indicators:** Two-Speed, Engine Preheat. **Data Display:** Operating Hours, Engine rpm, Maintenance Clock Countdown, Battery Voltage, Service Codes, Engine Preheat. **Other:** Audible Alarm, Lights. **Optional Deluxe Instrumentation Panel:** *Additional displays for: Engine rpm, Coolant Temperature and Oil Pressure; System Voltage and Hydraulic Oil Temperature. *Additional Features Included: Keyless Start, Digital Clock, Job Clock, Password Lockout, Multi-language Display, Help Screens, Diagnostic Capability and Engine / Hydraulic Systems Shutdown Function.

Capacities

Fuel Tank	79,9 L (21.1 U.S. gal)
Hydraulic Reservoir Only (Center of Sight Glass)	Tank Cap. 15,1 L (4.0 U.S. gal)
Hydraulic System (with Reservoir)	54,9 L (14.5 U.S. gal)
Cooling System	8,3 L (2.2 U.S. gal)
Engine Oil and Filter	7,1 L (7.5 qt)
Final Drive (each)	1,0 L (1.1 qt)
Air Conditioning Refrigerant (R-134a)	0,77 kg (1.7 lb)

Tracks

Type	Rubber	Steel
Width	400 mm (15.7 in)	400 mm (15.7 in)
Number Of Shoes	Single Assembly	39
Number of Track Rollers (per side)	5	5

Ground Pressure

Rubber Tracks - Standard Arm Long Arm	27,2 kPa (0,272 bar) (3.95 psi) 27,9 kPa (0,280 bar) (4.05 psi)
Steel Tracks - Standard Arm Long Arm	28,5 kPa (0,285 bar) (4.14 psi) 29,3 kPa (0,293 bar) (4.25 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, (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 and (iv) auxiliary hydraulic quick couplers for six (6) months or 200 hours, whichever occurs first. For new Bobcat excavators sold in the United States or Canada that are equipped with Bobcat Engines, the engine is covered for an additional twelve (12) months after the initial twelve (12) month warranty period, or a total of 2000 hours, whichever occurs first, will apply on machines with a delivery date on or after January 1, 2018. 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 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.

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Printed in U.S.A.

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

WARNING: Cancer and Reproductive Harm.

For more information go to www.P65Warnings.ca.gov.

WARNING: Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.