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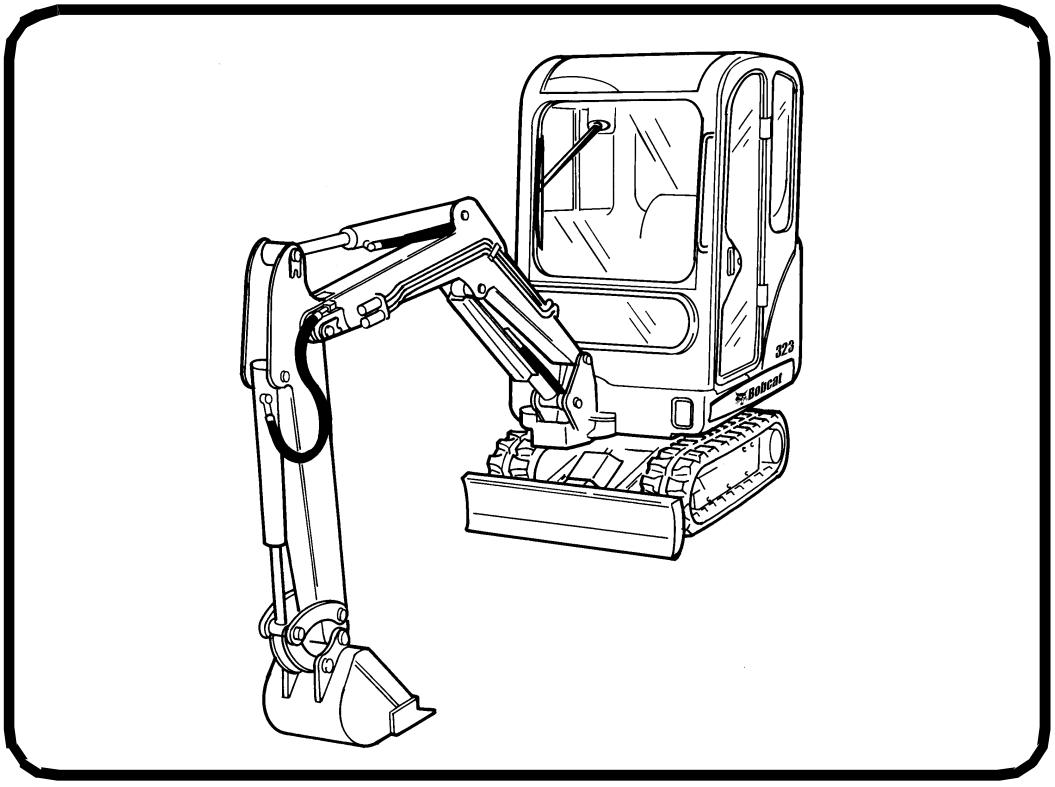
Bobcat®

Operation & Maintenance Manual
323 Compact Excavator

S/N A9JZ11001 & Above



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6986957 (2-08) Revised (10-09) (1)

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OPERATOR SAFETY WARNING

WARNING

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

W-2001-0502

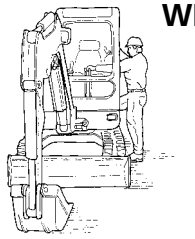
Safety Alert Symbol: **This symbol with a warning statement, means: “Warning, be alert! Your safety is involved!” Carefully read the message that follows.**

CORRECT

P-90216

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

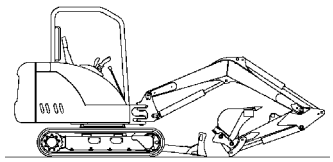
WRONG



B-19961

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

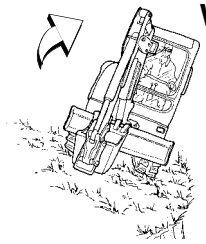
CORRECT



MS-1853

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

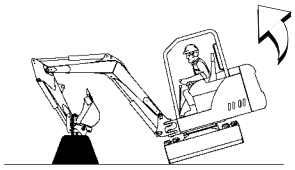
WRONG



B-19934

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

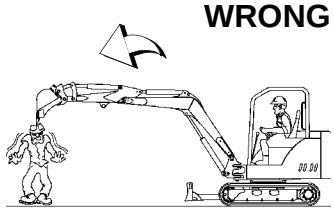
WRONG



MS-1858

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

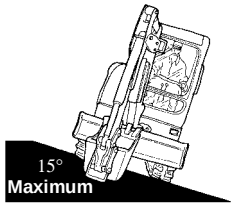
WRONG



MS1859

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

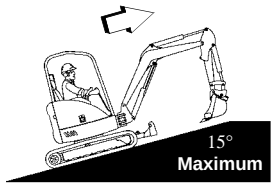
CORRECT



B-19936

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

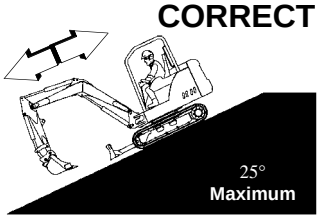
CORRECT



MS-1786

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

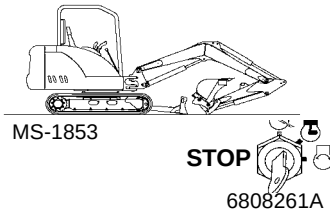
CORRECT



MS-1861

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

CORRECT



6808261A

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

CORRECT

B-21928

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

SAFETY EQUIPMENT

1. **Seat Belt**
2. **Slew Lock**
3. **ROPS/TOPS Canopy or Cab**
4. **Safety Signs (Decals)**
5. **Safety Tread**
6. **Grab Handles**

OSW24-0409

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REFERENCE INFORMATION

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

Bobcat Excavator Serial Number _____

Engine Serial Number _____

_____

_____

NOTES _____

_____

_____

_____

_____

YOUR BOBCAT® EXCAVATOR DEALER:

_____

ADDRESS:

_____

PHONE:

_____

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

Bobcat Company Europe
Drève Richelle 167
B-1410 WATERLOO
Belgium

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FOREWORD

This manual gives the owner/operator necessary operating, and preventive maintenance instructions for the Bobcat Excavator.

Read this manual completely and know the Bobcat Excavator before operating and servicing it. All references to left or right on the excavator are given in relation to the operator's left or right hand while in the operator's seat.

For further information, see your Bobcat Excavator dealer. Parts Manuals, Service Manuals and extra Operation & Maintenance Manuals are also available.

The Bobcat Compact Excavator Operator Training Course is available from your Bobcat dealer.

BOBCAT COMPANY IS IS0 9001 CERTIFIED V

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- Engine Serial Number VII
- Excavator Serial Number VII

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BOBCAT COMPANY IS IS0 9001 CERTIFIED

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

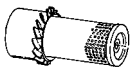
British Standards Institute (**BSI**) is the Certified Registrar Bobcat Company chose to assess the Company's compliance with the ISO 9001 at Bobcat's manufacturing facilities in Gwinner and Bismarck, North Dakota (U.S.A.), Pontchateau (France), Dobris (Czech Republic) and the Bobcat corporate offices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

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

CALIFORNIA
PROPOSITION 65 WARNING

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

REGULAR MAINTENANCE ITEMS

ENGINE OIL FILTER 6671057	BATTERY 6670251
FUEL FILTER 6667352	FLUID, Hydraulic/Hydrostatic 6903117 - (2.5 Gal.) 6903118 - (5 Gal.) 6903119 - (55 Gal.)
 AIR FILTER, Outer 6673752	RADIATOR CAP 05-6723
AIR FILTER, Inner 6673753	PROPYLENE GLYCOL ANTI-FREEZE, Premixed [-34° F (-37°C)] 6724094
PRIMARY HYDRAULIC FILTER 6653336	PROPYLENE GLYCOL ANTI-FREEZE, Concentrate 6724354
MOTOR OIL 6903105 . . . . SAE 15W/40 CE/SG (12 qt.) 6903106 . . . . SAE 15W/40 CE/SG (1 Gal.) 6903113 . . . . . SAE 15W/40 CE/SG (2.5 Gal.) 6903107 . . . . SAE 10W/30 CE/SG (12 qt.) 6903108 . . . . SAE 10W/30 CE/SG (1 Gal.) 6903112 . . . . . SAE 10W/30 CE/SG (2.5 Gal.)	6903109 . . . . . SAE 30W CE/SG (12 qt.) 6903110 . . . . . SAE 30W CE/SG (1 Gal.) 6903111 . . . . . SAE 30W CE/SG (2.5 Gal.)

NOTE: Always verify Part Numbers with your Bobcat dealer.

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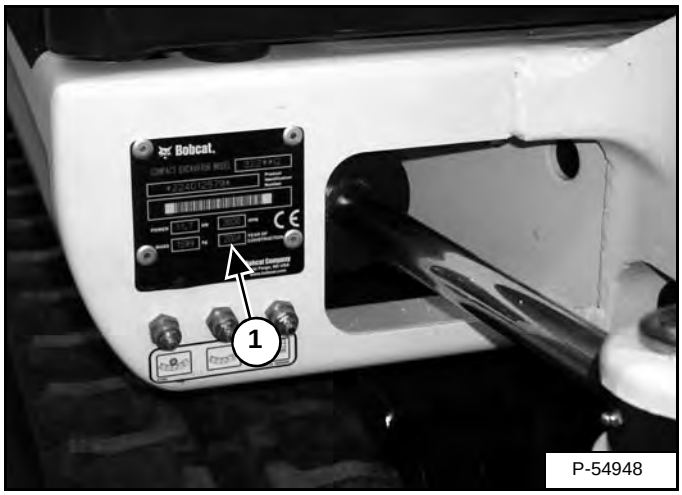
SERIAL NUMBER LOCATIONS

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

Excavator Serial Number

Figure 1



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

Explanation of Excavator Serial Number:

XXXX XXXXX

- Module 2. - Production Sequence (Series)
- Module 1. - Model / Engine Combination

1. The four digit Model/Engine Combination Module number identifies the model number and engine combination.

2. The five digit Production Sequence Number identifies the order which the excavator is produced.

Engine Serial Number

Figure 2

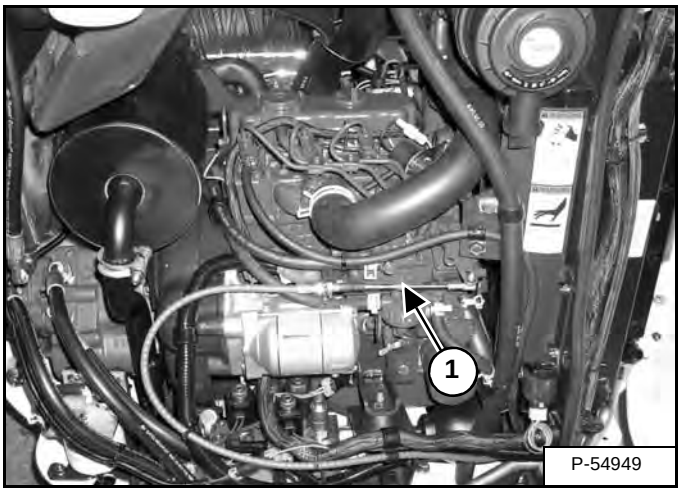
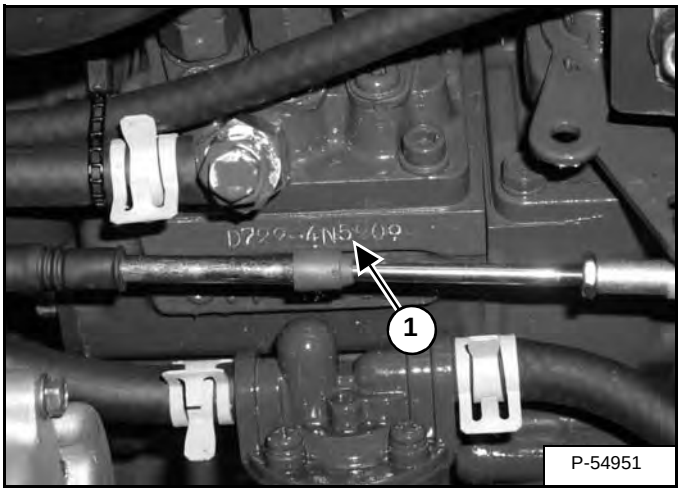


Figure 3



The engine serial number (Item 1) **[Figure 2]** & **[Figure 3]** is located on the engine in the locations shown.

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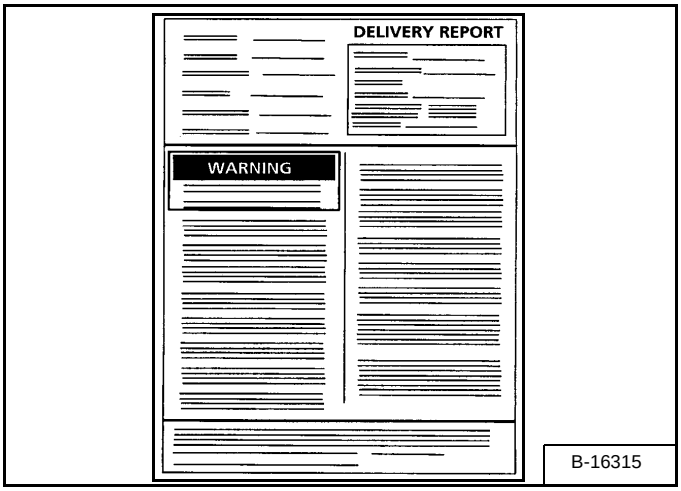
DELIVERY REPORT

Figure 4



The Delivery Report items must be explained to the owner/operator by the dealer. The dealer is to fill out the form and the owner/operator signs the form to indicate his understanding **[Figure 4]**.

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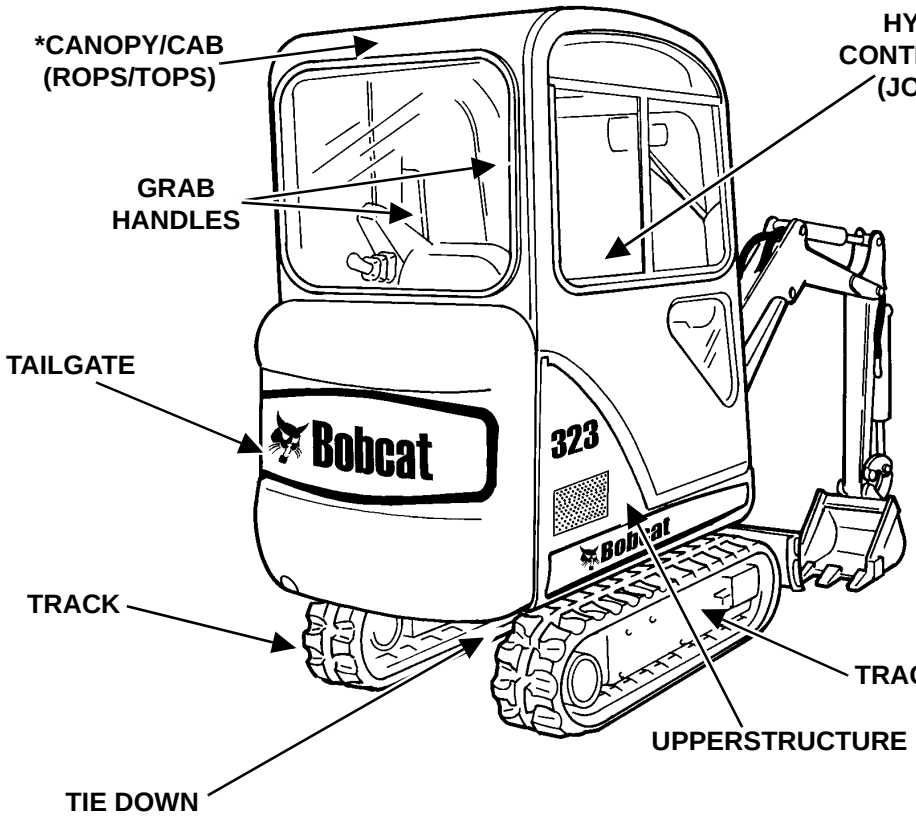
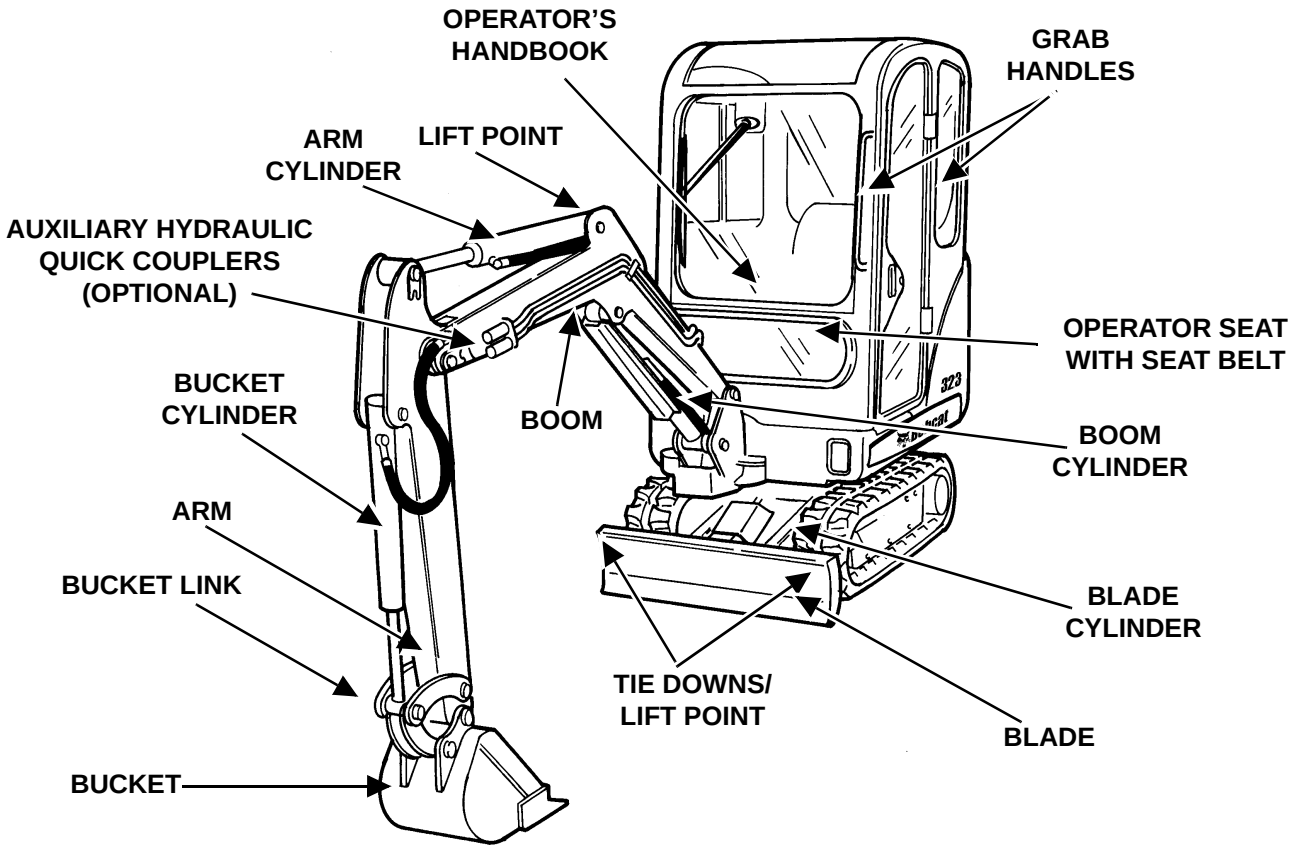
BOBCAT EXCAVATOR IDENTIFICATION





* FOGS (Falling Object Guards) is available from your Bobcat Excavator dealer.

B-23067A
B-23066A

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FEATURES, ACCESSORIES, AND ATTACHMENTS

Standard Items

Model 323 Bobcat Excavators are equipped with the following standard items:

- Canopy with ROPS/TOPS Approval
- 38 inch (965 mm) Dozer Blade
- Two 7 inch (178 mm) Blade extensions
- 9.06 inch (230 mm) Rubber Tracks
- Two-Speed Travel
- Auxiliary Hydraulics
- Hydraulic and Travel Control Lockouts
- Hydraulically Expandable undercarriage (from 38.6 - 53.5 inch [998 - 1359 mm])
- Work Lights - Boom and Frame Mounted
- Horn
- Hydraulic Joystick Controls
- ISO/STD Control Pattern Selection Feature
- Spark Arrestor Muffler

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
- Travel Motion Alarm
- Catalytic Exhaust Purifier
- Top Guard Kit (FOGS)
- Steel Track
- Special Application Cab
- Rental Investment Protection System (RIPS)
- Engine block heater

Specifications subject to change without notice

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.

- Trenching bucket
- Grading bucket
- Auger
- Hydraulic Clamp
- Breaker

Buckets

Increase the versatility of your Bobcat Excavator with a variety of bucket sizes.

- 9 inch (225 mm) Trenching
- 12 inch (300 mm) Trenching
- 16 inch (406 mm) Trenching
- 18 inch (457 mm) Trenching
- 20 inch (508 mm) Trenching
- 39 inch (991 mm) Grading

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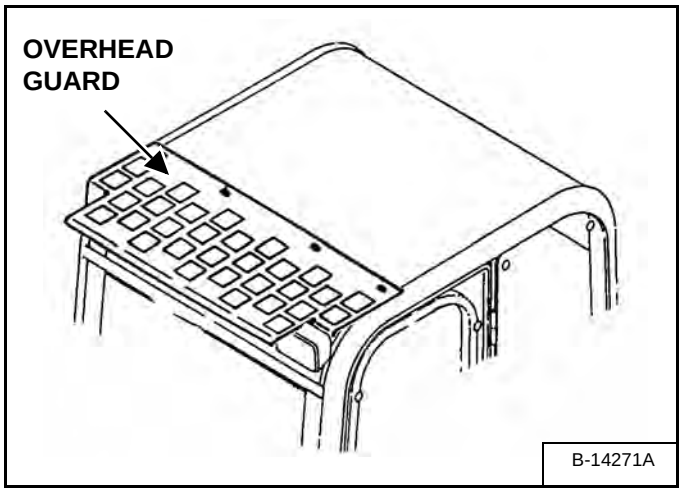
Falling Object Guards (FOGS)

The FOGS provides additional protection from smaller objects which can fall on the canopy or cab.

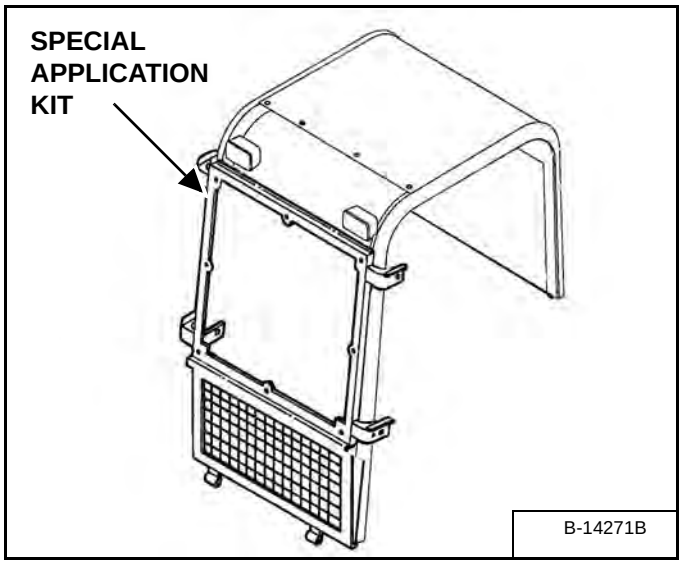
For the canopy or cab to meet the FOGS (ISO 10262 - level 1), the excavator must have the overhead guard *and* the Special Applications Kit installed.



Special Applications Kit

The Special Applications Kit can be installed when certain attachments are used on the excavator to restrict material from entering the canopy or cab openings.

The Special Applications Kit includes a upper and lower screen guard.



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.

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SAFETY INSTRUCTIONS

Before Operation

Carefully follow the operating and maintenance instructions in this manual.

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

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

The dealer explains the capabilities and restrictions of the Bobcat excavator and attachment for each application. The dealer demonstrates the safe operation according to Bobcat instructional materials, which are also available to operators. The dealer can also identify unsafe modifications or use of unapproved attachments. The attachments and buckets are designed for a Rated Lift Capacity. They are designed for secure fastening to the Bobcat excavator. The user must check with the dealer, or Bobcat literature, to determine safe loads of materials of specified densities for the machine - attachment combination.

The following publications and training materials provide information on the safe use and maintenance of the Bobcat machine and attachments:

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the machine and attachment is in safe operating condition.

- The Operation & Maintenance Manual delivered with the machine or attachment gives operating information as well as routine maintenance and service procedures. It is a part of the machine and can be stored in a container provided on the machine. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.

- Machine signs (decals) instruct on the safe operation and care of your Bobcat machine or attachment. The signs and their locations are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat dealer.

- An Operator's Handbook is fastened to the operator cab of the excavator. It's brief instructions are convenient to the operator. The Handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.

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

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

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

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

The dealer and owner / operator review the recommended uses of the product when delivered. If the owner / operator will be using the machine for a different application(s) he or she must ask the dealer for recommendations on the new use.

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

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

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Safe Operation Is The Operator's Responsibility

Safety Alert Symbol

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

WARNING

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

W-2001-1285

IMPORTANT

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

I-2019-0284

DANGER

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

D-1002-1107

WARNING

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

W-2044-1107

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

Check all of the items on the Bobcat Service Schedule Decal under the 8-10 hour column or as shown in the Operation & Maintenance Manual.

Safe Operation Needs A Qualified Operator

For an operator to be qualified, he or she must not use drugs or alcoholic drinks which impair alertness or coordination while working. An operator who is taking prescription drugs must get medical advice to determine if he or she can safely operate a machine.

A Qualified Operator Must Do The Following:

Understand the Written Instructions, Rules and Regulations

- The written instructions from Bobcat Company include the Delivery Report, Operation & Maintenance Manual, Operator's Handbook, Safety Manual and machine signs (decals).
- Check the rules and regulations at your location. The rules may include an employer's work safety requirements. Regulations may apply to local driving requirements or use of a Slow Moving Vehicle (SMV) emblem. Regulations may identify a hazard such as a utility line.

Have Training with Actual Operation

- Operator training must consist of a demonstration and verbal instruction. This training is given by your Bobcat dealer before the product is delivered.
- The new operator must start in an area without bystanders and use all the controls until he or she can operate the machine and attachment safely under all conditions of the work area. Always fasten seat belt before operating.
- Operator Training Courses are available from your Bobcat dealer in English and Spanish. They provide information for safe and efficient equipment operation. Safety videos are also available.
- Service Safety Training Courses are available from your Bobcat dealer. They provide information for safe and correct service procedures.

Know the Work Conditions

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

SI EXC-0208

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

Operation

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

Electrical

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

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

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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.

Starting

Do not use ether or starting fluids on any engine that has glow plugs. 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 Arrestor Exhaust System

The spark arrestor 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 arrestor exhaust system regularly to make sure it is maintained and working properly. Use the procedure in the Operation & Maintenance Manual for cleaning the spark arrestor muffler (if equipped).

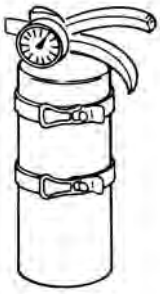
Welding And Grinding

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.

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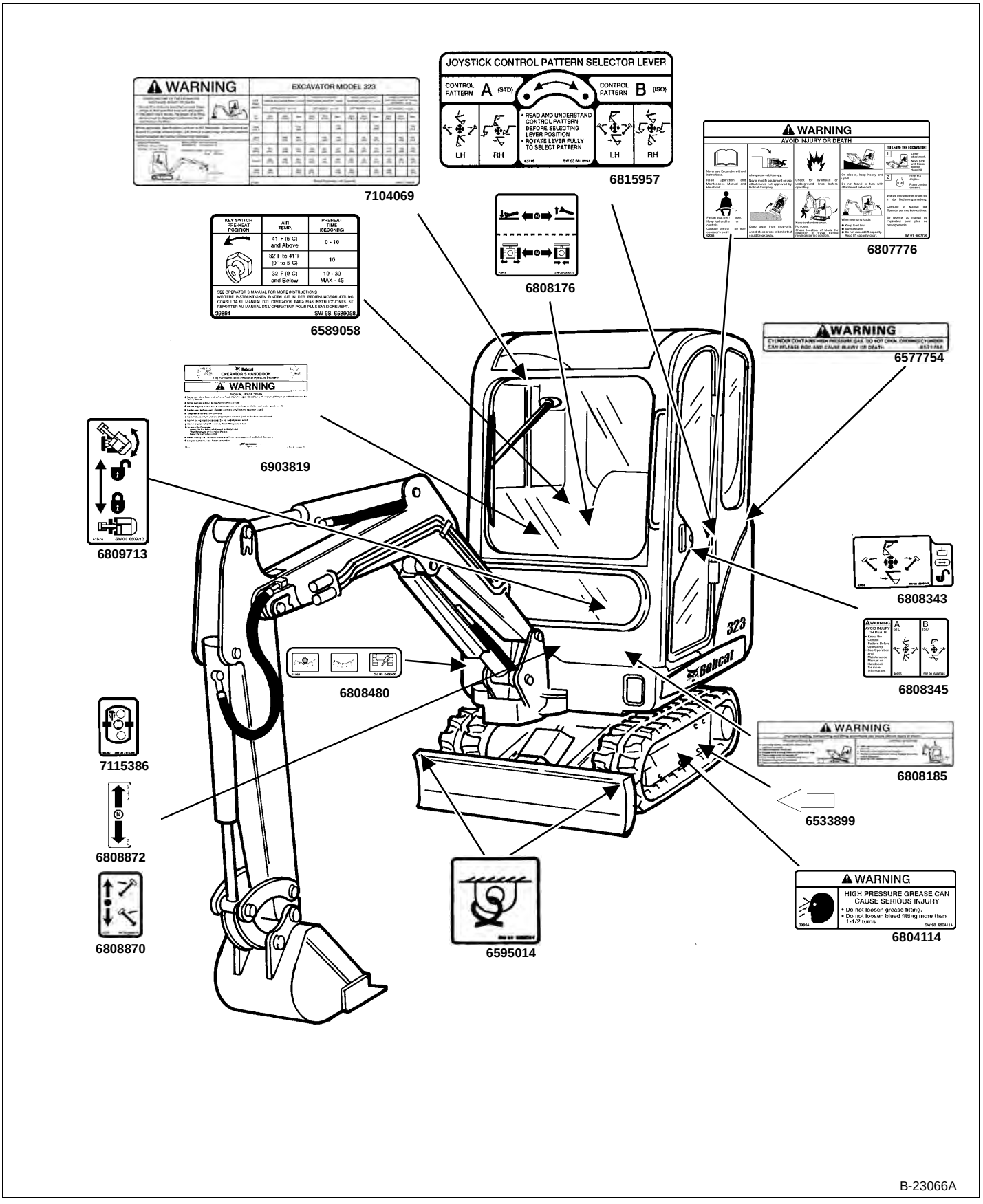
MACHINE SIGNS (DECALS)

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.



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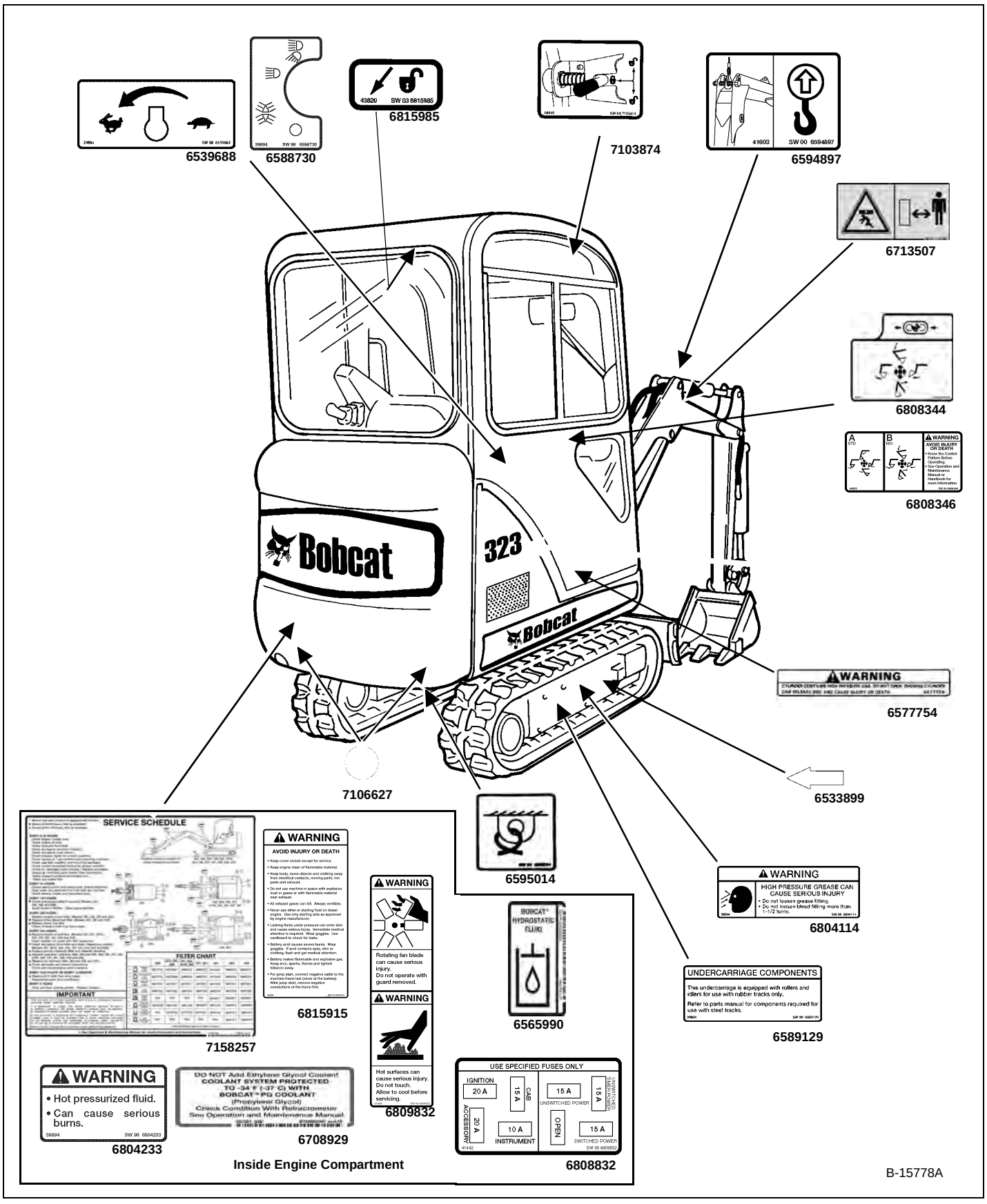
MACHINE SIGNS (DECALS) (CONT'D)

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.



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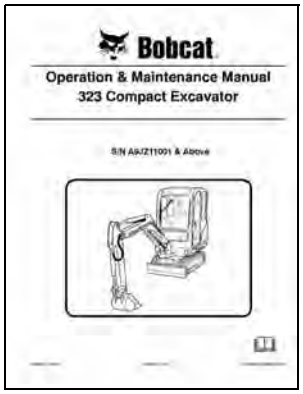
PUBLICATIONS AND TRAINING RESOURCES

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

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



OPERATION & MAINTENANCE MANUAL

6986957

- Complete instructions on the correct operation and the routine maintenance of the Bobcat Excavator.

SERVICE MANUAL

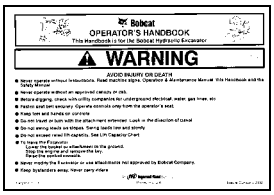
6986958

- Complete maintenance instructions for your Bobcat Excavator.

SAFETY MANUAL

6901951

- Provide basic safety procedures and warnings for your Bobcat Excavator



OPERATOR'S HANDBOOK

6903819

Gives basic operation instructions and safety warnings

COMPACT EXCAVATOR OPERATOR TRAINING COURSE

6903186

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

EXCAVATOR SERVICE SAFETY COURSE

6900916

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

OPERATOR SAFETY VIDEO

6903181

Provides basic safety instructions

OPERATOR SAFETY DVD

6904762

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

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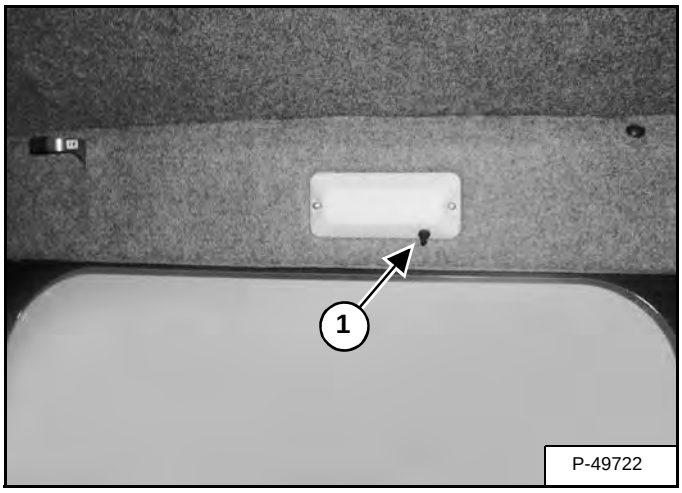
Cab Interior Light (If Equipped)

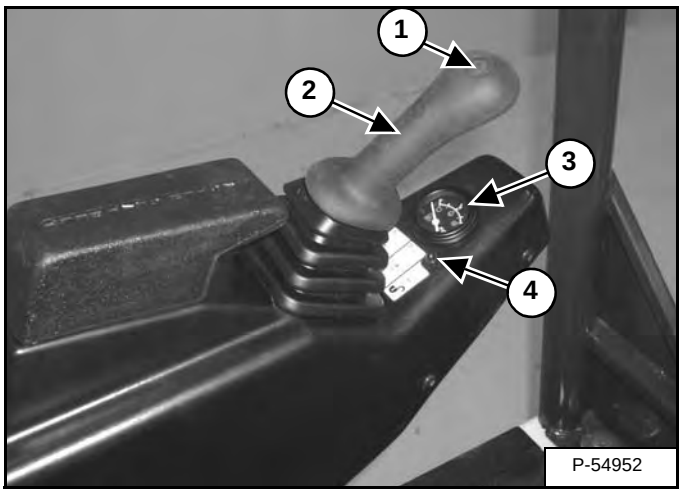
Figure OI-1



Cab Interior Light (If Equipped) - Press the button (Item 1) **[Figure OI-1]** to turn the light ON. Press again to turn light OFF.

Left Console

Figure OI-2

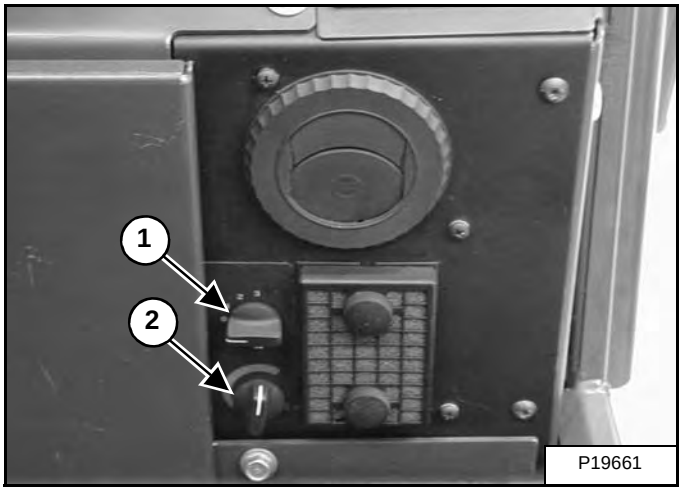


Left Console **[Figure OI-2]**

REF. NO.	DESCRIPTION	FUNCTION/OPERATION
1	Horn	Press button to sound horn.
2	Left Joystick	(See HYDRAULIC CONTROLS on Page OI-16).
3	Fuel Gauge	Shows the amount of fuel in the tank.
4	Hydraulic Lockout Indicator	When consoles are down and locked, indicator light will be ON. Hydraulic and traction system controls will operate.

Heater (If Equipped)

Figure OI-3



Heater **[Figure OI-3]**

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

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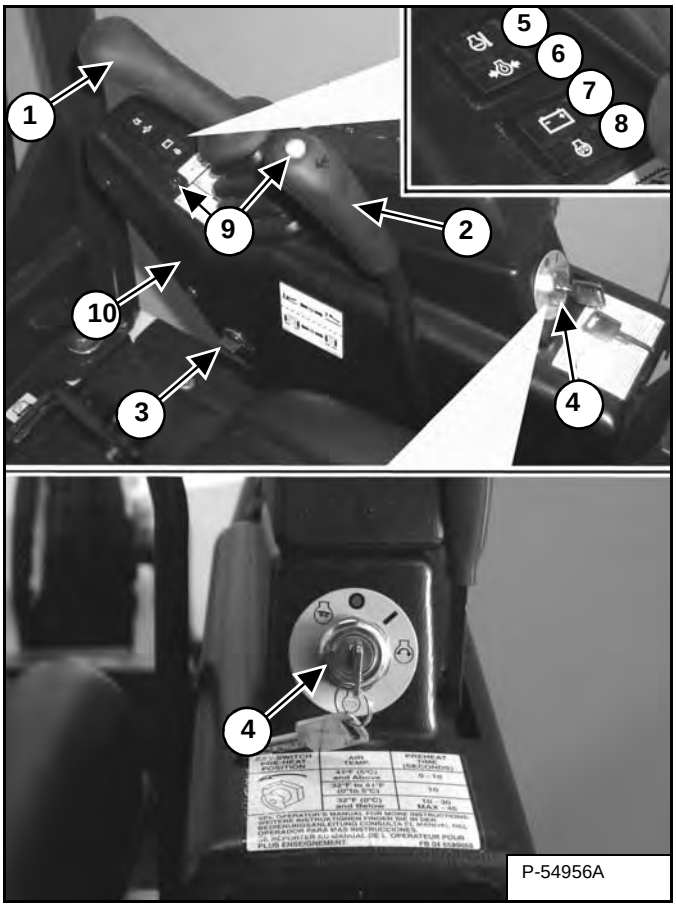
Right Console

Figure OI-4



Right Console **[Figure OI-4]**

REF. NO.	DESCRIPTION	FUNCTION/OPERATION
1	Right Joystick	(See HYDRAULIC CONTROLS on Page OI-16).
2	Blade / Track Expansion Lever	Use with Blade/Track Expansion Switch to raise/lower the blade or expand/retract the tracks.
3	Auxiliary Power Outlet	Provides a 12V receptacle for accessories
4	Key Switch	(See STARTING THE ENGINE on Page OI-28).
5	Engine Coolant Temperature Warning Light	Light comes ON when coolant temperature is above allowable range. Alarm also sounds. STOP the engine if light comes ON.
6	Engine Oil Pressure Warning Light	Light comes ON when pressure is below allowable range. Alarm also sounds. STOP the engine if light comes ON.
7	Charging System Light	Light comes ON when the alternator is NOT charging the battery.
8	Preheat Light	Light comes ON when key is turned to PREHEAT position.
9	Two-Speed Button and Light	Engages and disengages High Range Travel Speed. (See Two-Speed Travel on Page OI-7).
10	Alarm	(Inside right console) Alarm sounds when key is ON and engine is stopped; also when engine oil pressure is low or coolant temperature is high.

NOTE: Always turn key switch and all accessories to OFF position after the engine is stopped. The battery will discharge if the key is left ON. Alarm will sound if the key is in the ON position with the engine stopped.

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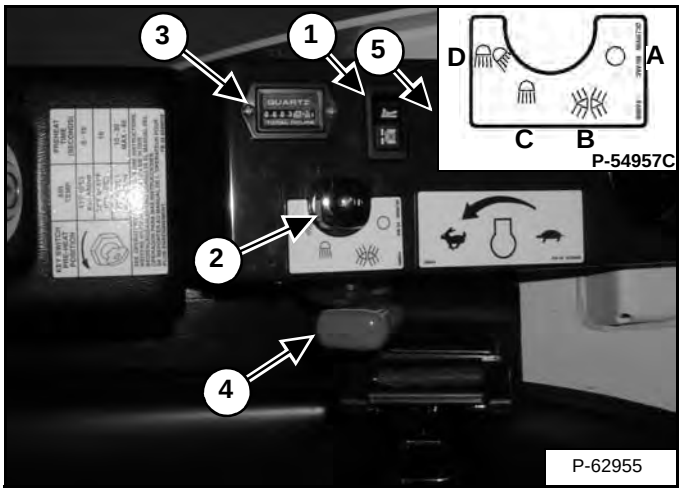
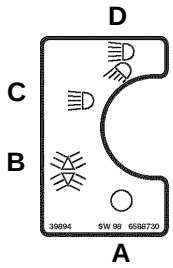
Right Control Panel

Figure OI-5

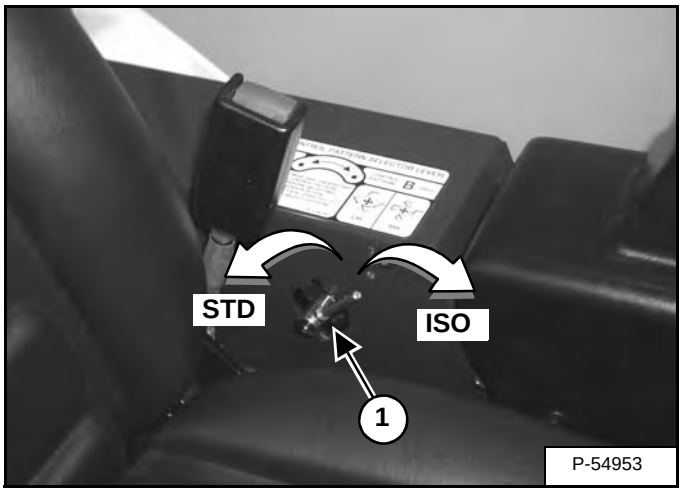


Right Console **[Figure OI-5]**

REF. NO.	DESCRIPTION	FUNCTION/OPERATION
1	Blade / Track Expansion Switch	Switch functions between raise/ lower the blade and track expansion. (See BLADE CONTROL LEVER on Page OI-20). or (See TRACK FRAME EXPANSION on Page OI-21).
2	Light Switch (Work, Strobe, Flasher) 	**A.** Light Switch is OFF **B.** Strobe Light or Flasher is ON (If Equipped) **C.** Front Work Lights plus 'B' is ON (If Equipped) **D.** Additional Work Lights plus 'B' and 'C' is ON (If Equipped)
3	Hourmeter	Records the total operating hours of the excavator
4	Engine Speed Control	Push forward to increase speed; backward to decrease.
5	Wiper / Washer (If Equipped)	Press left side to turn wiper ON. Press and hold for washer. Press right side to turn OFF.

STD / ISO Selector Valve

Figure OI-6



STD / ISO Selector Valve (Item 1) **[Figure OI-6]** - Move the lever to the rear to select STANDARD Control Pattern. Move to the front to select ISO Control Pattern.

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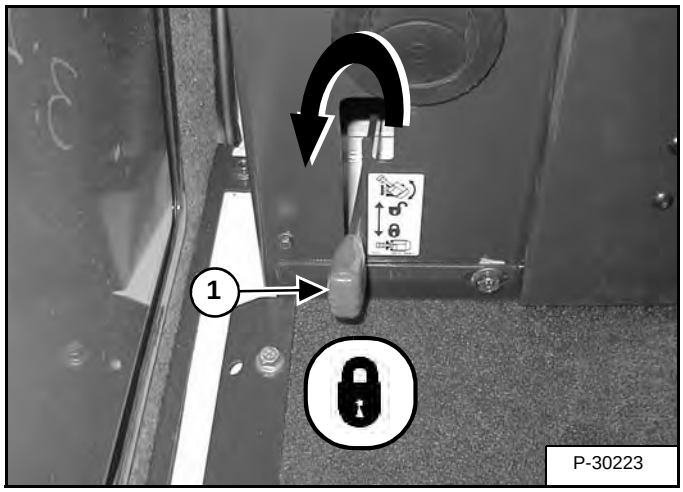
Upperstructure Slew Lock

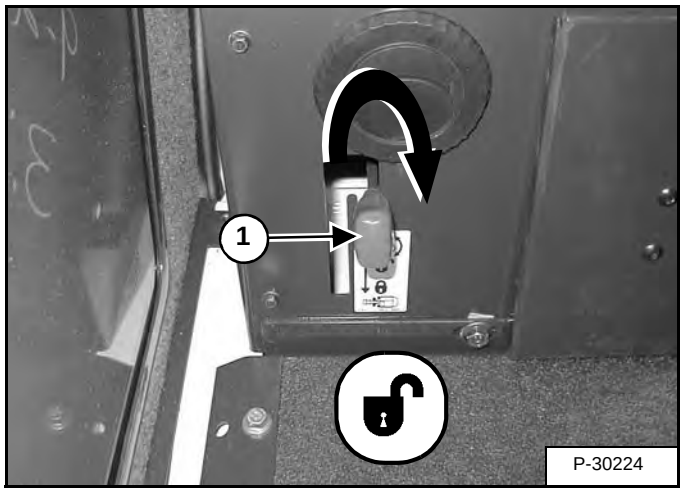
Figure OI-7



Move the lever (Item 1) **[Figure OI-7]** *down* to engage the Upperstructure Slew Lock. When the Slew Lock is engaged (locked), the upperstructure of the excavator is locked to the track frame and will not rotate. The upper structure must be parallel to the track frame to engage the Slew Lock.

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

Figure OI-8



Move the lever (Item 1) **[Figure OI-8]** *up* to disengage the upperstructure from the track frame. Secure the lever in the unlocked position.

Raising And Lowering The Console(s)

Figure OI-9

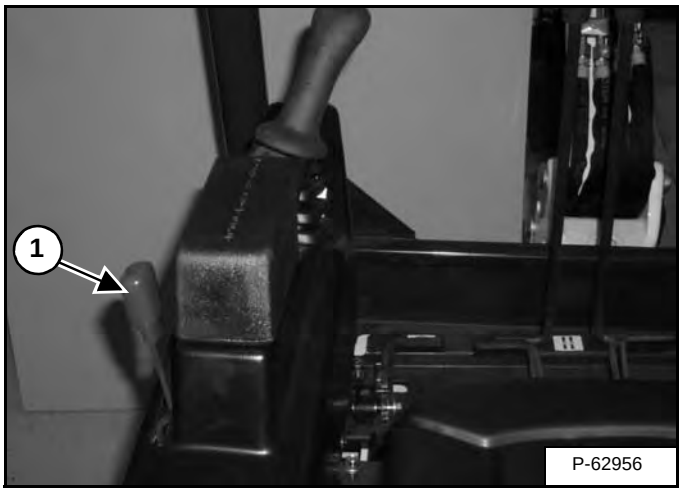
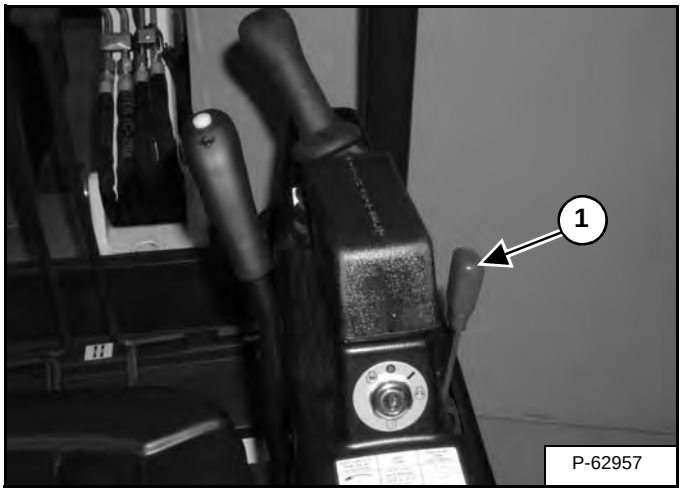


Figure OI-10



Pull the lever(s) (Item 1) **[Figure OI-9]** & **[Figure OI-10]** backward to release and raise the console(s) to provide entry and exit from the canopy/cab.

When either console is raised, the hydraulic control levers (joysticks) and traction system will not function.

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

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

Lower the console(s) **[Figure OI-9]** & **[Figure OI-10]** until latched in the down position.

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

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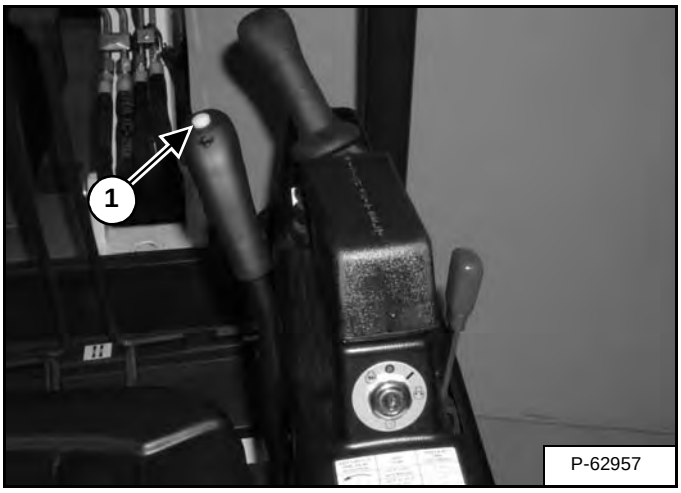
Two-Speed Travel

Figure OI-11



Press the button (Item 1) **[Figure OI-11]** (on the blade lever) to engage the High-Range; press again for Low-Range.

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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 3471, 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 3471, 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.

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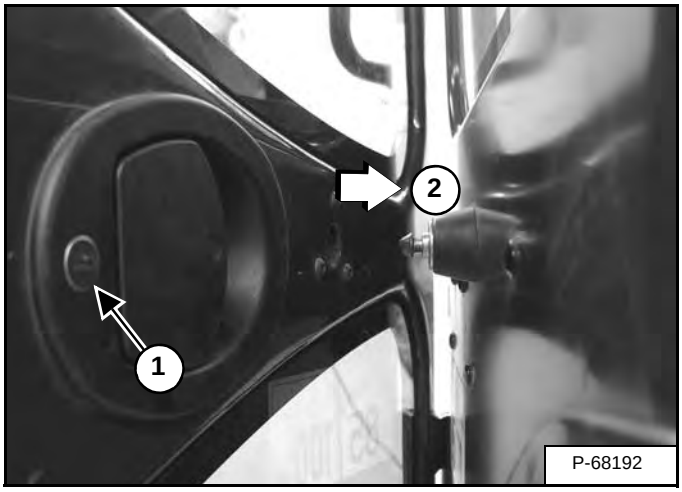
Cab Door

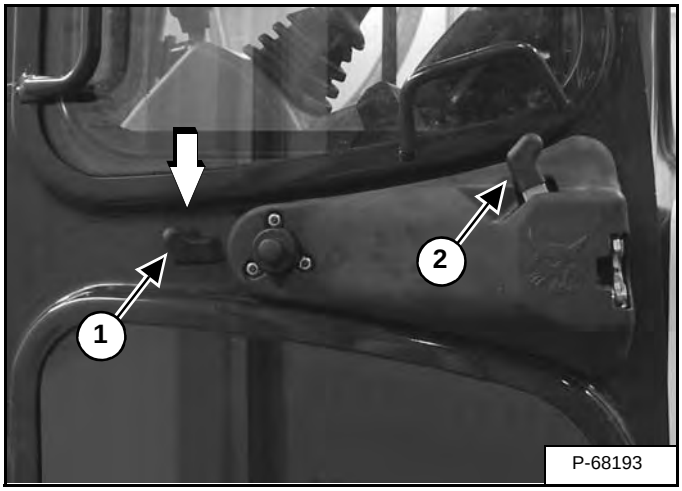
Figure OI-12



The cab door can be locked (Item 1) **[Figure OI-12]** with the same key as the starter switch.

Push the door all the way open (Item 2) **[Figure OI-12]** until the latch engages to hold the door in the open position.

Figure OI-13

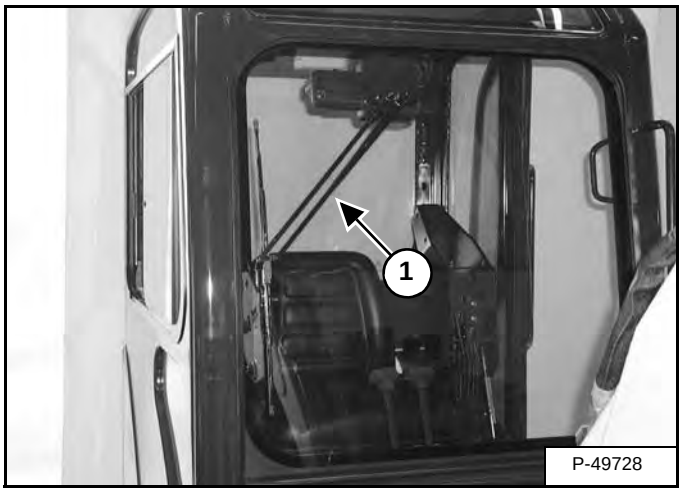


When the door is in the open position, push down on the latch (Item 1) **[Figure OI-13]** and close the door.

From inside the cab, open the door using handle (Item 2) **[Figure OI-13]**.

Front Window Wiper

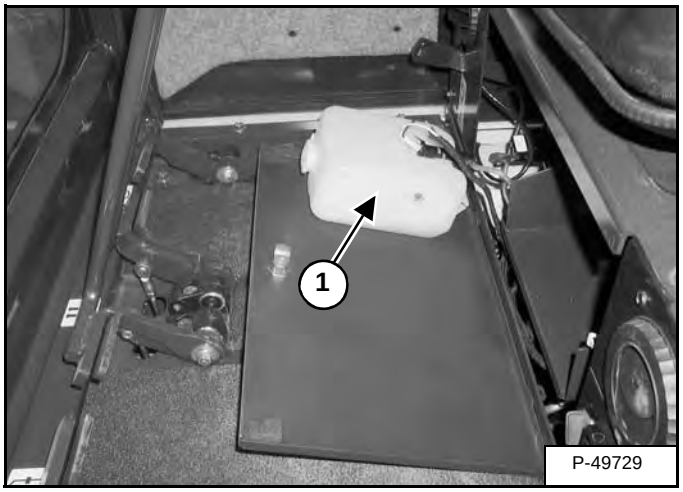
Figure OI-14



The front window is equipped with a wiper (Item 1) **[Figure OI-14]** and washer.

Window Washer Reservoir

Figure OI-15



The window washer reservoir (Item 1) **[Figure OI-15]** is located on the inside of the storage compartment door.

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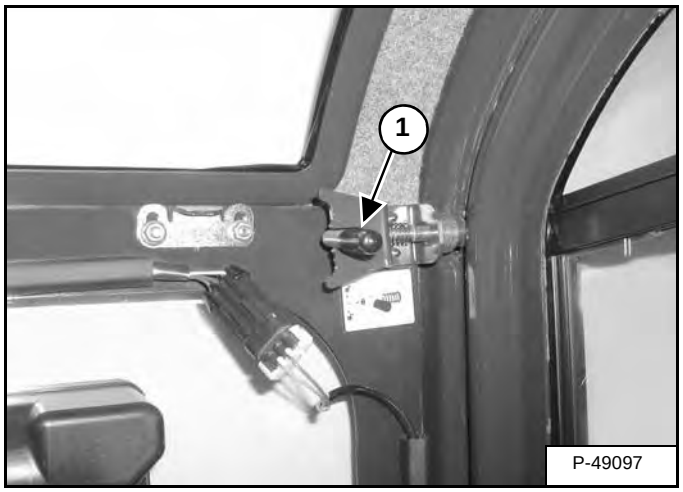
Front Window

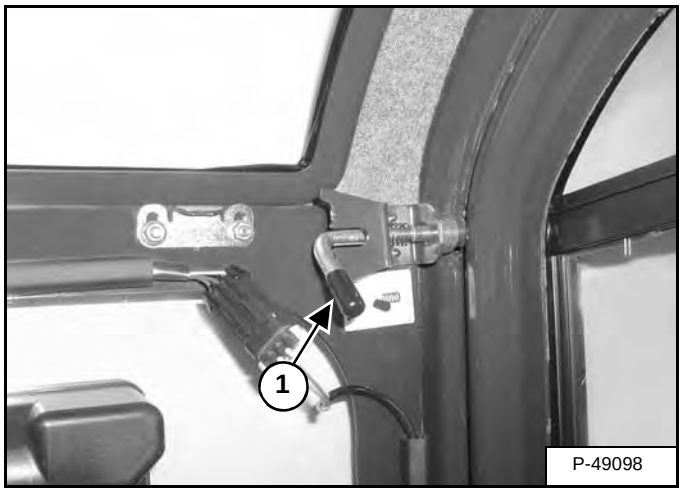
Opening The Front Window

Figure OI-16



Retract the two top window latch pins (Item 1) **[Figure OI-16]**.

Figure OI-17



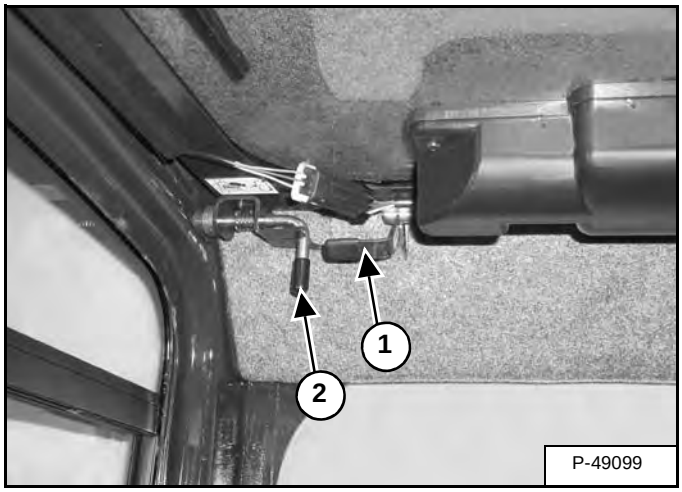
Turn the two top latches (Item 1) **[Figure OI-17]** to the unlocked position.

Figure OI-18

Use both window grab handles to pull the top of the window in **[Figure OI-18]**.

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

Figure OI-19



When the window is fully raised, the latch (Item 1) will close on the bracket. Turn the two top latches (Item 2) **[Figure OI-19]** to the locked position.

Closing The Front Window

Support the window while releasing both window latch pins and placing the pins in the unlocked position **[Figure OI-19]**.

Support the window using the left grab handle and pull down on the latch (Item 1) **[Figure OI-19]** to release the window.

Use both window grab handles to pull the window down **[Figure OI-18]**.

Rotate the top latches (Item 1) **[Figure OI-17]** to the locked position (Item 1) **[Figure OI-16]**.

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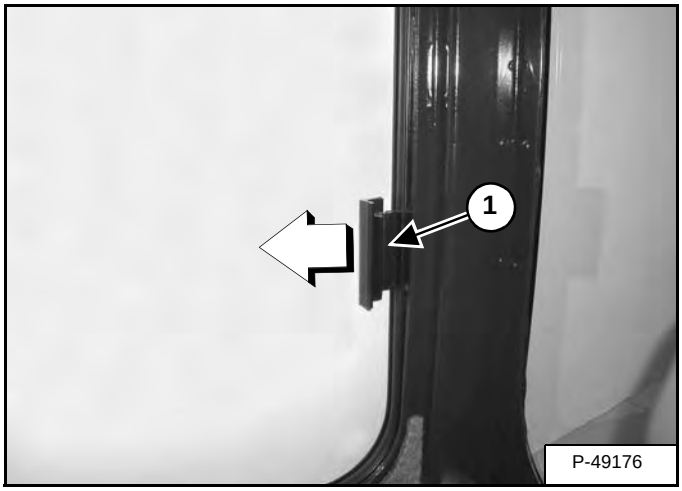
Right Side Windows

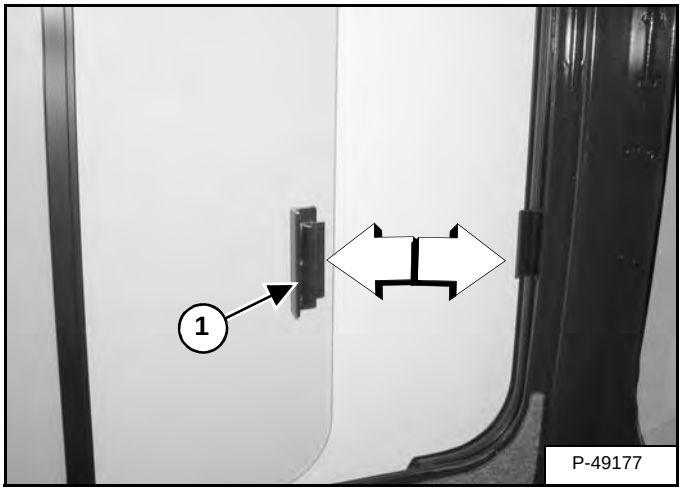
Opening the right rear window

Figure OI-20



Pull forward on the latch (Item 1) **[Figure OI-20]**.

Figure OI-21

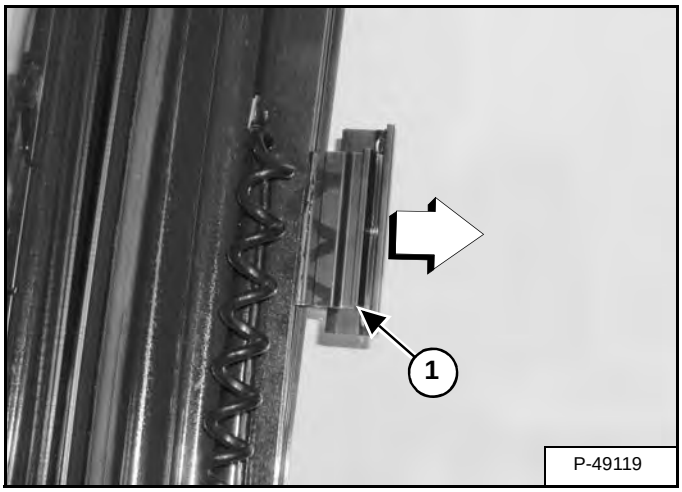


Pull the latch/handle (Item 1) **[Figure OI-21]** forward to open the window.

Push the handle back to close the window.

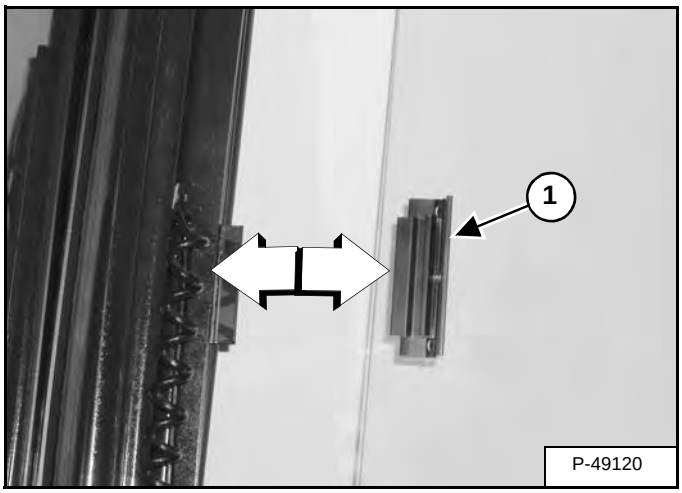
Opening the right front window

Figure OI-22



Pull back on the latch (Item 1) **[Figure OI-22]**.

Figure OI-23



Pull the latch/handle (Item 1) **[Figure OI-23]** back to open the window.

Push the handle forward to close the window.

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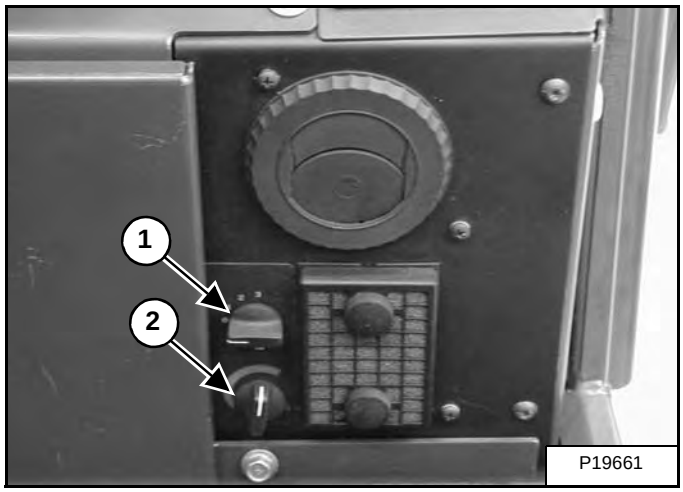
Heater (If Equipped)

Figure OI-24



The optional cab is equipped with a heater.

Fan Switch (Item 1) **[Figure OI-24]** - Turn clockwise to increase fan speed; counterclockwise to decrease. There are four positions; OFF - LO - MED - HI.

Temperature Control (Item 2) **[Figure OI-24]** - Turn clockwise to increase temperature; counterclockwise to decrease.

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TRAVEL CONTROLS

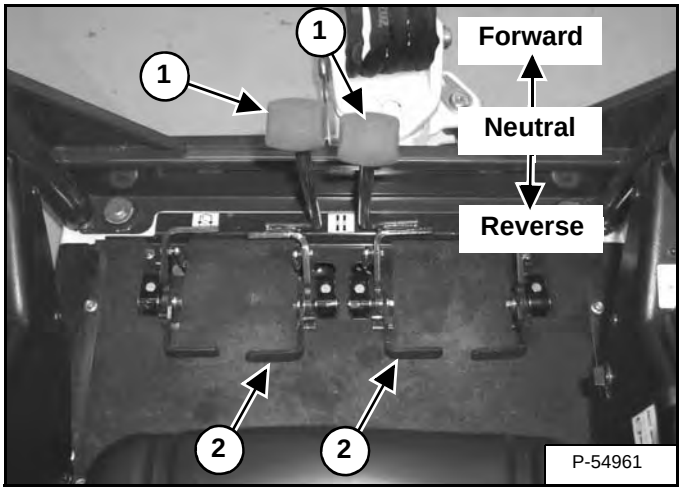
Description

The travel control levers control the movement of the excavator.

Forward And Reverse Travel

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

Figure OI-25



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 OI-25]** forward for forward travel; backward for reverse travel.

* Steering can also be controlled with foot pedals (Item 2) **[Figure OI-25]** (If equipped). 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.**

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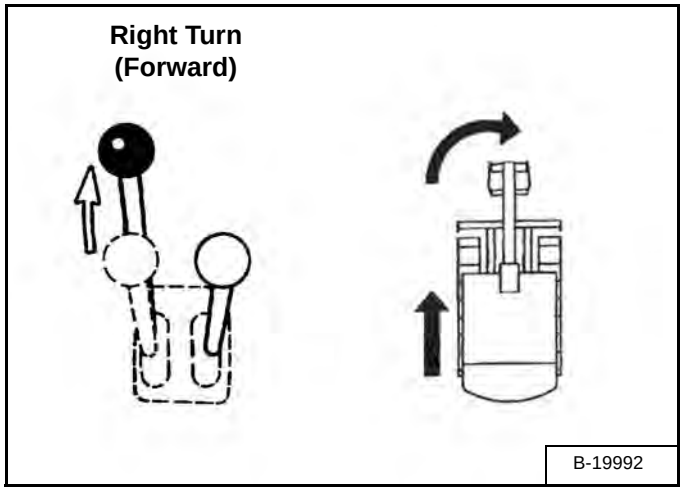
Turning

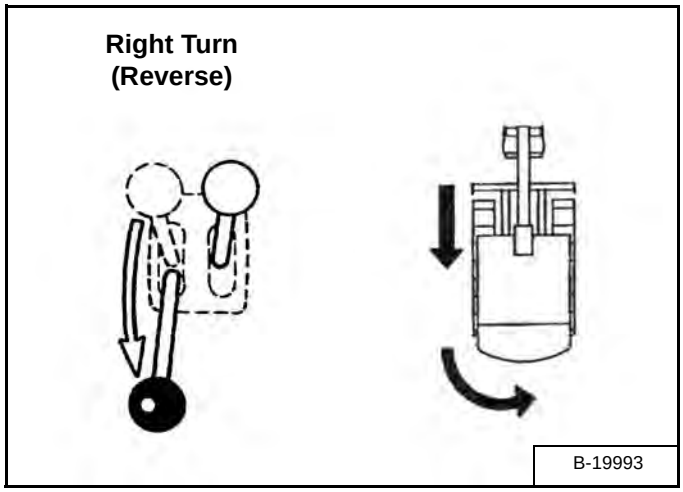
Right Turn

Figure OI-26



Push the left steering lever forward to turn right **[Figure OI-26]** while traveling forward.

Figure OI-27



Pull the left steering lever backward to turn right **[Figure OI-27]** while traveling backward.

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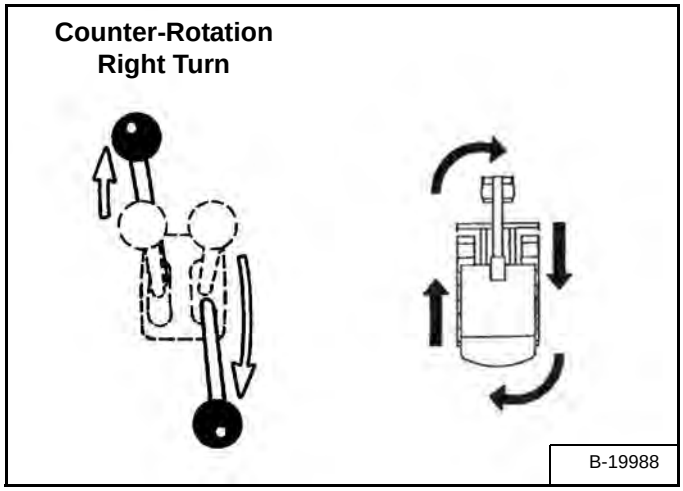
STEERING LEVERS/FOOT PEDALS (CONT'D)

Turning (Cont'd)

Counter - Rotation Right Turn

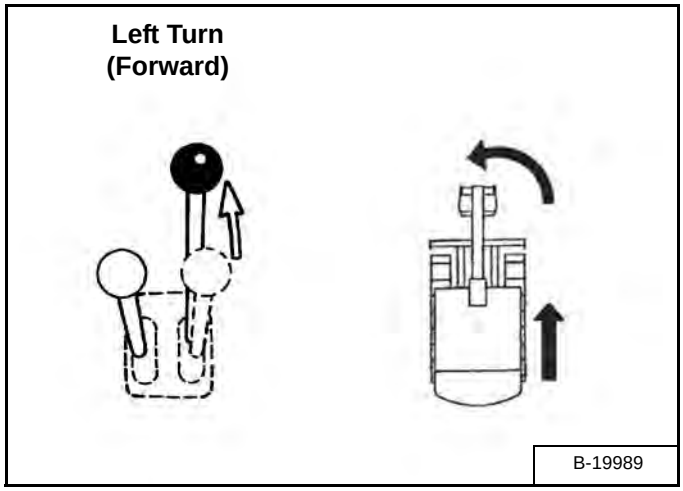
Figure OI-28



Push the left steering lever forward and pull the right steering lever backward **[Figure OI-28]**.

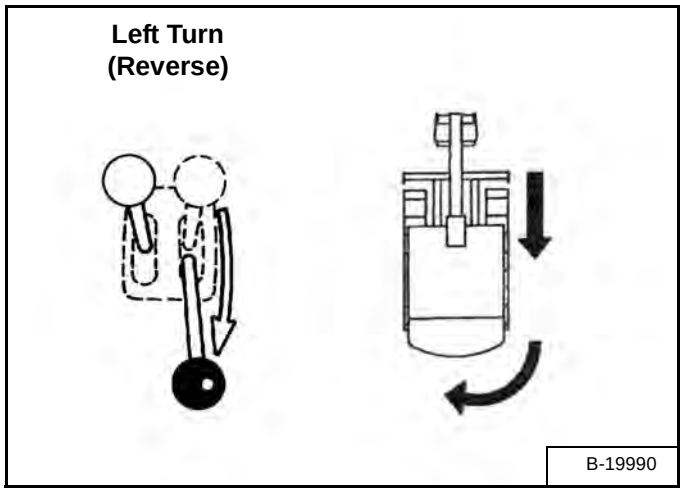
Left Turn

Figure OI-29



Push the right steering lever forward to turn left **[Figure OI-29]** while traveling forward.

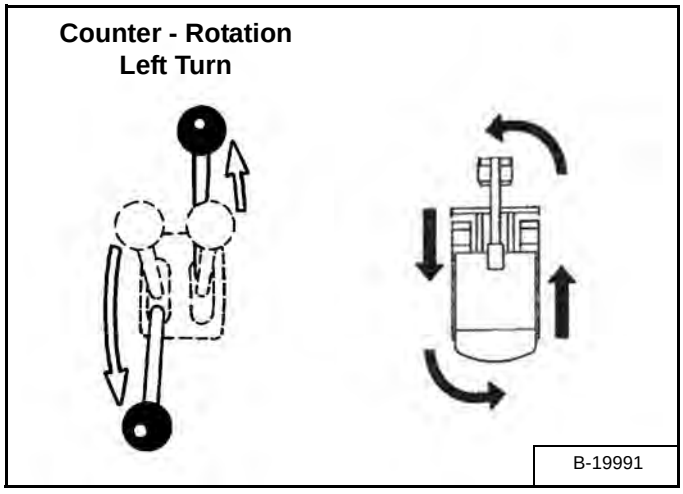
Figure OI-30



Pull the right steering lever backward to turn left while traveling backward **[Figure OI-30]**.

Counter-Rotation Left Turn

Figure OI-31



Push the right steering lever forward and pull the left steering lever backward **[Figure OI-31]**.

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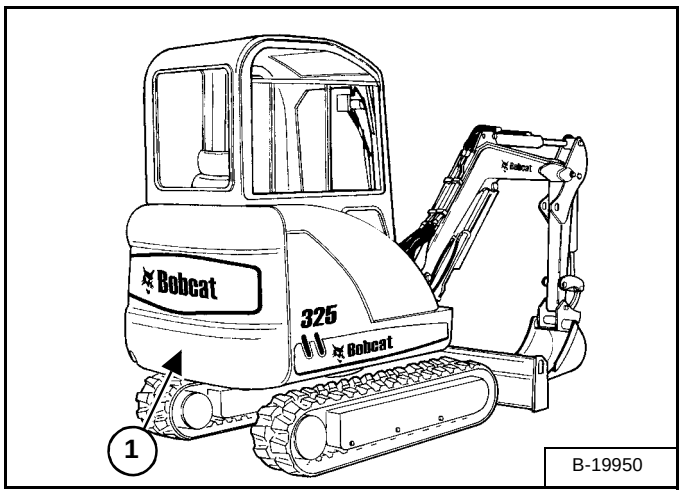
MOTION ALARM SYSTEM (IF EQUIPPED)

Operation

Figure OI-32



This excavator may be equipped with a motion alarm system. The motion alarm (Item 1) **[Figure OI-32]** is located inside the lower part of the engine compartment.

⚠ 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.

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The motion alarm will sound when the operator moves the travel control levers in the 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 (IF EQUIPPED) on Page PM-8)

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HYDRAULIC CONTROLS

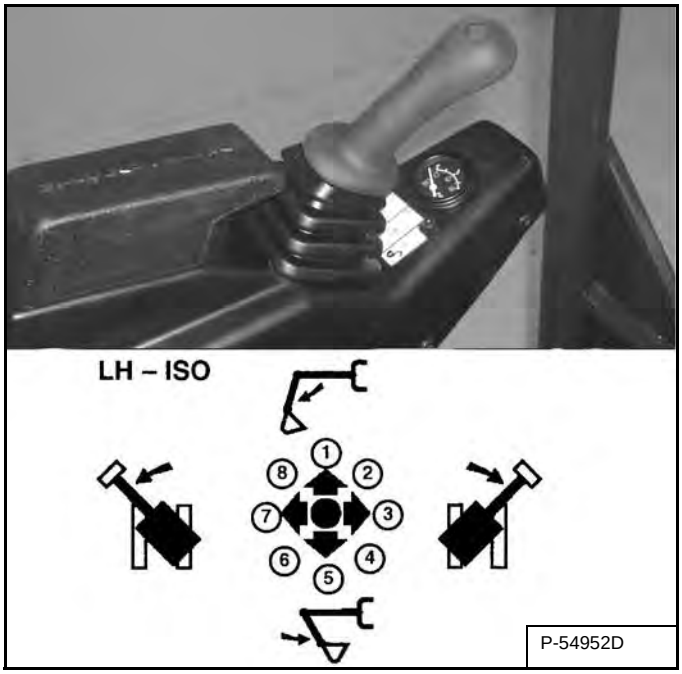
Description

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 the ISO Control Pattern **[Figure OI-33]** & **[Figure OI-34]** or in the STANDARD Control Pattern **[Figure OI-35]** & **[Figure OI-36]**.

ISO Control Pattern

Left Control Lever

Figure OI-33



The work equipment (boom, arm, bucket, and upperstructure slew) is operated by using the left and right control levers (joysticks) **[Figure OI-33]** & **[Figure OI-34]**.

The left lever is used to operate the arm and slew the upperstructure **[Figure OI-33]**.

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

IMPORTANT

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

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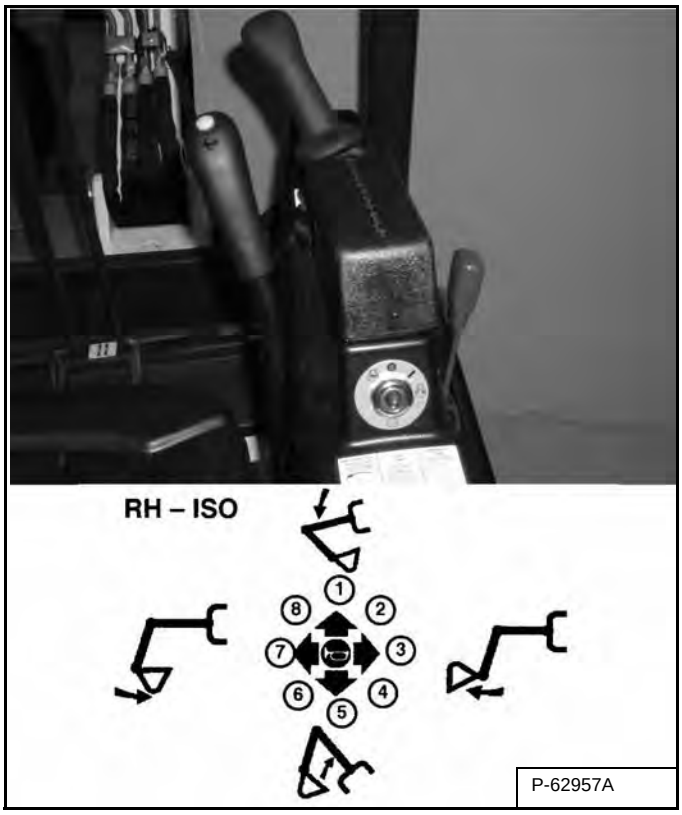
Right Control Lever

Figure OI-34



The right lever is used to operate the boom and bucket **[Figure OI-34]**.

1. Boom lower.
2. Boom lower and bucket dump.
3. Bucket dump.
4. Boom raise and bucket dump.
5. Boom raise.
6. Boom raise and bucket curl.
7. Bucket curl.
8. Boom lower and bucket curl.

⚠ WARNING

AVOID INJURY OR DEATH

Before leaving the machine:

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

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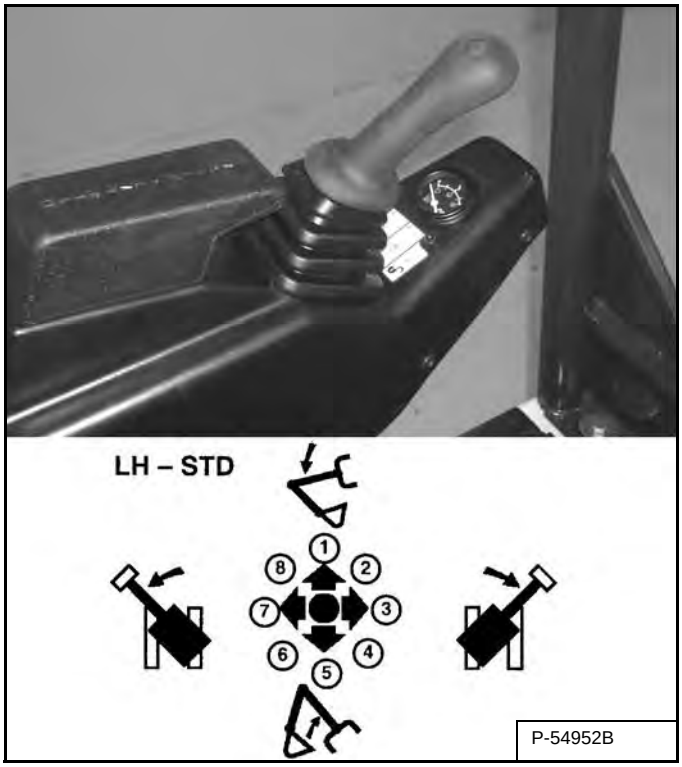
Standard Control Pattern

Left Control Lever

Figure OI-35



The work equipment (boom, arm, bucket and upperstructure slew) is operated by using the right and left control levers (joysticks) **[Figure OI-35]** & **[Figure OI-36]**.

The left lever is used to operate the boom and slew the upperstructure **[Figure OI-35]**.

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

IMPORTANT

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

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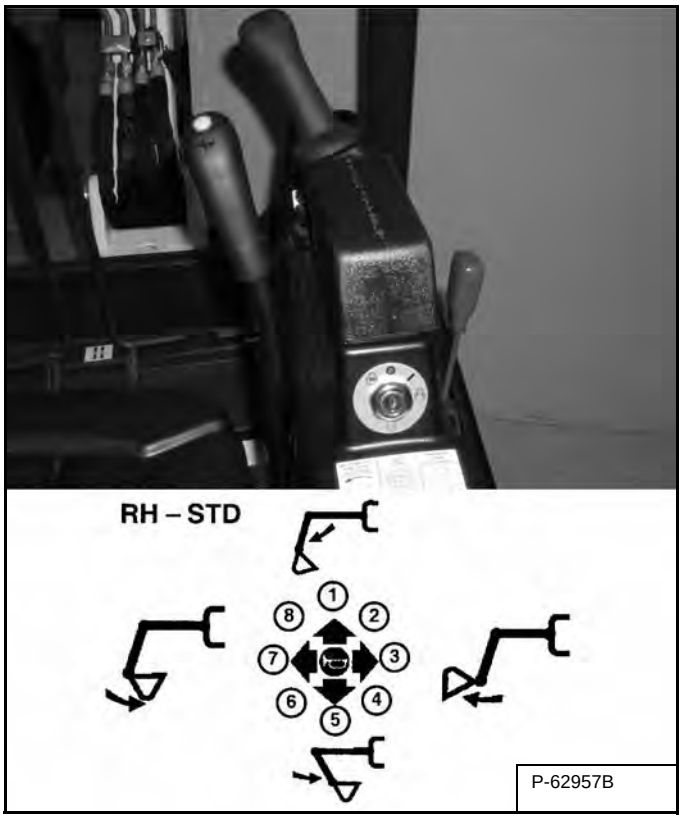
Right Control Lever

Figure OI-36



The right lever is used to operate the arm and bucket **[Figure OI-36]**.

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 & remove the key.**

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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.

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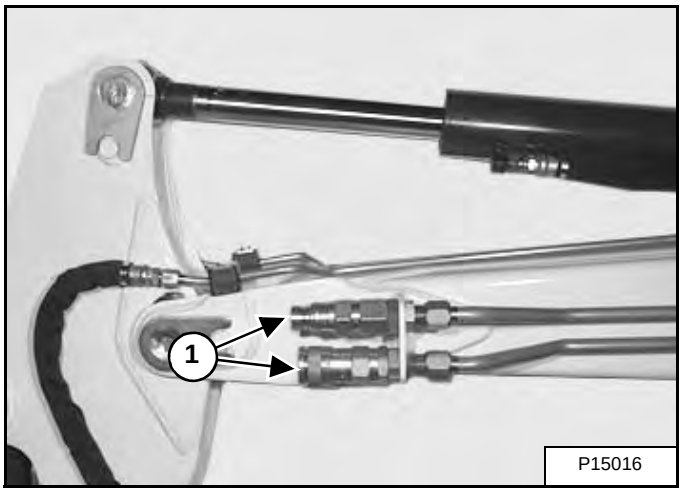
Figure OI-37



Excavators and attachments have flush faced couplers (Item 1) **[Figure OI-37]**.

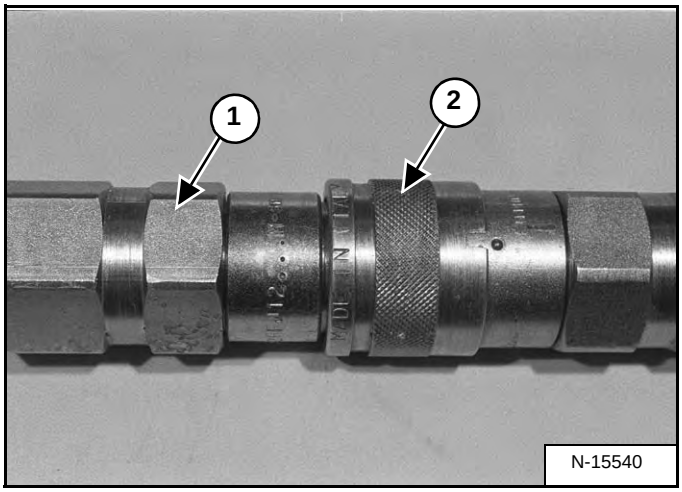
To Connect:

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 OI-37]** 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 OI-38



Hold the male coupler (Item 1). Retract the sleeve (Item 2) **[Figure OI-38]** on the female coupler until the couplers disconnect.

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Auxiliary Hydraulics

Figure OI-39

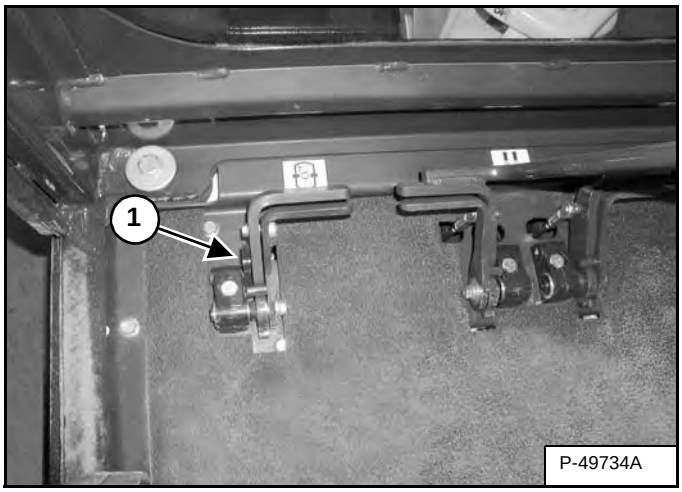
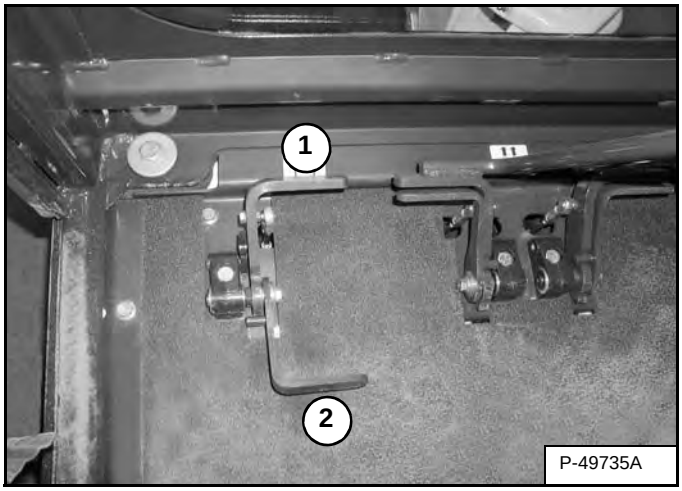


Figure OI-40



The left pedal **[Figure OI-39]** & **[Figure OI-40]** controls attachments (such as a hydraulic breaker) when mounted on the arm.

Release the pedal lock (Item 1) **[Figure OI-39]** and pivot the heel of the pedal to the rear.

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

Push the toe of the pedal (Item 1) to activate hydraulic pressure / flow to the female coupler; heel (Item 2) **[Figure OI-40]** to activate hydraulic pressure / flow to the male coupler.

NOTE: A Special Application Kit, which includes a Lexan upper window and a lower screen guard, is available and recommended for use with the hydraulic breaker attachment. See your dealer for availability.

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

Relieve Hydraulic Pressure (Excavator And Attachment)

Excavator:

Put the attachment flat on the ground.

Stop the engine.

With the engine off, move the pedal (Item 1 & 2) **[Figure OI-40]** in both directions several times.

Attachments:

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

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

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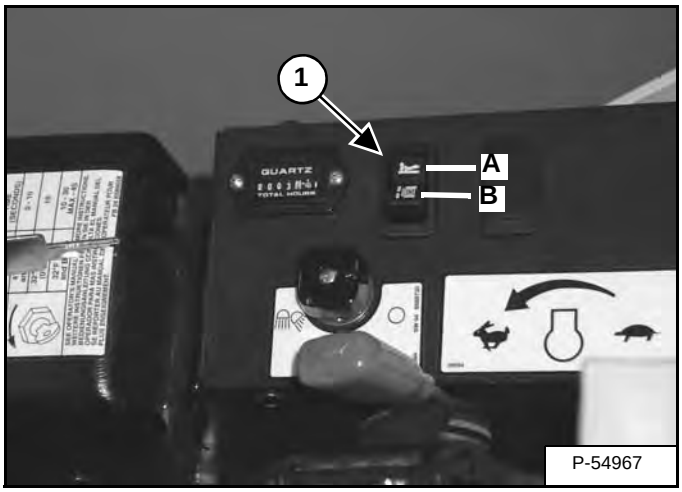
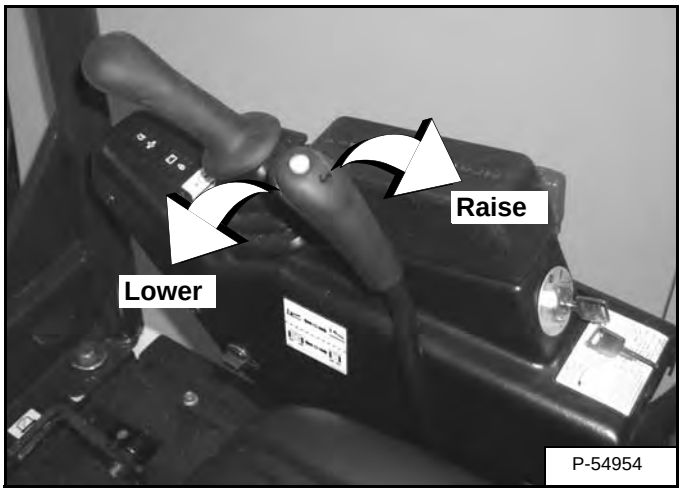
BLADE CONTROL LEVER

Figure OI-41



Push the Blade/Track-Expansion Switch (Item 1) **[Figure OI-41]** to the Blade position, `A'.

Figure OI-42



Move the lever forward to lower the blade **[Figure OI-42]**.

Move the lever backward to raise the blade **[Figure OI-42]**.

NOTE: Keep the blade lowered when digging to help stabilize machine.

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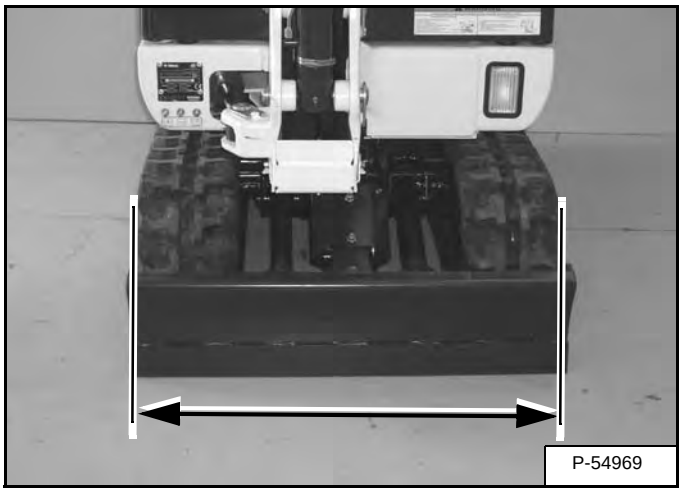
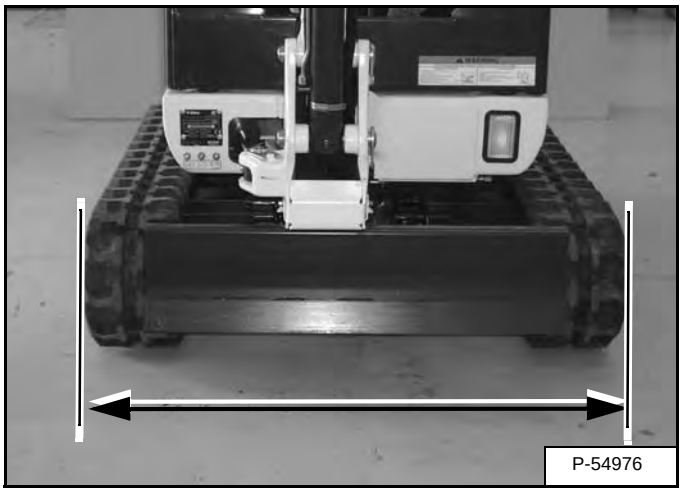
TRACK FRAME EXPANSION

Figure OI-43



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

Figure OI-44



Expand the track frame for increased digging performance **[Figure OI-44]**.

IMPORTANT

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

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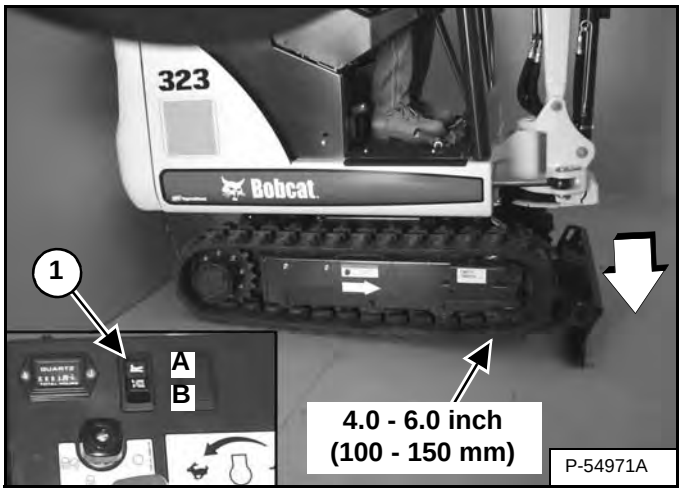
Figure OI-45

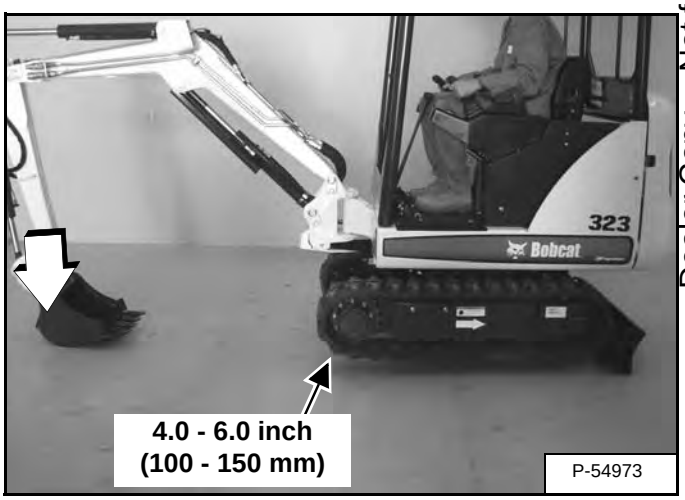


Push the Blade / Track-Expansion switch (Item 1) **[Figure OI-45]** to the Blade position, 'A'.

With the boom and arm positioned over the blade, lower the blade until the track is raised 4.0 - 6.0 in. (100 - 150 mm) off the ground **[Figure OI-45]**.

Rotate the upperstructure 180 degrees.

Figure OI-46



Lower the boom and arm to raise the rear of the excavator until the track is 4.0 - 6.0 in. (100 - 150 mm) off the ground **[Figure OI-46]**.

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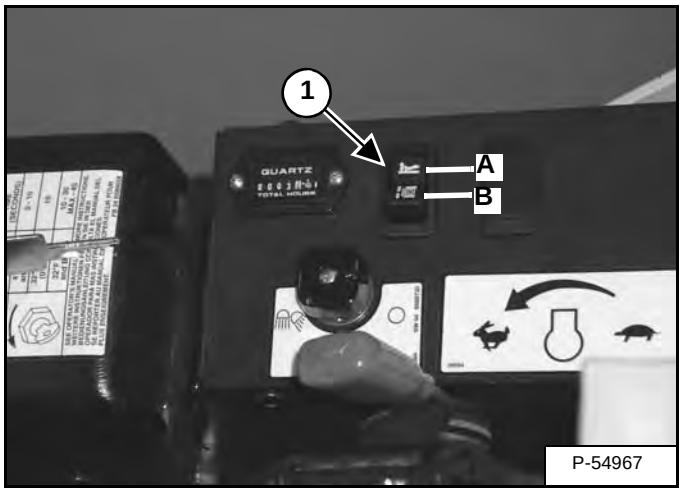
TRACK FRAME EXPANSION (CONT'D)

Figure OI-47



Push the Blade/Track-Expansion switch (Item 1) **[Figure OI-47]** to the Track-Expansion position, `B'.

IMPORTANT

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

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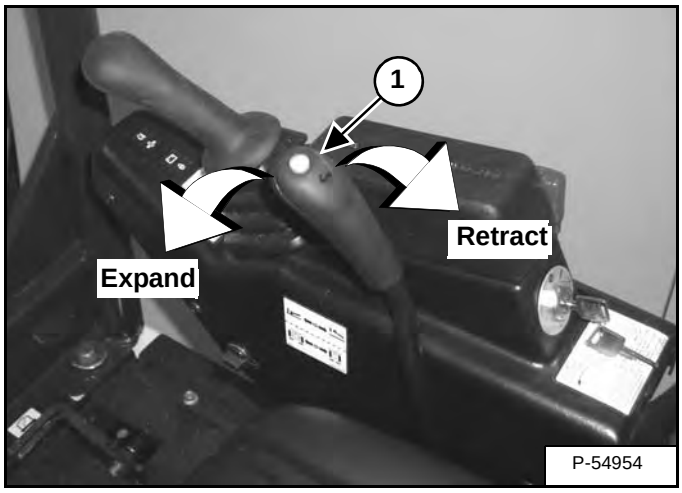
Figure OI-48

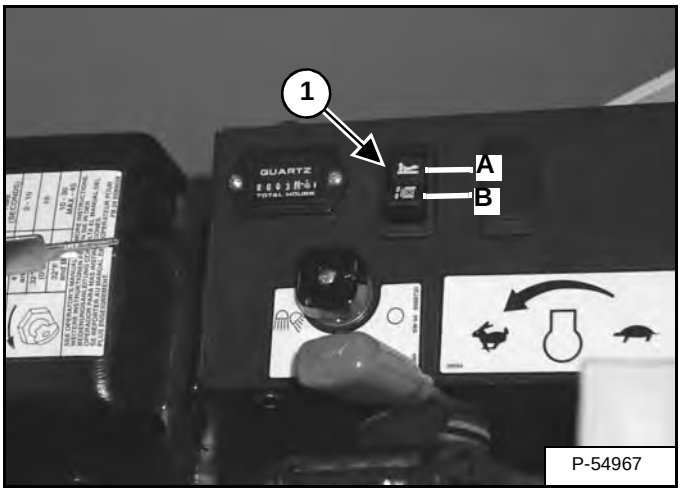


Push the Blade / Track-Expansion lever (Item 1) **[Figure OI-48]** forward to expand the track frame. Hold the lever forward until the track frame is fully expanded.

Pull the Blade / Track-Expansion lever (Item 1) **[Figure OI-48]** back to retract the track frame. Hold the lever back until the track frame is fully retracted.

The track frame must be either in the fully expanded or fully retracted position when in use.

Figure OI-49



NOTE: Always return the Blade / Track Expansion switch to the Blade position 'A' (Item 1) [Figure OI-49] during operation so that the track does not move when using the blade lever.

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

Rotate the upperstructure 180 degrees.

Raise the blade until the track is on the ground.

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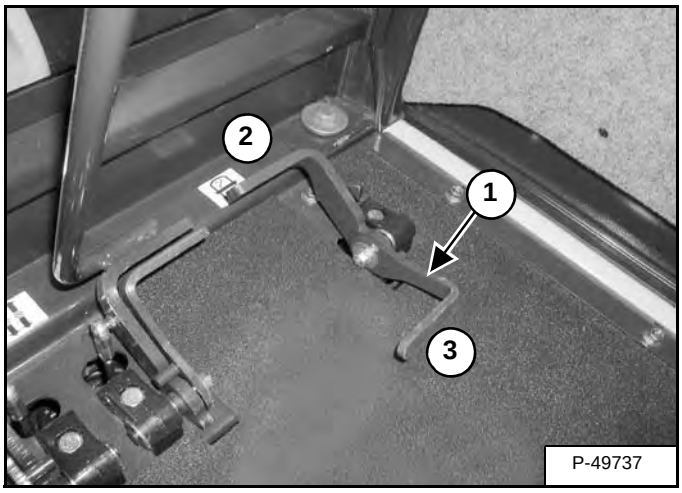
BOOM SWING PEDAL

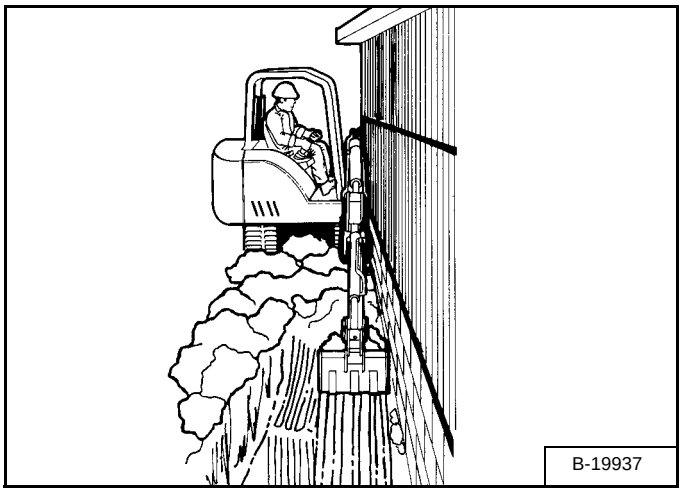
Figure OI-50



Release the pedal lock and pivot the heel of the pedal to the rear (Item 1) **[Figure OI-50]**.

Push the toe of the pedal (Item 2) to swing the boom to the right; push the heel (Item 3) **[Figure OI-50]** to swing left.

Figure OI-51



NOTE: The purpose of the boom swing pedal is to offset the boom with respect to the upperstructure for digging close to a structure [Figure OI-51].

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DAILY INSPECTION

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 (See Service Schedule on Page OI-25). It is located inside the rear door of the excavator.

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.
- Clean cab heater filter (if equipped).
- Check front horn and motion alarm (if equipped) for proper function.

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

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 12 inches (300 mm) from the decal. Wash from the center of the decal toward the edges.**

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Service Schedule

SERVICE SCHEDULE

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

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

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

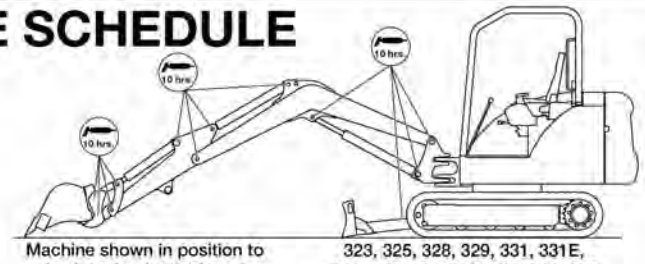
EVERY 100 HOURS
■ Check and adjust belt(s) if required. (Models 323, 325, 328 and 329)
Spark Arrestor Muffler - Clean spark chamber.

EVERY 250 HOURS
Replace engine oil and filter. (Models 325, 328, 329 and 425)
■ Replace inline diesel fuel filter. (Models 425, 430 and 435)
■ Replace diesel fuel filter.
Check oil level in both final drive cases.

EVERY 500 HOURS
■ Replace engine oil and filter. (Models 323, 331, 331E, 334, 335, 337, 341, 430 and 435)
Clean radiator, oil cooler and *A/C condenser.
▲ Check and adjust drive belts and idlers. Replace as needed. (Models 331, 331E, 334, 335, 337, 341, 425, 430 and 435)
▲ Replace primary hydraulic filter and reservoir breather.
▲ Replace case drain hydraulic filter. (Models 325, 328, 329, 331, 334, 331E, 335, 337, 341, 425, 430 and 435)
▲ Replace fan hydraulic filter. (Models 430 and 435)
▲ Check alternator and starter connections.
Check and adjust engine valve clearance.

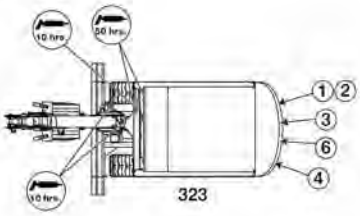
EVERY 1000 HOURS OR EVERY 12 MONTHS
▲ Replace oil in both final drive cases.
Replace hydraulic fluid and filter(s).

EVERY 2 YEARS
Drain and flush cooling system - Replace coolant.

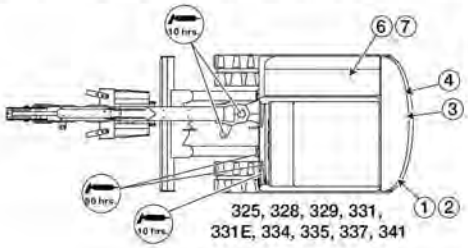


Machine shown in position to check hydraulic fluid levels.

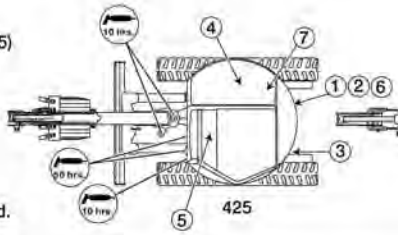
323, 325, 328, 329, 331, 331E, 334, 335, 337, 341, 425, 430, 435



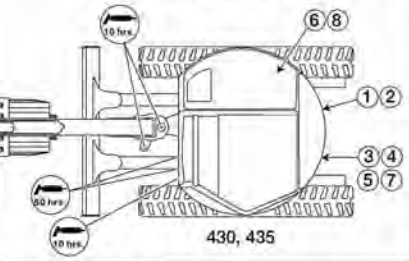
323



325, 328, 329, 331, 331E, 334, 335, 337, 341



425



430, 435

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

	323	325, 328, 329	331, 334, 331E, 335	337, 341	425	430	435
1. PRIMARY AIR FILTER	6673752	6672467	6666333	6666375	6672467	6666333	6666375
2. SECONDARY AIR FILTER	6673753	6672468	6666334	6666376	6672468	6666334	6666376
3. ENGINE OIL FILTER	6671057	6675517	6675517	6675517	6657635	6675517	6675517
4. FUEL FILTER	6667352	6667352	6667352	6667352	6667352	6667352	6667352
5. INLINE FUEL FILTER	N/A	N/A	N/A	N/A	6633977	6633977	6633977
6. PRIMARY HYDRAULIC FILTER	6653336	6661248	6661248	6670207	6661248	6668819	6668819
7. DRAIN HYDRAULIC FILTER	N/A	6516722	6516722	6516722	6661022	6681012	6681012
8. FAN HYDRAULIC FILTER	N/A	N/A	N/A	N/A	N/A	6681012	6681012

• See illustrations above for filter locations.

• See Operation & Maintenance Manual for more information and instructions.

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PRE-STARTING PROCEDURE

Operation & Maintenance Manual And Operator's Handbook Locations

Figure OI-52

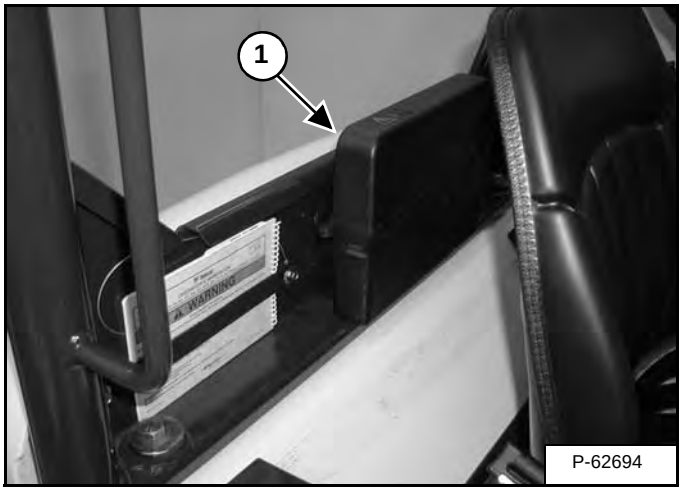
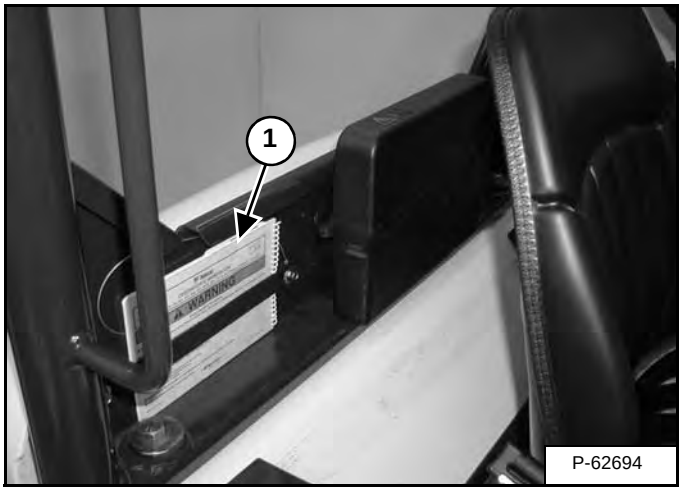


Figure OI-53



Read and understand the Operation & Maintenance Manual that is stored in the container (Item 1) **[Figure OI-52]** (located on the back of the operator seat) and the Operator's Handbook (Item 1) **[Figure OI-53]** (located at the left rear corner of the cab) before operating.

Use the grab handles, the tracks and the safety treads to enter and exit the canopy/cab.

Entering The Excavator

Figure OI-54

Use the grab handles, the tracks and the safety treads to enter and exit the cab **[Figure OI-54]**.

⚠ 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.

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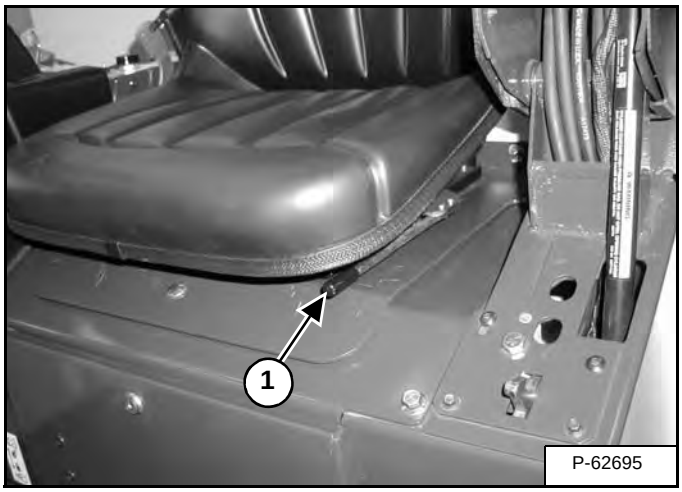
Seat Adjustment

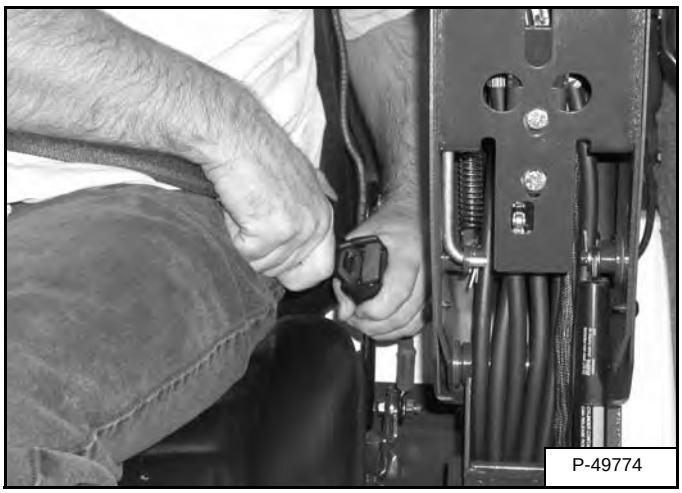
Figure OI-55



Release the seat lever (Item 1) **[Figure OI-55]** to adjust the seat forward or backward to a comfortable operation.

Seat Belt Adjustment

Figure OI-56



Fasten the seat belt **[Figure OI-56]**.

Control Console

Figure OI-57

Lower the control console **[Figure OI-57]**.

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

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STARTING THE ENGINE

Perform the PRE-STARTING PROCEDURE (See PRE-STARTING PROCEDURE on Page OI-26).

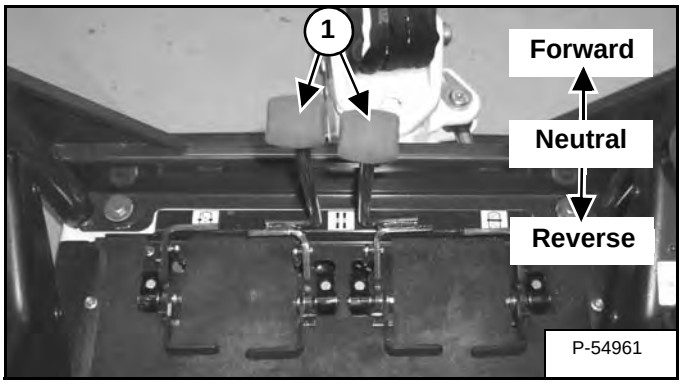
WARNING

AVOID INJURY OR DEATH

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

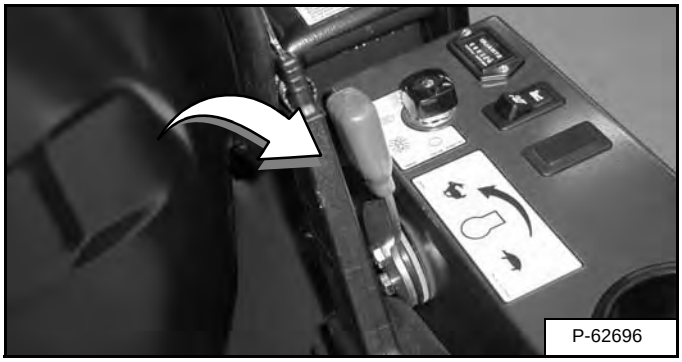
W-2135-1108

Figure OI-58



Put control levers (Item 1) **[Figure OI-58]** in the neutral position.

Figure OI-59



Move the engine speed control to low idle **[Figure OI-59]**.

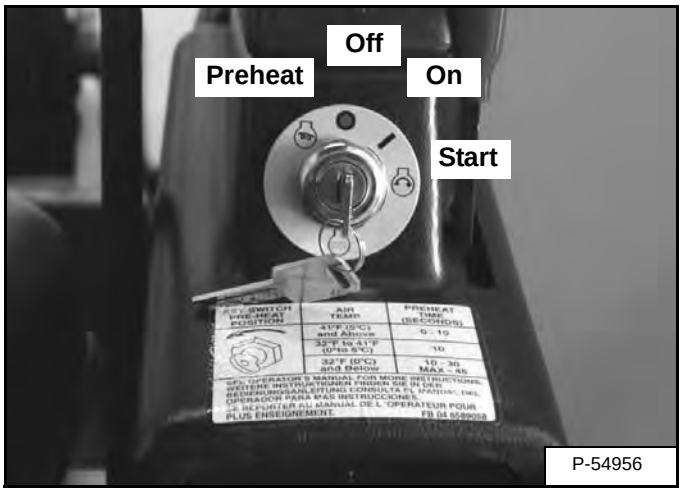
WARNING

AVOID INJURY OR DEATH

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

W-2050-0807

Figure OI-60



Turn the key to PREHEAT position (if required). (See Cold Temperature Starting Procedure on Page OI-29).

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

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

Turn the key switch OFF to stop the engine.

IMPORTANT

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

I-2034-0700

WARNING

AVOID INJURY OR DEATH

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

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Cold Temperature Starting Procedure

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 OI-17).

Make sure the battery is fully charged.

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 OI-23).

Install an engine heater.

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2071-0907

Figure OI-61

Push the speed control lever fully forward **[Figure OI-61]**.

IMPORTANT

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

I-2034-0700

Figure OI-62

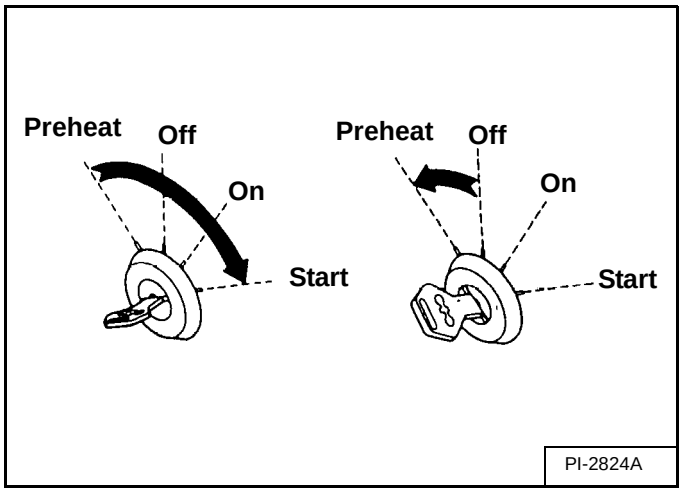
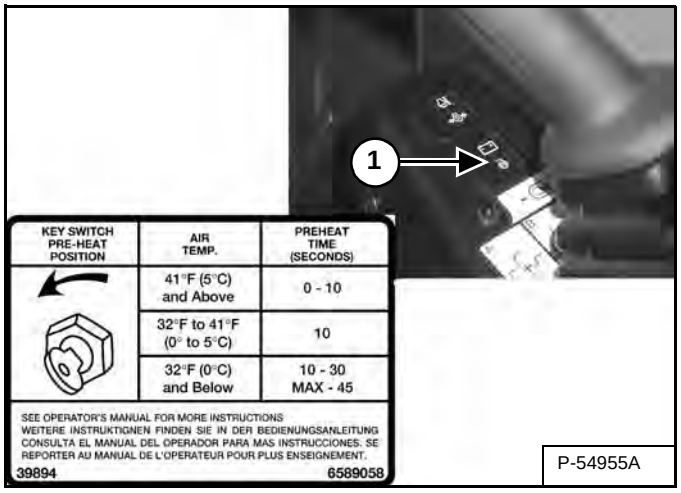


Figure OI-63



Turn the key to PREHEAT **[Figure OI-62]**. The light (Item 1) **[Figure OI-63]** will come ON. Preheat the engine for 15 seconds maximum.

Turn the key to START **[Figure OI-62]** and release the key when the engine starts. It will return to the ON position.

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

Turn the key switch OFF to stop the engine **[Figure OI-62]**.

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Warming The Hydraulic System

WARNING

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

W-2381-0700

Let the engine run for a minimum of 5 minutes to warm the engine and the hydraulic fluid before operating the excavator.

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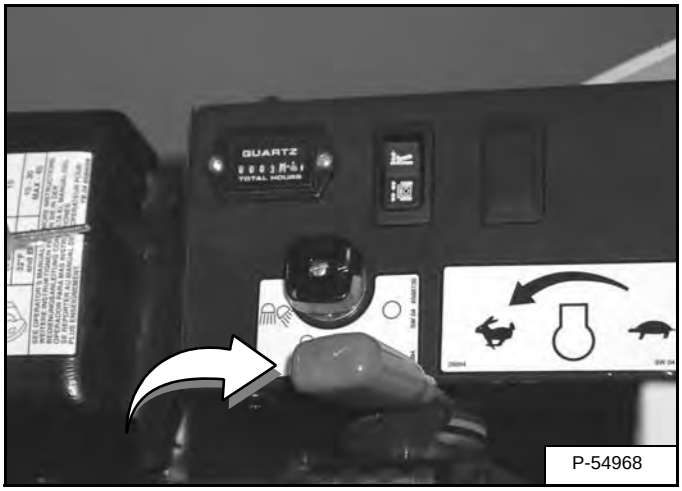
STOPPING THE ENGINE AND LEAVING THE EXCAVATOR

Procedure

Figure OI-64

Stop the machine on level ground. Lower the work equipment and the blade to the ground **[Figure OI-64]**.

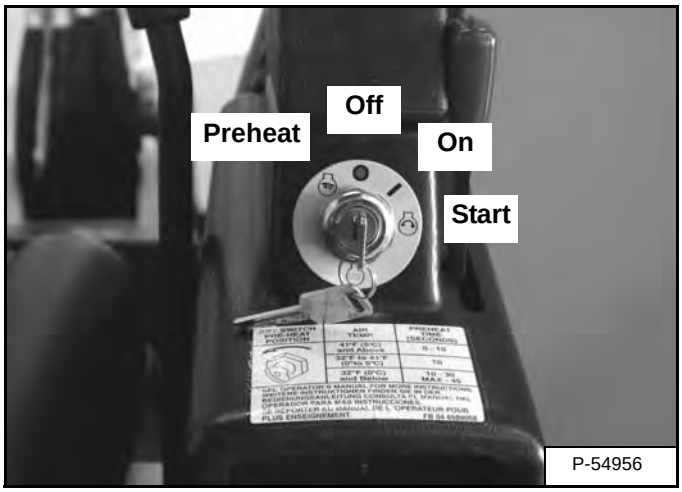
Figure OI-65



Move the speed control lever fully backward **[Figure OI-65]**.

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

Figure OI-66



Turn the key switch OFF **[Figure OI-66]**.

Disconnect the seat belt. Remove the key from the switch to prevent operation of machine by unauthorized personnel. Exit machine.

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Emergency Exits

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

Figure OI-67

Figure OI-68

Slide the window to the front of the excavator and exit through the side window **[Figure OI-67]**, or open the front window and exit **[Figure OI-68]**.

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Installing And Removing The Attachment

WARNING

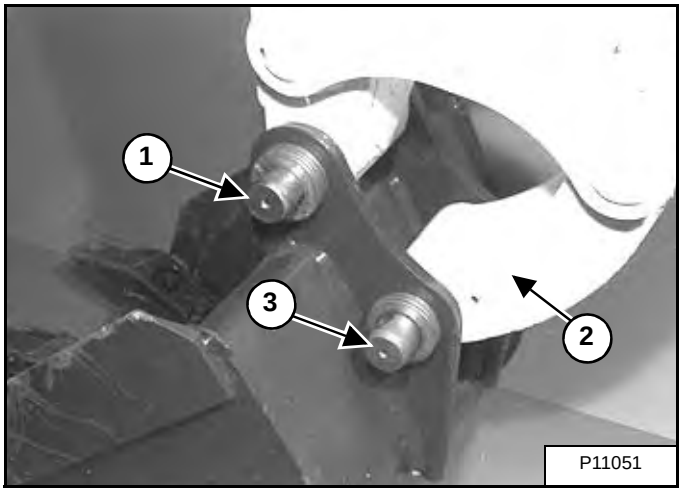
AVOID INJURY OR DEATH

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

Installation

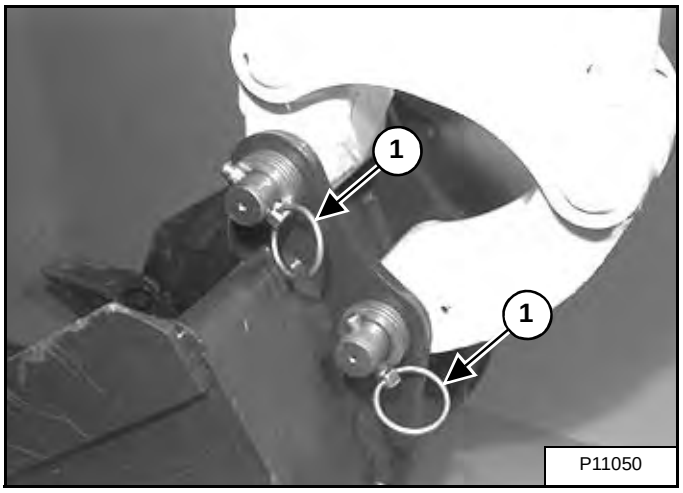
Figure OI-69



Install the arm into the bucket, align the hole, install the pivot pin and washer (Item 1) **[Figure OI-69]**.

Install the link (Item 2) into the bucket, align the hole, install the pivot pin and washer (Item 3) **[Figure OI-69]**.

Figure OI-70



Install the fasteners (Item 1) **[Figure OI-70]**. Add grease to the pivot.

Removing

Park the excavator on a flat surface and put the bucket on the ground.

Remove the fasteners (Item 1) **[Figure OI-70]**.

Remove the washers and the pivot pins.

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

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OPERATING PROCEDURE

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, water, sewer, irrigation, etc.) located and marked. Work slowly in areas of underground utilities.

Remove objects or other construction material that could damage the excavator or cause personal injury.

Always check ground conditions before starting your work:

- Look for signs of instability such as cracks or settlement.
- Be aware of weather conditions that can affect ground stability.
- Check for adequate traction if working on a slope.

Basic Operating Instructions

When operating on a public road or highway, always follow local regulations. For example: A slow moving vehicle (SMV) sign, or direction signals may be required.

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

IMPORTANT

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

I-2015-0284

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

Operating Near An Edge Or Water

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

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

Lowering The Work Equipment (Engine STOPPED)

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

Figure OI-71

The joystick lock switch disengages the hydraulic control functions from the joysticks when the console(s) are raised **[Figure OI-71]**.

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

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

Use the control lever to lower the boom.

Lower the control console(s) to engage the hydraulic control functions of the joysticks **[Figure OI-71]**.

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Lifting A Load

Do not exceed the Rated Lift Capacity. (See LIFT CHART (7104069) on Page OI-4).

⚠ WARNING

AVOID INJURY OR DEATH

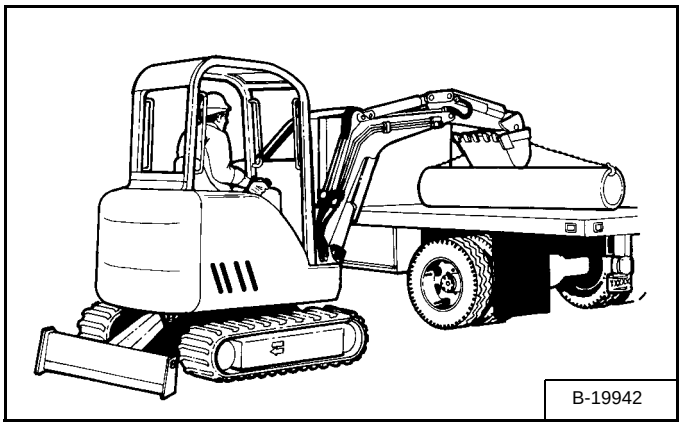
Do not exceed rated lift capacity. Excessive load can cause tipping or loss of control.

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 OI-72



Make sure the load is evenly weighted and centered on the lifting chain, and is secured to prevent the load from shifting **[Figure OI-72]**.

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.

⚠ WARNING

AVOID INJURY OR DEATH

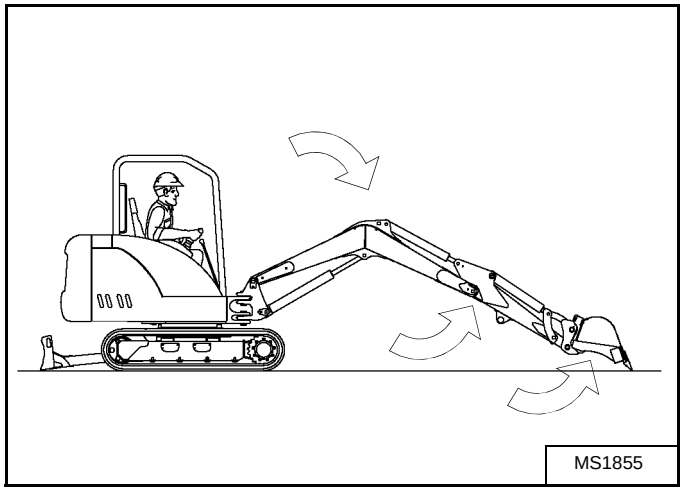
Check area to be excavated for overhead or underground lines such as electrical, gas, oil, water, etc. CALL 1-888-258-0808 and consult local utilities before digging. Extreme caution must be used in areas where utility lines are present.

W-2116-0903

Excavating

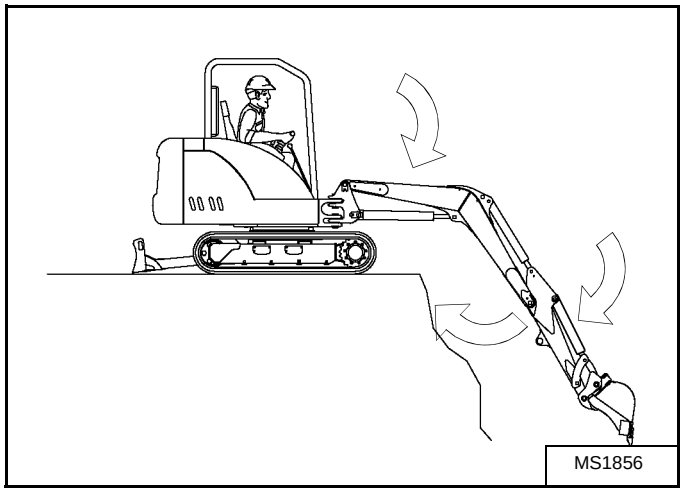
Lower the blade to provide stability.

Figure OI-73



Extend the arm, lower the boom, and open the bucket **[Figure OI-73]**.

Figure OI-74



Retract the arm, while lowering boom and curling the bucket **[Figure OI-74]**.

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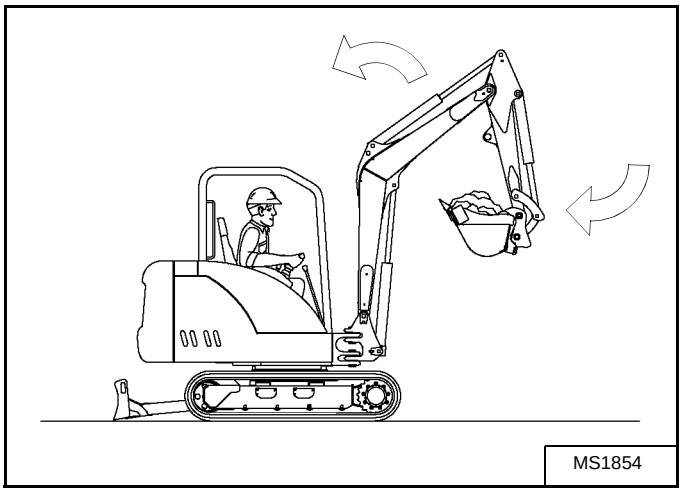
Excavating (Cont'd)

Figure OI-75



Raise the boom, retract the arm and curl the bucket **[Figure OI-75]**.

Rotate the upperstructure. (See Upperstructure Slew Lock on Page OI-6).

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

⚠ WARNING

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

W-2119-0788

⚠ WARNING

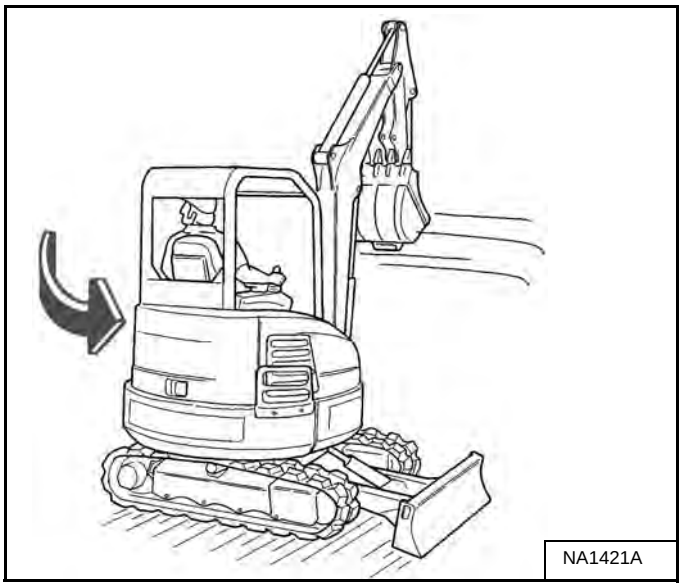
AVOID INJURY OR DEATH

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 10 ft. (3m)
230 kV	At least 16 ft. (5m)
740 kV	At least 33 ft. (10m)

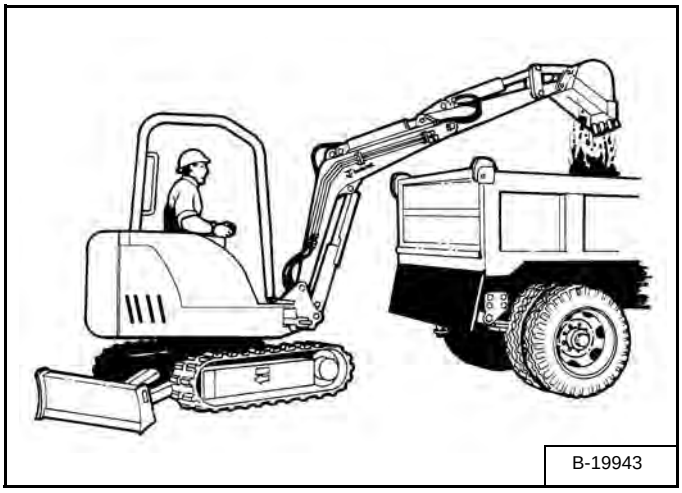
W-2757-0908

Figure OI-76



Look in the direction of rotation and make sure there are no bystanders in the work area before rotating the upperstructure **[Figure OI-76]**.

Figure OI-77



Extend the arm and uncurl the bucket to dump the material into a pile or truck **[Figure OI-77]**.

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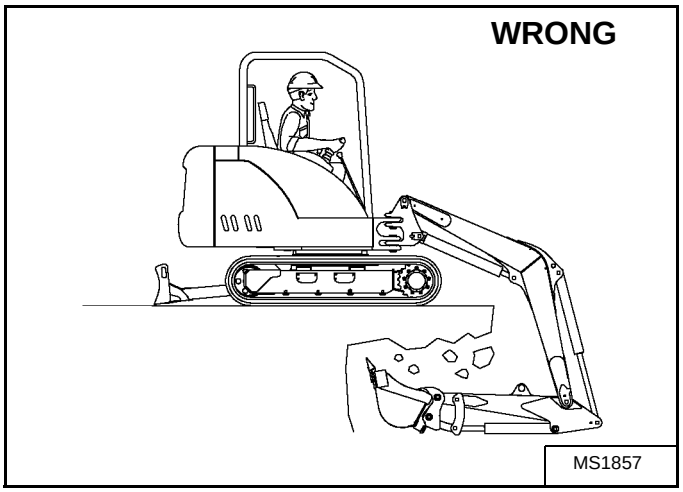
Excavating (Cont'd)

Figure OI-78



Do not dig under the excavator **[Figure OI-78]**.

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

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

Boom Swing

Figure OI-79

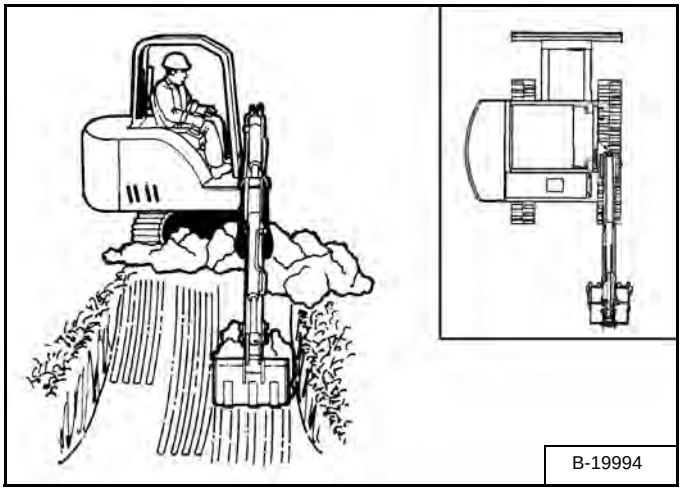


Figure OI-80

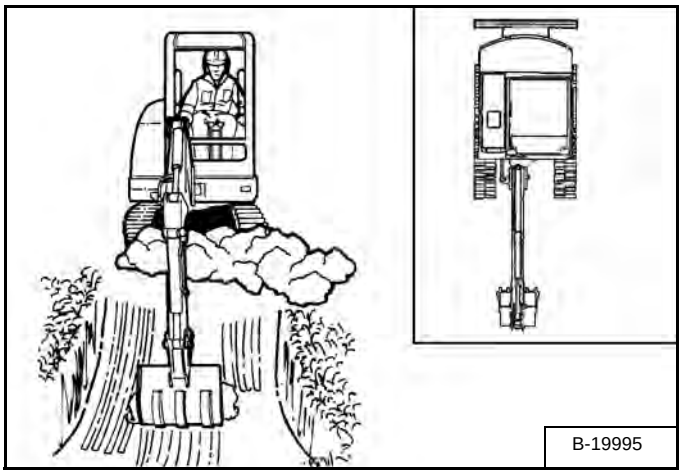
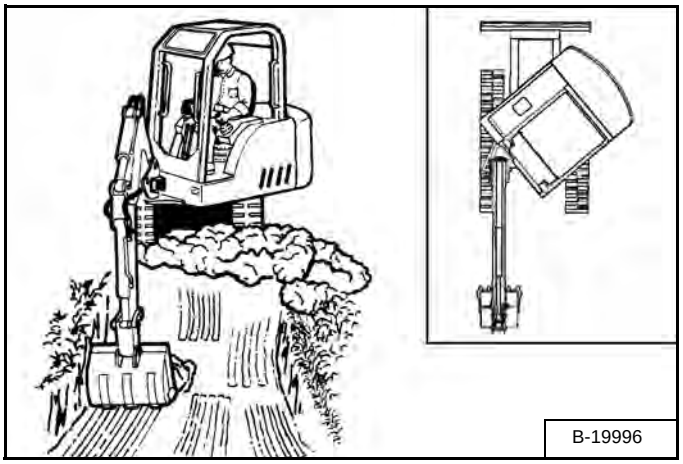
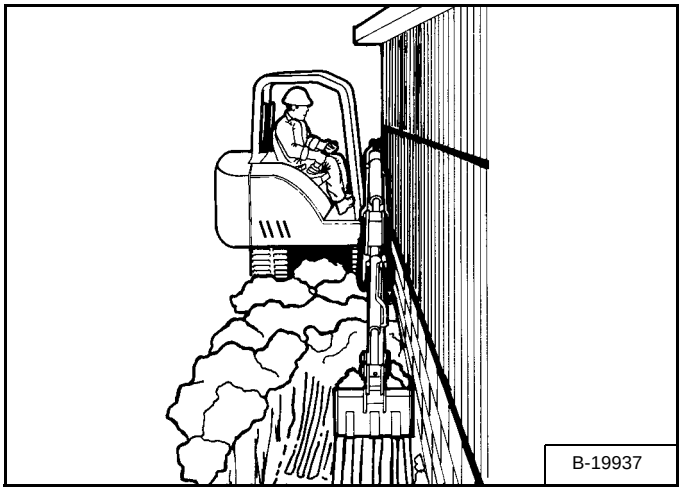


Figure OI-81



Slew the upperstructure, offset the boom to the left **[Figure OI-79]**, center **[Figure OI-80]** and right **[Figure OI-81]** to dig a square hole the width of the machine without repositioning the excavator.

Figure OI-82



The boom offset allows the operator to dig close to buildings and other structures **[Figure OI-82]**.

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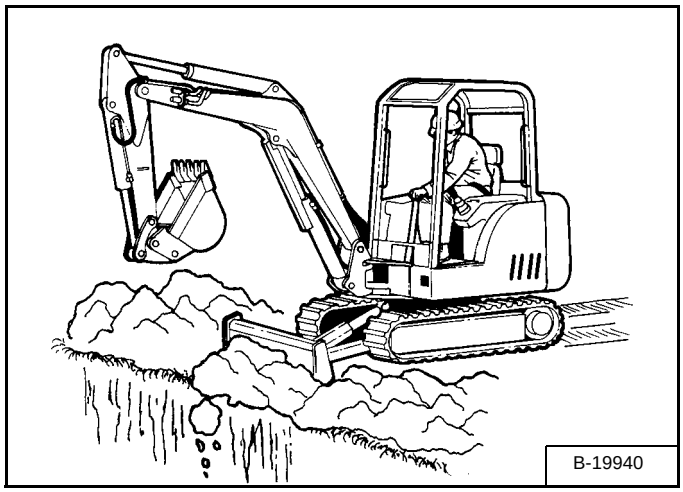
Backfilling

Figure OI-83



Use the blade to backfill the trench or hole after excavating **[Figure OI-83]**.

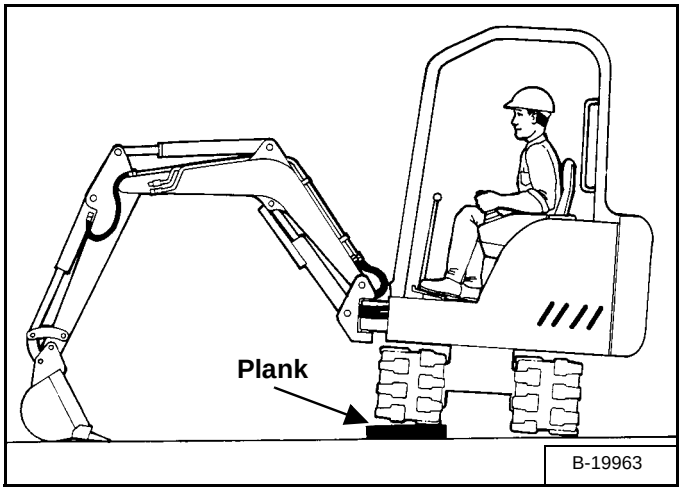
Driving The Excavator

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.

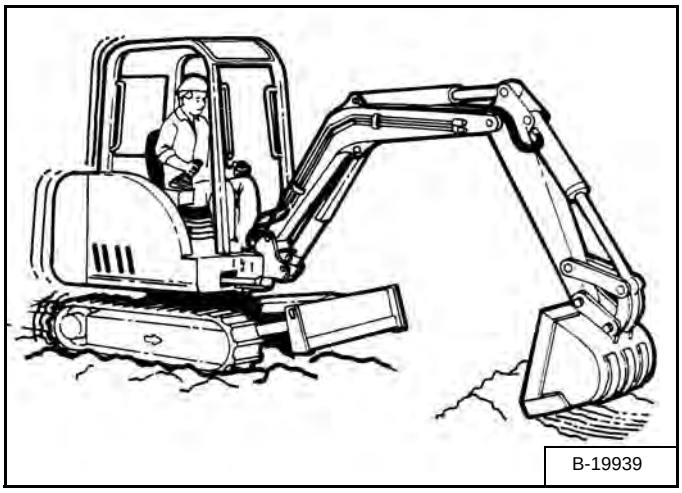
Figure OI-84



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 OI-84]**.

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

Figure OI-85



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 OI-85]**.

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Operating On Slopes

⚠ WARNING

AVOID INJURY OR DEATH

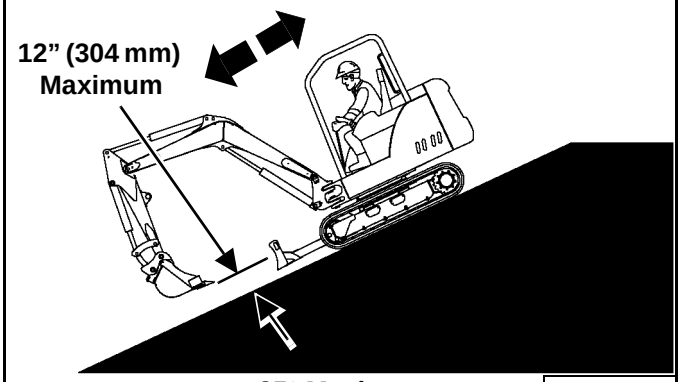
- **Do not travel across or up slopes that are over 15 degrees.**
- **Do not travel down or back up slopes that exceed 25 degrees.**
- **Look in the direction of travel.**

W-2497-0304

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

Figure OI-86

Traveling Down or Backing Up Slopes



25° Maximum MS1861

When traveling down or backing up grades that exceed 15 degrees, put the machine in the position shown, and run the engine slowly **[Figure OI-86]**.

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.**

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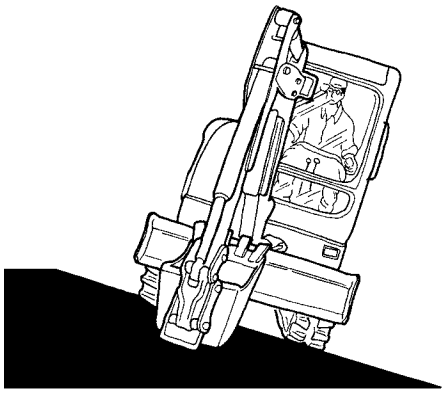
Figure OI-87

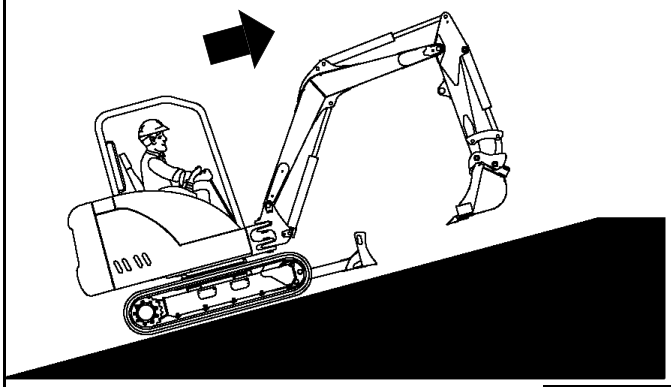
Traveling On Side Slopes



15° Maximum B-19936

Figure OI-88

Traveling Up Slopes



15° Maximum MS1860

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 OI-87]** & **[Figure OI-88]**.

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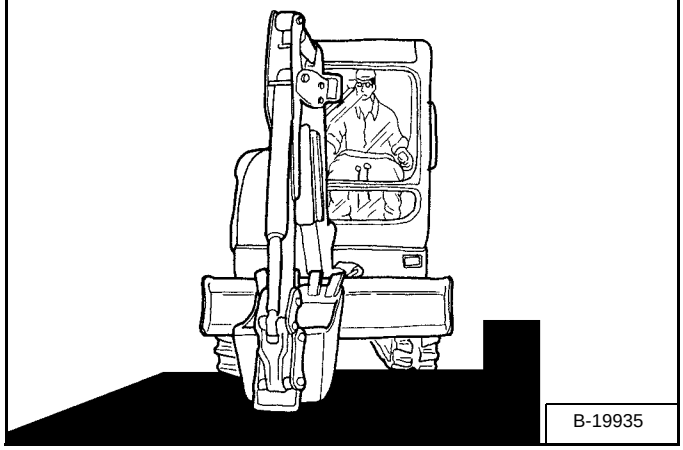
Operating On Slopes (Cont'd)

Figure OI-89

Recommended Position For Working On A Slope



When operating on a slope, level the work area before beginning **[Figure OI-89]**.

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

Do not work on slopes which are over 15 degrees.

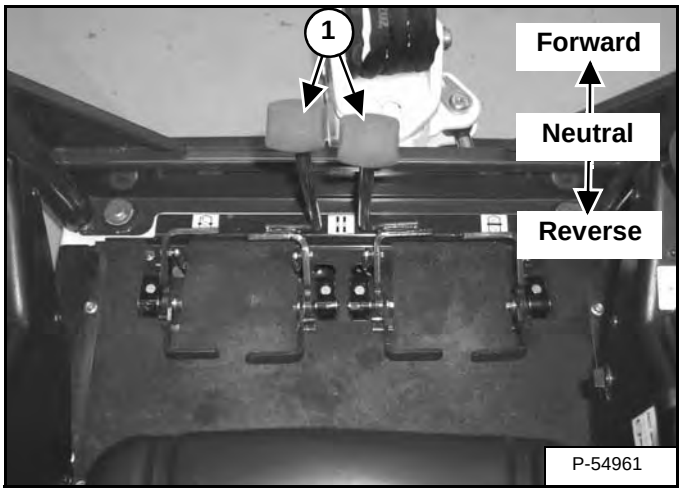
Use a slow work cycle.

Avoid working with the tracks across the slope. This will reduce stability and increase the tendency for the machine to slide. Position the excavator with the blade downhill and lowered.

Avoid swinging or extending the bucket more than necessary in a down hill direction. When you must swing the bucket downhill, keep the arm low and skid the bucket downhill.

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

Figure OI-90



To brake the machine when going down a slope, move the steering levers (Item 1) **[Figure OI-90]** to the *NEUTRAL* position. This will engage the hydrostatic braking.

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

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

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

Use the control lever to lower the boom.

Start the engine and resume operation.

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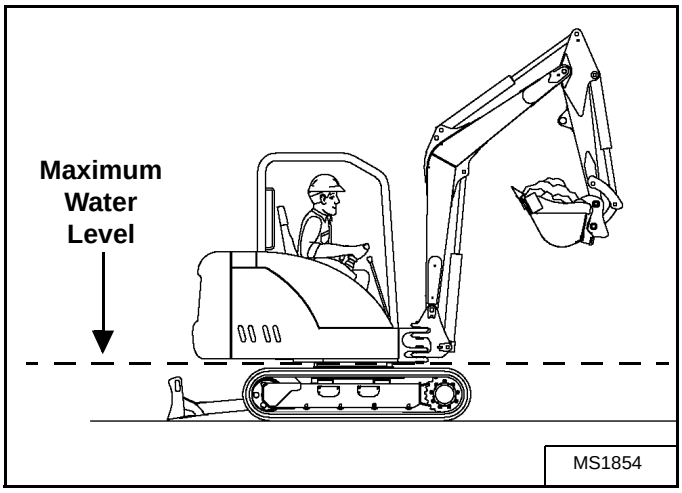
Operating In Water

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 OI-91



Do not operate or immerse the excavator in water higher than the bottom of the swing bearing **[Figure OI-91]**.

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.

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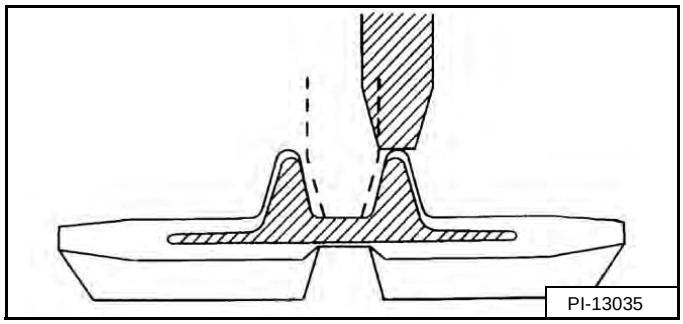
Avoiding Track Damage

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 OI-92

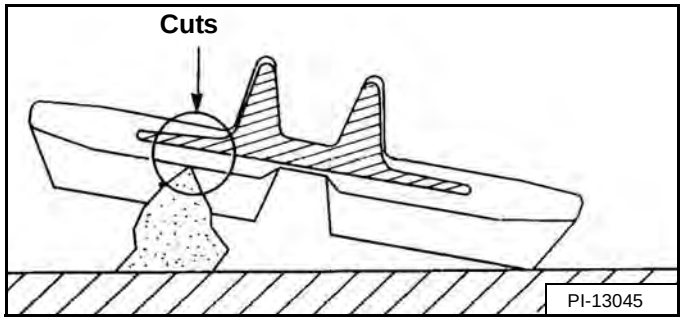


Incorrect track tension: When the rubber track is detracting, the idler or sprocket rides on the projections of the embedded metal **[Figure OI-92]** causing the embedded metal to be exposed to corrosion. (See TRACK TENSION on Page OI-31).

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 OI-93

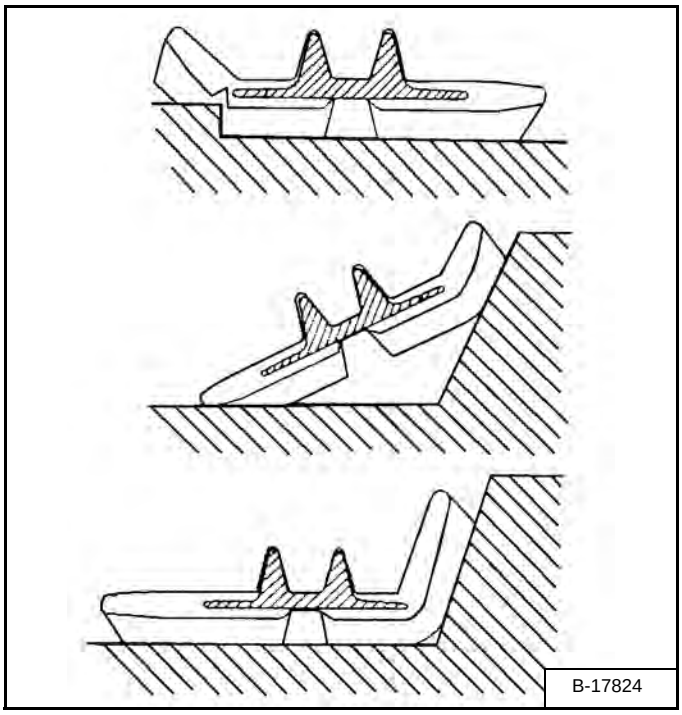


When rubber tracks drive over projections or sharp objects in the field, the concentrated forces applied cause cuts on the lug side rubber surface **[Figure OI-93]**. In case of making turns on projections, the lug side rubber surface will have an even higher chance to be cut. If the cuts run through 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 OI-94



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 OI-94]**.

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

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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 move 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 & 1/2 times the weight of the excavator.

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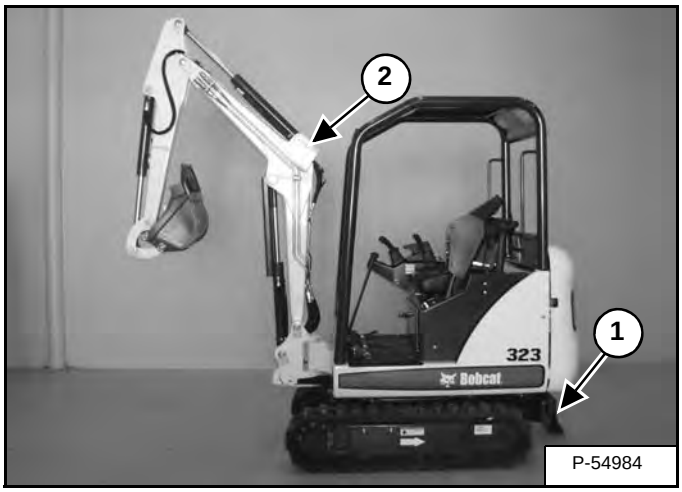
LIFTING THE EXCAVATOR

Figure OI-95



Fully extend the cylinders of the bucket, arm, and boom so that the excavator is in the position as shown **[Figure OI-95]**.

Engage the upperstructure slew lock. (See Upperstructure Slew Lock on Page OI-6).

Raise the blade all the way.

Put all the control levers in neutral.

⚠ WARNING

AVOID INJURY OR DEATH

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

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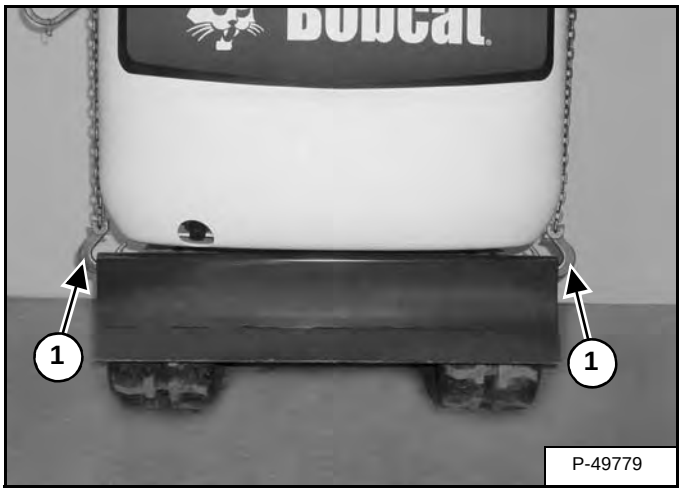
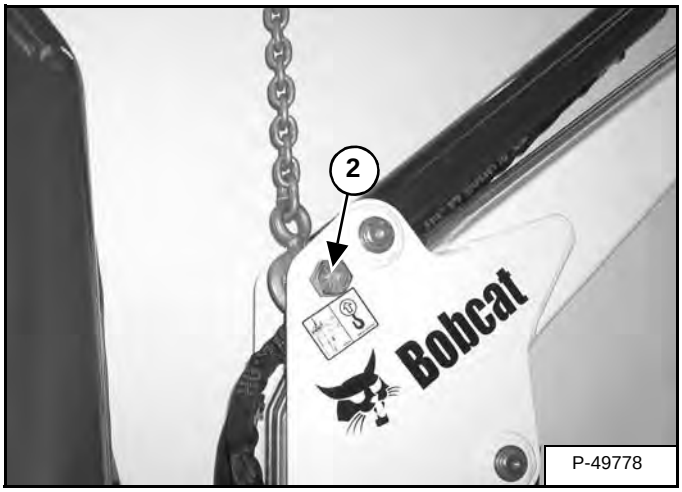
Figure OI-96



Fasten chains to the ends of the blade (Item 1) **[Figure OI-95]** and **[Figure OI-96]** and up to a lifting fixture above the canopy/cab. The lifting fixture must extend over the sides of the canopy/cab to prevent the chains from hitting the ROPS/TOPS.

Figure OI-97



Install a one inch (25 mm) bolt and nut (Grade 5 or 8) through the holes at the boom (Item 2) **[Figure OI-95]** and **[Figure OI-97]**. Fasten a chain from the bolt to the lift fixture.

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TRANSPORTING THE EXCAVATOR

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.

Remove the blade extensions (If equipped). (See BLADE EXTENSION on Page PM-34).

Retract the track frame if required. (See TRACK FRAME EXPANSION on Page OI-21).

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 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 excavator to prevent the front of the transport vehicle from raising.

Determine the direction of the track movement before moving the machine (blade forward). Engage the upperstructure slew lock (See Upperstructure Slew Lock on Page OI-6).

Figure OI-98

Move the machine forward onto the transport vehicle **[Figure OI-98]**.

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

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

Stop the engine and remove the key.

Put blocks under the front and rear of the tracks.

Figure OI-99

Figure OI-100

Fasten chains to the front corners of the blade and to the tie down loop at the rear **[Figure OI-99]** & **[Figure OI-100]** 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.

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PREVENTIVE MAINTENANCE

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TRAVEL MOTOR PM-31
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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

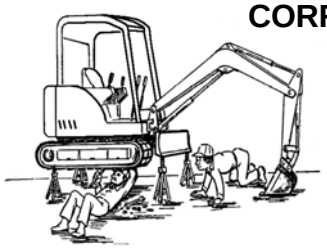
Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

CORRECT

P-90216

Never service the Bobcat Excavator without instructions.

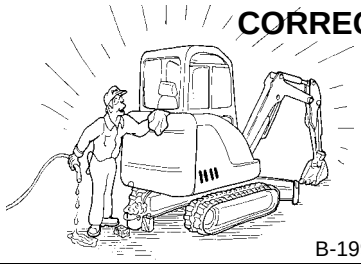
CORRECT



B-19964

Use the correct procedure to lift and support the excavator.

CORRECT



B-19959

Cleaning and maintenance are required daily.

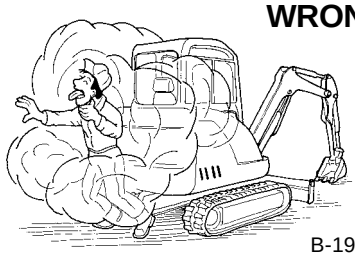
WRONG

B-19965

Have good ventilation when welding or grinding painted parts.

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

WRONG

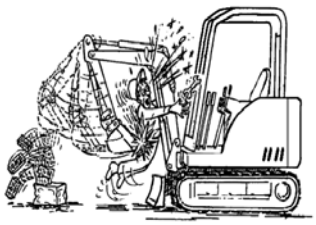


B-19960

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

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

WRONG

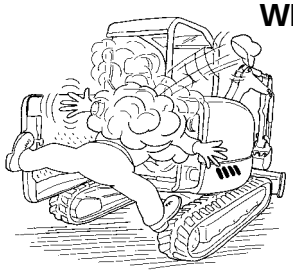


B-19966

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



B-19962

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

B-19958

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.

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SERVICE SCHEDULE

Chart

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

SERVICE SCHEDULE		HOURS					
ITEM	**SERVICE REQUIRED**	**8-10**	**50**	**100**	**250**	**500**	**■ 1000**
Engine Coolant	Check coolant level. Add premixed coolant as needed.						
Engine Oil	Check the engine oil level and add as needed.						
Hydraulic Fluid, Hoses and Tubelines	Check the hydraulic fluid level and add as needed. Check for damage and leaks. Repair or replace as needed.						
Engine Air Filter and Air System	Check condition indicator and empty dust cup as needed. Check air system for leaks.						
Tracks	Check and adjust track tension as needed.						
Indicators and Lights	Check for correct operation of all indicators and lights.						
Control Console Lockout	Check for proper function. Repair or replace as needed.						
Operator Canopy/Cab	Check condition. Check mounting hardware.						
Seat Belt	Check condition. Check mounting hardware.						
Safety Signs and Safety Treads	Check for damaged signs (decals) and safety treads. Replace any signs or safety treads that are damaged or worn.						
Pivot Points	Grease all machinery pivot points.						
Cab Heater Air Filter (Option)	Clean the filter as needed.						
Swing Circle and Pinion	Grease two fittings.						
Fuel Tank & Filter	Drain water and sediment from fuel tank and fuel filter.						
Battery	Check battery, cables, connections and electrolyte level. Add distilled water as needed.						
Alternator / Fan Belt	Check condition of belt and adjust as needed.		^				
Spark Arrestor Muffler	Clean the spark chamber.						
Fuel Filter	Replace fuel filter.						
Travel Motor	Check lubricant level in both travel motors.						
Engine Oil and Filter	Replace oil & filter. Use CD or better grade oil and Bobcat filter.		•				
Radiator, & Oil Cooler	Clean debris from the radiator fins.						
Hydraulic Filter and Reservoir Breather	Replace the filter and reservoir breather.			••			
Alternator & Starter	Check the alternator and starter connections.			••			
Engine Valves	Check and adjust the engine valve clearance.						
Travel Motor	Replace lubricant in both travel motors.			••			
Hydraulic System	Replace the hydraulic fluid and filters. Clean the reservoir.						
Coolant	Drain and flush the cooling system. Replace the coolant.	Every 2 years					

^ Check after the first 50 hours, then as scheduled.
• First oil and filter change must occur at 50 hours; then as scheduled.
•• Check after the first 100 hours, then as scheduled.
■ Or every 12 months.

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CONTROL CONSOLE LOCKOUTS

Inspection And Maintenance

Figure PM-1

When either console is raised **[Figure PM-1]** (left hand console shown), 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.

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.

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

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

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

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SEAT BELT

Inspection And Maintenance

WARNING

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

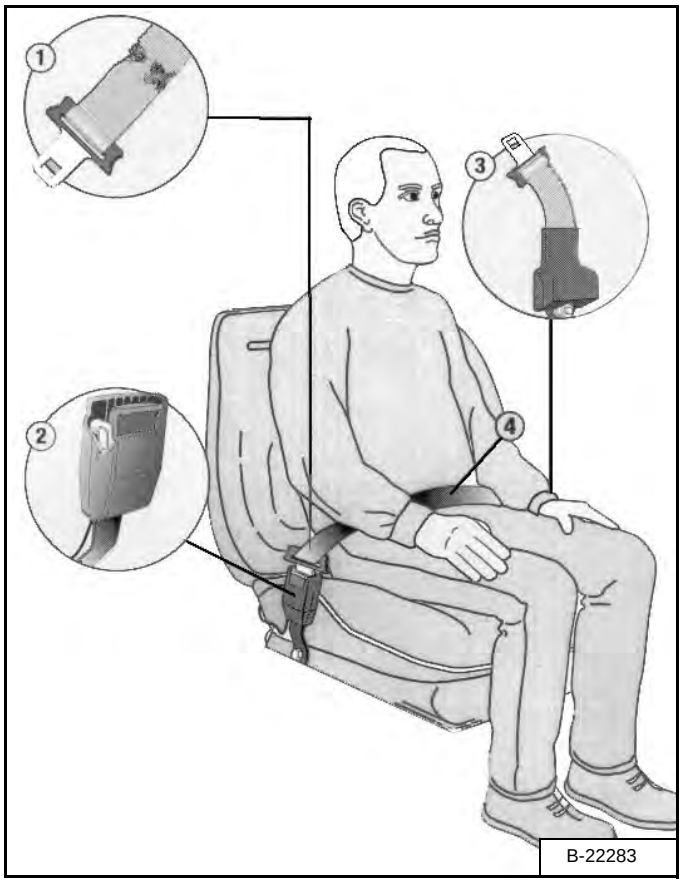
W-2466-0703

Check the seat belt daily for correct function.

Inspect the seat belt system thoroughly yearly or more often if the machine is exposed to severe environmental conditions or applications.

The seat belt system should be repaired or replaced if it shows cuts, fraying, extreme or unusual wear, significant discolorations due to ultraviolet (UV) rays from the sun, dusty/dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor (if equipped), or hardware.

Figure PM-2



The items below are referenced in **[Figure PM-2]**.

1. Check the seat belt 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 proper function. Make sure latch plate is not excessively worn, deformed or buckle is not damaged.

3. Check the retractor web storage device (if equipped) by extending the seat belt webbing to determine if it extends and retracts the 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 weakened.

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

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MOTION ALARM SYSTEM (IF EQUIPPED)

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 the either the forward or reverse direction

Inspecting

Figure PM-3

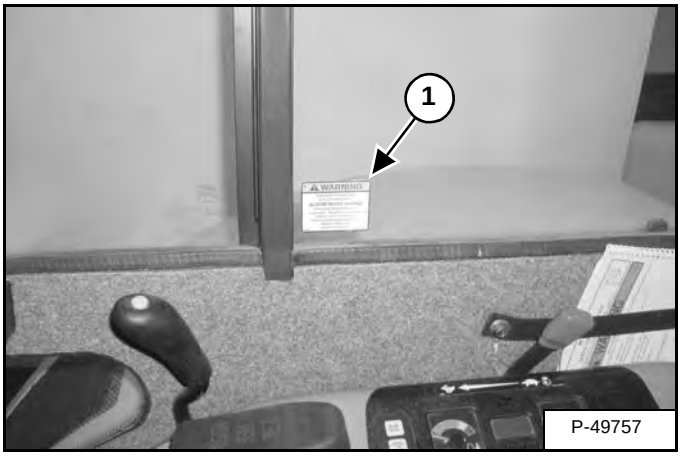
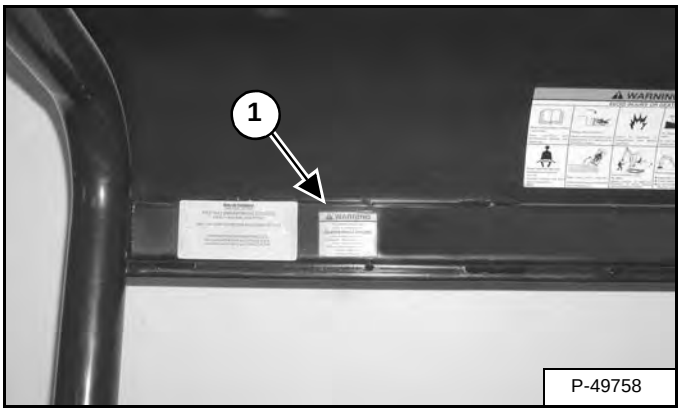


Figure PM-4



Inspect for damaged or missing motion alarm decal (Item 1) **[Figure PM-3]** (cab machine) or (Item 1) **[Figure PM-4]** (canopy machine). Replace if required.

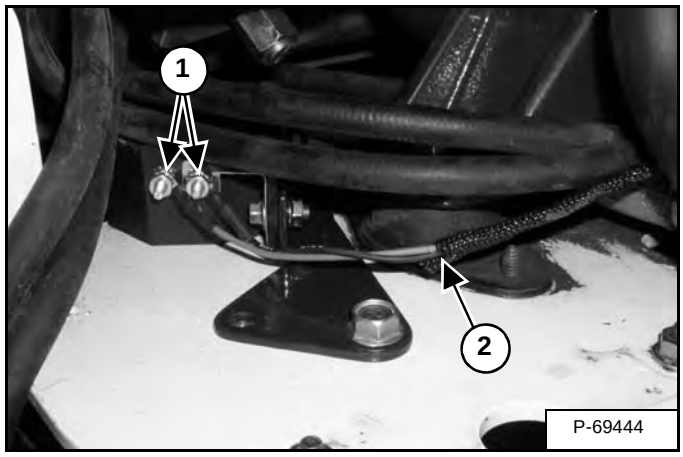
Sit in the operator's seat. Turn excavator key to ON position but do not start the engine.

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.

Turn excavator key to OFF position.

The motion alarm is mounted to the louver at the bottom rear of the excavator. (The louver must be removed to access the back-up alarm. See the Service Manual for the correct procedure.)

Figure PM-5



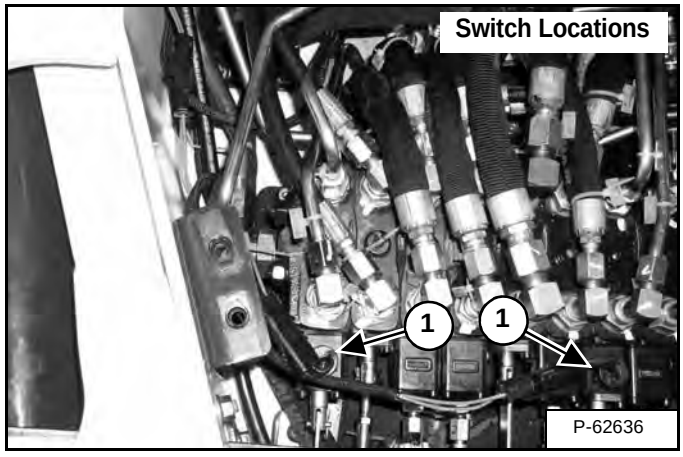
Inspect the motion alarm electrical connections (Item 1) **[Figure PM-5]**, wire harness (Item 2) **[Figure PM-5]** and motion alarm switches (Item 1) **[Figure PM-6]** for tightness and damage. Repair or replace any damaged components.

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

Adjusting Switch Position

Stop the engine. Open the right side cover.

Figure PM-6



The two travel control switches (Item 1) **[Figure PM-6]** are located in the actuator housings on the control valve travel sections.

The switches (Item 1) **[Figure PM-6]** are non-adjustable. They must be fully installed into the actuator housings and tightened. Tighten the switch to 31 ft.-lb. (42 N•m).

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

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TAILGATE

Opening And Closing The Tailgate

WARNING

AVOID INJURY OR DEATH

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

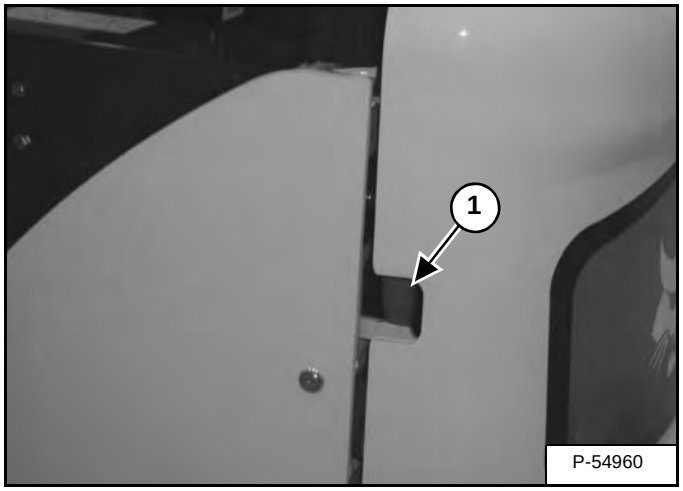
W-2012-0497

WARNING

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

W-2020-1285

Figure PM-7



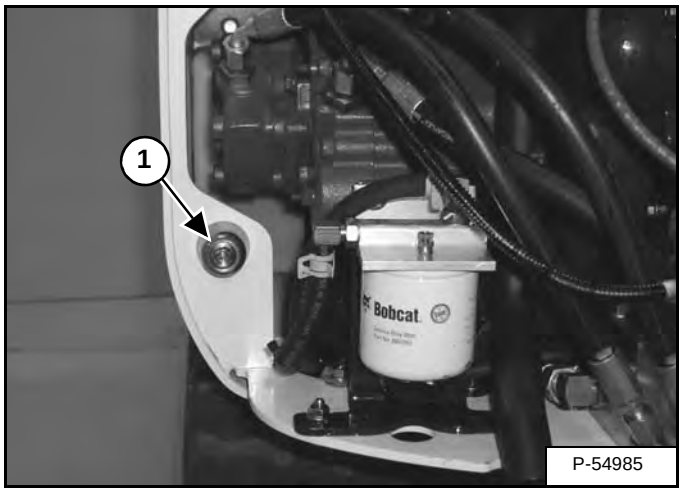
Release the latch (Item 1) **[Figure PM-7]** and pull the tailgate open.

Push firmly to close the tailgate.

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

Adjusting the Bumper

Figure PM-8

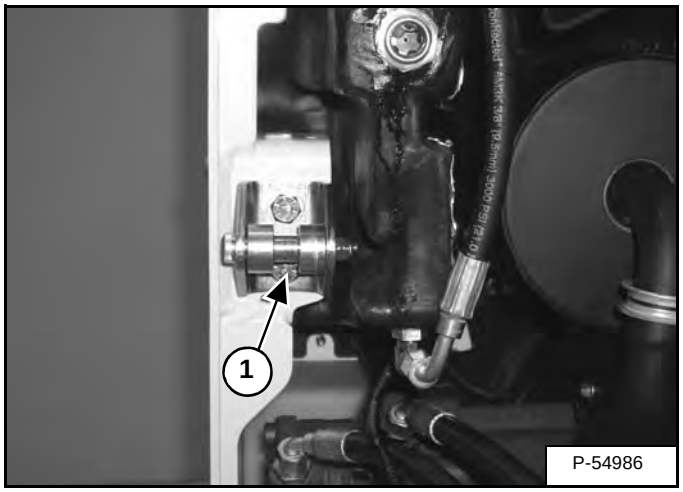


The door bumper (Item 1) **[Figure PM-8]** can be adjusted for alignment with the tailgate.

Close the tailgate before operating the excavator.

Adjusting The Tailgate Catch

Figure PM-9



The door catch (Item 1) **[Figure PM-9]** can be adjusted by loosening the two bolts, moving the catch, and tightening the two bolts.

Close the tailgate before operating the excavator.

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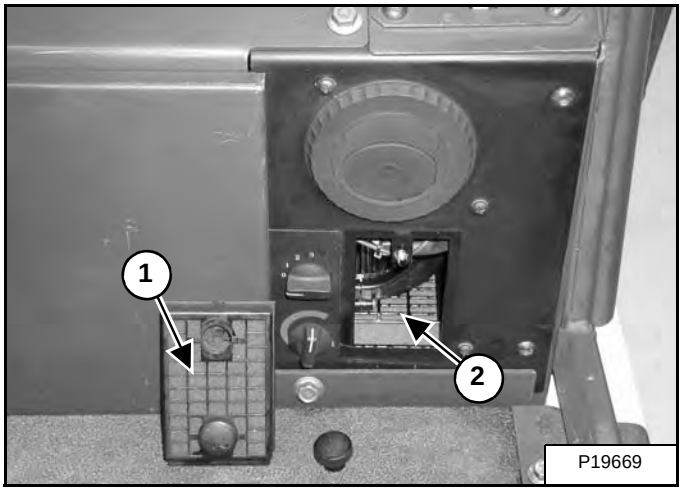
CAB FILTERS

Cleaning And Maintenance

The recirculation filter must be cleaned regularly. The filter is located at the left of the operator seat.

Figure PM-10



The recirculation filter is located on the front of the heater panel (Item 1) **[Figure PM-10]**.

Remove the knobs and remove the filter. Wash the filter with a mild detergent and water. Dry the filter before installing. Install the filter and tighten knobs.

The fresh air filter must be cleaned regularly.

The fresh air filter is located on the bottom of the heater, (Item 2) **[Figure PM-10]**.

Remove the filter. Wash the filter with a mild detergent and water. Dry the filter before installing. Install the filter and secure.

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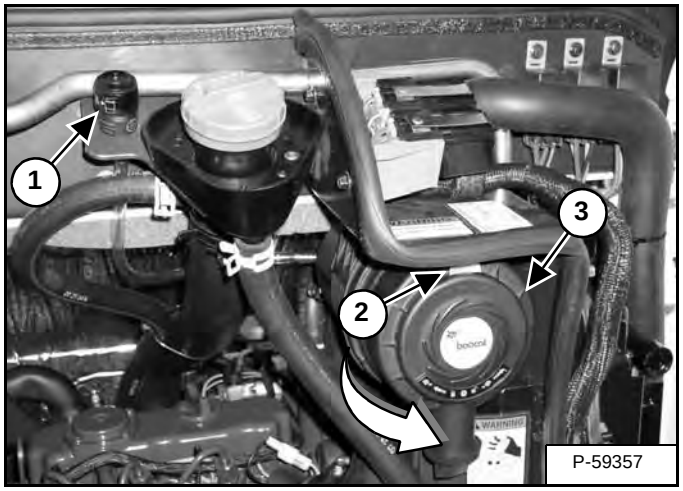
AIR CLEANER

See the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page PM-5) for the correct service interval.

Daily Check

Figure PM-11



Check the condition indicator (Item 1) **[Figure PM-11]**. 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 Filter Elements

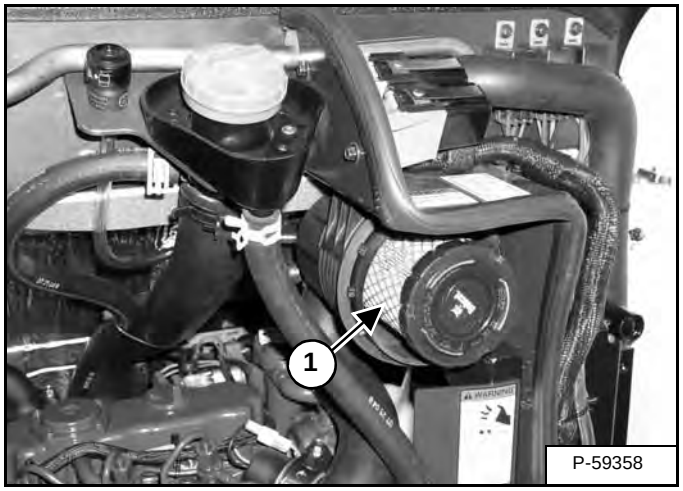
Outer Filter

Pull the locking tab (Item 2) **[Figure PM-11]**.

Turn the dust cup (Item 3) **[Figure PM-11]** counter-clockwise about 1/8 turn.

Remove and clean the dust cup.

Figure PM-12



Pull the outer filter (Item 1) **[Figure PM-12]** from the air cleaner housing.

Check the housing for damage.

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

Install a new outer filter.

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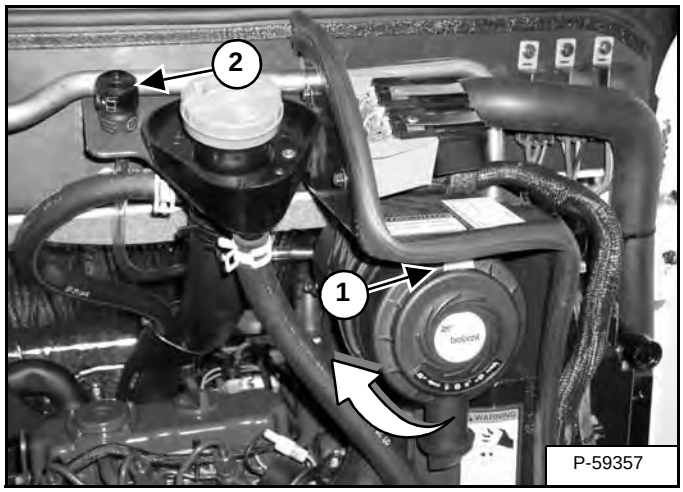
Replacing Filter Elements (Cont'd)

Figure PM-13



Install the dust cup and turn about 1/8 turn **[Figure PM-13]**.

Push locking tab in (Item 1) **[Figure PM-13]**.

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

Inner Filter

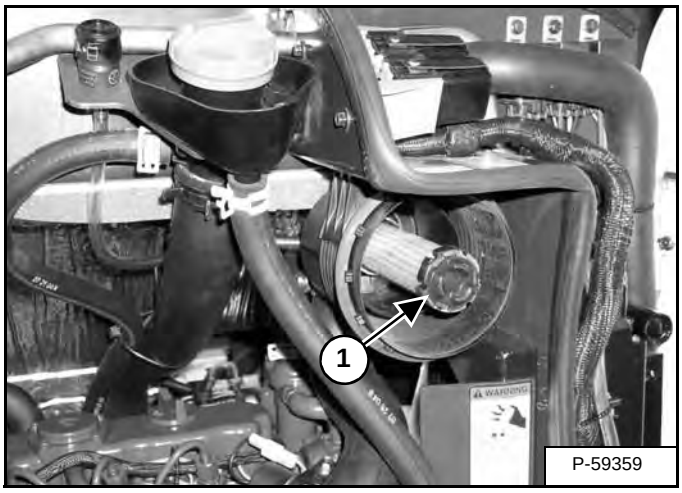
Only replace the inner filter under the following conditions:

- 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 PM-13]** on the top of the condition indicator and start the engine. Run at full RPM, then reduce engine speed and stop the engine. If the red ring shows in the condition indicator, replace the inner filter.

Remove the dust cup, outer filter and inner filter.

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

Figure PM-14



Install the new inner filter. **[Figure PM-14]**.

Install the outer filter and the dust cup.

Press the button on the condition indicator to reset the condition indicator by remove the red ring.

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FUEL SYSTEM

Fuel Specifications

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

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

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

At a minimum, Low Sulfur (500 ppm sulfur) Diesel Fuel must be used in this machine.

The following fuels may also be used in this machine:

- Ultra Low Sulfur (15 ppm sulfur) Diesel Fuel.
- Biodiesel Blend Fuel - Must contain no more than five percent biodiesel mixed with low sulfur or ultra low sulfur petroleum based diesel. This is commonly marketed as B5 blended diesel fuel.

⚠ 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

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.

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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

Filling The Fuel Tank

Open the tailgate.

Figure PM-15

Remove the fuel fill cap (Item 1) **[Figure PM-15]**.

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

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

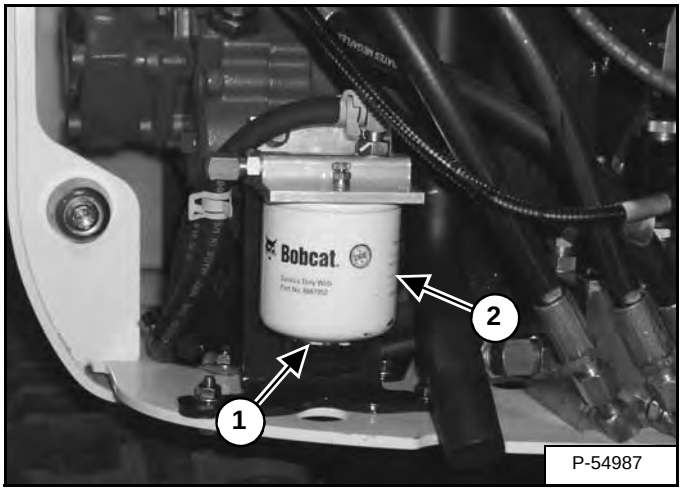
See the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page PM-5) for the service interval when to remove water from or replace the fuel filter.

Fuel Filters

Removing Water

Open the tailgate.

Figure PM-16



Loosen the drain (Item 1) **[Figure PM-16]** at the bottom of the filter to drain water from the filter.

Replacing Element

Remove the filter (Item 2) **[Figure PM-16]**.

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 PM-15)

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Draining The Fuel Tank

See the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page PM-5) for the correct service interval.

Turn the upperstructure until the fuel tank drain is centered between the rear tracks.

Figure PM-17

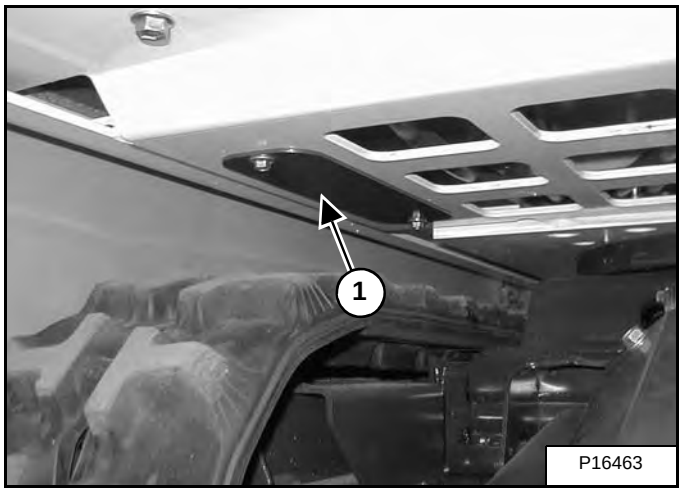
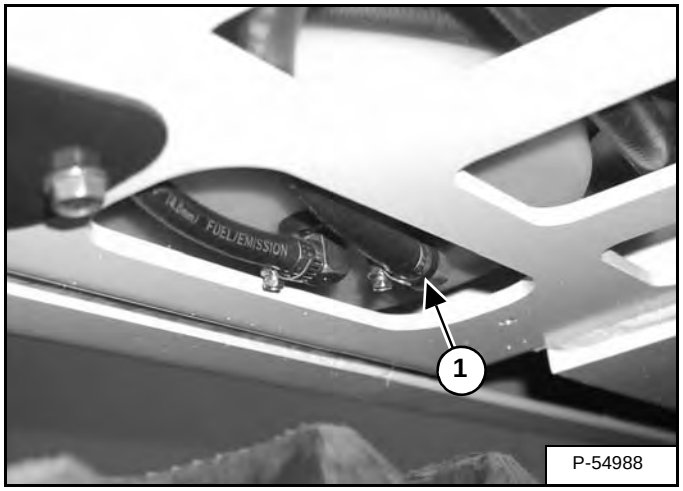


Figure PM-18



Remove the access panel (Item 1) **[Figure PM-17]** on the bottom of the engine compartment. Loosen the clamp (Item 1) **[Figure PM-18]** and disconnect the fuel hose.

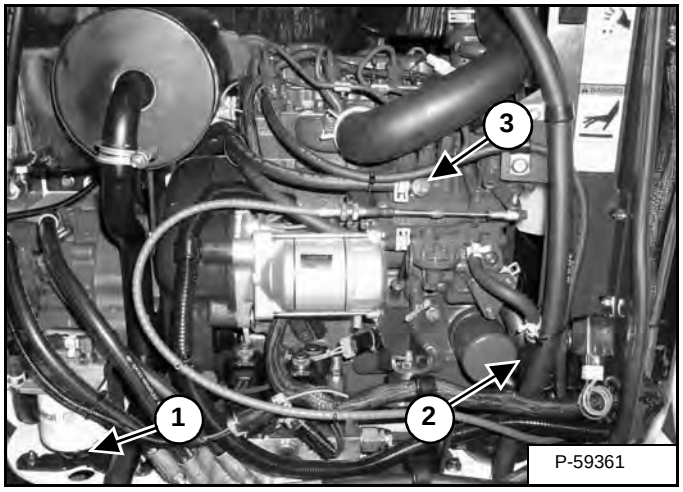
Drain the fuel into a container.

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

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 PM-19



Open the fuel filter vent (Item 1) **[Figure PM-19]**.

Operate the hand pump (priming bulb) (Item 2) **[Figure PM-19]** until the fuel flows from the vent with no air bubbles.

Close the vent (Item 1) **[Figure PM-19]** on the fuel filter housing.

Start the engine. It may be necessary to open the vent (Item 3) **[Figure PM-19]** (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

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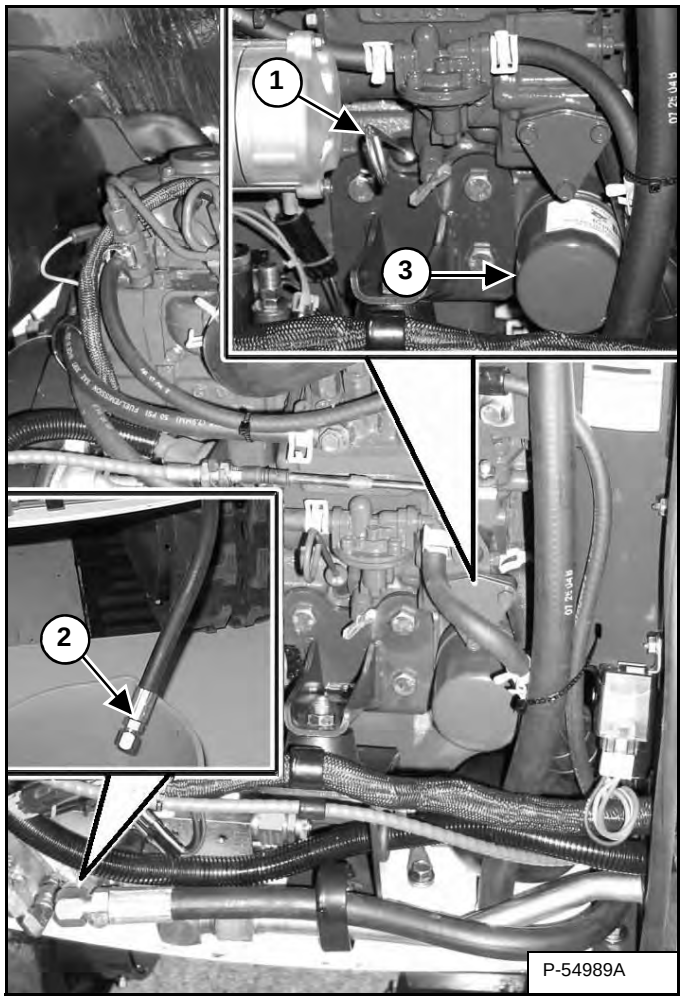
ENGINE LUBRICATION SYSTEM

Checking And Adding Engine Oil

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

Figure PM-20



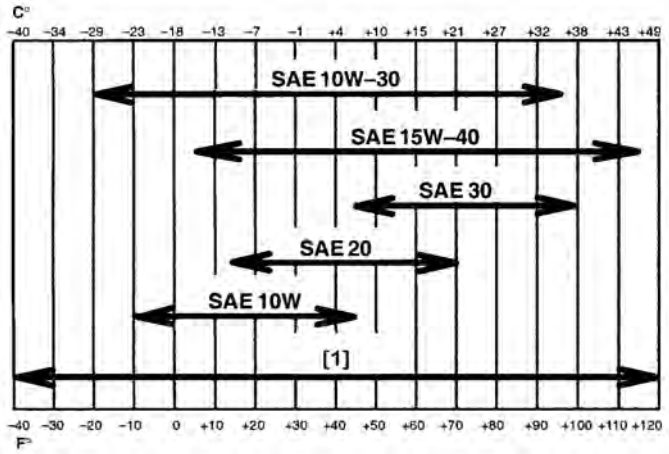
Open the rear door and remove the dipstick (Item 1) **[Figure PM-20]**.

Keep the oil level between the marks on the dipstick.

Engine Oil Chart

Figure PM-21

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 CI-4 OR BETTER)

[1] Synthetic Oil - Use recommendation from Synthetic Oil Manufacturer.

Use good quality engine oil that meets API Service Classification of CI-4 or better **[Figure PM-21]**.

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Removing And Replacing Oil And Filter

See the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page PM-5) for the service interval for replacing the engine oil and filter.

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

Open the tailgate.

Remove the drain plug (Item 2) **[Figure PM-20]**. Drain the oil into a container and recycle or dispose of used oil in an environmentally safe manner.

Remove the oil filter (Item 3) **[Figure PM-20]** and clean the filter housing surface.

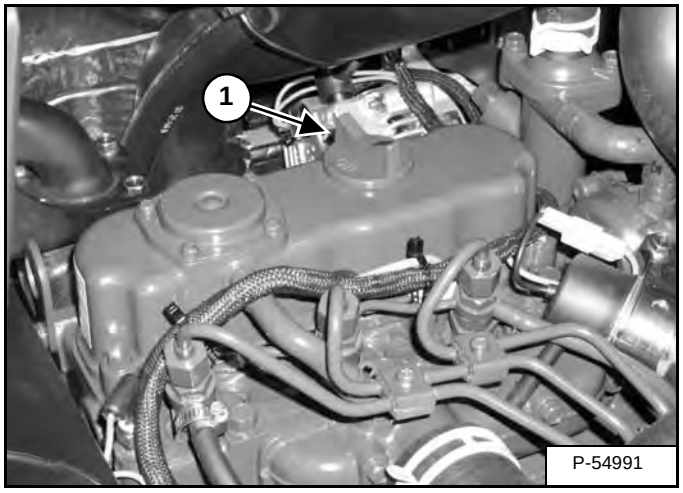
Use a genuine Bobcat filter.

Put clean oil on the filter gasket.

Install the filter and hand tighten.

Install and tighten the oil drain plug.

Figure PM-22



Remove the fill cap (Item 1) **[Figure PM-22]**.

Put in 3.4 qts. (3,2 L) of oil into the engine.

Use a good quality motor oil that meets the correct API Service Classification **[Figure PM-21]**.

Install the fill cap.

Start the engine and let it run for several minutes.

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

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

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COOLING SYSTEM

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

Cleaning

Open the tailgate.

Use air pressure or water pressure to clean the radiator and oil cooler.

Checking Level

WARNING

AVOID BURNS

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

W-2070-1203

WARNING

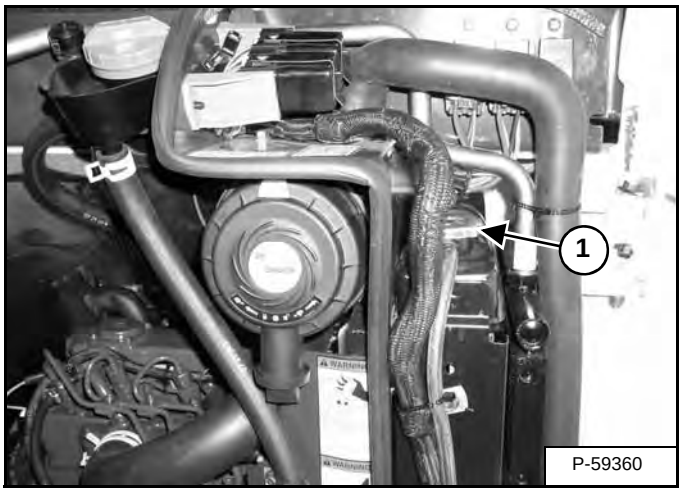
AVOID INJURY OR DEATH

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

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

W-2019-0907

Figure PM-23



When the engine is cool, remove the radiator cap (Item 1) **[Figure PM-23]**.

The coolant level must be 0.750 - 1.0 inch (20 - 25 mm) below the filler neck.

If the coolant level is low, add premixed coolant to the radiator.

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.

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Removing And Replacing Coolant

See the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page PM-5) for correct service intervals.

Turn the upperstructure so there is access to the engine and radiator from between the tracks. Stop the engine.

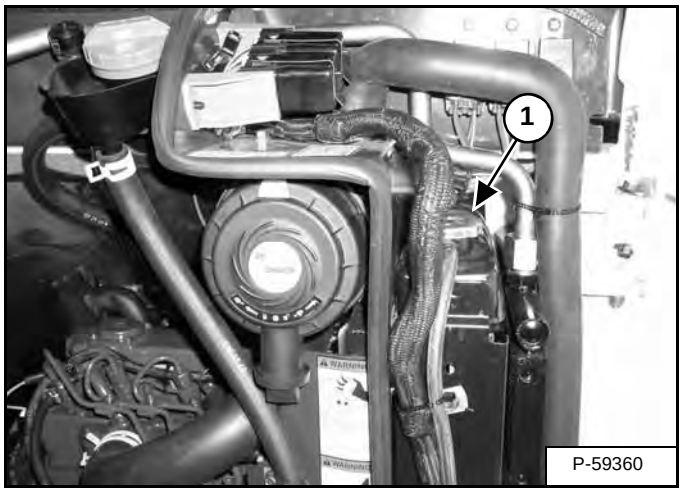
⚠ WARNING

AVOID BURNS

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

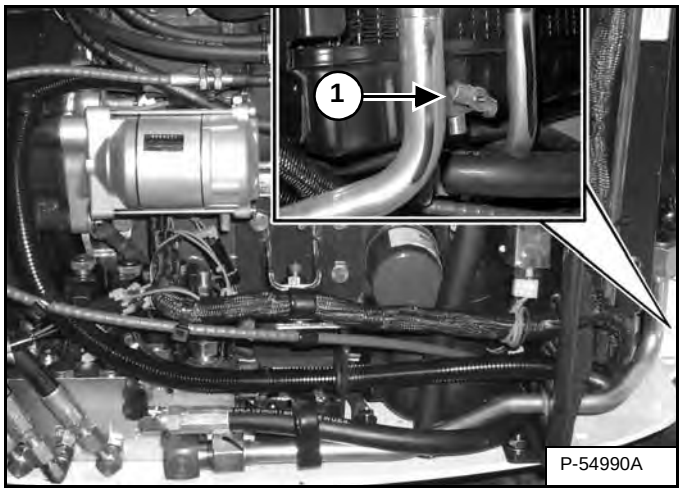
W-2070-1203

Figure PM-24



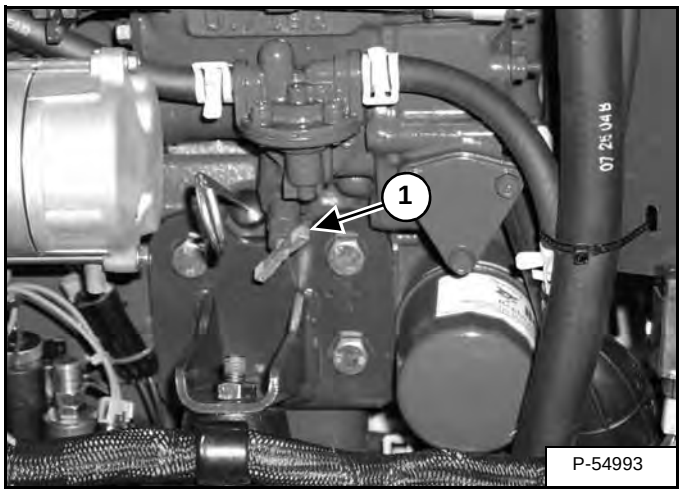
When the engine is cool, loosen and remove the radiator cap (Item 1) **[Figure PM-24]**.

Figure PM-25



Open the drain valve (Item 1) **[Figure PM-25]** at the bottom of the radiator and drain the coolant into a container.

Figure PM-26



Open the drain valve (Item 1) **[Figure PM-26]** on the engine block and drain the coolant into a container.

After all the coolant is removed, close the drain valve.

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

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Removing And Replacing Coolant (Cont'd)

Mix the coolant in a separate container.

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

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

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

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

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

Add premixed coolant until the level is correct.

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

Add coolant to the recovery tank as needed.

Close the tailgate.

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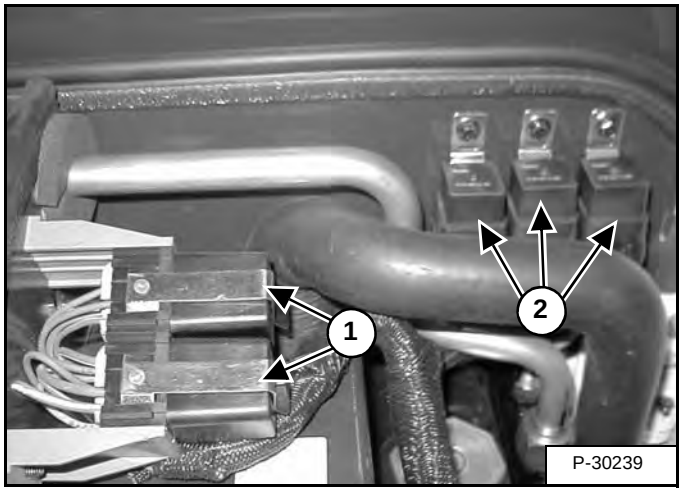
ELECTRICAL SYSTEM

Description

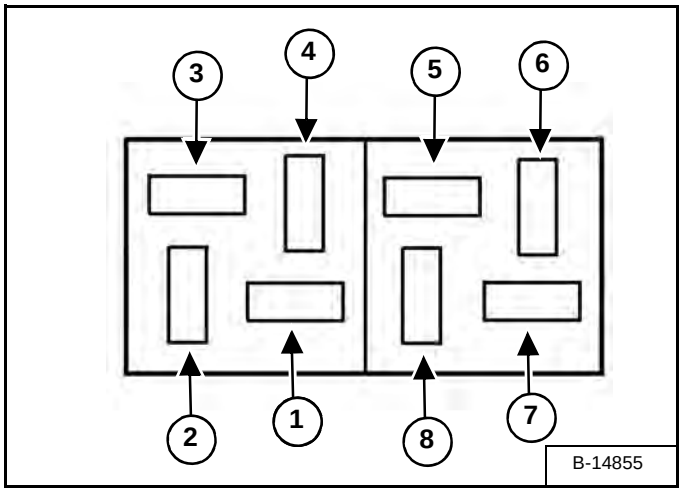
Figure PM-27



The excavator has a 12 volt, negative ground electrical system. The electrical system is controlled by fuses and relays located in the right side of the engine compartment (Items 1 & 2) **[Figure PM-27]**. The fuses will protect the electrical system when there is an electrical overload. The reason for the overload must be found before starting the engine again.

Fuses And Relay Location / Identification

Figure PM-28



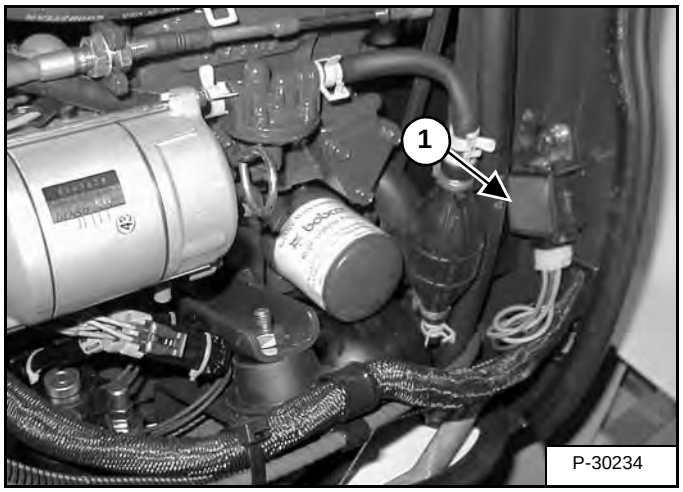
1. **Instrument** - 10A (SW) Hourmeter, Warning Buzzer & Fuel Gauge Back Light
2. **Accessory** - 20A (SW) Accessory Connector, Heater & Horn
3. **Start** - 20A (SW) Key Switch, Unswitched Accessory Connector
4. **Cab** - 15A (SW) Cab Power, Lights, Wiper & Dome Light
5. **Power** - 15A (UNSW) Appliance Socket
6. **Timer Power** - 15A (UNSW) Stop Timer Module
7. **Power -** 15A (SW) Stop Timer Module
8. **Open** - Not Used **[Figure PM-28]**

Always replace fuses using the same type and capacity.

Fuel Timer And Diode Location / Identification

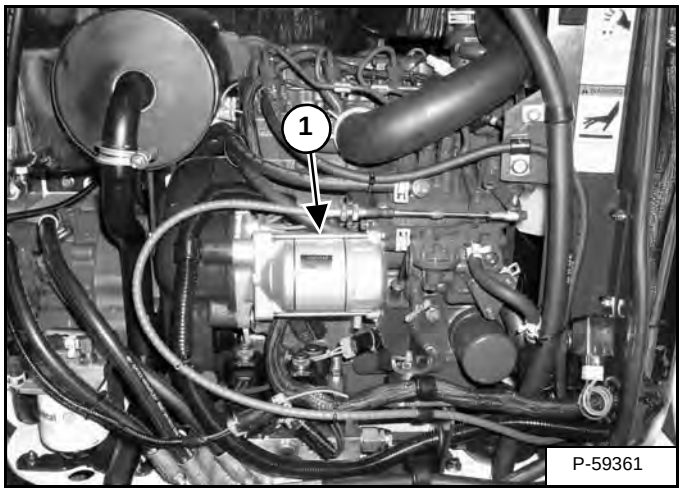
The three electrical relays (Item 2) **[Figure PM-27]** are located in the engine compartment to the right of the fuel fill. The three relays control the starter, glow plugs and switched power circuits.

Figure PM-29



The fuel shutoff timer (Item 1) **[Figure PM-29]** is located on the right side of the engine compartment.

Figure PM-30



There are two diodes (Item 1) **[Figure PM-30]** in the harness behind the starter. They are for alternator feedback protection and the glow plug during start function.

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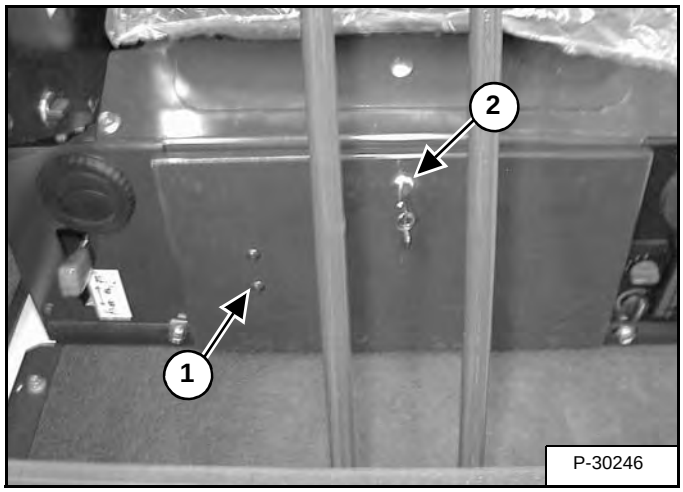
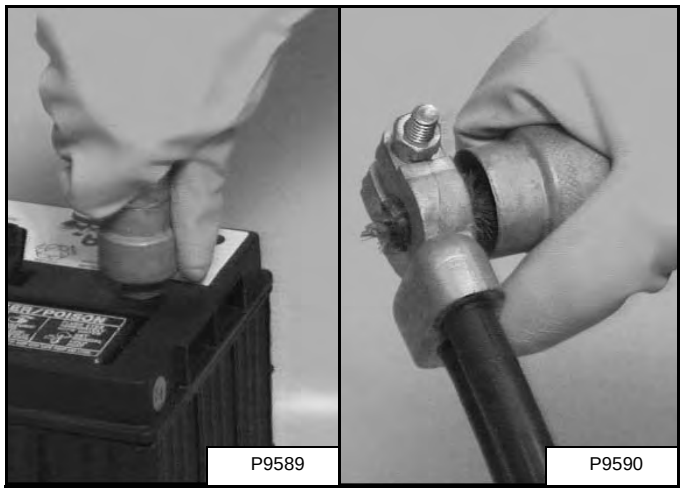
Battery Maintenance

Figure PM-31



The battery is located under the operator's seat, behind the storage compartment cover (Item 1). Use the key (Item 2) **[Figure PM-31]** to open the compartment.

Figure PM-32



The battery cables must be clean and tight **[Figure PM-32]**. Remove acid or corrosion from the battery and cables using a sodium bicarbonate and water solution. Cover the battery terminals and cable ends with battery saver grease to prevent corrosion.

Check for broken or loose connections.

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

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

If the electrolyte level is lower than 0.50 inch (13 mm) above the plates, add distilled water only.

⚠ WARNING

AVOID INJURY OR DEATH

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

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

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

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Using A Booster Battery (Jump Starting)

IMPORTANT

If jump starting the excavator from a second machine:

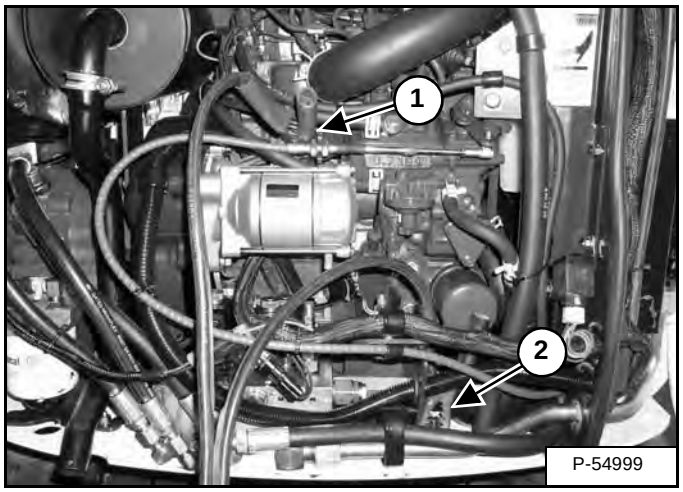
When jump starting the excavator from a battery installed in a second machine, make sure the engine is NOT running while using the glow plugs. High voltage spikes from a running machine can burn out the glow plugs.

I-2060-0906

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

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

Figure PM-33



Open the tailgate **[Figure PM-33]**.

Connect one end of the first cable to the positive (+) terminal of the booster battery. Connect the other end of the same cable to the positive (+) terminal (Item 1) **[Figure PM-33]** 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 negative excavator cable (Item 2) **[Figure PM-33]** fastened to the frame.

NOTE: (See Cold Temperature Starting Procedure on Page OI-29)

IMPORTANT

Damage to the alternator can occur if:

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

I-2222-0903

Start the engine. After the engine has started, remove the negative (-) cable first (Item 2) **[Figure PM-33]**.

Disconnect the cable from the excavator starter (Item 1) **[Figure PM-33]**.

⚠ 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.

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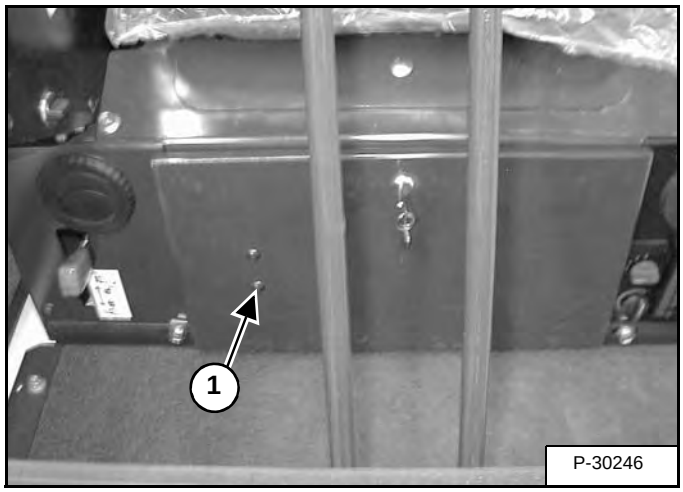
Removing And Installing The Battery

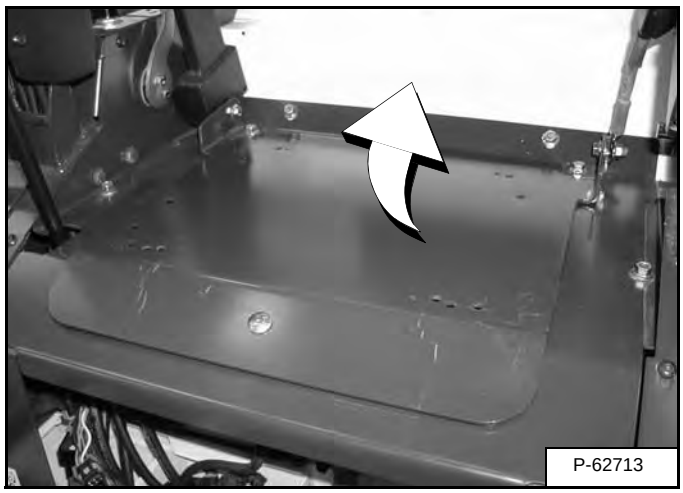
Figure PM-34



Open the storage compartment cover (Item 1) **[Figure PM-34]**.

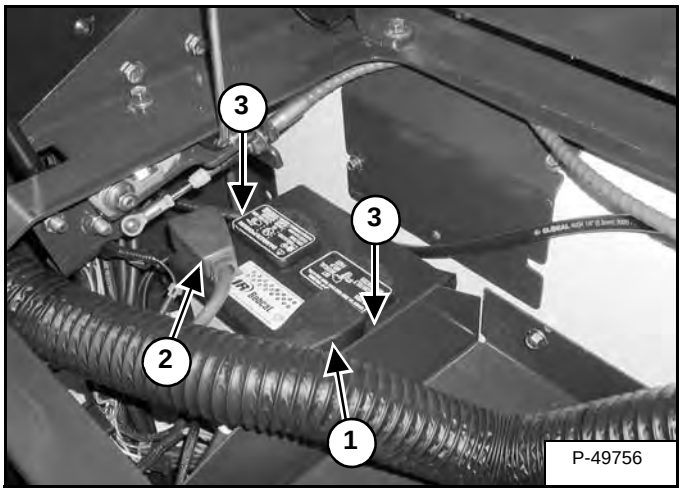
Remove seat and seat pan.

Figure PM-35



Remove seat and raise the seat pan **[Figure PM-35]**. (See Belt Adjustment on Page PM-32)

Figure PM-36



Disconnect the negative (-) cable (Item 1) **[Figure PM-36]** first.

Disconnect the positive (+) cable (Item 2) **[Figure PM-36]**.

Remove the bolts (Item 3) **[Figure PM-36]** from the hold down clamp and remove the 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 PM-36]** 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.

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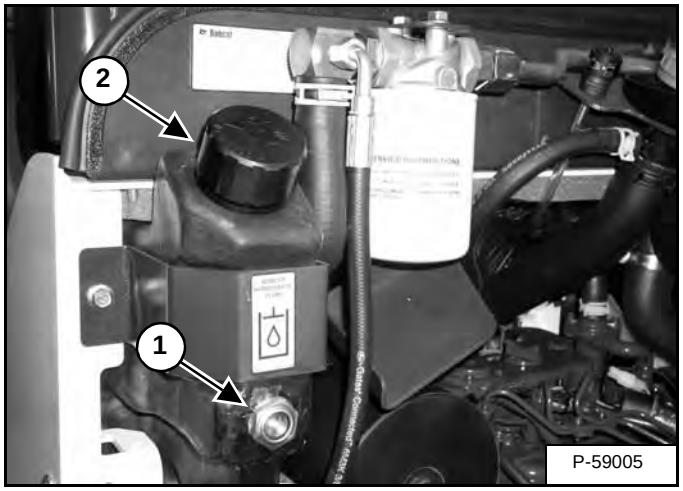
HYDRAULIC SYSTEM

Checking And Adding Fluid

Put the machine on a level surface.

Retract the arm and bucket cylinders, put the bucket on the ground and raise the blade. Stop the engine.

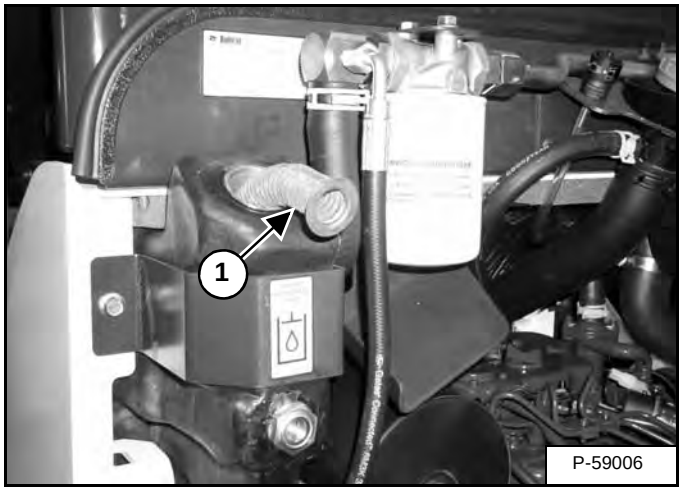
Figure PM-37



Open the tailgate. The fluid must be at the center of the sight gauge (Item 1) **[Figure PM-37]**.

Remove oil fill cap (Item 2) **[Figure PM-37]**.

Figure PM-38



Check the condition of the screen (Item 1) **[Figure PM-38]** in the fill neck of the reservoir. The screen must be installed in fill neck when adding oil.

Add the correct fluid to the reservoir until it is at the center of the sight gauge (Item 1) **[Figure PM-37]**. (See REGULAR MAINTENANCE ITEMS on Page V)

Install the cap. Close the tailgate.

⚠ WARNING

AVOID INJURY OR DEATH

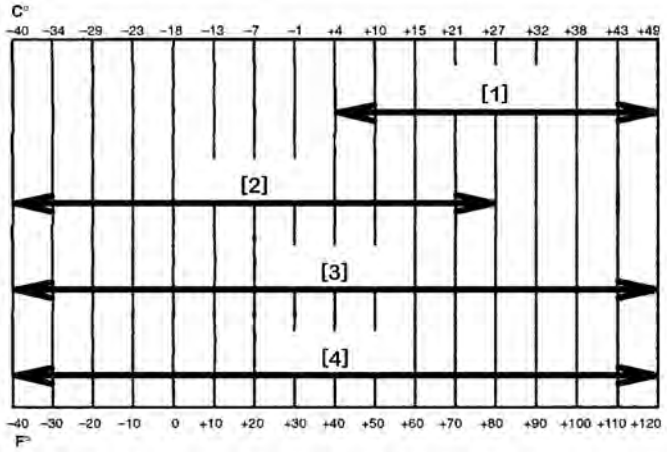
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire.

W-2103-0508

Hydraulic / Hydrostatic Fluid Chart

Figure PM-39

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



TEMPERATURE RANGE ANTICIPATED DURING MACHINE USE

[1] VG 100; Minimum VI 120
[2] VG 46; Minimum VI 140
[3] Synthetic Fluid; VG 46; Minimum VI 150
[4] BOBCAT Hydraulic / Hydrostatic Fluid

Use only recommended fluid in the hydraulic system **[Figure PM-39]**.

Add hydraulic fluid as needed to bring the level to the center of sight gauge (Item 1) **[Figure PM-37]**.

Install the oil fill cap.

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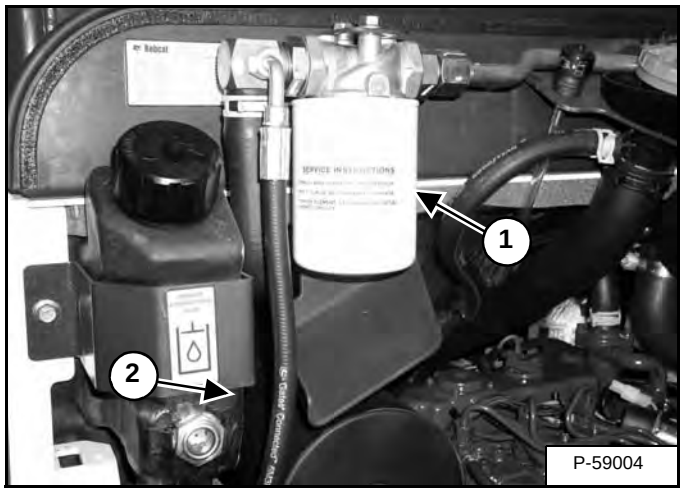
Removing And Replacing The Hydraulic Filter

See the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page PM-5) for the correct service interval.

Open the tailgate.

Figure PM-40



Remove the filter (Item 1) **[Figure PM-40]**.

Clean the housing where the filter gasket makes contact.

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

Start the engine. Run the excavator through the hydraulic functions. Stop the engine. Check the fluid level at the sight gauge (Item 2) **[Figure PM-40]** and add as needed. Check the filter area for leaks.

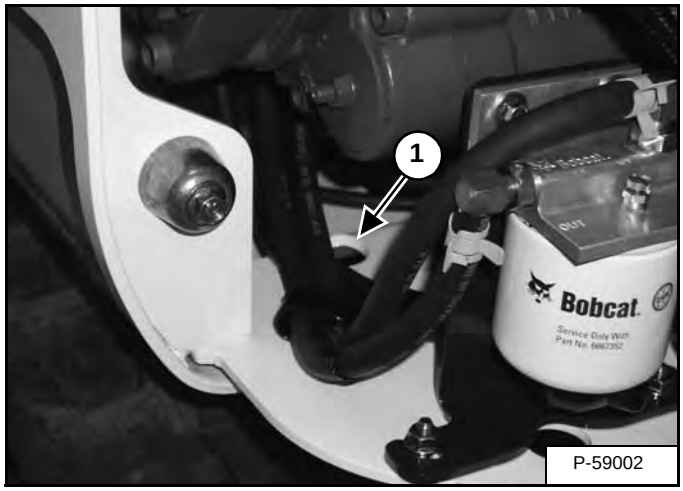
Removing And Replacing Hydraulic Fluid

See the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page PM-5) for the correct service interval.

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

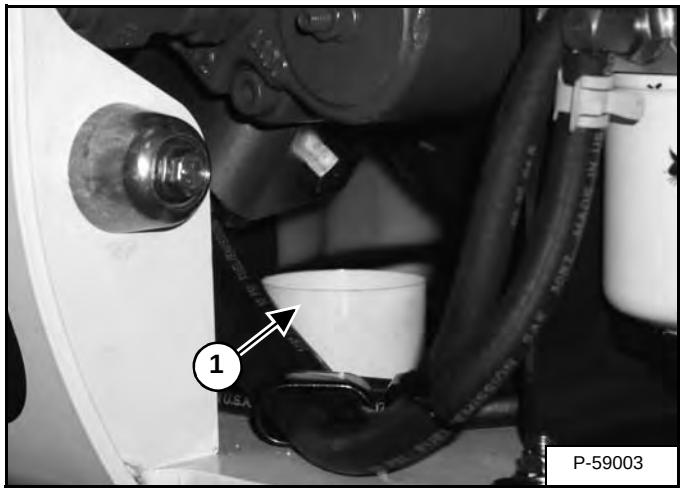
Remove and replace the hydraulic filter.

Figure PM-41



A hole (Item 1) **[Figure PM-41]** is provided in the housing for ease of draining the hydraulic fluid.

Figure PM-42



Install a funnel (Item 1) **[Figure PM-42]** in the hole.

Place a container under the funnel.

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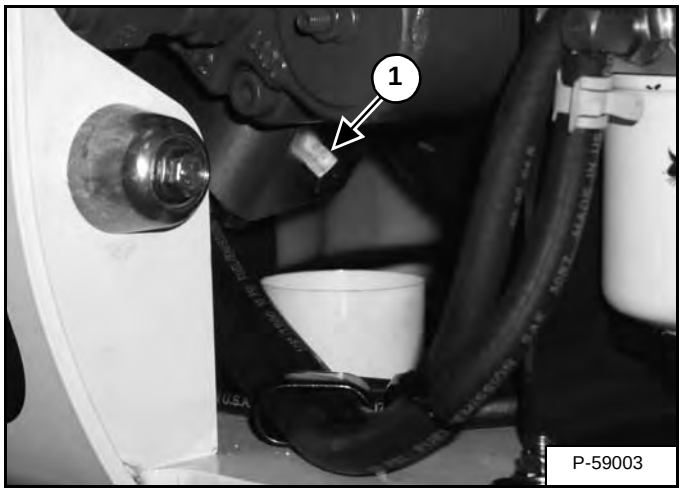
Removing And Replacing Hydraulic Fluid (Cont'd)

Figure PM-43



Remove the drain plug (Item 1) **[Figure PM-43]** and drain the hydraulic fluid into the container.

IMPORTANT

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

I-2067-0499

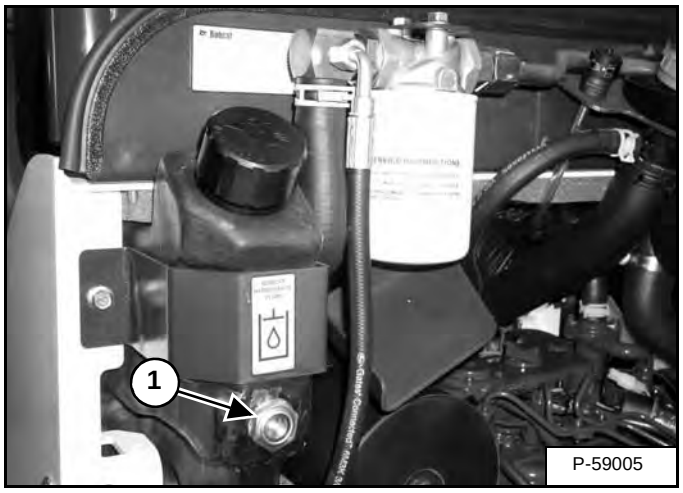
IMPORTANT

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

I-2045-0788

Install the drain plug.

Figure PM-44



Add fluid to the reservoir until it is at the center of the sight gauge (Item 1) **[Figure PM-44]**. (See REGULAR MAINTENANCE ITEMS on Page V)

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

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SPARK ARRESTOR MUFFLER

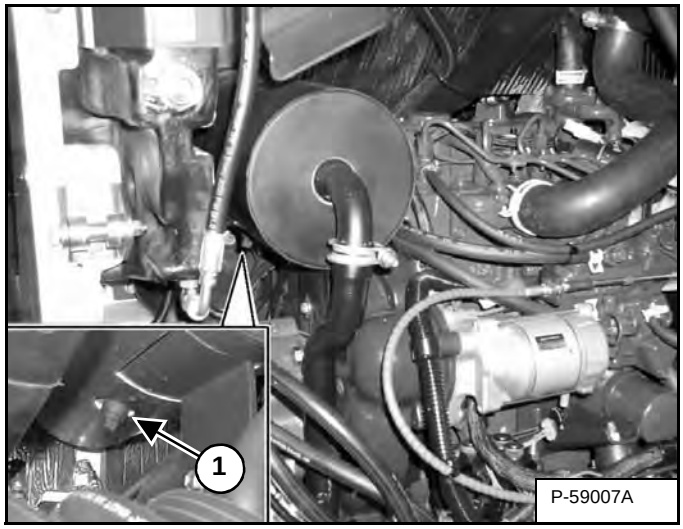
Cleaning Procedure

See the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page PM-5) for the correct service interval.

Do not operate the excavator with a defective exhaust system.

Stop the engine. Open the tailgate.

Figure PM-45



Remove the plug (Item 1) **[Figure PM-45]** from the bottom of the muffler.

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

Stop the engine. Install and tighten the plug.

Close the tailgate.

⚠ 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

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TRACK TENSION

NOTE: The wear of undercarriage parts vary with working conditions and types of soil conditions. Maintain the correct track tension by inspecting regularly. (See SERVICE SCHEDULE on Page PM-5) for the correct service interval.

Adjusting

Figure PM-46

Raise one side of the machine (approximately four inches) using the boom and arm as shown in **[Figure PM-46]**.

Raise the blade fully and install jackstands under the blade and the track frame. Lower the machine until all machine weight is on the jackstands.

Stop the engine.

⚠ WARNING

AVOID INJURY

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

W-2142-0903

Figure PM-47

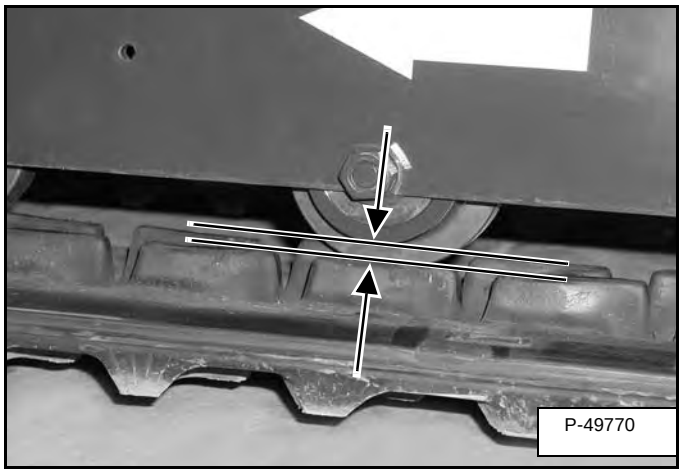


Figure PM-48

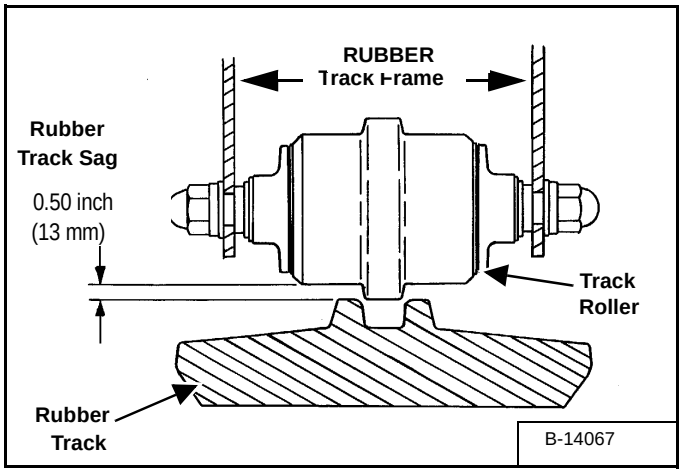
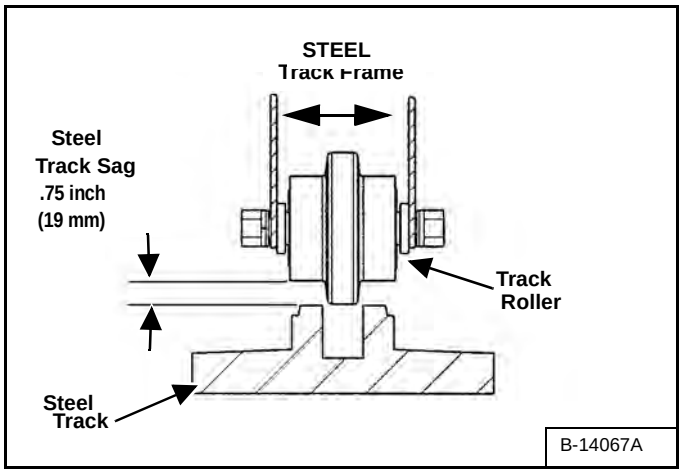


Figure PM-49



Measure the rubber or steel track sag at the middle track roller **[Figure PM-47]**. Do not get your fingers into pinch points between the track and the track roller. Use material of appropriate size to check the gap between the contact edge of the roller and top edge of the track guide lug **[Figure PM-47]**, **[Figure PM-48]** & **[Figure PM-49]**.

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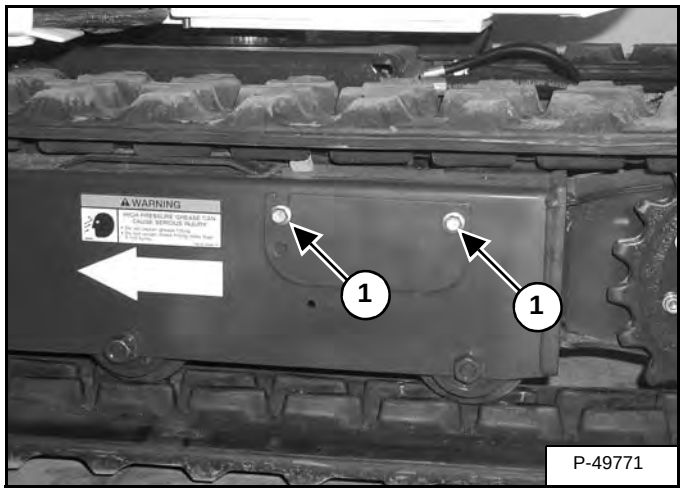
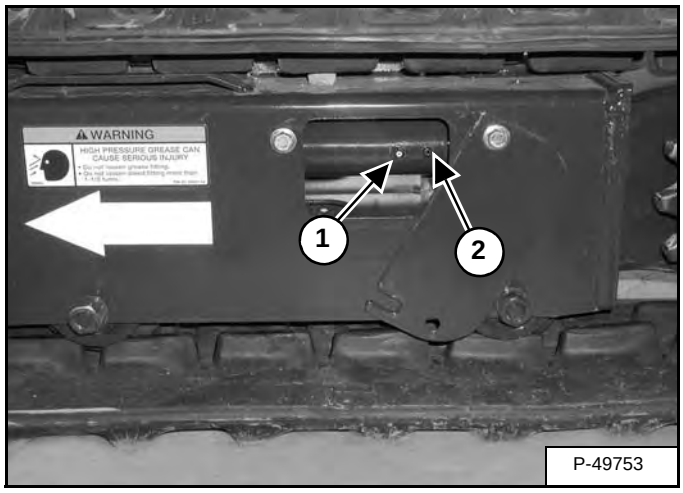
Adjusting (Cont'd)

Figure PM-50



Loosen its two bolts (Item 1) **[Figure PM-50]** from the cover. Pivot the cover downward.

Figure PM-51



Add grease to the fitting (Item 1) **[Figure PM-51]** until the track tension is correct.

If tension is too tight, loosen the bleed screw (Item 2) **[Figure PM-51]** (1 turn maximum) and let grease flow out of the bleed screw. When tension is correct, tighten the bleed screw.

Repeat the procedure for the other side.

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

WARNING

HIGH PRESSURE GREASE CAN CAUSE SERIOUS INJURY

- **Do not loosen grease fitting.**
- **Do not loosen bleed fitting more than 1 - 1/2 turns.**

W-2781-0109

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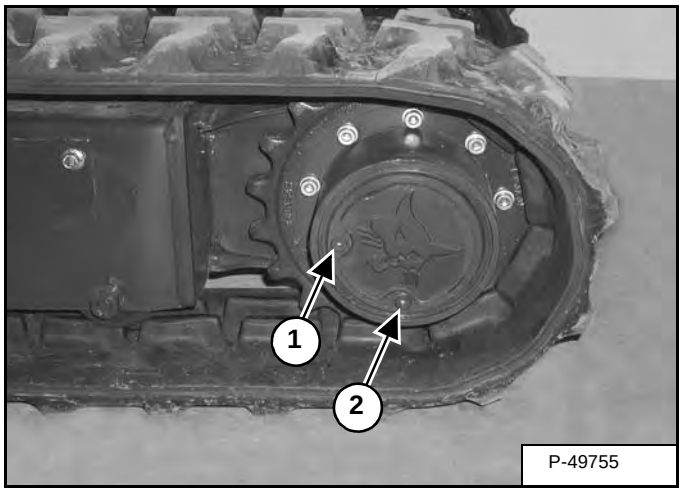
TRAVEL MOTOR

Checking And Adding Oil

Figure PM-52



Put the machine on a level surface with the plugs positioned as shown (Items 1 & 2) **[Figure PM-52]**.

Remove the plug (Item 1) **[Figure PM-52]**. The oil level should be at the bottom edge of the plug hole.

Add gear lube (SAE 80W90) through the hole if the oil level is below the hole. (See Capacities on Page SPEC-7)

Install and tighten both plugs.

Repeat the procedure for the other side.

Removing And Replacing Oil

(See SERVICE SCHEDULE on Page PM-5) for the correct service interval.

Put the machine on a level surface with the plugs positioned as shown (Items 1 & 2) **[Figure PM-52]**.

Remove the bottom plug (Item 2) and top plug (Item 1) **[Figure PM-52]** and drain into a container. Recycle or dispose of the used lubricant in an environmentally safe manner.

After all the gear lube is removed, install plug (Item 2) **[Figure PM-52]**.

Add gear lube (SAE 80W90) to the plug hole (Item 1) **[Figure PM-52]** until the gear lube level is at the bottom edge of the plug hole. (See Capacities on Page SPEC-7)

Install and tighten the plug.

Repeat the procedure for the other side.

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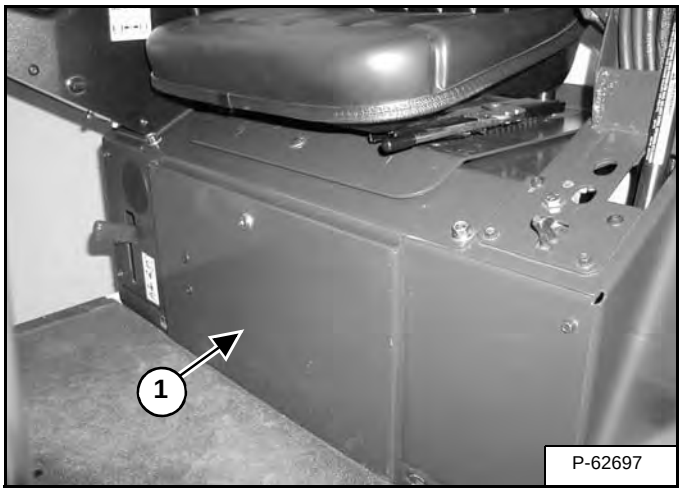
ALTERNATOR BELT

Belt Adjustment

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

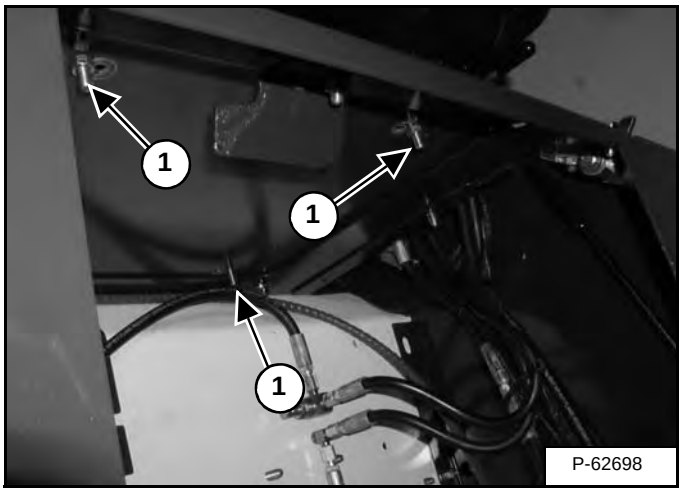
Stop the engine.

Figure PM-53



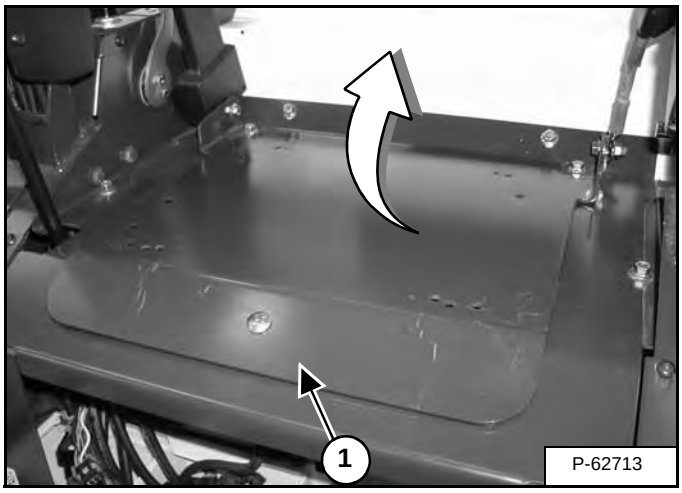
Use the start key to remove the cover (Item 1) **[Figure PM-53]** from the storage compartment.

Figure PM-54



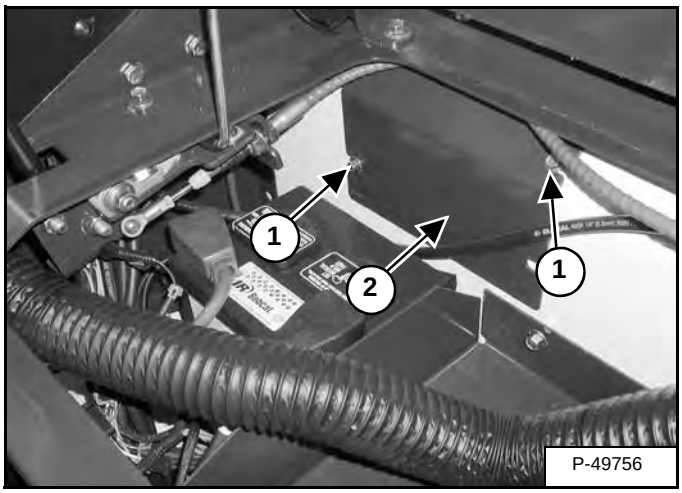
Remove the four nuts (Item 1) **[Figure PM-54]** from the seat bolts and remove seat and rail assembly.

Figure PM-55



Reach into the storage compartment (Item 1) **[Figure PM-55]** and turn the release for the seat pan. Raise the seat pan and tip it toward the rear of the machine.

Figure PM-56



Remove two bolts (Item 1) and remove the access panel (Item 2) **[Figure PM-56]**.

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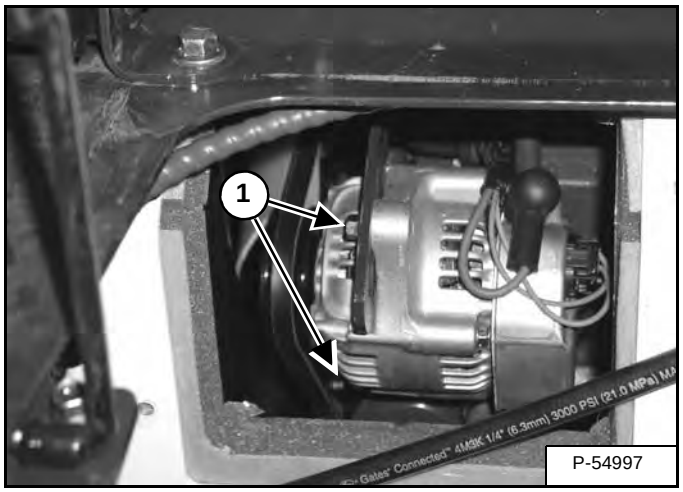
Belt Adjustment (Cont'd)

Figure PM-57



Loosen the alternator mounting and adjustment bolts (Item 1) **[Figure PM-57]**.

If a belt tension tool is available, move the alternator toward the front of the machine **[Figure PM-57]** until the belt has (New belt = 56 - 60 lbf. or Used belt = 48 - 52 lbf.) tension.

If a belt tension tool is not available, move the alternator toward the front of the machine **[Figure PM-57]** until the belt has 0.50 inch (13 mm) movement at the middle of the belt span with 13 lbs. (58 N) of force.

Tighten the mounting and adjustment bolts.

Install the access panel, lower the seat pan and engage the latch.

Install the seat and the storage compartment cover.

Belt Replacement

(See ALTERNATOR BELT on Page PM-32) for removal of components to access the alternator belt.

Loosen the alternator mounting and adjustment bolts (Item 1) **[Figure PM-57]** and loosen the belt all the way.

Remove the belt and install a new belt.

Adjust the belt as shown above.

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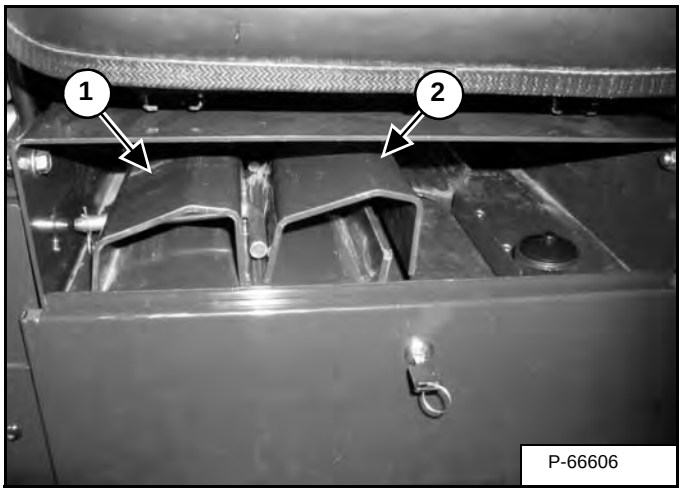
BLADE EXTENSION

Description

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

Figure PM-58

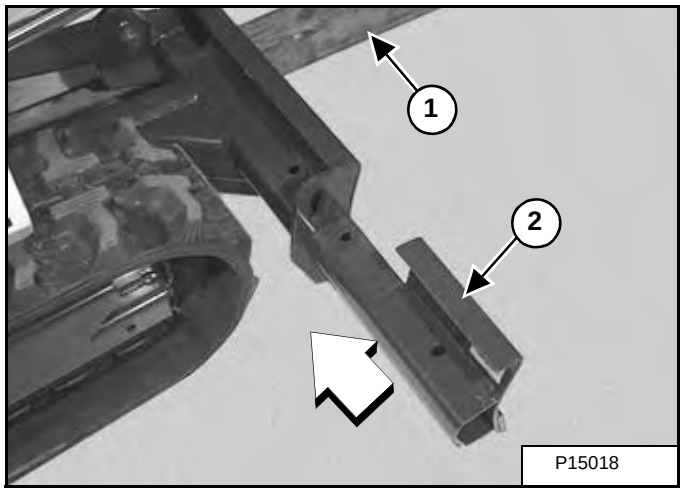


The blade extensions (Item 1 and 2) **[Figure PM-58]** are stored under the operator seat.

NOTE: The blade extensions needed to be installed under the operator seat as shown for cab models. Both mounting pins must be installed in the left blade extension (Item 1) [Figure PM-58]. If the blade extensions are installed differently, breakage to the water bottle and cap could result.

Installing And Removing

Figure PM-59



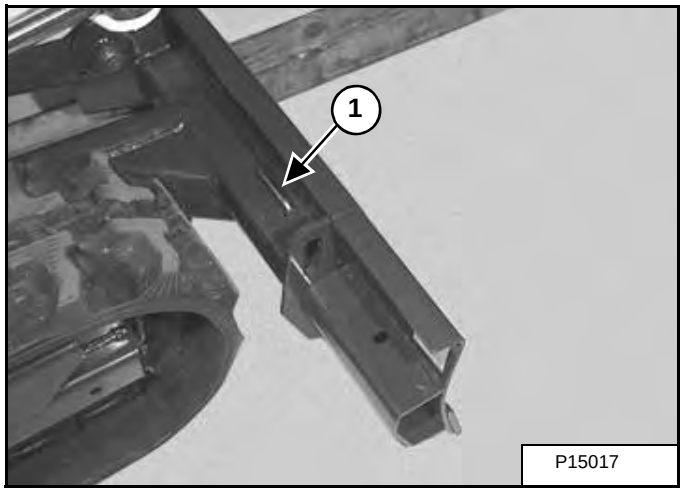
Put a block (Item 1) **[Figure PM-59]** under the blade.

Fully lower the blade to the block.

Stop the engine.

Slide the extension (Item 2) **[Figure PM-59]** into the blade frame.

Figure PM-60



Install the pin (Item 1) **[Figure PM-60]**.

Remove the blade extensions when transporting the excavator, or when a narrow operating width is needed. Under normal operating conditions, the blade width should match the track width.

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TRACK ROLLER AND IDLER LUBRICATION

Procedure

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

BUCKET

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.**

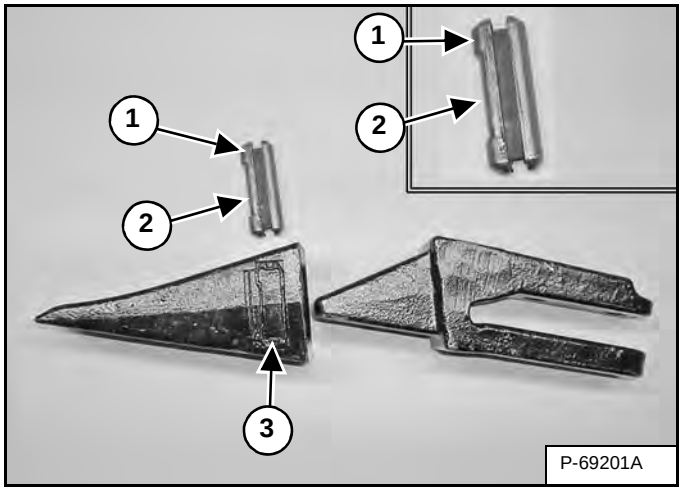
W-2505-0604

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 PM-61



The tooth has a unique retaining pin (Item 1). The retaining pin 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 PM-61]** 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.

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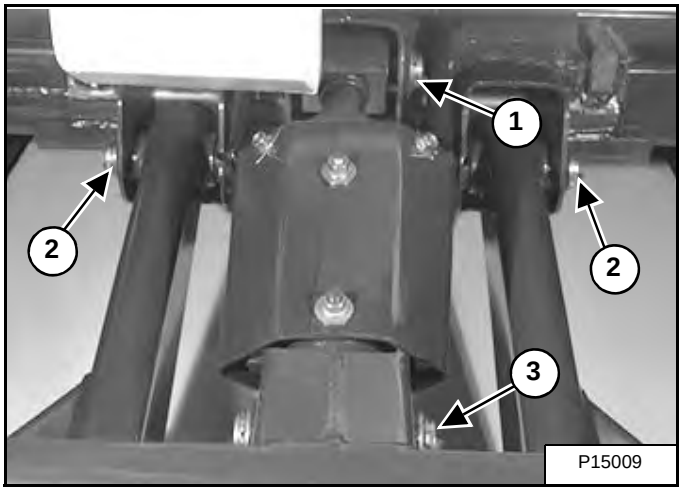
LUBRICATION OF THE HYDRAULIC EXCAVATOR

Lubricate the Hydraulic Excavator as specified in the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page PM-5) for the best performance of the machine.

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

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

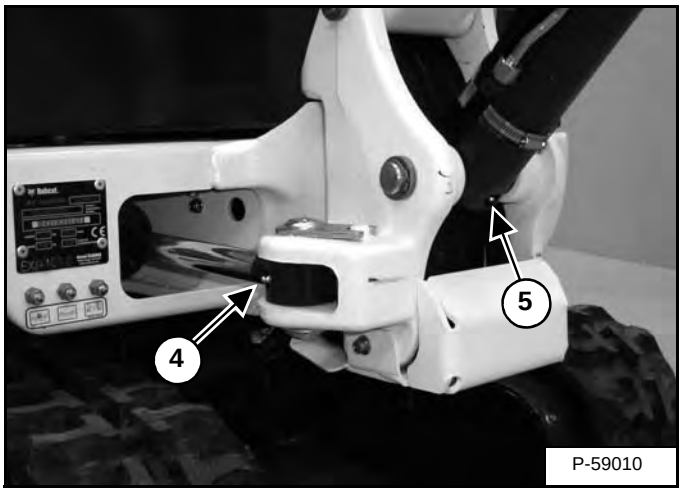
Figure PM-62



Ref Description (# of Fittings)

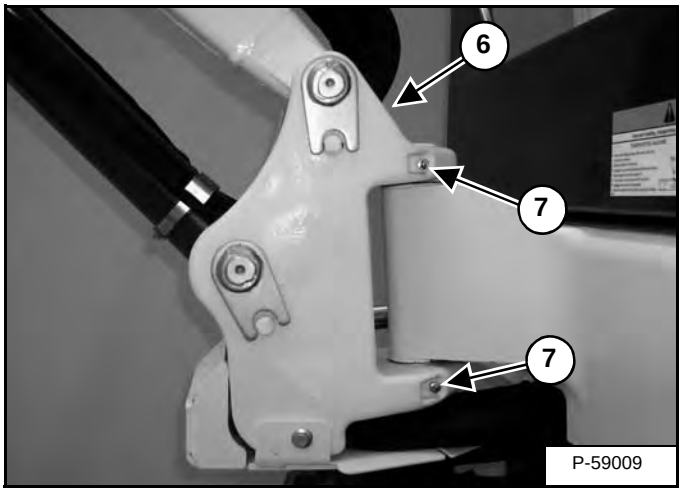
1. Blade Cylinder-Rod End, every 8 - 10 hours (1) **[Figure PM-62]**
2. Blade Pivots, every 8 - 10 hours (2) **[Figure PM-62]**
3. Blade Cylinder-Base End, every 8 - 10 hours (1) **[Figure PM-62]**

Figure PM-63



4. Boom Swing Cylinder-Rod End, every 8 - 10 hours (1) **[Figure PM-63]**
5. Boom Cylinder-Base End, every 8 - 10 hours (1) **[Figure PM-63]**

Figure PM-64



6. Boom Base Pivot, every 8 - 10 hours (1) **[Figure PM-64]**
7. Boom Swing Pivot, every 8 - 10 hours (2) **[Figure PM-64]**

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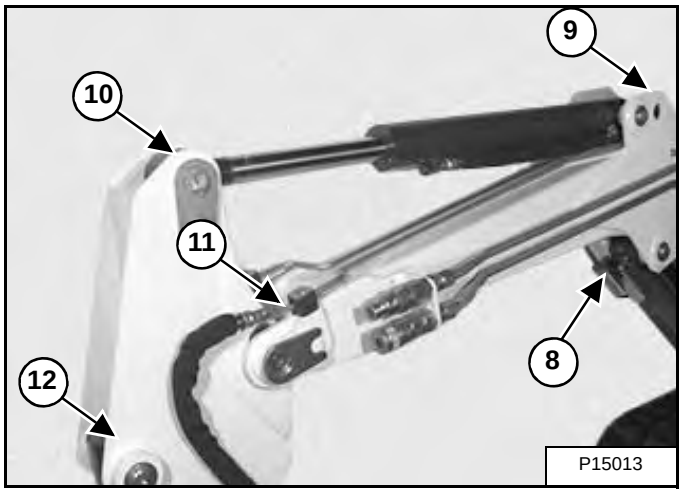
Figure PM-65



8. Boom Cylinder-Rod End, every 8 - 10 hours (1) **[Figure PM-65]**

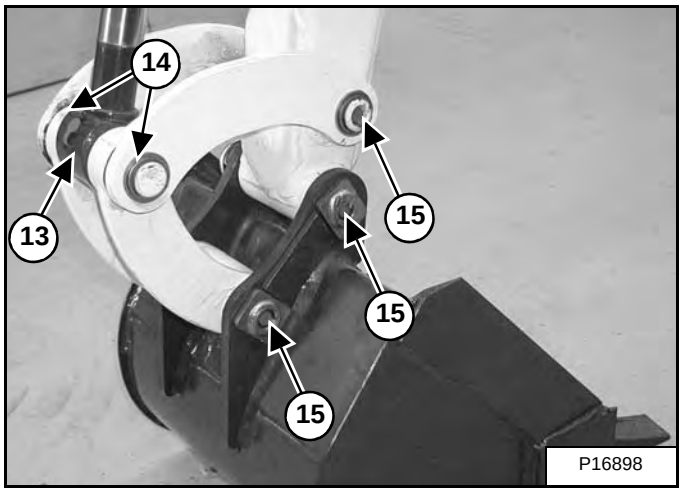
9. Arm Cylinder-Base End, every 8 - 10 hours (1) **[Figure PM-65]**

10. Arm Cylinder-Rod End, every 8 - 10 hours (1) **[Figure PM-65]**

11. Arm Pivot, every 8 - 10 hours (1) **[Figure PM-65]**

12. Bucket Cylinder-Base End, every 8 - 10 hours (1) **[Figure PM-65]**

Figure PM-66



13. Bucket Cylinder-Rod End, every 8 - 10 hours (1) **[Figure PM-66]**

14. Bucket Link Pivots, every 8 - 10 hours (2) **[Figure PM-66]**

15. Bucket Pivots, every 8 - 10 hours (3) **[Figure PM-66]**

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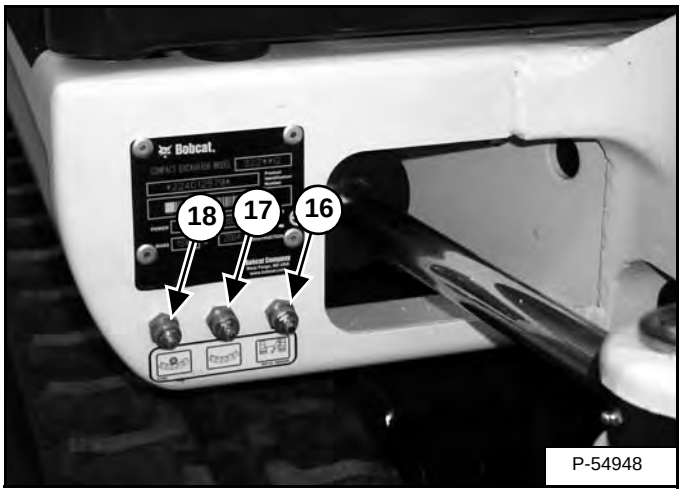
Figure PM-67



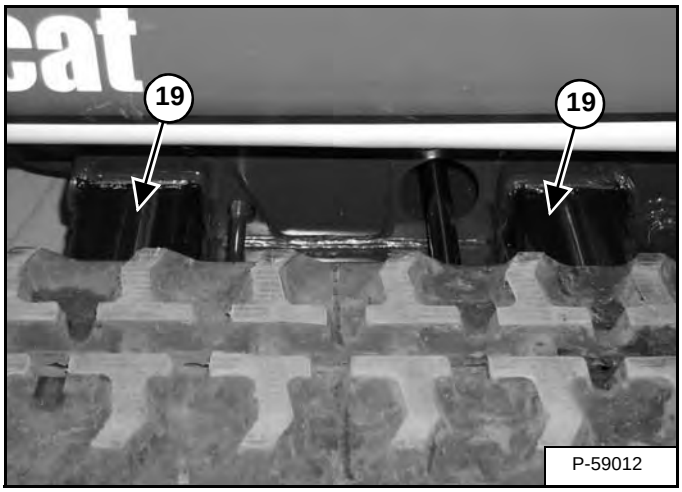
16. Boom Swing Cylinder-Base End every 8 - 10 hours **[Figure PM-67]**

17. Swing Circle Pinion, every 50 hours. Pump 4 times with a grease gun. Rotate the upperstructure 180° and repeat. **[Figure PM-67]**

18. Swing Circle Bearing, every 50 hours **[Figure PM-67]**

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

Figure PM-68



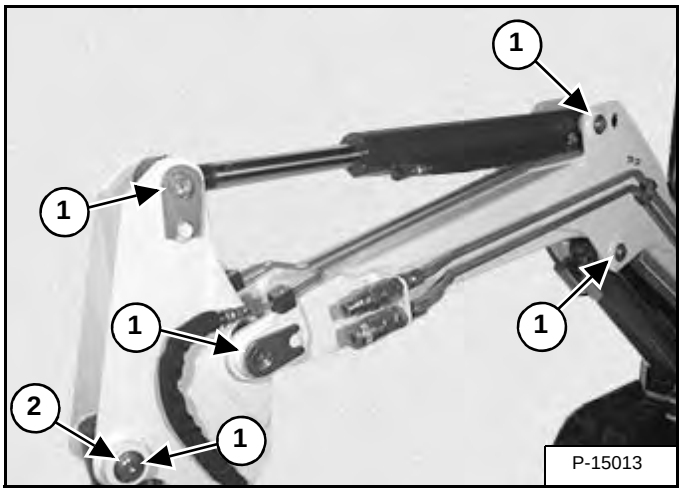
19. Track Expansion Tube, as required **[Figure PM-68]**.

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

PIVOT PINS

Inspection And Maintenance

Figure PM-69



The boom, arm and cylinders pivots (Item 1) have a large pin held in position with a snap ring (Item 2) **[Figure PM-69]**.

Check that the snap rings are securely inserted into the grooves on the pins and that the snap rings are not damage. See your Bobcat dealer for replacement parts.

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EXCAVATOR STORAGE AND RETURN TO SERVICE

Storage

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

- Thoroughly clean the excavator including the engine compartment.
- Lubricate the excavator.
- Replace worn or damaged parts.
- Drive the excavator onto planks in a dry protected shelter.
- Lower the boom fully with the bucket flat on the ground.
- Put grease on any exposed cylinder rods.
- Put fuel stabilizer in the fuel tank and run the engine a few minutes to circulate the stabilizer to the pump and fuel injectors.
- Drain and flush the cooling system. Refill with premixed coolant.
- Replace all fluids and filters (engine, hydraulic).
- Replace all filters (i.e.: air cleaner, heater, etc.).
- Put all controls in neutral position.
- Remove the battery. Be sure the electrolyte level is correct then charge the battery. Store it in a cool dry place above freezing temperatures and charge it periodically during storage.
- Cover the exhaust pipe opening.
- Tag the machine to indicate that it is in storage condition.

Return to Service

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

- Check the engine and hydraulic oil levels; check coolant level.
- Install a fully charged battery.
- Remove grease from exposed cylinder rods.
- Check all belt tensions.
- Be sure all shields and guards are in place.
- Lubricate the excavator.
- Remove cover from exhaust pipe opening.
- Start the engine and let run for a few minutes while observing the instrument panels and systems for correct operation.
- Drive the excavator off of the planks.
- Operate machine, check for correct function.
- Stop the engine and check for leaks. Repair as needed.

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MACHINE SIGN TRANSLATIONS

LIFT CHART (7104069) MST-4

SERVICE SCHEDULE (7158257). MST-6

WARNING (6808185) MST-3

WARNING (6807776) MST-9

WARNING (6804114, 6577754, 6804233, 6809832) MST-12

WARNING (6815915) MST-11

WARNING (6808345, 6808346) MST-13

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WARNING (6808185)

WARNING

Improper loading, transporting and lifting procedures can cause serious injury or death.

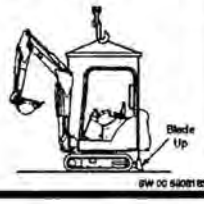
TRANSPORTING MACHINE

- 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.

41742

LIFTING MACHINE

- Lifting device must have adequate capacity to lift machine.
- Maintain center of gravity and balance.
- Position machine as shown below. Engage the swing lock (if equipped).
- Never lift with operator on machine.



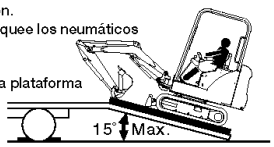
SW 00 6808185

ADVERTENCIA

Ejecutar procedimientos de carga, transporte y elevación no adecuados puede causar lesiones serias o accidentes fatales.

TRANSPORTE DE LA MÁQUINA

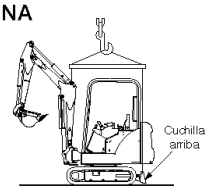
- Utilice rampas de carga metálicas con costados y superficies antideslizantes.
- Asegure las rampas a la plataforma de apoyo del camión.
- Enganche el freno de estacionamiento del camión y bloquee los neumáticos del mismo.
- El ángulo de la rampa no debe exceder los 15º.
- La parte superior de la rampa debe estar nivelada con la plataforma de apoyo del camión.
- Enganche el seguro de giro (si viene equipado).
- Asegure la máquina con amarres y bloquee las orugas.



41742

ELEVACIÓN DE LA MÁQUINA

- El dispositivo de elevación debe tener la capacidad adecuada para elevar la máquina.
- Mantenga el centro de gravedad y balance.
- Posicione la máquina como se muestra.
- Enganche el seguro de giro (si viene equipado).
- Jamás eleve con un operador en la máquina.



SW 01 6808185 AR

AVERTISSEMENT

Le non respect des procédures de chargement, de transport et de levage peut causer des blessures graves, voire mortelles.

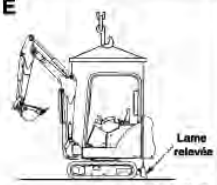
TRANSPORT DE LA MACHINE

- 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

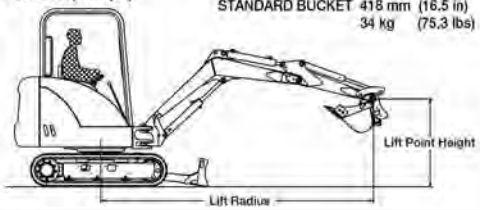
- Do not lift or hold any load that exceeds these ratings at their specified load radii and height.
- Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.

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.

CIRCUIT PRESSURES
WORKING 186 bar (2700 psi)
HOLDING 230 bar (3335 psi)

BOOM LENGTH 1640 mm (64.6 in)
ARM LENGTH 1123 mm (44.2 in)

STANDARD BUCKET 418 mm (16.5 in)
34 kg (75.3 lbs)



EXCAVATOR MODEL 323

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)			RATED LIFT CAPACITY OVER SIDE, BLADE UP,TRACKS EXPANDED - kg (lb)		
	LIFT RADIUS - mm (in)			LIFT RADIUS - mm (in)			LIFT RADIUS - mm (in)			LIFT RADIUS - mm (in)		
mm (in)	2000 (78.7)	3000 (118.1)	Max.	2000 (78.7)	3000 (118.1)	Max.	2000 (78.7)	3000 (118.1)	Max.	2000 (78.7)	3000 (118.1)	Max.
3000 (118.1)			*178 (392)			*173 (382)			*178 (392)			*188 (414)
2000 (78.7)		*208 (458)	*205 (452)		*197 (435)	193 (425)		152 (334)	125 (275)		*204 (450)	*201 (443)
1000 (39.4)	*404 (892)	*249 (548)	*222 (490)	*384 (847)	191 (420)	147 (324)	257 (566)	135 (297)	104 (230)	*415 (914)	*258 (568)	*223 (492)
Ground	*532 (1172)	*290 (640)	*244 (538)	313 (690)	177 (390)	150 (331)	220 (486)	122 (269)	111 (245)	421 (929)	235 (518)	185 (407)
-1000 (-39.4)	*436 (962)		*270 (596)	305 (673)		194 (428)	203 (448)		143 (316)	*409 (902)		*271 (598)

61228

* Rated Hydraulic Lift Capacity

SW 04 7104069

ADVERTENCIA

UNA SOBRECARGA PUEDE LADEAR LA EXCAVADORA Y CAUSAR LESIONES O ACCIDENTES FATALES

- No eleve o sostenga una carga que exceda estos límites funcionales en sus radios de carga y altura especificados
- Se muestra la carga nominal total. El peso de todos los dispositivos de elevación debe deducirse para determinar la carga neta que se puede elevar.

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

PRESIONES DE CIRCUITO
PARA TRABAJO 186 bares (2700 psi)
PARA SOSTENER 203 bares (2950 psi)

LARGO DEL "BOOM" 1640 mm (64.6 in)
LARGO DEL BRAZO 1123 mm (44.2 in)

CUCHARÓN ESTÁNDAR 418 mm (16.5 in)
34 kg (75.3 lbs)

EXCAVADORA MODELO 323

ALTURA DE PUNTO DE ELEV.	CAPACIDAD DE ELEV. NOMINAL SOBRE LA PALA, PALA ABAJO – kg. (lb.)			CAPACIDAD DE ELEV. NOMINAL SOBRE LA PALA, PALA ABAJO – kg. (lb.)			CAPACIDAD DE ELEV. NOMINAL SOBRE LA PALA, PALA ABAJO – kg. (lb.)			CAPACIDAD DE ELEV. NOMINAL SOBRE EL COSTADO, PALA ARRIBA – kg. (lb.)		
	RADIO DE ELEVACIÓN mm (pulg.)			RADIO DE ELEVACIÓN mm (pulg.)			RADIO DE ELEVACIÓN mm (pulg.)			RADIO DE ELEVACIÓN mm (pulg.)		
mm (in)	2000 (78.7)	3000 (118.1)	Max.	2000 (78.7)	3000 (118.1)	Max.	2000 (78.7)	3000 (118.1)	Max.	2000 (78.7)	3000 (118.1)	Max.
3000 (118.1)			*178 (392)			*173 (382)			*178 (392)			*188 (414)
2000 (78.7)		*208 (458)	*205 (452)		*197 (435)	193 (425)		152 (334)	125 (275)		*204 (450)	*201 (443)
1000 (39.4)	*404 (892)	*249 (548)	*222 (490)	*384 (847)	191 (420)	147 (324)	257 (566)	135 (297)	104 (230)	*415 (914)	*258 (568)	*223 (492)
Tierra	*532 (1172)	*290 (640)	*244 (538)	313 (690)	177 (390)	150 (331)	220 (486)	122 (269)	111 (245)	421 (929)	235 (518)	185 (407)
-1000 (-39.4)	*436 (962)		*270 (596)	305 (673)		194 (428)	203 (448)		143 (316)	*409 (902)		*271 (598)

61228

* Capacidad de elevación nominal hidráulica

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LIFT CHART (7104069) (CONT'D)

AVERTISSEMENT

PELLE MODÈLE 323

TOUTE SURCHARGE PEUT FAIRE BASCULER LA PELLE 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.
- 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.

Dans la mesure du possible, les caractéristiques sont conformes aux normes ISO. Elles sont susceptibles d'être modifiées sans préavis. Le point de levage s'entend comme le point d'articulation du godet (godet standard) avec le vérin de godet en extension complète.

PRESSION DES CIRCUITS
TRAVAIL 180 bar
MAINTIEN 230 bar

LONGUEUR DE LA FLÈCHE 1640 mm
LONGUEUR DU BRAS 1123 mm
GODET STANDARD 416 mm 34 kg

HAUTEUR DU POINT DE LEVAGE	CAPACITÉ NOMINALE DE LEVAGE EN BOUT AVEC LAME ABAISSÉE - kg			CAPACITÉ NOMINALE DE LEVAGE EN BOUT AVEC LAME RELEVÉE - kg			CAPACITÉ NOMINALE DE LEVAGE LATÉRAL AVEC LAME RELEVÉE - kg			CAPACITÉ NOMINALE DE LEVAGE LATÉRAL, LAME RELEVÉE ET CHENILLES ÉTENDUES - kg		
	RAYON DE LEVAGE - mm			RAYON DE LEVAGE - mm			RAYON DE LEVAGE - mm			RAYON DE LEVAGE - mm		
mm	2000	3000	Maxi	2000	3000	Maxi	2000	2000	Maxi	2000	3000	Maxi
3000			*178			*173			*176			*188
2000		*208	*205		*197	193		152	125		*204	*201
1000	*404	*249	*222	*304	191	147	257	135	104	*415	*258	*223
Sol	*332	*250	*244	813	177	150	220	122	111	421	235	185
-1000	*436		*270	305		194	303		143	*409		*271

* Capacité de levage hydraulique

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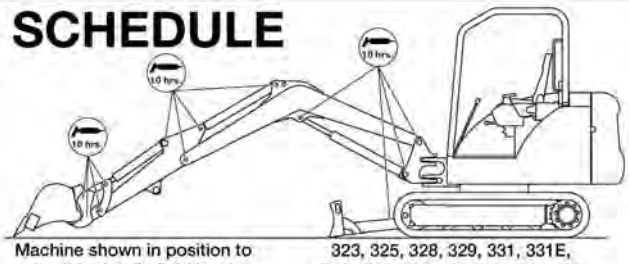
* Service only when machine is equipped with this item.
■ Service at first 50 hours, then as scheduled.
▲ Service at first 100 hours, then as scheduled.

SERVICE SCHEDULE



Machine shown in position to check hydraulic fluid levels.

323, 325, 328, 329, 331, 331E, 334, 335, 337, 341, 425, 430, 435

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

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

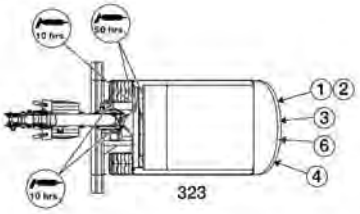
EVERY 100 HOURS
■ Check and adjust belt(s) if required. (Models 323, 325, 328 and 329)
Spark Arrestor Muffler - Clean spark chamber.

EVERY 250 HOURS
Replace engine oil and filter. (Models 325, 328, 329 and 425)
■ Replace inline diesel fuel filter. (Models 425, 430 and 435)
■ Replace diesel fuel filter.
Check oil level in both final drive cases.

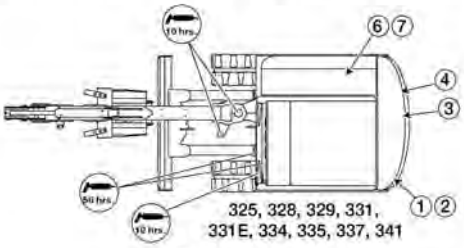
EVERY 500 HOURS
■ Replace engine oil and filter. (Models 323, 331, 331E, 334, 335, 337, 341, 430 and 435)
Clean radiator, oil cooler and *A/C condenser.
▲ Check and adjust drive belts and idlers. Replace as needed. (Models 331, 331E, 334, 335, 337, 341, 425, 430 and 435)
▲ Replace primary hydraulic filter and reservoir breather.
▲ Replace case drain hydraulic filter. (Models 325, 328, 329, 331, 334, 331E, 335, 337, 341, 425, 430 and 435)
▲ Replace fan hydraulic filter. (Models 430 and 435)
▲ Check alternator and starter connections.
Check and adjust engine valve clearance.

EVERY 1000 HOURS OR EVERY 12 MONTHS
▲ Replace oil in both final drive cases.
Replace hydraulic fluid and filter(s).

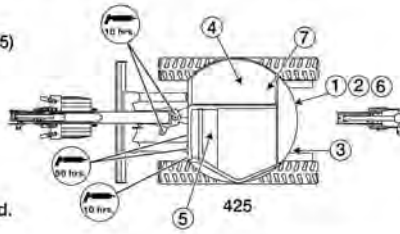
EVERY 2 YEARS
Drain and flush cooling system - Replace coolant.



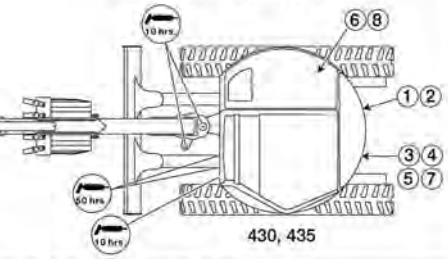
323



325, 328, 329, 331, 331E, 334, 335, 337, 341



425



430, 435

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

	323	325, 328, 329	331, 334, 331E, 335	337, 341	425	430	435
1. PRIMARY AIR FILTER	6673752	6672467	6666333	6666375	6672467	6666333	6666375
2. SECONDARY AIR FILTER	6673753	6672468	6666334	6666376	6672468	6666334	6666376
3. ENGINE OIL FILTER	6671057	6675517	6675517	6675517	6657635	6675517	6675517
4. FUEL FILTER	6667352	6667352	6667352	6667352	6667352	6667352	6667352
5. INLINE FUEL FILTER	N/A	N/A	N/A	N/A	6633977	6633977	6633977
6. PRIMARY HYDRAULIC FILTER	6653336	6661248	6661248	6670207	6661248	6668819	6668819
7. DRAIN HYDRAULIC FILTER	N/A	6516722	6516722	6516722	6661022	6681012	6681012
8. FAN HYDRAULIC FILTER	N/A	N/A	N/A	N/A	N/A	6681012	6681012

• See illustrations above for filter locations.

• See Operation & Maintenance Manual for more information and instructions.

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PROGRAMA DE MANTENIMIENTO

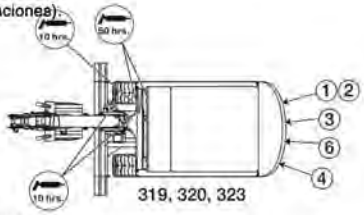
* Dé servicio solamente cuando la máquina está equipada con este artículo.
■ Dé servicio a las primeras 50 horas y luego según lo programado.
▲ Dé servicio a las primeras 100 horas y luego según lo programado.

CADA 8-10 HORAS:
Revise el nivel del enfriador de motor.
Revise el nivel del aceite de motor.
Revise el nivel del fluido hidráulico.
Revise el indicador de condición del depurador de aire.
Revise y gradúe la tensión de la oruga.
Revise que las luces del indicador funcionen adecuadamente.
Revise la condición de la cubierta o cabina* y del armamento de fijación.
Revise la condición del cinturón de seguridad y del armamento de fijación.
Revise que el seguro de la(s) consola(s) de control funcione adecuadamente.
Revise la presencia de calcomanías averiadas – reponga, si es del caso.
Engrase todos los puntos de pivote de la maquinaria. (Ver ilustraciones).
* Aplique grasa para deslizar el brazo extensible.
* Limpie el filtro del calefactor de la cabina.

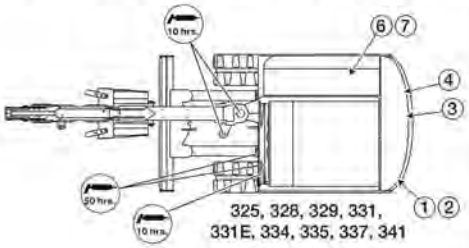
La máquina se muestra en posición para revisar los niveles del fluido hidráulico.

319, 320, 323, 325, 328, 329, 331, 331E, 334, 335, 337, 341, 425, 428, 430, 435

CADA 50 HORAS
Engrase el piñón de giro y el tornamesas. (Ver ilustraciones).
Drene el agua y sedimento del tanque de combustible y del filtro de combustible.
Revise la batería y los cables, y el nivel electrolítico.



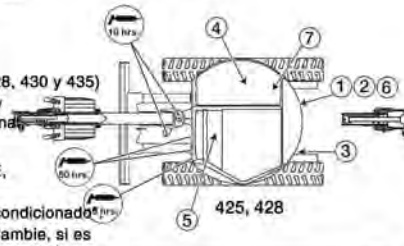
319, 320, 323



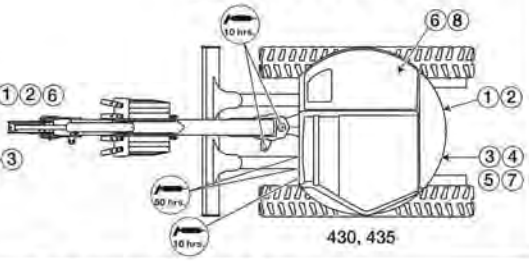
325, 328, 329, 331, 331E, 334, 335, 337, 341

CADA 100 HORAS
■ Revise y ajuste el(los) cinturón(es). (Modelos 319, 320, 323, 325, 328 y 329)
Silenciador del sistema parachispas – limpie la cámara de chispas.
■ Cambie el aceite y filtro de motor (modelo 320)

CADA 250 HORAS
Cambie el filtro de combustible diesel.
■ Cambie el filtro de combustible diesel en línea. (Modelos 425, 428, 430 y 435)
■ Cambie el aceite y filtro de motor. (Modelos 325, 328, 329, 425 y 428). Revise el nivel del aceite en ambas cajas de transmisión final.



425, 428



430, 435

CADA 500 HORAS
■ Cambie el aceite y filtro de motor. (Modelos 319, 323, 331, 331E, 334, 335, 337, 341, 430 y 435)
Limpie el radiador, enfriador de aceite y condensador del aire acondicionado.
▲ Revise y gradúe las correas de transmisión y poleas tensoras. Cambie, si es del caso. (Modelos 331, 331E, 334, 335, 337, 341, 425, 428, 430 y 435)
▲ Cambie el filtro hidráulico primario.
▲ Cambie el filtro hidráulico de la caja de descarga. (Modelos 325, 328, 329, 331, 331, 331E, 335, 337, 341, 425, 428, 430 y 435)
Cambie el filtro hidráulico del ventilador. (Modelos 430 y 435)
▲ Revise las conexiones del alternador y arrancador.
Revise y gradúe la holgura de la válvula del motor.

CADA 1000 HORAS O CADA 6 MESES
▲ Cambie el aceite en ambas cajas de transmisión final.
Drene y purgue el sistema de enfriamiento – cambia el enfriador.
Cambie el fluido y filtro(s) hidráulico(s) – limpie el reservorio.

IMPORTANTE

ESTA MÁQUINA ESTÁ EQUIPADA CON UN SILENCIADOR DEL SISTEMA PARACHISPAS APROBADO POR EL DEPTO. DE SERVICIO DE SILVICULTURA U.S.D.A.

ESTE SILENCIADOR SE DEBE LIMPIAR PARA MANTENERLO EN CONDICIONES DE TRABAJO. ADEMÁS SE LE DEBE DAR MANTENIMIENTO VACIANDO LA CÁMARA DE CHISPAS CADA 100 HORAS DE OPERACIÓN.

SI ESTA MÁQUINA SE UTILIZA EN SUELOS CUBIERTOS DE BOSQUES, MATORRALES O GRAMA, DEBE ESTAR EQUIPADO CON UN PARACHISPAS EN EL SISTEMA DE ESCAPE Y MANTENERSE EN CONDICIONES DE TRABAJO. NO CUMPLIR LO ANTERIOR ES UNA VIOLACIÓN DE LA SECCIÓN 4442 PRC DE LA LEY DEL ESTADO DE CALIFORNIA.
REFIÉRASE A LAS LEYES Y REGLAMENTOS LOCALES PARA CONOCER LOS REQUISITOS DEL PARACHISPAS.

TABLA DE FILTROS

	319, 320, 323	325, 328, 329	331, 334, 331E, 335	337, 341	425, 428	430	435
1. FILTRO DE AIRE PRIMARIO	6673752	6672467	6666333	6666375	6672467	6666333	6666375
2. FILTRO DE AIRE SECUNDARIO	6673753	6672468	6666334	6666376	6672468	6666334	6666376
3. FILTRO DE ACEITE DE MOTOR	6671057	6675517	6675517	6675517	6657635	6675517	6675517
4. FILTRO DE COMBUSTIBLE	6667352	6667352	6667352	6667352	6667352	6667352	6667352
5. FILTRO DE COMBUSTIBLE EN LÍNEA	N/A	N/A	N/A	N/A	6633977	6633977	6633977
6. FILTRO HIDRÁULICO PRIMARIO	6653336	6661248	6661248	6670207	6661248	6668819	6668819
7. FILTRO HIDRÁULICO DE DESCARGA	N/A	6516722	6516722	6516722	6661022	6681012	6681012
8. FILTRO HIDRÁULICO DEL VENTILADOR	N/A	N/A	N/A	N/A	N/A	6681012	6681012

* Ver las ilustraciones arriba para conocer las ubicaciones de los filtros.

• Ver el manual de operación y mantenimiento para mayor información e instrucciones.

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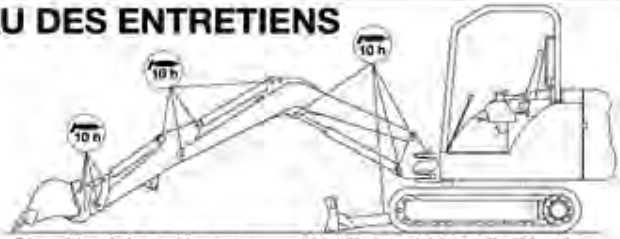
* Entretien uniquement pour les machines qui en sont équipées.
■ Effectuez l'entretien après 50 heures, puis selon le tableau.
▲ Effectuez l'entretien après 100 heures, puis selon le tableau.

TABLEAU DES ENTRETIENS

TOUTES LES 8-10 HEURES D'UTILISATION
Vérifiez le niveau du liquide de refroidissement.
Vérifiez le niveau d'huile moteur.
Vérifiez le niveau du fluide hydraulique.
Vérifiez l'indicateur d'état du filtre à air.
Vérifiez et réglez la tension des chenilles.
Vérifiez le bon fonctionnement des témoins lumineux.
Vérifiez l'état du toit de protection ou de la cabine* et de leurs fixations.
Vérifiez l'état de la ceinture de sécurité et de ses fixations.
Vérifiez le bon fonctionnement du verrouillage du ou des tableaux de commande.
Vérifiez que les autocollants ne sont pas abîmés - Remplacez-les au besoin.
Vérifiez tous les points pivots de la machine. Voyez les illustrations.
*Graissez la partie coulissante du bras extensible.
*Nettoyez le filtre du chauffage de la cabine.

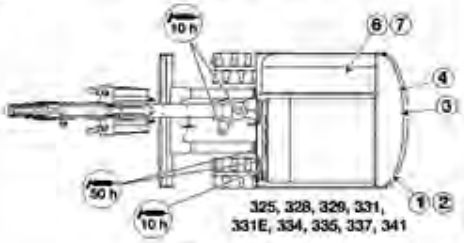


Disposition de la machine pour la vérification des niveaux de fluide hydraulique.

319, 320, 323, 325, 328, 329, 331, 331E, 334, 335, 337, 341, 425, 428, 430, 435

TOUTES LES 50 HEURES D'UTILISATION
Graissez le pignon et le cercle d'orientation. Voyez les illustrations.
Purgez le réservoir de carburant et le filtre d'alimentation de l'eau et des sédiments.
Vérifiez la batterie, les câbles et le niveau d'électrolyte.

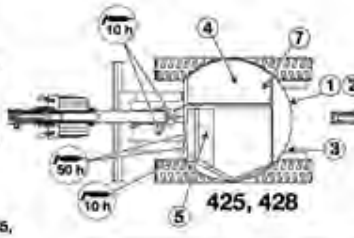
319, 320, 323



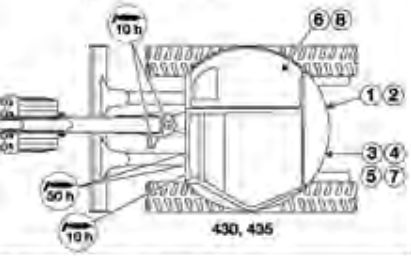
325, 328, 329, 331, 331E, 334, 335, 337, 341

TOUTES LES 100 HEURES D'UTILISATION
■ Vérifiez et réglez la (les) courroie(s) au besoin. (Modèles 319, 320, 323, 325, 328 et 329)
Silencieux pare-étincelles - Videz la chambre à étincelles.
■ Remplacez l'huile et le filtre à huile moteur. (Modèle 320)

TOUTES LES 250 HEURES D'UTILISATION
Remplacez le filtre du carburant diesel.
■ Remplacez le filtre intégré à la conduite du carburant diesel. (Modèles 425, 428, 430 et 435)
■ Remplacez l'huile et le filtre à huile moteur. (Modèles 325, 328, 329, 425 et 428) Vérifiez le niveau d'huile dans les deux carters de réduction finale.



425, 428



430, 435

TOUTES LES 500 HEURES D'UTILISATION
■ Remplacez l'huile et le filtre à huile moteur. (Modèles 319, 323, 331, 331E, 334, 335, 337, 341, 430 et 435)
Nettoyez le radiateur, le refroidisseur d'huile et le condenseur de la climatisation*.
▲ Vérifiez et réglez les courroies d'entraînement et les roues de tension. Remplacez-les au besoin. (Modèles 331, 331E, 334, 335, 337, 341, 425, 428, 430 et 435)
▲ Remplacez le filtre hydraulique primaire.
▲ Remplacez le filtre hydraulique du retour de carter. (Modèles 325, 328, 329, 331, 334, 331E, 335, 337, 341, 425, 428, 430 et 435)
Remplacez le filtre hydraulique du ventilateur. (Modèles 430 et 435)
▲ Vérifiez les connexions de l'alternateur et du démarreur.
Vérifiez et réglez le jeu des soupapes moteur.

TOUTES LES 1000 HEURES OU TOUS LES 6 MOIS :
▲ Remplacez l'huile dans les deux carters de réduction finale.
Videz et rincez le circuit de refroidissement - Remplacez le liquide de refroidissement.
Remplacez le fluide et le(s) filtre(s) hydrauliques - Nettoyez le réservoir.

IMPORTANT

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

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

SI CETTE MACHINE EST UTILISÉE EN ZONE DE FORÊTS, DE BROUSSAILLES OU D'HERBAGES PRÉSENTANT DES RISQUES D'INCENDIE, ELLE DOIT ÊTRE ÉQUIPÉE D'UN PARE-ÉTINCELLES AJOUTÉ AU CIRCUIT D'ÉCHAPPEMENT ET MAINTENU EN BON ÉTAT DE MARCHE. LE NON RESPECT DE CETTE OBLIGATION CONTREVIENT À LA LOI DE L'ÉTAT DE CALIFORNIE, SECTION 4442, PRC.

VEUILLEZ VOUS RÉFÉRER AUX RÉGLEMENTATIONS LOCALES POUR LES EXIGENCES APPLICABLES DANS VOTRE CAS EN MATIÈRE DE PARE-ÉTINCELLES.

TABLEAU DES FILTRES

		319, 320, 323	325, 328, 329	331, 334, 331E, 335	337, 341	425, 428	430	435
1.	FILTRE À AIR PRIMAIRE	6673752	6672467	6666333	6666375	6672467	6666333	6666375
2.	FILTRE À AIR SECONDAIRE	6673753	6672468	6666334	6666376	6672468	6666334	6666376
3.	FILTRE À HUILE MOTEUR	6671057	6675517	6675517	6675517	6657635	6675517	6675517
4.	FILTRE À CARBURANT	6667352	6667352	6667352	6667352	6667352	6667352	6667352
5.	FILTRE D'ALIMENTATION INTÉGRÉ	S. O.	S. O.	S. O.	S. O.	6633977	6633977	6633977
6.	FILTRE HYDRAULIQUE PRIMAIRE	6653336	6661248	6661248	6670207	6661248	6668819	6668819
7.	FILTRE HYDRAULIQUE DU RETOUR DE CARTER	S. O.	6516722	6516722	6516722	6661022	6681012	6681012
8.	FILTRE HYDRAULIQUE DU VENTILATEUR	S. O.	S. O.	S. O.	S. O.	S. O.	6681012	6681012

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

● Consultez le manuel d'utilisation et d'entretien pour des instructions et informations supplémentaires. 70384 SW 7151799 fr

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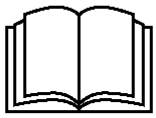
WARNING (6807776)

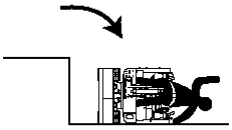
⚠ WARNING

AVOID INJURY OR DEATH



Never use Excavator without instructions.

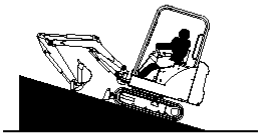
Read Operation and Maintenance Manual and Handbook.



Always use cab/canopy.

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

Check for overhead or underground lines before operating.

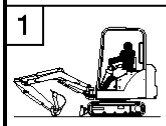


On slopes, keep heavy end uphill.

Do not travel or turn with attachment extended.

TO LEAVE THE EXCAVATOR:

1



Lower attachment.

Never park with tracks pointed down hill.

2

Stop the engine.

Raise control console.

Fasten seat belt securely.
Keep feet and hands on controls.
Operate controls only from operator's position.
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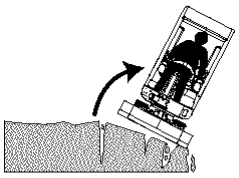
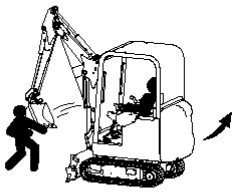
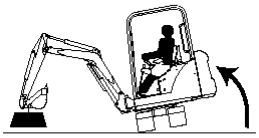


Keep away from drop-offs.

Avoid steep areas or banks that could break away.



Keep bystanders away.
No riders.
Check location of blade for direction of travel before moving steering controls.



When swinging loads:

- Keep load low.
- Swing slowly.
- Do not exceed lift capacity. Read lift capacity chart.

Weitere instrucktionen finden sie in der Bedienungsanleitung.

Consulte el Manual del Operador par mas instrucciónes.

Se reporter au manual de l'opérateur pour plus de renseignements.

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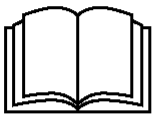
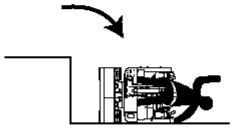
⚠ ADVERTENCIA

EVITE LESIONES OR ACCIDENTES FATALES



Jamás utilice la Excavadora sin leer las instrucciones previamente.

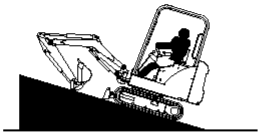
Lea el Manual de operación y mantenimiento y el Manual del Operador.



Utilice siempre la cabina/ cubierta.

Jamás modifique los equipos o utilice implementos no aprobados por Bobcat Company.

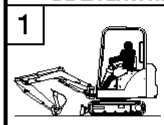
Verifique la presencia de líneas aéreas y subterráneas antes de operar.



En pendiente, mantenga el extremo pesado cuesta arriba.

ANTES DE BAJARSE DE LA EXCAVADORA:

1



Baje el implemento.

Jamás estacione la unidad con las orugas mirando cuesta abajo.

2

Detenga el motor.

Levante la consola de control.

Abróchese el cinturón de seguridad con firmeza.
Mantenga los pies y las manos en los controles.
Opere los controles solamente desde el asientodel operador.
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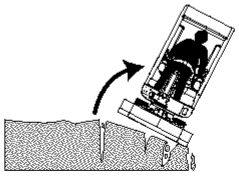
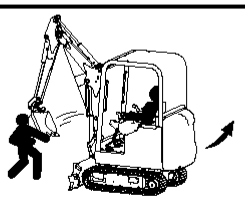
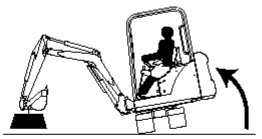


Manténgase alejado de pendientes perpendiculares.

Evite áreas muy inclinadas o bancos desprendibles.



Mantenga a los espectadores alejados. No lleve pasajeros.
Revise la ubicación de la cuchilla para la dirección del desplazamiento antes de mover los controles de dirección.



Cuando gire cargas:

- Mantenga la carga abajo.
- Gire lentamente.
- No exceda la capacidad de elevación. Lea la tabla de capacidad de elevación.

Weitere instrucktionen finden sie in der Bedienungsanleitung.

Consulte el Manual del operador para obtener mayores instrucciones.

Se reporter au manual de l'opérateur pour plus de renseignements.

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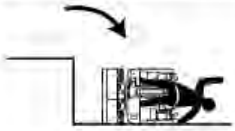
⚠ AVERTISSEMENT

EVITER LES BLESSURES OU LA MORT

N'utilisez jamais la pelle sans instructions. Lisez le Manuel de l'Opérateur et d'Entretien ainsi que le Guide de l'Opérateur.



Utilisez toujours une cabine/canopy. Ne modifiez jamais l'équipement et ne rajoutez pas d'accessoires non approuvés par Bobcat.

Vérifiez la présence de lignes aériennes ou de conduites souterraines.

En pente, maintenez le côté lourd vers le haut. Ne déplacez pas et ne tournez pas la machine avec l'accessoire en extension.

AVANT DE QUITTER LA PELLE :

1

Abaissez l'accessoire. Ne stationnez jamais chenil--les vers le bas.

2 STOP

Arrêtez le moteur.

Relevez la console de commande.

Bouclez soigneusement la ceinture de sécurité. N'actionnez les commandes qu'à partir du siège de l'opérateur.

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Evitez les endroits escarpés ou les surfaces instables.

Eloignez les spectateurs. Ne prenez pas de passagers. Vérifiez la position de la lame avant de déplacer les commandes de translation.

Tenez la charge vers le bas. Tournez lentement. Ne dépassez pas la capacité de levage (voyez le tableau).

Weitere instrucktionen finden sie in der Bedienungsanleitung.

Consulte el Manual del Operador par mas instrucciónes.

Voir Manuel de l'Opérateur et d'Entretien pour plus de renseignements.

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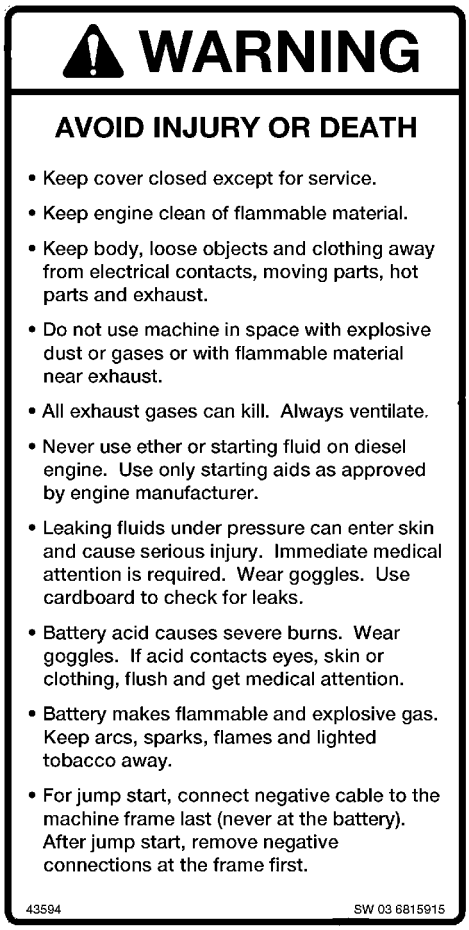
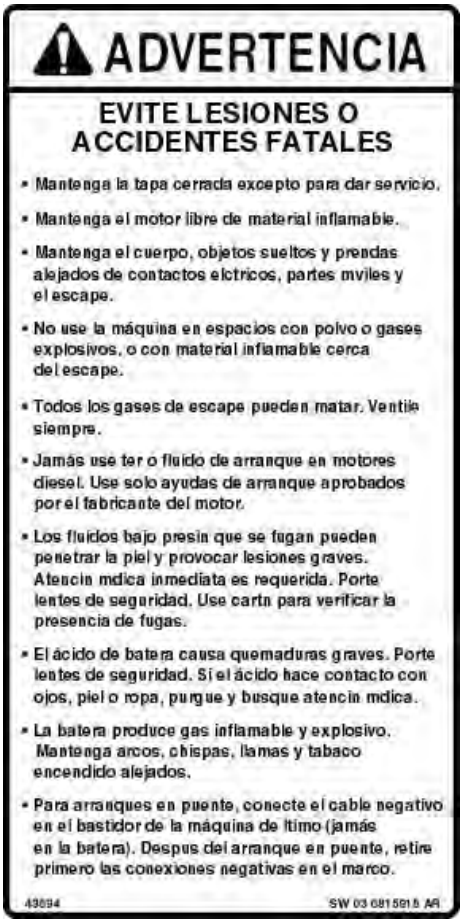
WARNING (6815915)





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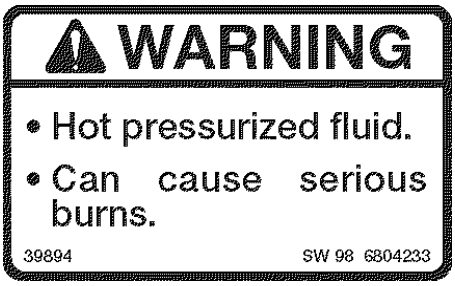
WARNING (6804114, 6577754, 6804233, 6809832)



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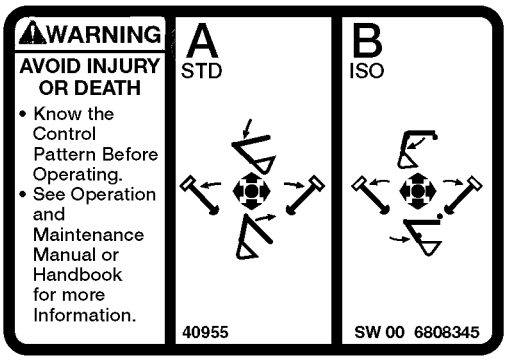
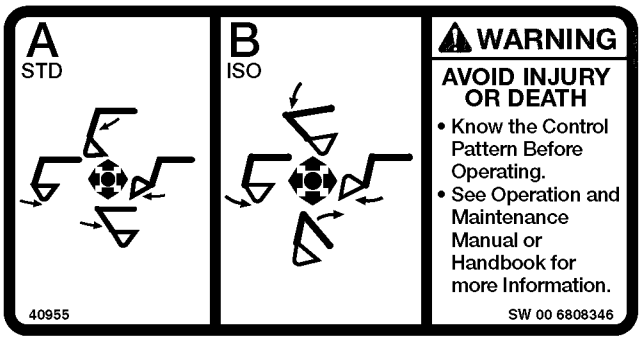
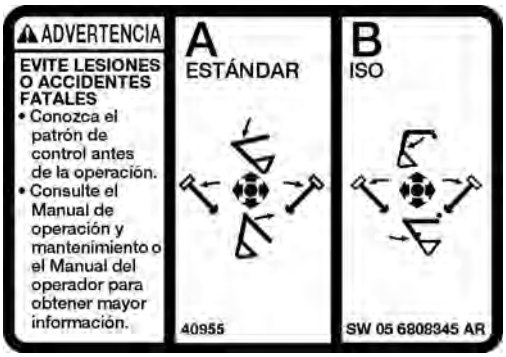
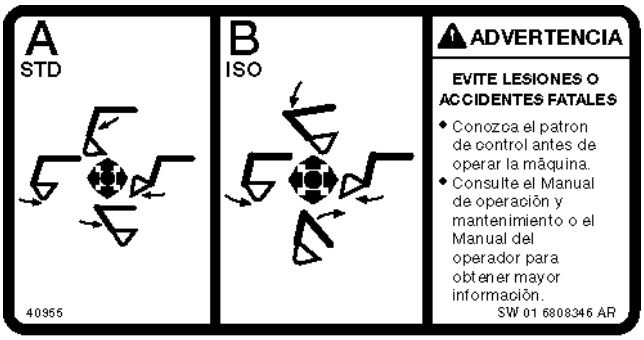
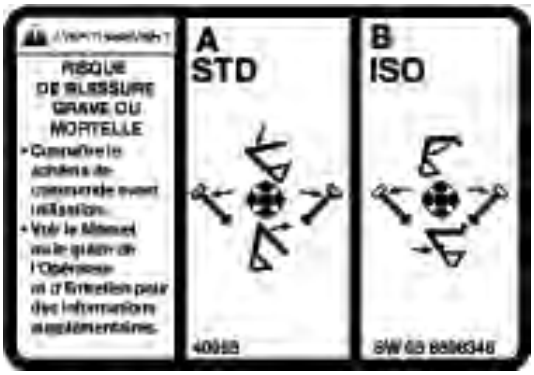
WARNING (6808345, 6808346)

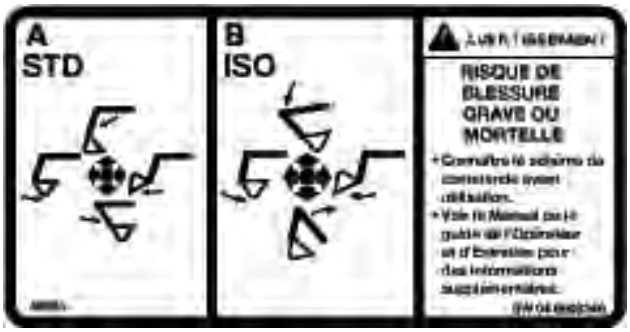












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SPECIFICATIONS

SPECIFICATIONS. SPEC-3
323 Excavator Machine Dimensions SPEC-3
Controls SPEC-5
Crawler Track Design SPEC-8
Drive System SPEC-7
Electrical System SPEC-7
Engine SPEC-5
Hydraulic Cycle Times SPEC-7
Hydraulic Cylinders SPEC-6
Hydraulic System. SPEC-6
Instrumentation SPEC-7
Performance SPEC-5
Slew System SPEC-7
Undercarriage SPEC-8

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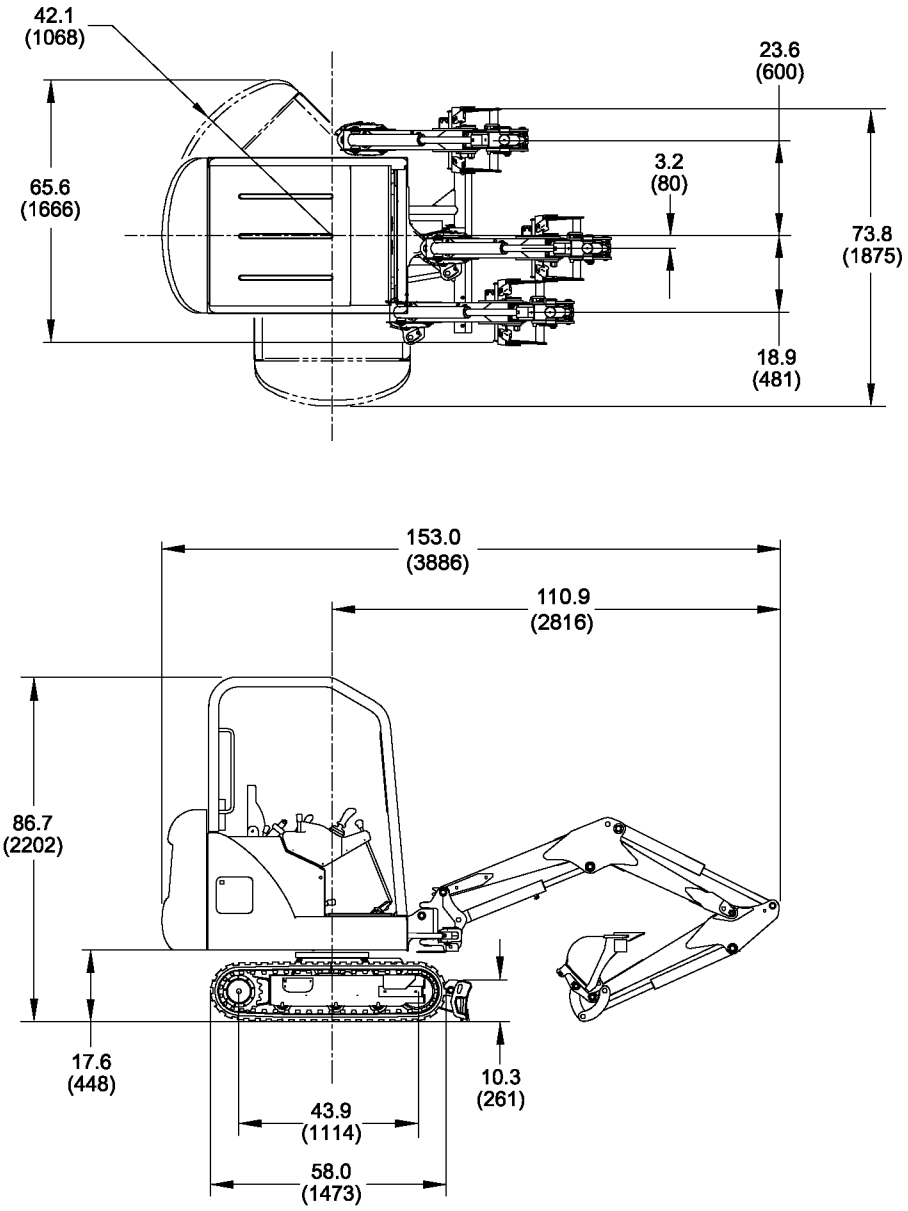
323 Excavator Machine Dimensions

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



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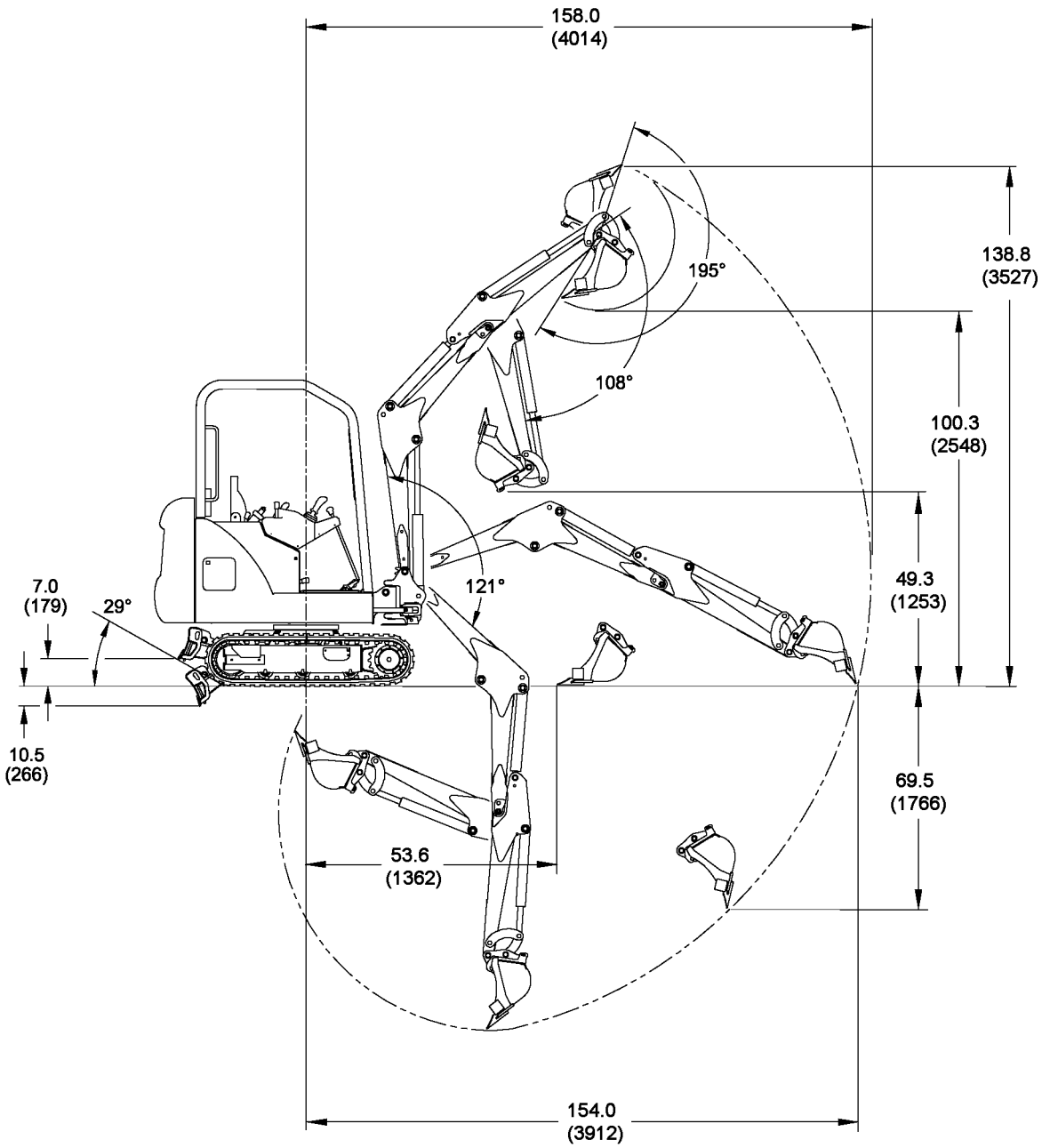
323 Excavator Machine Dimensions (Cont'd)

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



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Performance

Operating weight (Canopy w/ 20 inch Bucket & Rubber Tracks)	3668 lb. (1664 kg)
Operating weight (Cab w/ 20 inch Bucket & Rubber Tracks)	3878 lb. (1759 kg)
If Equipped with Steel Tracks - add	117 lb. (53 kg)
Travel Speed	Low 1.42 mph (2,29 km/hr.) High 2.37 mph (3,81 km/hr.)
Digging Force (per ISO 6015)	
Arm Bucket	1996 lbf. (8879 N) 3751 lbf. (16685 N)
Boom Swing (Offset)	Left 90° - Right 50°

Controls

Steering	Two hand levers or foot pedals
Hydraulics	Two hand operated levers (joysticks) control boom, bucket, arm and upperstructure slew
Auxiliary Hydraulics	Electric switch in right joystick
Auxiliary Pressure Release	Electric switch in right joystick
Engine	Hand Lever engine speed, key type start switch
Starting Aid	Glow Plugs - activated by key switch
Brakes Service Holding Swing Service Holding	 Hydraulic lock in motor circuit Hydraulic lock on motor Locking Pin

Engine

Make/Model	Kubota D722-E3B-BC-5
Fuel/Cooling	Diesel/Liquid (Antifreeze mixture)
Horsepower (SAE Net)	13.3 HP (9,9 kW) @ 2500 RPM
Torque @ 2000 RPM (SAE Net)	31.1 ft.-lb. (42,2 N•m)
Number Of Cylinders	3
Displacement	43.9 ci (0.72 L)
Bore/Stroke	2.64 x 2.68 in. (67,1 x 68,1 mm)
Lubrication	Pressure System with Filter
Crankcase Ventilation	Closed Breathing
Air Cleaner	Dry replaceable paper dual cartridge
Ignition	Diesel-Compression
Low Idle Speed	1275-1375 RPM
High Idle Speed	2800 RPM
Engine Coolant	Propylene Glycol / water mixture (53% PG / 47% water)

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Hydraulic System

Pump - Hydraulic	Engine driven, dual outlet variable displacement piston/gear pump
Pump Capacity Gear Pump (One) Piston Pump (Two)	 One - 3.43 GPM (13,0 L/min.) Two - 3.96 GPM (15,0 L/min.)
Auxiliary Flow	7.9 GPM (30,0 L/min.)
Control Valve	9 spool open center parallel type
Fluid Type	Bobcat Fluid, Hydraulic/Hydrostatic 6903117 - (2.5 Gal.) 6903118 - (5 Gal.) 6903119 - (55 Gal.)
System Relief Pressure Travel Circuits Slew Circuit Boom, Arm, Bucket, Blade, Boom Swing, Auxiliary Hydraulics	 2700 PSI (186 bar) 1750-1800 PSI (121-124 bar) 2700 PSI (186 bar)
Joystick Pressure	435 PSI (30 bar)
Arm Port Relief Base End Rod End	2900 PSI (200 bar) 3335 PSI (230 bar)
Boom Port Relief Base & Rod End	3335 PSI (230 bar)
Bucket Port Relief Base End Rod End	2900 PSI (200 bar) 3335 PSI (230 bar)
Main Hydraulic Filter Bypass	25 PSI (1.7 bar)

Hydraulic Cylinders

Cylinder	Bore	Rod	Stroke
Boom (cushion up)	2.38 in. (60,3 mm)	1.38 in. (34,9 mm)	13.59 in. (345,2 mm)
Arm	2.38 in. (60,3 mm)	1.50 in. (38,1 mm)	16.57 in. (420,9 mm)
Bucket	2.25 in. (57,2 mm)	1.50 in. (38,1 mm)	15.16 in. (385,1 mm)
Boom Swing	3.25 in. (82,6 mm)	1.25 in. (31,8 mm)	17.71 in. (373,6 mm)
Blade	2.38 in. (60,3 mm)	1.38 in. (34,9 mm)	5.20 in. (132,1 mm)
Undercarriage	2.00 in. (50,8 mm)	1.00 in. (25,4 mm)	14.96 in. (380 mm)

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Hydraulic Cycle Times

Bucket Curl	1.9 seconds
Bucket Dump	1.2 seconds
Arm Retract	2.5 seconds
Arm Extend	1.6 seconds
Boom Raise	3.9 seconds
Boom Lower	2.8 seconds
Boom Swing Left	3.9 seconds
Boom Swing Right	3.5 seconds
Blade Raise	2.6 seconds
Blade Lower	2.6 seconds
Undercarriage - Expand	4.6 seconds
Undercarriage - Retract	3.6 seconds
Slew	10.2 RPM

Electrical System

Starting Aid	Glow Plugs
Alternator	12 - volts, 40 amps, open, negative ground
Battery	12 volts - 530 CCA @ 0° F (-18° C)
Starter	12 volts; gear reduction 1.9 Hp (1.4 kw)
Instrumentation	Fuel gauge, audible alarm, visual warning for engine functions and hourmeter

Drive System

Drive Motor	Each track is independently driven by an axial piston motor
Type of Reduction	Two-stage planetary gear reduction

Slew System

Slew Motor	Orbit Motor
Slew Circle	Single row shear type ball bearing with internal gear
Slew Speed	10.2 RPM

Capacities

Fuel Tank	7.3 Gal. (27,5 L)
Hydraulic Reservoir Only (Center of Sight Glass)	Tank Cap. 6.8 qt. (6,5 L)
Hydraulic System (with Reservoir)	4.9 Gal. (18,5 L)
Cooling System	6.0 qt. (5.7 L)
Engine Oil and Filter	3.75 qt. (3,5 L)
Final Drive (each)	0.55 qt. (0,5 L)

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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	38.58 in. (980 mm) retracted 53.54 in. (1360 mm) expanded

Ground Pressure

With Rubber Track	4.39 PSI (0.303 bar)
With Steel Track	4.53 PSI (0.312 bar)

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WARRANTY

WARRANTY WARRANTY-3

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WARRANTY

Bobcat Excavators

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

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

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

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