EN

Bobcat®

Operation & Maintenance Manual

E10z

Compact Excavator

S/N B4PD11001 & Above

7349189enGB (12-20) (A)

Printed in Belgium
Original Instructions

OPERATOR SAFETY WARNING

⚠ WARNING

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

W-2001-0502

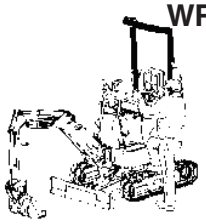
⚠ **Safety Alert Symbol:** **This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.**

CORRECT

P-90216

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

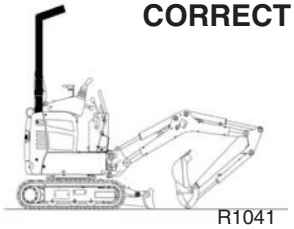
WRONG



R1078

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

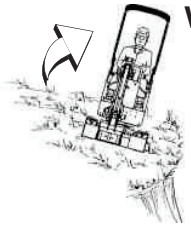
CORRECT



R1041

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

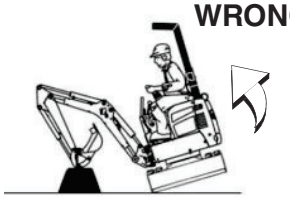
WRONG



R1065

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

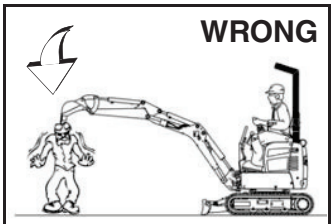
WRONG



R1066

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

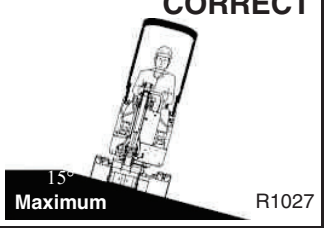
WRONG



R1067

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

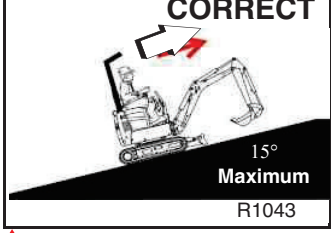
CORRECT



R1027

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

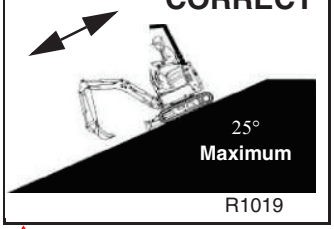
CORRECT



R1043

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

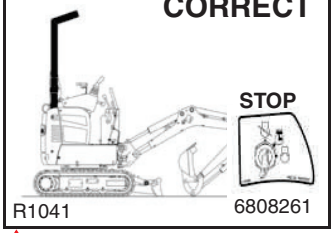
CORRECT



R1019

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

CORRECT



R1041 6808261

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

CORRECT

B-21928

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

CORRECT

NA1421A

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

SAFETY EQUIPMENT

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

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

OSW56-0917

CONTENTS

REFERENCE INFORMATION

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

Excavator Serial Number _____

Engine Serial Number _____

NOTES:

_____

_____

_____

_____

YOUR BOBCAT DEALER:

_____

ADDRESS:

_____

PHONE:

_____

CE

Bobcat Company
P.O. Box 128
Gwinner, ND 58040-0128
UNITED STATES OF AMERICA

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

FOREWORD

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

DECLARATION OF CONFORMITY

For Model E10z

Contents of EC Declaration of Conformity

This information is provided in the operators manual to comply with clause 1.7.4.2(c) of Annex I of Machinery Directive 2006/42/EC.

The official EC Declaration of Conformity is supplied in a separate document.

Manufacturer

Bobcat

Bobcat Company
World Headquarters
250 East Beaton Drive
West Fargo, ND 58078-6000
UNITED STATES OF AMERICA

Technical Documentation
Homologation Manager
Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
263 12 Dobris
CZECH REPUBLIC

Directive 2000/14/EC: Noise Emission in the Environment by Equipment For Use Outdoors

Notified Body
Technical and Test Institute for Construction
Prague, Czech Republic
Notified Body Number: 1020

EC Certificate No.
1020-090-022395

Conformity Assessment Procedure(s)
2000/14/EC, Annex VIII, Full Quality Assurance

Sound Power Levels [Lw(A)]

Measured Sound Power	**93dBA**
Guaranteed Sound Power	**93dBA**

Description of Equipment
Type of Equipment: Excavator
Model Name: E10Z
Model Code: B4PD

Engine Manufacturer: Kubota
Engine Model: D722-EF15
Engine Power: 7,5 kW @ 2000 RPM

Equipment conforms to CE Directive(s) Listed Below
2006/42/EC: Machinery Directive
2014/30/EU: Electromagnetic Compatibility Directive

Declaration of Conformance
This equipment conforms to the requirements specified in all the EC Directives listed in this declaration.

Effective From:

14 September 2018

BOBCAT COMPANY IS ISO 9001 CERTIFIED

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

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

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

REGULAR MAINTENANCE ITEMS

	ENGINE OIL FILTER 6671057		PRIMARY HYDRAULIC FILTER 6653336
	FUEL FILTER 6667352		BATTERY 6669600
	AIR FILTER, Outer 6673752		RADIATOR CAP 6702797
	AIR FILTER, Inner 6673753		

NOTE: Always verify Part Numbers with your Bobcat dealer.

Packaging	Lineart	Bobcat Equipment												Only for Wheeled EXC and AL	
		ENGINE / LOADER TRANSMISSION					HYDRAULIC/ HYDROSTATIC		ANTIFREEZE COOLANT				AXLE / TRANSMISSION		BRAKE FLUID
		Bobcat Engine Power SAE 0W30 -35°C +30°C	Bobcat Engine Power SAE 10W30 -25°C +30°C	Bobcat Engine Power SAE 10W30 CJ4	Bobcat Engine Power SAE 15W40 -20°C +40°C	Bobcat Engine Power SAE 15W40	Bobcat Engine Power SAE 20W50 -15°C +50°C	Bobcat Superior SH Hydraulic/Hydrostatic -35°C +50°C	Bobcat Bio Hydraulic Hydraulic/Hydrostatic	Bobcat PG Coolant Concentrated	Bobcat PG Coolant 4 Seasons Protection -36°C	Bobcat EG Coolant Concentrated	Bobcat EG Coolant Premixed	Bobcat Axle / Transmission oil SAE 85W90 LS -12°C -50°C	Bobcat Axle / Transmission Oil ISO 100 -20°C +40°C	Bobcat Brake Fluid LHM
5 L Can		6987796A	6987789A	6987818A	6987819A	6987790A	6987797A	6987791A	6987792A		6987793A	6987803A	6987804A	6987805A	6987794A	6987795A
25 L Container		6987796B	6987789B	6987818B	6987819B	6987790B	6987797B	6987791B	6987792B	6987813B	6987793B	6987803B	6987804B	6987805B	6987794B	
209 L Drum		6987796C	6987789C	6987818C	6987819C	6987790C	6987797C	6987791C	6987792C	6987813C	6987793C	6987803C	6987804C	6987805C	6987794C	
1000 L Tank		6987796D	6987789D	6987818D	6987819D	6987790D	6987797D	6987791D	6987792D	6987813D	6987793D	6987803D	6987804D	6987805D		
400 gr Grease		Bobcat Multi-Purpose Grease										6987888				
		Bobcat Supreme HD Grease										6987889				
		Bobcat Extreme HP Grease										6987890				

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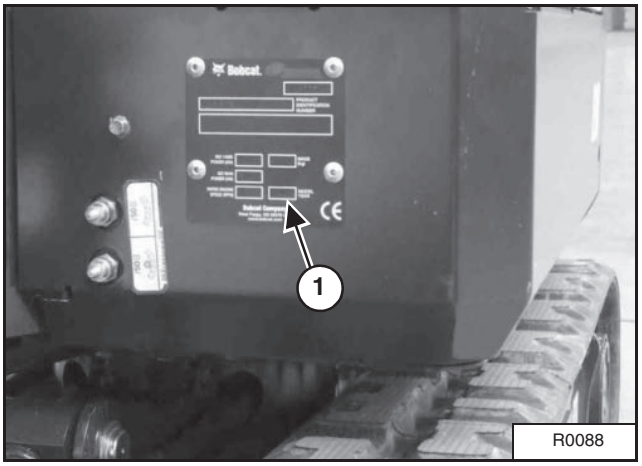
SERIAL NUMBER LOCATIONS

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

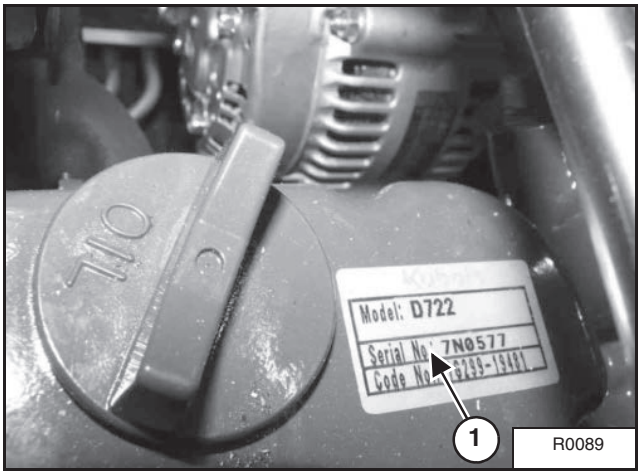
Figure 1



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

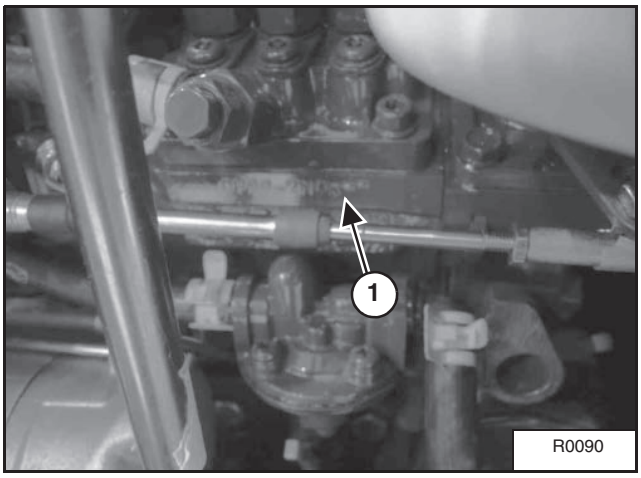
Engine Serial Number

Figure 2



The engine serial number is located as a plate (Item 1) on the top of the engine **[Figure 2]**.

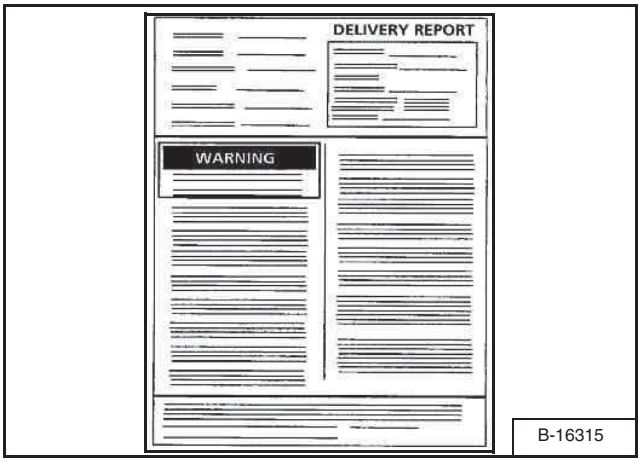
Figure 3



It also appears engraved on the side of the engine (Item 1) **[Figure 3]**.

DELIVERY REPORT

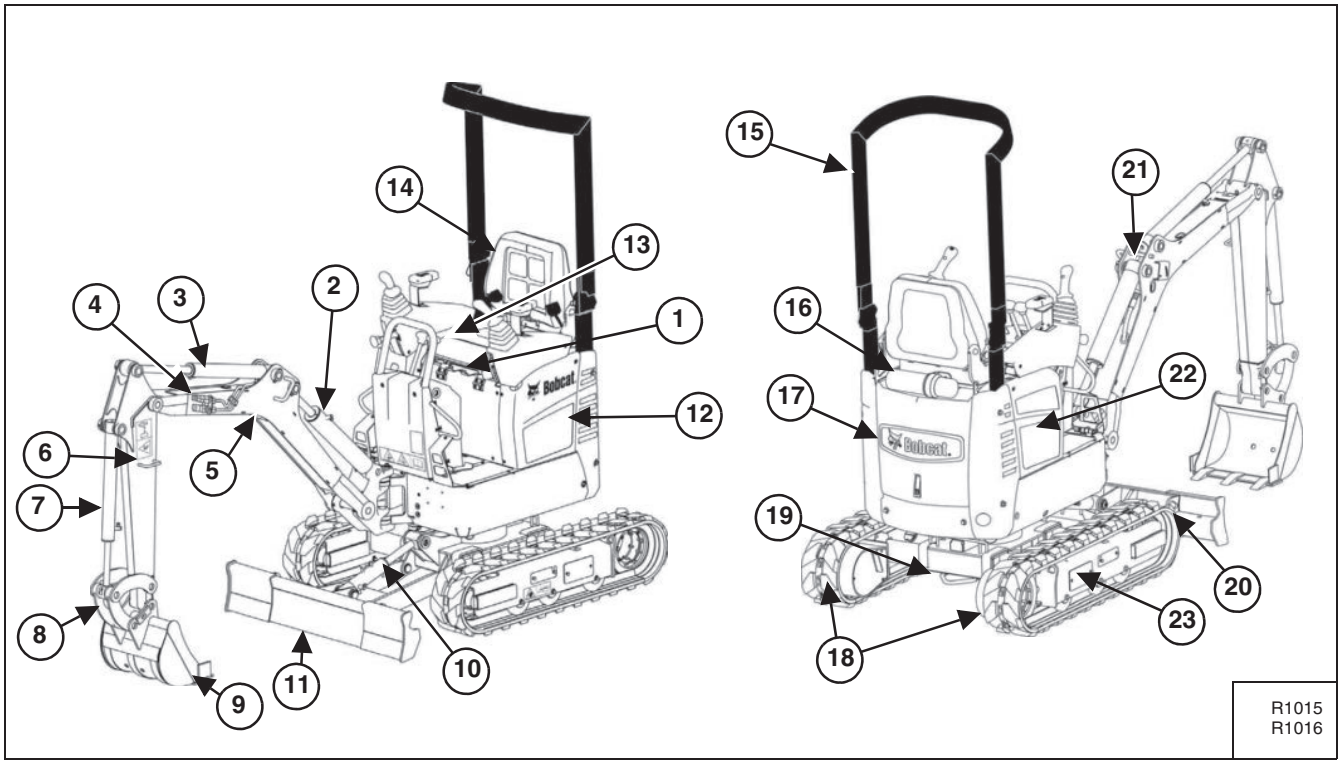
Figure 4



The delivery report **[Figure 4]** contains a list of items that must be explained or shown to the owner or operator by the dealer when the Bobcat excavator is delivered.

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

EXCAVATOR IDENTIFICATION



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Operator's Handbook	**15**	Tip-Over Protective Structure (TOPS)
2	Boom Cylinder	**16**	Operation & Maintenance Manual
3	Arm Cylinder	**17**	Tailgate
4	Auxiliary Quick Couplers	**18**	Tracks
5	Boom	**19**	Tie Downs
6	Arm	**20**	Tie Downs / Lift Point (Both Sides)
7	Bucket Cylinder	**21**	Lift Point
8	Bucket Link / Attachment Coupler (If Equipped)	**22**	Right Side Cover
9	Bucket **[A]**	**23**	Track Frames
10	Blade Cylinder		
11	Blade		
12	Upperstructure		
13	Control Levers (Joysticks)		
14	Operator's Seat with Seat Belt		

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

FEATURES, ACCESSORIES AND ATTACHMENTS

Standard Items

Model E10z Bobcat excavators are equipped with the following standard items:

- 710 mm dozer blade / 1100 mm extended
- 180 mm rubber track
- Auxiliary hydraulics
- Control console locks
- Horn
- Hydraulically expandable undercarriage from 710 to 1100 mm
- Retractable seat belt
- Spark arrester muffler
- Suspension seat
- Two speed travel
- * TOPS canopy
- Vandalism protection
- Working lights
- Fuel Filter Sediment Bowl

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.

- Hydraulic Oil Cooler Kit
- Motion alarm
- Auxiliary double action
- Beacon
- Strobe
- Exhaust Purifier kit
- Travel Motor Hose Guard
- Keyless Start
- Track Expansion
- Side Mirror
- Boom Light
- Cylinder Covers (Demolition) kit
- Lifting Device
- Spark Arrestor Muffler
- Mechanical Pin Grabber Coupler

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

Attachments

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

The versatile Bobcat excavator quickly turns into a multi-job machine with a variety of attachments.

Se your Bobcat dealer for more details on these and other attachments and field accessories.

- Digging bucket
- Grading bucket
- Hydraulic breaker

OPERATOR CANOPY (TOPS)

The excavator has an operator canopy (TOPS - Tip-Over Protective Structure) as standard equipment. The TOPS meets ISO 3471 and ISO 12117.

The canopy provides operator protection if the excavator is tipped over. The seat belt must be worn for TOPS protection.

⚠ 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

SAFETY AND TRAINING RESOURCES

SAFETY INSTRUCTIONS

Before Operation

Carefully follow the operating and maintenance instructions in this manual.

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

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

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

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

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

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

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

- An Operator's Handbook is fastened to the operator cab of the excavator. Its brief instructions are convenient to the operator. See your Bobcat dealer for more information on translated versions.

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.

Safe Operation Is The Operator's Responsibility

Safety Alert Symbol

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

WARNING

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

W-2001-0502

IMPORTANT

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

I-2019-0284

DANGER

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

D-1002-1107

WARNING

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

W-2044-1107

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

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

Safe Operation Needs A Qualified Operator

For an operator to be qualified, he or she must not use drugs or alcoholic drinks which impair alertness or co-ordination 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 and machine signs (decals).
- Check the rules and regulations at your location. The rules may include an employer's work safety requirements. For driving on public roads, the machine must be equipped as stipulated by the local regulations authorising operation on public roads in your specific country. 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.

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.
- 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 EMEA-0913

Avoid Silica Dust

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

FIRE PREVENTION

Maintenance

The machine and some attachments have components that are at high temperatures under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential fire hazard.

The operator's area, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.

All fuels, most lubricants and some coolants mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Operation

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

Electrical

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

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

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 petrol or diesel fuel for cleaning parts. Use commercial non-flammable solvents.

Fueling

Stop the engine and let it cool before adding fuel. No smoking! Do not refuel a machine near open flames or sparks. Fill the fuel tank outdoors.

Ultra Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations with higher Sulfur content. Avoid death or serious injury from fire or explosion. Consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

Starting

Do not use ether or starting fluids on any engine that has glow plugs. These starting aids can cause explosion and injure you or bystanders.

Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting.

Spark Arrester Exhaust System

The spark arrester exhaust system is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot.

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

Welding And Grinding

Always clean the machine and attachment, disconnect the battery, and disconnect the wiring from the Bobcat controllers before welding. Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the machine when welding.

Have good ventilation when grinding or welding painted parts. Wear dust mask when grinding painted parts. Toxic dust or gas can be produced.

Dust generated from repairing non-metallic 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.

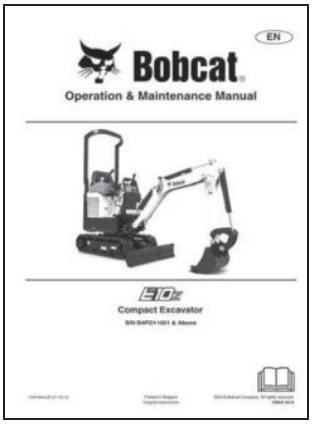
Fire Extinguishers

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.

PUBLICATIONS AND TRAINING RESOURCES

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

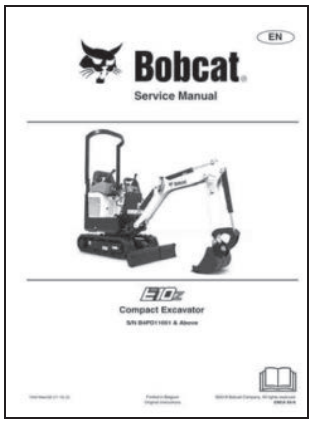
For the latest information on Bobcat products and the Bobcat Company, visit our Web site at **Bobcat.eu**.



OPERATION & MAINTENANCE MANUAL

7349189enGB

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



SERVICE MANUAL

6986788enUS

- Complete maintenance instructions for your Bobcat excavator.

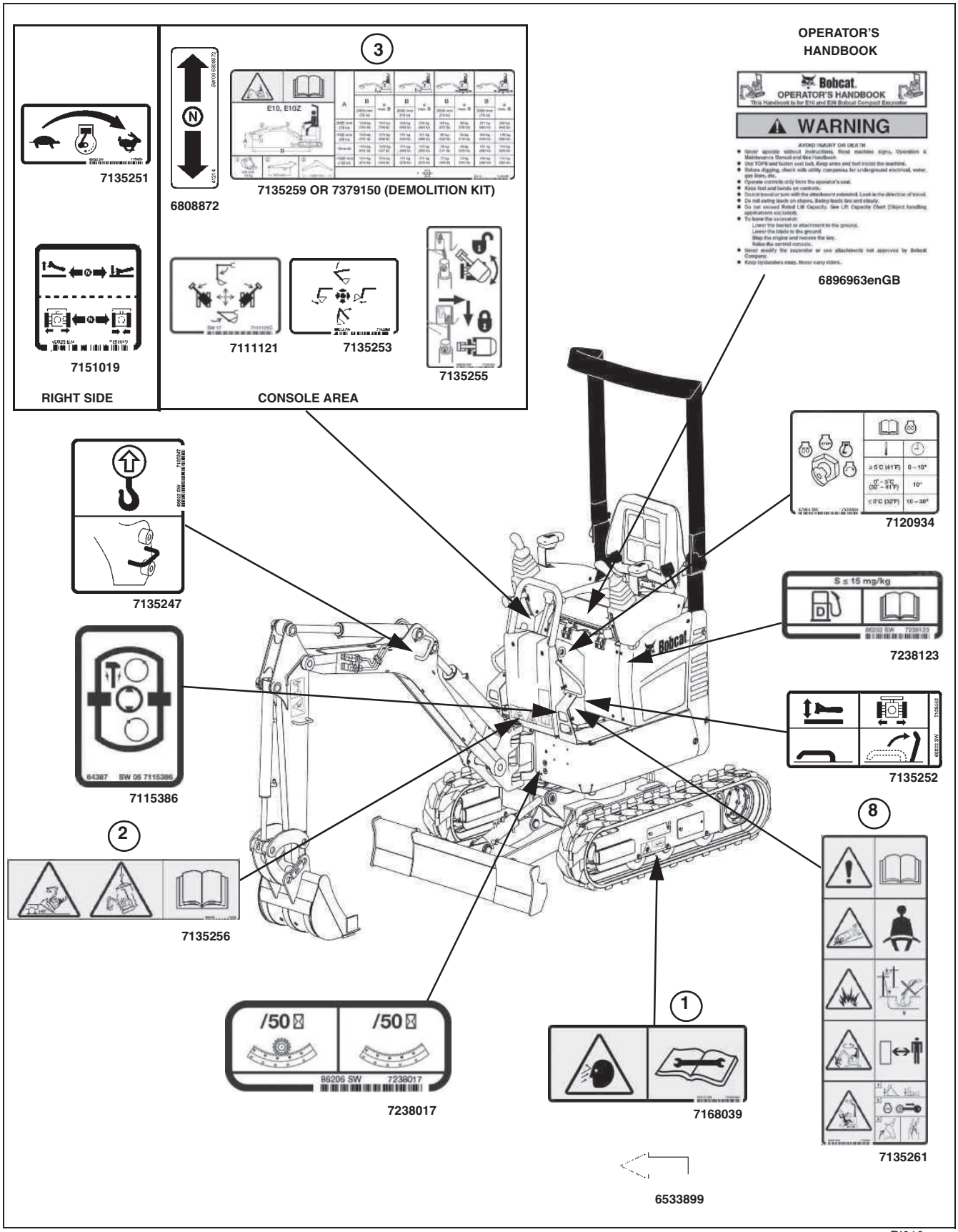
OPERATOR'S HANDBOOK

6986963enGB

Gives basic operation instructions and safety warnings.

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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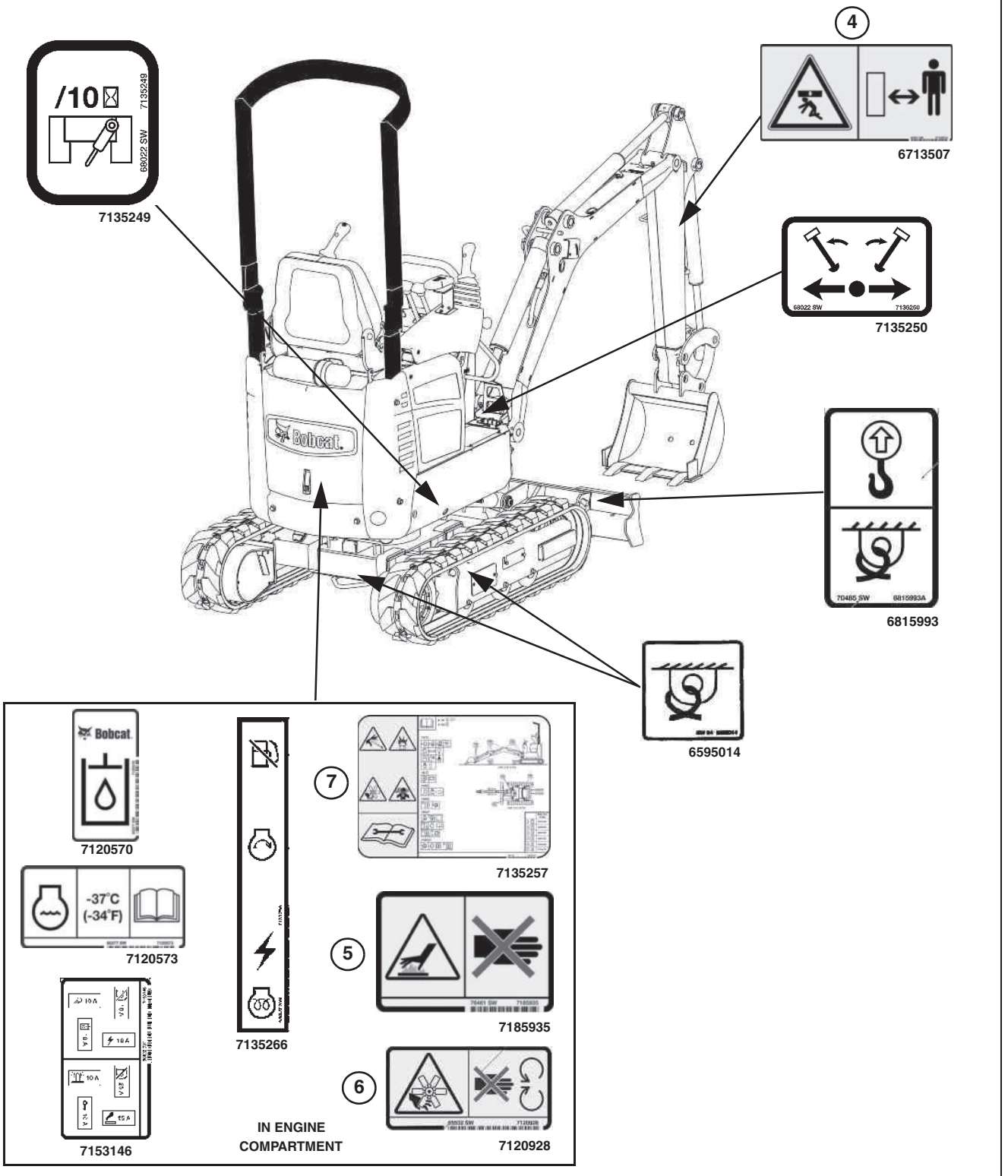
MACHINE SIGNS (DECALS) (CONT'D)

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.

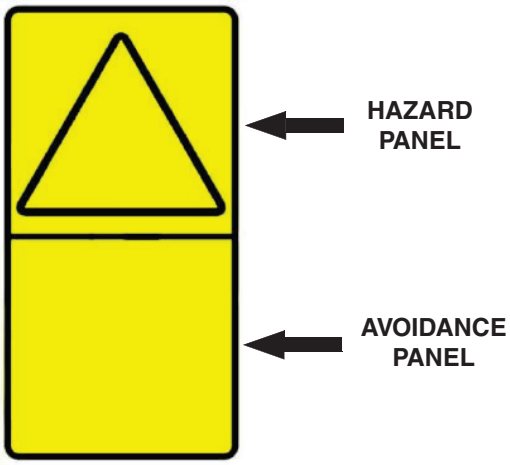


R1015

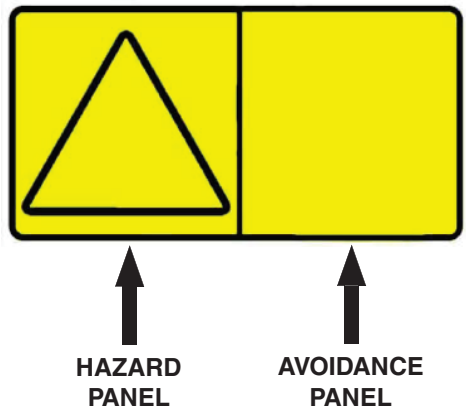
Pictorial Only Safety Signs

Safety signs are used to alert the equipment operator or maintenance person to hazards that may be encountered in the use and maintenance of the equipment. The location and description of the safety signs are detailed in this section. Please become familiarized with all safety signs installed on the excavator.

Vertical Configuration



Horizontal Configuration



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

Hazard panels depict a potential hazard enclosed in a safety alert triangle.

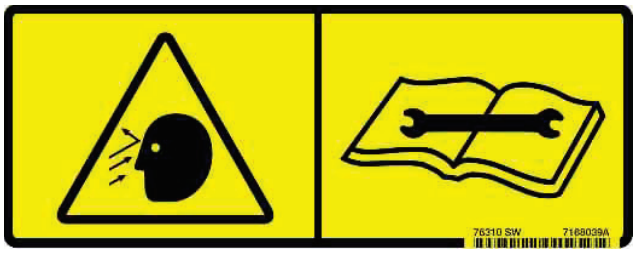
Avoidance panels depict actions required to avoid the hazards.

A safety sign may contain more than one hazard panel and more than one avoidance panel.

NOTE: See the numbered MACHINE SIGNS (DECALS) on Page 15 and Machine Signs (Decals) (Cont'd) on Page 16 for the machine location of each corresponding numbered pictorial only decals as shown below.

1. Thrown Or Flying Objects (7168039)

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



WARNING

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

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

W-2516-0110

2. Transporting And Lifting (7135256)

This safety sign is located on the front of the canopy..

WARNING

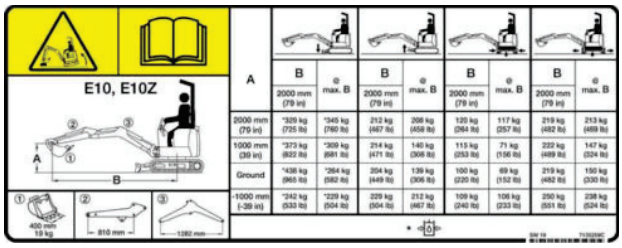
Improper loading, transporting and lifting procedures can cause serious injury or death. Read and understand the Operation & Maintenance Manual prior to transporting or lifting the machine.

W-2517-0110

Pictorial Only Safety Signs (Cont'd)

3. Lift Capacity (Object Handling Applications Excluded) (7135259 or 7379150)

This safety sign is located inside the operator's area.



WARNING

Overload can tip the excavator and cause serious injury or death.

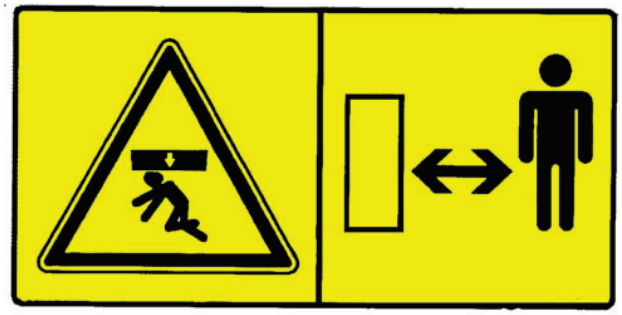
- **Do not lift or hold any load that exceeds these ratings at their specific load radii and height.**
- **Total rated load is shown. The weight of all lifting devices must be deducted to determine the net load that can be lifted.**

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

W-2519-0110

4. Crush Hazard (6713507)

This safety sign is located on both sides of the boom.



WARNING

Keep away from the operating machine to avoid serious injury or death.

W-2520-0106

5. Hot Surfaces (7185935)

This safety sign is located inside the engine compartment.

WARNING

AVOID BURNS

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

W-2070-1203

6. Hot Surfaces And Rotating Fan (7120928)

This safety sign is located inside the engine compartment.

WARNING

Rotating fan blade can cause serious injury or death. Keep away from fan and moving parts. Do not operate with guard removed.

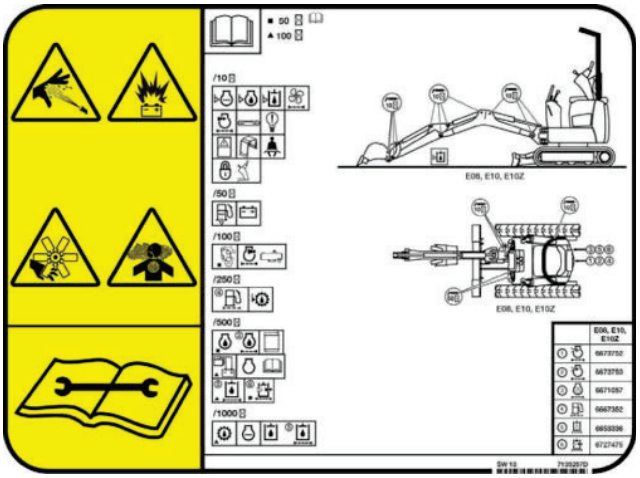
Hot surfaces can cause injury. Do not touch. Allow to cool before servicing.

W-2521-0106

Pictorial Only Safety Signs (Cont'd)

7. High Pressure, Battery, Rotating Fan And Exhaust Gases (7135257)

This safety sign is located in the engine compartment.



WARNING

Leaking fluids under pressure can enter the skin and cause serious injury or death. Immediate medical attention is required. Wear goggles. Use cardboard to check for leaks.

Battery makes flammable and explosive gas. Keep arcs, sparks, flames and lighted tobacco away. Keep away from electrical contacts

Rotating fan can cause serious injury. Keep away from fan and moving parts. Do not operate with guard removed.

All exhaust gases can kill. Always ventilate.

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

W-2522-0110

8. General Hazard (7135261)

This safety sign is located on the front of the cab.

WARNING

Failure to obey warning signs and instructions can cause serious injury or death. Never use excavator without instructions. Read and understand the Operation & Maintenance Manual and Handbook.

Keep away from dropoffs, steep areas or banks that could break away.

Explosion or electrocution can occur if machine contacts utility lines or pipes. Check for overhead or underground lines before operating.

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

Failure to operate machine from the operator's position can cause serious injury or death.

To Leave Excavator:
1. Lower attachment and blade to ground.
2. Stop engine and remove the key (if equipped).
3. Raise control console.

W-2518-0110

OPERATING INSTRUCTIONS

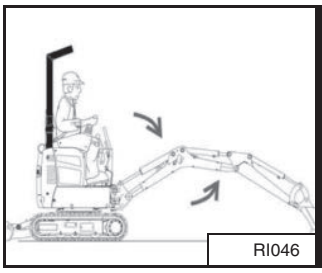
INTENDED USE

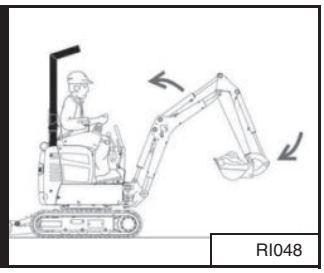
This machine is classified as an Excavator as defined in ISO 6165. This machine has tracks and commonly a mounted bucket for the principle intended functions of excavating, loading and backfilling loose materials such as earth, gravel, or crushed rock.

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

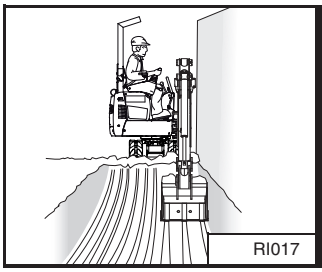
Examples of intended use include:

Excavating

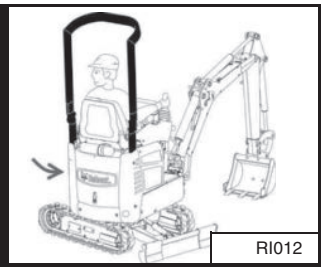

RI046


RI048

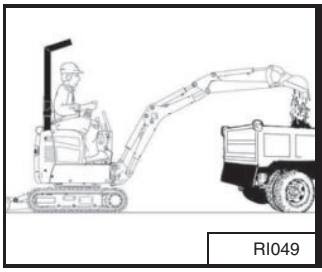
Boom Swing


RI017

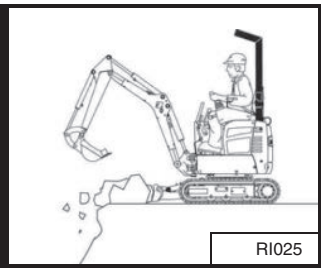
Rotating the Upperstructure


RI012

Loading Material


RI049

Backfilling


RI025

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2374-0500

⚠ WARNING

AVOID INJURY OR DEATH

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

VOLTAGE	MINIMUM DISTANCE
up to 50 kV	3 m (10 ft)
beyond 50 kV	5 m (17 ft)

W-2757-EN-0513

⚠ WARNING

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

W-2119-0910

IMPORTANT

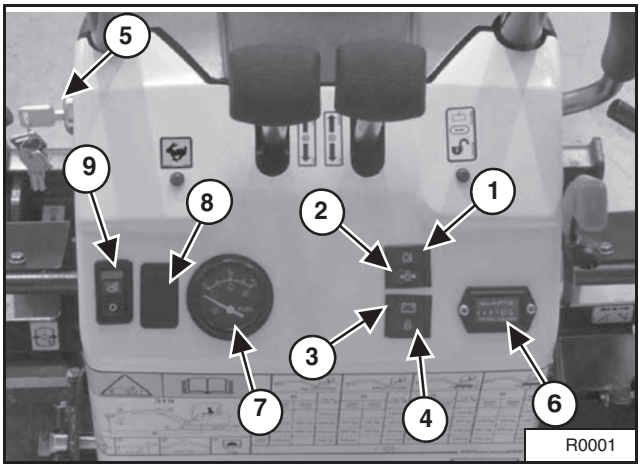
Avoid impacting objects with the blade. Damage to blade and undercarriage components may occur.

I-2256-0507

INSTRUMENTS AND CONSOLES

Instrumentation

Figure 5

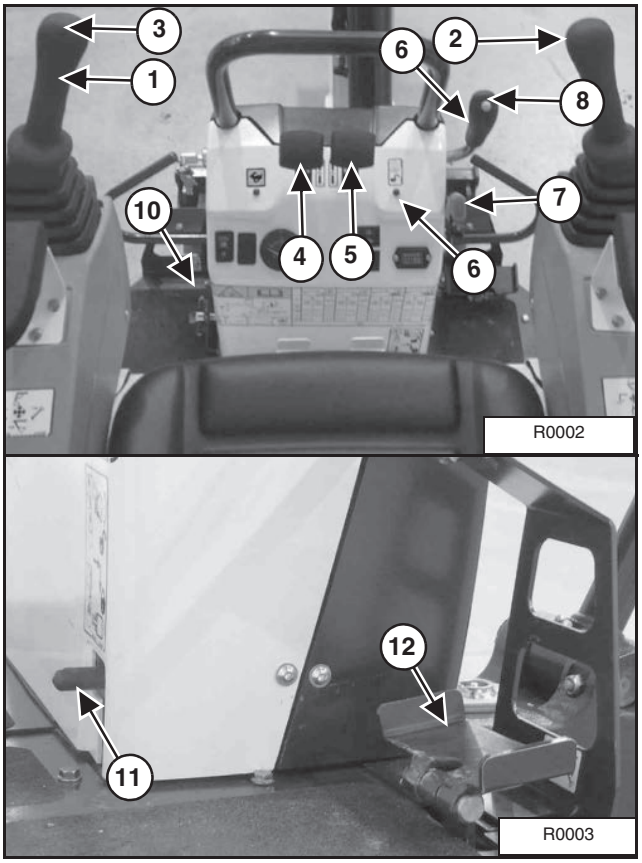


All the instruments are located on the control console **[Figure 5]**.

REF. NO	DESCRIPTION	FUNCTION / OPERATION
1	Engine Coolant Temperature Warning Lamp	Light comes ON when coolant temperature is above allowable range. Alarm also sounds. STOP the engine if light comes ON.
2	Engine Oil Pressure Warning Lamp	Light comes ON when pressure is below allowable range. Alarm also sounds. STOP the engine if light comes ON.
3	Charging System Lamp	Light comes ON when the alternator is NOT charging the battery.
4	Glow Plug Indicator Lamp	Light comes ON when key is turned in PREHEAT position
5	Key Starter Switch	Used to activate glow plugs, start and stop engine.
6	Hourmeter	Records the total operating hours of the machine.
7	Fuel Gauge	Shows the amount of fuel in the tank.
8	Blade / Track Expansion Switch	Switch functions between raise / lower the blade and track expansion. (See Blade / Track Expansion Switch on page 31)
9	Boom Light	Lightens the working area.
10	Hydraulic Lockout Indicator Lamp	Light comes ON when hydraulic lockout is ON.

Operator Controls

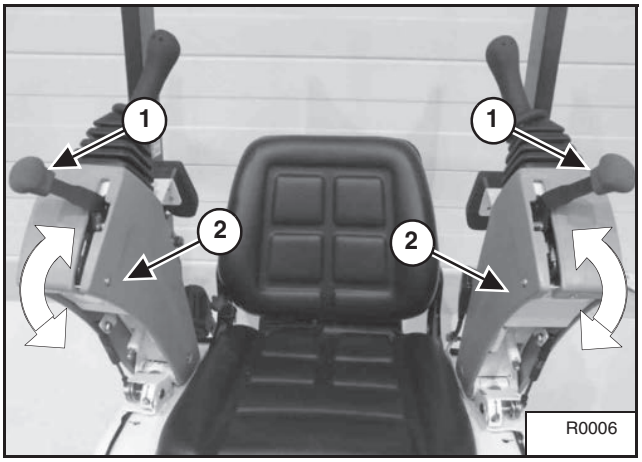
Figure 6



REF. NO	DESCRIPTION	FUNCTION / OPERATION
1	Left Hand Control Joystick	(See Control Joysticks on Page 28.)
2	Right Hand Control Joystick	(See Control Joysticks on Page 28.)
3	Horn	
5	Left Steering Lever	(See Left Turn on Page 27.)
6	Right Steering Lever	(See Right Turn on Page 26.)
7	Engine Speed Control Lever	(See ENGINE SPEED CONTROL on page 24.)
8	Two-Speed Button	(See Two-Speed Travel on page 24.)
9	High Range Indicator	
10	Auxiliary Hydraulic Pedal	(See HYDRAULIC CONTROLS on Page 28.)
11	Upperstructure Slew Lock	(See UPPERSTRUCTURE SLEW LOCK on Page 33.)
12	Boom Swing Pedal	(See Boom Swing Pedal on Page 30.)

Raising And Lowering The Levers

Figure 7

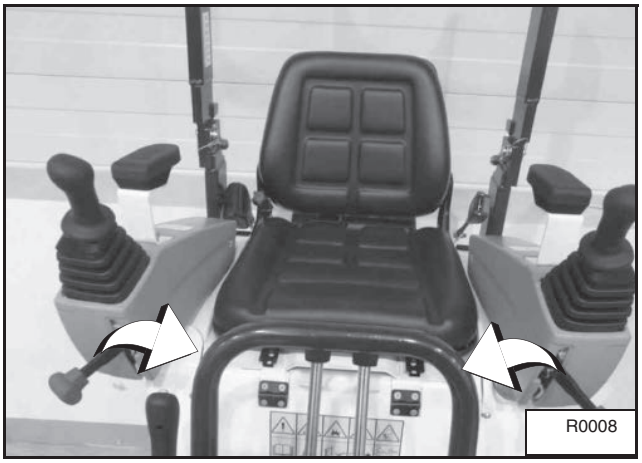


Pull the control lockout lever(s) (Item 1) **[Figure 7]** up to release and raise the console(s) (Item 2) to provide entry and exit from the canopy.

NOTE: When either console is raised, the hydraulic control joysticks and the traction system are locked and will not function.

Before operating the machine, lower the control lockout consoles (Item 2) **[Figure 7]** by pushing the control lockout lever(s) (Item 1) until latched in the down position.

Figure 8

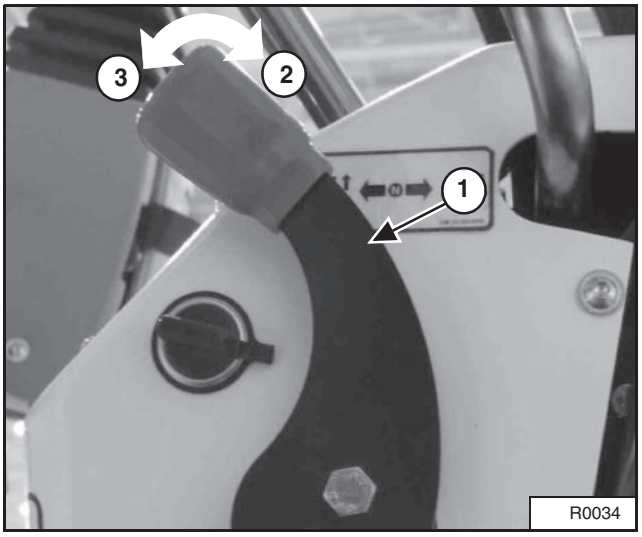


The control lockout consoles can be narrowed **[Figure 8]** to match the tracks' width or to improve operator comfort. Raise the control lockout lever(s) (Item 1) **[Figure 7]** and pull them closer to the operator seat.

ENGINE SPEED CONTROL

Operation

Figure 9

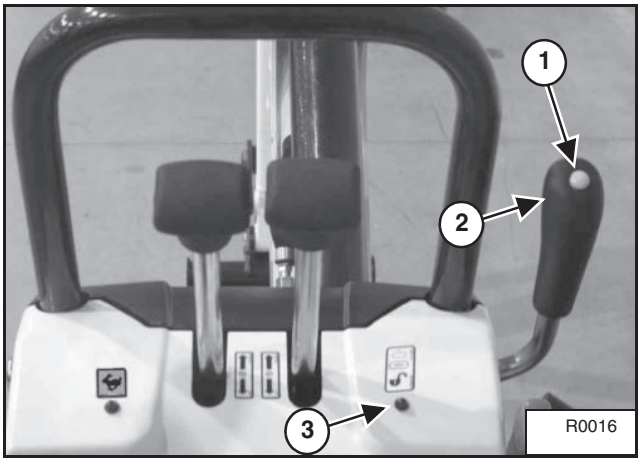


The engine speed control lever (Item 1) **[Figure 9]** controls the rpm of the engine.

Push (Item 2) the lever to increase engine rpm; pull (Item 3) to decrease rpm **[Figure 9]**.

Two-Speed Travel

Figure 10



Press the button (Item 1) on the blade / track width control lever (Item 2) to engage the high-range.

Press the button again to disengage.

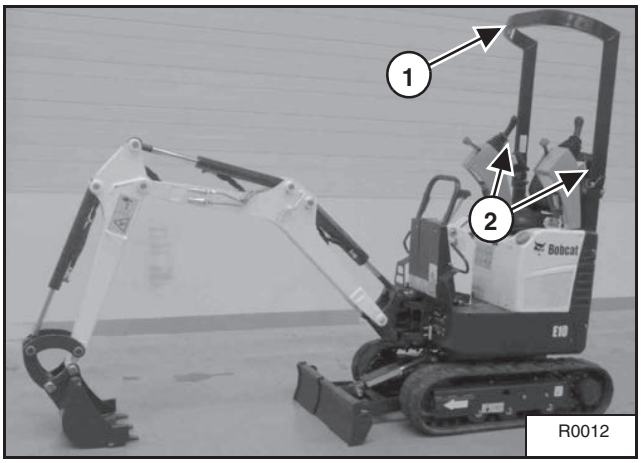
The green light (Item 3) will be ON when high-range is engaged **[Figure 10]**.

Press the button again to disengage.

OPERATOR CANOPY

TOPS Approved

Figure 11



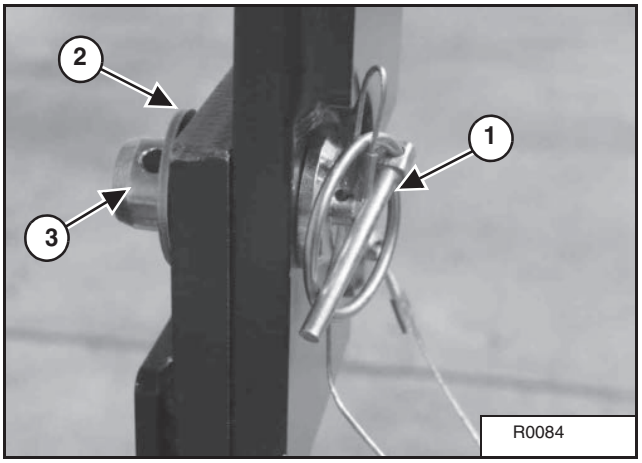
The excavator has an operator canopy (TOPS) (Tip-Over Protective Structure) (Item 1) (meets ISO 12117) as standard equipment **[Figure 11]**.

The canopy provides operator protection if the excavator tips over. The seat belt must be worn for TOPS protection.

Lowering The TOPS Canopy

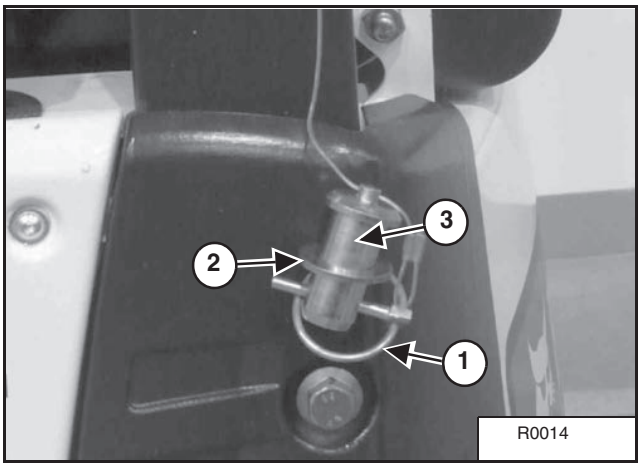
Lowering the TOPS canopy allows to reduce the machine height in order to pass through small doors.

Figure 12



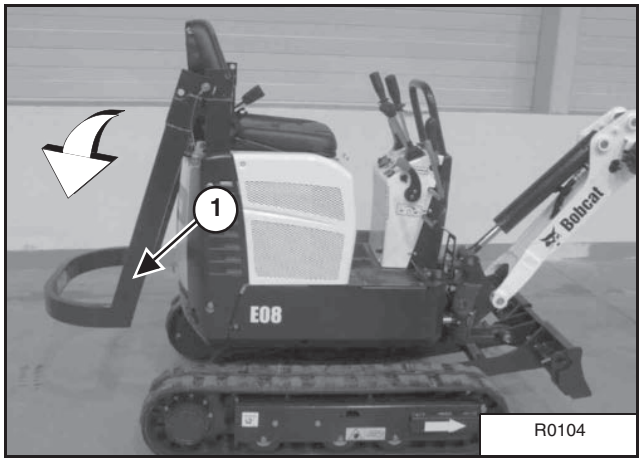
Remove the clip (Item 1), the washer (Item 2) and the spindle (Item 3) **[Figure 12]** on both sides of the canopy (Item 2) **[Figure 11]**.

Figure 13



Keep the clip (Item 1) and the washer (Item 2) within the spindle (Item 3) **[Figure 13]**.

Figure 14



Lower the canopy (Item 1) **[Figure 14]**.

Raising The TOPS Canopy

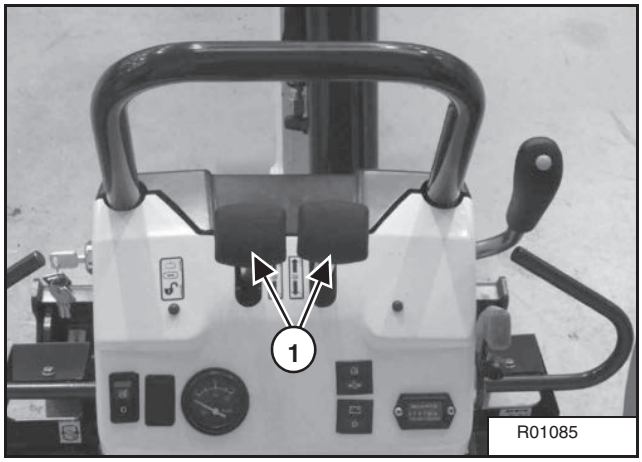
To raise the TOPS canopy, follow the same procedure in reverse.

STEERING LEVERS

Driving Forward And Reversing

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

Figure 15

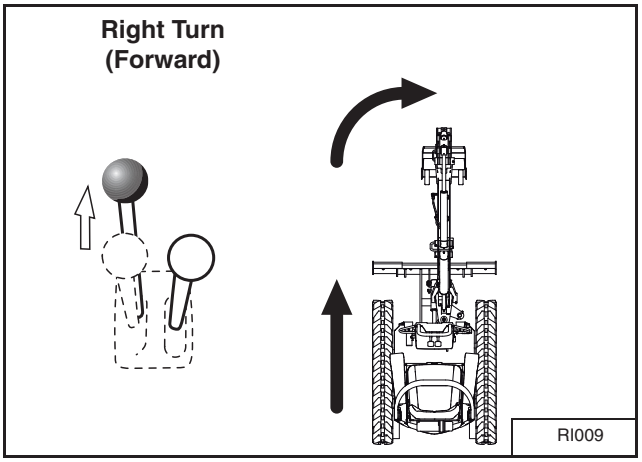


Position the blade at the front of the machine (as you sit in the operator's seat). Slowly move both steering levers (Item 1) **[Figure 15]** forward for forward travel; backward for reverse travel.

Turning

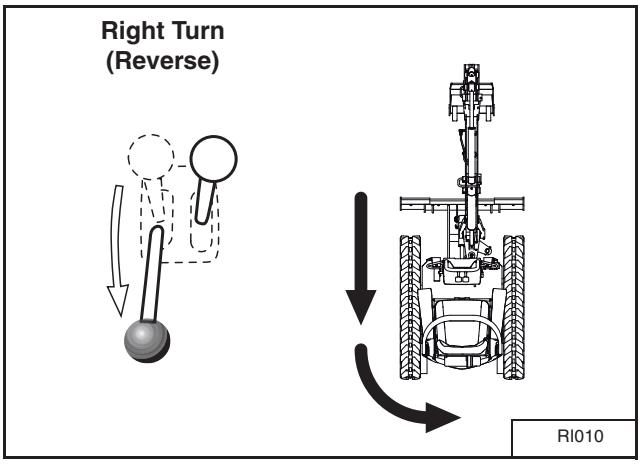
Right Turn

Figure 16



Push the left steering lever forward to turn right **[Figure 16]** while driving forward.

Figure 17

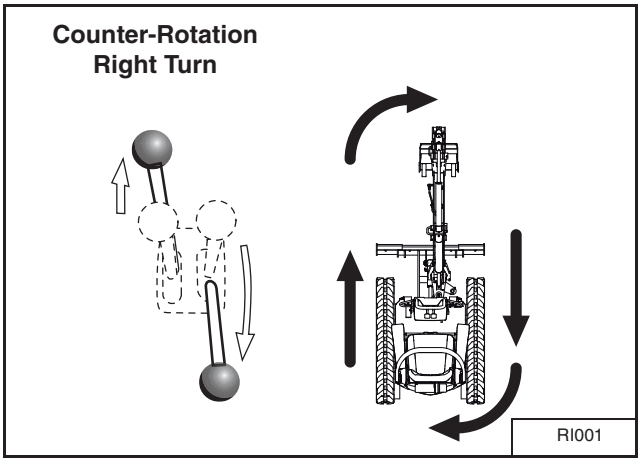


Pull the left steering lever backward to turn right **[Figure 17]** while reversing.

Turning (Cont'd)

Counter-Rotation Right Turn

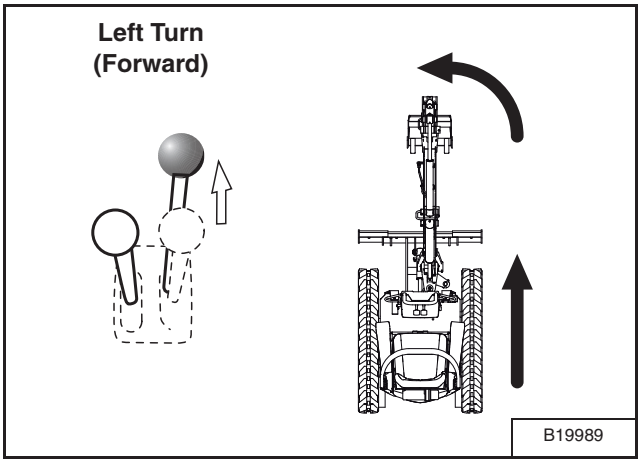
Figure 18



Pull the left steering lever forward and pull the right steering lever backward **[Figure 18]**.

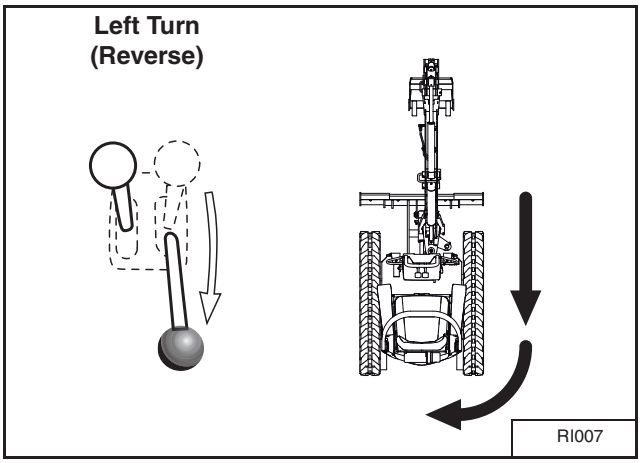
Left Turn

Figure 19



Push the right steering lever forward to turn left **[Figure 19]** while driving forward.

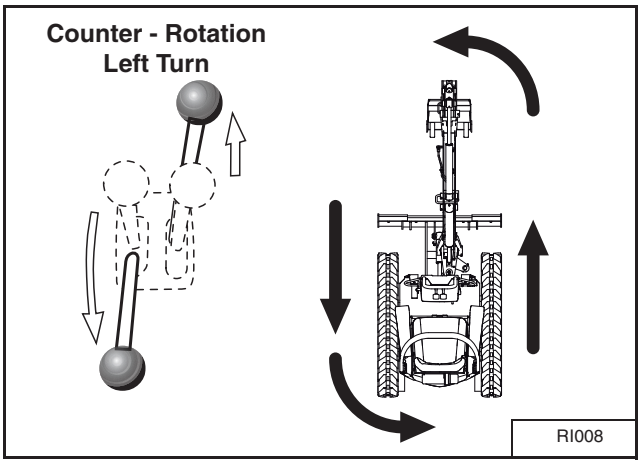
Figure 20



Pull the right steering lever backward to turn left while reversing **[Figure 20]**.

Counter-Rotation Left Turn

Figure 21

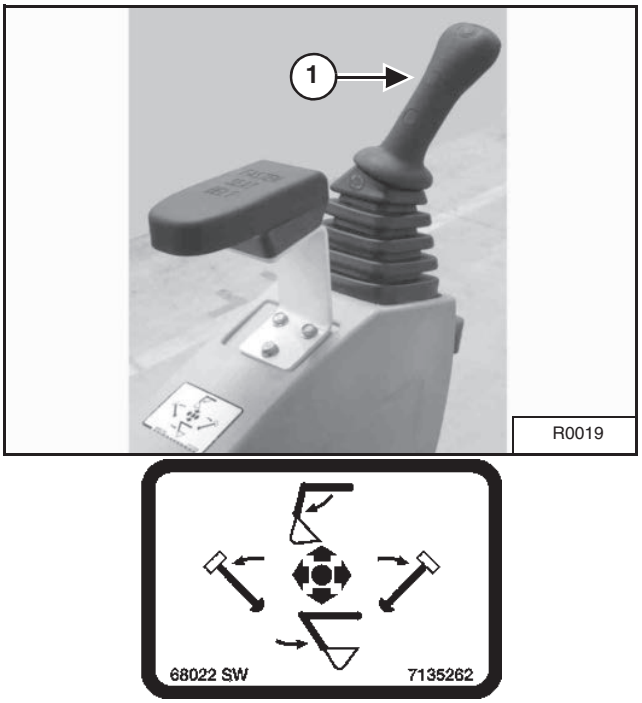


Push the right steering lever forward and pull the left steering lever backward **[Figure 21]**.

Control Joysticks

Left Control Joystick

Figure 22



The work equipment (boom, arm, bucket, and upperstructure slew) is operated by using the left and right control joysticks **[Figure 22]** and **[Figure 23]**.

The left control joystick (Item 1) is used to operate the arm and slew the upperstructure **[Figure 22]**.

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

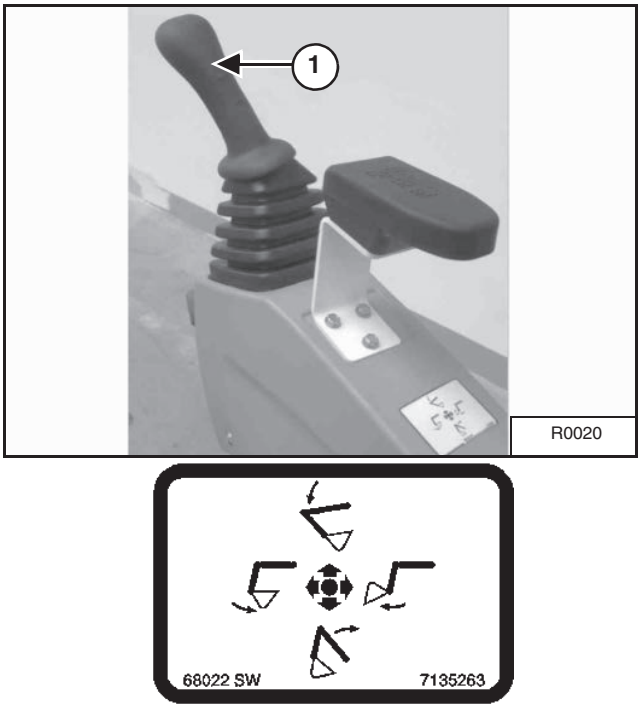
IMPORTANT

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

I-2051-0905

Right Control Joystick

Figure 23



The right control joystick (Item 1) is used to operate the boom and bucket **[Figure 24]**.

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

⚠ WARNING

AVOID INJURY OR DEATH

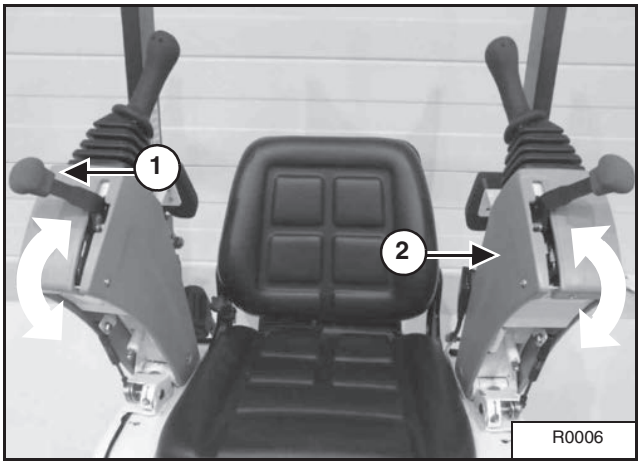
Before leaving the machine:

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

W-2196-0595

Control Lockout Lever

Figure 24



The control lock lever (Item 1) **[Figure 24]** disengage the hydraulic control functions from the control joysticks when either console is raised.

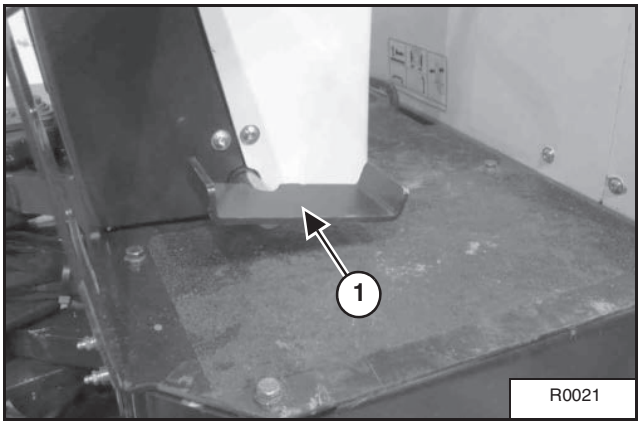
NOTE: If the engine stops, the boom / bucket (attachments) can be lowered to the ground using hydraulic pressure in the accumulator. The control console(s) must be in the locked down position, and the key switch in the ON position.
Use the control lever to lower the boom.

Lower the control console(s) (Item 2) **[Figure 24]** to engage the hydraulic control functions of the control joysticks.

Auxiliary Hydraulic Pedal

The left pedal controls attachments (such as a hydraulic breaker) when mounted on the arm.

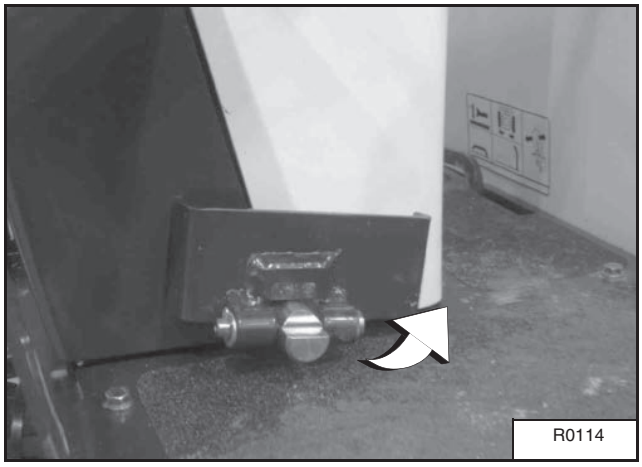
Figure 25



Press the auxiliary hydraulics pedal (Item 1) **[Figure 25]** to provide hydraulic pressure to the top hydraulic line. Release the pedal to stop hydraulic flow.

Only the top auxiliary line is pressurised. The bottom line is for return oil flow.

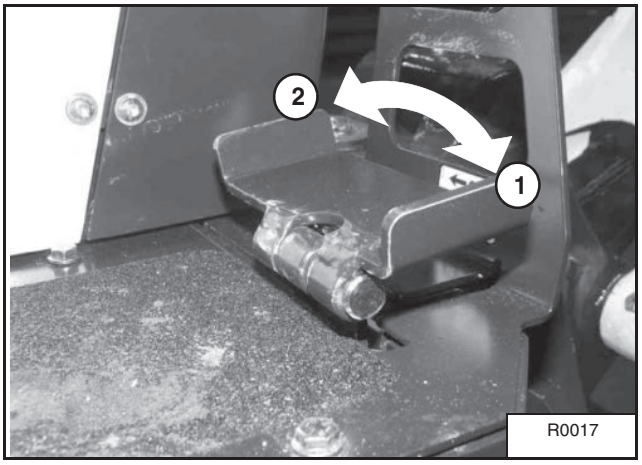
Figure 26



When you are not using the auxiliary flow, the pedal can be folded to prevent operation of the hydraulic functions **[Figure 26]**.

Boom Swing Pedal

Figure 27

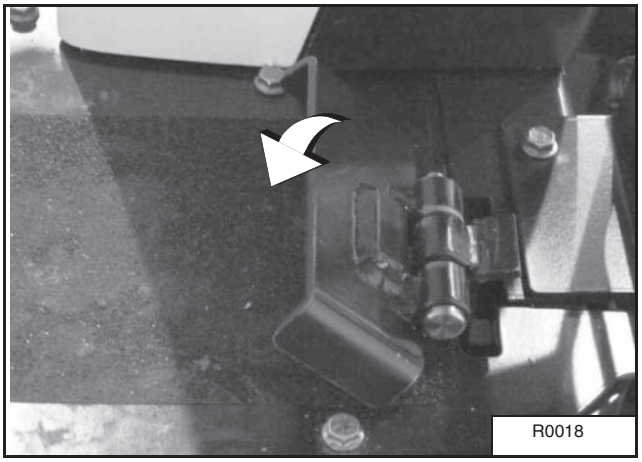


The boom swing pedal is located at the right side of the control console **[Figure 27]**.

Press the right side (Item 1) **[Figure 27]** of the pedal to swing the boom to the right.

Press the left side (Item 2) **[Figure 27]** of the pedal to swing the boom to the left.

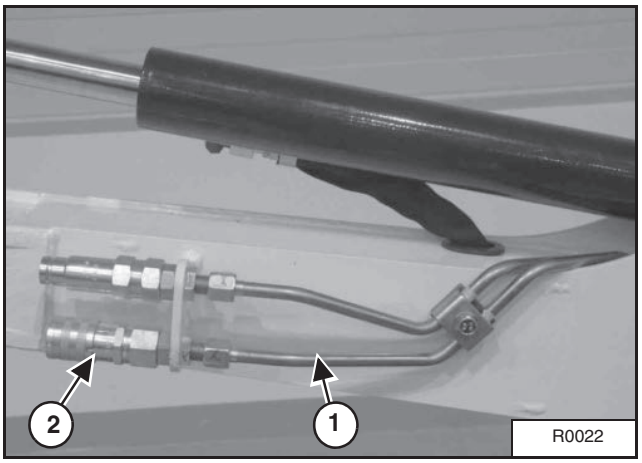
Figure 28



When not in use, the boom swing pedal can be folded inward to prevent operation of the boom swing function. In this position it can be used as a footrest **[Figure 28]**.

Quick Connectors

Figure 29



Excavators have auxiliary hydraulic lines (Item 1) **[Figure 29]** located on the boom.

Quick connectors (Item 2) **[Figure 29]** are available for use with hydraulically controlled attachments.

⚠ 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

NOTE: With the engine stopped and the attachment flat on the ground, move the left pedal back and forth several times. This relieves pressure that can be trapped in the auxiliary circuit.

Quick Connectors (Cont'd)

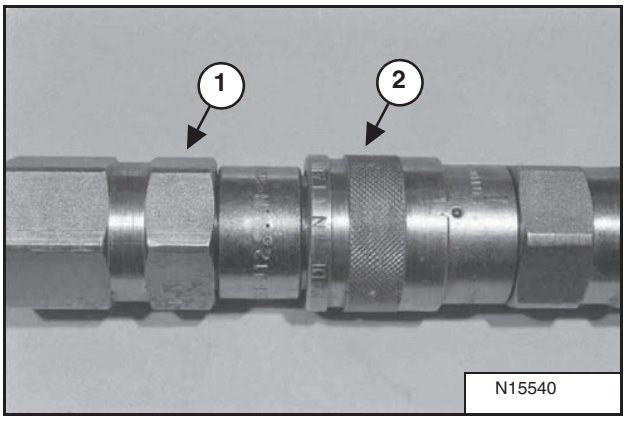
To Connect:

Clean the surface and the outside diameter of both the male and female connectors. Replace connectors that show signs of corroding, cracking, damage, or excessive wear **[Figure 29]**.

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

To Disconnect:

Figure 30

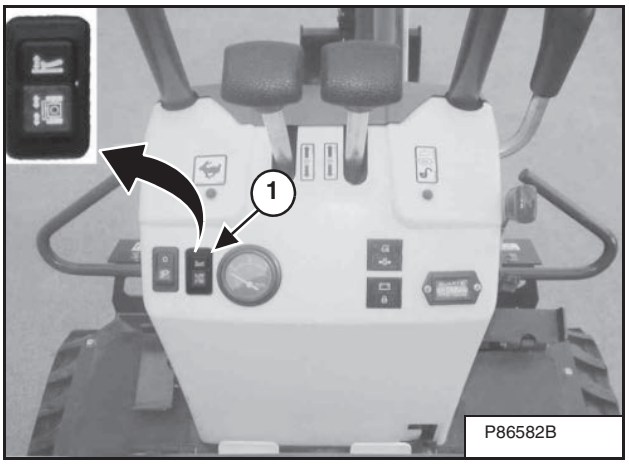


Hold the male connector (Item 1). Pull back the sleeve (Item 2) **[Figure 30]** on the female connector until the connectors disconnect.

BLADE CONTROL

Blade / Track Expansion Switch

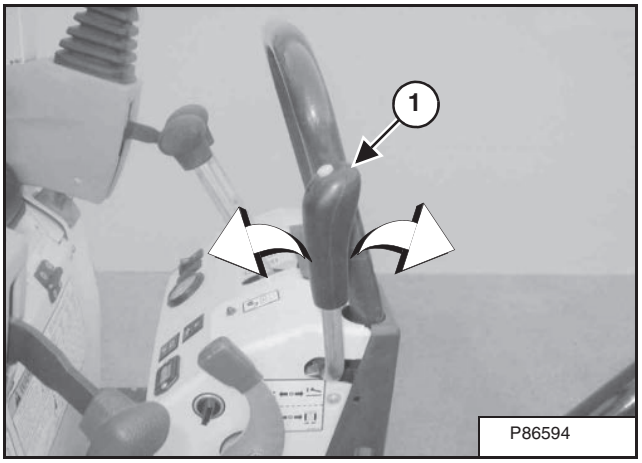
Figure 31



Press the top of the Blade / Track Expansion Switch (Item 1) **[Figure 31]** to put the switch in the BLADE position.

Raising and Lowering the Blade

Figure 32



With the Blade / Track Expansion Switch (Item 1) **[Figure 31]** in the BLADE position, move the Blade / Track Expansion Lever (Item 1) **[Figure 32]** forward to lower the blade.

Move the Blade / Track Expansion Lever (Item 1) **[Figure 32]** back to raise the blade.

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

TRACK FRAME EXPANSION

Expanding And Retracting The Tracks

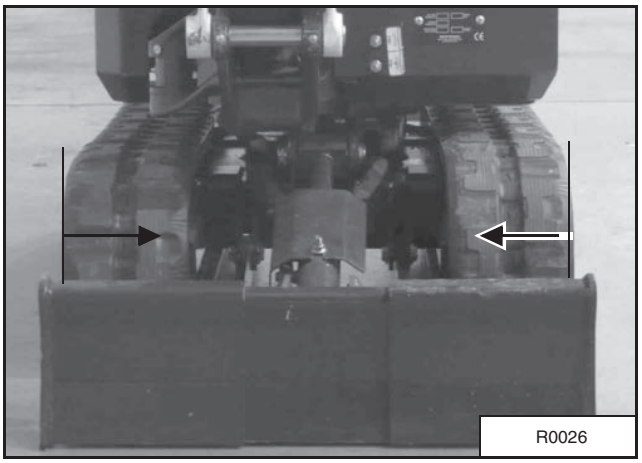
NOTE: Always expand tracks when working on slopes or in rough conditions.

IMPORTANT

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

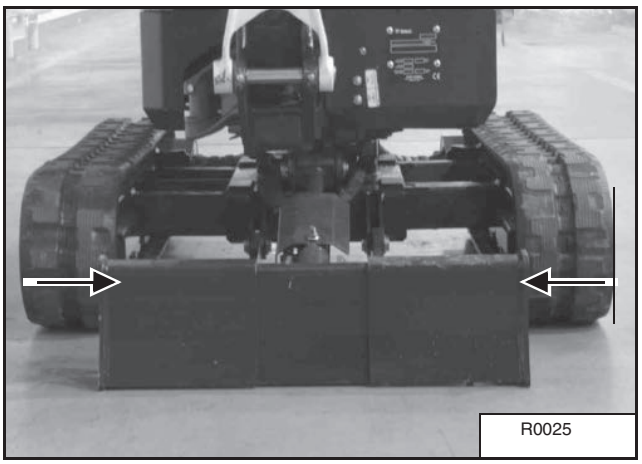
I-2193-0599

Figure 33



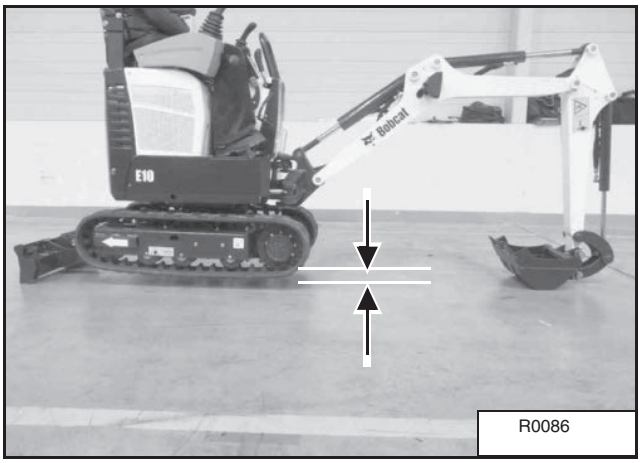
The excavator can be operated with the track frame retracted for transport on a trailer or to access narrow areas **[Figure 33]**.

Figure 34



Expand the track frame **[Figure 34]** for increased digging performance.

Figure 35



With the boom and arm positioned over the blade, lower the blade until the tracks are raised 25 to 50 mm (1.0 – 2.0 in) off the ground **[Figure 35]**.

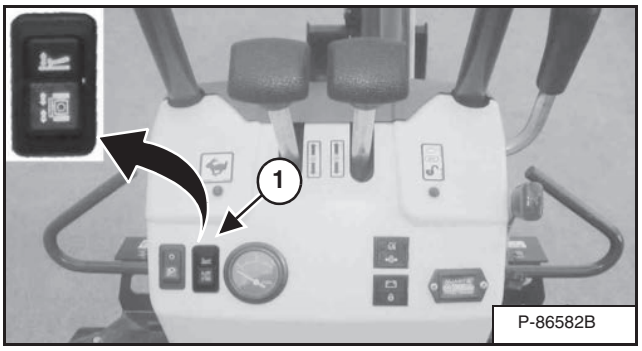
Rotate the upper structure 180 degrees.

Lower the boom and arm to raise the rear of the excavator until the track is 25 to 50 mm (1.0 – 2.0 in) off the ground **[Figure 35]**.

TRACK FRAME EXPANSION (CONT'D)

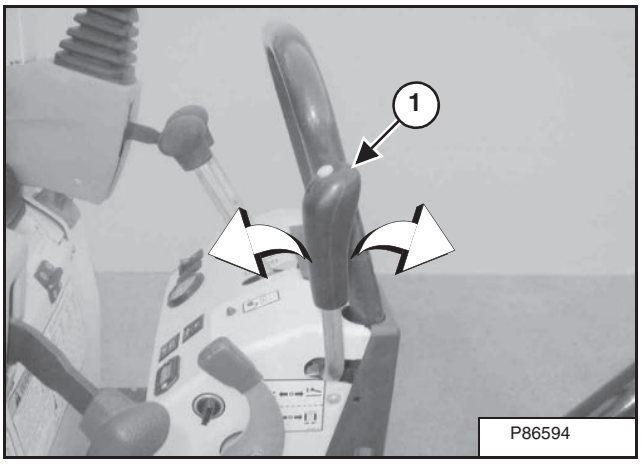
Expanding And Retracting The Tracks (Cont'd)

Figure 36



Press the bottom of the Blade / Track Expansion Switch (Item 1) **[Figure 36]** to put the switch in the TRACK position.

Figure 37



With the Blade / Track Expansion Switch (Item 1) **[Figure 36]** in the TRACK position, move the Blade / Track Expansion Lever (Item 1) **[Figure 37]** forward to expand the tracks.

Move the Blade / Track Expansion Lever (Item 1) **[Figure 37]** back to retract the tracks.

NOTE: Always return the Switch (Item 1) [Figure 36] to the BLADE position during operation so that the track does not move when using the blade lever.

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

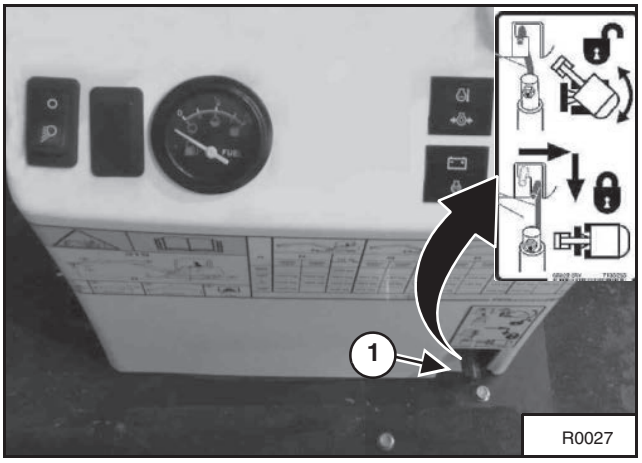
Raise the boom and arm to lower the rear of the excavator to the ground.

Raise the blade all the way.

Rotate the upperstructure 180 degrees.

UPPERSTRUCTURE SLEW LOCK

Figure 38



Move the slew lock pin (Item 1) **[Figure 38]** to the right and down to engage the upperstructure slew lock. Fit the pin properly to fully engage the slew lock. When the slew lock is engaged (locked), the upperstructure of the excavator is locked to the track frame and will not rotate.

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

Move the slew lock pin (Item 1) **[Figure 38]** up and to the left to disengage the upperstructure from the track frame. Fit the lever properly to fully disengage the slew lock.

⚠ WARNING

AVOID INJURY

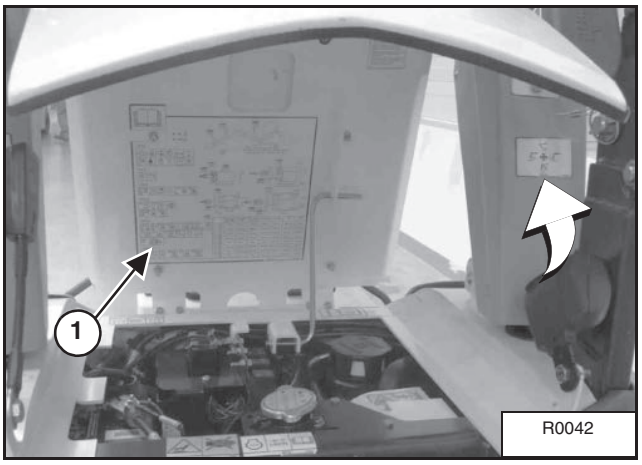
The upperstructure slew lock lever must be engaged when transporting the machine.

W-2197-0904

Daily Inspection And Maintenance

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

Figure 39



The Service Schedule decal (Item 1) **[Figure 39]** is located inside the tailgate.

A complete list of scheduled maintenance tasks is also located in the Service Schedule (See SERVICE SCHEDULE on page 57.)

⚠ WARNING

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

W-2001-0502

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

⚠ 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

IMPORTANT

This machine is factory equipped with a spark arrester exhaust system.

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

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

If this machine is operated on flammable forest, brush, or grass covered land, a spark arrester attached to the exhaust system may be required and must be maintained in working order. Refer to local laws and regulations for spark arrester requirements.

I-2284-EN-0909

Daily Inspection and Maintenance (Cont'd)

Check the following items before each day of operation:

- Operator Canopy (TOPS) and mounting hardware.
- Seat belt and mounting hardware. Replace seat belt if damaged.
- Check for damaged decals, replace as needed.
- Check control console lockouts.
- Check air cleaner and intake hoses / clamps.
- Check the Attachment Mounting System for damaged or loose parts.
- Check engine oil level and engine for leaks.
- Drain water from fuel filter.
- Check engine coolant level (in both the coolant recovery tank and in the radiator) and system 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

- **Keep door / cover closed except for service.**
- **Keep engine clean of flammable material.**
- **Keep body, loose objects and clothing away from electrical contacts, moving parts, hot parts and exhaust.**
- **Do not use the machine in space with explosive dusts or gases or with flammable material near exhaust.**
- **Never use ether or starting fluid on diesel engine with glow plugs or air intake heater. Use only starting aids as approved by engine manufacturer.**
- **Leaking fluids under pressure can enter skin and cause serious injury.**
- **Battery acid causes severe burns; wear goggles. If acid contacts eyes, skin, or clothing, flush with water. For contact with eyes, flush and get medical attention.**
- **Battery makes flammable and explosive gas. Keep arcs, sparks, flames and lighted tobacco away.**
- **For jump start, connect negative cable to the machine engine last (never at the battery). After jump start, remove negative connection at the engine first.**
- **Exhaust gases can kill. Always ventilate.**

W-2782-0409

IMPORTANT

PRESSURE WASHING DECALS

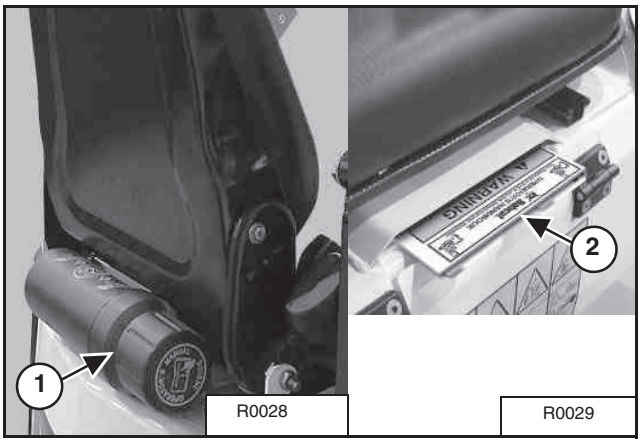
- **Never direct the stream at a low angle toward the decal that could damage the decal causing it to peel from the surface.**
- **Direct the stream at a 90 degree angle and at least 300 mm (12 in) from the decal. Wash from the center of the decal toward the edges.**

I-2226-0910

PRE-STARTING PROCEDURE

Before Starting The Engine

Figure 40



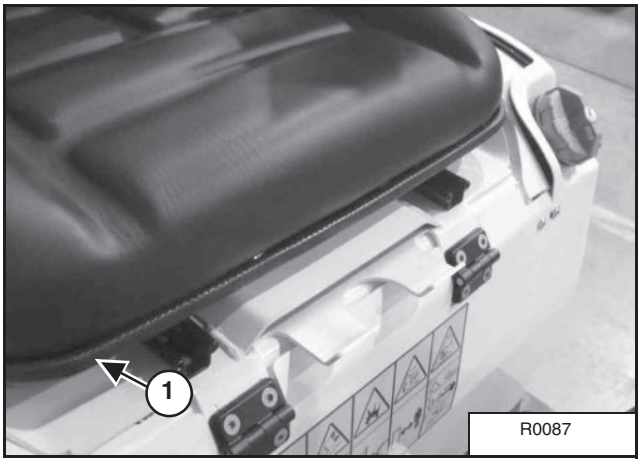
Read and understand the Operation & Maintenance Manual (Item 1) and the Operator's Handbook (Item 2) **[Figure 40]** before operating.

The Operation & Maintenance Manual and other manuals can be kept in a container (Item 1) **[Figure 40]** provided behind the operator's seat.

NOTE: Make sure the engine cover is latched.

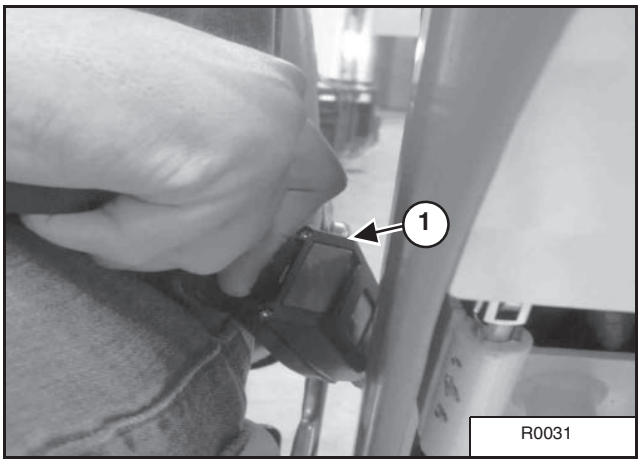
Use the canopy, the tracks and safety treads to enter.

Figure 41



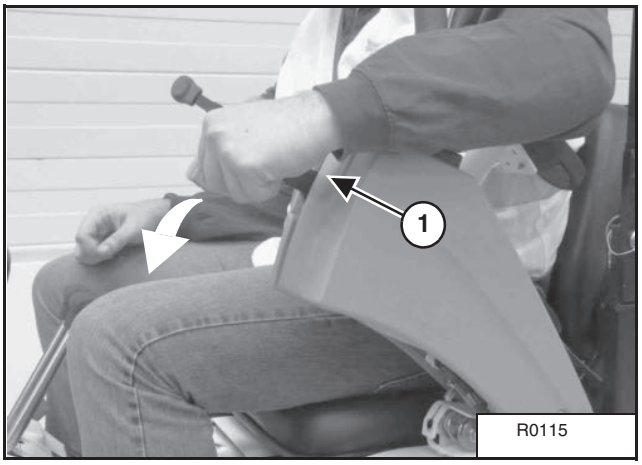
Release the seat lever (Item 1) **[Figure 41]** to adjust the seat forward or backward for comfortable operation.

Figure 42



Fasten the seat belt (Item 1) **[Figure 42]**.

Figure 43



Lower the control lockout levers (Item 1) **[Figure 43]** before operating the machine.

NOTE: The control lockout levers must be in the down position for the hydraulic control levers to operate.

STARTING THE ENGINE

Perform the PRE-STARTING PROCEDURE. (See PRE-STARTING PROCEDURE on Page 36.)

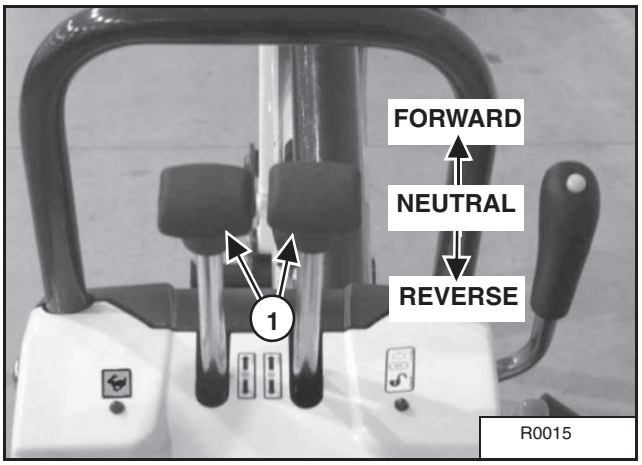
⚠ WARNING

AVOID INJURY OR DEATH

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

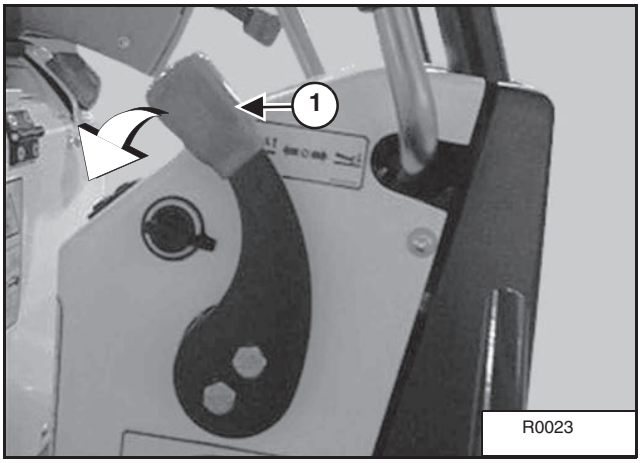
W-2135-1108

Figure 44



Put the steering levers (Item 1) **[Figure 44]** in the NEUTRAL position.

Figure 45



Move the engine speed control lever (Item 1) **[Figure 45]** to low idle.

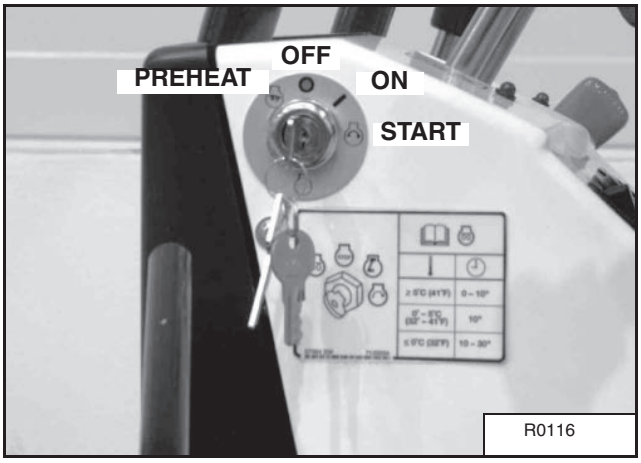
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2050-0807

Figure 46



Turn the key to the PREHEAT position (if required) **[Figure 46]**.

Turn the key to the START position **[Figure 46]** and release the key when the engine starts. It will return to the ON position.

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

Turn the key switch OFF to stop the engine.

IMPORTANT

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

I-2034-0700

Cold Temperature Starting Procedure

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.

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 74.)**.**

Install the engine heater

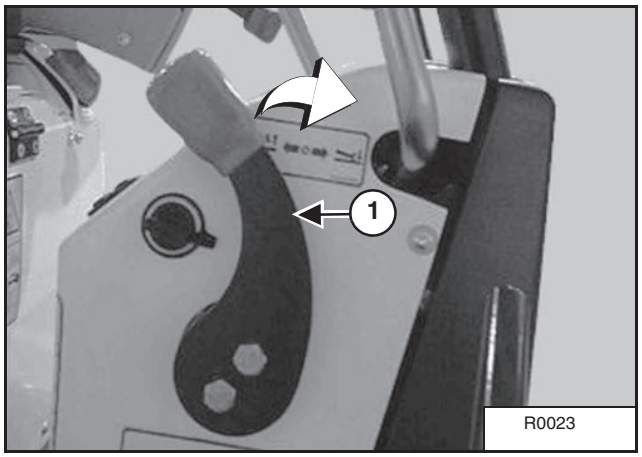
⚠ WARNING

EXPLOSION CAN CAUSE SERIOUS INJURY, DEATH OR SEVERE ENGINE DAMAGE

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

W-2071-0415

Figure 47



Push the engine speed control lever (Item 1) **[Figure 47]** fully forward.

IMPORTANT

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

I-2034-0700

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH

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

W-2051-0212

Figure 48

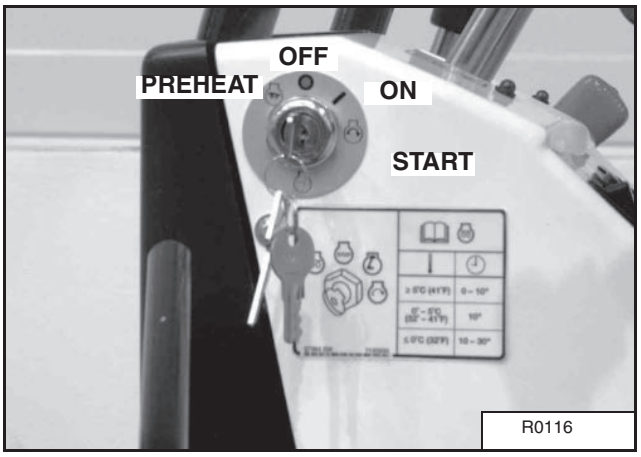
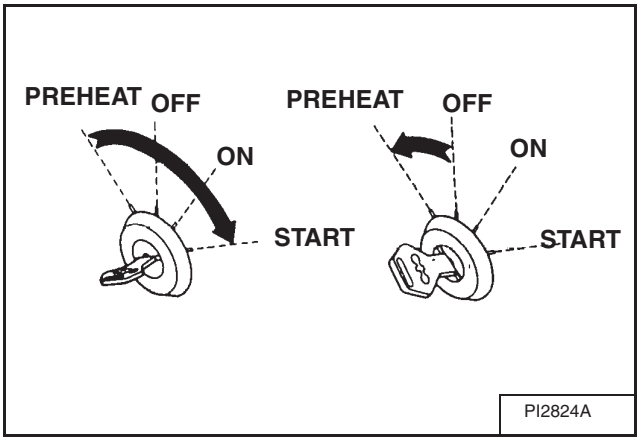


Figure 49



Turn the key to the PREHEAT position **[Figure 48]**. The light (Item 1) **[Figure 48]** will come ON. Preheat the engine for 15 seconds maximum.

Turn the key to the START position **[Figure 48]** and release the key when the engine starts. It will return to the ON position.

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

Turn the key switch OFF to stop the engine **[Figure 48]**,

Warming The Hydraulic System

⚠ WARNING

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

W-2381-0211

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

Installing And Removing The Attachment (Pin-On Attachment)

Installation

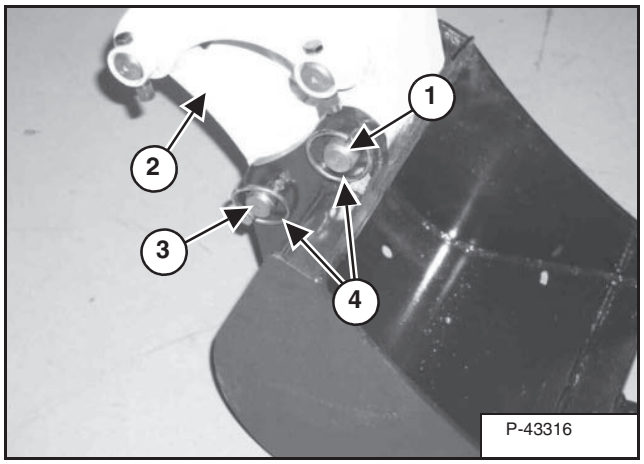
WARNING

AVOID INJURY OR DEATH

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

W-2140-0189

Figure 50



Install the link (Item 2) into the bucket, align the hole, install the pivot pin and washer (Item 3) **[Figure 50]**.

Install the arm into the bucket, align the hole, install the pivot pin (Item 1) **[Figure 50]**.

Install the fasteners (Item 4) **[Figure 50]**. Add grease to the pivot pins before operation.

Removal

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

Remove the fasteners and pivot pin (1, 3, and 4) **[Figure 50]**. Keep the pivot pins clean.

WARNING

AVOID INJURY OR DEATH

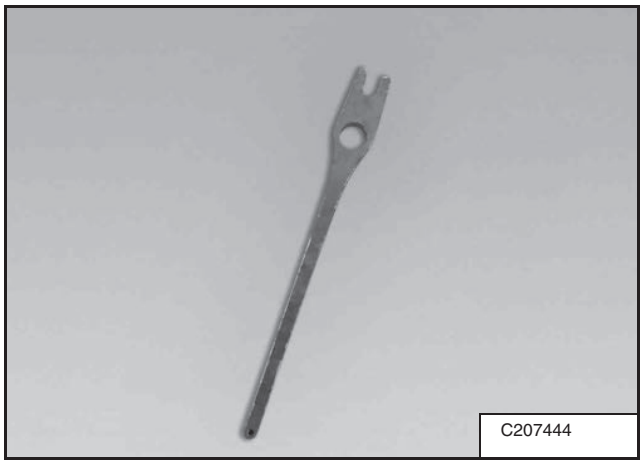
Never use attachments or buckets which are not approved by Bobcat Company. Buckets and attachments for safe loads of specified densities are approved for each model. Unapproved attachments can cause injury or death.

W-2052-0907

Installing And Removing The Attachment (Mechanical Pin Grabber Coupler)

Installation

Figure 51



You have been supplied with the release tool **[Figure 51]** that is required to disengage and engage the safety lock. Do not use alternative tools, as they may damage the coupler.

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

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2052-0907

⚠ WARNING

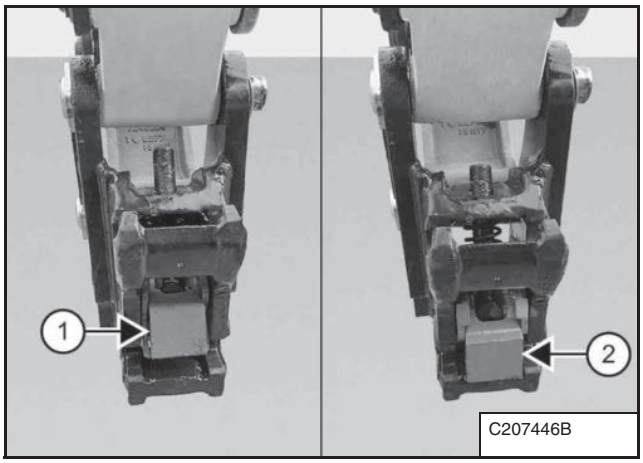
Keep all bystanders 6 m (20 ft) away from equipment when operating. Contact with moving parts, a trench cave-in or flying objects can cause injury or death.

W-2119-0910

A coupler equipped with the lifting device can only be used on machines on which the overload warning device and boom and arm load holding valves are installed. See your Bobcat dealer for available kits.

If your machine is equipped with a hydraulic clamp, fully retract the hydraulic clamp cylinder so the clamp is out of the way for installing the attachment.

Figure 52



Inspect the quick coupler. If the wedge and the trigger are in the primed position (Item 1) **[Figure 52]** proceed to **[Figure 54]**.

OR

If the wedge is in the engaged position (Item 2) **[Figure 52]**, proceed to **[Figure 53]**.

⚠ WARNING

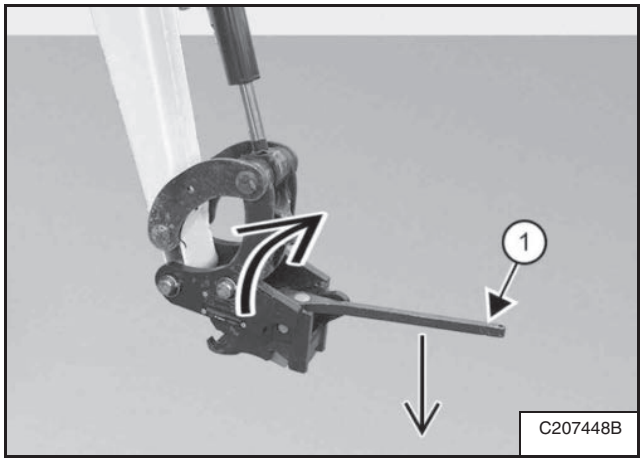
AVOID INJURY

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

W-2541-1106

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

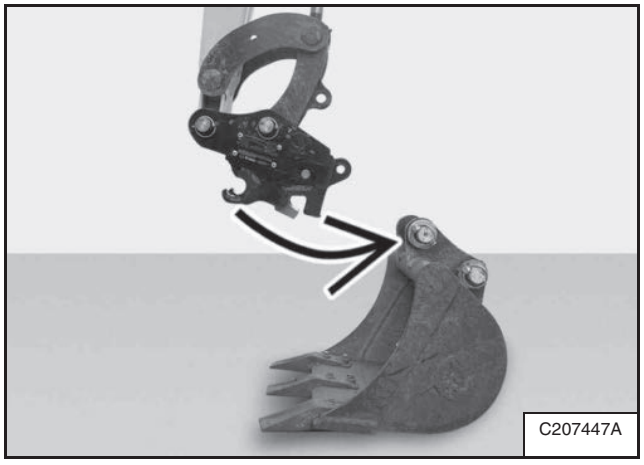
Figure 53



To prepare the quick coupler, do the following:

1. Stop the engine and exit the excavator.
2. Install the release tool (Item 1) **[Figure 53]**.
3. Rotate the release tool clockwise and hold **[Figure 53]**.
4. Push the release tool down **[Figure 53]**.
5. The bottom part of the wedge will withdraw from the rear pin slot and the trigger will drop down.
6. Remove the release tool and return it to a secure position.
7. Enter the excavator, fasten the seat belt, and start the engine.

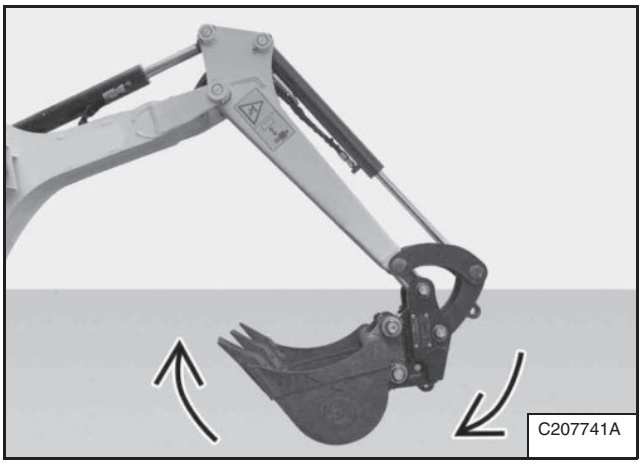
Figure 54



Guide the coupler front hooks onto the attachment front pin **[Figure 54]**.

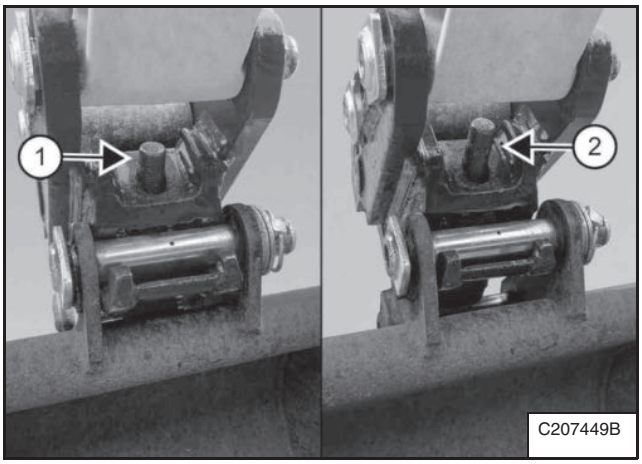
Raise the boom until there is approximately 500 mm (20 in) of clearance between the bottom of the attachment and the ground.

Figure 55



Extend the bucket cylinder and curl in the bucket **[Figure 55]** until you hear the wedge engage on the attachment back pin.

Figure 56



Visually inspect the indication bar to see if the coupler is fully engaged (Item 1) **[Figure 56]**.

If the visual indicator bar is not fully engaged (Item 2) **[Figure 56]**, the attachment must not be operated. Turn off the excavator and examine the coupler for dirt build up or damage. Refer to the service manual for further information.

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

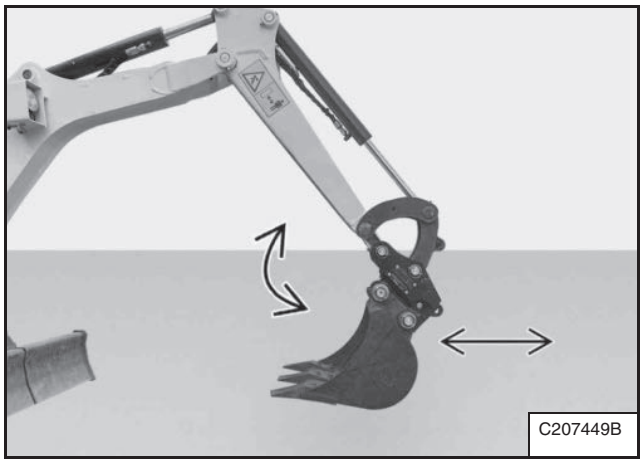
WARNING

AVOID INJURY OR DEATH

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

W-3024-0417

Figure 57



Shake the attachment vigorously and / or carry out a bump test to ensure the attachment is secured to the coupler **[Figure 57]**.

Removal

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

WARNING

AVOID INJURY OR DEATH

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

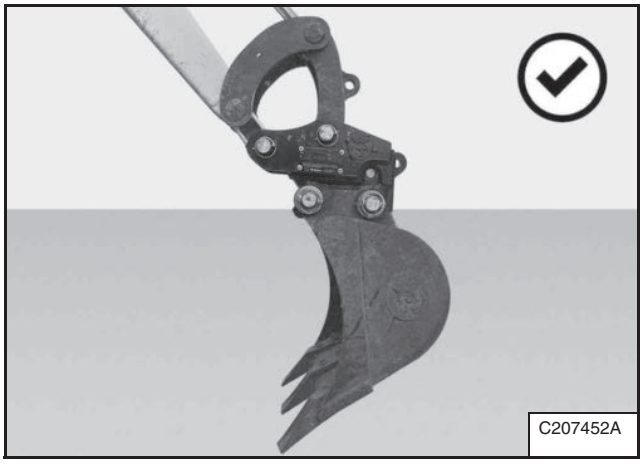
W-2052-0907

WARNING

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

W-2119-0910

Figure 58

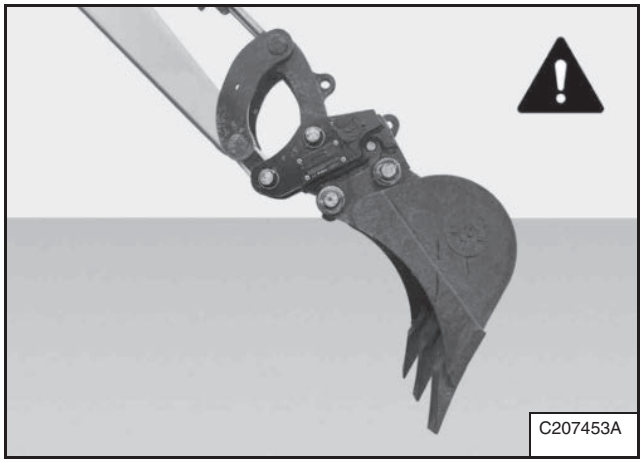


Position the attachment close to ground level at the angle shown **[Figure 58]**.

The bucket / attachment pins should be approximately parallel to the ground.

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

Figure 59



DO NOT RELEASE AN ATTACHMENT WITH THE COUPLER CURLED OPEN [Figure 59].

Stop the engine and exit the excavator.

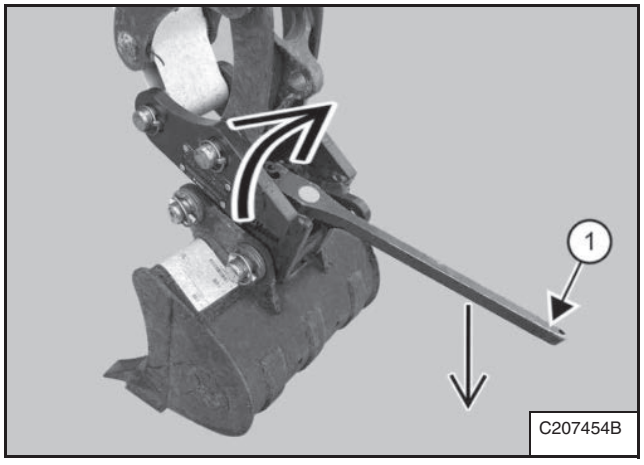
⚠ WARNING

AVOID INJURY

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

W-2541-1106

Figure 60



Firmly insert the release tool (Item 1) **[Figure 60]**.

⚠ WARNING

AVOID INJURY

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

W-2541-1106

Rotate the release tool clockwise and hold **[Figure 60]**.

Press the release tool down against the wedge to disengage the attachment back pin **[Figure 60]**.

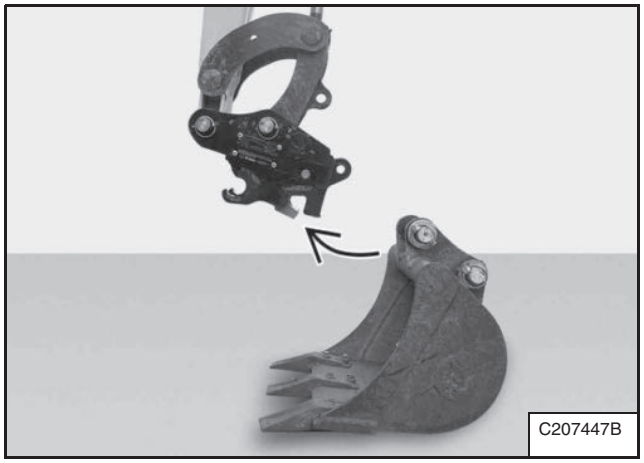
Remove the release tool and return it to a secure position.

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

Lower the attachment to the ground.

Roll the coupler back until the coupler disengages from the attachment.

Figure 61



Move the arm away from the attachment **[Figure 61]**.

Inspecting The Work Area

Before beginning operation, inspect the work area for unsafe conditions.

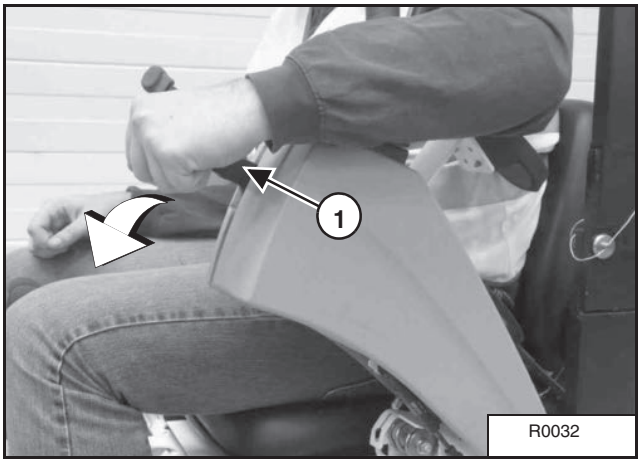
Look for sharp drop-offs or rough terrain. Have underground utility lines (gas, water, sewer, irrigation, etc.) located and marked.

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

Lowering The Work Equipment (Engine STOPPED)

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

Figure 62



The control lockout levers (Item 1) **[Figure 62]** disengage the hydraulic control functions from the control joysticks when they are raised.

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

Lower the control console(s) to engage the hydraulic control functions of the joysticks **[Figure 62]**.

Driving On Public Roads

When operating on a public road or motorway, always follow local regulations. For example: Slow Moving Vehicle Sign or direction signals can be required.

NOTE: Road kits are available from your Bobcat dealer to equip your machine for driving on public roads in European Union (EU) countries.

Always follow local regulations. For more information, contact your local Bobcat dealer.

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2374-0500

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

Steel tracks are not allowed on public roads. Plastic pads should be added on steel tracks to be allowed to travel on public roads.

IMPORTANT

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

I-2015-0284

Object Handling

The excavator must be equipped with the optional lift eye link (Item 1) **[Figure 63]**. See your Bobcat dealer for available Kits.

Do not exceed the Rated Lift Capacity. (See MACHINE SIGNS (DECALS) on Page 15.)

⚠ WARNING

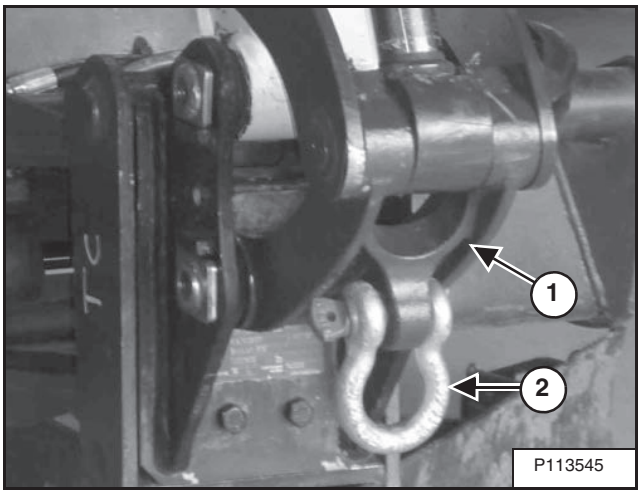
AVOID INJURY OR DEATH

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

W-2991-0714

Extend the bucket cylinder completely and lower the boom to the ground. Stop the engine. Exit the excavator. (See STOPPING THE EXCAVATOR on Page 51.)

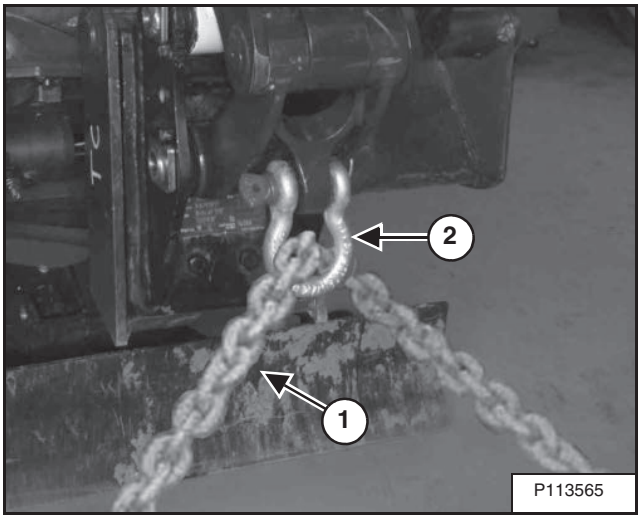
Figure 63



Install a clevis (Item 2) through the lift eye (Item 1) **[Figure 63]**.

NOTE: Visually check the lifting eye, the clevis and the lifting chain (lifting device) for any damage. Replace any damage components before lifting.

Figure 64

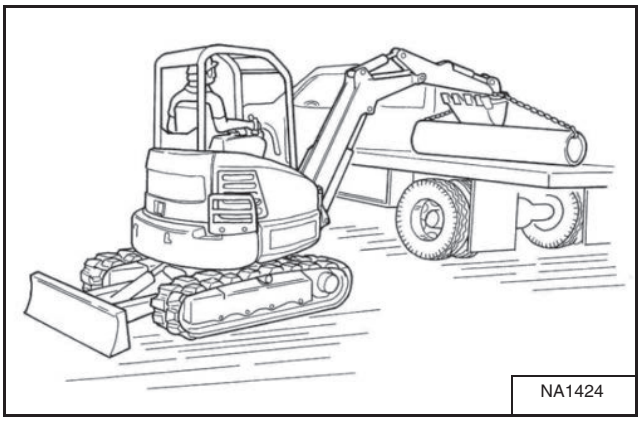


Install a lift chain (Item 1) (or other type of lifting device) through the clevis (Item 2) **[Figure 64]** and connect to the object to be lifted.

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

Enter the excavator, fasten the seat belt and start the engine. (See PRE-STARTING PROCEDURE on Page 36.)

Figure 65



Make sure the load is evenly weighted and centred on the lifting chain (or other type of lifting device), and is secured to prevent the load from shifting **[Figure 65]**.

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

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

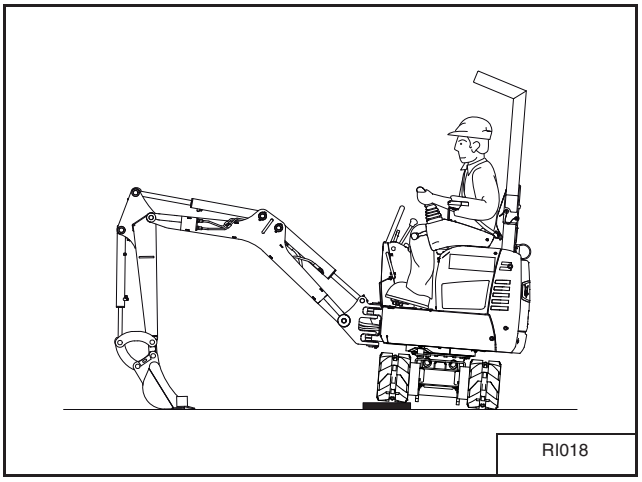
Driving The Excavator

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

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

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

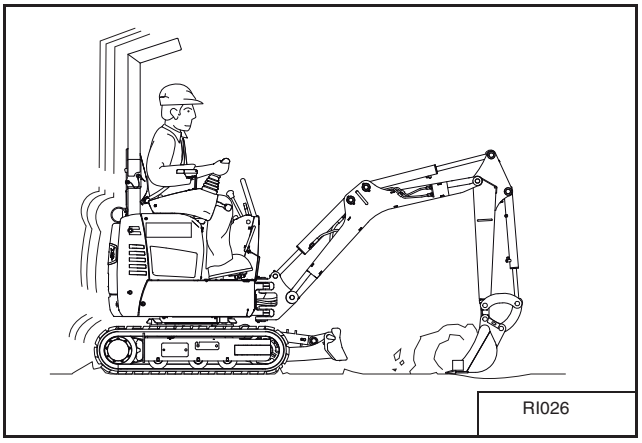
Figure 66



If one or both tracks have become stuck in soft or wet ground, raise one track at a time turning the upperstructure and pushing the bucket against the ground **[Figure 66]**.

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

Figure 67



The bucket can 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 67]**.

Operating On Slopes

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

⚠ WARNING

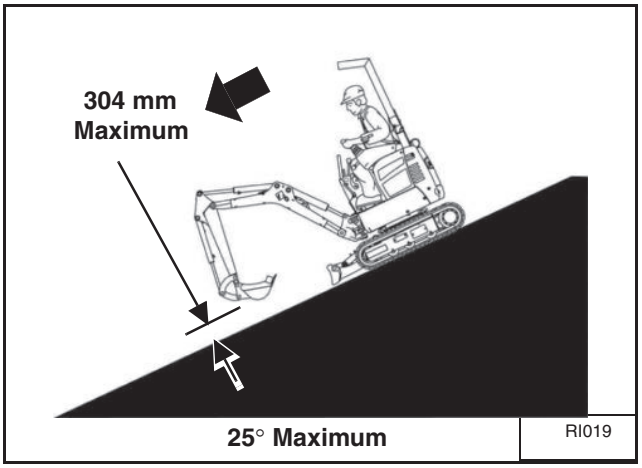
AVOID INJURY OR DEATH

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

W-2497-0304

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

Figure 68



When going down or backing up grades that exceed 15 degrees, put the machine in the position shown, and run the engine slowly **[Figure 68]**.

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

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

Stop the machine before moving the upper equipment controls. Never allow the blade to strike a solid object. Damage to the blade or hydraulic cylinder can result.

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2498-EN-1009

Figure 69

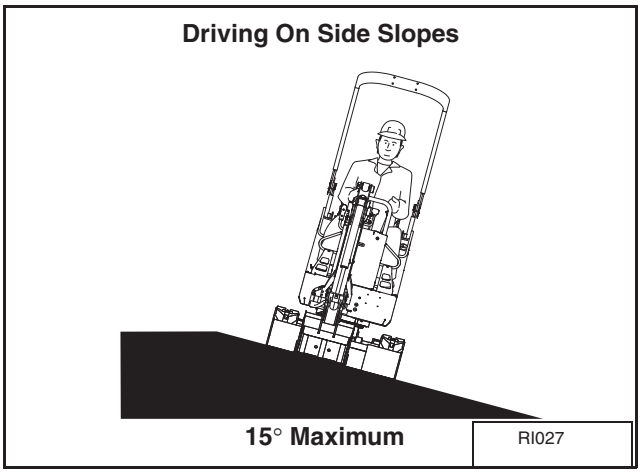
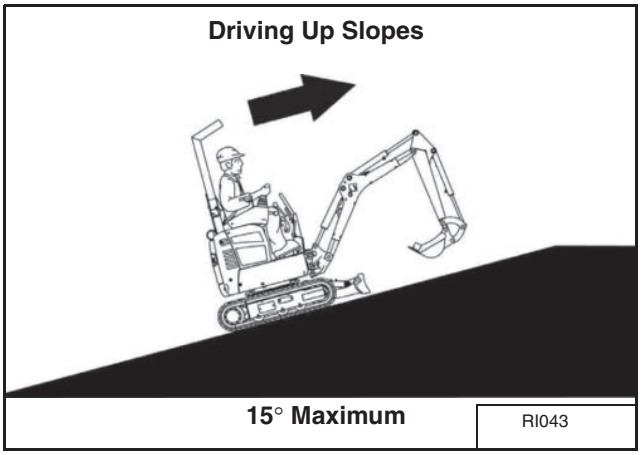


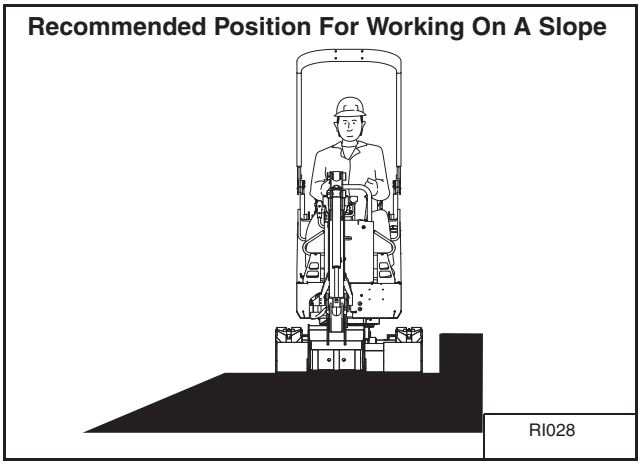
Figure 70



When going up slopes or on side slopes that are 15 degrees or less, position the machine as shown and run the engine slow **[Figure 69]** and **[Figure 70]**.

Operating On Slopes (Cont'd)

Figure 71



When operating on a slope, level the work area before beginning **[Figure 71]**.

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

Do not work on slopes which are over 15 degrees.

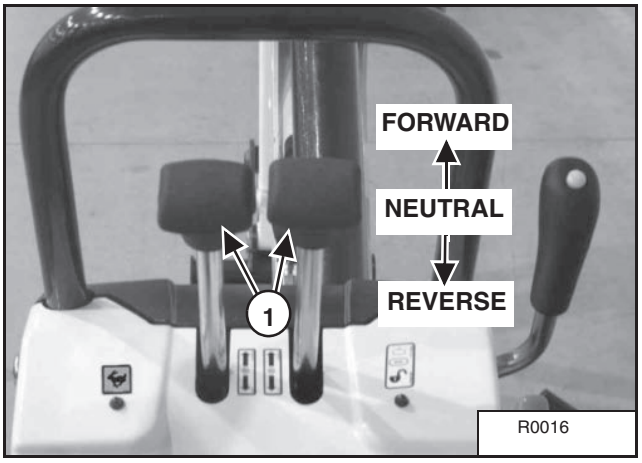
Use a slow work cycle.

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 soil far enough away from the trench or hole to prevent the possibility of a cave-in.

Figure 72



To brake the machine when going down a slope, move the steering levers (Item 1) **[Figure 72]** 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.

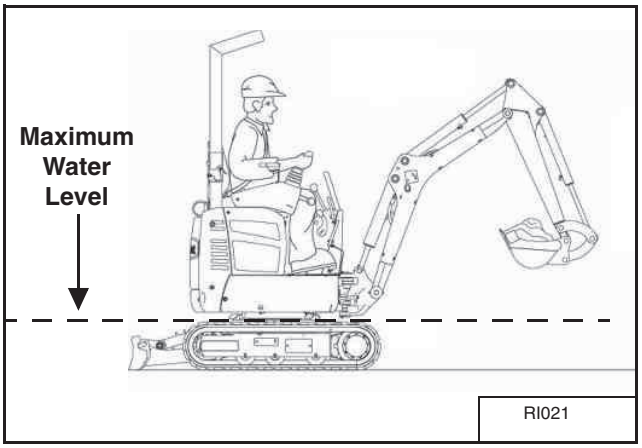
NOTE: If the engine stops, the boom / bucket (attachments) can be lowered to the ground using hydraulic pressure in the accumulator. The console must be in the locked down position, and the key switch in the ON position.
Use the control lever to lower the boom.

Start the engine and resume operation.

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 73



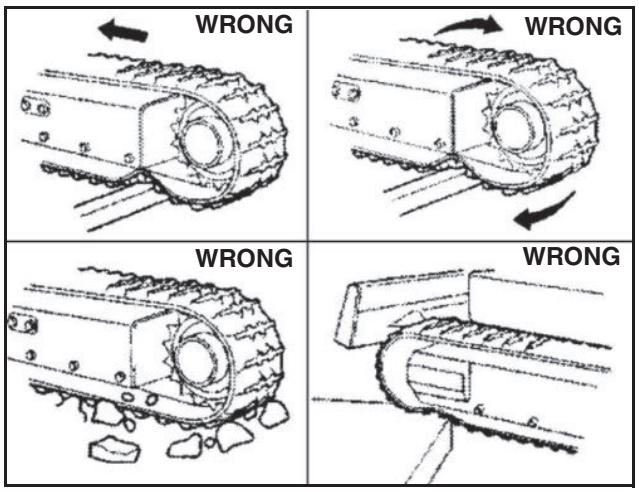
Do not operate or immerse the excavator in water higher than the bottom of the swing bearing **[Figure 73]**.

Grease the excavator when it has been operated or immersed in water for a period of time. Greasing forces the water out of the lubrication areas.

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

Avoiding Track Damage

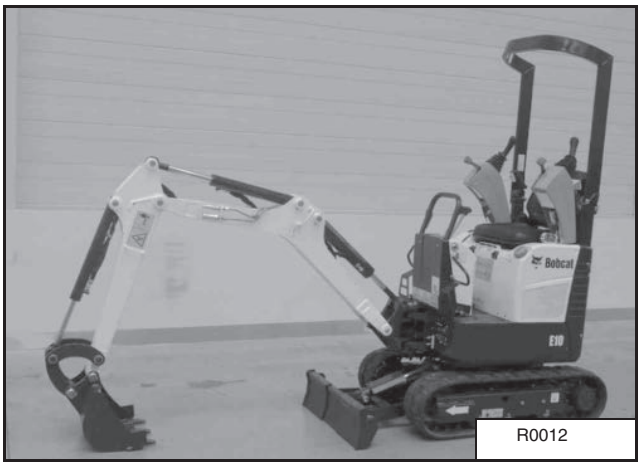
Figure 74



- Do not travel or turn on a sharp edge or stepped grade.
- The illustration **[Figure 74]** shows operating conditions to avoid to prevent damage to the rubber tracks.
- Do not turn sharply on a surface with a high-friction factor such as concrete or asphalt.
- Keep oil off the track. Clean any oil spills.
- Do not operate on a beach or in an area which can cause excessive corrosion.
- If the machine is not used for a long period of time, keep it indoors to prevent direct exposure to sunlight, rain, snow, etc.

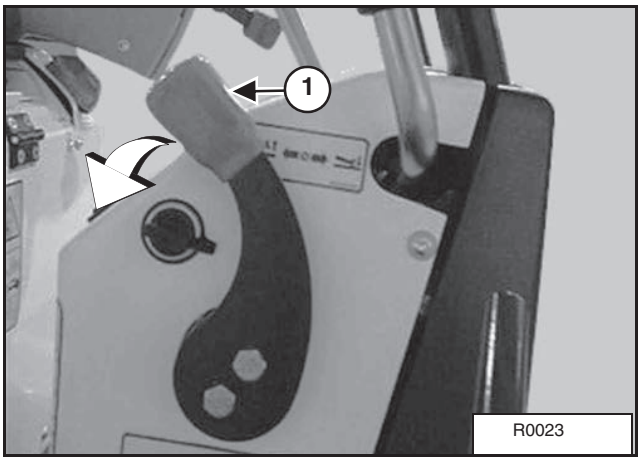
STOPPING THE EXCAVATOR

Figure 75



Stop the machine on level ground. Lower the work equipment and the blade to the ground **[Figure 75]**.

Figure 76



Move the engine speed control lever fully down **[Figure 76]** and run the engine at idle speed for about 5 minutes to allow it to cool.

Stop the engine.

Raise the control lockout levers.

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

LIFTING THE EXCAVATOR

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

Raise the blade all the way.

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

Put all the controls in neutral and engage the swing lock. (See UPPERSTRUCTURE SLEW LOCK on Page 33.)

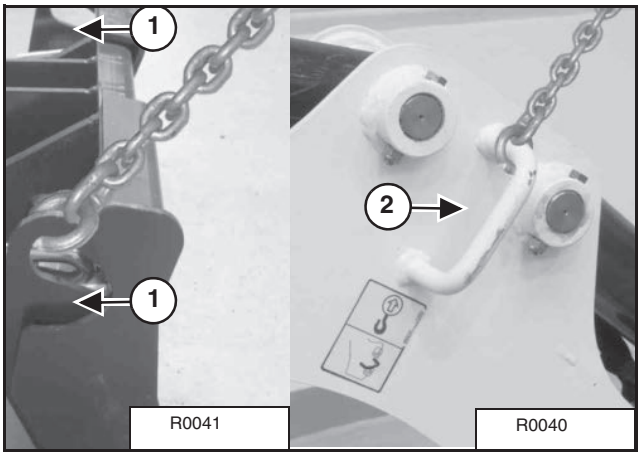
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2202-EN-0909

Figure 77



Fasten the chains to the ends of the blade (Item 1) **[Figure 77]** and up to a lifting fixture above the canopy.

Fasten a chain in the hook of the boom (Item 2) **[Figure 77]**.

TRANSPORTING THE EXCAVATOR

Loading Onto Transport Vehicle

When transporting the machine, observe the rules, motor vehicle laws and vehicle limit ordinances. Use a transport and towing vehicle of adequate length and capacity.

Align the ramps with the centre of the transport vehicle. Secure the ramps to the truck (or trailer) bed and be sure ramp angle does not exceed 15 degrees.

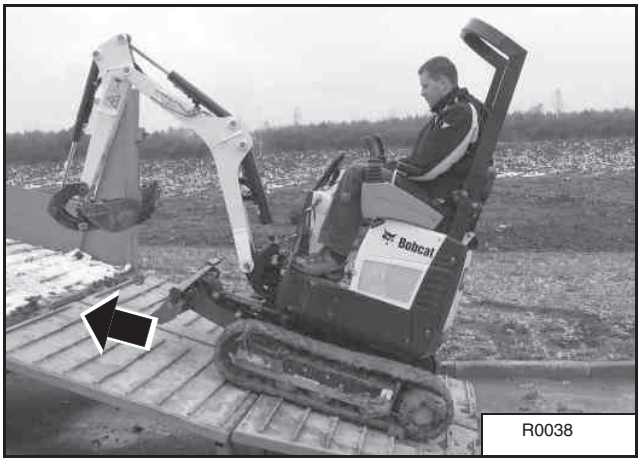
Use metal loading ramps with a slip resistant surface.

Use ramps that are the correct length and width, and can support the weight of the machine.

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

Determine the direction of the track movement before moving the machine (blade forward). Engage the swing lock. (See UPPERSTRUCTURE SLEW LOCK on Page 33.)

Figure 78



Move the machine forward onto the transport vehicle **[Figure 78]**.

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

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

Stop the engine and remove the key.

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

Fastening To Transport Vehicle

Figure 79

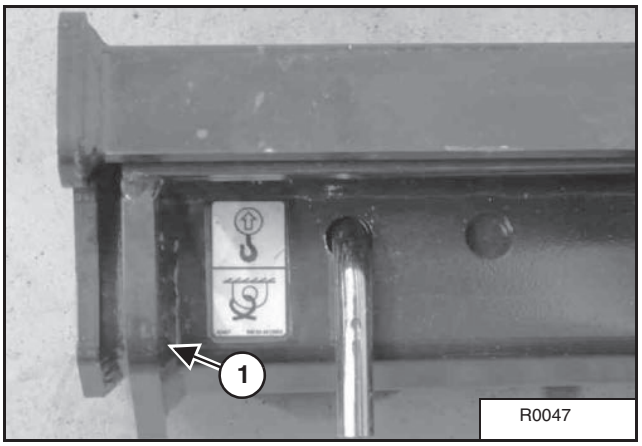


Figure 80

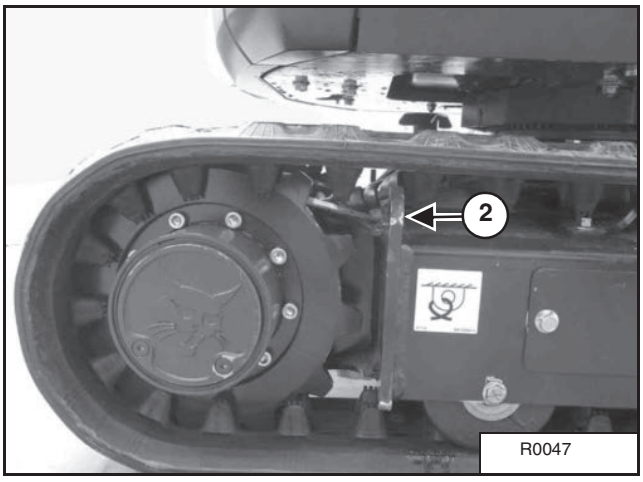
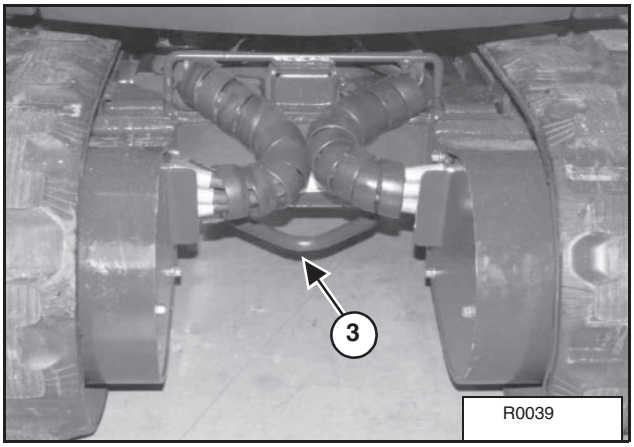


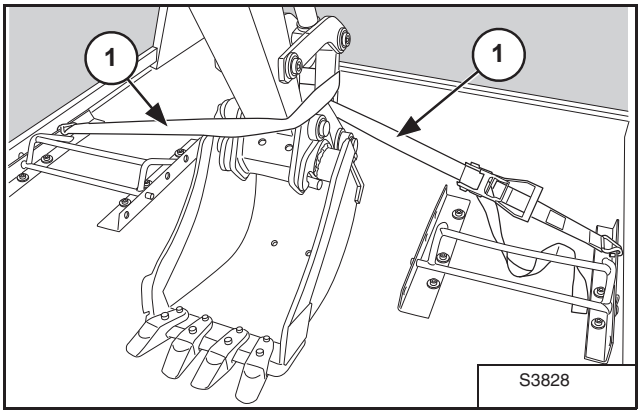
Figure 81



Fasten chains to the front corners of the blade (Item 1) **[Figure 79]**, to both sides of the tracks (Item 2) **[Figure 80]** and to the tie down loop at the rear of the track frame (Item 3) **[Figure 81]**.

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

Figure 82



- When on the transport vehicle, loop the chains through the holes in the mounting frame.
- Loop the chain (Item 1) **[Figure 82]** around the bucket link.

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH

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

W-2058-0807

PREVENTIVE MAINTENANCE

MAINTENANCE SAFETY

⚠ WARNING

Training is necessary before operating or servicing machine. Read and understand the Operation and Maintenance Manual, Operator's Handbook and signs (stickers) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0807

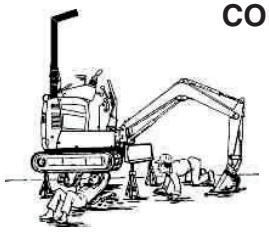
Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

CORRECT

P-90216

Never service the Bobcat Compact Excavator without instructions.

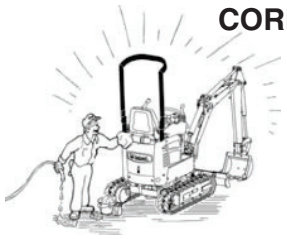
CORRECT



RI075

Use the correct procedure to lift and support the excavator.

CORRECT



RI072

Cleaning and maintenance are required daily.

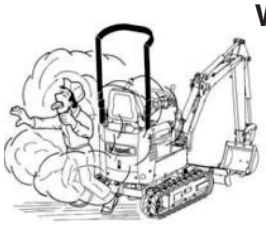
WRONG

RI076

Have good ventilation when welding or grinding painted parts.

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

WRONG

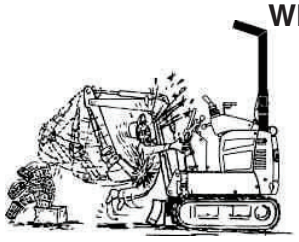


RI073

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

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

WRONG



RI077

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

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

WRONG

RI074

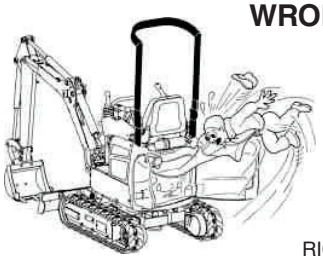
Stop, cool and clean engine of flammable materials before checking fluids.

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

Avoid contact with leaking hydraulic fluid or diesel fuel under pressure. It can penetrate the skin or eyes.

Never fill fuel tank with engine running, while smoking, or when near open flame.

WRONG



RI071

Keep body, jewellery and clothing away from moving parts, electrical contact, hot parts and exhaust.

Wear eye protection to guard from battery acid, compressed springs, fluids under pressure and flying debris when engines are running or tools are used. Use eye protections approved for type of welding.

Keep tailgate closed except for service. Close and latch tailgate before operating the excavator.

WRONG

B-19798

Lead-acid batteries produce flammable and explosive gases.

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

Batteries contain acid which burns eyes or skin on contact.

Wear protective clothing. If acid contacts body, flush well with water. For eye contact flush well and get immediate medical attention.

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

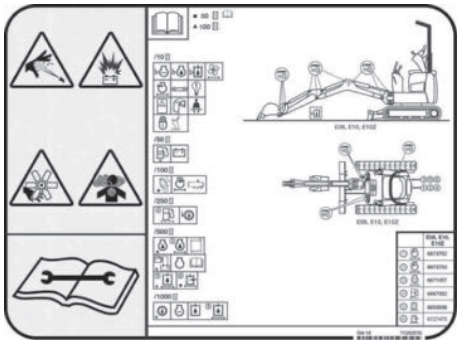
MSW33-0409

SERVICE SCHEDULE

Maintenance Intervals

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures.

The SERVICE SCHEDULE is a guide for correct maintenance of the Bobcat excavator.



See inside page of the back cover for symbols and identification.

⚠ WARNING

AVOID INJURY OR DEATH

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0807

Every 10 Hours (Before Starting The Excavator)

- **Engine Oil** - Check level and add as needed. (See Page 65.)
- **Engine Air Filters and Air System** - Check the condition indicator. Service only when required. Check for leaks and damaged components. (See Page 61.)
- **Engine Cooling System** - Clean debris from oil cooler, radiator and grille. Check coolant level COLD and add premixed coolant as needed. (See Page 67.)
- **Seat Belt, Seat Belt Retractors, Seat Belt Mounting hardware, Control Console Lockout** - Check the condition of seat belt and mounting hardware. Clean or replace seat belt retractors as needed. Check the control console lockout lever for proper operation. Clean dirt and debris from moving parts. (See Page 62.)
- **Motion Alarm** - Check for proper function (if equipped).
- **TOPS** - Check condition and mounting hardware. (See Page 25.)
- **Indicators and Lights** - Check for correct operation of all indicators and lights. (See Page 23.)
- **Safety Signs and Safety Tread** - Check for damaged signs (decals) and safety tread. Replace any signs and safety treads that are damaged. (See Page 15.)
- **Hydraulic Fluid** - Check fluid level and add as needed. (See Page 76.)
- **Track Tension** - Check tension and adjust as needed. (See Page 82.)
- **Pivot Points** - Grease all machinery pivot points. (See Page 86.)

First 50 Hours

- **Engine Oil and Filter** - Replace oil and filter. (See Page 65.)
- **Drive Belts (Alternator / Fan)** - Check condition. Replace as needed. (See Page 69.)

Every 50 Hours

- **Swing Bearing** - Grease swing bearing and swing pinion. Service every 10 hours when operating in water. (See Page 86.)
- **Battery** - Check cables, connections, and electrolyte level; add distilled water as needed. (See Page 72.)
- **Fuel Tank** - Drain water and sediment from fuel tank and fuel filter. (See Page 64.)

SERVICE SCHEDULE (CONT'D)

Maintenance Intervals (Cont'd)

First 100 Hours

- **Alternator and Starter** - Check connections.
- **Drive Motors (Final Drive)** - Replace fluid. (See Page 84.)
- **Hydraulic Filter** - Replace the hydraulic filter. (See Page 77.)

Every 100 Hours

- **Spark Arrestor Muffler** - Clean spark chamber. (See Page 81.)
- **Drive Belts (Alternator / Fan)** - Check condition. Replace as needed. (See Page 69.)

Every 250 Hours Or Every 12 Months

- **Fuel Filter** - Replace filter. (See Page 64.)
- **Drive Motors (Final Drive)** - Check fluid level and add as needed. (See Page 84.)

Every 500 Hours Or Every 12 Months

- **Engine Oil and Filter** - Replace oil and filter. (See Page 64.)
- **Cooling System** - Clean debris from radiator, hydraulic fluid cooler (if equipped). (See Page 67.)
- **Hydraulic Filter and Hydraulic Reservoir Breather Cap** - Replace the hydraulic filter, and the reservoir breather cap. (See Page 76.)
- **Alternator and Starter** - Check connections.
- **Engine Valves** - Adjust the engine valve clearance.

Every 1000 Hours Or Every 12 Months

- **Hydraulic Fluid and Filters** - Replace hydraulic fluid and filters. (See Page 76.)
- **Drive Motors (Final Drive)** - Replace fluid. (See Page 84.)

Every 24 Months

- **Coolant** - Replace the coolant. (See Page 67.)

SS EXC E08-E10 S5-K 07-18

Contents Of The Inspection Checkbook

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The service schedule is a guide for correct maintenance of the Bobcat Excavator.

The Inspection Checkbook contains the following information:

- Doosan Trading Limited Warranty Conditions
- Protection Plus Extended Warranty Conditions
- General Parts Policy
- General Information
- First Inspection
- Scheduled Services
- Authorised Identification
- Lubricants and Fluids Table
- Service Parts Charts

Your local dealer can order the Inspection Checkbook.
Part number: 4420310.

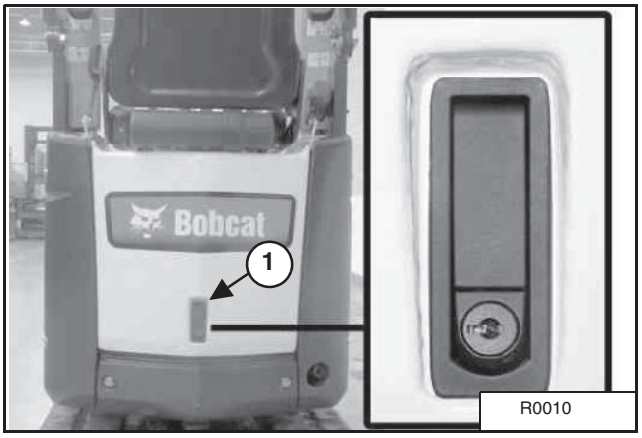
TAILGATE

Opening And Closing The Tailgate

⚠ WARNING

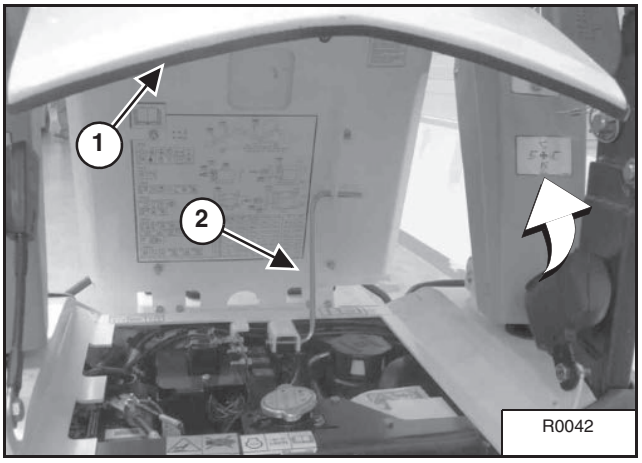
AVOID INJURY OR DEATH
Never service or adjust the machine when the engine is running unless instructed to do so in the manual.
W-2012-0497

Figure 83



Release the latch (Item 1) **[Figure 83]** and pull the tailgate open.

Figure 84



Pull the tailgate (Item 1) till blocking the wedge (Item 2) **[Figure 84]**.

To close the tailgate, carefully pull the wedge, handling the tailgate, and then close it until the latch is closed again.

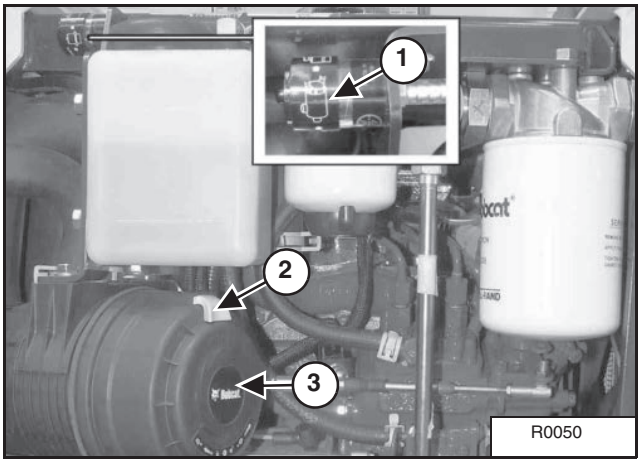
NOTE: The tailgate can be locked using the start key.

AIR CLEANER

(See SERVICE SCHEDULE on Page 57.) for the correct service interval.

Daily Check

Figure 85



Check the condition indicator (Item 1) **[Figure 85]**. If the red ring shows in the condition indicator, the filter needs to be replaced.

Replacing The Filters

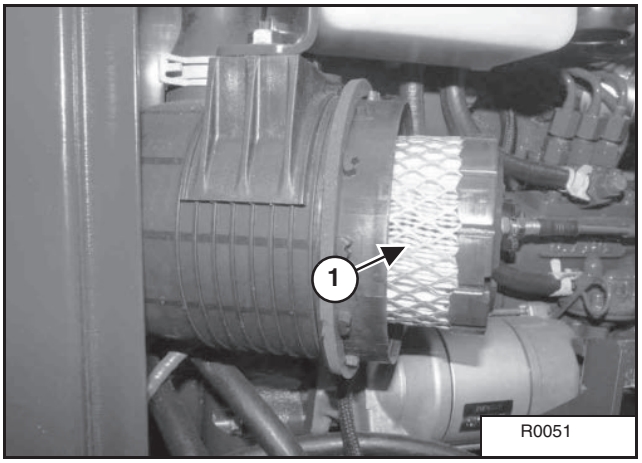
Outer Filter

Pull out the locking tab (Item 2) **[Figure 85]**.

Turn the dust cup (Item 3) **[Figure 85]** anticlockwise about 1/8 turn.

Remove and clean the dust cup.

Figure 86



Pull the outer filter (Item 1) **[Figure 86]** from the air cleaner housing.

Check the housing for damage.

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

Install a new outer filter.

Install the dust cup (Item 3) **[Figure 85]** and turn it clockwise about 1/8 turn.

Push the locking tab in (Item 2) **[Figure 85]**.

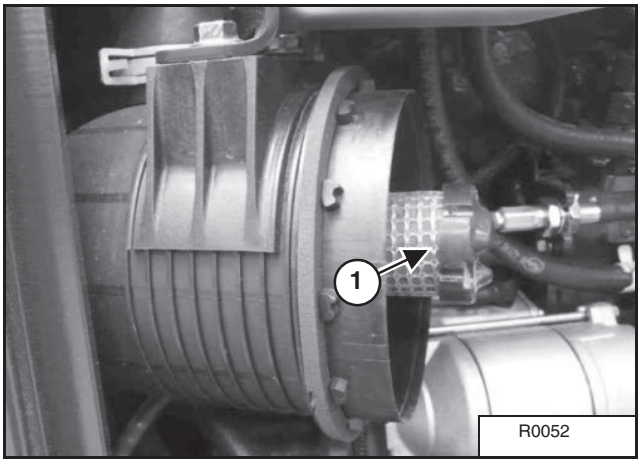
Check the air intake hose and the air cleaner housing for damage. Make sure all connections are tight.

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 on the top of the condition indicator (Item 1) **[Figure 85]** and start the engine. Run at full rpm, then reduce engine speed and stop the engine. If the red ring shows in the condition indicator, replace the inner filter.

Figure 87



Remove the dust cup (Item 3) **[Figure 85]**, the outer filter (Item 1) **[Figure 86]** and the inner filter (Item 1) **[Figure 87]**.

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

Install the new inner filter.

Install the outer filter and the dust cup.

Press the button on the condition indicator to reset the condition indicator (Item 1) **[Figure 85]** (the red ring will not show anymore).

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 discolourations 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.

The items below are referenced in **[Figure 88]**.

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.

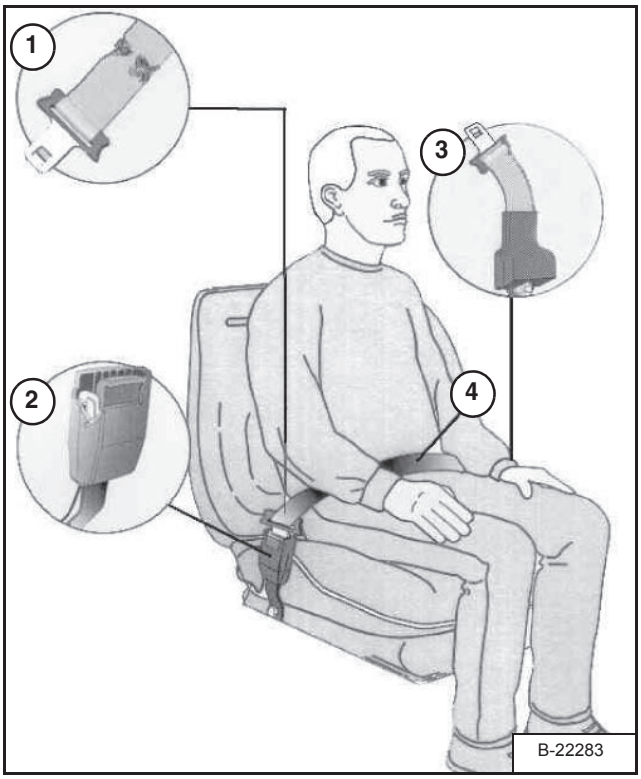
2. Check the buckle and latch for proper function. Make sure latch plate is not excessively worn, deformed or buckle is not damaged.

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 colour of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength can have weakened.

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

Figure 88



FUEL SYSTEM

Fuel Specifications

NOTE: Contact your local fuel supplier to receive recommendations for your region.

U.S. Standard (ASTM D975)

Use only clean, high quality diesel fuel, Grade Number 2-D or Grade Number 1-D.

Ultra low sulfur diesel fuel must be used in this machine. Ultra low sulfur is defined as 15 mg/kg (15 ppm) sulfur maximum.

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

TEMPERATURE	GRADE 2-D	GRADE 1-D
Above -9°C (+15°F)	100%	0%
Down to -21°C (-5°F)	50%	50%
Below -21°C (-5°F)	0%	100%

NOTE: Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than five percent biodiesel mixed with ultra low sulfur petroleum based diesel. This biodiesel blend fuel is commonly marketed as B5 blended diesel fuel. B5 blended diesel fuel must meet ASTM specifications.

E.U. Standard (EN590)

Use only clean, high quality diesel fuel that meets the EN590 specifications listed below:

- Ultra low sulfur diesel fuel defined as 10 mg/kg (10 ppm) sulfur maximum.
- Diesel fuel with cetane number of 51.0 and above.

NOTE: Biodiesel blend fuel may also be used in this machine. Biodiesel blend fuel must contain no more than seven percent biodiesel mixed with ultra low sulfur petroleum based diesel. This biodiesel blend fuel is commonly marketed as B7 blended diesel fuel. B7 blended diesel fuel must meet EN590 specifications.

Biodiesel Blend Fuel

Biodiesel blend fuel has unique qualities that should be considered before using in this machine:

- Cold weather conditions can lead to plugged fuel system components and hard starting.
- Biodiesel blend fuel is an excellent medium for microbial growth and contamination that 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.

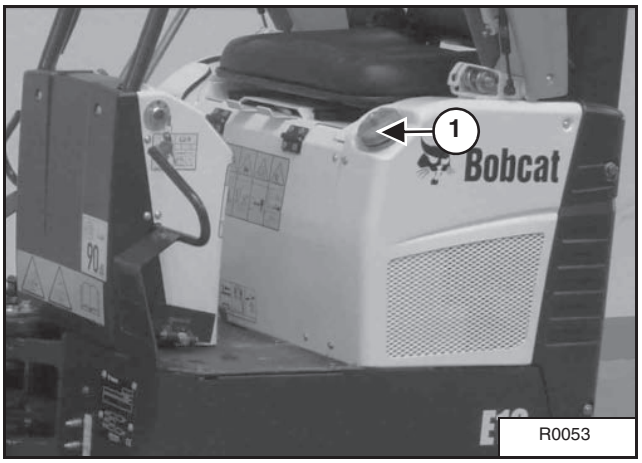
Apply the following guidelines if biodiesel blend fuel is used:

- 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 machine storage; drain the fuel tank, refill with 100% petroleum diesel fuel, add fuel stabiliser, and operate the engine for at least 30 minutes.

NOTE: Biodiesel blend fuel does not have long term stability and should not be stored for more than three months.

Filling The Fuel Tank

Figure 89



Remove the fuel fill cap (Item 1) under the left console using the key **[Figure 89]**.

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

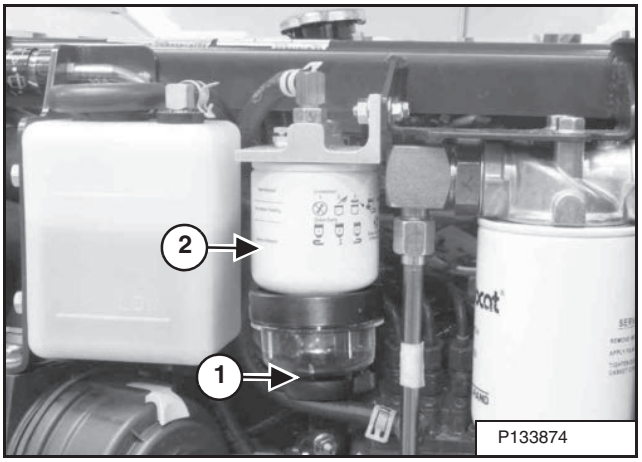
Install and tighten the fuel fill cap.

(See SERVICE SCHEDULE on Page 57.) for the service interval when to remove water from or replace the fuel filter.

Removing Water From The Fuel Filter

Open the tailgate.

Figure 90



Loosen the drain (Item 1) **[Figure 90]** at the bottom of the filter to drain water from the filter.

Replacing The Fuel Filter

Remove the filter (Item 2) **[Figure 90]**.

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

Remove the air from the fuel system. (See Removing Air From The Fuel System on Page 65.)

Draining The Fuel Tank

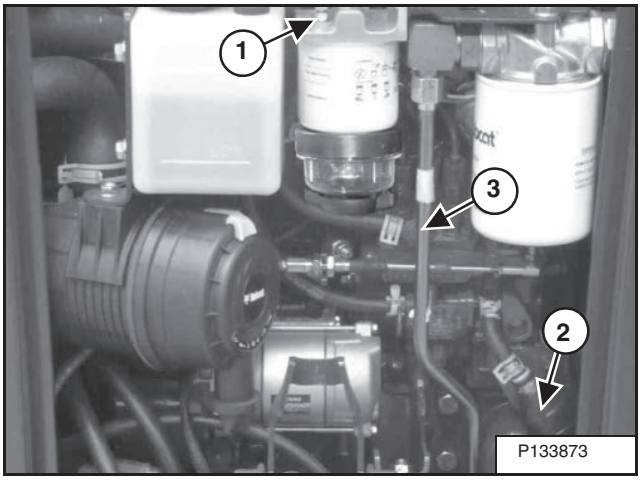
Remove the fuel line at the engine and put the end of the hose in a fuel can, squeeze the primer bulb (if equipped) and drain the fuel tank that way (siphon action).

(See SERVICE SCHEDULE on Page 57.) for the correct service interval.

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 91



Open the fuel filter vent (Item 1) **[Figure 91]**.

Operate the hand pump (priming bulb) (Item 2) **[Figure 91]** until the fuel flows from the vent with no air bubbles.

Close the vent (Item 1) **[Figure 91]** on the fuel filter housing.

Start the engine and let it run at low idle. It can be necessary to open the vent at the fuel injection pump (Item 3) **[Figure 91]** briefly until the engine runs smoothly.

⚠ WARNING

AVOID INJURY OR DEATH

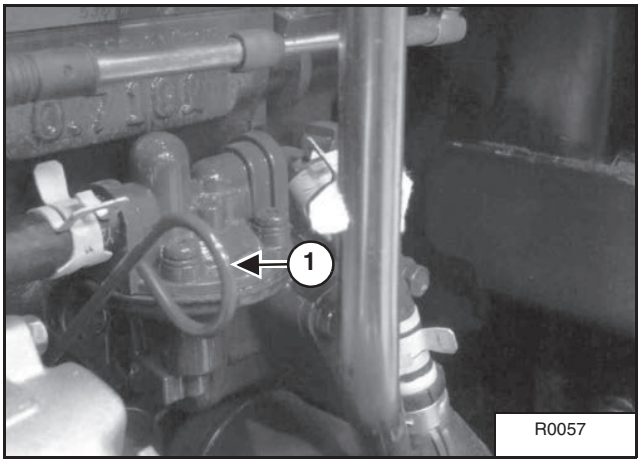
Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical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

W-2072-EN-0909

Checking And Adding Engine Oil

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

Figure 92



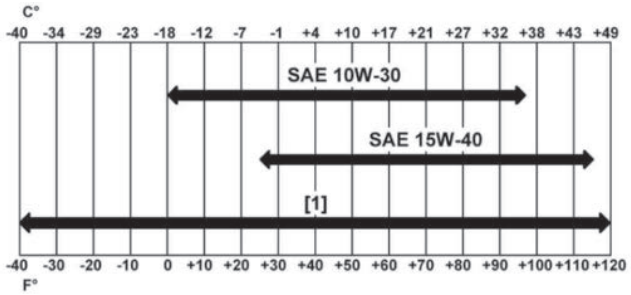
Open the rear door and remove the dipstick (Item 1) **[Figure 92]**.

Keep the oil level between the marks on the dipstick.

Engine Oil Chart

Figure 93

ENGINE OIL
RECOMMENDED SAE VISCOSITY NUMBER
(LUBRICATION OILS FOR DIESEL ENGINE CRANKCASE)



TEMPERATURE RANGE ANTICIPATED BEFORE NEXT OIL CHANGE (DIESEL ENGINES MUST USE API CLASSIFICATION CJ-4 OR BETTER)

[1] Bobcat Synthetic Oil – 5W-40.

Bobcat engine oils are recommended for use in this machine. If Bobcat engine oil is not available, use a good quality engine oil that meets API Service Classification of CJ-4 or better **[Figure 93]**.

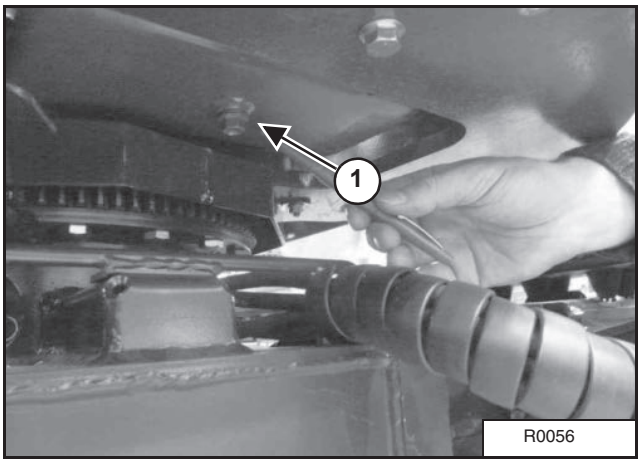
Replacing Oil And Filter

(See SERVICE SCHEDULE on Page 57.) for the service interval for replacing the engine oil and filter.

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

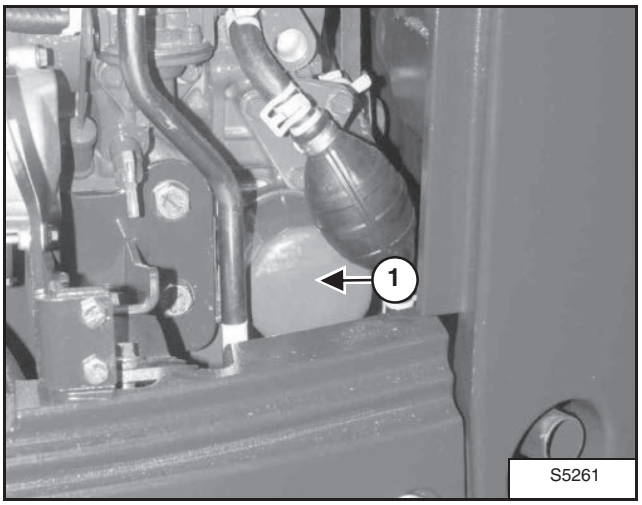
Open the tailgate.

Figure 94



Remove the drain plug (Item 1) **[Figure 94]**. Drain the oil into a container and recycle or dispose of used oil in an environmentally safe manner.

Figure 95



Remove the oil filter (Item 1) **[Figure 95]** and clean the filter housing surface.

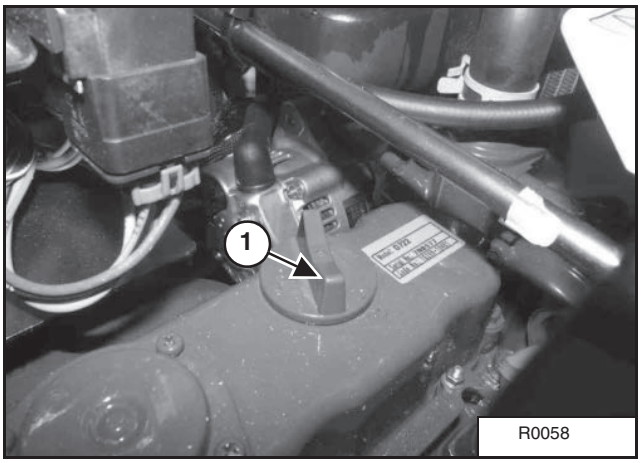
Use a genuine Bobcat filter.

Put clean oil on the filter gasket.

Install the filter and tighten by hand.

Install and tighten the drain plug (Item 1) **[Figure 94]**.

Figure 96



Remove the fill cap (Item 1) **[Figure 96]**.

Put 2,8 L of oil into the engine.

Use a good quality motor oil that meets the correct API Service Classification **[Figure 96]**.

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.

COOLING SYSTEM

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

Cleaning The Cooling System

Open the tailgate.

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

Checking The Coolant Level

⚠ WARNING

AVOID BURNS

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

W-2070-1203

⚠ WARNING

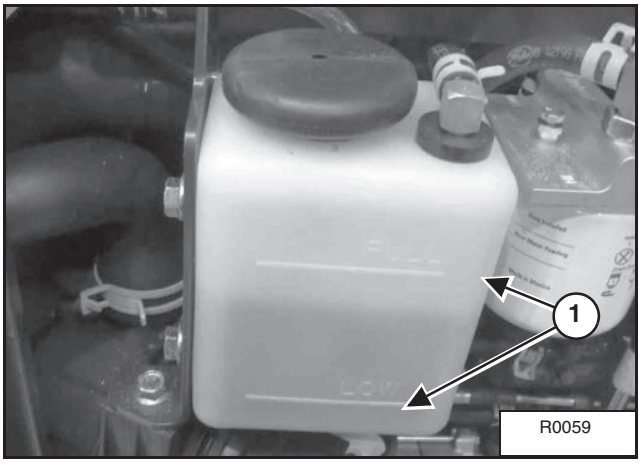
AVOID INJURY OR DEATH

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 97



The coolant level must be between the marks (Item 1) **[Figure 97]** on the coolant recovery tank.

IMPORTANT

AVOID ENGINE DAMAGE

Always use the correct ratio of water to antifreeze.

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

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

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

I-2124-0497

Replacing The Coolant

(See SERVICE SCHEDULE on Page 57.) for the service interval for replacing the engine oil and filter.

⚠ WARNING

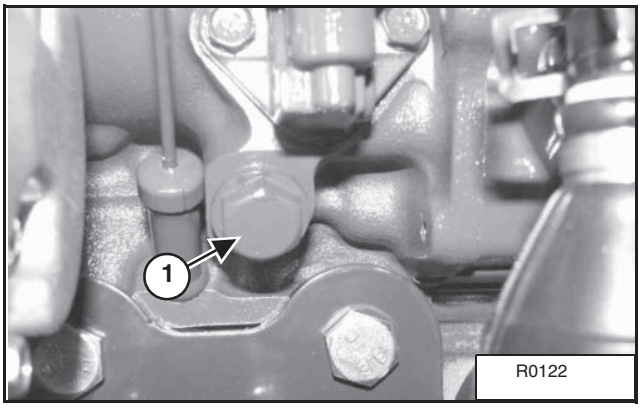
AVOID BURNS

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

W-2070-1203

When the engine is cool, remove the radiator cap.

Figure 98



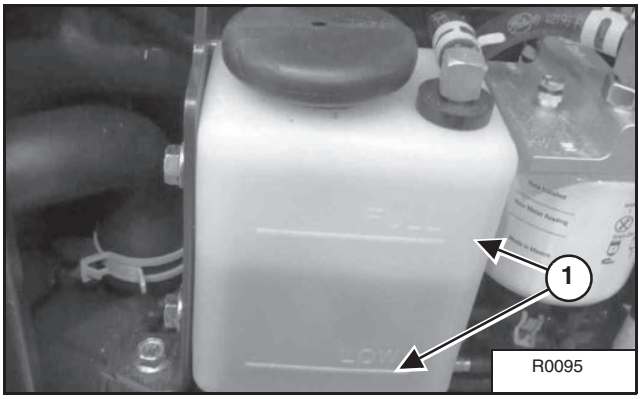
Open the drain valve (Item 1) **[Figure 98]** on the engine block and drain the coolant into a container.

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

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

Mix the coolant in a separate container. (See Fluid Capacities on Page 99.)

Figure 99



The coolant level must be between the marks (Item 1) **[Figure 99]** on the coolant recovery tank.

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

The correct mixture of coolant to provide a -37°C (-34°F) freeze protection is 5 L propylene glycol mixed with 4,4 L of water OR 1 U.S. gal propylene glycol mixed with 3.5 qt of water.

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

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

Add premixed coolant until the level is correct.

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

Add coolant to the recovery tank as needed.

Close the tailgate.

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.

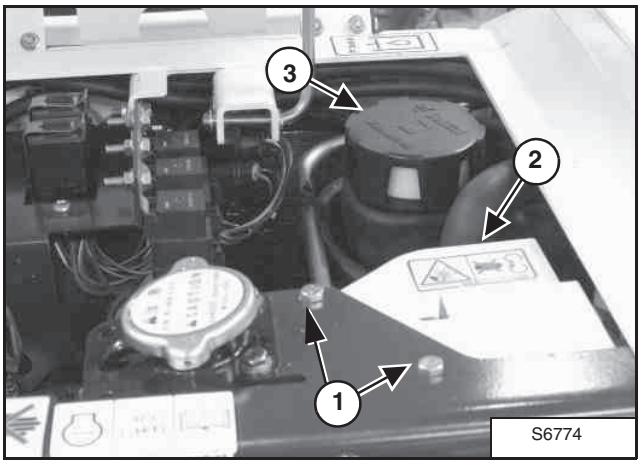
I-2124-0497

ALTERNATOR FAN BELT

Adjusting The Alternator Belt

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

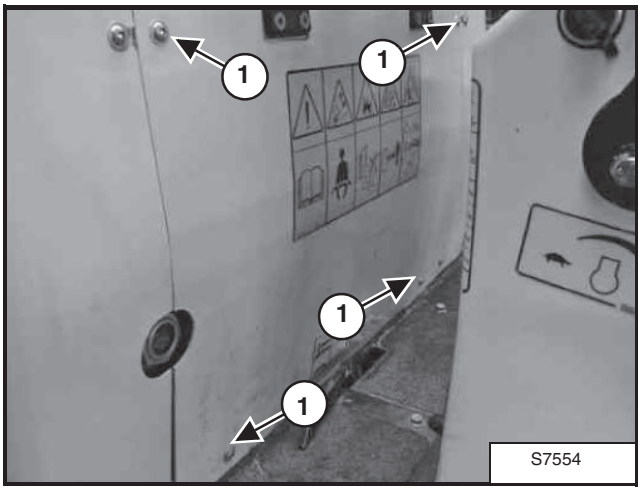
Figure 100



Remove the two bolts (Item 1) and remove the fan apron (Item 2) **[Figure 100]**.

Remove the fill cap (Item 3) **[Figure 100]** from the hydraulic reservoir.

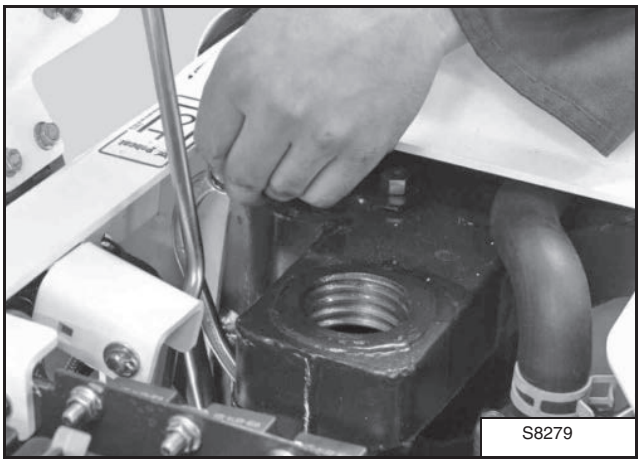
Figure 101



Remove the four bolts (Item 1) **[Figure 101]**.

Remove the cover.

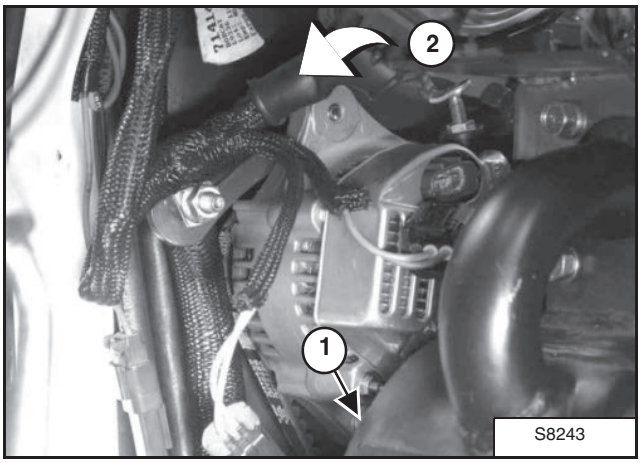
Figure 102



Loosen the upper alternator bolt using a bowed key wrench **[Figure 102]**.

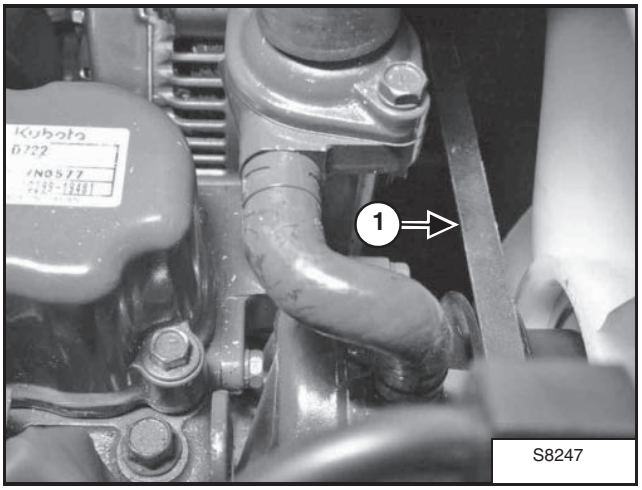
Adjusting The Alternator Belt (Cont'd)

Figure 103



Loosen the lower alternator mounting and adjustment bolt (Item 1) **[Figure 103]**.

Figure 104



If a belt tension tool is available, move the alternator toward the front of the machine (Item 2) **[Figure 103]** until the belt (Item 1) **[Figure 104]** has (New belt = 56 to 60 lbf or Used belt = 48 to 52 lbf) tension.

If a belt tension tool is not available, move the alternator toward the front of the machine (Item 2) **[Figure 103]** until the belt (Item 1) **[Figure 104]** has 13 mm (0.50 in) movement at the middle of the belt span with 58 N (13 lb) of force.

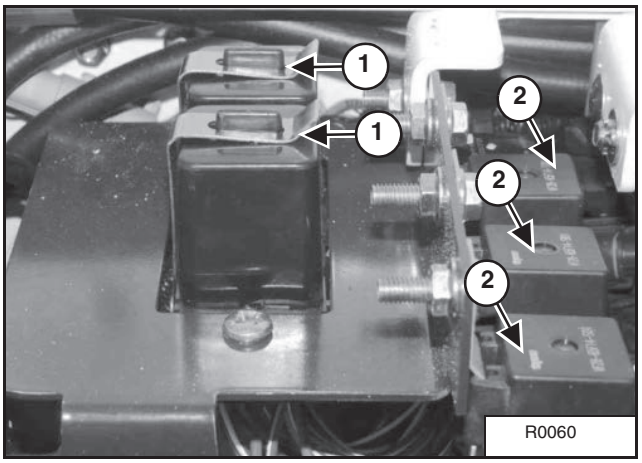
Tighten the mounting and adjustment bolts.

Install the cover, fill cap and fan apron.

ELECTRICAL SYSTEM

Description

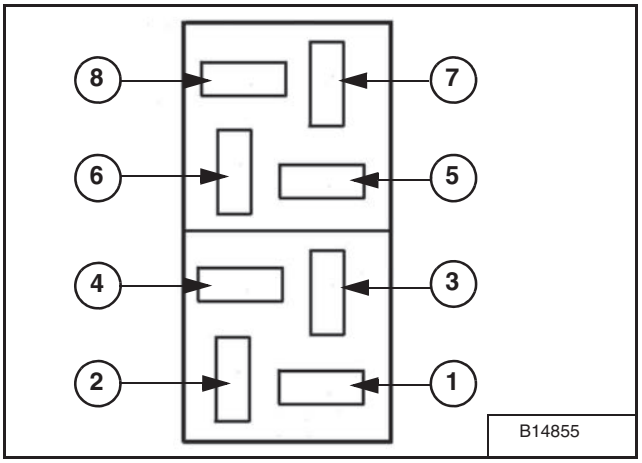
Figure 105



The excavator has a 12 volt, negative ground electrical system. The electrical system is controlled by fuses and relays located on top of the engine compartment (1 & 2) **[Figure 105]**. The fuses will protect the electrical system when there is an electrical overload. The reason for the overload must be found before starting the engine again.

Fuses

Figure 106



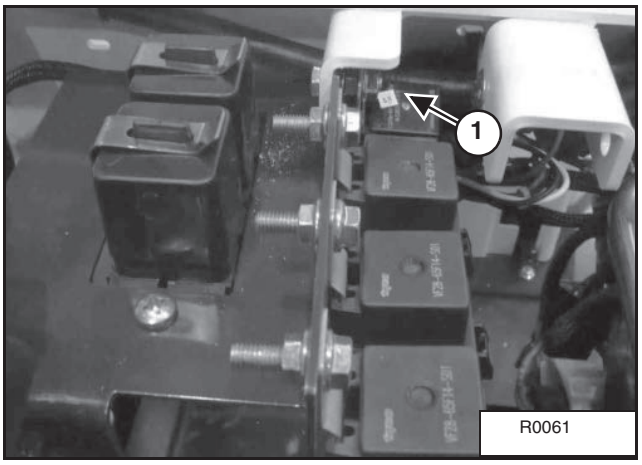
1. **Power Socket** - 15 A
2. **Ignition** - 10 A (SW)
3. **Timer** - 25 A (UNSW)
4. **Beacon** - 10 A
5. **Switch Power** - 10 A
6. **Valves horn** - 10 A
7. **Switched timer** - 10 A
8. **Light** - 10 A

Always replace fuses using the same type and capacity

Relays And Diodes

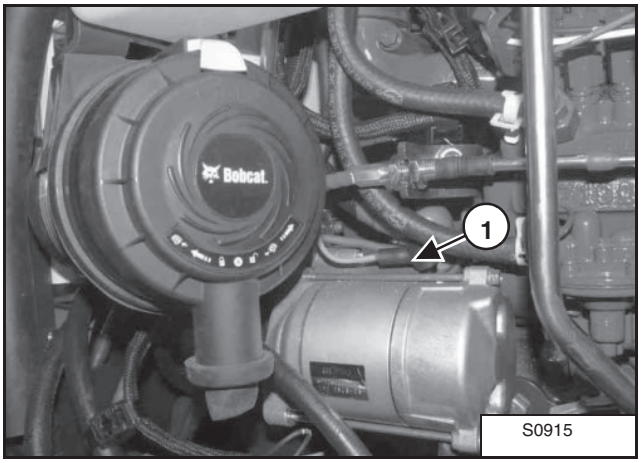
The three electrical relays (Item 2) **[Figure 105]** are located on top of engine compartment. The three relays control the starter, glow plugs and switched power circuits.

Figure 107



The fuel shut-off timer (Item 1) **[Figure 107]** is located on top of the engine compartment.

Figure 108



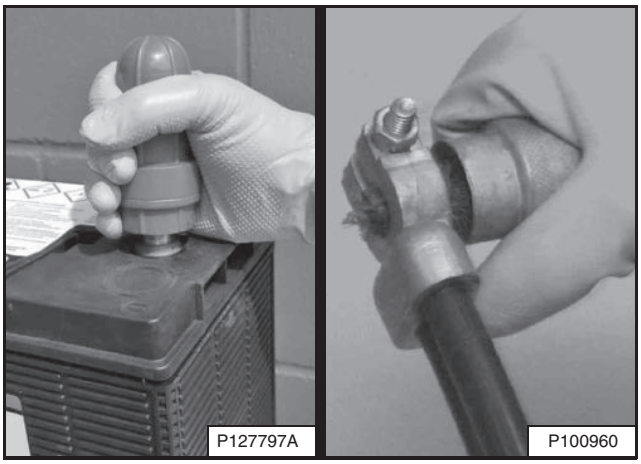
There are 2 diodes in the harness behind the starter (Item 1) **[Figure 108]**. The starter is located next to the cleaner, behind the access panel under the seat. The diodes are for alternator feedback protection and the glow plug during start function.

Battery Maintenance

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 57.)

The Bobcat brand battery supplied with your machine is sealed and does not require watering. Proper charging and storage are important to maximize the life of all batteries.

Figure 109



Simple steps for reliability and long battery life:

- Keep battery posts and terminals clean **[Figure 109]**.
- Keep terminals tight.
- Remove corrosion from battery and terminals with sodium bicarbonate (baking soda) and water solution.
- Put Bobcat Battery Saver or grease on the battery terminals and cable ends to prevent corrosion.
- Operate the machine for at least 15 minutes to recover from the battery drain caused by engine start up whenever practical.
- Maintain the battery charge level. This is a key factor for long battery life.
- Charge a severely discharged battery with a battery charger instead of relying on the machine charging system. (See Battery Charging on Page 73.)
- Check the battery state of charge every 30 days on machines that are not frequently used. (See Battery Testing on Page 73.)

⚠ WARNING

AVOID INJURY OR DEATH

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

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

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

W-2065-0807

Maintaining Battery Charge Level

All batteries will self-discharge over time. This machine has features that require battery power even when the machine is not being used. Use of a quality battery maintainer is highly recommended to ensure that your machine is ready to start when you need it and avoid costly battery replacement.

Battery Maintainers

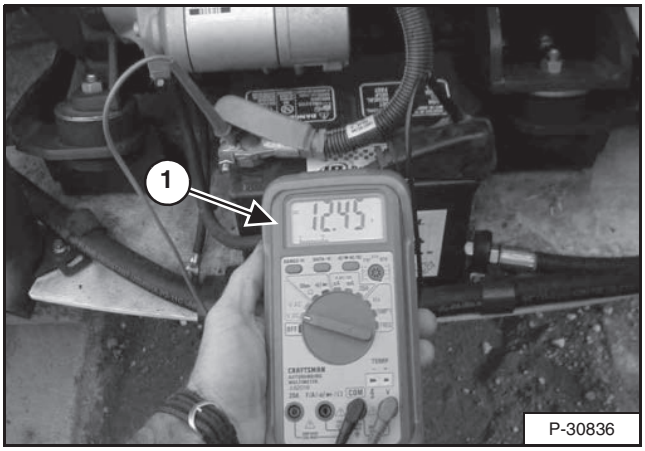
Use a good quality battery maintainer to keep the battery above 12.4 volts for machines that are not frequently used. Batteries below 12.4 volts must first be charged using a battery charger. Solar maintainers should have a minimum capacity of 10 watts to be effective.

Battery Service During Machine Storage

Remove the battery if storing the machine for an extended period of time. Fully charge the battery. Store the battery in a cool dry place above freezing and boost charge periodically. If battery removal is not desired, a good quality battery maintainer must be used to compensate for battery self-discharge and parasitic loads from machine controllers, accessories, and features such as connected machine intelligence.

Battery Testing

Figure 110



The simplest and most common check to determine battery state of charge is to use a digital multimeter or voltmeter (Item 1) **[Figure 110]**.

A battery found below 12.4 volts must be charged to 100% charge per the battery charger's recommendation. **Allow at least 60 minutes after operating the machine or charging the battery to get an accurate reading.**

If the reading is less than 12.4 volts after the battery has been charged for several hours, see your Bobcat dealer to have a more thorough battery test performed.

The freezing point of battery electrolyte is dependent on the battery state of charge. Keeping the battery voltage above 12.4 volts will help prevent batteries from freezing, even at extremely low temperatures.

If the battery freezes, the internal grid may be damaged and the case will be distorted or cracked. If this happens, dispose of the battery according to local regulations.

Battery Charging

A battery charger designed for 12 volt charging systems is recommended. Follow the battery charger manufacturer's instructions to charge the battery to 12.6 volts (100% charge). Batteries should be charged at room temperature to avoid an undercharge or overcharge condition. Never attempt to charge a frozen battery.

The following table can be used to identify the approximate amount of time required to charge a discharged battery. Allow at least 60 minutes after operating the machine or charging the battery to get an accurate reading.

BATTERY VOLTAGE	STATE OF CHARGE	CHARGER MAXIMUM RATE		
		30 Amps	20 Amps	10 Amps
12.6 V	100%	READY TO USE		
12.4 V	75%	0.9 hr.	1.3 hr.	2.5 hr.
12.2 V	50%	1.9 hr.	2.7 hr.	5.1hr.
12.0 V	25%	2.9 hr.	4.3 hr.	7.8 hr.
11.8 V	0%	4.0 hr.	5.7 hr.	10.7 hr.

NOTE: Use a good quality automatic charger to avoid battery damage from overcharging.

⚠ WARNING

BATTERY GAS CAN EXPLODE AND CAUSE SERIOUS INJURY OR DEATH

Keep arcs, sparks, flames and lighted tobacco away from batteries. When *jumping* from booster battery make final connection (negative) at machine frame.

Do not jump start or charge a frozen or damaged battery. Warm battery to 16°C (60°F) before connecting to a charger. Unplug charger before connecting or disconnecting cables to battery. Never lean over battery while boosting, testing or charging.

W-2066-0910

Using A Booster Battery (Jump Starting)

IMPORTANT

If jump starting the excavator from a second machine:

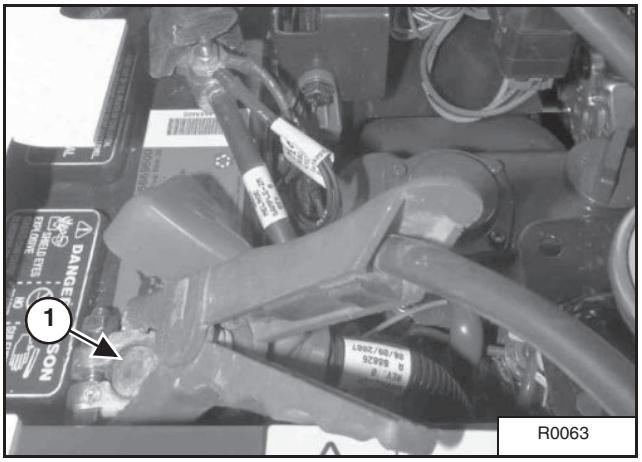
When jump starting the excavator from a battery installed in a second machine, make sure the engine is NOT running while using the glow plugs. High voltage spikes from a running machine can burn out the glow plugs.

I-2060-0906

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

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

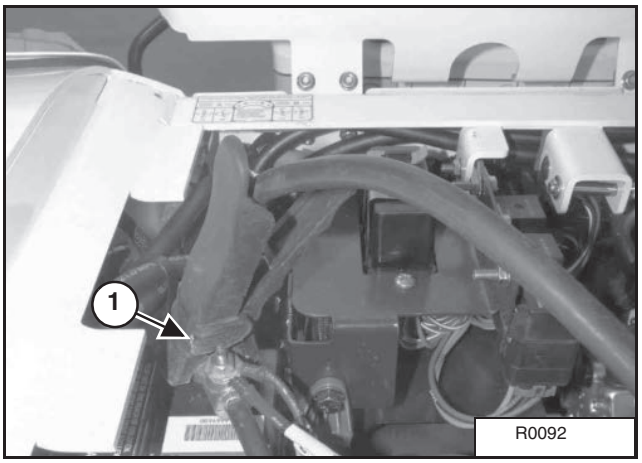
Figure 111



Remove the cover to the left of the operator's seat to access the battery.

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 111]** of the excavator battery.

Figure 112



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 bolt at the front left corner of the excavator (Item 1) **[Figure 112]**.

IMPORTANT

Damage to the alternator can occur if:

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

I-2223-0903

Start the engine. After the engine has started, remove the negative (-) cable first (Item 1) **[Figure 112]**.

Disconnect the cable from the excavator battery (Item 1) **[Figure 111]**.

Removing And Installing The Battery

⚠ WARNING

AVOID INJURY OR DEATH

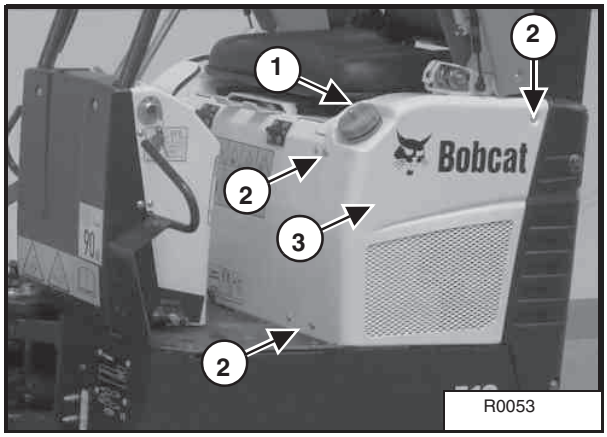
Batteries contain acid which burns eyes and skin on contact. Wear goggles, protective clothing and rubber gloves to keep acid off body.

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

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

W-2065-0807

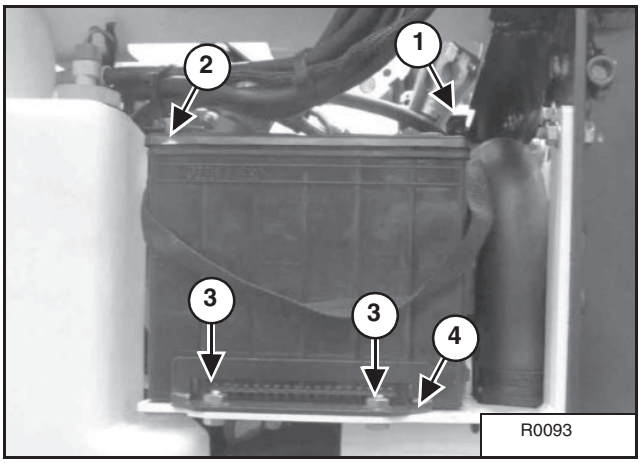
Figure 113



The battery is located to the left of the operator's seat. Remove the fuel cap (Item 1) with the start key and then the 3 bolts (Item 2) to remove the cover (Item 3) **[Figure 113]**.

NOTE: Put back the fuel cap as soon as the cover is removed, to avoid fuel vapor.

Figure 114



Disconnect the negative (-) cable (Item 1) **[Figure 114]** first.

Disconnect the positive (+) cable (Item 2) **[Figure 114]**.

Loosen the bolts (Item 3) **[Figure 114]** and remove the hold-down clamp (Item 4) to remove the battery.

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

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

Connect the battery cables. Connect the negative (-) cable (Item 1) **[Figure 114]** last to prevent sparks.

To replace the cover, first remove the fuel cap (Item 1) again, install the cover and tighten the 3 bolts (Item 2). Finally put back the fuel cap using the start key **[Figure 113]**.

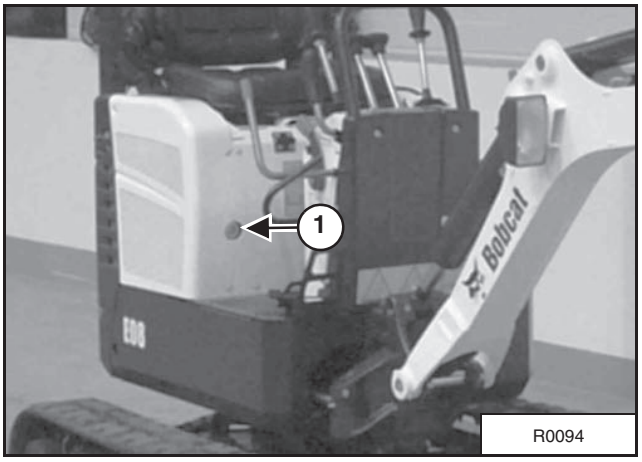
HYDRAULIC SYSTEM

Checking And Adding Hydraulic Fluid

Put the machine on a flat level surface.

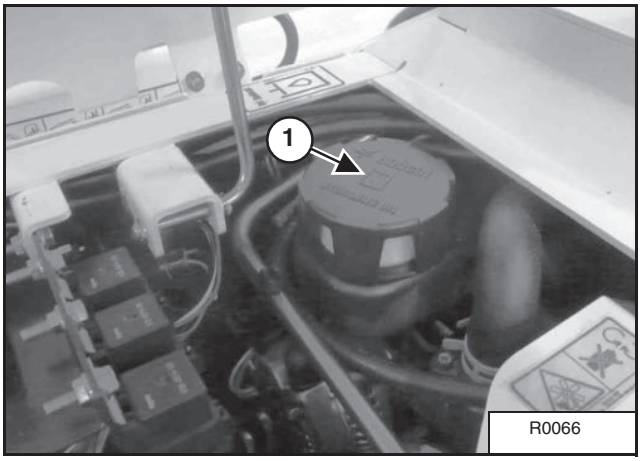
Retract the arm and bucket cylinders, put the bucket on the ground, lower the blade to the ground, and expand the tracks. Stop the engine.

Figure 115



The fluid must be at the centre of the sight gauge (Item 1) **[Figure 115]** and at normal storage temperature (15 - 25°C (60 - 77°F)).

Figure 116



Open the tailgate. Remove the oil fill cap (Item 1) **[Figure 116]**. Check the condition of the screen in the fill neck of the reservoir. The screen must be installed in the fill neck when adding oil.

Add the correct fluid to the reservoir until it is at the centre of the sight gauge (Item 1) **[Figure 115]**.

Install the cap. Close the tailgate.

⚠ WARNING

AVOID INJURY OR DEATH

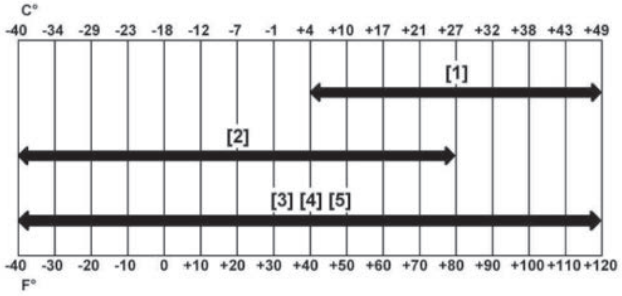
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire.

W-2103-0508

Hydraulic / Hydrostatic Fluid Chart

Figure 117

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



TEMPERATURE RANGE ANTICIPATED DURING MACHINE USE

[1] VG 100; Minimum VI 130
[2] VG 46; Minimum VI 150
[3] BOBCAT All-Season Fluid
[4] BOBCAT Synthetic Fluid
[5] BOBCAT Biodegradable Hydraulic / Hydrostatic Fluid (Unlike biodegradable fluids that are vegetable based, Bobcat biodegradable fluid is formulated to prevent oxidation and thermal breakdown at operating temperatures.)

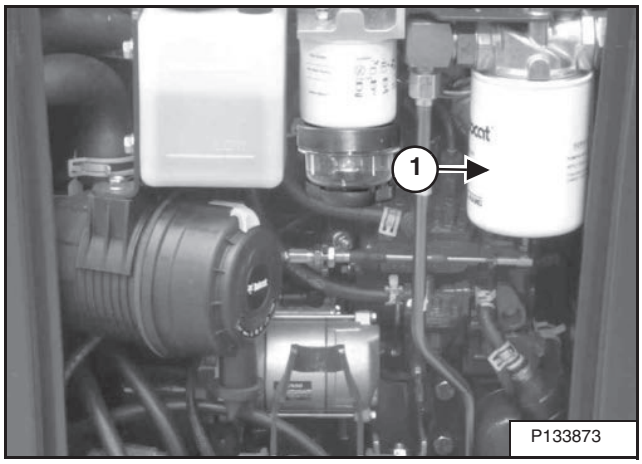
Install the oil fill cap.

Replacing The Hydraulic Filter

(See SERVICE SCHEDULE on Page 57.) for the correct service interval.

Open the tailgate.

Figure 118



Remove the hydraulic filter (Item 1) **[Figure 118]**.

Clean the housing where the filter gasket makes contact.

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

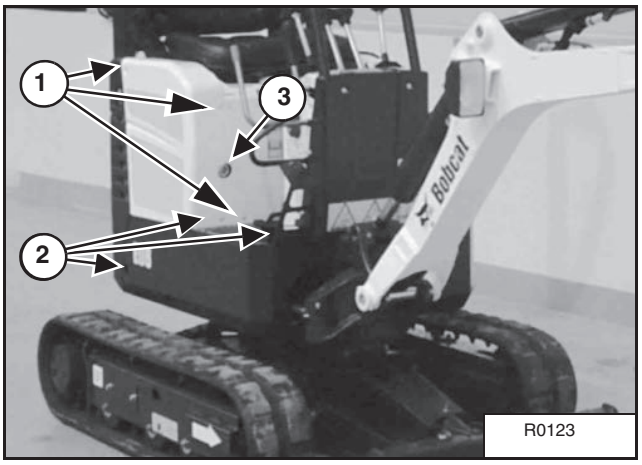
Start the engine. Run the excavator through the hydraulic functions. Stop the engine. Check the fluid level at the sight gauge (Item 2) **[Figure 115]** and add as needed. Check the filter area for leaks.

Draining Hydraulic Oil

(See SERVICE SCHEDULE on Page 57.) for the correct service interval.

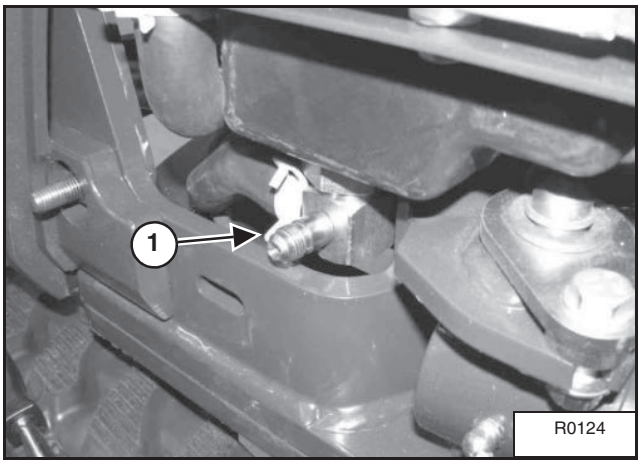
Retract the arm and bucket cylinders, lower the bucket to the ground. Stop the engine.

Figure 119



To gain access to drain the hydraulic oil, loosen the three bolts (Item 1) from the cover **[Figure 119]**. Pivot the cover downward. Then remove the black protection on the floor by loosening the bolts (Item 2)

Figure 120



Before removing the cap, place a container under the drain plug (Item 1) to collect the oil **[Figure 120]**.

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 regulations for the correct disposal.

I-2067-EN-0711

IMPORTANT

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

I-2045-0788

Install the cap again.

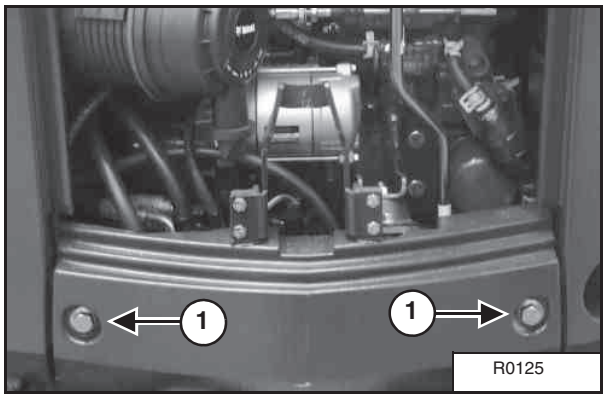
Add fluid to the reservoir until it is at the centre of the sight gauge (Item 3) **[Figure 119]**.

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

Replace the black protection and the cover.

Diagnostic Connectors

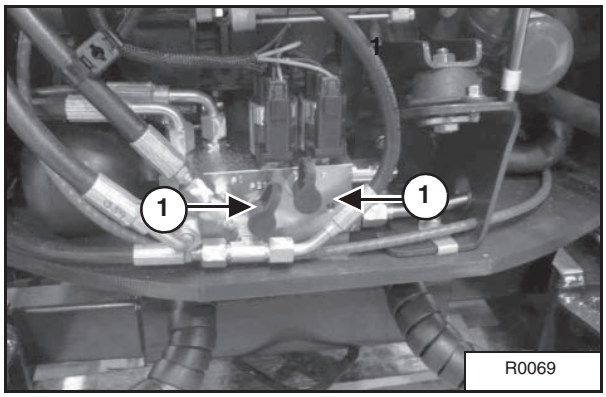
Figure 121



To gain access, remove the counterweight by loosening the two bolts (Item 1) **[Figure 121]**.

The connectors can be used by your Bobcat dealer to check circuit pressures.

Figure 122

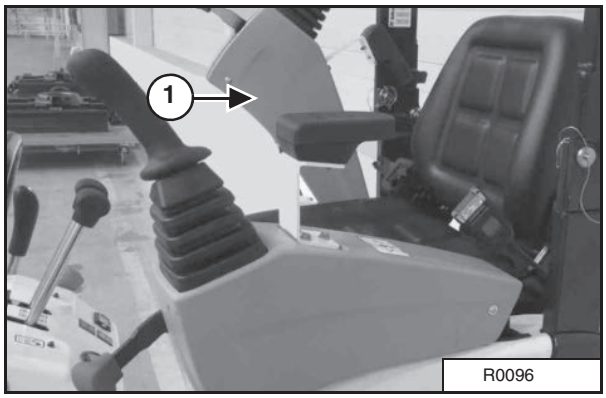


The 2 diagnostic connectors (Item 1) **[Figure 122]** are located on the hydraulic block.

CONTROL LOCKOUT LEVERS

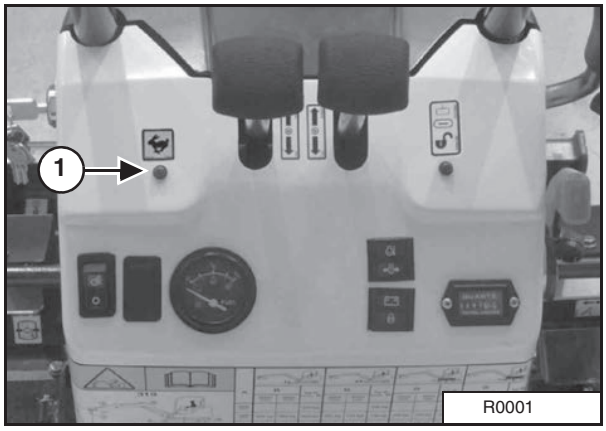
Inspection And Maintenance

Figure 123



When a console is raised **[Figure 123]**, the hydraulic control joysticks and traction system must not function.

Figure 124



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

Raise the right console (Item 1) **[Figure 123]**. The green light (Item 1) **[Figure 124]** on the console will go off.

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

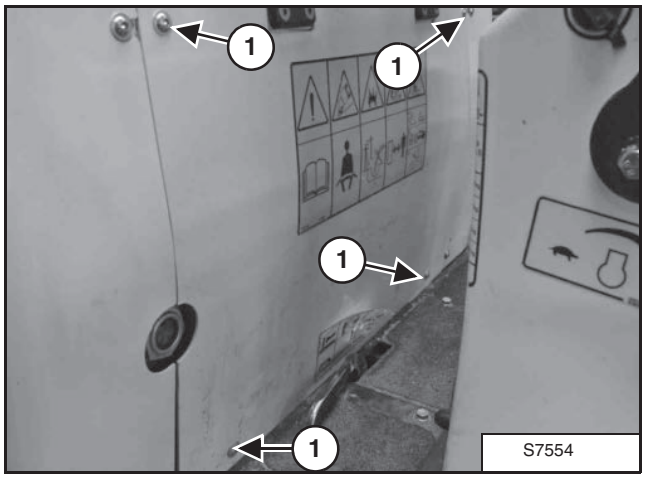
The joystick control levers and traction system must be deactivated when either console is raised.

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

SPARK ARRESTER MUFFLER

Cleaning Procedure

Figure 125



Remove the four bolts (Item 1) **[Figure 125]**.

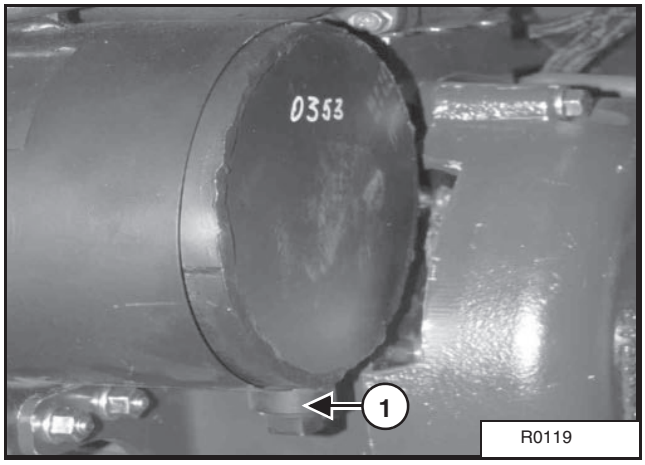
Remove the cover.

(See SERVICE SCHEDULE on Page 57.) for the correct service interval.

Do not operate the excavator with a defective exhaust system.

Stop the engine. Open the tailgate.

Figure 126



Remove the plug (Item 1) **[Figure 126]** 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.

Install the cover.

Tighten the bolts.

Close the tailgate.

⚠ WARNING

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

W-2011-1285

⚠ WARNING

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

Failure to do so can cause injury or death.

W-2203-0595

⚠ WARNING

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

W-2068-1285

TRACK TENSION

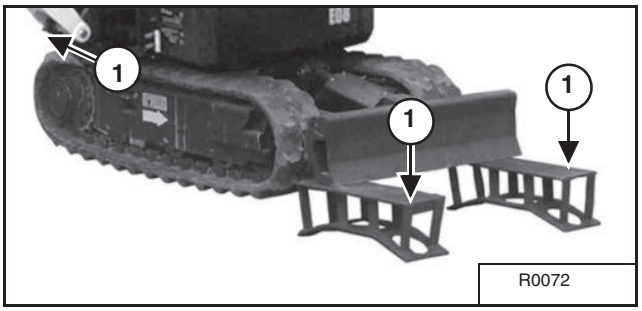
NOTE: The wear of undercarriage parts varies with working conditions and types of soil conditions. Maintain the correct track tension by inspecting regularly. (See SERVICE SCHEDULE on Page 57.) or the correct service interval.

Adjusting

Figure 127

Raise one side of the machine (approximately 102 mm) using the boom and arm as shown in **[Figure 127]**.

Figure 128



Raise the blade fully and install jackstands (Item 1) **[Figure 128]** under the blade and the track frame. Lower the machine until all machine weight is on the jackstands **[Figure 128]**.

Stop the engine.

Figure 129

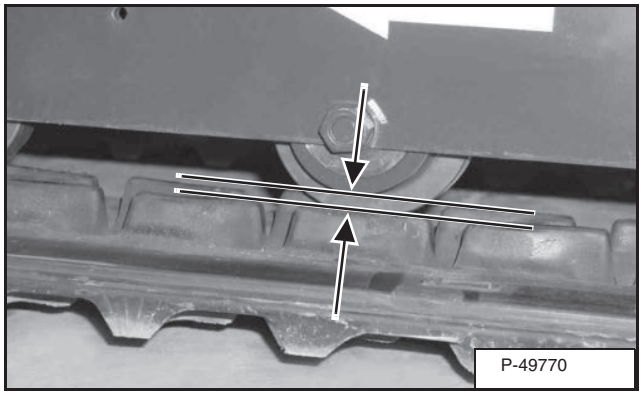


Figure 130

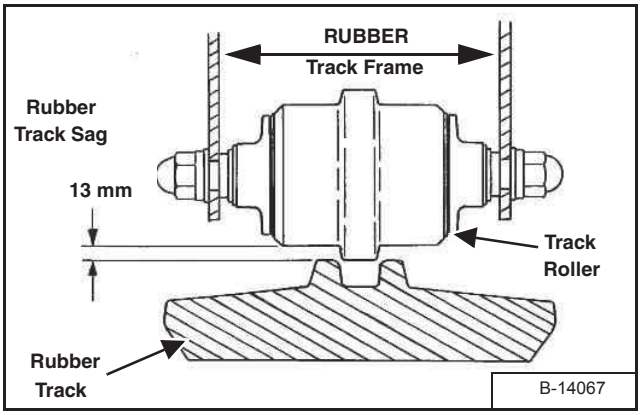
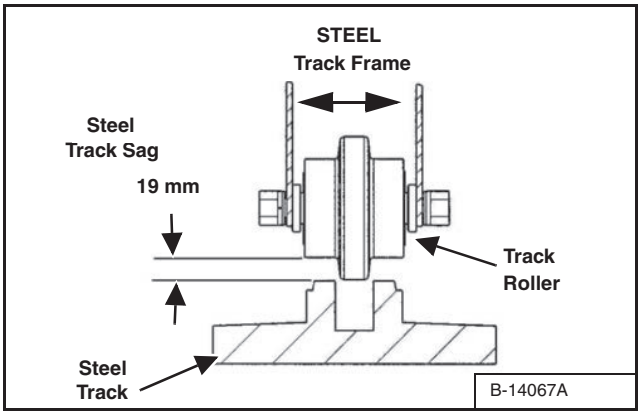
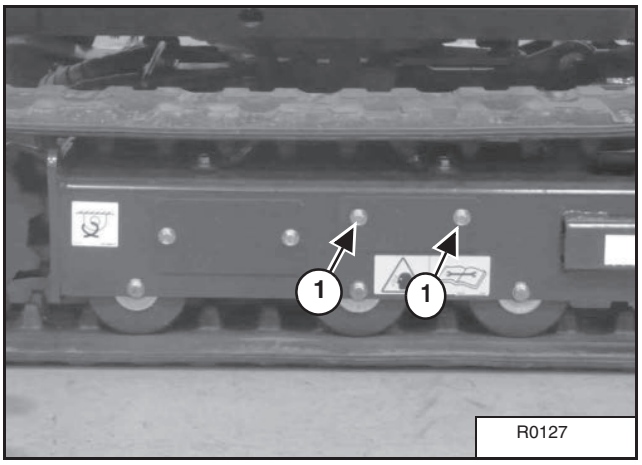


Figure 131



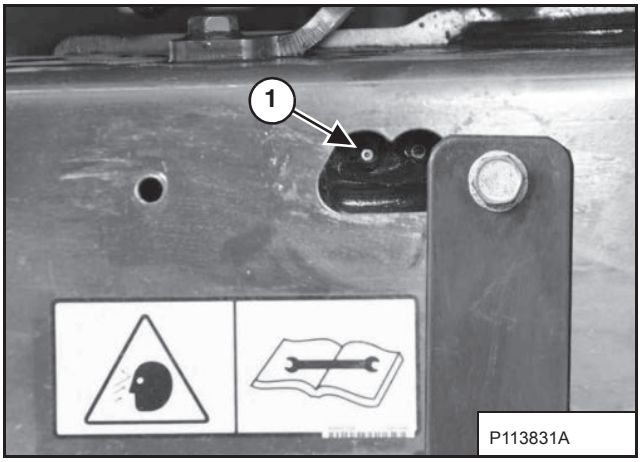
Measure the rubber or steel track (if equipped) sag at the middle track roller **[Figure 129]**. Do not get your fingers into pinch points between the track and the track roller. Use material of appropriate size to check the gap between the contact edge of the roller and top edge of the track guide lug **[Figure 129]**, **[Figure 130]**, and **[Figure 131]**.

Figure 132



Loosen the two bolts (Item 1) **[Figure 132]** from the cover. Pivot the cover downward.

Figure 133



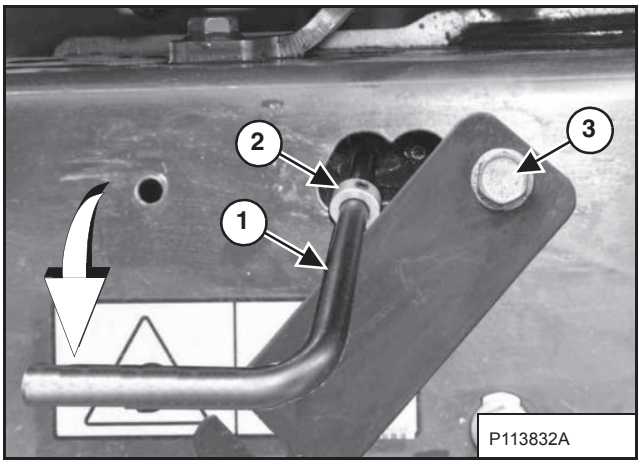
Increase Track Tension

Add grease to the fitting (Item 1) **[Figure 133]** until the track tension is correct **[Figure 130]** or **[Figure 131]**.

NOTE: Do not remove track tension fitting unless pressure is released. See [Figure 134].

NOTE: If replacement is necessary, always replace track tension fitting (Item 1) [Figure 133] with the genuine Doosan parts. The fitting is a special fitting designed for high pressure.

Figure 134



Decrease Track Tension

⚠ WARNING

HIGH PRESSURE GREASE CAN CAUSE SERIOUS INJURY

- **Do not loosen the track tension fitting more than 1 - 1/2 turns.**

W-2994-0515

Pressure must be released from the grease cylinder to *decrease* track tension.

Install the bleed tool (7277225) on the track tension fitting (Item 1), adjust and tighten the collar (Item 2) **[Figure 134]** to fit behind the edge of the access cover.

Tighten the access cover bolt (Item 3) **[Figure 134]** to secure the tool.

Turn the tool 90° anticlockwise and let the grease flow into a container. Release pressure until the track adjustment is correct **[Figure 130]**.

Tighten the track tension fitting to 24 – 30 N•m (18 – 22 ft-lb) torque. Pivot the access cover closed and tighten the access cover bolts.

If the track tension is still loose after adjusting, it indicates the track is worn. See your dealer for replacement parts.

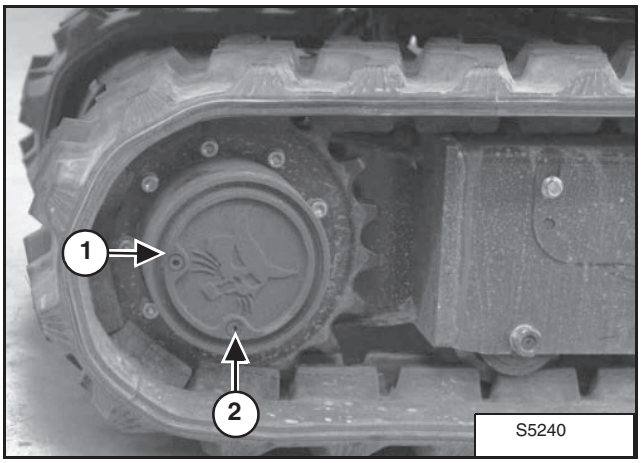
Raise the excavator and remove the jackstands.

Repeat the procedure for the other side.

DRIVE MOTOR

Checking Oil Level

Figure 135



Put the machine on a level surface with the plugs positioned as shown (Items 1 and 2) **[Figure 135]**.

Remove the top plug (Item 1) **[Figure 135]**. The oil level should be at the bottom edge of the plug hole.

Add gear lube through the plug hole if the oil level is below the hole. See Chart for capacity and type.

Install and tighten the top plug.

Repeat procedure for the other side.

Draining The Drive Motor

(See SERVICE SCHEDULE on Page 57.) for the correct service interval.

Put the machine on a level surface with the plugs positioned as shown (Items 1 and 2) **[Figure 135]**.

Remove the bottom plug (Item 2) and the top plug (Item 1) **[Figure 135]** and drain into container. Recycle or dispose of the used lubricant in an environmentally safe manner.

After all the gear lube is removed, install the bottom plug (Item 2) **[Figure 135]**.

Add gear lube to the top plug hole (Item 1) **[Figure 135]** until the gear lube level is at the bottom edge of the plug hole. See Chart for capacity and type..

Install and tighten the top plug.

Repeat the procedure for the other side.

BLADE EXTENSION

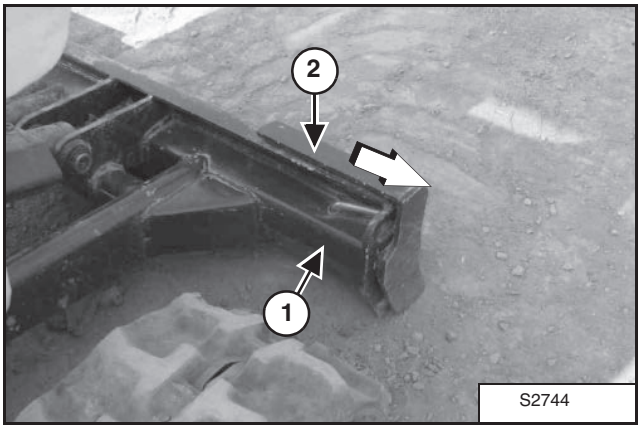
Description

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

Extending And Retracting

Extending

Figure 136



Raise the blade from the ground. Stop the engine.

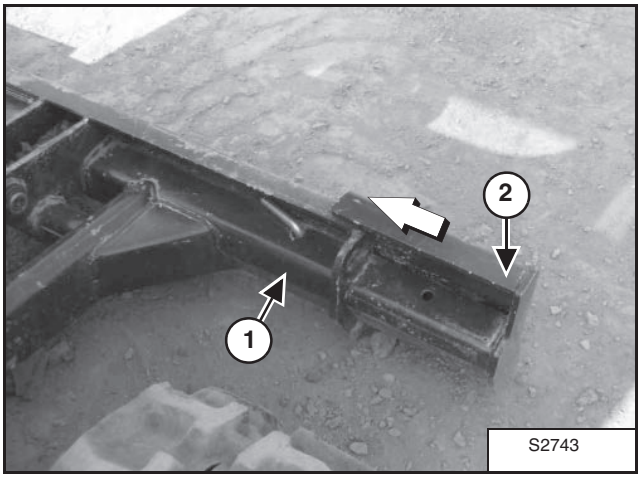
Remove the pin (Item 1) **[Figure 136]**.

Slide the blade extension (Item 2) **[Figure 136]** away from the blade frame into the extended position.

Secure the blade extension in the extended position with the pin.

Retracting

Figure 137



Raise the blade from the ground. Stop the engine.

Remove the pin (Item 1) **[Figure 137]**.

Slide the blade extension (Item 2) **[Figure 137]** toward the blade frame into the retracted position.

Secure the blade extension in the retracted position with the pin.

TRACK ROLLER AND IDLER LUBRICATION

Procedure

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

LUBRICATION OF THE HYDRAULIC EXCAVATOR

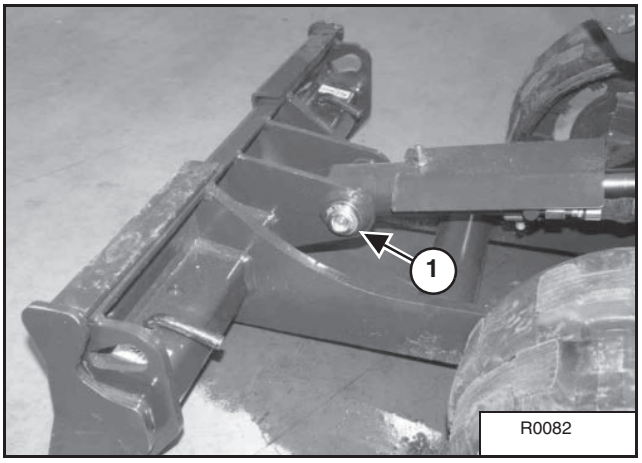
Lubricate the Hydraulic Excavator as specified in the SERVICE SCHEDULE (See SERVICE SCHEDULE on Page 57.) for the best performance of the machine.

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

Always use a good quality lithium based multipurpose grease when lubricating the machine. Apply the lubricant until extra grease shows.

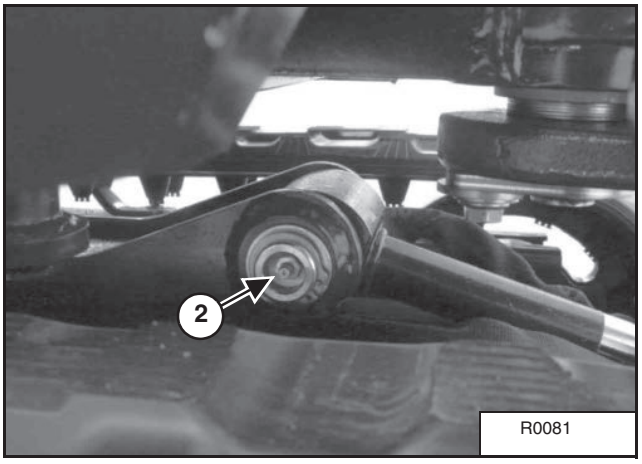
Blade

Figure 138



1. Blade Cylinder-Base End, every 8 – 10 hours (Item 1) **[Figure 138]**

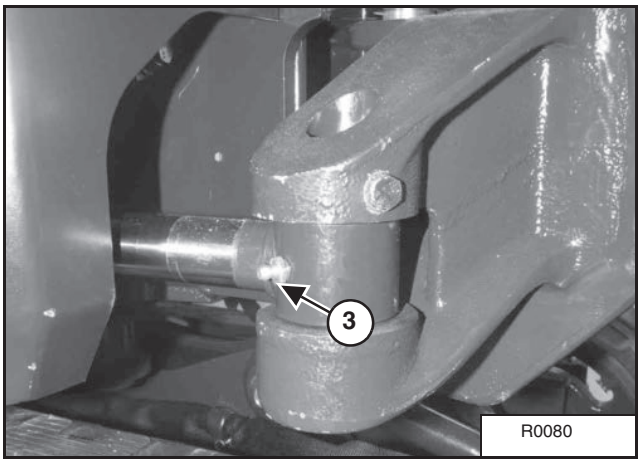
Figure 139



2. Blade Pivots, every 8 – 10 hours (Item 2) **[Figure 139]**

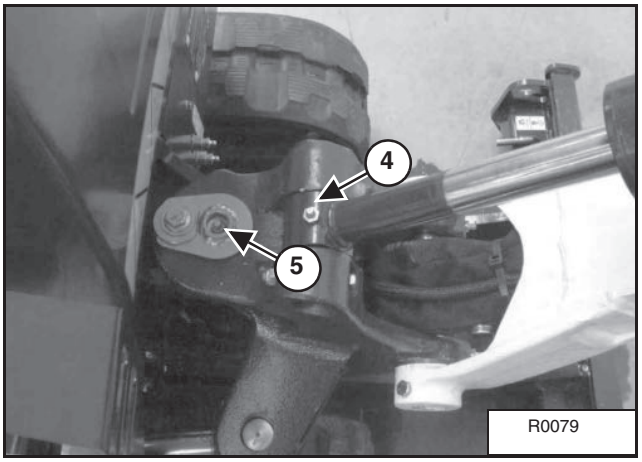
Boom Swing And Boom Base

Figure 140



3. Boom Swing Cylinder, Rod End, every 8 – 10 hours (Item 3) **[Figure 140]**.

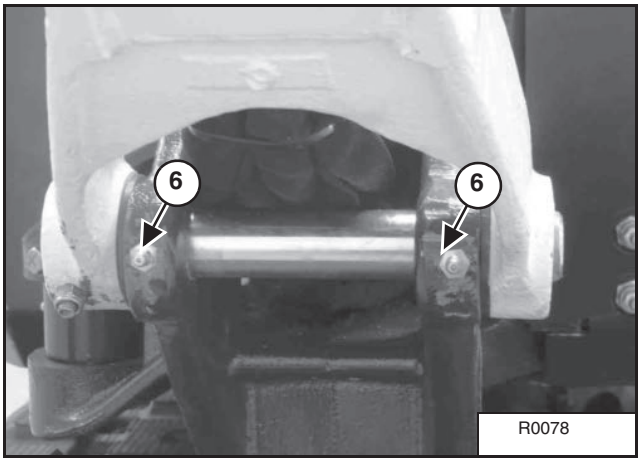
Figure 141



4. Boom Cylinder, Rod End (Item 4) **[Figure 141]**.

5. Boom Swing Pivot, every 8 – 10 hours (Item 5) **[Figure 141]**.

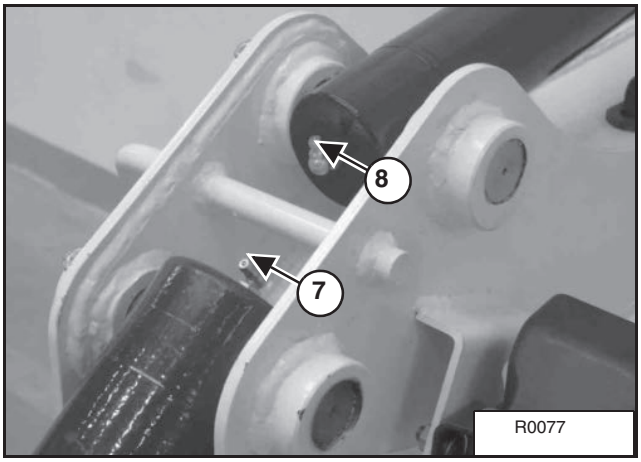
Figure 142



6. Boom, Base Pivot, every 8 – 10 hours (Item 6) **[Figure 142]**.

Boom, Middle

Figure 143

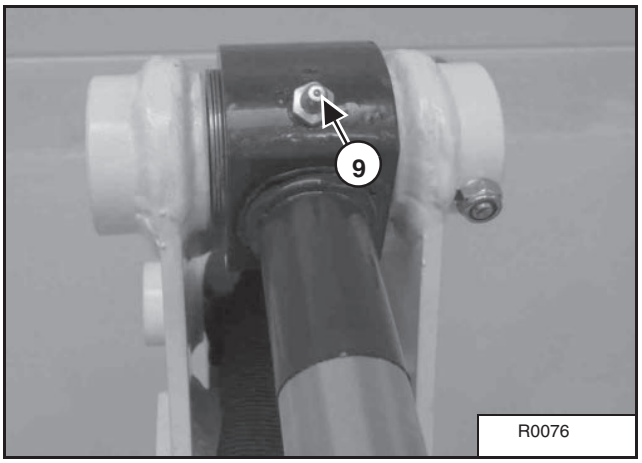


7. Boom Cylinder, Base End, every 8 – 10 hours (Item 7) **[Figure 143]**.

8. Arm Cylinder, Base End, every 8 – 10 hours (Item 8) **[Figure 143]**.

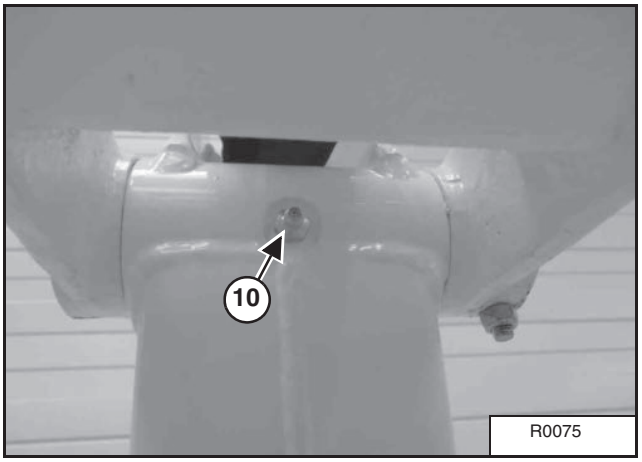
Boom And Arm (Cont'd)

Figure 144



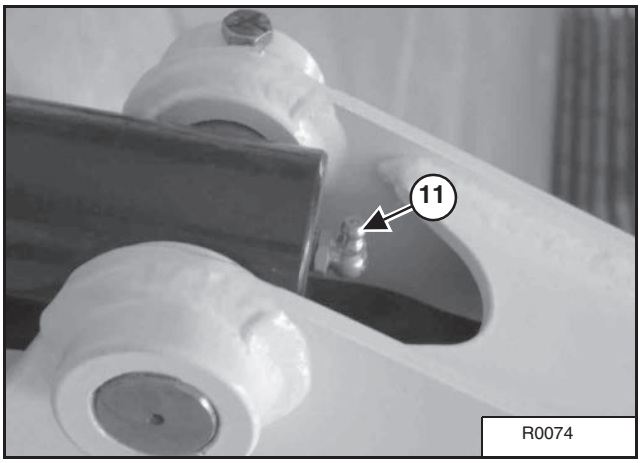
9. Arm Cylinder, Rod End, every 8 – 10 hours (Item 9) **[Figure 144]**.

Figure 145



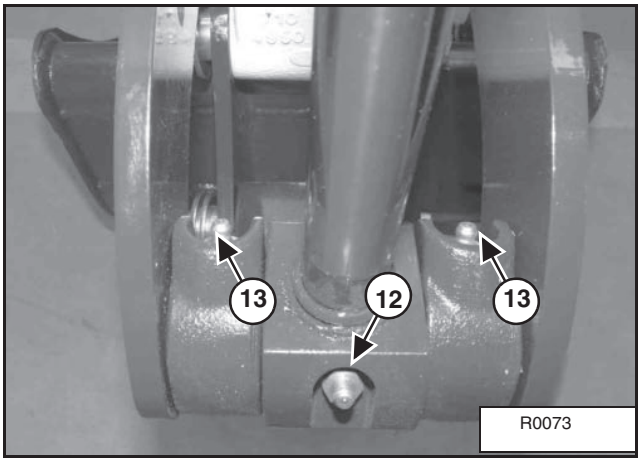
10. Arm Pivot, every 8 – 10 hours (Item 10) **[Figure 145]**.

Figure 146



11. Bucket Cylinder, Base End, every 8 – 10 hours (Item 11) **[Figure 146]**.

Figure 147

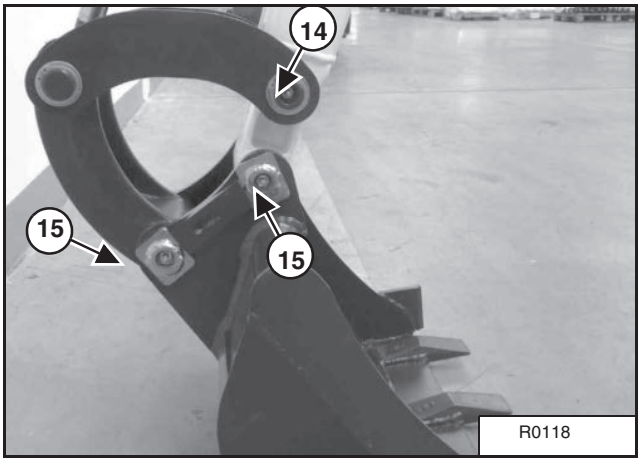


12. Bucket Cylinder, Rod End, every 8 – 10 hours (Item 12) **[Figure 147]**.

13. Bucket Link, Bucket Cylinder Pivot, every 8 – 10 hours (Item 13) **[Figure 147]**.

Boom And Arm (Cont'd)

Figure 148

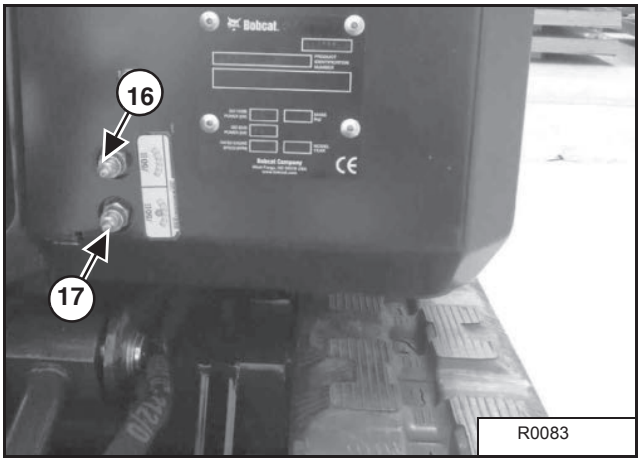


14. Bucket Link Pivot, every 8 – 10 hours (Item 14) **[Figure 148]**.

15. Bucket Pivots, every 8 – 10 hours (Item 15) **[Figure 148]**.

Frame Fittings

Figure 149



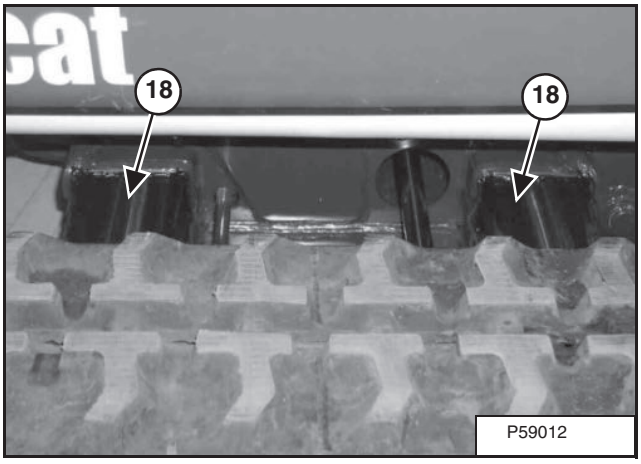
16. Swing Circle Bearing, every 50 hours (Item 16) **[Figure 149]**.

17. Swing Circle Pinion, every 50 hours (Item 17) **[Figure 149]**. Pump 4 times with a grease gun. Rotate the upper structure 180° and repeat.

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

Track Expansion Tube

Figure 150



18. Track Expansion Tube, as required (Item 18) **[Figure 150]**.

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

EXCAVATOR STORAGE AND RETURN TO SERVICE

Storage

Sometimes it can 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 stabiliser in the fuel tank and run the engine a few minutes to circulate the stabiliser 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 fluid 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.

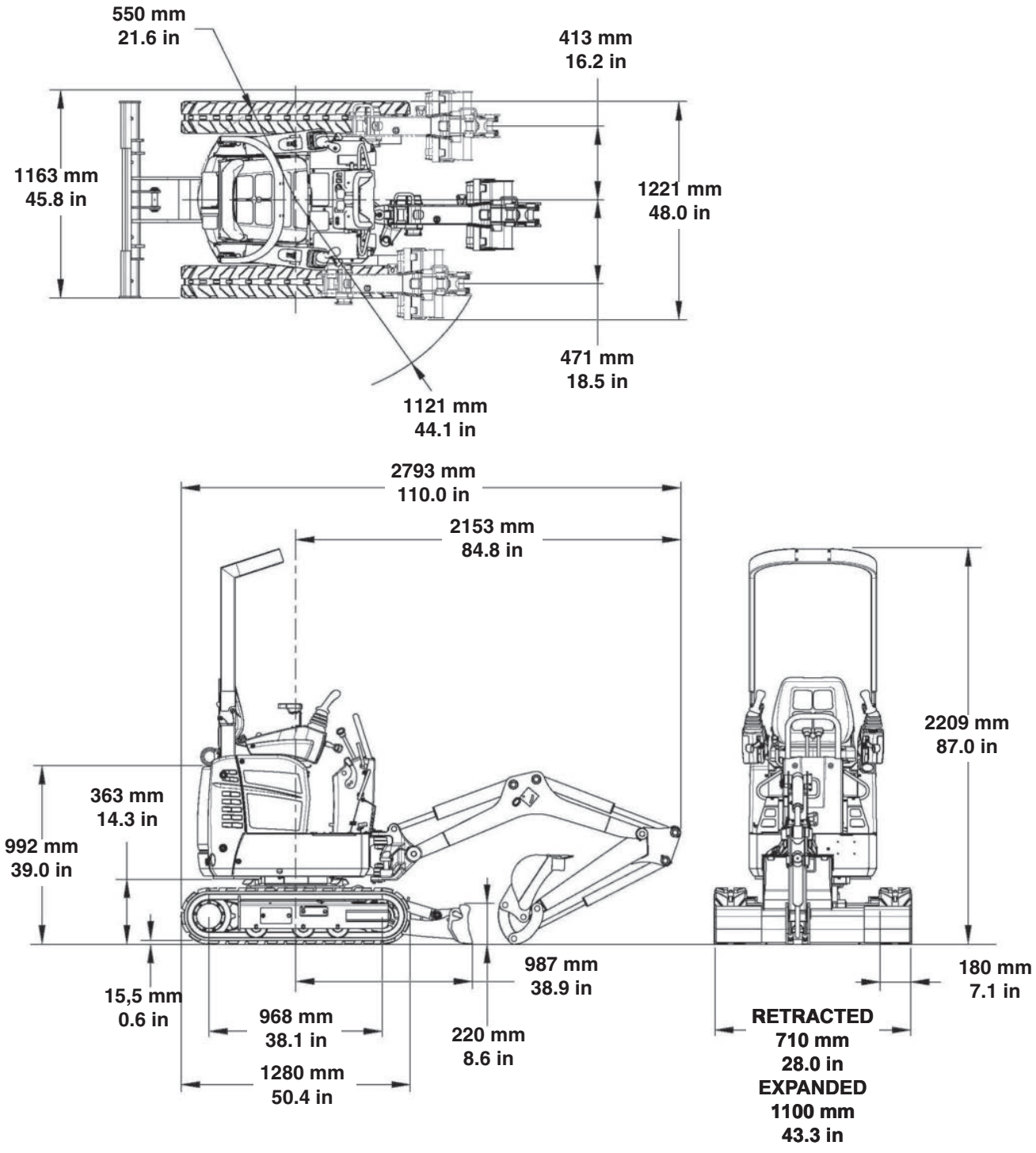
SPECIFICATIONS

Certain specification(s) are based on engineering calculations and are not actual measurements. Specification(s) are provided for comparison purposes only and are subject to change without notice. Specification(s) for your individual Bobcat equipment will vary based on normal variations in design, manufacturing, operating conditions and other factors.

EXCAVATOR SPECIFICATIONS

Machine Dimensions

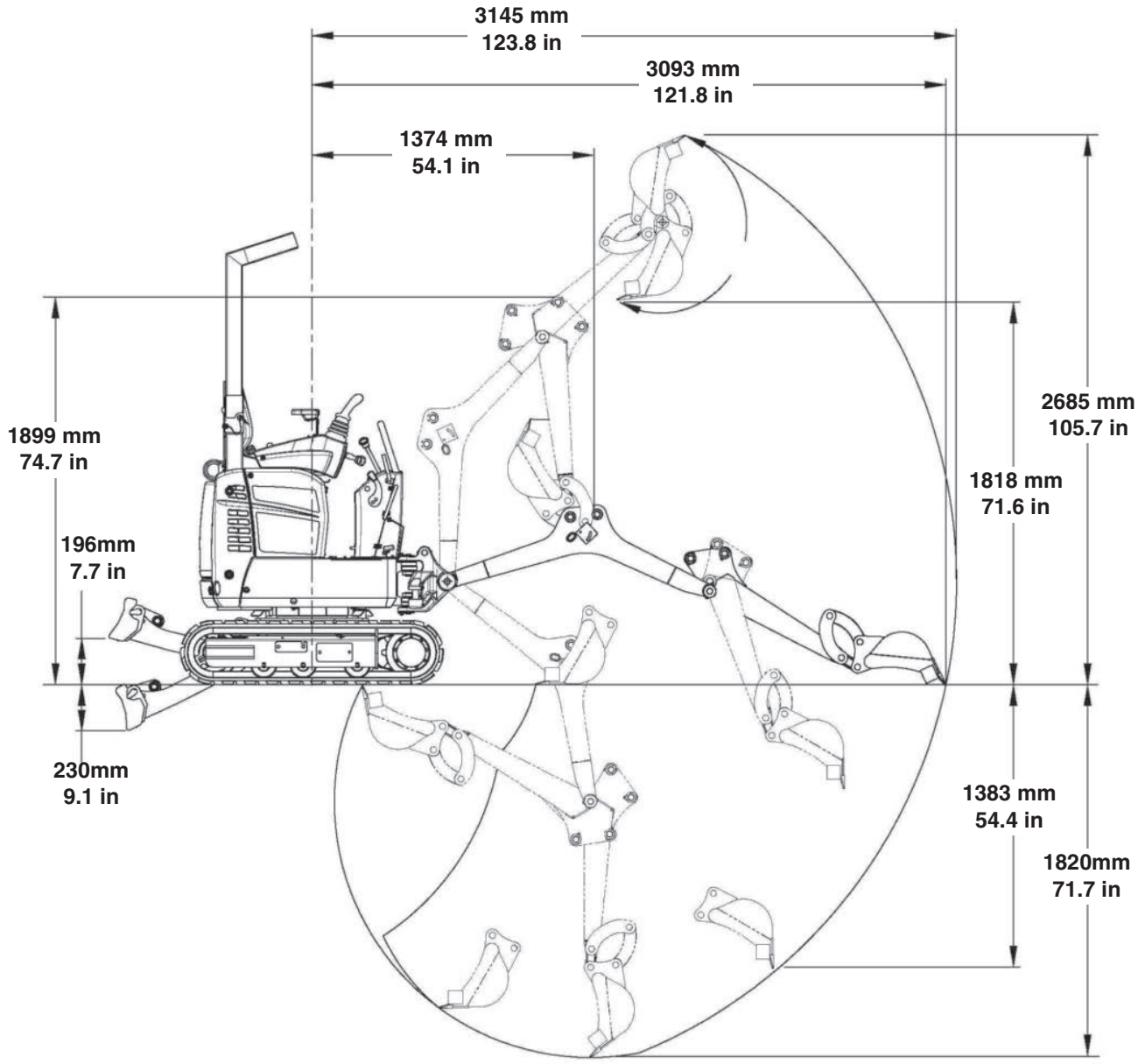
- All dimensions are given in mm.
- Where applicable, specification conform to SAE or ISO standards and are subject to change without notice.



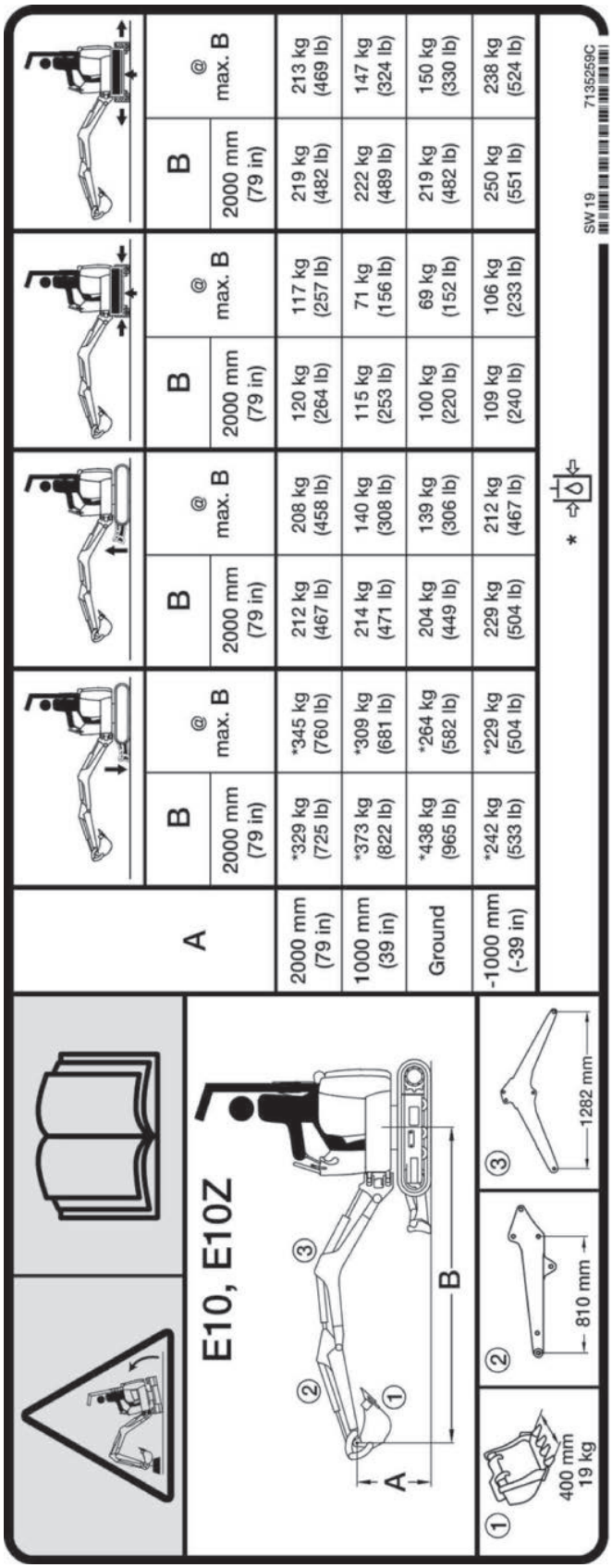
EXCAVATOR SPECIFICATIONS (CONT'D)

Working Range

- All dimensions are given in mm.
- Where applicable, specification conform to SAE or ISO standards and are subject to change without notice.

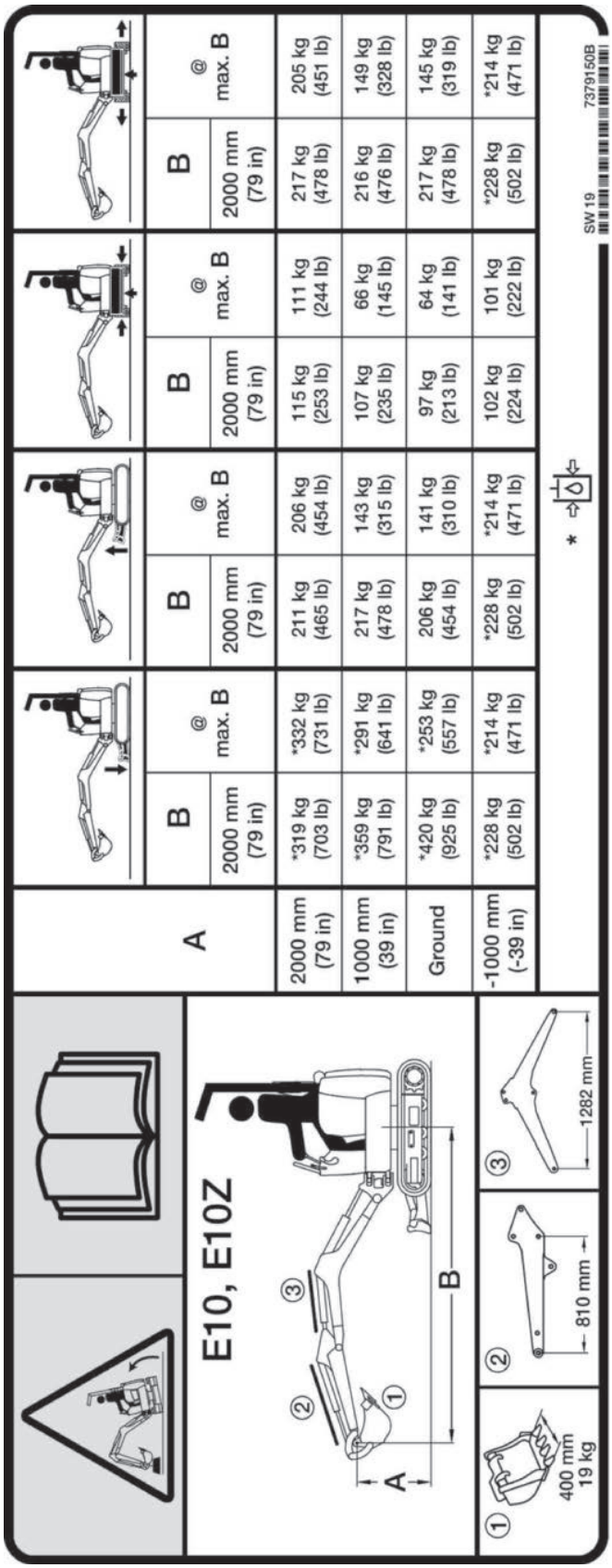


Lift Capacity (Object Handling Applications Excluded)



A	B 2000 mm (79 in)	B @ max. B	B 2000 mm (79 in)	B @ max. B	B 2000 mm (79 in)	B @ max. B
2000 mm (79 in)	*329 kg (725 lb)	*345 kg (760 lb)	212 kg (467 lb)	208 kg (458 lb)	120 kg (264 lb)	117 kg (257 lb)	219 kg (482 lb)	213 kg (469 lb)
1000 mm (39 in)	*373 kg (822 lb)	*309 kg (681 lb)	214 kg (471 lb)	140 kg (308 lb)	115 kg (253 lb)	71 kg (156 lb)	222 kg (489 lb)	147 kg (324 lb)
Ground	*438 kg (965 lb)	*264 kg (582 lb)	204 kg (449 lb)	139 kg (306 lb)	100 kg (220 lb)	69 kg (152 lb)	219 kg (482 lb)	150 kg (330 lb)
-1000 mm (-39 in)	*242 kg (533 lb)	*229 kg (504 lb)	229 kg (504 lb)	212 kg (467 lb)	109 kg (240 lb)	106 kg (233 lb)	250 kg (551 lb)	238 kg (524 lb)

Lift Capacity (Demolition Kit)



A	B (2000 mm (79 in))	B @ max. B	B (2000 mm (79 in))	B @ max. B	B (2000 mm (79 in))	B @ max. B
2000 mm (79 in)	*319 kg (703 lb)	*332 kg (731 lb)	211 kg (465 lb)	206 kg (454 lb)	115 kg (253 lb)	111 kg (244 lb)	217 kg (478 lb)	205 kg (451 lb)
1000 mm (39 in)	*359 kg (791 lb)	*291 kg (641 lb)	217 kg (478 lb)	143 kg (315 lb)	107 kg (235 lb)	66 kg (145 lb)	216 kg (476 lb)	149 kg (328 lb)
Ground	*420 kg (925 lb)	*253 kg (557 lb)	206 kg (454 lb)	141 kg (310 lb)	97 kg (213 lb)	64 kg (141 lb)	217 kg (478 lb)	145 kg (319 lb)
-1000 mm (-39 in)	*228 kg (502 lb)	*214 kg (471 lb)	*228 kg (502 lb)	*214 kg (471 lb)	102 kg (224 lb)	101 kg (222 lb)	*228 kg (502 lb)	*214 kg (471 lb)

* ⇨

EXCAVATOR SPECIFICATIONS (CONT'D)

Performance

Digging force, arm (ISO 6015)	5550 N (1248 lbf)
Digging force, bucket (ISO 6015)	8294 N (1865 lbf)
Drawbar pull (theoretical at 90% efficiency)	9905 N (2227 lbf)
Ground pressure	28,8 kPa (0.28 bar) (4.18 psi)

Function Time

Boom raise time	4.2 s
Boom lower time	4.2 s
Bucket curl time	3.2 s
Bucket dump time	2.3 s
Arm retract time	3.9 s
Arm extend time	2.6 s
Boom swing left time	4.1 s
Boom swing right time	3.2 s
Blade raise time	1.7 s
Blade lower time	1.2 s
Slew rate	9 rpm
Undercarriage expand time	5.0 s
Undercarriage retract time	3.5 s

Weights

Operating weight with TOPS canopy, rubber tracks, 400 mm bucket	1176 kg (2593 lb)

Controls

Engine	Hand levers on right hand side
Starting	Key-type starter switch and shutdown
Blade	Right hand lever
Boom swing	Right foot pedal
Hydraulics	Two levers control boom, bucket, arm and upper structure slew
Auxiliary hydraulics	Left-hand foot pedal
Upper structure slew brake	Hydraulic lock on motor
Holding brake for upper structure slew	Pin lock
Steering	Direction and speed controlled by two hand levers

Engine

Make / Model	Kubota / D722-E4B-BCZ-6 (Stage 5)
Fuel	Diesel
Cooling	Liquid
Horsepower: – Gross power (ISO 14396) – Gross power (SAE J1995) – Net power (SAE J1349 / ISO 9249)	 7,5 kW (10.0 hp) @ 2000 rpm 7,6 kW (10.2 hp) @ 2000 rpm 7,4 kW (9.9 hp) @ 2000 rpm
Maximum governed speed	2000 rpm
High idle speed	2250 – 2350 rpm
Low idle speed	1175 – 1275 rpm
Torque: – Gross torque (SAE J1995) – Net torque (SAE J1349 / ISO 9249)	 40,1 N•m (39.6 lb-ft) @ 1600 rpm 39,1 N•m (28.8 lb-ft) @ 1600 rpm
Number of cylinders	3
Displacement	0.72 L (43.9 in^3)
Bore	67 mm (2.6 in)
Stroke	68 mm (2.7 in)
Lubrication	Forced lubrication with cartridge type filter
Crankcase ventilation	Closed breathing
Air filter	Dual dry replaceable paper cartridge
Ignition	Compression ignited (diesel)
Starting aid	Intake air heater

Electrical

Alternator	12 V - 40 A - open frame with internal regulator
Battery	12 V - 500 cold cranking A at -18 °C, 90 min reserve capacity
Starter	12 V - reduction on drive - 1,4 kW

Hydraulic System

Pump Type	Double gear pump
Pump capacity	2 @10 L/min @ 2000 RPM (2.6 U.S. gpm)
System relief pressure	19000 kPa (1910 bar) (2756 psi)
Joystick control pressure	3000 kPa (30 bar) (435 psi)
System relief pressure for slew circuits	8400 kPa (84 bar) (1218 psi)
Main hydraulic filter bypass	172 kPa (1.72 bar) (25 psi)
Boom base and arm rod port relief	23200 kPa (232 bar) (3365 psi)
Arm base port relief	22500 kPa (225 bar) (3263 psi)
Control valve	Nine-spool parallel type, open centre
Hydraulic filter	Full-flow replaceable
Fluid lines	SAE standard tubelines, hoses, and fittings
Auxiliary flow	20 L/min (5.3 U.S. gpm)

EXCAVATOR SPECIFICATIONS (CONT'D)

Hydraulic Cylinders

Boom cylinder	Cushion up
Boom cylinder bore	63,5 mm (2.5 in)
Boom cylinder rod	31,8 mm (1.3 in)
Boom cylinder stroke	312,4 mm (12.3 in)
Arm cylinder	Cushion
Arm cylinder bore	50,8 mm (2.0 in)
Arm cylinder rod	31,8 mm (1.3 in)
Arm cylinder stroke	325,6 mm (12.8 in)
Bucket cylinder	No cushion
Bucket cylinder bore	44,5 mm (1.8 in)
Bucket cylinder rod	25,4 mm (1.0 in)
Bucket cylinder stroke	385,1 mm (15.2 in)
Boom swing cylinder	No cushion
Boom swing cylinder bore	57,1 mm (2.3 in)
Boom swing cylinder rod	31,8 mm (1.3 in)
Boom swing cylinder stroke	274,6 mm (10.8 in)
Blade cylinder	No cushion
Blade cylinder bore	50,8 mm (2.0 in)
Blade cylinder rod	31,8 mm (1.3 in)
Blade cylinder stroke	96,8 mm (3.8 in)
Undercarriage cylinder	No cushion
Undercarriage cylinder bore	44,5 mm (1.8 in)
Undercarriage cylinder rod	25,4 mm (1.0 in)
Undercarriage cylinder stroke	400,1 mm (15.8 in)

Drive System

Travel motor	Each track is driven by hydrostatic axial piston motor
Drive reduction	Two-stage planetary gear reduction 23,04:1

Traction

Track width, rubber, standard	180 mm (7.1 in)
Track adjusters	Grease type adjusters, rubber
Track type, standard	Half-pitch, rubber
Travel speed	2,1 km/h (1.3 mph)
Travel speed, high range (option)	2,8 km/h (1.7 mph)
Undercarriage	Sealed track rollers with box section track roller frame
Number of track rollers per side	3
Gradeability travelling down or backing up slopes	25°
Gradeability travelling on side slopes	15°
Gradeability travelling up side slopes	15°

Fluid Capacities

Cooling system	3,0 L (3.2 qt)
Engine lubrication plus oil filter	2,8 L (3.0 qt)
Fuel reservoir	16,0 L (16.9 qt)
Hydraulic reservoir	2,6 L (2.8 qt)
Hydraulic system with bucket and dipper cylinder retracted, bucket on the ground, and blade down	9,4 L (9.9 qt)
Travel motor (each)	0,5 L (0.5 qt)

Instrumentation

- Hour meter
- Fuel gauge
- Engine temperature gauge with audible alarm
- Engine oil pressure indicator with audible alarm
- Charging system indicator with audible alarm
- Air intake heater indicator
- Console indicator

Environmental

DECLARED SINGLE-NUMBER NOISE EMISSION VALUES In accordance with ISO 4871	
Noise level per Directive 2000/14/EC - L_{wA}	93 dB(A)
Operator noise level per ISO 6395:2008 - L_{pA}	80 dB(A)

DECLARED VIBRATION EMISSION VALUES In accordance with EN 12096		
	Value	Uncertainty
Whole-body vibration per ISO 2631-1	0,68 m/s^2	0,34 m/s^2
Hand-arm vibration per ISO 5349-1	0,7 m/s^2	---

ENGINE CO_2 EMISSION VALUES	
CO_2 emission	1019,8 g/kWh
This CO_2 measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.	

Temperature Range

Operation and storage	-17° – +43°C (-1.3° – +109.4°F)

WARRANTY

WARRANTY

BOBCAT EXCAVATORS

Doosan Bobcat EMEA s.r.o. ("Bobcat") warrants that this Bobcat® Excavator will be free from defects in design, material or workmanship for twenty four (24) months from the retail date to the owner or 2000 hours of machine usage, whichever occurs first. During the warranty period, only official Bobcat dealers (as listed on www.bobcat.com) are entitled to deal with warranty claims and shall repair or replace, at Bobcat's option, without charge for parts, labour or travel of technicians, any part of the Bobcat® equipment which fails because of defects in design, material or workmanship. The owner shall provide any official Bobcat dealer with prompt written notice of the defect and allow reasonable time for replacement or repair. Bobcat may, at its option, request failed parts to be returned to the factory or to any other designated location. Transportation of the Bobcat® equipment to the official Bobcat dealer for warranty work is not the responsibility of Bobcat. Service schedules must adhere to prescribed intervals and Bobcat® genuine parts/lubricants must be used. The warranty does not apply to tires, tracks or other accessories not manufactured by Bobcat. For warranty coverage on engines, consult with your official Bobcat dealer. For these non-covered items, the owner shall refer solely to the warranty, if any, of the respective manufacturers thereof, in accordance with the respective manufacturers warranty statement. Coverage for air-conditioning refill and couplers is limited as failures generally originate from factors not under Bobcat's control such as, but not limited to, prolonged storage or abuse. This limited coverage is, depending on the component, 50 to 500 hours of machine usage. The warranty does not cover: (i) Oils and lubricants, coolant fluids, filter elements, brake linings, tune-up parts, bulbs, fuses, alternator fan belts, drive belts, pins, bushings and other high-wear items. (ii) Damages resulting from abuse, misuse, accidents, alterations, use of non-genuine Bobcat parts, use of the product with any bucket or attachment not approved by Bobcat, air flow obstructions, or failure to maintain or use the Bobcat product according to the instructions applicable to it. (iii) Ground engaging parts such as bucket teeth and cutting edges. (iv) Fuel or hydraulic system cleaning, engine tune-up, brake inspection or adjustment. (v) Adjustments or slight defects which generally do not affect the stability or reliability of the machine. (vi) Damage or defect resulting from improper storage, weathering, lack of use, use and operation in a corrosive or chemical environment. (vii) Damage or defect caused by operation of the product under extreme weather or geographical conditions without the written agreement of Bobcat.

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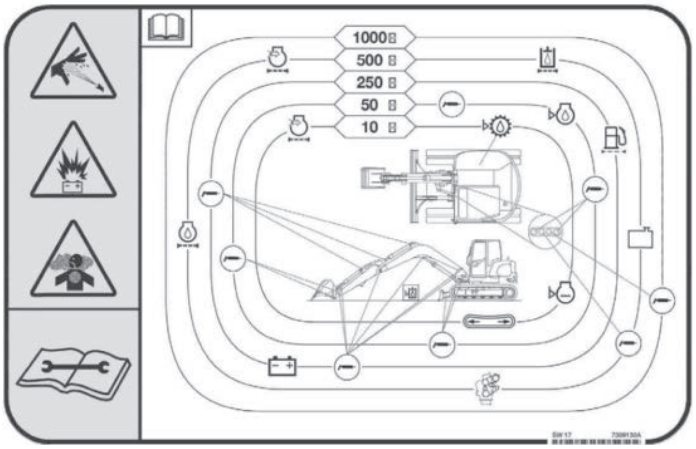
ALPHABETICAL INDEX

SERVICE SCHEDULE SYMBOLS



	**Check Engine Oil**		**Check Gear Box and / or Travel Motor Fluid**
	**Change Engine Oil and Filter**		**Change Gear Box and / or Travel Motor Fluid**
	**Check Engine Coolant**		**Check Track Tension, Adjust As Needed**
	**Change Engine Coolant**		**Check Belt Tension, Adjust Or Replace As Needed**
	**Check Engine Air Filter, Change As Necessary**		**Lubricate Grease Fittings**
	**Drain Contaminants From Fuel Filter**		**Seat Belt**
	**Drain Contaminants From Fuel Tank**		**Cab / Canopy**
	**Change Fuel Filter**		**Spark Arrestor Muffler**
	**Check Hydraulic Fluid**		
	**Change Hydraulic Fluid and Filter(s)**		