EN

Bobcat®

Operation & Maintenance Manual

CE
UK
CA

E26

Compact Excavator

S/N B4B811001 & Above

7349751enGB (12-20) (E)

Printed in Belgium
Original Instructions

EMEA S5-K

OPERATOR SAFETY WARNING

⚠ WARNING

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

W-2001-0502

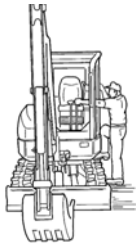
Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

CORRECT

P-90216

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

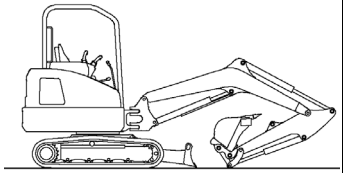
WRONG



NA1418

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

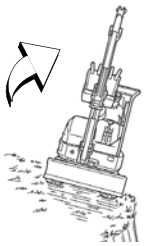
CORRECT



NA1435B

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

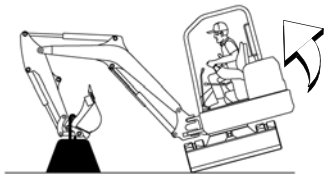
WRONG



NA1419

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

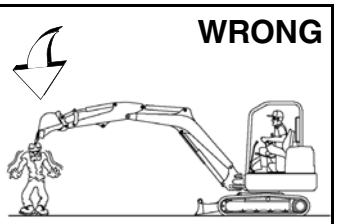
WRONG



NA1439A

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

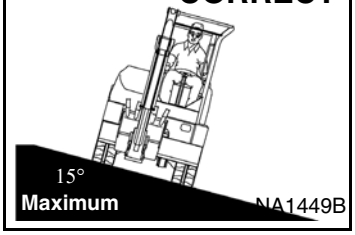
WRONG



NA1445A

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

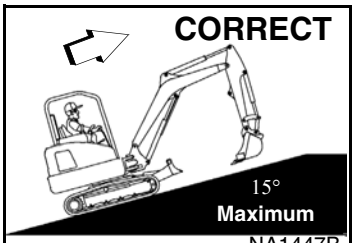
CORRECT



NA1449B

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

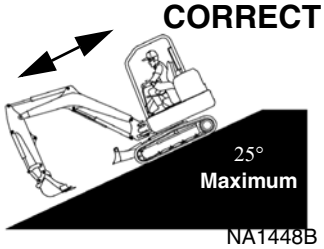
CORRECT



NA1447B

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

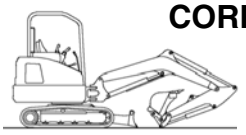
CORRECT



NA1448B

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

CORRECT



NA1435B 6808261

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

CORRECT

B-21928

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

CORRECT

NA1421A

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

SAFETY EQUIPMENT

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

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

OSW66-EN-0117

CONTENTS

REFERENCE INFORMATION

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

Excavator Serial Number _____

Engine Serial Number _____

NOTES:

_____

_____

_____

_____

YOUR BOBCAT DEALER:

_____

ADDRESS:

_____

PHONE:

_____

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 E26

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
26312 Dobříš
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	**93dB(A)**
Guaranteed Sound Power	**93dB(A)**

Description of Equipment
Type of Equipment: Excavator
Model Name: E26
Model Code: B4B8

Engine Manufacturer: Kubota
Engine Model: D1105-EF07
Engine Power: 15,4 kW @ 2400 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:

20 August 2018

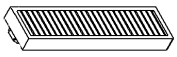
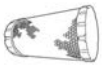
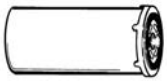
BOBCAT COMPANY IS ISO 9001 CERTIFIED

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 6657635	 FRESH AIR FILTER 7176099 RECIRCULATION FILTER 7222791
 FUEL FILTER 6667352	 BATTERY 7304126
 AIR FILTER, Outer 6673752  AIR FILTER, Inner 6673753	 HYDRAULIC FILL / BREATHER CAP 7024201
 PRIMARY HYDRAULIC FILTER 6661248 CASE DRAIN HYDRAULIC FILTER 7009365	 RADIATOR CAP 7348260

NOTE: Always verify Part Numbers with your Bobcat dealer.

Fluids, Lubricants And Fuel

The fluids, lubricants and fuel described below are those used in the factory and apply to operating conditions in European temperate climate areas. Please see your Bobcat dealer for requirements in other climate areas.

Read and understand the preventive maintenance required before adding or replacing any fluids or lubricants.

ENGINE SYSTEMS				
Machine Components	**Fluids And Lubricants**	**T° Range**	**Packaging****	**Part Number**
Engine	- Bobcat Engine Power SAE 10W30 CJ4 / ACEA E9	-25°C – +30°C	A, B, C, D	6987818*
	- Bobcat Engine Power SAE 15W40 CJ4 / ACEA E9	-20°C – +40C	A, B, C, D	6987819
Cooling Circuit	- Bobcat PG Coolant Concentrated	-36°C	B, C, D	6987803*
	- Bobcat PG Coolant 4 Seasons	-36°C	A, B, C, D	6987793
Fuel Tank	- High-quality diesel fuel that meets EN590	-	-	*

HYDRAULIC / HYDROSTATIC SYSTEMS				
Machine Components	**Fluids And Lubricants**	**T° Range**	**Packaging****	**Part Number**
Hydraulic Oil Tank	- Bobcat Superior SH Hydraulic / Hydrostatic	-35°C – +50°C	A, B, C, D	6987791*
	- Bobcat Biodegradable Hydraulic / Hydrostatic	-35°C – +50°C	A, B, C, D	6987792

MECHANICAL SYSTEMS				
Machine Components	**Fluids And Lubricants**	**Drop Point**	**Packaging****	**Part Number**
All Mechanical Systems	- Bobcat Multipurpose Grease	From 260°C	E	6987888*
	- Bobcat Supreme HD Grease	From 280°C	E	6987889
	- Bobcat Extreme HP Grease	From 260°C	E	6987890

(*) Factory Filled Fluids And Lubricants

(**) Packaging Available:

A = 5 L Can

B = 25 L Container

C = 209 L Drum

D = 1000 L Tank

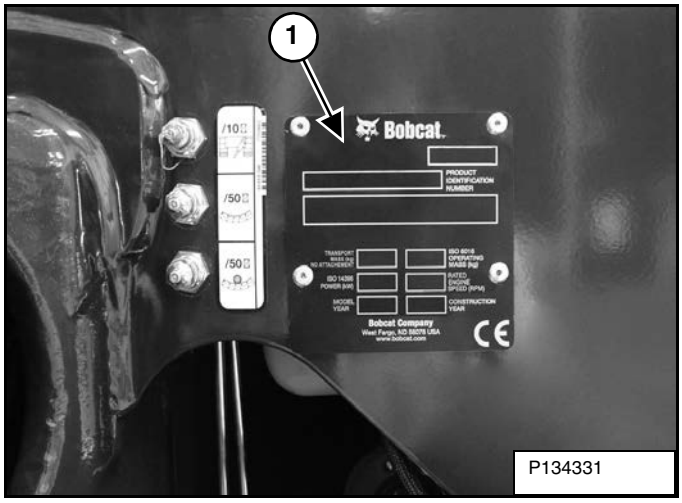
E = 400 g Tube

SERIAL NUMBER LOCATION

Always use the serial number of the excavator when requesting service information or when ordering parts. Earlier 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

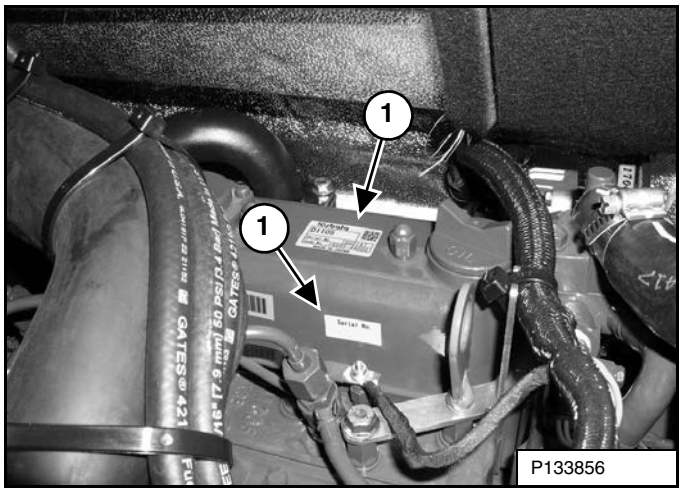
Figure 1



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

Engine Serial Number

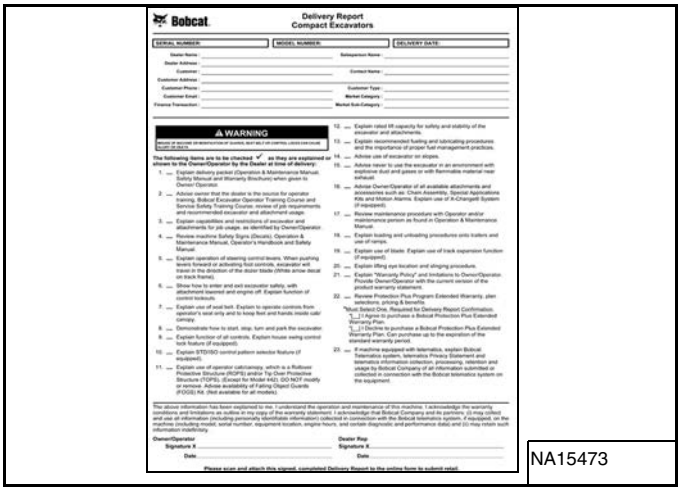
Figure 2



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

DELIVERY REPORT

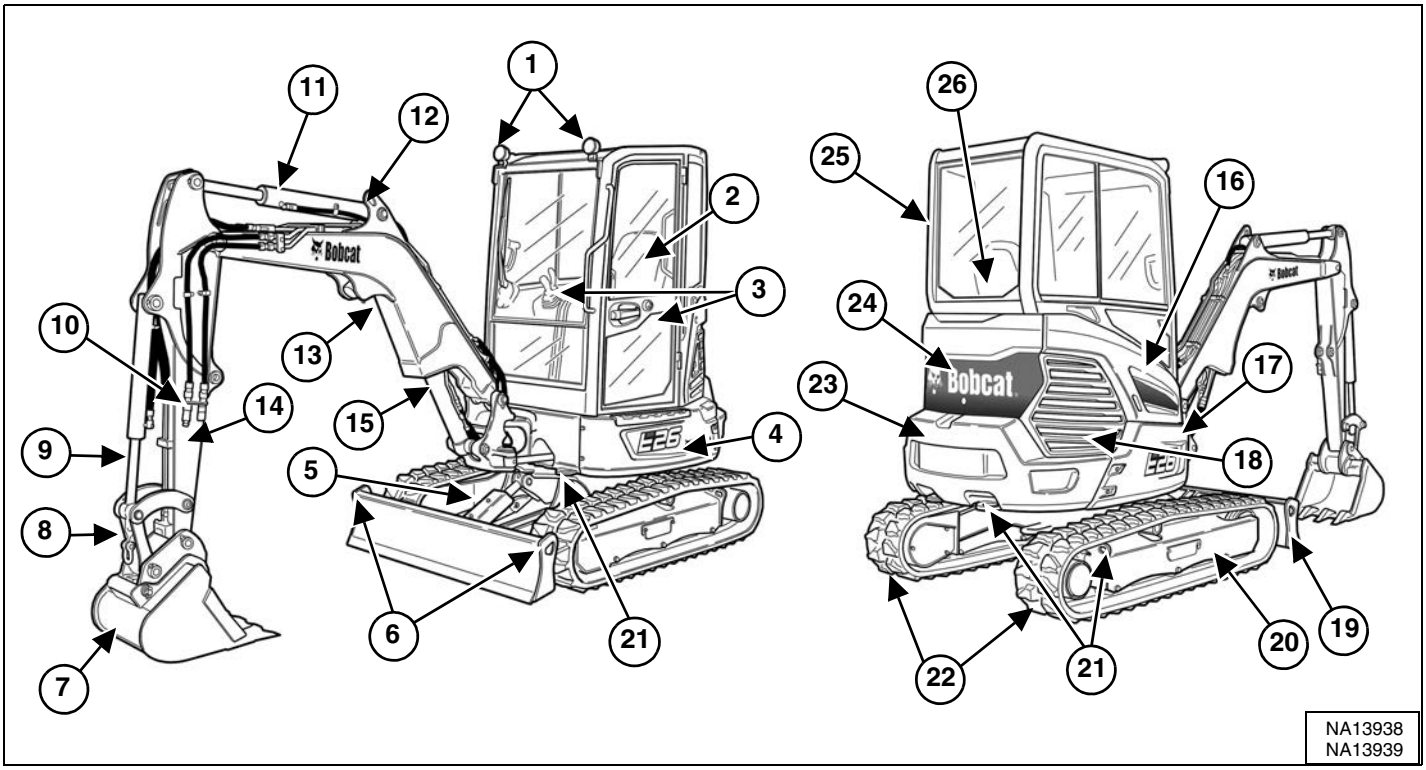
Figure 3



The delivery report **[Figure 3]** contains a list of items that must be explained or shown to the owner or operator by the dealer when the Bobcat excavator is delivered.

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

EXCAVATOR IDENTIFICATION



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	LIGHTS (IF EQUIPPED)	**16**	RIGHT SIDE COVER
2	OPERATOR'S SEAT WITH SEAT BELT	**17**	RIGHT SIDE PANEL
3	JOYSTICKS	**18**	REAR SIDE COVER
4	UPPERSTRUCTURE	**19**	BLADE
5	BLADE CYLINDER	**20**	TRACK FRAME
6	TIE-DOWNS / LIFT POINTS	**21**	TIE-DOWNS (BOTH SIDES)
7	BUCKET [1]	**22**	TRACKS [3]
8	ATTACHMENT QUICK COUPLER (IF EQUIPPED) [2]	**23**	COUNTERWEIGHT
9	BUCKET CYLINDER	**24**	TAILGATE
10	AUXILIARY HYDRAULIC COUPLERS (IF EQUIPPED)	**25**	CANOPY / CAB (ROPS / TOPS / FOPS) [4]
11	ARM CYLINDER	26	OPERATOR'S HANDBOOK
12	LIFT POINT		
13	BOOM		
14	ARM		
15	BOOM CYLINDER		

[1] BUCKET - Several different buckets and other attachments are available from the Bobcat excavator.
[2] ATTACHMENT COUPLER - Optional attachment couplers are available.
[3] TRACKS - Optional tracks are available.
[4] ROPS, TOPS - (Roll-Over Protective Structure / Tip-Over Protective Structure) per ISO 12117-2 and ISO 12117. FOPS (Falling Object Protective Structure) / Top Guard per ISO 10262 - level 1.

FEATURES, ACCESSORIES AND ATTACHMENTS

Standard Items

Model E26 Bobcat excavators are equipped with the following standard items:

- 1500 mm (59.1 in) Dozer Blade
- Canopy with ROPS / TOPS / FOPS Approval
- Standard Instrument Panel
- 250 mm (9.8 in) Rubber Tracks
- Two-Speed Travel
- Auto Shift Drive Motors
- Engine Speed Control Lever
- Hydraulic and Travel Control Lockouts
- Boom and Frame Mounted Work Lights
- Engine and Hydraulic System Monitor with Shut Down
- Horn
- Hydraulic Joystick Controls
- Basic Seat
- Retractable Seat Belt
- Advanced Diagnostics
- Counterweight
- Fuel Filter with 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.

- Enclosed Cab With Heater
- Engine Speed Control Dial With Auto Idle Feature
- Travel Motion Alarm
- Keyless Start
- Deluxe Instrument Panel
- Canopy / Cab Mounted Lights
- Auxiliary Hydraulics and Quick Couplers
- Direct to Tank Auxiliary Hydraulics
- Counterweight (Additional)
- Primary and Secondary Auxiliary Hydraulics
- Top Guard Kit (FOGS)
- Front Guard Kit (upper and lower guards)
- Load Holding Valve - Boom
- Load Holding Valve - Arm
- Lifting Device
- Travel Hose Protection
- Rotating Beacon Light
- Strobe Light
- Side Mirror
- Radio
- Fire Extinguisher
- Deluxe Electrical Control (7 Pin Harness)
- Attachment Quick Coupler, Klac™ System
- Attachment Quick Coupler, German Style Quick Coupler
- Attachment Quick Coupler, Bobcat Hydraulic Quick Coupler
- Attachment Quick Coupler, Mechanical Pin Grabber
- Bobcat Hydraulic Pin Grabber Coupler HPG2
- Auxiliary Hydraulic Lines Mounted On Arm*
- Vinyl Or Cloth Suspension Seat
- Demolition Cylinder Cover

This option may influence the availability of other attachments. See your Bobcat Dealer for information about approved attachments for auxiliary hydraulic lines mounted on the arm.

Attachments

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

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

See your Bobcat dealer for information about approved attachments and attachment Operation & Maintenance Manuals.

- Auger
- Breaker
- Flail Mower
- Hydraulic Clamp
- Tilt Coupler

Buckets Available

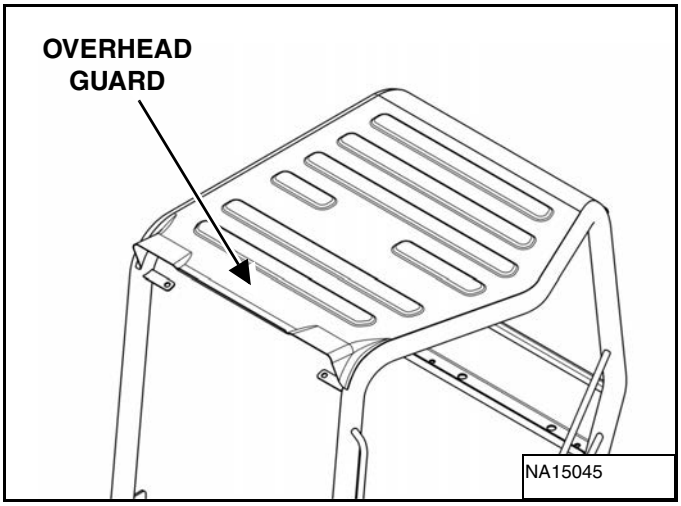
Increase the versatility of your Bobcat Excavator with a variety of bucket sizes.

Many bucket styles, widths and different capacities are available for a variety of different applications. They include Trenching, Digging, Grading, Tilt, to name a few. See your Bobcat dealer for the correct bucket for your Bobcat excavator and application.

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

Falling-Object Guards (FOGS) (Canopy Model)

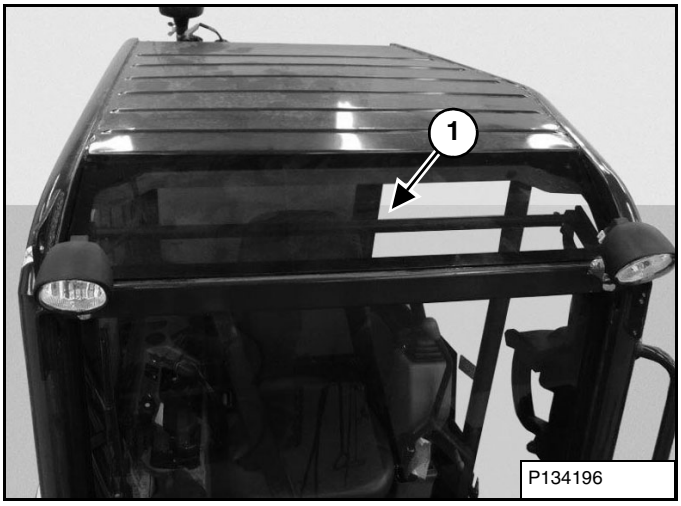
Figure 4



The canopy is equipped with a top guard that offers protection from smaller objects that can fall on the canopy. It also restricts material from entering canopy openings. It meets the top guard requirements in ISO 10262 **[Figure 4]**.

Falling-Object Protective Structure (FOPS) (Cab Model)

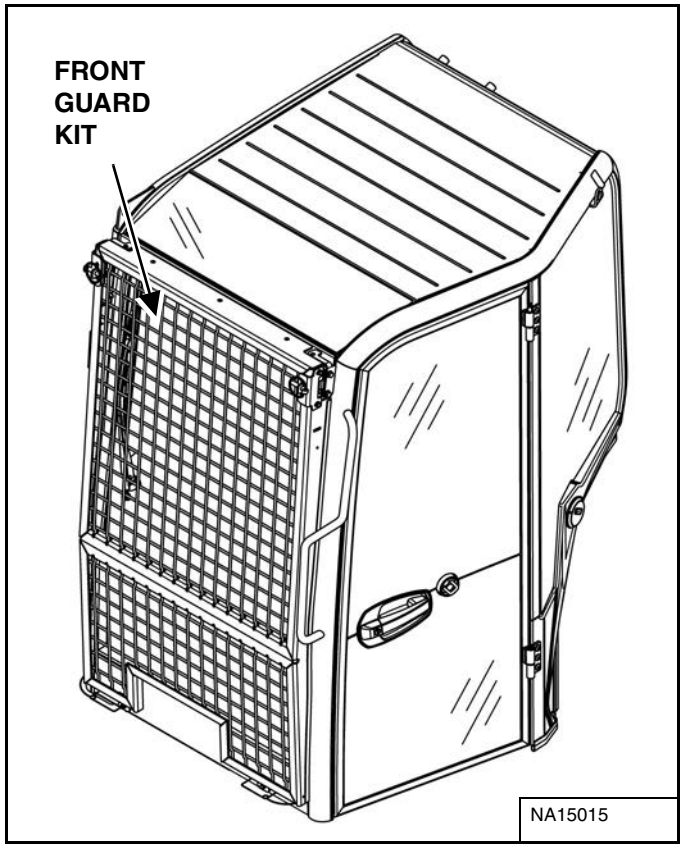
Figure 5



The top window (Item 1) **[Figure 5]** on cab models is a Falling Object Protective Structure (FOPS) that meets the top guard requirements in ISO 10262.

Front Guard Kit

Figure 6



Available for applications that require protection from objects entering the front of the excavator.

The excavator must have the Front Guard Kit **[Figure 6]** installed to meet the front guard requirements in FOGS ISO 10262 - level 1.

Kit includes an upper and lower screen guard.

See your Bobcat Dealer for more information.

Front Guard Kit Inspection And Maintenance

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

SAFETY AND TRAINING RESOURCES

SAFETY INSTRUCTIONS

Before Operation

Carefully follow the operating and maintenance instructions in this manual.

The Bobcat excavator is highly 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.

FIRE PREVENTION (CONT'D)

Hydraulic System

Check hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Hydraulic tubes and hoses must be properly routed and have adequate support and secure clamps. Tighten or replace any parts that show leakage.

Always clean fluid spills. Do not use 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).

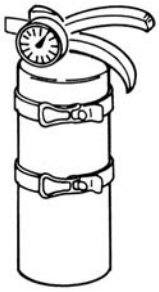
Welding And Grinding

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

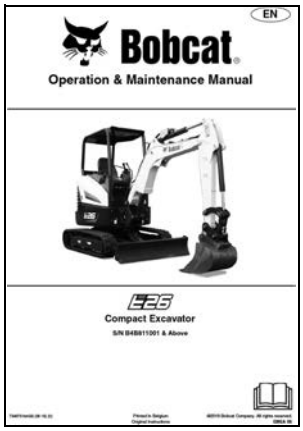
The following publications are also available for your Bobcat excavator. You can order them from your Bobcat dealer.

For the latest information on Bobcat products and the Bobcat Company, visit our Website at **Bobcat.com/training** or **Bobcat.com**

OPERATOR'S HANDBOOK

7350243enGB

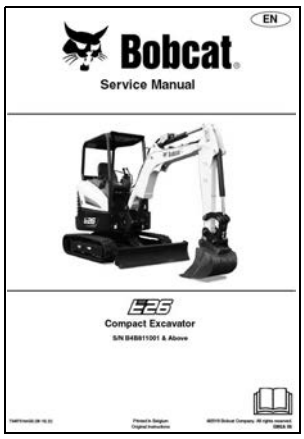
Gives basic operation instructions and safety warnings.



OPERATION & MAINTENANCE MANUAL

7349751enGB

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



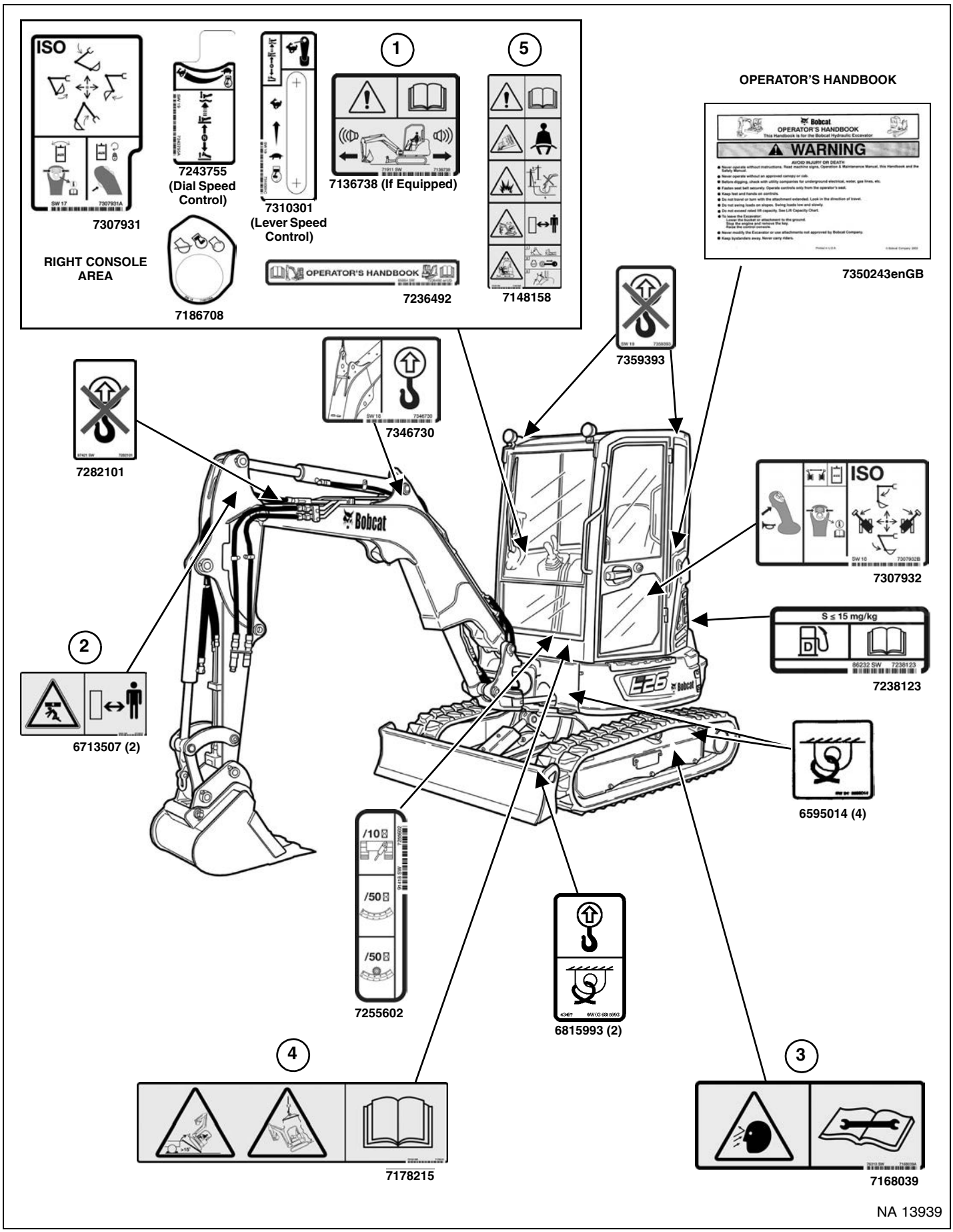
SERVICE MANUAL

7348752enUS

- Complete maintenance instructions for the Bobcat excavator.

MACHINE SIGNS (DECALS)

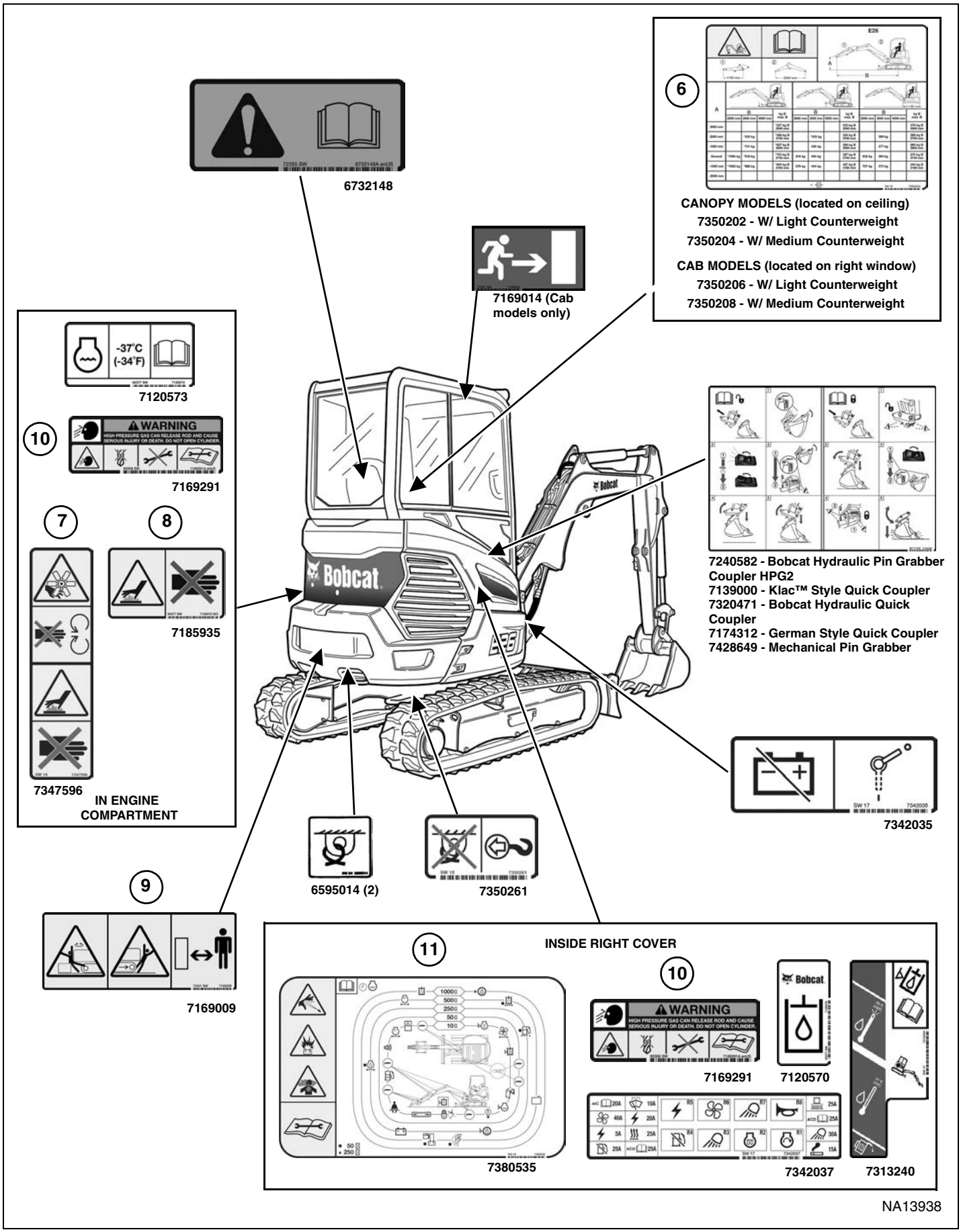
Follow the instructions on all the Machine Signs (Decals) that are on the excavator. Replace any damaged machine signs and be sure they are in the correct locations. Machine signs are available from your Bobcat excavator dealer.



NA 13939

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.

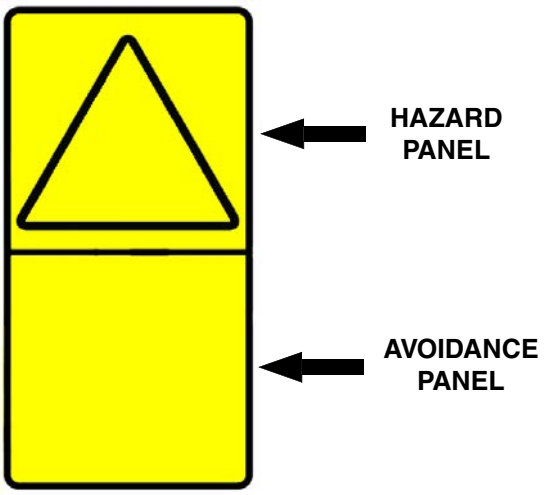


MACHINE SIGNS (DECALS) (CONT'D)

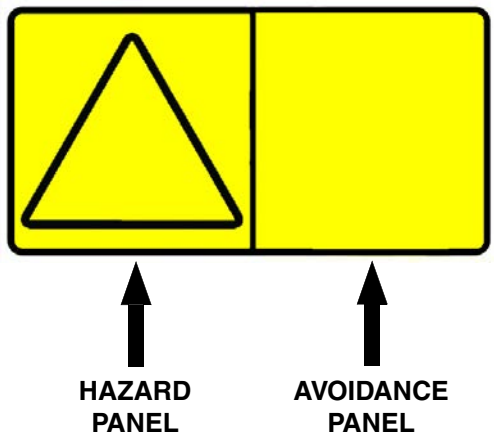
Pictorial Only Safety Signs

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

Vertical Configuration



Horizontal Configuration



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

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

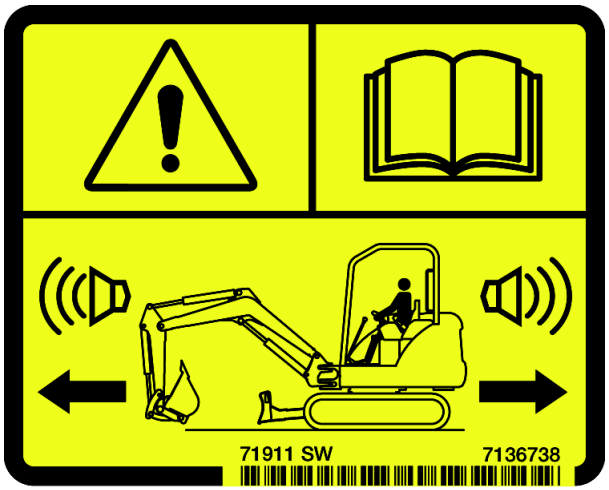
Avoidance panels depict actions required to avoid the hazards.

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

NOTE: See the numbered MACHINE SIGNS (DECALS) on Page 16 and Machine Signs (Decals) (Cont'd) on Page 17 for the machine location of each corresponding numbered pictorial only decals as shown below.

1. Motion Alarm (7136738)

This safety sign is located on the ceiling of canopy models and on the right window of cab models.



⚠ WARNING

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

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

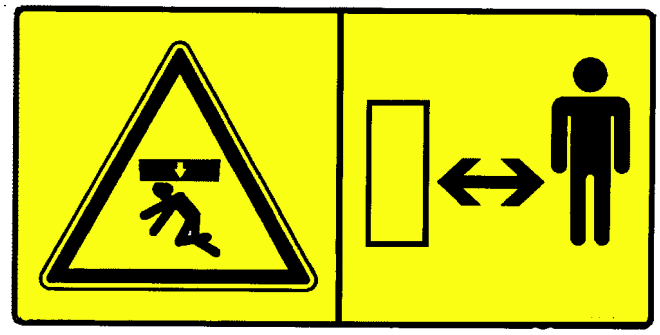
The operator is responsible for the safe operation of this machine.

W-2786-0309

Pictorial Only Safety Signs (Cont'd)

2. Crush Hazard (6713507)

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



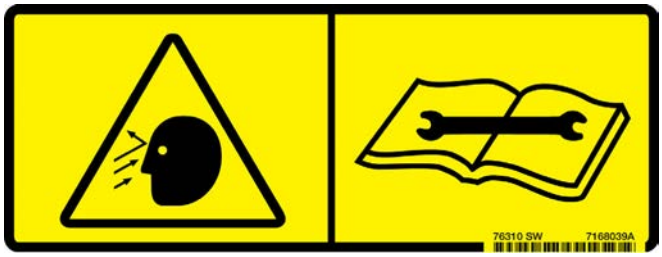
⚠ WARNING

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

W-2520-0106

3. 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

4. Transporting And Lifting (7178215)

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

⚠ 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)

5. General Hazard (7148158)

This safety sign is located inside the operator's area on the right side near the floor.

⚠ 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.

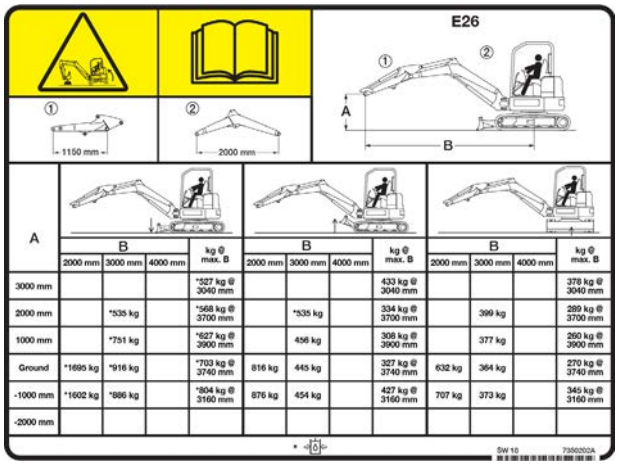
Failure to operate machine from the operator's position can cause serious injury or death.

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

6. Lift Capacity (7350202, 7350204, 7350206, 7350208)

This safety sign is located on the ceiling of canopy models and on the right window of cab models.



A	B 2000 mm	B 3000 mm	B 4000 mm	kg @ max. B
3000 mm				*527 kg @ 3040 mm
2000 mm		*535 kg		*568 kg @ 3700 mm
1000 mm		*751 kg		*627 kg @ 3900 mm
Ground	*1695 kg	*916 kg		*703 kg @ 3740 mm
-1000 mm	*1602 kg	*886 kg		*804 kg @ 3160 mm
-2000 mm				

A	B 2000 mm	B 3000 mm	B 4000 mm	kg @ max. B
3000 mm				433 kg @ 3040 mm
2000 mm		*535 kg		334 kg @ 3700 mm
1000 mm		456 kg		308 kg @ 3900 mm
Ground	816 kg	445 kg		327 kg @ 3740 mm
-1000 mm	876 kg	454 kg		427 kg @ 3160 mm
-2000 mm				

A	B 2000 mm	B 3000 mm	B 4000 mm	kg @ max. B
3000 mm				378 kg @ 3040 mm
2000 mm		399 kg		289 kg @ 3700 mm
1000 mm		377 kg		260 kg @ 3900 mm
Ground	632 kg	364 kg		270 kg @ 3740 mm
-1000 mm	707 kg	373 kg		345 kg @ 3160 mm
-2000 mm				

SW 10 7350202A

⚠ 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

Pictorial Only Safety Signs (Cont'd)

7. Hot Surfaces and Rotating Fan (7347596)

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

8. Hot Surfaces (7185935)

This safety sign is located under the right cover.

⚠ WARNING

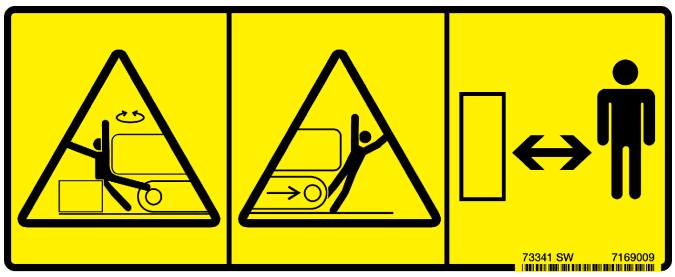
AVOID BURNS

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

W-2070-1203

9. Stay Away (7169009)

This safety sign is located on the rear of the upperstructure below the tailgate.



⚠ WARNING

AVOID INJURY OR DEATH

- **Keep out of swing area or travel path.**
- **Always look in the direction of travel.**
- **Make sure swing area is clear of bystanders and objects.**

W-2775-1208

Pictorial Only Safety Signs (Cont'd)

10. Thrown or Flying Objects (7169291)

This safety sign is located on the gas springs under the rear cover and inside the right cover.

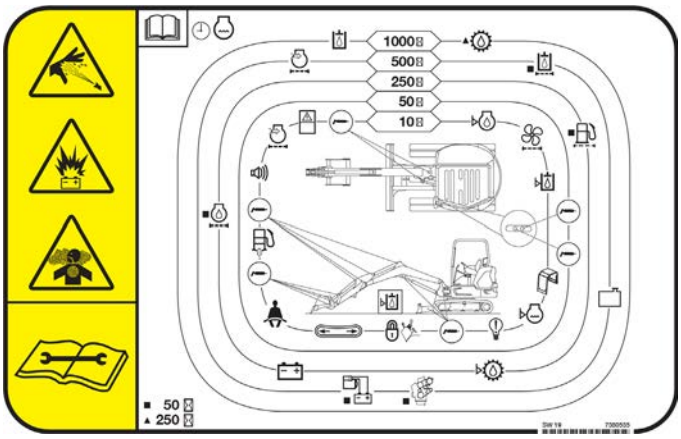
WARNING

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

W-2523-0106

11. High Pressure, Battery, Rotating Fan, Exhaust Gases and Service Schedule (7380535)

This safety sign is located inside the right cover. (See SERVICE SCHEDULE on Page 109.)



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

OPERATING INSTRUCTIONS

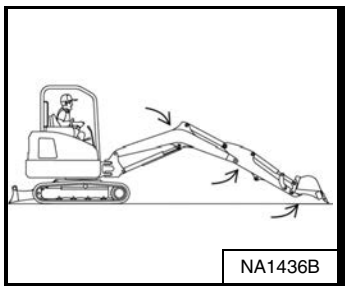
INTENDED USE

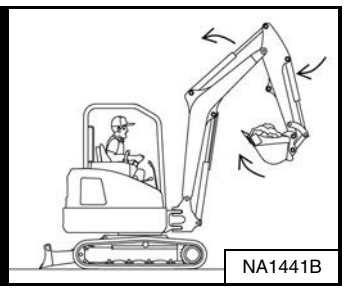
This machine is classified as an Excavator as defined in ISO 6165. This machine has tracks and commonly a mounted bucket for the principle intended functions of excavating, loading and backfilling loose materials such as earth, gravel, or crushed rock.

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

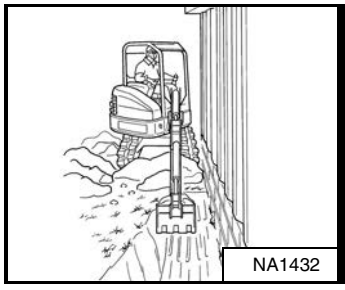
Examples of intended use include:

Excavating

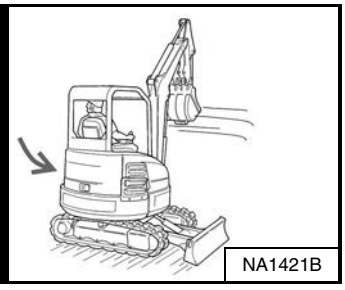

NA1436B


NA1441B

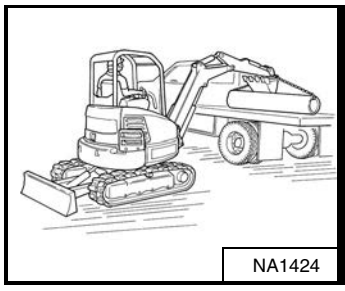
Boom Swing


NA1432

Rotating the Upperstructure


NA1421B

Loading Material


NA1424

Backfilling


NA1423

⚠ 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

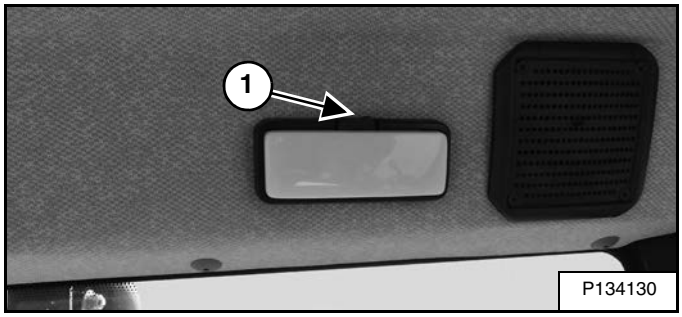
Avoid impacting objects with the blade. Damage to blade and undercarriage components may occur.

I-2256-0507

INSTRUMENTS AND CONSOLES

Cab Interior Light (If Equipped)

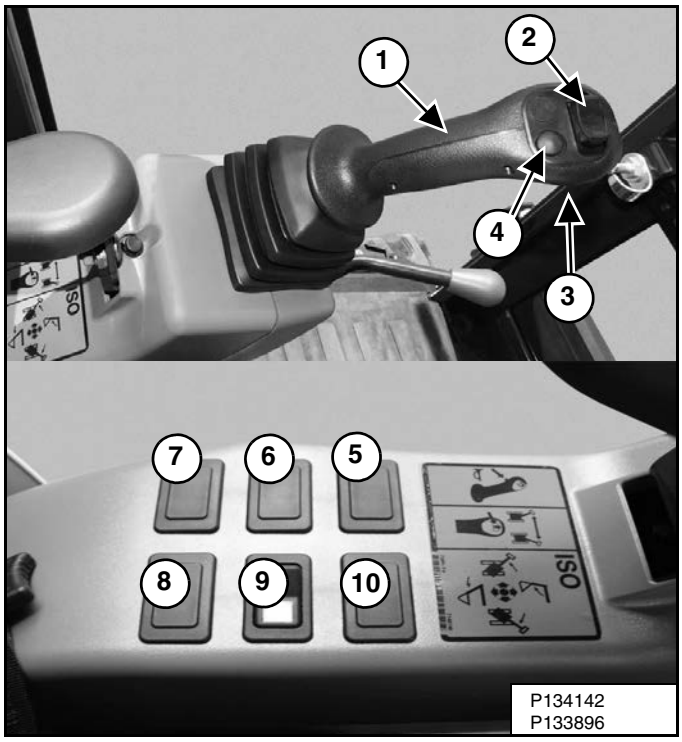
Figure 7



Press the rocker switch on top of the light (Item 1) **[Figure 7]** to turn the light ON and OFF.

Left Console

Figure 8



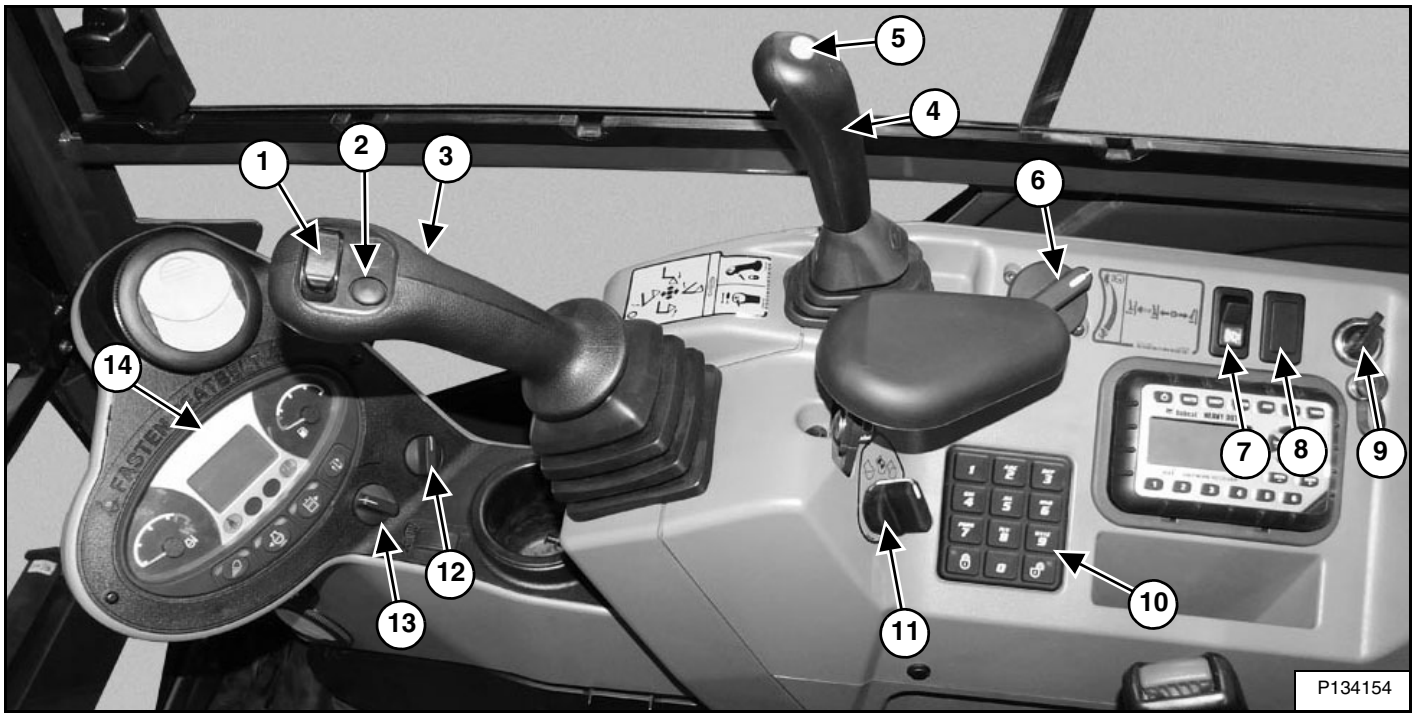
Left Console **[Figure 8]**

REF. NO	DESCRIPTION	FUNCTION / OPERATION
1	Left Joystick	(See HYDRAULIC CONTROLS on Page 46.)
2	Boom Swing / Secondary Auxiliary Hydraulic Switch	(See BOOM SWING on Page 58.)(See Secondary Auxiliary Hydraulics Location on Page 52.)
3	Horn	Press the switch on the bottom of the left joystick to sound the horn.
4	Left Joystick Button	Push the button to toggle between boom swing and optional auxiliary hydraulics (if equipped).
5	Wiper / Washer Switch (if equipped)	Press the switch to the left to turn wiper ON. Press and hold switch to the left to activate window washer. Press the switch to the right to turn wiper OFF.
6	Hydraulic Quick Coupler ON / OFF Switch (if equipped)	Press switch to the left to turn the quick coupler ON. Press the switch to the right to turn OFF. (See Installing And Removing The Attachment (Bobcat Hydraulic Quick Coupler) on Page 85.)
7	Beacon / Strobe Light (if equipped)	Press switch to the left to turn ON the Beacon / Strobe light. Press the switch to the right to turn OFF.
8	Hydraulic Quick Coupler INTENT Switch (if equipped)	Press switch to the left to initiate the quick coupler install or remove mode. (See Installing And Removing The Attachment (Bobcat Hydraulic Quick Coupler) on Page 85.)
9	Overload Warning Device Switch (if equipped)	Press the switch to the left to activate the Overload Warning Device. Press the switch to the right to deactivate the system. (See OVERLOAD WARNING DEVICE on Page 56.)
10	Not used for this model	

INSTRUMENTS AND CONSOLES (CONT'D)

Right Console

Figure 9



REF	DESCRIPTION	FUNCTION / OPERATION
1	Auxiliary Hydraulic Switch (if equipped)	(See HYDRAULIC CONTROLS on Page 46.)
2	Right Joystick Button	Not used on this model.
3	Right Joystick	(See HYDRAULIC CONTROLS on Page 46.)
4	Blade Control Lever	Controls raising and lowering the blade. Push all the way forward to put blade in float position. (See BLADE CONTROL LEVER on Page 57.)
5	Two-Speed Button	Engages and disengages High Range Travel Speed. (See Two-Speed Travel on Page 35.)
6	Engine Speed Control Lever or Engine Speed Control Dial	Controls rpm of the engine. (See ENGINE SPEED CONTROL on Page 57.)
7	Motion Alarm Cancel Switch	Temporarily disables the motion alarm. (See MOTION ALARM SYSTEM on Page 43.)
8	Direct to Tank Switch (if equipped)	Press switch to direct auxiliary return flow to the hydraulic oil reservoir. (See Direct To Tank Switch on Page 56.)
9	Auxiliary Power Outlet	12 volt receptacle for accessories.
10	Keypad (if equipped)	Enter the password to start the engine (See Standard Instrument Panel - Keyless Start on Page 67.) (See Deluxe Instrument Panel - Keyless Start on Page 68.)
11	Key Switch or Keyless Start Switch	Always perform the PRE-STARTING PROCEDURE (See PRE-STARTING PROCEDURE on Page 64.) before starting the engine. (See STARTING THE ENGINE on Page 66.)
12	Temperature Control (if equipped)	Turn clockwise to increase temperature; anticlockwise to decrease.
13	Fan Motor Switch (if equipped)	Turn clockwise to increase fan speed; anticlockwise to decrease.
14	Instrument Panel	(See Instrument Panel - Standard on Page 29.) (See Instrument Panel - Deluxe on Page 32.)

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

Instrument Panel - Standard

Figure 10

REF. NO.	DESCRIPTION	FUNCTION / OPERATION
1	Lights	Press once to turn on work lights. (Left green LED illuminates.) Press again to turn all lights off. (Left green LED off.)
		Press and hold 5 seconds to display software version in display screen.
2	Auto Idle Feature	Press once to turn Auto Idle Feature ON. (Left green LED illuminates.) Press a second time to turn OFF. (Left and right green LEDs off.) (See Auto Idle Feature on Page 36.)
3	AUX Hydraulic Button	Press once to enable auxiliary hydraulic function. (Left green LED illuminates.) Continue to press and release to scroll through the selectable auxiliary hydraulic settings (3-2-1-OFF). Press and hold (minimum of one second) to enable the continuous flow auxiliary hydraulic feature. (Right green LED illuminates.) Continue to press and release to scroll through the continuous flow selectable auxiliary hydraulic settings (3-2-1-OFF). (See Auxiliary Hydraulics in this manual)
4	Information	Press to cycle through the following information, which is displayed on the Data Display Screen, Item 6: • Hourmeter (On startup) • Job Clock (1 and 2) • Engine rpm • Auxiliary hydraulics information (if equipped) • Battery voltage • Maintenance clock (Press and hold 7 seconds when displayed to reset the maintenance clock.) • Service codes*
5	Engine Temperature Gauge	Shows the engine coolant temperature.
6	Data Display Screen	The data display screen shows the Hourmeter at start up and then changes to engine rpm during normal operation of the excavator. When preheat is activated, the display screen will show the remaining preheat time. Can also be used to display Job Clock, Engine rpm, Auxiliary hydraulics information (if equipped), Battery voltage, Maintenance clock, Service Codes, and Selectable Auxiliary Hydraulic Flow.

INSTRUMENTS AND CONSOLES (CONT'D)

Instrument Panel - Standard (Cont'd)

REF. NO.	DESCRIPTION	FUNCTION / OPERATION
7	Fuel Gauge	Shows the amount of fuel in the tank.
8	Seat Belt	Fasten Seat Belt Reminder. Light stays on for 45 seconds to remind operator to fasten seat belt.
9		Not used for this model.
10		Not used for this model.
11	Left Console Lockout	Icon ON when left console is raised. Icon OFF when left console is lowered.
12	General Warning **	Malfunction with one or more machine functions. (See DIAGNOSTIC SERVICE CODES on Page 154.)
13	High Range Engaged ***	Icon is illuminated when two-speed travel is enabled.
14	Engine Coolant Temperature **	Engine coolant temperature high or sensor error.
15	Engine Malfunction **	Engine malfunction or failure.
16	Hydraulic System Malfunction **	Hydraulic system malfunction or failure.
17	Fuel	Fuel level low or sensor error. (Icon is ON when fuel level is low, Icon flashes when fuel sensor fault is activated.)
18		Not used for this model.
19		Not used for this model.
20		Not used for this model.
21		Not used for this model.

* See SYSTEM SETUP AND ANALYSIS for Service Code Description. (See DIAGNOSTIC SERVICE CODES on Page 154.)

** Icons will be ON or flashing when diagnostic system indicates a problem. (See DIAGNOSTIC SERVICE CODES on Page 154.)

*** Icons will be flashing when diagnostic system indicates a problem. (See DIAGNOSTIC SERVICE CODES on Page 154.)

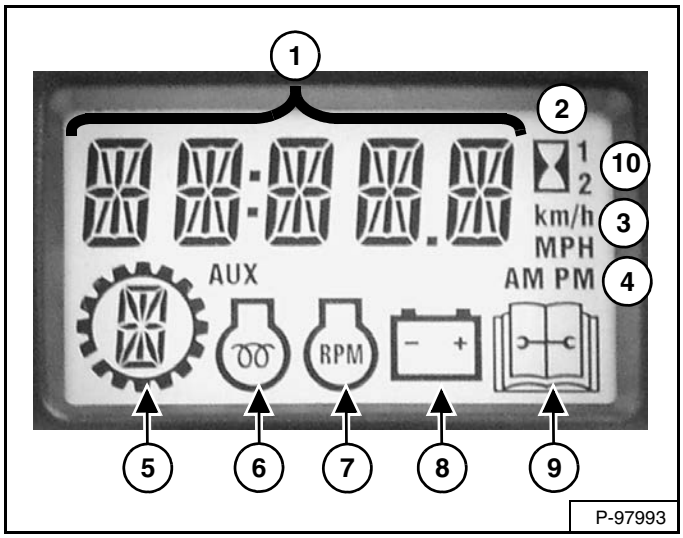
Instrument Panel - Standard (Cont'd)

Indicator Icons

The display screen can display the following information:

- Operating hours
- Job Clock (1 and 2)
- Engine rpm
- Auxiliary hydraulics information (if equipped)
- Battery voltage
- Maintenance clock countdown
- Service codes

Figure 11

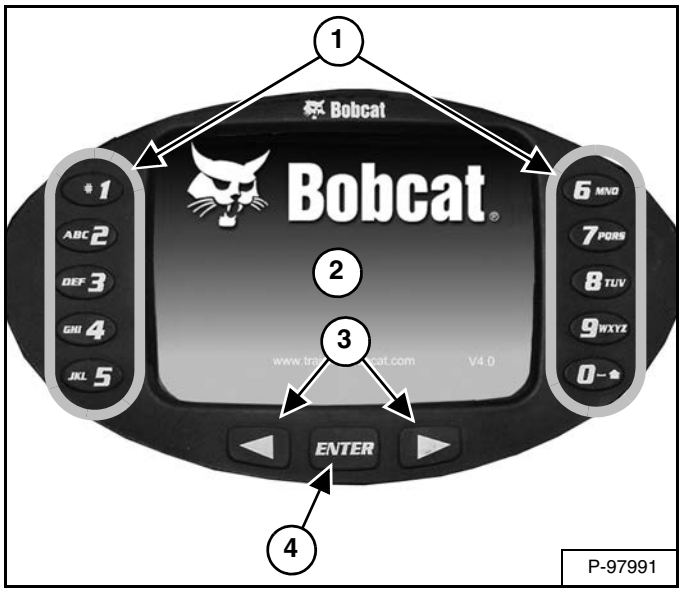


The display screen is shown in **[Figure 11]**. The data display will show operating hours upon startup.

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

Instrument Panel - Deluxe

Figure 12



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

1. **Keypad:** Use the keypad:

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

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

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

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

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

Figure 13

Turn the start key to the ON position.

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

NOTE: Your excavator (with Deluxe Instrument Panel) will have an Owner Password. Your dealer will provide you with this password. Change the password to one that you will easily remember to prevent unauthorised use of your excavator. (See Changing The Owner, User 1, And User 2 Password on Page 164.) Keep your password in a safe location for future needs.

Enter The Password:

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

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

See CONTROL PANEL SETUP for further description of screens to set up the system for your use. (See CONTROL PANEL SETUP on Page 158.)

Lights

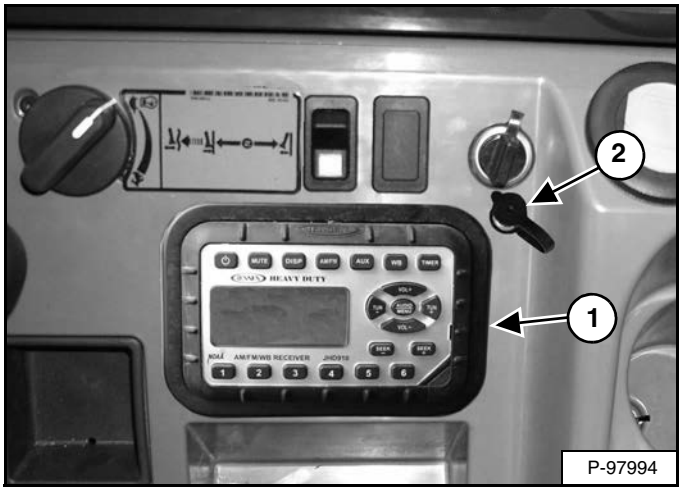
Press keypad [1] **[Figure 13]** once for FRONT work lights. Press a second time to turn all lights off.

Change Language:

The language can be changed at any time. (See CONTROL PANEL SETUP on Page 158.)

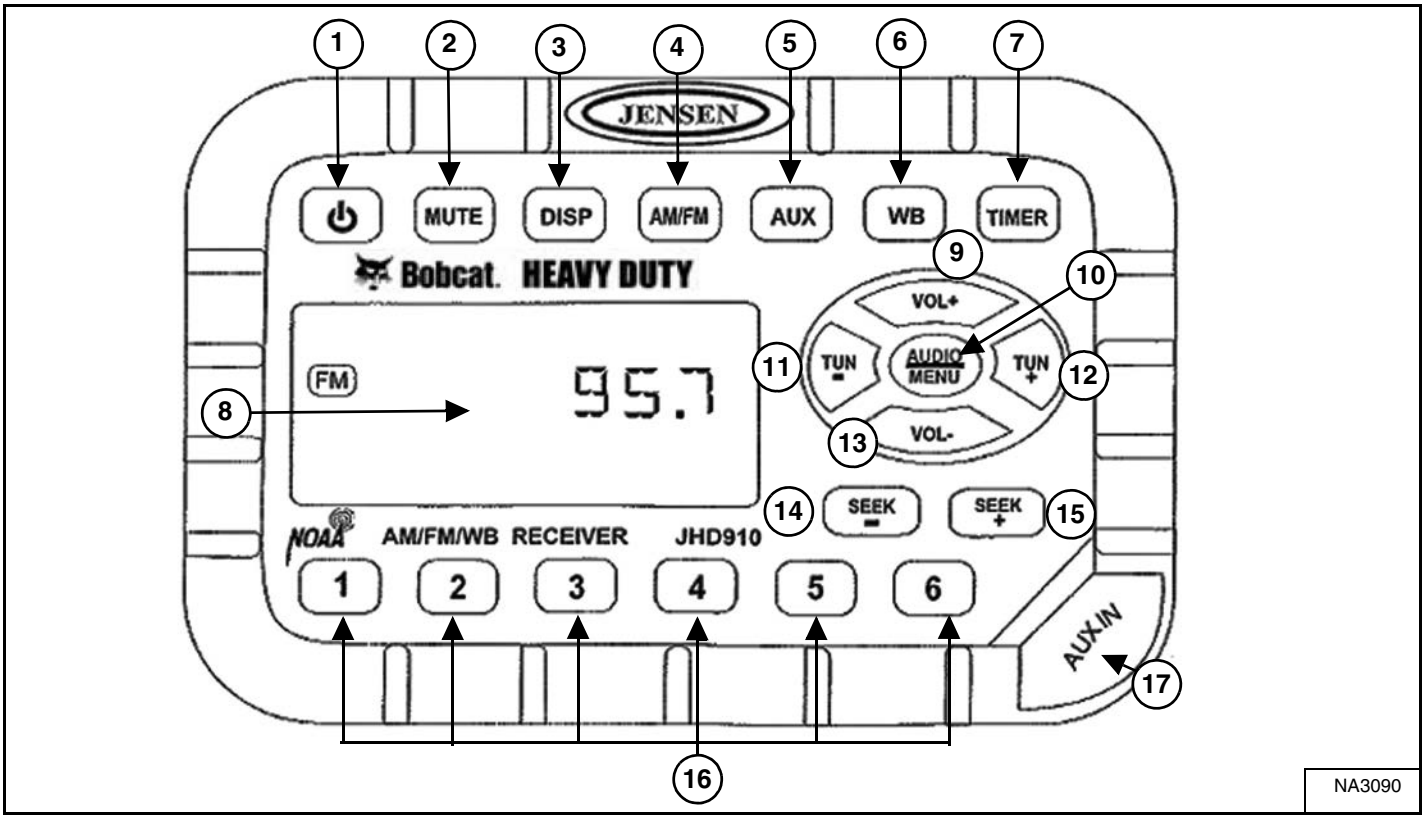
Radio Option

Figure 14



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

Figure 15



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

INSTRUMENT AND CONSOLES (CONT'D)

Radio (Cont'd)

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

Raising And Lowering The Console

Raise the console before exiting the cab.

Figure 16

Pull up on the release handle **[Figure 16]**. The lift spring will assist in raising the console.

Lower the console before operating the excavator.

Push down on the lever **[Figure 16]** until the latch is engaged.

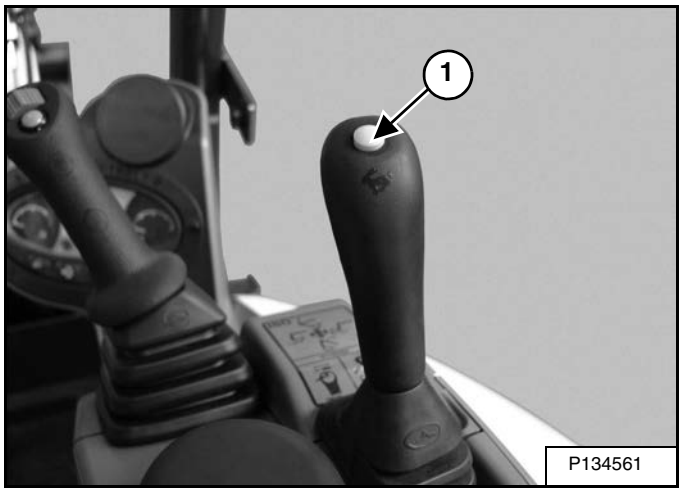
NOTE: When the console is raised, the hydraulic and traction system functions are locked and will not operate.

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

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

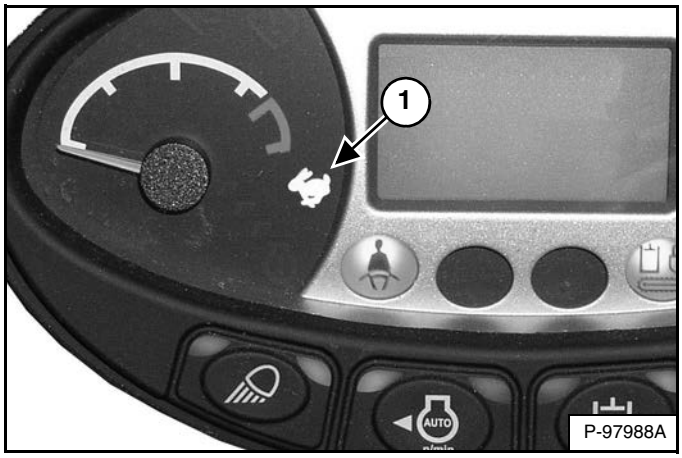
Two-Speed Travel

Figure 17



Press the button (Item 1) **[Figure 17]** to engage the high range. Press a second time to disengage.

Figure 18



When high range is engaged, the two-speed travel icon (Item 1) **[Figure 18]** will illuminate.

Press the button (Item 1) **[Figure 17]** again to disengage.

Auto Shift Drive Motors

The travel motors are equipped with an auto shift feature that senses hydraulic pressure. When in high range, the travel motors will automatically shift to low range when more torque is required and return to high range when hydraulic pressure decreases.

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

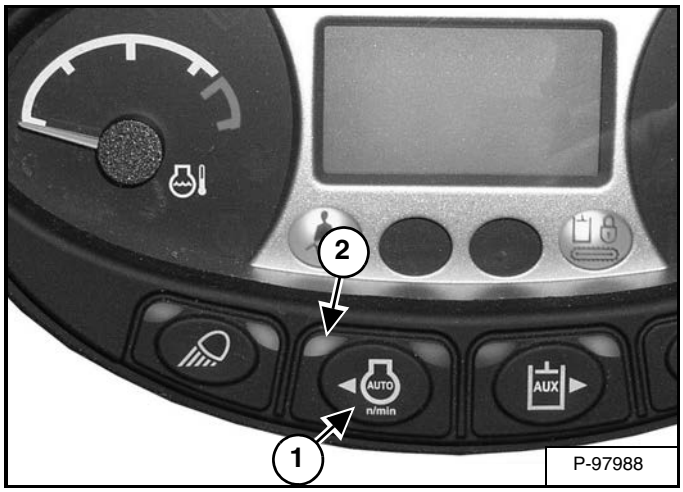
Auto Idle Feature

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

NOTE: Auto idle is only available on machines equipped with a dial throttle.

Standard Panel

Figure 19



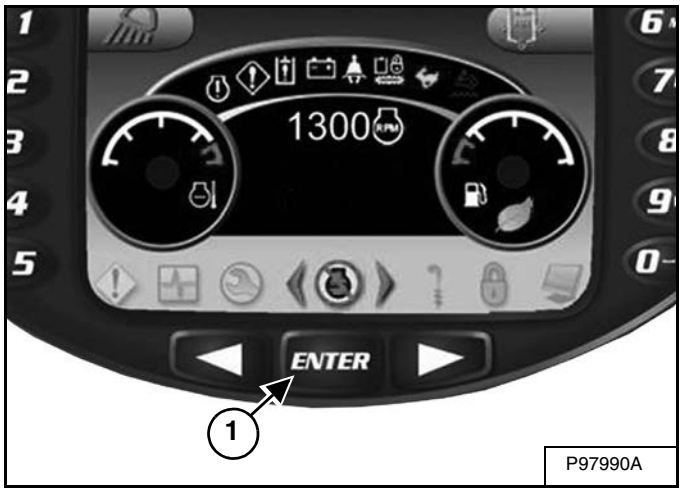
The automatic idle switch (Item 1) **[Figure 19]** is used to engage or disengage the automatic idle feature.

Press the switch (Item 1) once to engage automatic idle and the LED (Item 2) will illuminate. Press the switch (Item 1) a second time to disengage automatic idle, the LED (Item 2) **[Figure 19]** will be OFF.

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

Deluxe Panel

Figure 20



Press ENTER (Item 1) once to engage automatic idle. Press ENTER (Item 1) **[Figure 20]** again and auto idle will be OFF.

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

NOTE: When equipped with the Deluxe Instrument Panel, the time delay for auto idle to activate can be adjusted. (See Auto Idle Time Delay on Page 160.)

OPERATOR CANOPY (ROPS / TOPS / FOPS)

Description

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

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

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

FOPS - Falling Objects Protective structure, Top Guard per ISO 10262 - Level 1.

⚠ WARNING

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

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OPERATOR CAB (ROPS / TOPS / FOPS)

Description

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

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

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

FOPS - Falling Objects Protective structure, Top Guard per ISO 10262 - Level 1.

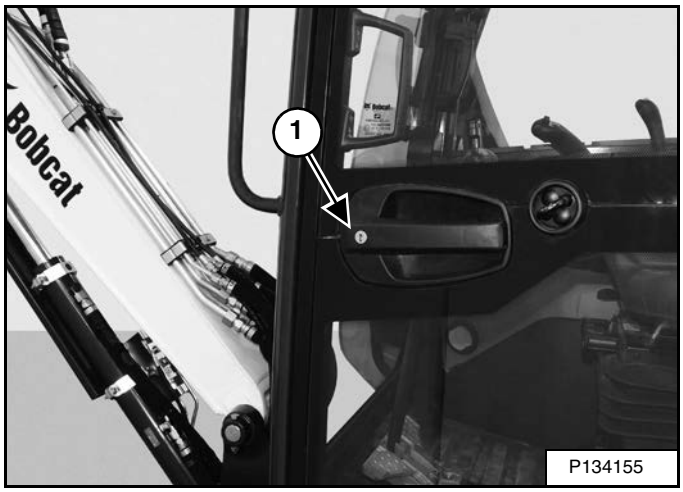
⚠ WARNING

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

W-2069-0200

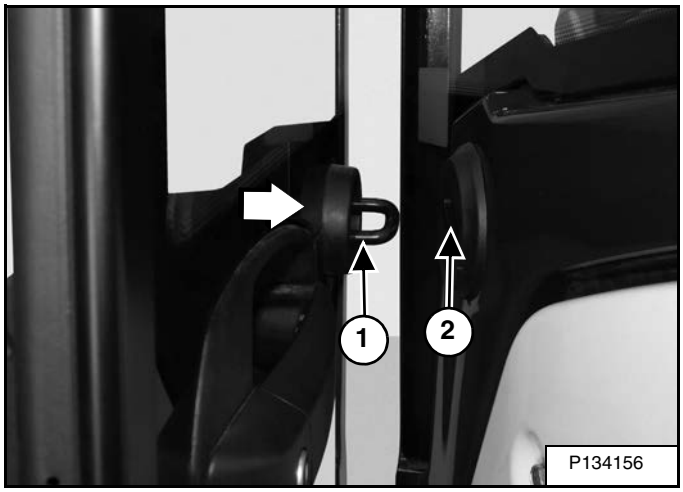
Cab Door

Figure 21



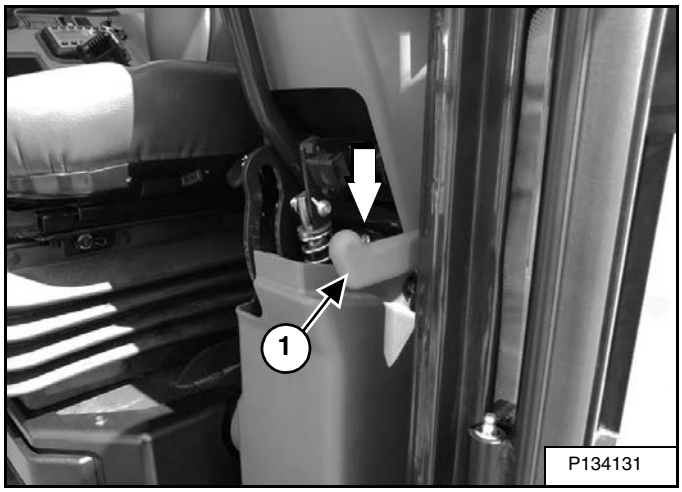
The cab door can be locked (Item 1) **[Figure 21]** with the same key as the starter switch.

Figure 22



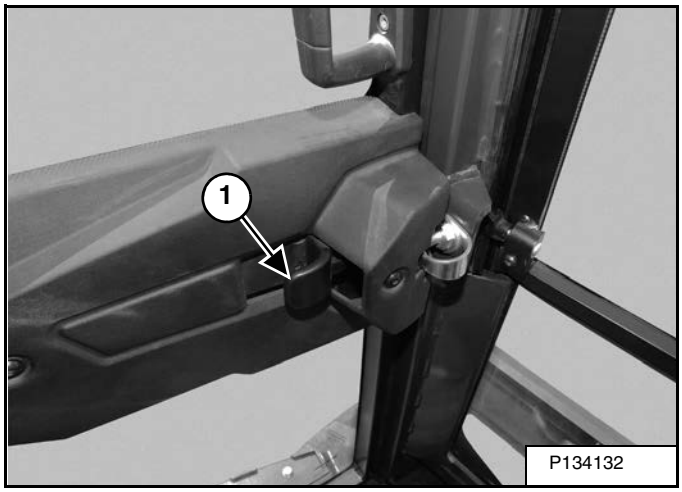
Push the door all the way open until the latch post (Item 1) engages in the latch (Item 2) **[Figure 22]** to hold the door in the open position.

Figure 23



When the door is in the open position, push down on the latch (Item 1) **[Figure 23]** to close the door.

Figure 24

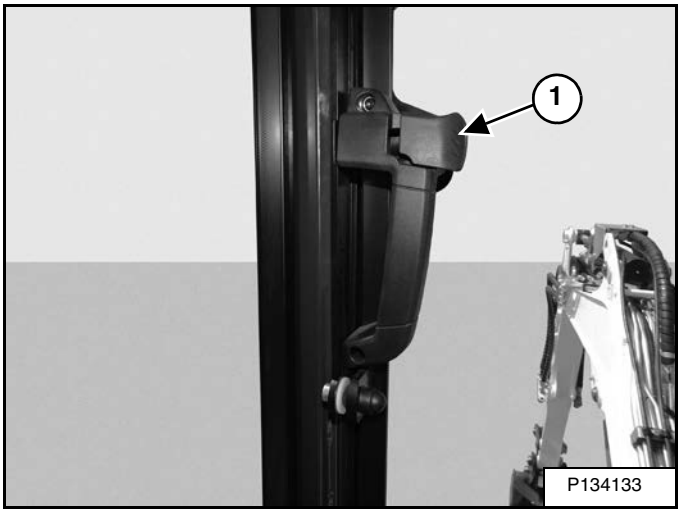


From inside the cab, open the door using the handle (Item 1) **[Figure 24]**.

Front Window

Opening The Front Window

Figure 25



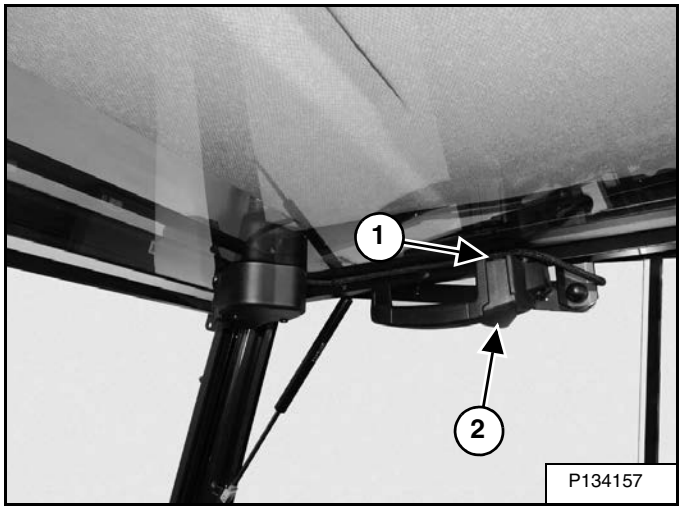
Push the window latch buttons (Item 1) **[Figure 25]** on both sides.

Figure 26

Use both window grab handles (Item 1) **[Figure 26]** to pull the top of the window in.

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

Figure 27



When the window is fully raised, the latch (Item 1) **[Figure 27]** (both sides) will close on the bracket in the latched position.

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

Closing The Front Window

Use both window grab handles to support the window while pressing the window latch button (Item 2) **[Figure 27]** (both sides).

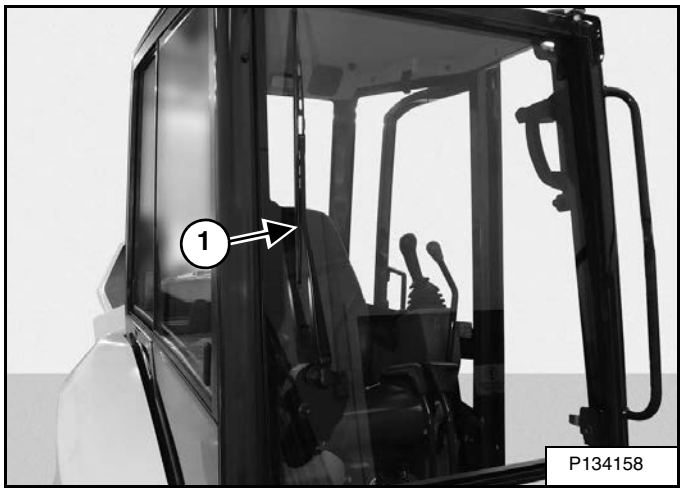
Use both window grab handles (Item 1) **[Figure 26]** to pull the window down fully.

Press the top of the window in until the latch locks into the latched position (both sides) **[Figure 25]**.

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

Front Wiper

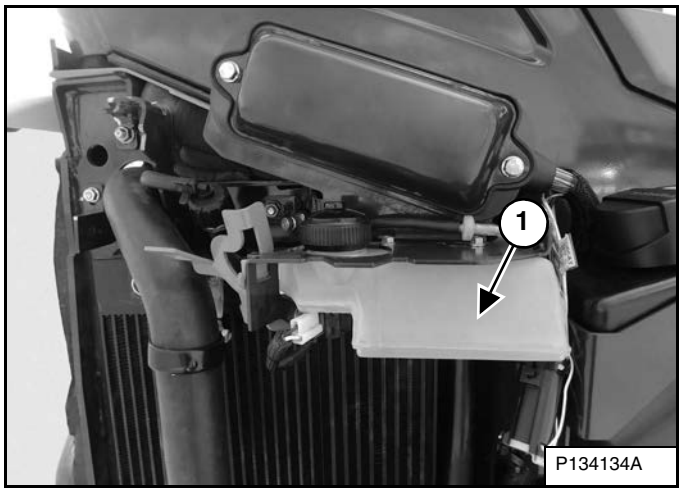
Figure 28



The front window is equipped with a wiper (Item 1) **[Figure 28]** and washer.

Window Washer Reservoir

Figure 29

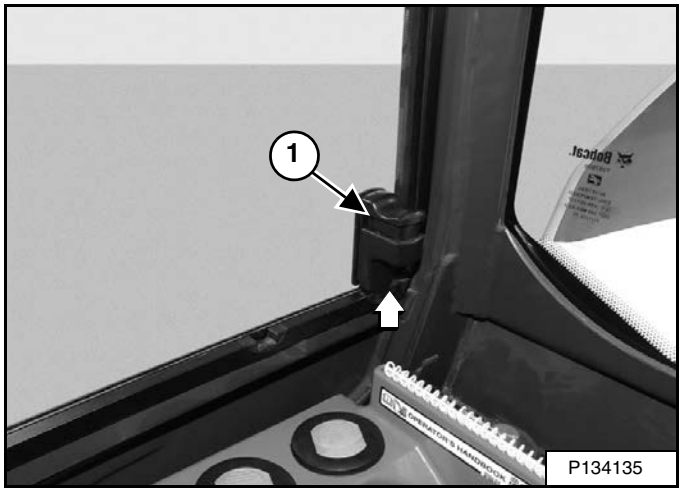


The window washer reservoir (Item 1) **[Figure 29]** is located under the right side cover.

Right Side Windows

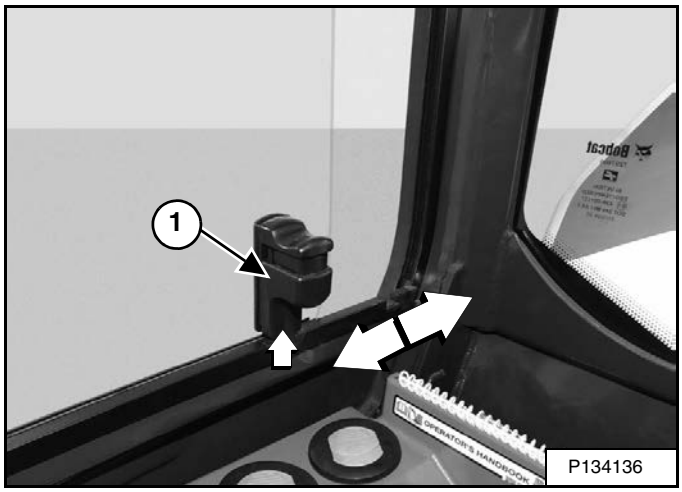
Opening The Right Rear Window

Figure 30



Pull up on the bottom latch (Item 1) **[Figure 30]**.

Figure 31



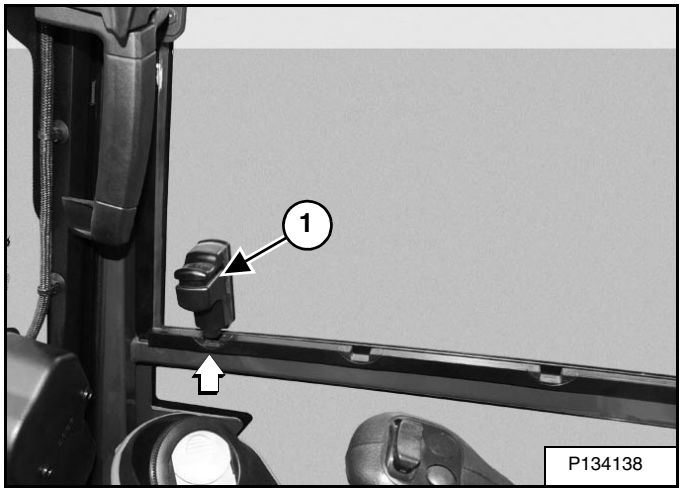
Pull the latch (Item 1) **[Figure 31]** forward to open the window until the desired stop. Release the bottom latch and snap the lock in place.

Closing The Right Rear Window

Pull up on the bottom latch (Item 1) **[Figure 30]** and push the latch back to close the window.

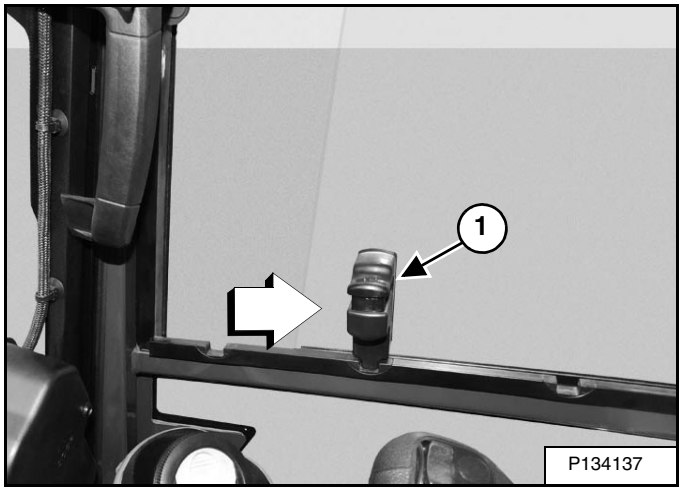
Opening The Right Front Window

Figure 32



Pull up on the bottom latch (Item 1) **[Figure 32]** located at the front of the front window.

Figure 33



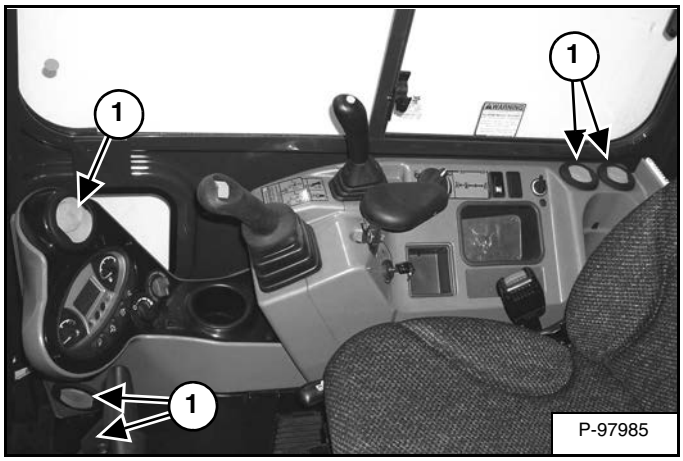
Pull the latch (Item 1) **[Figure 33]** backward to open the window until the desired stop. Release the bottom latch and snap the lock in place.

Closing The Right Front Window

Pull up on the bottom latch (Item 1) **[Figure 32]** and push the latch forward to close the window.

Heating And Ventilation Ducting

Figure 34



The louvres (Item 1) **[Figure 34]** can be positioned as needed to direct the air flow to various areas in the cab.

EMERGENCY EXIT

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

Right Side Rear Window

Figure 35

Exit through the window **[Figure 35]**.

Front Window

Figure 36

Open the front window and exit **[Figure 36]**.

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

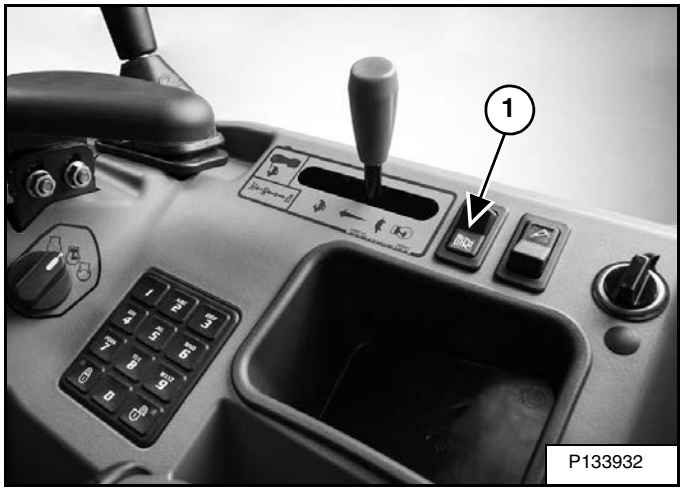
MOTION ALARM SYSTEM

Operation

Figure 37

This excavator can be equipped with a motion alarm system. The motion alarm is located underneath the rear of the excavator.

Figure 38



The motion alarm can be temporarily disabled by pressing the Motion Alarm switch (Item 1) **[Figure 38]** while the machine is moving. As soon as the travel levers are returned to the NEUTRAL position, the motion alarm will be enabled.

⚠ WARNING

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

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

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

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The motion alarm will sound when the operator moves the travel control levers (Item 1) **[Figure 39]** in either the forward or reverse direction.

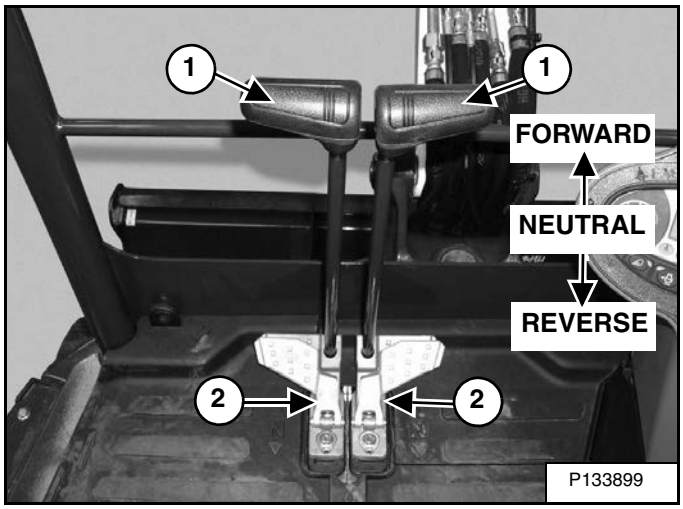
If the alarm does not sound, or for adjustment instructions, see inspection and maintenance instructions for the motion alarm system in the preventive maintenance section of this manual. (See MOTION ALARM SYSTEM on Page 113.)

TRAVEL CONTROLS

Forward And Reverse Travel

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

Figure 39



Position the blade so it is at the front of the machine (as you sit in the operator's seat). Slowly move both steering levers* (Item 1) **[Figure 39]** forward for forward travel; backward for reverse travel.

* Travel can also be controlled with foot pedals (Item 2) **[Figure 39]**. Pivot the heel of the pedals forward for additional space on the floor.

⚠ WARNING

AVOID INJURY OR DEATH

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

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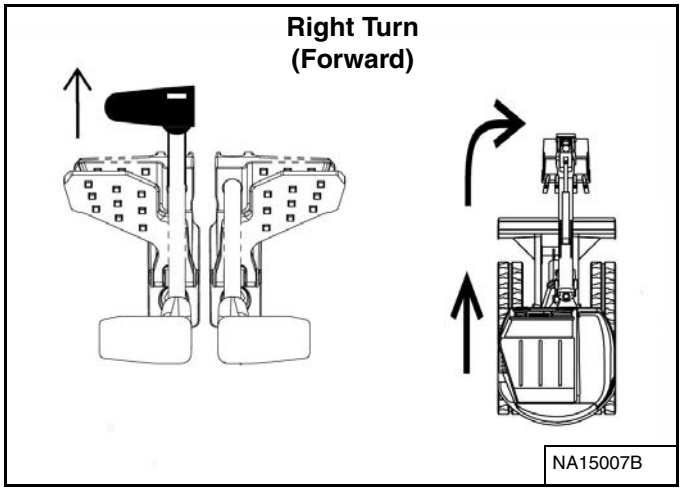
Turning

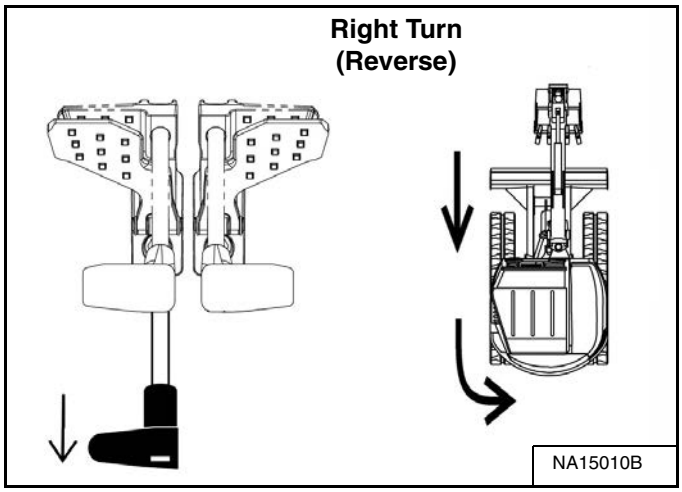
Right Turn

Figure 40



Push the left steering lever forward to turn right **[Figure 40]** while travelling forward.

Figure 41

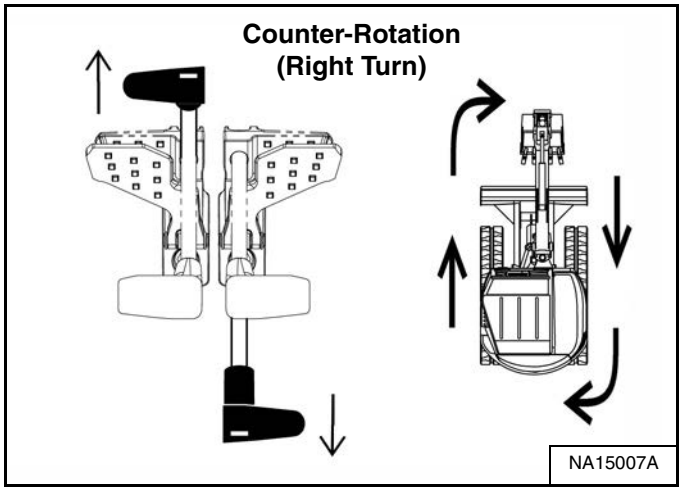


Pull the left steering lever backward to turn right while travelling backward **[Figure 41]**

Turning (Cont'd)

Counter-Rotation Right Turn

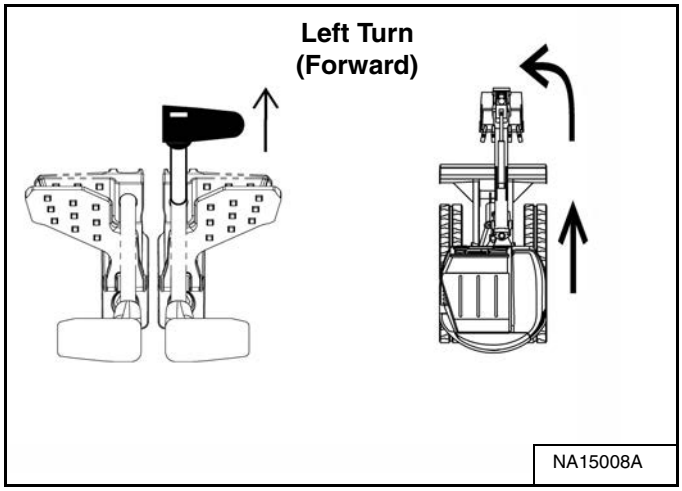
Figure 42



Push the left steering lever forward and pull the right steering lever backward **[Figure 42]**.

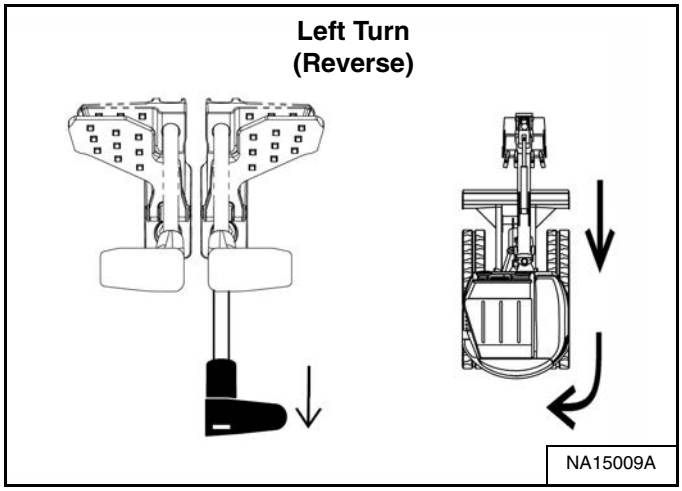
Left Turn

Figure 43



Push the right steering lever forward to turn left while travelling forward **[Figure 43]**.

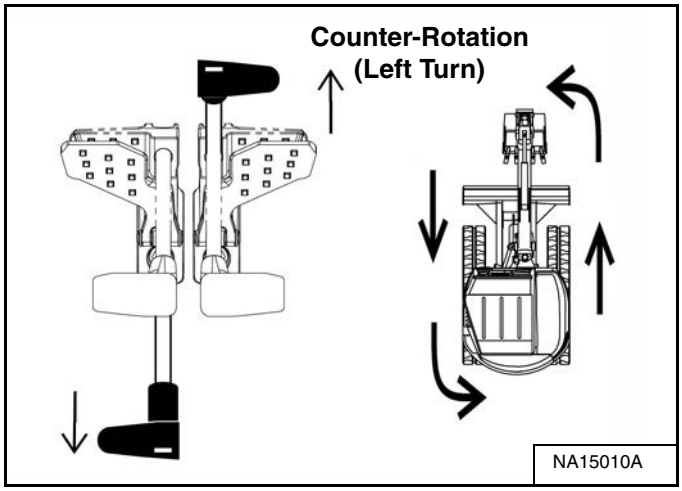
Figure 44



Pull the right steering lever backward to turn left while travelling backward **[Figure 44]**.

Counter-Rotation Left Turn

Figure 45



Push the right steering lever forward and pull the left steering lever backward **[Figure 45]**.

HYDRAULIC CONTROLS

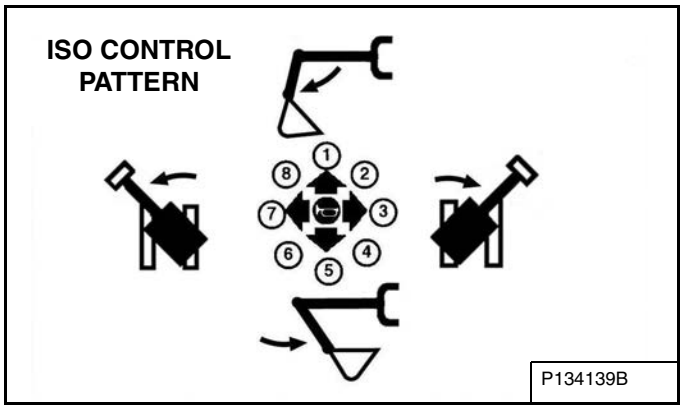
Description

Operate the work equipment (boom, arm, bucket, and upperstructure slew) with the left and right joysticks.

Left Joystick

Figure 46

Figure 47



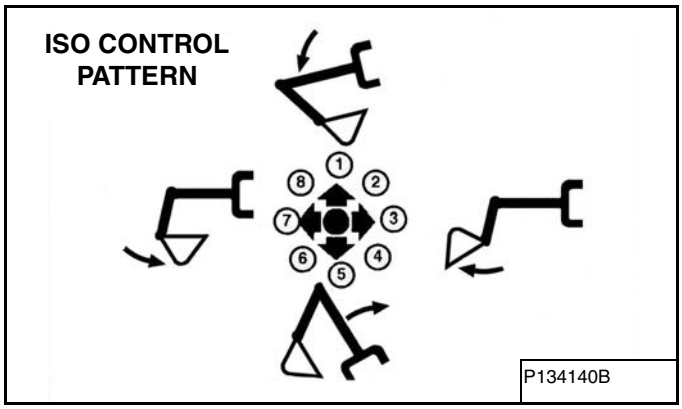
The left joystick **[Figure 46]** is used to operate the arm and slew the upperstructure **[Figure 47]**.

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

Right Joystick

Figure 48

Figure 49



The right joystick **[Figure 48]** is used to operate the boom and bucket **[Figure 49]**.

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

⚠ WARNING

AVOID INJURY OR DEATH

Before leaving the machine:

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

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Quick Couplers

⚠ WARNING

AVOID BURNS

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

W-2220-0396

⚠ WARNING

AVOID INJURY OR DEATH

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

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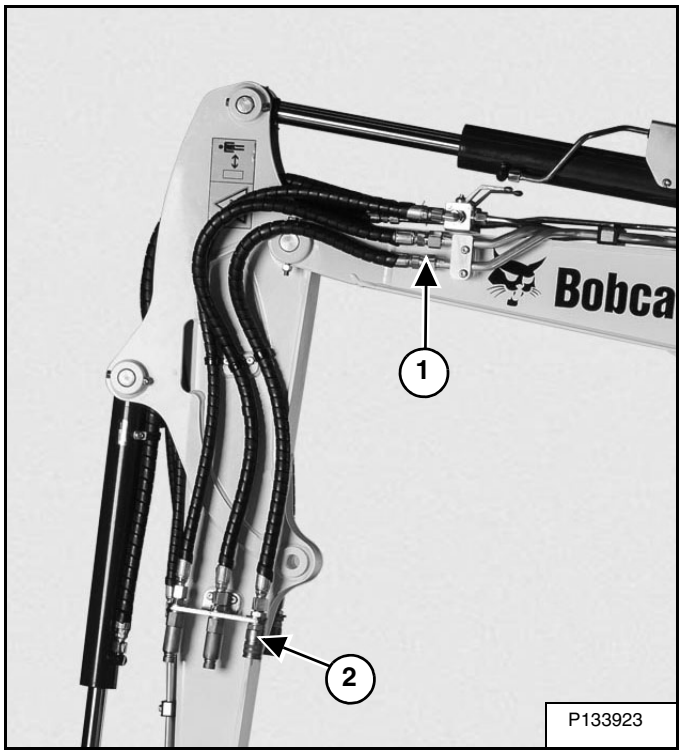
Figure 50



If equipped with auxiliary hydraulics, the excavator and attachments are supplied with flush faced couplers. The couplers can be mounted on the boom (Item 1) or on the arm (Item 2) **[Figure 50]**.

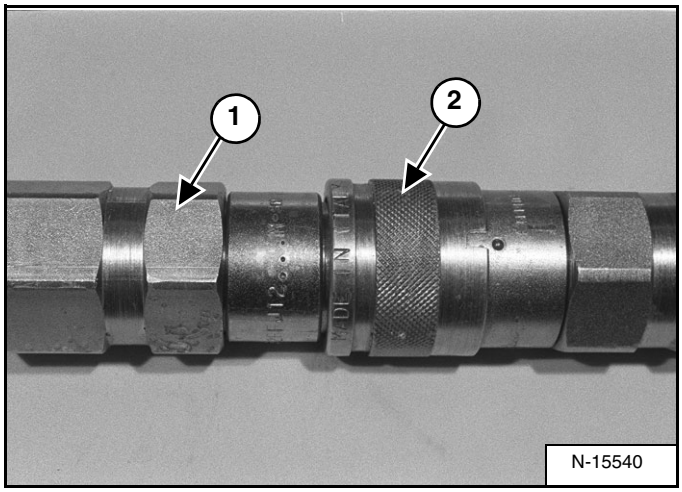
To Connect:

Remove any dirt or debris from the surface of both the male and female couplers, and from the outside diameter of the male coupler. Visually check the couplers for corroding, cracking, damage, or excessive wear. If any of these conditions exist, the coupler(s) (Item 1) **[Figure 50]** must be replaced.

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

To Disconnect:

Figure 51



Hold the male coupler (Item 1). Retract the sleeve (Item 2) **[Figure 51]** on the female coupler until the couplers disconnect.

Selectable And Continuous Auxiliary Hydraulic Flow Description

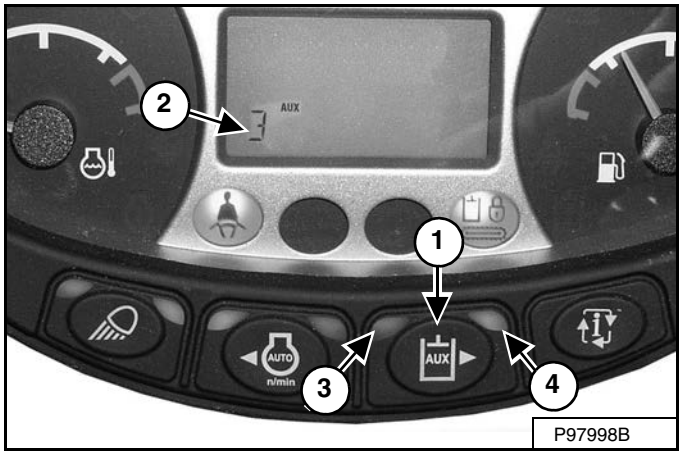
The primary auxiliary hydraulics have Selectable Auxiliary Hydraulic Flow or Continuous Auxiliary Hydraulic Flow. This allows the operator to select a hydraulic flow that matches the attachment's hydraulic requirements.

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

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

Activating Primary Auxiliary Hydraulics With Standard Instrument Panel

Figure 52



Selectable Flow Auxiliary Hydraulics - Press the AUX Hydraulics button (Item 1) **[Figure 52]**. A beep will sound each time the auxiliary button is pressed. The last selected auxiliary hydraulic flow (Mode 3, Mode 2, or Mode 1) will appear in the data display (Item 2) **[Figure 52]**. The left LED (Item 3) **[Figure 52]** will illuminate.

Press the AUX Hydraulics button (Item 1) **[Figure 52]** to scroll through the flow settings (3, 2, 1). The setting will appear in the data display (Item 2) **[Figure 52]**. Once the setting is selected, it will stay at that setting until a different auxiliary flow is selected by the operator, even after engine restart.

Continuous Flow Auxiliary Hydraulics - Press and hold the AUX Hydraulics button (Item 1) **[Figure 52]** for more than one second. The right LED (Item 4) **[Figure 52]** will illuminate. Press the AUX Hydraulics button (Item 1) **[Figure 52]** again to scroll through the flow settings (3, 2, 1).

Selectable Auxiliary Hydraulic Flow Settings For Selected Attachments

The auxiliary hydraulics can be set to Mode 3 (shown on display as 3^{AUX}), Mode 2 (2^{AUX}), Mode 1 (1^{AUX}), or OFF. Mode 3 allows maximum hydraulic flow, Mode 2 allows medium hydraulic flow, and Mode 1 allows low hydraulic flow.

AUX FLOW SETTING	FLOW	ATTACHMENTS
Mode 3 (3^{AUX})	Maximum	Breaker, Vibratory Plate Compactor, Auger
Mode 2 (2^{AUX})	Medium	Clamp, Grapple
Mode 1 (1^{AUX})	Low	Power Tilt, Hydra Tilt

Activating Primary Auxiliary Hydraulics With Deluxe Instrument Panel (Software Version 88.02 Or Below)

Figure 53

Selectable Flow Auxiliary Hydraulics - Press key 6 (Item 1) **[Figure 53]** to activate auxiliary hydraulics. Press key 6 (Item 1) **[Figure 53]** again to scroll through the flow settings (see table below).

Continuous Flow Auxiliary Hydraulics - Press and hold key 6 (Item 1) **[Figure 53]** for more than one second. The continuous flow icons below will illuminate. Press key 6 (Item 1) **[Figure 53]** to scroll through the flow settings (see table below).

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

Activating Primary Auxiliary Hydraulics With Deluxe Instrument Panel (Software Version 88.03 Or Above)

Figure 54

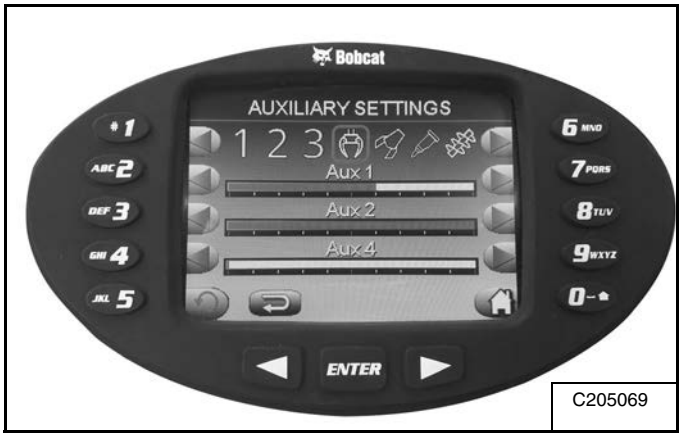
NOTE: Updated deluxe panels have the Aux icon (Item 3) [Figure 54] on the Gauges screen.

Selectable Flow Auxiliary Hydraulics - Press key 6 (Item 1) **[Figure 54]** to activate auxiliary hydraulics.

Continuous Flow Auxiliary Hydraulics - Press and hold key 6 (Item 1) **[Figure 54]** for more than one second. The continuous flow icon will illuminate.

Setting Auxiliary Hydraulic Flow Rate

Figure 55



Press key 7 (Item 2) **[Figure 54]** to open the AUXILIARY SETTINGS screen and set auxiliary flow rate.

On the AUXILIARY SETTINGS screen, press keys 1 or 6 to scroll through the settings **[Figure 55]**. See the table below for an explanation of the icons. Select the icon that corresponds to your attachment or select one of the Custom settings to save your own flow rates.

Activating Primary Auxiliary Hydraulics With Deluxe Instrument Panel (Software Version 88.03 Or Above) (Cont'd)

Adjust the flow rate percentages with keys 2 – 4 and 7 – 9. After changing a flow rate, press the save icon to save the setting.

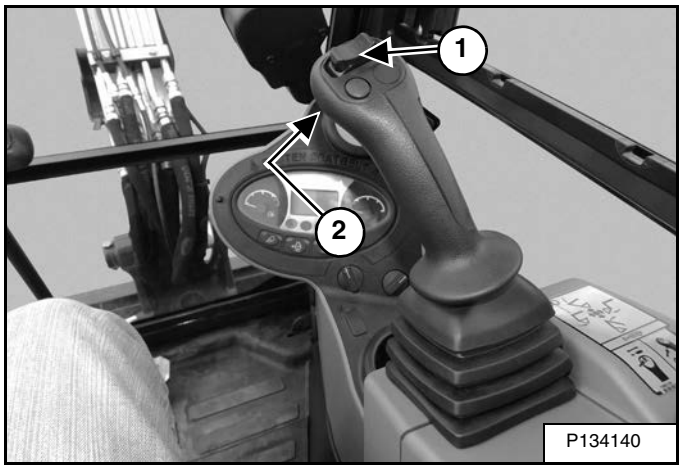
Press key 0 to return to the Gauge screen.

Press key 5 to return settings to the default setting.

ICON	DESCRIPTION
	Selectable Flow
	Continuous Flow
	Secondary Auxiliary
	Auauger
	Cutter / Crusher
	Breaker
	Rotating Grapple
	Flail Mower
	Tilt Coupler
	Custom Setting 1
	Custom Setting 2
	Custom Setting 3

Operating Attachments With Primary Auxiliary Hydraulics

Figure 56



After activating auxiliary hydraulics and selecting Selectable or Continuous flow (See Activating Primary Auxiliary Hydraulics With Standard Instrument Panel on Page 48.), (See Activating Primary Auxiliary Hydraulics With Deluxe Instrument Panel (Software Version 88.02 Or Below) on Page 49.), or (See Activating Primary Auxiliary Hydraulics With Deluxe Instrument Panel (Software Version 88.03 Or Above) on Page 49.), operate the attachment as follows:

- Move the switch (Item 1) **[Figure 56]** on the right joystick to the right to supply hydraulic flow to the female coupler.
- Move the switch (Item 1) **[Figure 56]** to the left to supply hydraulic flow to the male coupler.
- Move the switch (Item 1) **[Figure 56]** halfway and the auxiliary functions will move at approximately one-half speed.
- Press the button (Item 2) **[Figure 56]** on the front of the handle to provide continuous flow to the female coupler.
- Press the switch (Item 1) to the left while pressing the button (Item 2) **[Figure 56]** on the front of the handle to provide continuous flow to the male coupler.
- Press the button (Item 2) **[Figure 56]** a second time to stop auxiliary flow to the quick couplers.

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

Releasing Hydraulic Pressure In Excavator With Standard Instrument Panel

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

Put the attachment flat on the ground.

Stop the engine and turn the key switch to ON.

NOTE: The left console must be fully lowered to release hydraulic pressure.

Figure 57

If the auxiliary hydraulics are disabled, press AUX Hydraulics button (Item 1) **[Figure 57]** and then move the switch (Item 1) **[Figure 56]** to the right and left several times.

If the auxiliary hydraulics are enabled, then move the switch (Item 1) **[Figure 56]** to the right and left several times.

Releasing Hydraulic Pressure In Excavator With Deluxe Instrument Panel

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

Put the attachment flat on the ground.

Stop the engine and turn the start switch to ON.

NOTE: The left console must be fully lowered to release hydraulic pressure.

Figure 58

Press either Scroll button (Item 1) **[Figure 58]** until the above screen is visible.

Press key 6 **[Figure 58]** and the AUX PRESSURE RELEASE screen **[Figure 59]** will appear.

Figure 59

Press the ENTER button (Item 1) **[Figure 59]** to release auxiliary pressure in the excavator. An hour glass symbol will appear and when pressure is released, the screen will show *Auxiliary Hydraulic Pressure Release*.

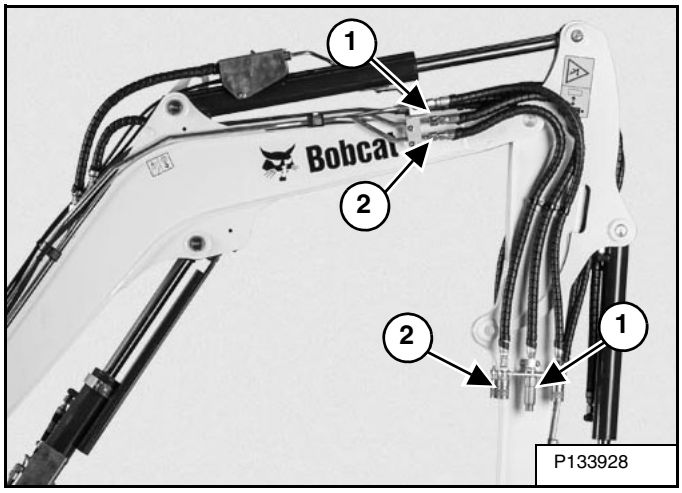
Releasing Hydraulic Pressure In Attachments

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

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

Secondary Auxiliary Hydraulics Location

Figure 60



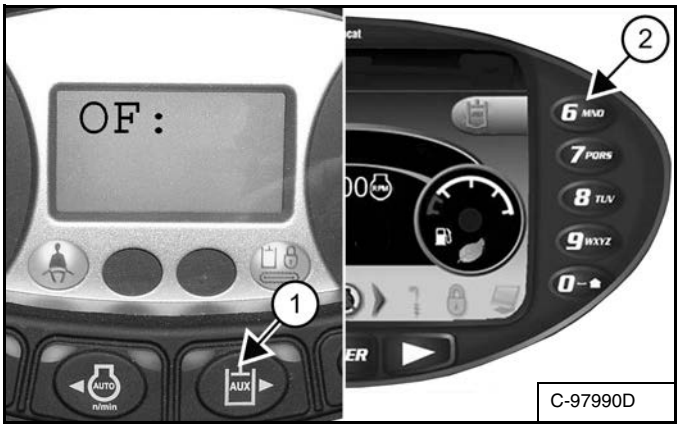
When machines are equipped with secondary auxiliary hydraulics, the second set of hydraulic couplers will be mounted on the right side of the arm or boom.

- Move the switch to the right to supply hydraulic flow to the male coupler.
- Move the switch halfway and the auxiliary functions will move at approximately one-half speed.

Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.02 Or Below)

If your machine's software has been updated, (See Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.03 Or Above) on Page 54.).

Figure 61

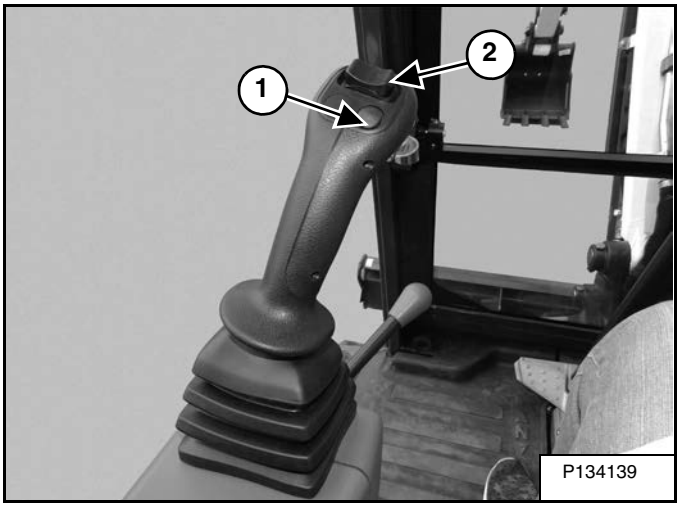


1. Activate auxiliary hydraulics.

- *Standard Instrument Panel:* Press the AUX Hydraulics button (Item 1) **[Figure 64]**.

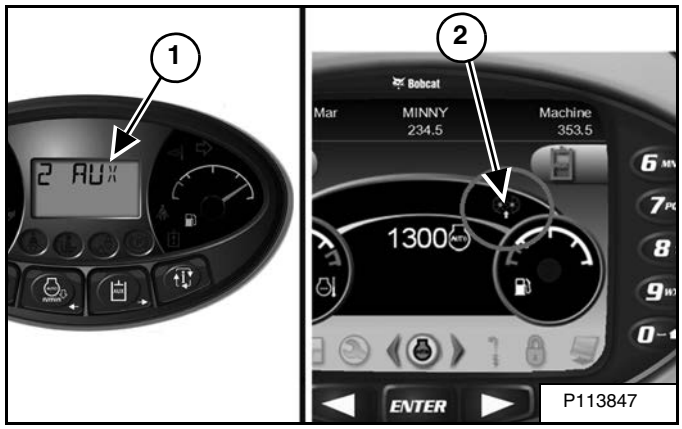
- *Deluxe Instrument Panel:* Press key 6 (Item 2) **[Figure 64]**.

Figure 62



2. Press and hold the button (Item 1) **[Figure 62]** on the left joystick until a beep is heard to switch between the boom swing function and the secondary auxiliary hydraulics.

Figure 63



- *Standard Instrument Panel:* The display (Item 1) **[Figure 63]** will show *2 AUX* when in the second auxiliary mode.

- *Deluxe Instrument Panel:* The icon (Item 2) **[Figure 63]** will be illuminated when in the second auxiliary mode.

3. Operate the attachment as follows:

- Move the switch (Item 2) **[Figure 62]** on the left control lever to the left to supply hydraulic flow to the female coupler.

- Move the switch (Item 2) **[Figure 62]** to the right to supply hydraulic flow to the male coupler.

- Move the switch (Item 2) **[Figure 62]** halfway and the auxiliary functions will move at approximately one-half speed.

Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.03 Or Above)

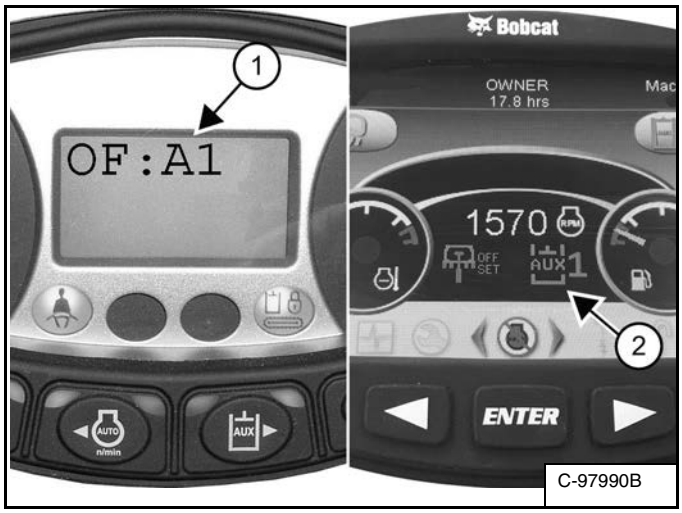
Figure 64

1. Activate auxiliary hydraulics.

- *Standard Instrument Panel:* Press the AUX Hydraulics button (Item 1) **[Figure 64]**.

- *Deluxe Instrument Panel:* Press key 6 (Item 2) **[Figure 64]**.

Figure 65



2. The display will indicate that the left joystick controls boom swing offset and the right joystick controls primary auxiliary hydraulics.

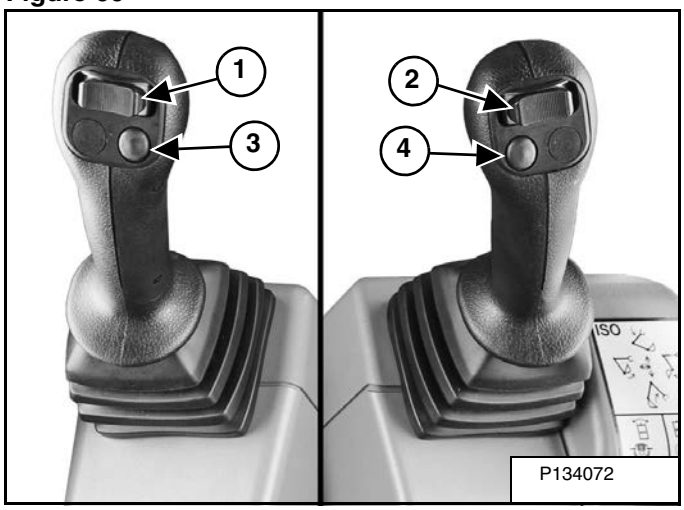
- *Standard Instrument Panel:* The display will show [OF:A1] (Item 1) **[Figure 65]**.

- *Deluxe Instrument Panel:* The display will show Offset and Aux1 icons (Item 2) **[Figure 65]**.

3. Press the left joystick button (Item 3) **[Figure 66]** until two beeps are heard to select Aux2.

NOTE: The joystick switches must be in the neutral position before you press a joystick button to change to a different auxiliary.

Figure 66



4. Operate the attachment with the joystick switches.

- Use the left joystick switch (Item 1) **[Figure 66]** to control the hydraulics indicated on the left side of the display panel (OF or Aux2).

- Use the right joystick switch (Item 2) **[Figure 66]** to control the hydraulics indicated on the right side of the display panel (Aux1).

To set auxiliary hydraulics flow rate, (See Setting Auxiliary Hydraulic Flow Rate on Page 49.).

Releasing Secondary Auxiliary Hydraulic Pressure In Excavator

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

1. Put the attachment flat on the ground.

2. Stop the engine and turn the key to ON.

3. Make sure left console is fully lowered.

4. Activate auxiliary hydraulics. (See Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.02 Or Below) on Page 53.) (See Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.03 Or Above) on Page 54.)

5. Activate secondary auxiliary hydraulics. (See Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.02 Or Below) on Page 53.) (See Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.03 Or Above) on Page 54.)

6. Move the left joystick switch (Item 2) **[Figure 62]** to the right and left several times to release pressure.

Releasing Secondary Auxiliary Hydraulic Pressure In Attachment

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

- Follow procedure above to release pressure in excavator.

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

- Connect the female coupler from the attachment.

Direct To Tank Switch

The direct to tank switch (if equipped) is located on the right console.

Figure 67

Push the top of the switch (Item 1) **[Figure 67]** to direct auxiliary return flow to the hydraulic oil reservoir. The button will illuminate.

Push the bottom of the switch (Item 1) **[Figure 67]** to select two-way hydraulic auxiliary flow operation.

OVERLOAD WARNING DEVICE

Description

NOTE: The excavator must be equipped with the optional boom load holding valve to install the overload warning device.

The overload warning device (if equipped), senses hydraulic pressure in the boom lift circuit. When the hydraulic pressure in the boom lift circuit reaches a predetermined pressure setting, a buzzer will sound that indicates an overload condition.

If the buzzer sounds, immediately move the arm closer to the excavator and lower the boom. Reduce the size of the load before attempting to re-lift the load.

Operation

Figure 68

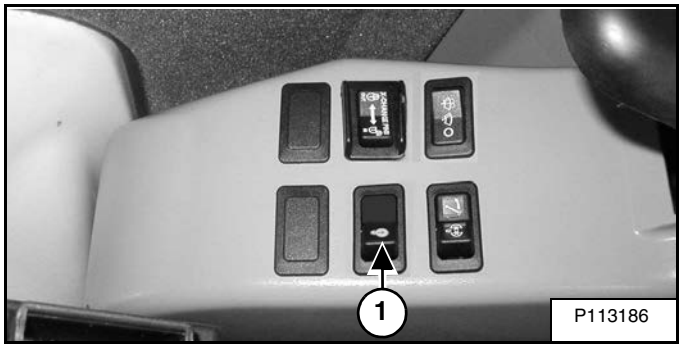
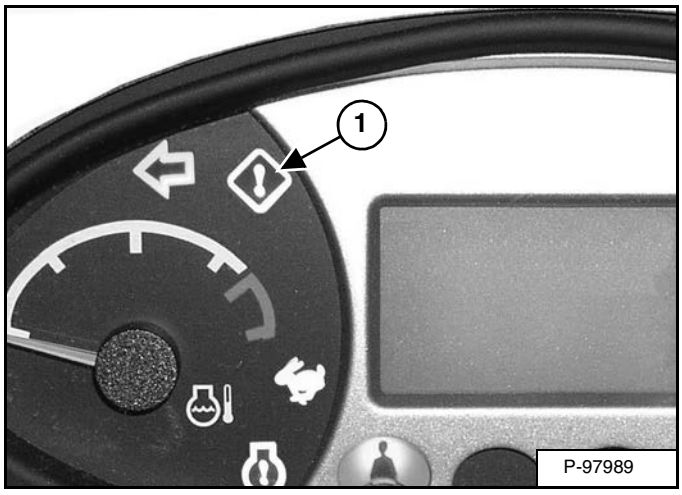


Figure 69



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

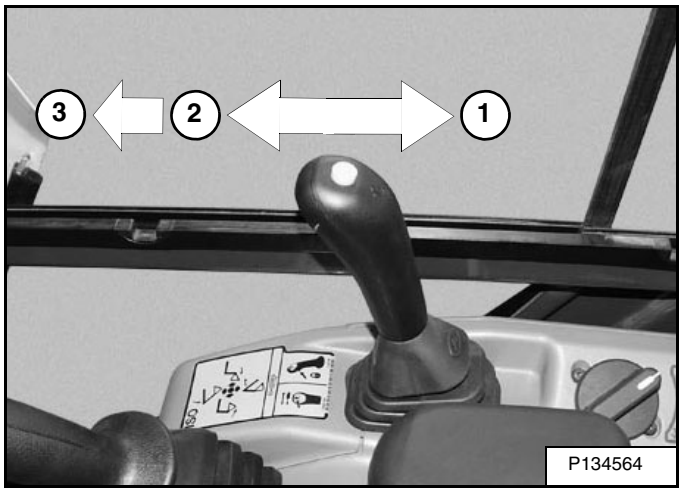
A buzzer will sound and the general warning icon (Item 1) **[Figure 69]** will illuminate when the boom is overloaded.

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

BLADE CONTROL LEVER

Raising And Lowering Blade

Figure 70



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

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

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

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

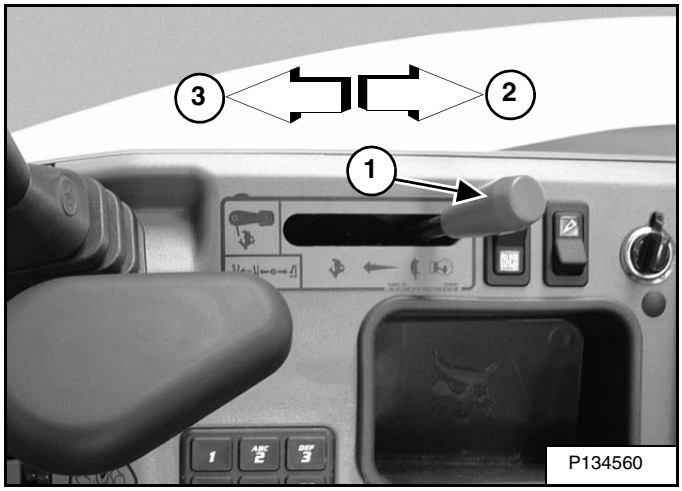
NOTE: Keep blade lowered for increased digging performance.

ENGINE SPEED CONTROL

Setting Engine Speed (RPM)

Engine Speed Control Lever (If Equipped)

Figure 71

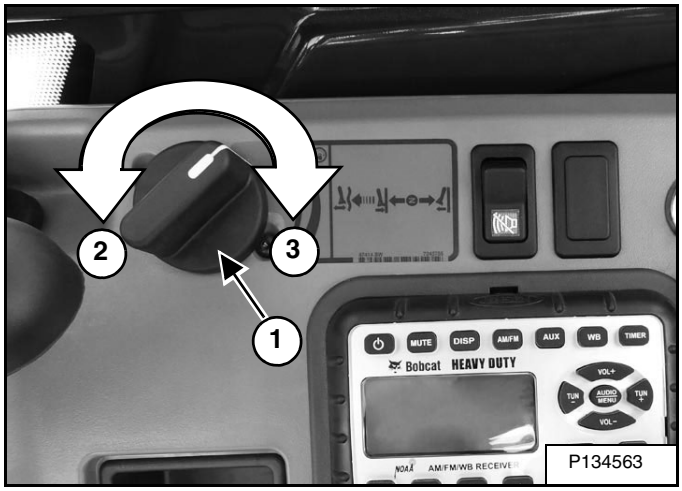


The engine speed control lever (Item 1) **[Figure 71]** controls engine rpm.

Pull the engine speed control lever back (Item 2) to reduce engine rpm. Push the engine speed control lever forward (Item 3) **[Figure 71]** to increase engine rpm.

Engine Speed Control Dial (If Equipped)

Figure 72



The engine speed control dial (Item 1) **[Figure 72]** controls engine rpm.

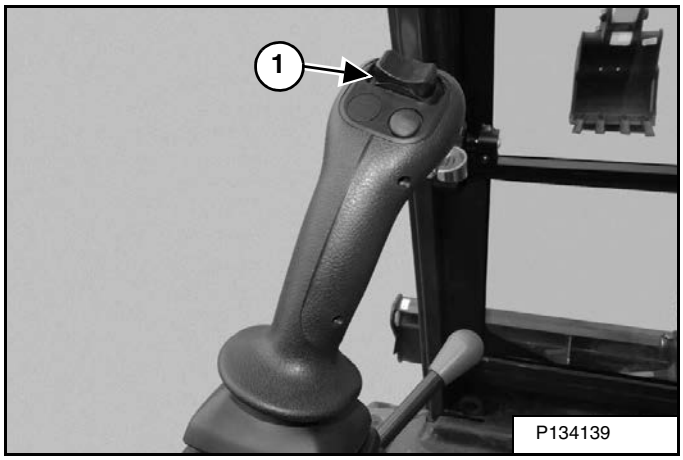
Rotate the engine speed control dial anticlockwise (Item 2) to reduce engine rpm. Rotate the engine speed control dial clockwise (Item 3) **[Figure 72]** to increase engine rpm.

NOTE: Auto idle feature is only available with the engine speed control dial (Item 1) [Figure 72]. (See Auto Idle Feature on Page 36.)

BOOM SWING

Operation

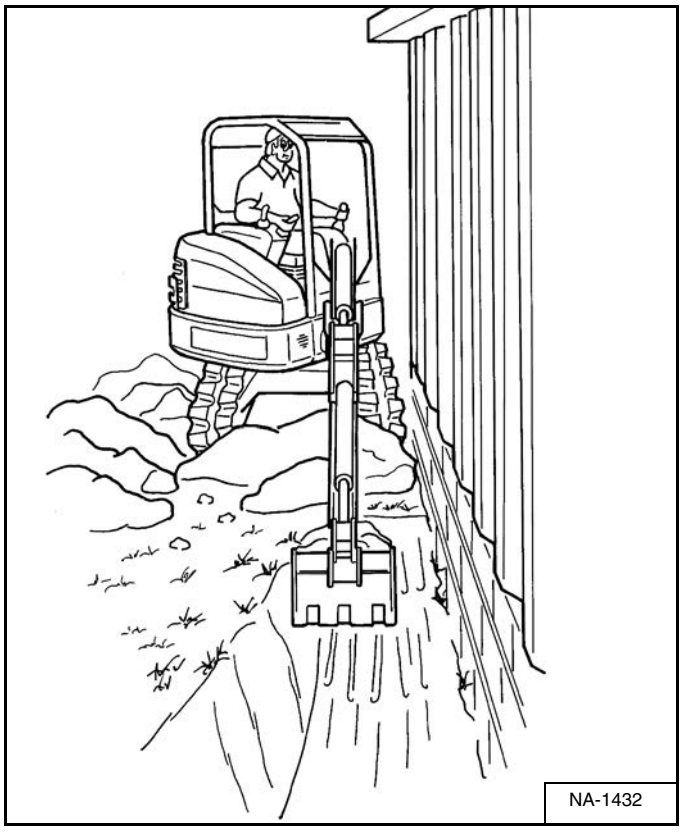
Figure 73



When no auxiliary hydraulics are enabled, control the boom swing with the left joystick switch (Item 1) **[Figure 73]**. Move the switch to the left to swing the boom to the left. Move the switch to the right to swing the boom to the right.

For instructions on operating the boom swing / auxiliary hydraulics (See Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.02 Or Below) on Page 53.) (See Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.03 Or Above) on Page 54.).

Figure 74



NOTE: The purpose of the boom swing is to offset the boom with respect to the upperstructure for digging close to a structure [Figure 74].

BOOM LOAD HOLDING VALVE

Description

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

⚠ WARNING

AVOID INJURY OR DEATH

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

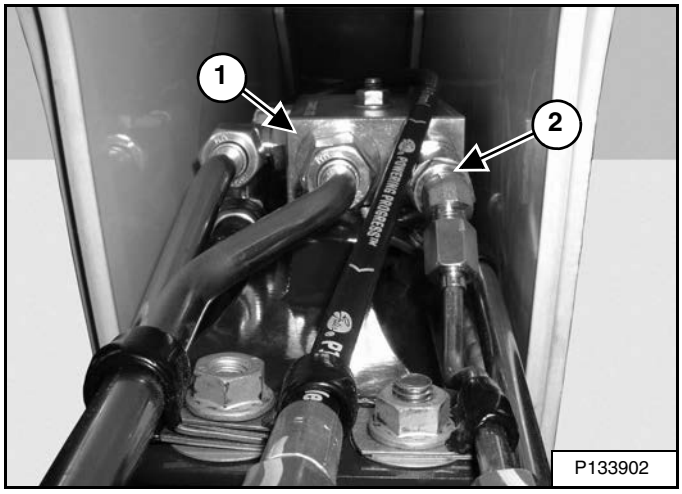
W-2793-0409

Lowering The Boom With Accumulator Pressure

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

Lowering The Boom With NO Accumulator Pressure

Figure 75



If the excavator is equipped with a boom load holding valve (Item 1) **[Figure 75]**, it will be attached to the boom cylinder at the base end.

NOTE: DO NOT remove or adjust the relief valve (Item 2) [Figure 75]. If this valves has been tampered with, the valve will need to be replaced. See your Bobcat dealer for replacement parts.

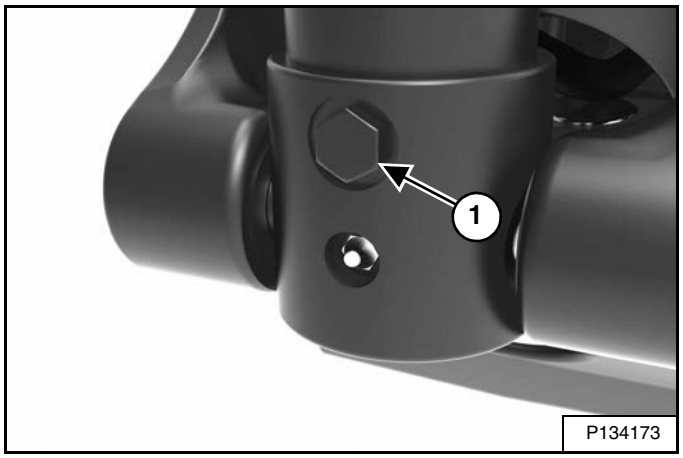
⚠ WARNING

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.

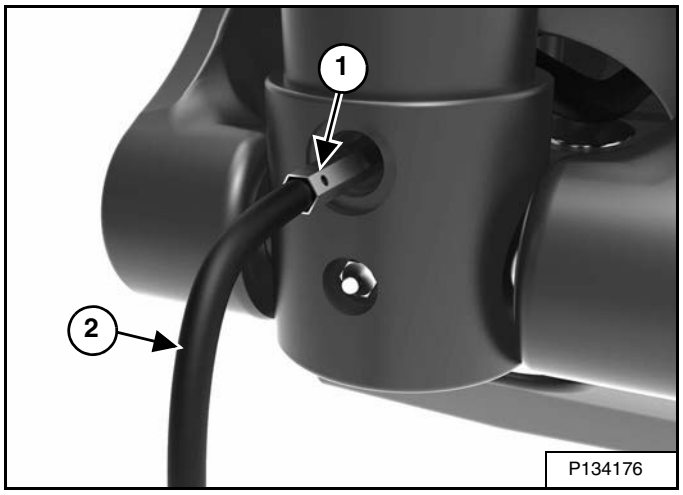
W-2220-0396

Figure 76



Remove the cap (Item 1) at the base of the boom cylinder **[Figure 76]**.

Figure 77



Insert a 3/8 inch spanner wrench into the bleeder fitting (Item 1) **[Figure 77]**.

Insert a 6mm hose into the spanner wrench (Item 2) **[Figure 77]**. Place a container under the hose end to catch the hydraulic fluid.

Slowly rotate the bleeder valve anticlockwise 45° to 90° and allow the boom to lower fully to the ground.

After the boom is fully lowered, tighten the bleeder valve clockwise to 23 – 26 N•m (16 – 18 ft-lb). Reinstall the cap (Item 1) **[Figure 76]**.

ARM LOAD HOLDING VALVE

Description

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

⚠ WARNING

AVOID INJURY OR DEATH

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

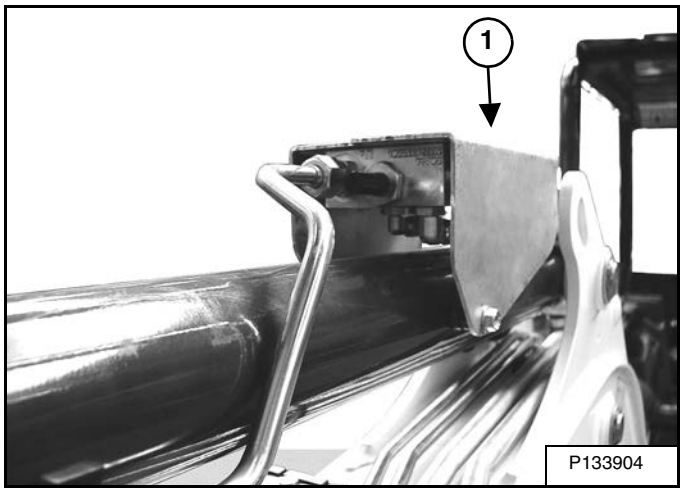
W-2793-0409

Lowering The Arm With Accumulator Pressure

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

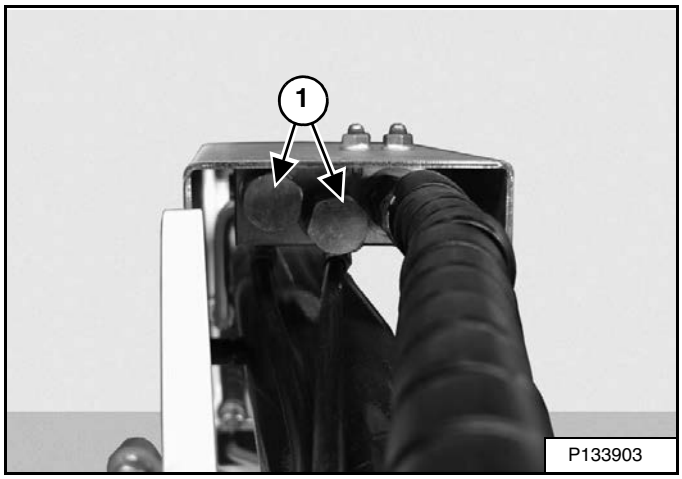
Lowering The Arm With NO Accumulator Pressure

Figure 78



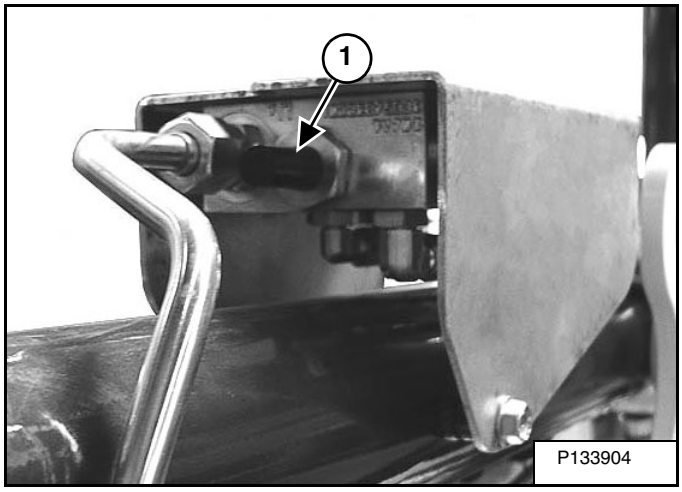
If the excavator is equipped with an arm load holding valve (Item 1) **[Figure 78]**, it will be attached to the arm cylinder base end as shown.

Figure 79



NOTE: DO NOT remove or adjust the two port relief valves (Item 1) [Figure 79]. If the port relief valves have been tampered with, see your Bobcat dealer for service.

Figure 80



Remove the plastic protective cap (Item 1) **[Figure 80]** from the valve.

⚠ WARNING

AVOID BURNS

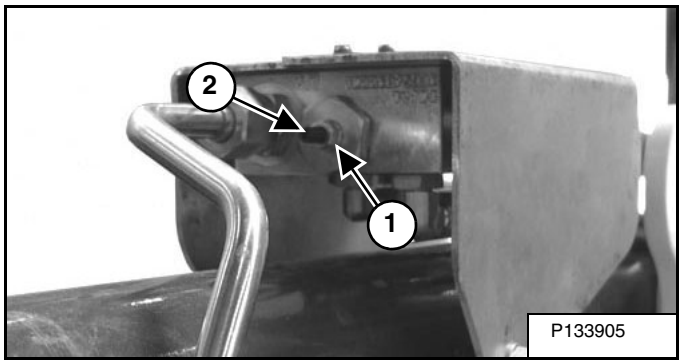
Hydraulic fluid, tubes, fittings and quick couplers can get hot when running machine and attachments. Be careful when connecting and disconnecting quick couplers.

W-2220-0396

ARM LOAD HOLDING VALVE (CONT'D)

Lowering Arm With NO Accumulator Pressure (Cont'd)

Figure 81



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

Loosen the jam nut (Item 1). Install a hex wrench into the valve screw (Item 2) **[Figure 81]** and slowly rotate the screw clockwise 45° to 90° turn and allow the arm to lower.

After the arm is lowered, rotate the screw (Item 2) anticlockwise 45° to 90° turn and tighten the lock nut (Item 1) **[Figure 81]**. Reinstall the base end hose.

DAILY INSPECTION

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 82

The Service Schedule decal (Item 1) **[Figure 82]** is located inside the right cover.

A complete list of scheduled maintenance is also located in the Service Schedule. (See SERVICE SCHEDULE on Page 109.)

⚠ 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 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

Check the following items before each day of operation:

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

Daily Inspection and Maintenance (Cont'd)

⚠ 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

Operation & Maintenance Manual And Operator's Handbook Locations

Figure 83

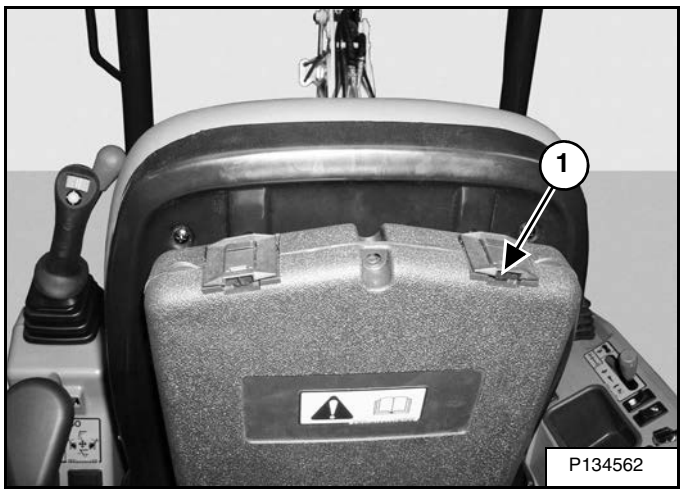
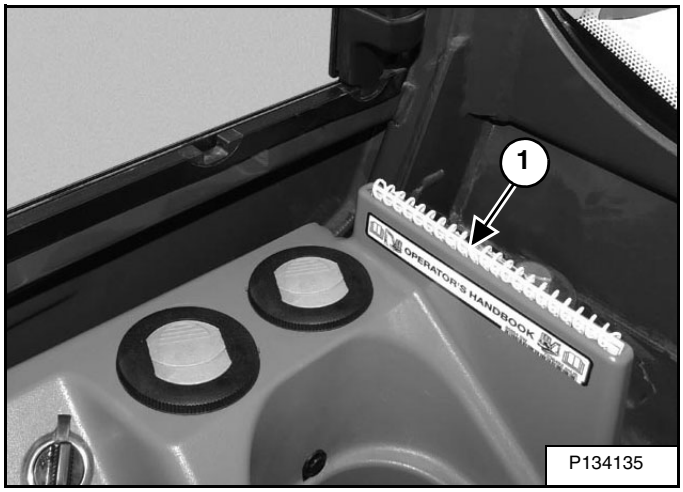


Figure 84



Read and understand the Operation & Maintenance Manual (Item 1) **[Figure 83]** (located inside the storage box on the back of the operator's seat) and the Operator's Handbook (Item 1) **[Figure 84]** before operating.

Entering The Excavator

Figure 85

Use the grab handles and tracks to enter the canopy / cab **[Figure 85]**.

⚠ WARNING

AVOID INJURY OR DEATH

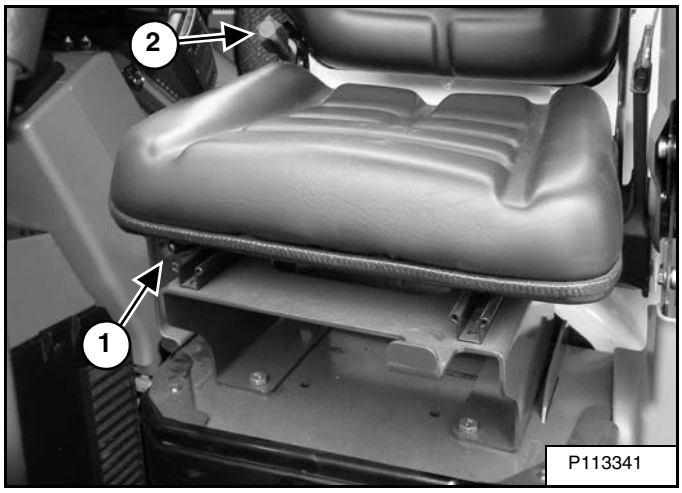
Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after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

W-2003-0807

Seat Adjustment

Standard Seat

Figure 86

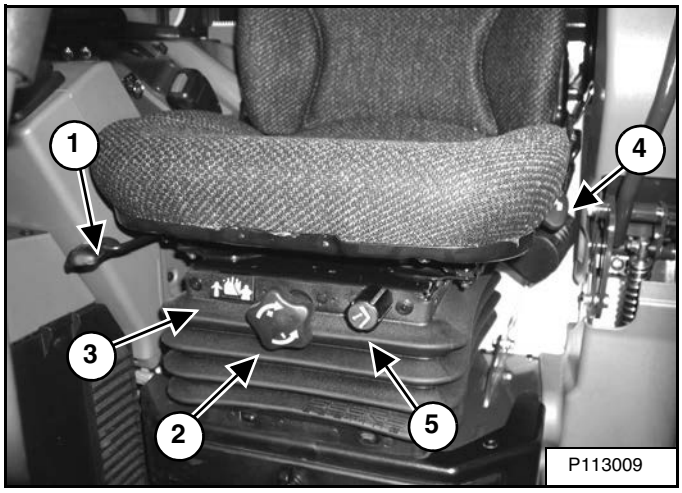


Release the seat lever (Item 1) **[Figure 86]** to adjust the seat forward or back.

Sit in the seat and turn the knob (Item 2) **[Figure 86]** to adjust the position of the back cushion.

Suspension Seat (If Equipped)

Figure 87



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

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

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

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

Seat Belt

Figure 88

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

Standard Instrument Panel - Key Start

⚠ WARNING

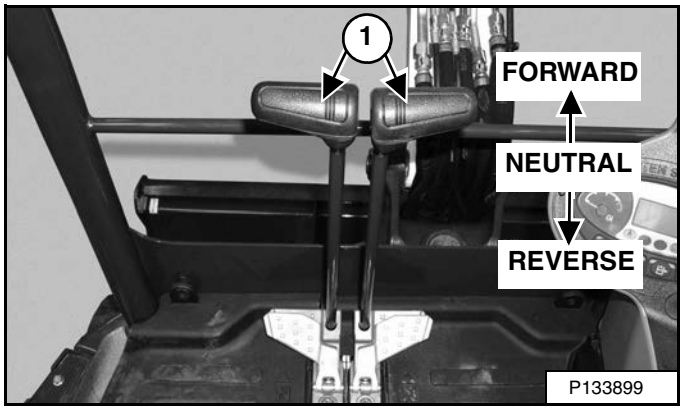
AVOID INJURY OR DEATH

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

W-2135-1108

Perform the PRE-STARTING PROCEDURE. (See PRE-STARTING PROCEDURE on Page 64.)

Figure 89



Put control levers (Item 1) **[Figure 89]** in the NEUTRAL position.

Figure 90

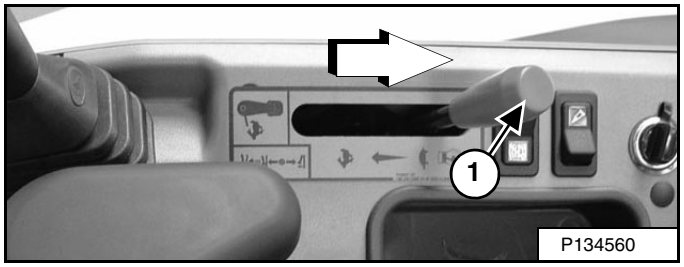
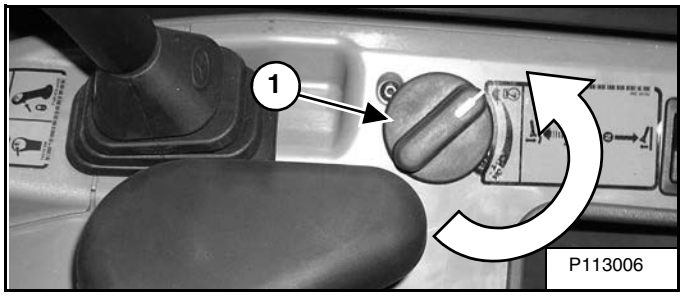


Figure 91



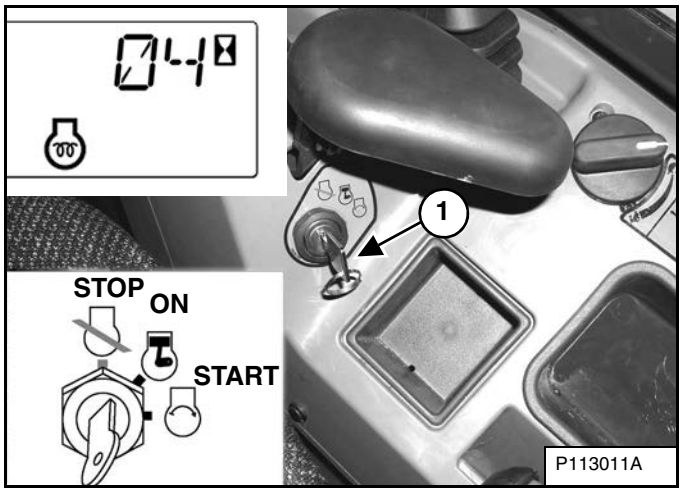
Move the engine speed control lever (Item 1) **[Figure 90]** back or turn the engine speed control dial (Item 1) **[Figure 91]** anticlockwise to low idle.

IMPORTANT

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

I-2034-0700

Figure 92



Turn the key (Item 1) **[Figure 92]** to the ON position. If preheating is required, the glow plugs will automatically cycle and the remaining preheat time (in seconds) will show in the data display screen (see inset). (Preheat icon will be ON).

Turn the key to START and release the key when the engine starts. It will return to the ON position **[Figure 92]**.

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

Turn the key switch OFF to stop the engine.

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2050-0807

Standard Instrument Panel - Keyless Start

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2135-1108

Perform the PRE-STARTING PROCEDURE. (See PRE-STARTING PROCEDURE on Page 64.)

Figure 93

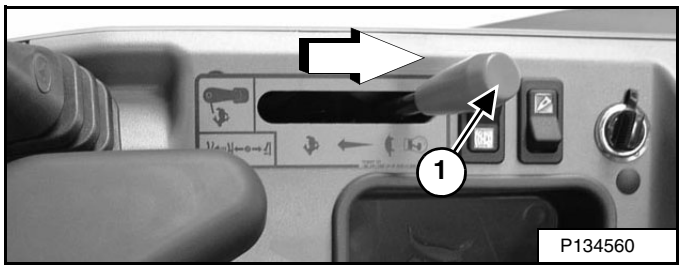
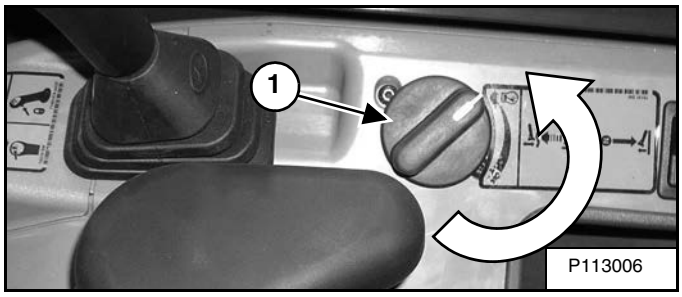
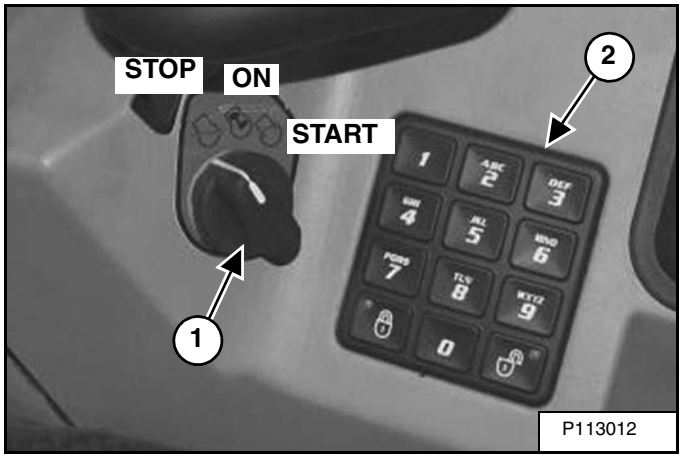


Figure 94



Move the engine speed control lever (Item 1) **[Figure 93]** back or turn the engine speed control dial (Item 1) **[Figure 94]** anticlockwise to low idle.

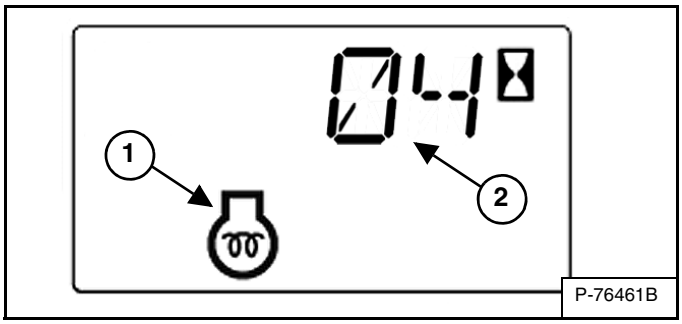
Figure 95



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

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

Figure 96



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

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

IMPORTANT

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

I-2034-0700

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

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

Check for the cause before starting the engine again.

Password Lockout Feature

See Password Lockout Feature. (See Password Lockout Feature on Page 165.)

Deluxe Instrument Panel - Keyless Start

⚠ WARNING

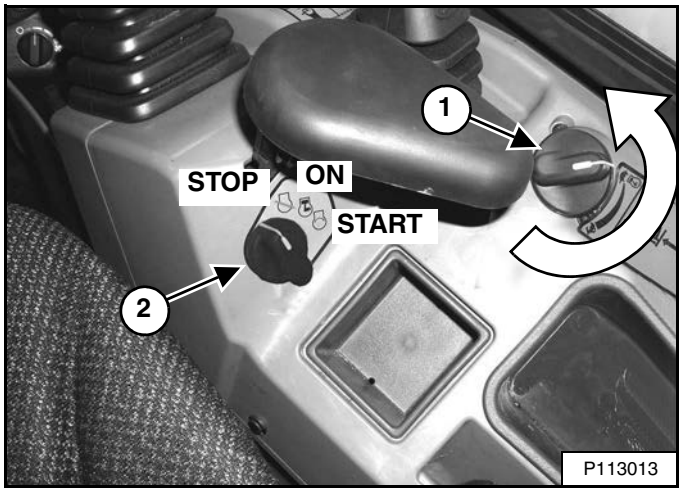
AVOID SERIOUS INJURY OR DEATH

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

W-2051-0212

Perform the PRE-STARTING PROCEDURE. (See PRE-STARTING PROCEDURE on Page 64.)

Figure 97

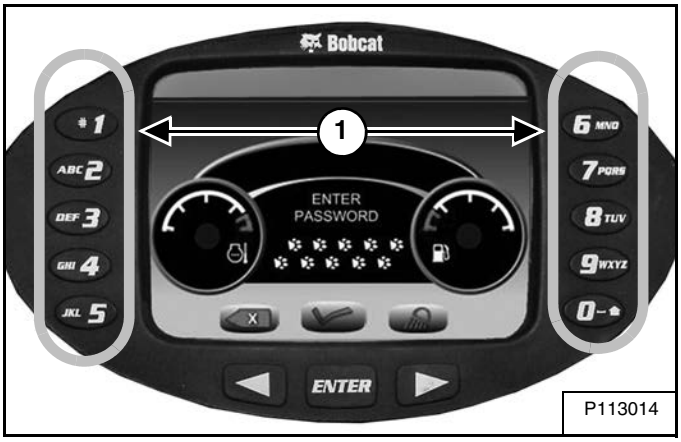


Set the engine speed control (Item 1) **[Figure 97]** to the low idle position.

NOTE: Excavators with a Deluxe Instrument Panel have a permanent, randomly generated Master Password set at the factory. Your excavator will also be assigned an Owner Password. Your dealer will provide you with this password. Change the owner password to one that you will easily remember to prevent unauthorised use of your excavator. (See Changing The Owner, User 1, And User 2 Password on Page 164.) Keep your password in a safe location for future needs.

NOTE: The Password Lockout feature can be used to allow starting of the excavator without a password. If unlocked, the start switch will start the machine without using a password. (See Password Lockout Feature on Page 165.)

Figure 98



With the left console raised, turn the start switch (Item 2) **[Figure 97]** to ON. The message **[ENTER PASSWORD]** will appear on the display screen if the Deluxe Instrument Panel is locked. (If not locked, use the start switch without a password to start the engine.)

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

Figure 99

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

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

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

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

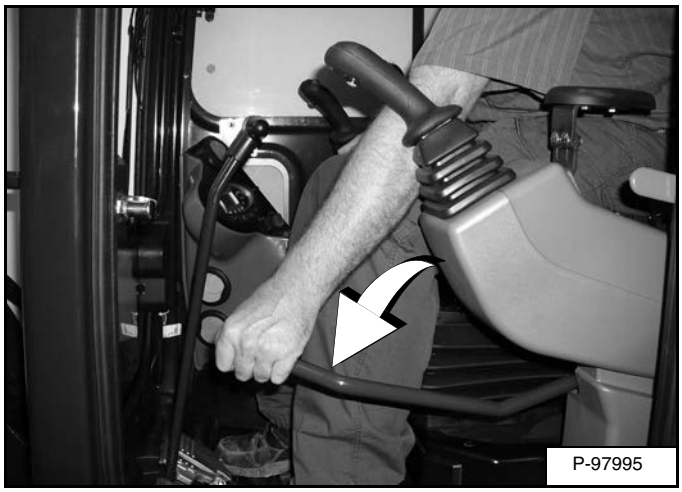
Check for the cause before starting the engine again.

Password Lockout Feature

See Password Lockout Feature. (See Password Lockout Feature on Page 167.)

Lowering The Control Console

Figure 100



Lower the control console **[Figure 100]**.

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

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

Warming The Hydraulic System

IMPORTANT

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

I-2007-0910

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

Cold Temperature Starting

WARNING

EXPLOSION CAN CAUSE SERIOUS INJURY, DEATH OR SEVERE ENGINE DAMAGE

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

W-2071-0415

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

- Replace the engine oil with the correct type and viscosity for the anticipated starting temperature. (See Engine Oil Chart on Page 126.)
- Make sure the battery is fully charged.
- Install an engine heater.

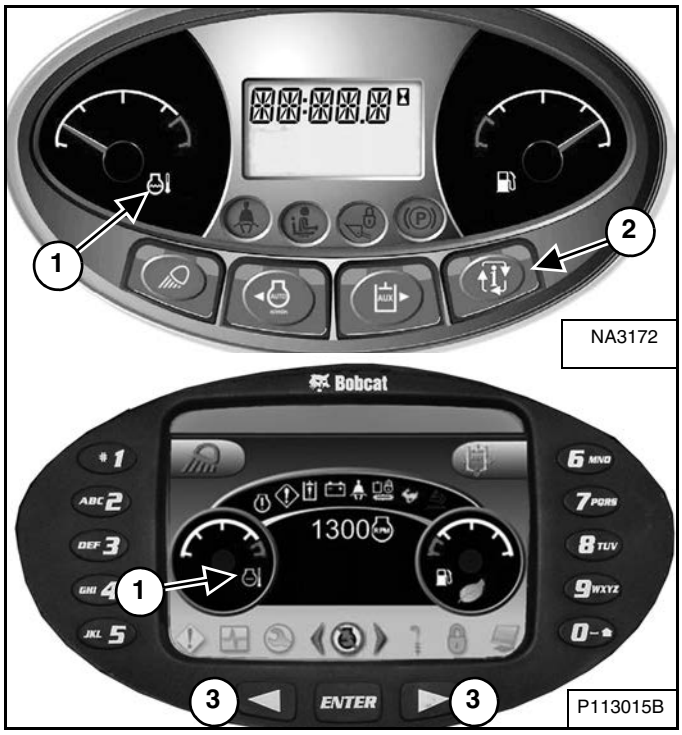
NOTE: If the battery is discharged (but not frozen) a booster battery can be used to jump start the excavator. (See Using A Booster Battery (Jump Starting) on Page 136.)

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

MONITORING THE DISPLAY PANELS

Instrument Panel

Figure 101



Frequently monitor the temperature and fuel gauges **[Figure 101]**.

After the engine is running, frequently monitor the instrument panel **[Figure 101]** for machine condition.

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

EXAMPLE: Engine Coolant Temperature is High.

The Engine Coolant Temperature icon (Item 1) **[Figure 101]** is ON.

Press the Information button (Item 2) (Standard Panel) or press a scroll button (Item 3) **[Figure 101]** (Deluxe Panel) repeatedly to cycle the data display until the service code screen is displayed. One of the following SERVICE CODES is displayed.

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

Find the cause of the service code and correct before operating the excavator again. (See DIAGNOSTIC SERVICE CODES on Page 154.)

NOTE: The optional Deluxe Instrumentation Panel offers an additional view of service codes that includes a brief description. (See DIAGNOSTIC SERVICE CODES on Page 154.)

Warning And Shutdown

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

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

The SHUTDOWN feature is associated with the following icons:

General Warning
Engine Malfunction
Engine Coolant Temperature
Hydraulic Fluid Temperature

STOPPING THE ENGINE AND LEAVING THE EXCAVATOR

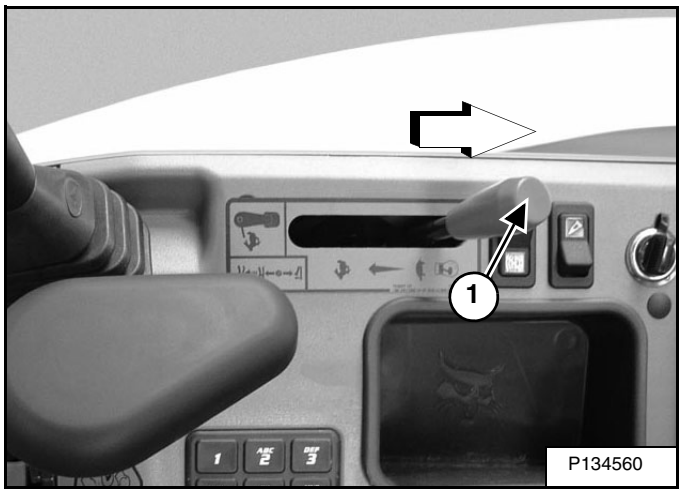
Procedure

Figure 102

Stop the machine on level ground. Lower the work equipment and the blade to the ground **[Figure 102]**.

Engine Speed Control Lever (If Equipped)

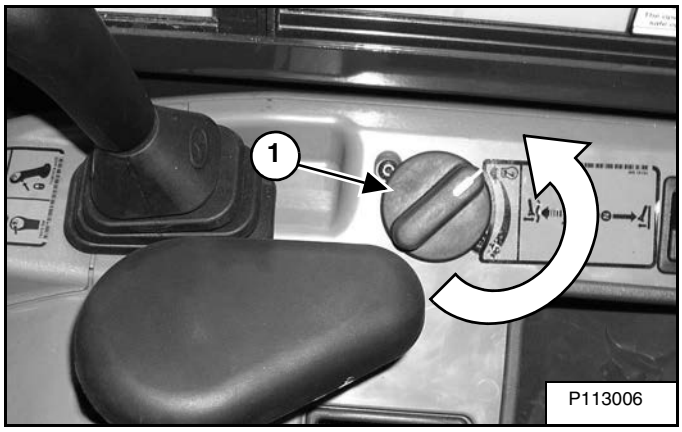
Figure 103



Pull the engine speed control lever (Item 1) **[Figure 103]** back to low idle.

Engine Speed Control Dial (If Equipped)

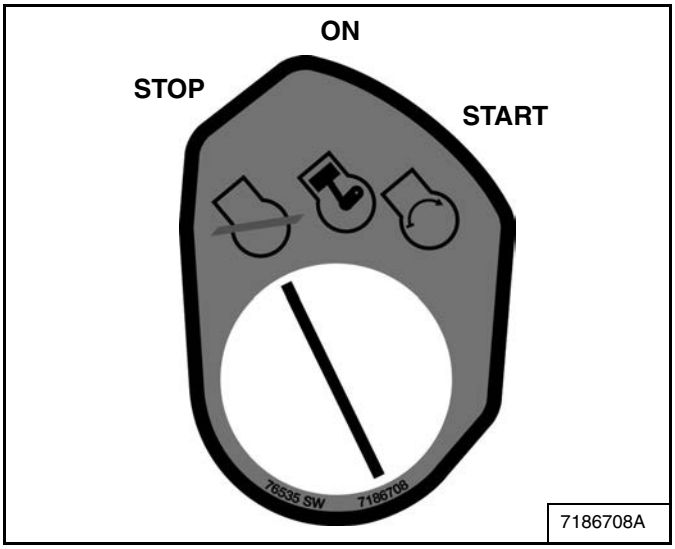
Figure 104



Rotate the engine speed control dial (Item 1) **[Figure 104]** anticlockwise to low idle.

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

Figure 105



Turn the start switch to STOP **[Figure 105]**.

Disconnect the seat belt. Remove the key from the switch (if equipped) to prevent operation of machine by unauthorised personnel. Raise the control console and exit the machine.

Installing And Removing The Attachment (Pin-On Attachment)

Installation

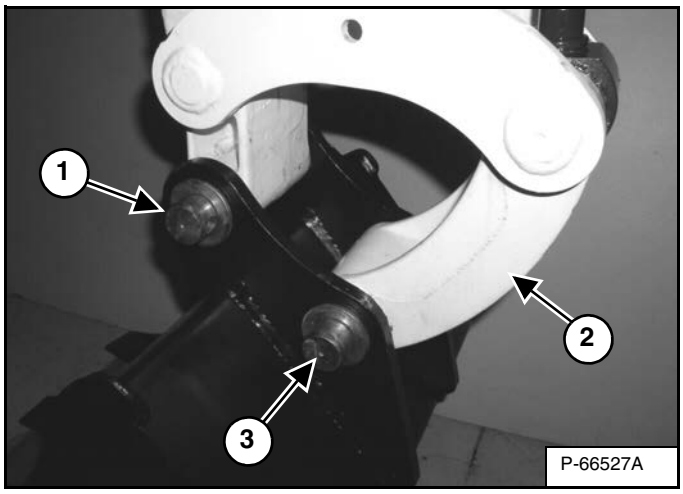
WARNING

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 106

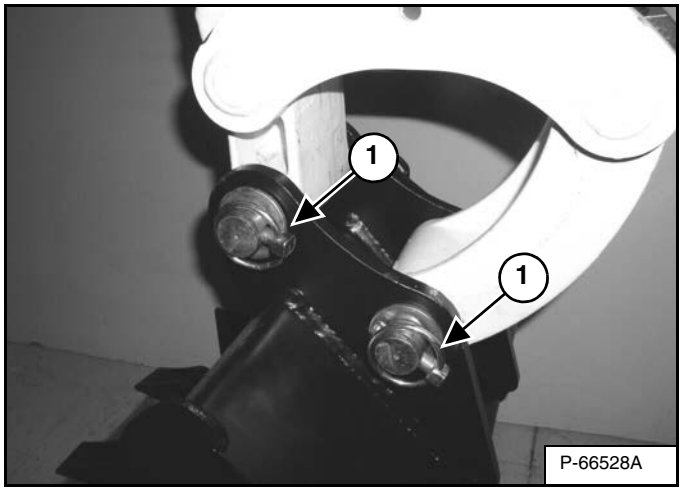


Install the arm into the bucket and align the mounting hole.

Install the pin (Item 1) **[Figure 106]** and washers.

Install the link (Item 2) in the bucket and align the mounting hole. Install the pin (Item 3) **[Figure 106]** and washers.

Figure 107



Install the two retainer pins (Item 1) **[Figure 107]**. Install grease in the grease fittings.

Removal

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

Remove the two retainer pins (Item 1) **[Figure 107]**.

Remove the washers and pins (Items 1 and 3) **[Figure 106]**.

Do not damage the dust seals in the arm.

WARNING

AVOID INJURY OR DEATH

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

W-2052-0907

Installing And Removing The Attachment (Quick Coupler, Klac™ System)

Installation

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

⚠ WARNING

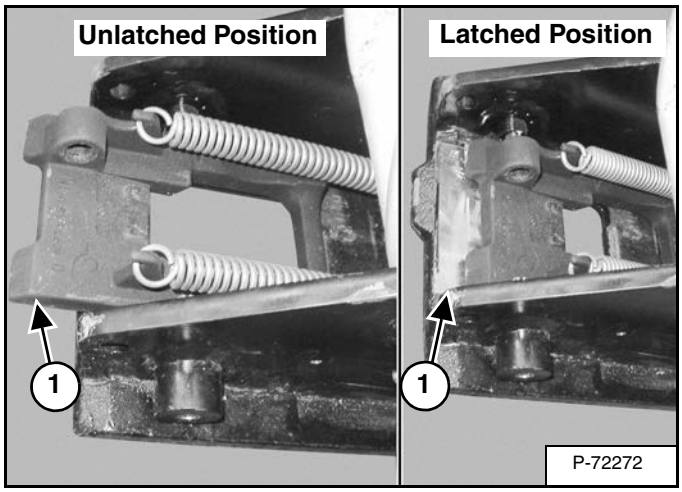
AVOID INJURY OR DEATH

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

W-2052-0907

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

Figure 108



Fully retract the bucket cylinder.

Stop the engine and exit the excavator.

Inspect the quick coupler to make sure the latch is in the unlatched position (Item 1) **[Figure 108]**.

If the latch is in the latched position, see **[Figure 109]** for additional information.

If the latch is in the unlatched position, proceed to **[Figure 110]**.

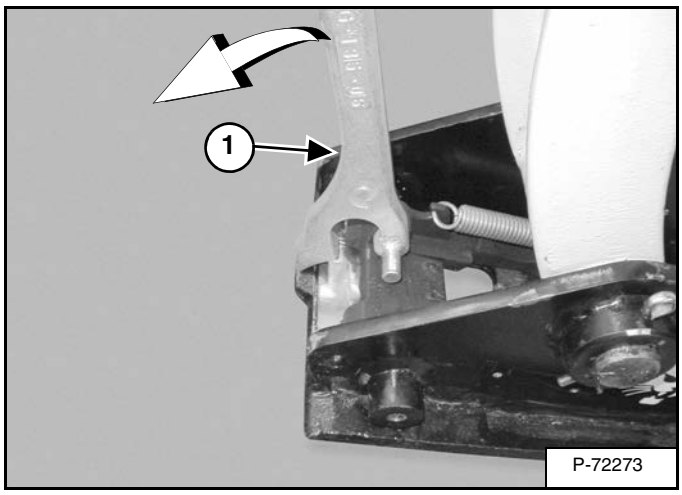
⚠ WARNING

AVOID INJURY

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

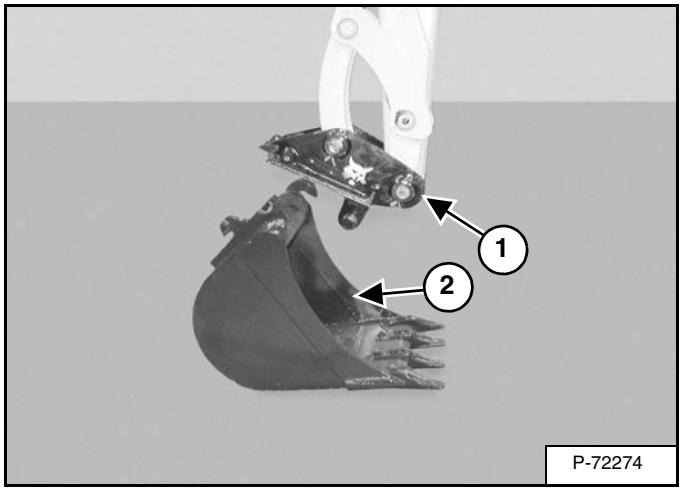
W-2541-1106

Figure 109



To unlatch the quick coupler, install the tool (Item 1) **[Figure 109]** and pull the handle. The latch will move completely forward. The latch will lock in the unlatched position.

Figure 110



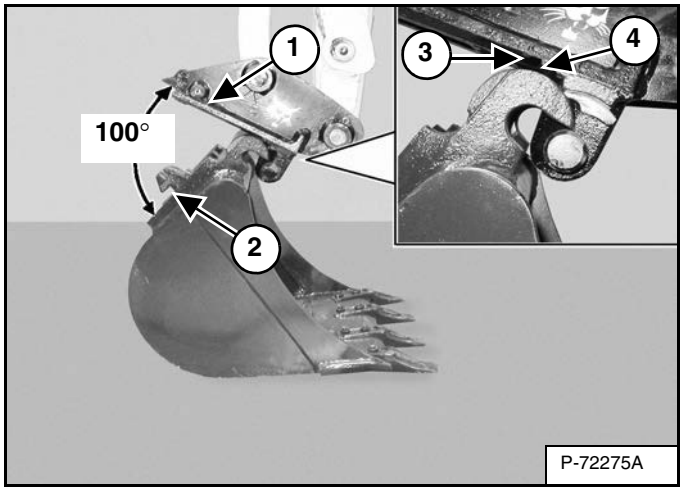
Enter the excavator, fasten the seat belt and start the engine.

Position the quick coupler (Item 1) near the attachment (Item 2) as shown **[Figure 110]**.

Installing And Removing The Attachment (Quick Coupler, Klac™ System) (Cont'd)

Installation (Cont'd)

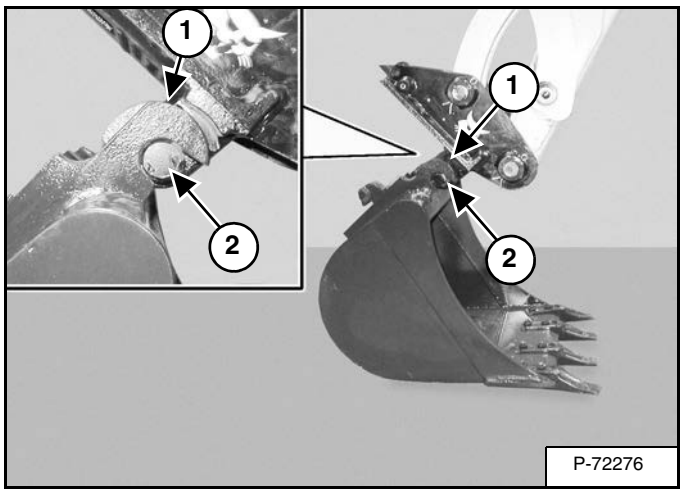
Figure 111



There must be at least 100° between the quick coupler surface (Item 1) and the attachment mounting surface (Item 2) **[Figure 111]**. Extend the arm out to get the required angle for proper installation.

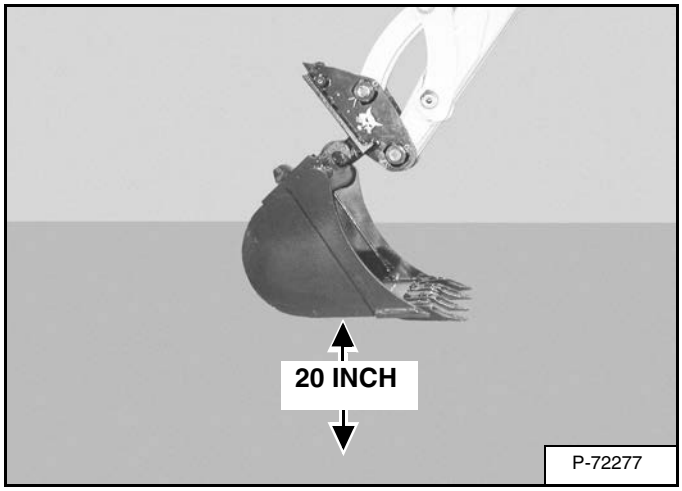
NOTE: There must be proper clearance (100° minimum) between the hook (Item 3) and the quick coupler (Item 4) [Figure 111]. Possible damage to the attachment hooks or the quick coupler could occur without proper clearance.

Figure 112



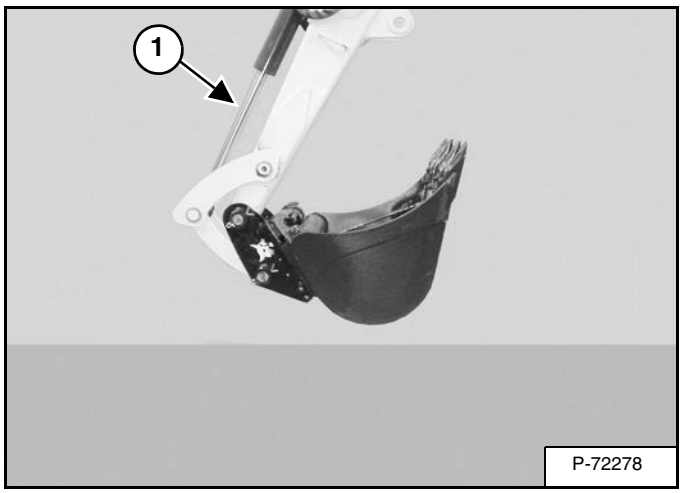
Raise the boom and extend the arm until the hooks of the attachment (Item 1) engage the pins (Item 2) of the quick coupler **[Figure 112]**.

Figure 113



Raise the boom until there is approximately 500 mm (20.0 in) of clearance between the bottom of the attachment and the ground **[Figure 113]**.

Figure 114



Extend the bucket cylinder (Item 1) **[Figure 114]** fully.

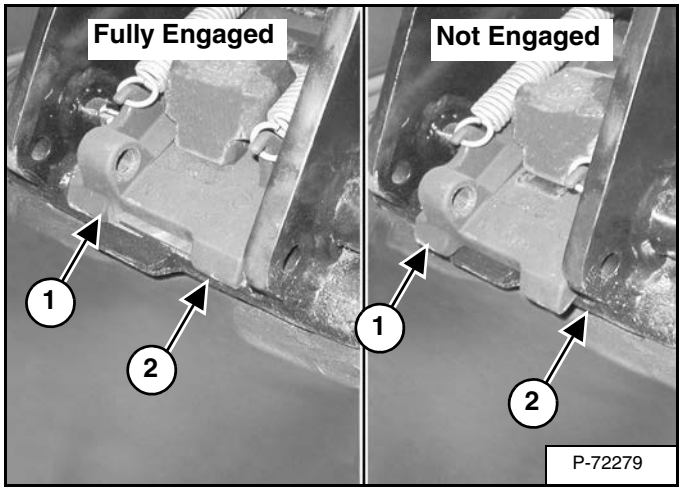
Lower the attachment until it is flat on the ground.

Stop the engine and exit the excavator.

Installing And Removing The Attachment (Quick Coupler, Klac™ System) (Cont'd)

Installation (Cont'd)

Figure 115



Visually inspect the quick coupler latch (Item 1) to the bucket mount (Item 2) **[Figure 115]**. The latch must be fully engaged.

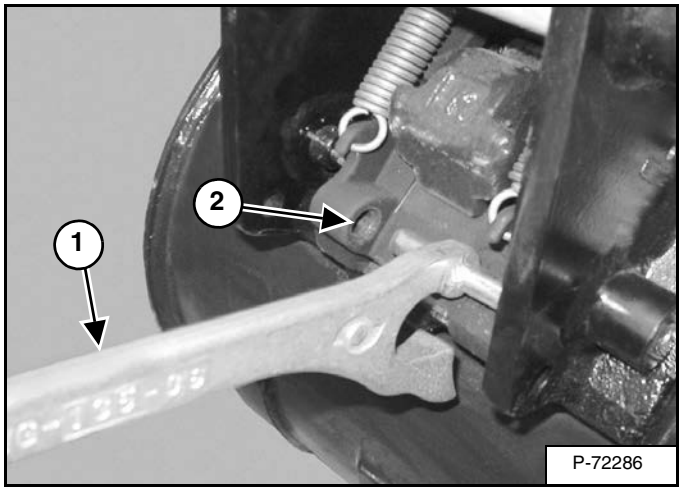
⚠ WARNING

AVOID INJURY

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

W-2541-1106

Figure 116



If the latch is not engaged, install the tool (Item 1) in the hole (Item 2) **[Figure 116]** of the quick coupler and push down to unlatch the quick coupler. Remove the tool. Enter the excavator, fasten the seat belt and start the engine. Raise the attachment 500 mm (20.0 in) off of the ground and fully extend the bucket cylinder. Lower the attachment until it is flat on the ground. Stop the engine and exit the excavator.

Again, visually inspect the quick coupler to make sure the latch (Item 1) **[Figure 115]** is fully engaged. If it is not fully engaged, remove the attachment and inspect both the quick coupler and the attachment for damage or debris. (See Inspection And Maintenance on Page 111.)

Installing And Removing The Attachment (Quick Coupler, Klac™ System) (Cont'd)

Removal

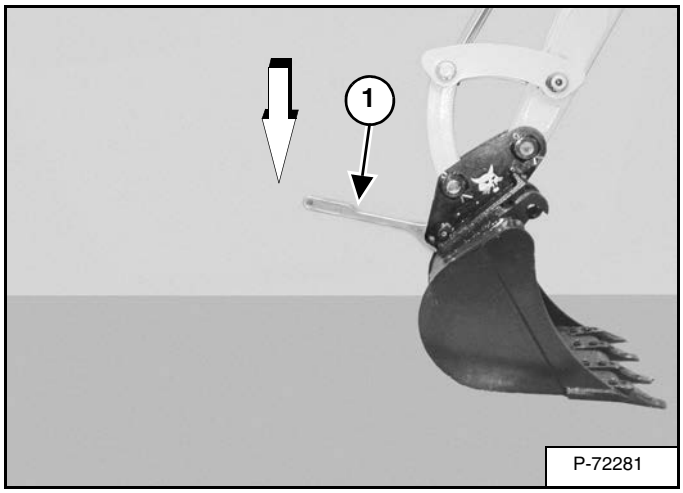
⚠ WARNING

AVOID INJURY

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

W-2541-1106

Figure 117



Position the attachment flat on the ground.

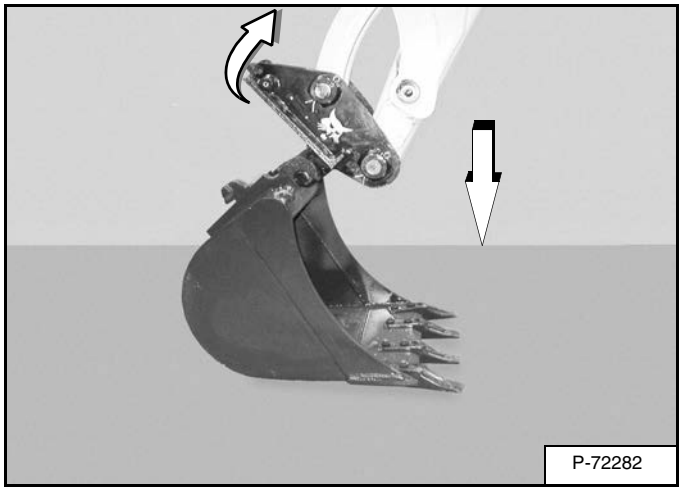
Install the quick coupler tool (Item 1) into the hole (Item 2) **[Figure 116]** in the quick coupler.

Push down on the tool (Item 1) **[Figure 117]** to unlock the latch.

Remove the tool.

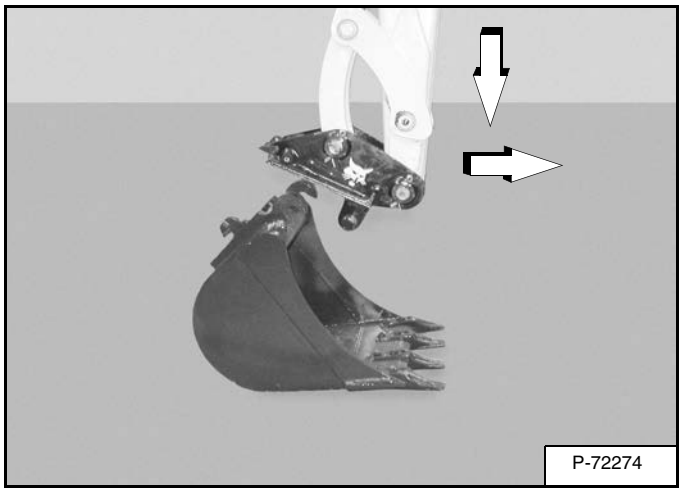
Enter the excavator, fasten the seat belt and start the engine.

Figure 118



Retract the bucket cylinder fully and lower the boom **[Figure 118]** until the attachment is on the ground.

Figure 119



Continue to lower the boom and move the arm towards the excavator until the quick coupler is clear of the attachment **[Figure 119]**.

Installing And Removing The Attachment (German Style Coupler)

The type of quick coupler installed on the excavator may influence the excavator's rated lift capacity and the availability of attachments.

To determine the lift capacity changes, see the applicable lift capacity chart:

(See Rated Lift Capacity - Canopy With Light Counterweight on Page 172.), (See Rated Lift Capacity - Canopy With Medium Counterweight on Page 173.), (See Rated Lift Capacity - Cab With Light Counterweight on Page 174.), (See Rated Lift Capacity - Cab With Medium Counterweight on Page 175.).

See your Bobcat dealer for a list of approved attachments for the type of quick coupler installed on the machine.

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

Installation

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

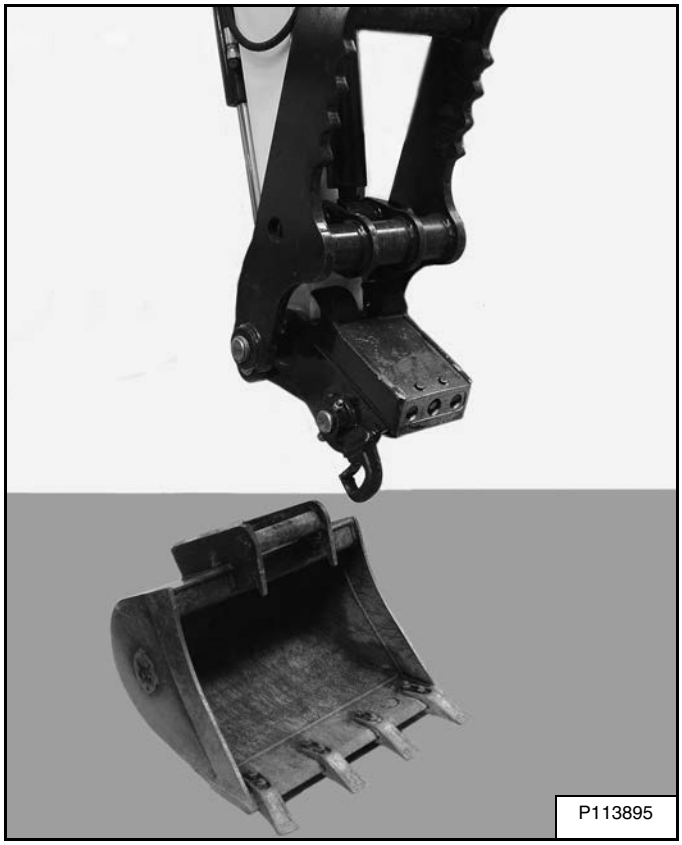
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2052-0907

Figure 120



Position the arm and quick coupler to the attachment **[Figure 120]**.

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

Installing And Removing The Attachment (German Style Coupler) (Cont'd)

Installation (Cont'd)

Figure 121

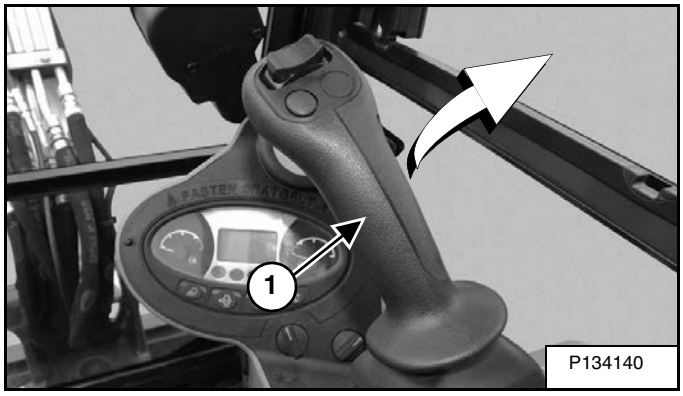
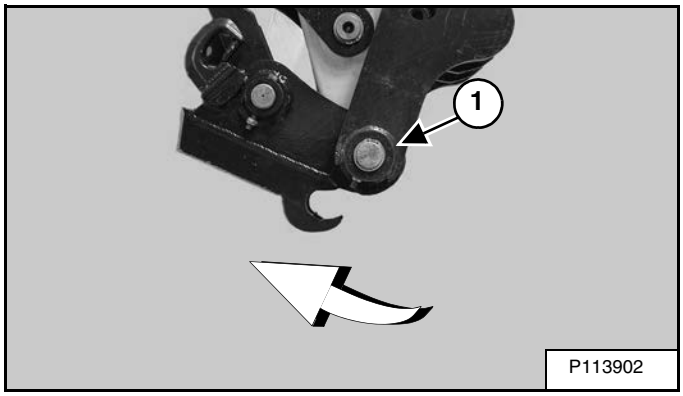


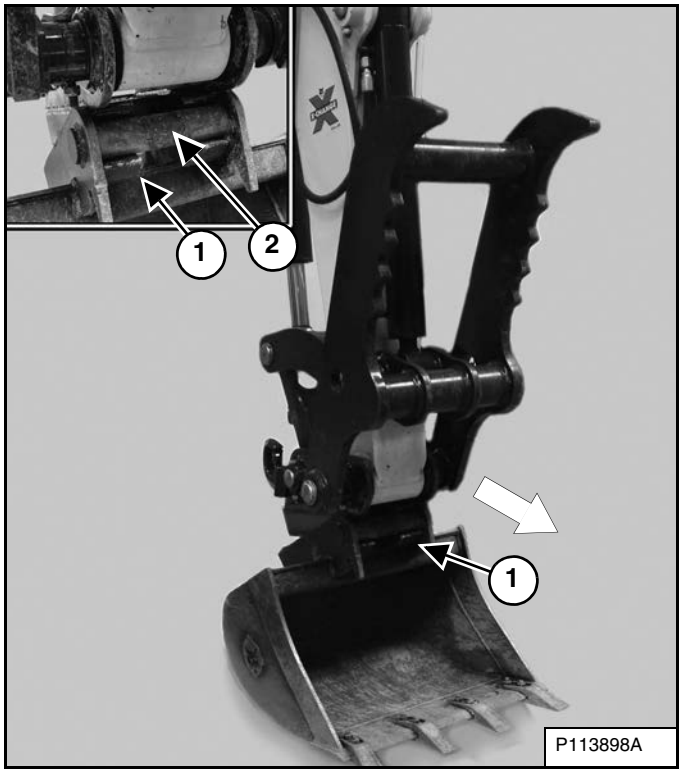
Figure 122



Move the right joystick (Item 1) **[Figure 121]** to the right (OUT) to curl the coupler (Item 1) **[Figure 122]** back, fully away from the cab.

Lower the coupler onto the attachment.

Figure 123



Engage the coupler hooks (Item 1) onto the attachment shaft (Item 2) **[Figure 123]**.

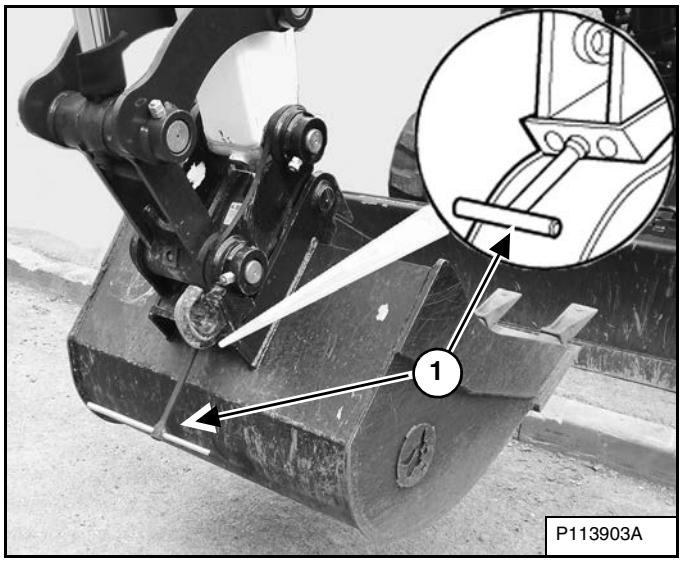
Figure 124

Move the right joystick (Item 1) **[Figure 121]** to the left (IN) and curl the coupler (Item 1) **[Figure 124]** toward the cab fully.

Installing And Removing The Attachment (German Style Coupler) (Cont'd)

Installation (Cont'd)

Figure 125



Stop the engine and leave the machine. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 71.)

Use the supplied wrench (Item 1) **[Figure 125]** and turn the wrench clockwise until the locking pins fully engaged.

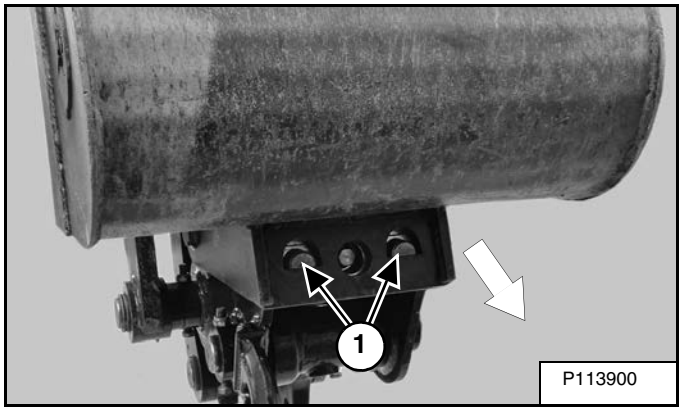
⚠ WARNING

AVOID INJURY OR DEATH

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

W-3023-0417

Figure 126



Visually check that the locking pins (Item 1) **[Figure 126]** are extended through the holes in the attachment mounting frame, securely fastening the attachment to the coupler.

If both locking pins do not engage in the locked position, see your Bobcat dealer for service.

⚠ WARNING

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

W-2119-0910

Enter the excavator, fasten the seat belt and start the engine. (See PRE-STARTING PROCEDURE on Page 64.)

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

Lower the attachment flat to the ground.

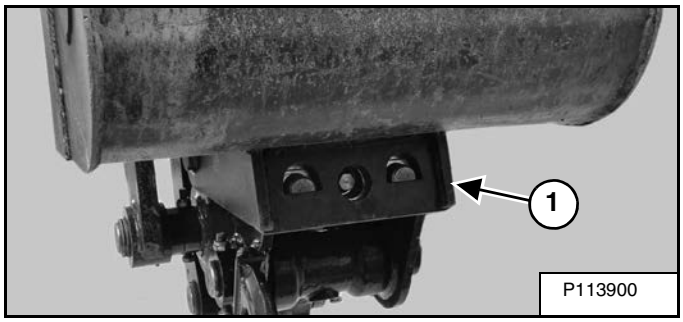
Park the excavator on a level surface.

Installing And Removing The Attachment (German Style Coupler) (Cont'd)

Removal

Enter the excavator, fasten the seat belt and start the engine. (See PRE-STARTING PROCEDURE on Page 64.)

Figure 127

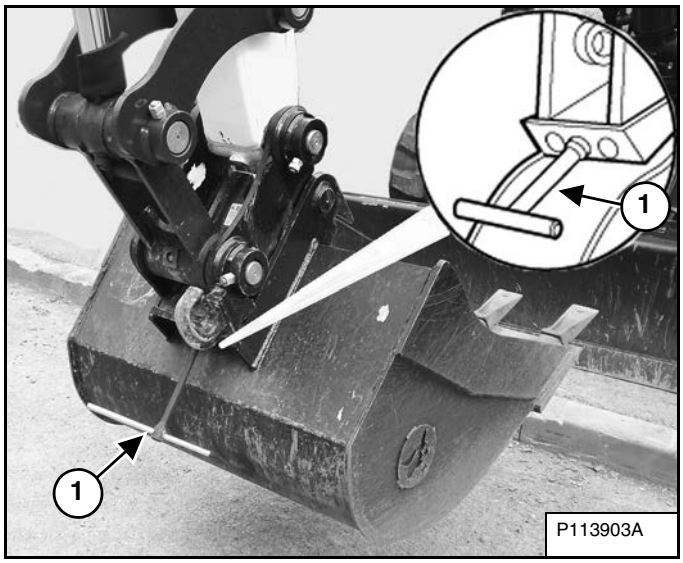


Raise the boom.

Move the right joystick (Item 1) **[Figure 121]** to the left (IN) and curl the coupler (Item 1) **[Figure 127]** toward the cab fully.

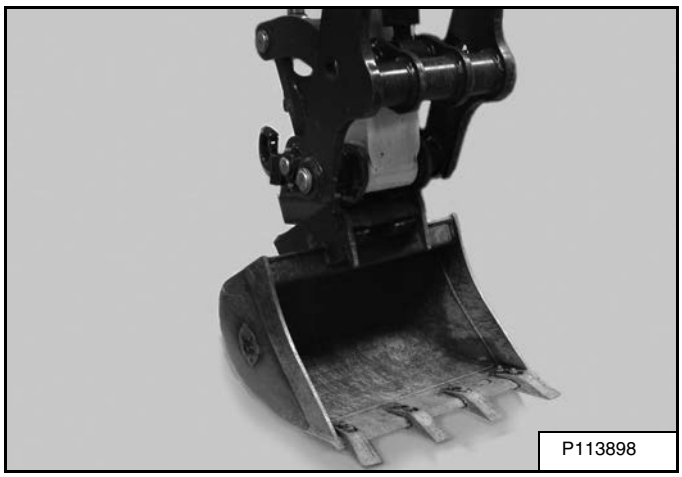
Stop the engine and exit the excavator. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 71.)

Figure 128



Use the supplied wrench (Item 1) **[Figure 128]** and turn the wrench anticlockwise until the locking pins are fully disengaged.

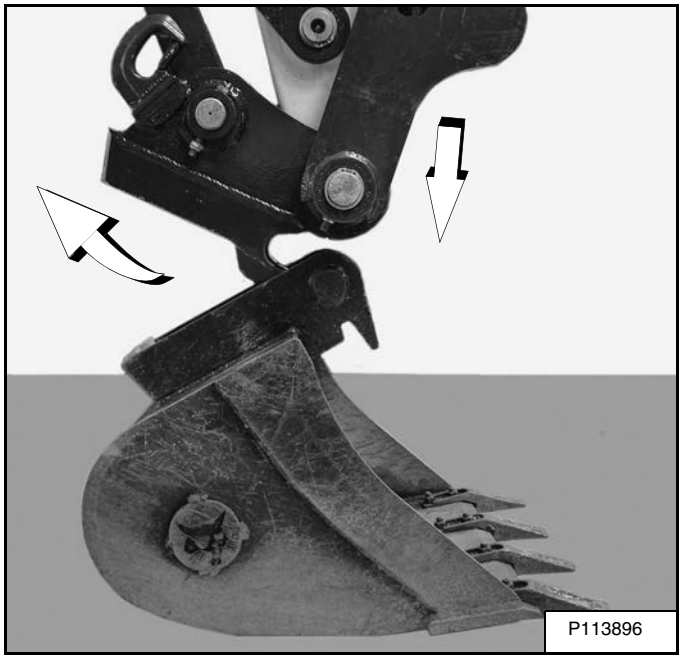
Figure 129



Enter the excavator, fasten the seat belt and start the engine. (See PRE-STARTING PROCEDURE on Page 64.)

With the attachment slightly off of the ground, roll the quick coupler back until the coupler starts to disengage from the attachment **[Figure 129]**.

Figure 130



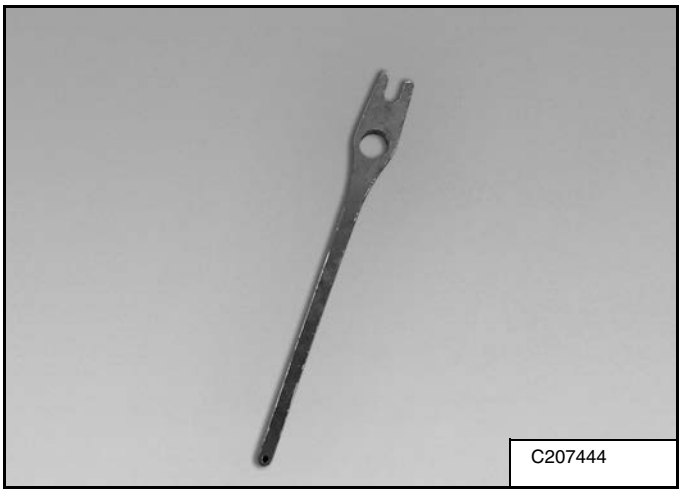
Roll the quick coupler back fully and lower the boom and arm until the attachment is on the ground and the quick coupler is disengaged from the attachment pins **[Figure 130]**.

Move the arm away from the attachment.

Installing And Removing The Attachment (Mechanical Pin Grabber Coupler)

Installation

Figure 131



You have been supplied with the release tool **[Figure 131]** 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

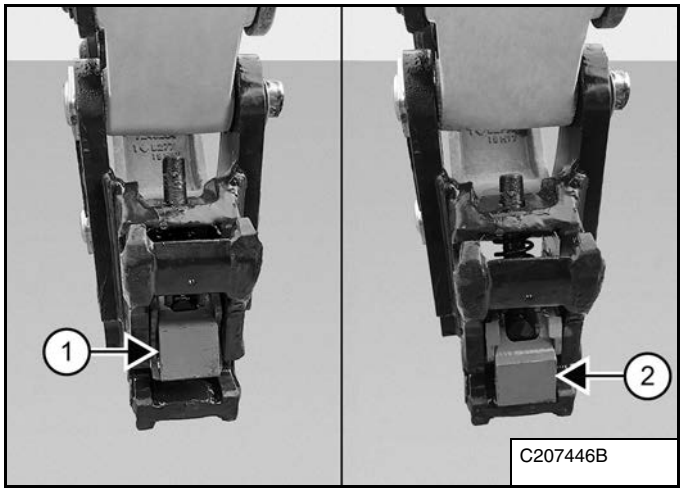
Keep all bystanders 6 m (20 ft) away from equipment when operating. Contact with moving parts, a trench cave-in or flying objects can cause injury or death.

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 132



Inspect the quick coupler. If the wedge and the trigger are in the primed position (Item 1) **[Figure 132]** proceed to **[Figure 134]**.

OR

If the wedge is in the engaged position (Item 2) **[Figure 132]**, proceed to **[Figure 133]**.

⚠ WARNING

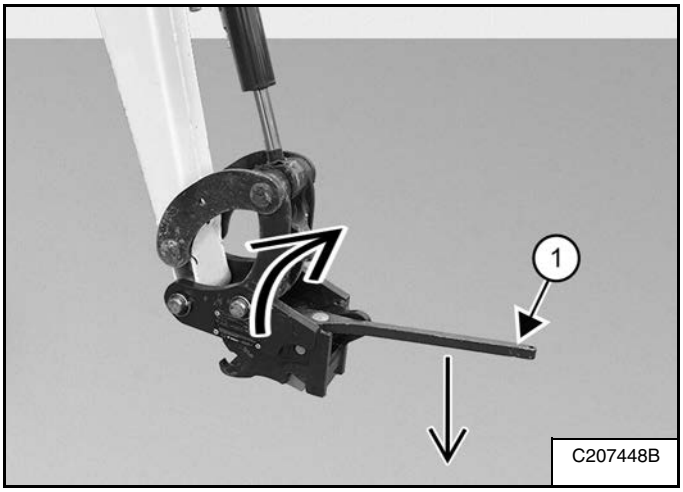
AVOID INJURY

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)

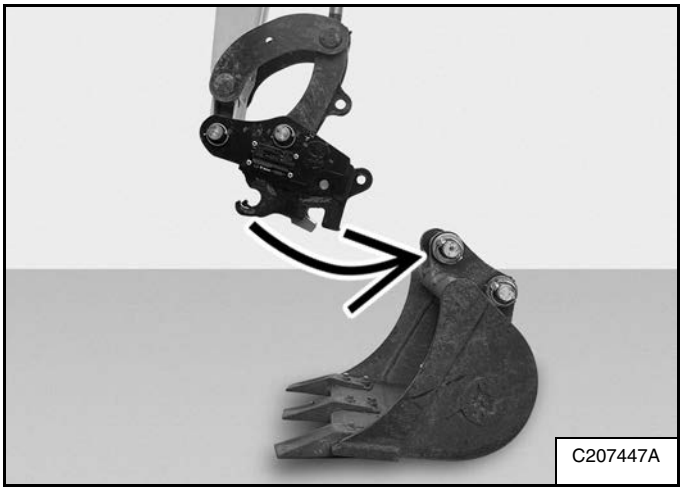
Figure 133



To prepare the quick coupler, do the following:

1. Stop the engine and exit the excavator.
2. Install the release tool (Item 1) **[Figure 133]**.
3. Rotate the release tool clockwise and hold **[Figure 133]**.
4. Push the release tool down **[Figure 133]**.
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.

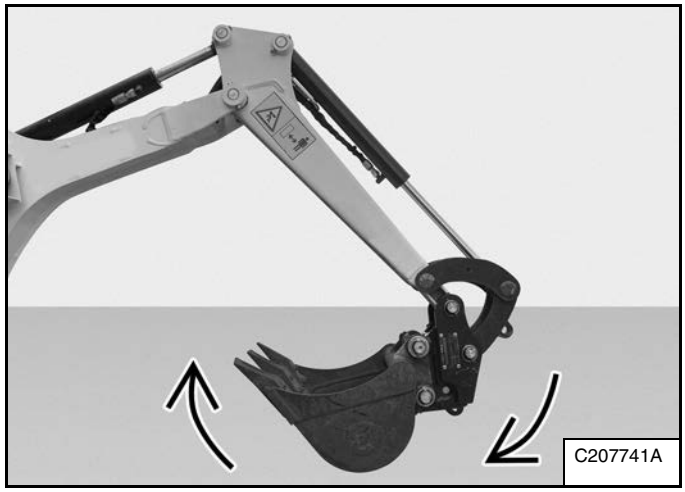
Figure 134



Guide the coupler front hooks onto the attachment front pin **[Figure 134]**.

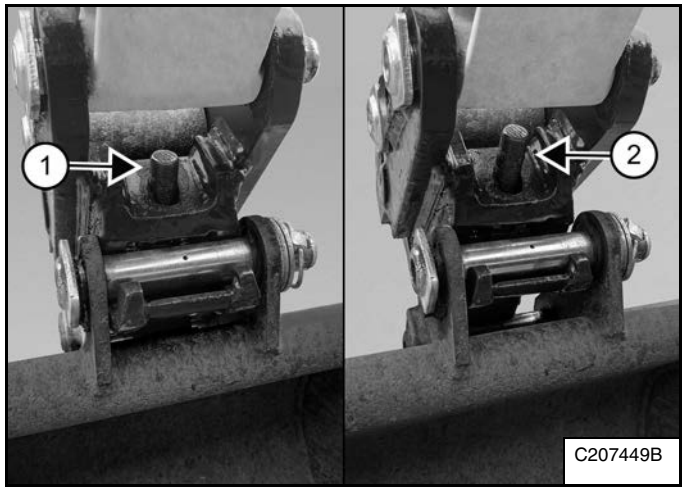
Raise the boom until there is approximately 500 mm (20 in) of clearance between the bottom of the attachment and the ground.

Figure 135



Extend the bucket cylinder and curl in the bucket **[Figure 135]** until you hear the wedge engage on the attachment back pin.

Figure 136



Visually inspect the indication bar to see if the coupler is fully engaged (Item 1) **[Figure 136]**.

If the visual indicator bar is not fully engaged (Item 2) **[Figure 136]**, 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)

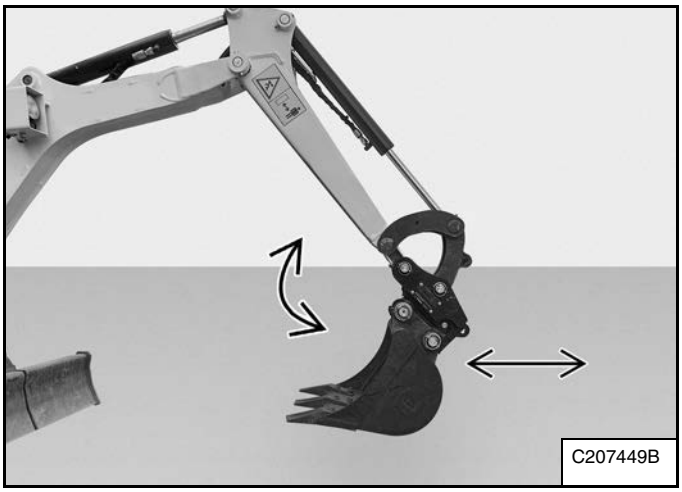
⚠ WARNING

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 137



Shake the attachment vigorously and / or carry out a bump test to ensure the attachment is secured to the coupler **[Figure 137]**.

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

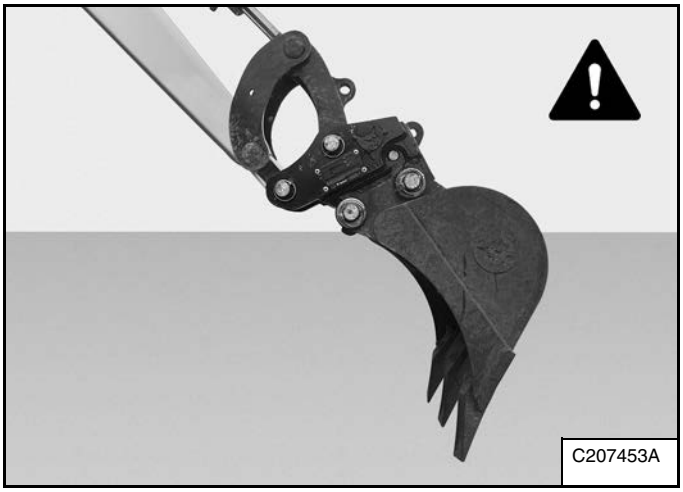
Figure 138

Position the attachment close to ground level at the angle shown **[Figure 138]**.

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

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

Figure 139



DO NOT RELEASE AN ATTACHMENT WITH THE COUPLER CURLED OPEN [Figure 139].

Stop the engine and exit the excavator.

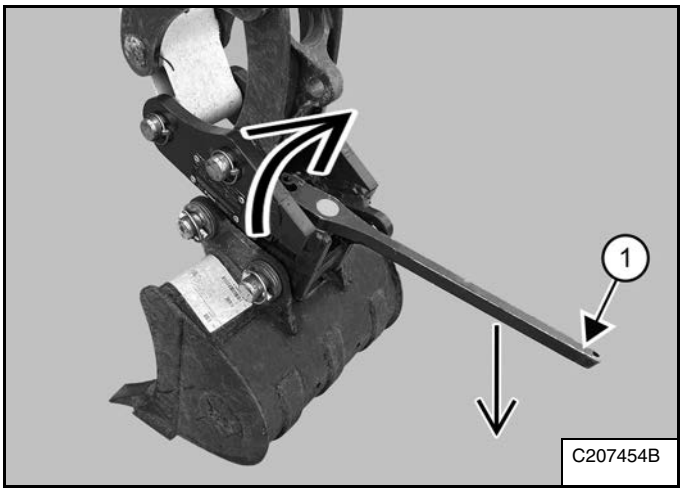
⚠ WARNING

AVOID INJURY

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

W-2541-1106

Figure 140



Firmly insert the release tool (Item 1) **[Figure 140]**.

⚠ 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 140]**.

Press the release tool down against the wedge to disengage the attachment back pin **[Figure 140]**.

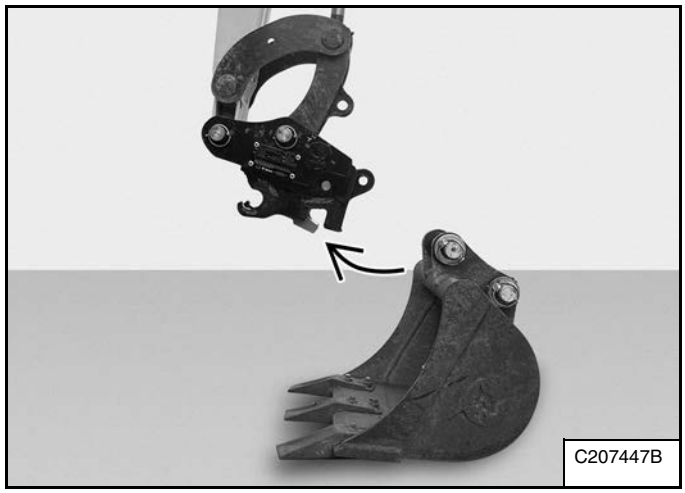
Remove the release tool and return it to a secure position.

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 141



Move the arm away from the attachment **[Figure 141]**.

Installing And Removing The Attachment (Bobcat Hydraulic Quick Coupler)

The type of quick coupler installed on the excavator may influence the excavator's rated lift capacity and the availability of attachments.

To determine the lift capacity changes, see the applicable lift capacity chart:

(See Rated Lift Capacity - Canopy With Light Counterweight on Page 172.), (See Rated Lift Capacity - Canopy With Medium Counterweight on Page 173.), (See Rated Lift Capacity - Cab With Light Counterweight on Page 174.), (See Rated Lift Capacity - Cab With Medium Counterweight on Page 175.).

See your Bobcat dealer for a list of approved attachments for the type of quick coupler installed on the machine.

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

Installation

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

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2052-0907

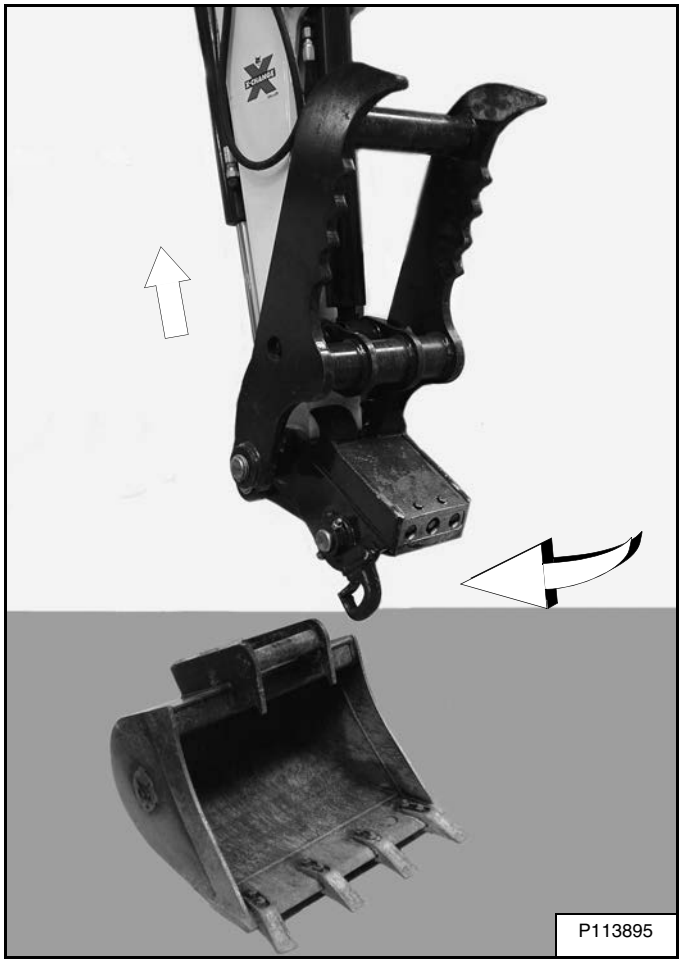
⚠ WARNING

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

Start the engine. (See PRE-STARTING PROCEDURE on Page 64.)

Figure 142



Position the arm and quick coupler to the attachment **[Figure 142]**.

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

Installing And Removing The Attachment (Bobcat Hydraulic Quick Coupler) (Cont'd)

Installation (Cont'd)

⚠ 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 143

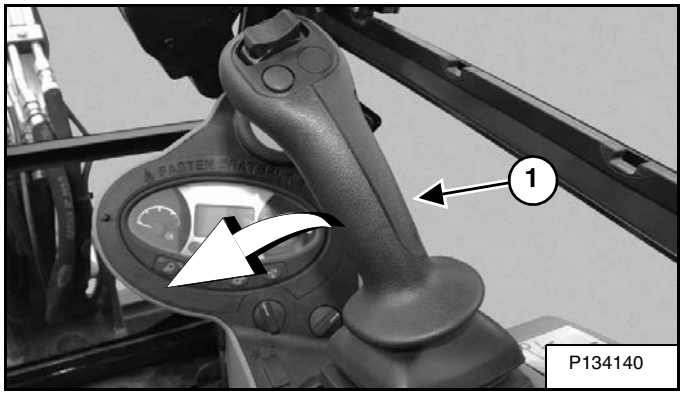
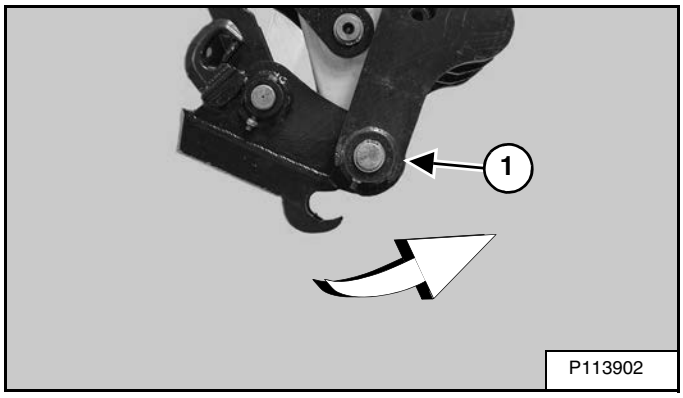
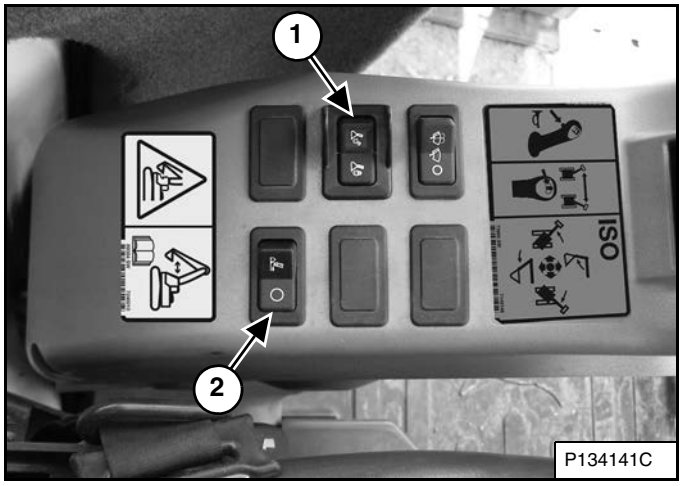


Figure 144



Move the right joystick (Item 1) **[Figure 143]** to the left (IN) to curl the coupler (Item 1) **[Figure 144]** fully in toward the cab.

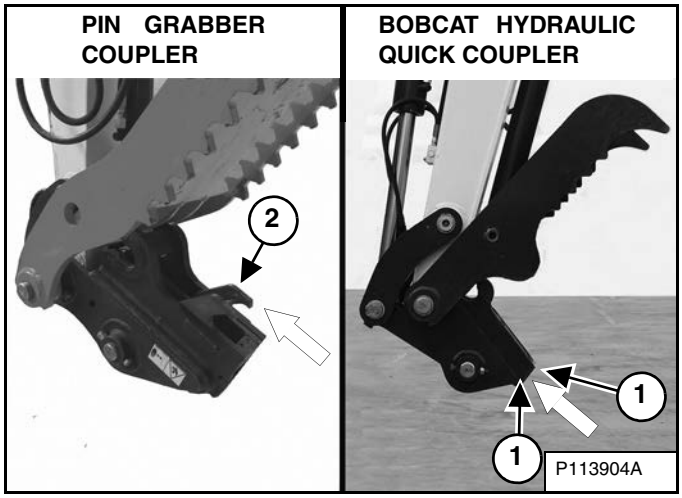
Figure 145



Press the coupler ON / OFF switch (Item 1) **[Figure 145]** to the left (ON) position to enable the quick coupler feature. The switch will illuminate when in the ON position and a buzzer will sound.

While holding the right joystick (Item 1) **[Figure 143]** to the left (IN), press and release the INTENT switch (Item 2) **[Figure 145]** within five seconds after pressing the ON / OFF switch (Item 1) **[Figure 145]**. (The buzzer will continue to sound and the light (Item 1) **[Figure 145]** will stay ON.)

Figure 146

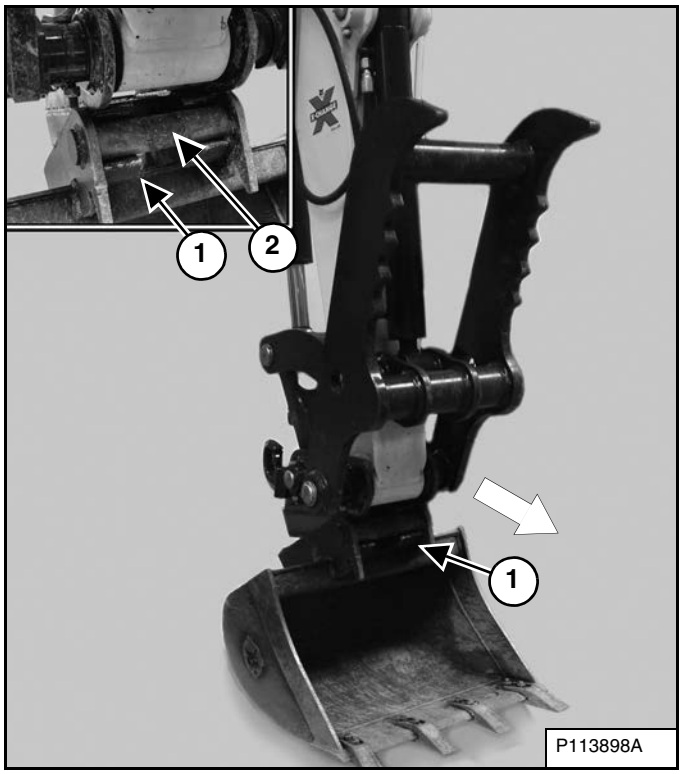


Continue holding the right joystick (Item 1) **[Figure 143]** to the left (IN) until the pins (Item 1) **[Figure 146]** are fully retracted or the locking clasp (Item 2) **[Figure 146]** is fully retracted.

Installing And Removing The Attachment (Bobcat Hydraulic Quick Coupler) (Cont'd)

Installation (Cont'd)

Figure 147



Roll the coupler out. Move the arm toward the attachment. Reposition the boom, arm and coupler until the coupler (Item 1) is positioned over the attachment pin (Item 2) **[Figure 147]**. Raise the attachment up slightly.

Figure 148

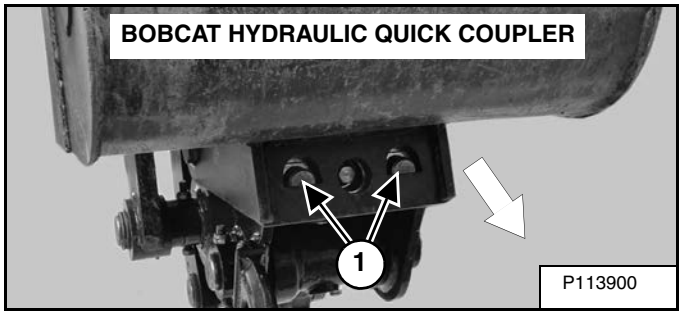
Curl the quick coupler in fully **[Figure 148]**.

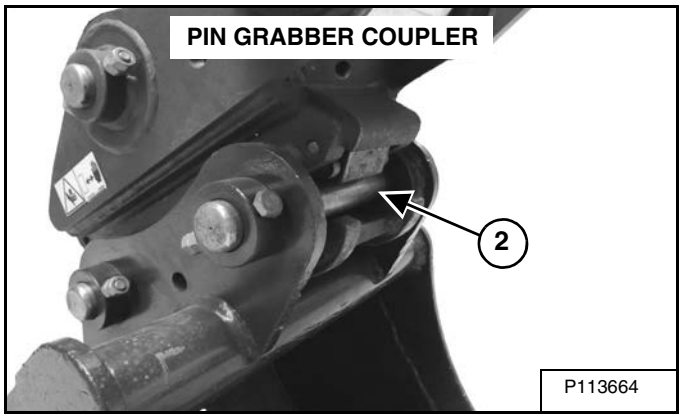
Press the coupler ON / OFF switch (Item 1) **[Figure 145]** to the right, (OFF) position. The switch light and buzzer will turn OFF.

For the Hydraulic German Style Coupler; The locking pins will extend and engage the attachment mount locking the attachment to the coupler.

For the Pin Grabber Coupler; Continue to curl the bucket in for an additional ten seconds to allow the locking clasp to move and lock to the bucket pins.

Figure 149





For the Hydraulic German Style Coupler; Visually check that the locking pins (Item 1) **[Figure 149]** are extended through the holes in the attachment mounting frame, securely fastening the attachment to the coupler.

If both locking pins do not engage in the locked position, see your Bobcat dealer for service.

For the Pin Grabber Quick Coupler; Visually check that the green locking clasp (Item 2) **[Figure 149]** is FULLY ENGAGED AND LOCKED, securely fastening the attachment to the coupler.

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

If the locking clasps do not engage in the locked position, see your Bobcat dealer for service.

Lower the attachment flat to the ground.

⚠ 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

Installing And Removing The Attachment (Bobcat Hydraulic Quick Coupler) (Cont'd)

Removal

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

⚠ WARNING

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

W-2119-0910

Enter the excavator and start the engine. (See PRE-STARTING PROCEDURE on Page 64.)

Figure 150

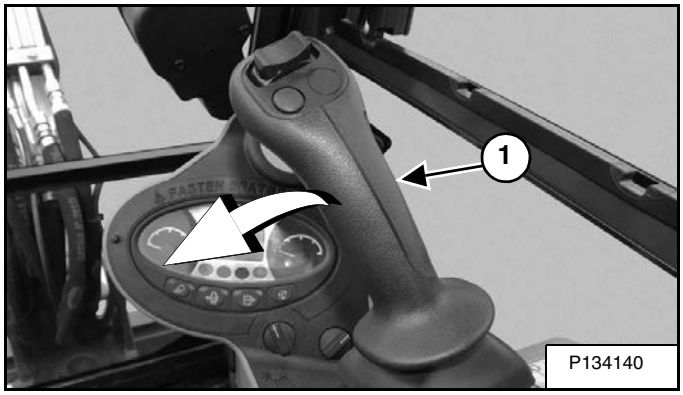
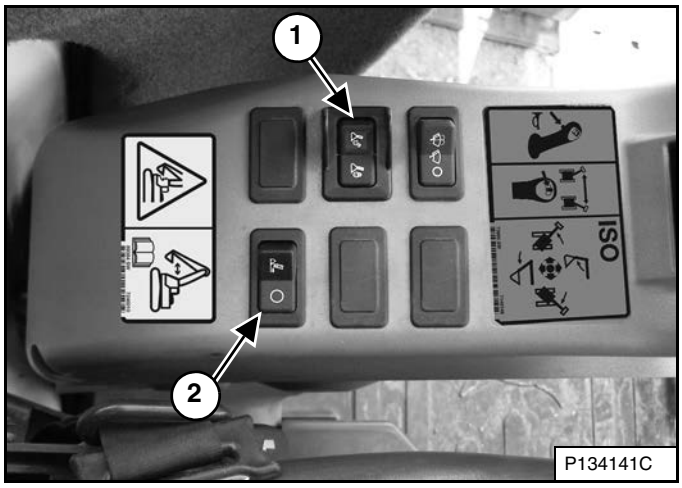


Figure 151

Raise the attachment slightly off of the ground.

Move the right joystick (Item 1) **[Figure 150]** to the left (IN) to curl the coupler (Item 1) **[Figure 151]** fully in toward the cab.

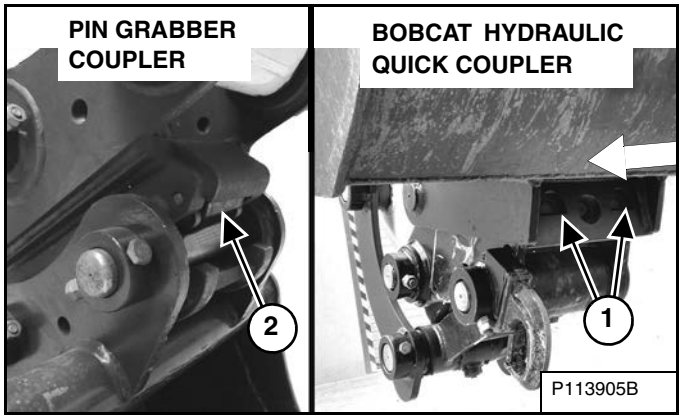
Figure 152



Press the coupler ON / OFF switch (Item 1) **[Figure 152]** to the left (ON) position to enable the quick coupler feature. The switch will illuminate when in the ON position and a buzzer will sound.

While holding the right joystick (Item 1) **[Figure 150]** to the left (IN), press and release the INTENT switch (Item 2) **[Figure 152]** within five seconds after pressing the ON / OFF switch (Item 1) **[Figure 152]**. (The buzzer will continue to sound and the light (Item 1) **[Figure 152]** will stay ON.)

Figure 153



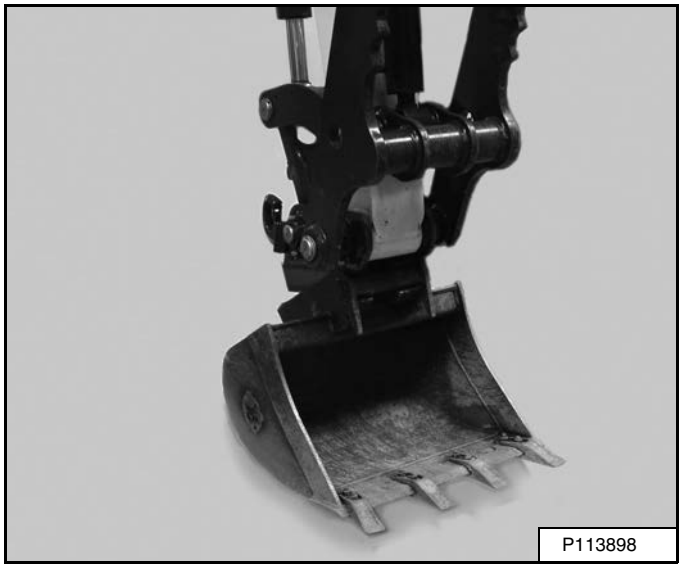
For the Hydraulic German Style Coupler; Continue holding the right joystick (Item 1) **[Figure 150]** to the left (IN) until the pins (Item 1) **[Figure 153]** are fully retracted to unlock the attachment from the quick coupler.

For the Pin Grabber Quick Coupler; Continue holding the right joystick (Item 1) **[Figure 150]** to the left (IN) until the green locking clasp (Item 2) **[Figure 150]** retracts and will unlock the attachment from the quick coupler.

Installing And Removing The Attachment (Bobcat Hydraulic Quick Coupler) (Cont'd)

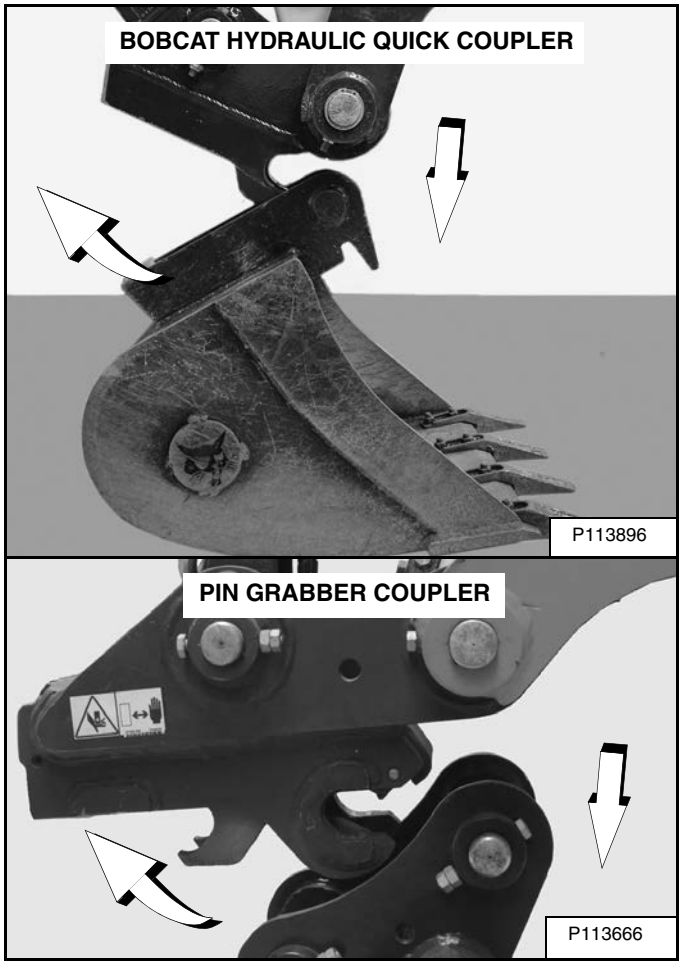
Removal (Cont'd)

Figure 154



With the attachment slightly off the ground, roll the quick coupler back until the coupler starts to disengage from the attachment **[Figure 154]**.

Figure 155

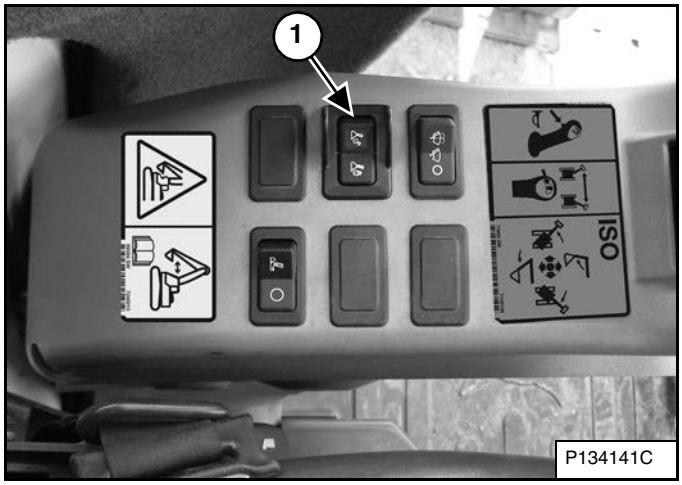


Roll the quick coupler back fully.

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

Move the arm away from the excavator until the quick coupler is clear of the attachment **[Figure 155]**.

Figure 156



Press the coupler ON / OFF switch (Item 1) **[Figure 156]** to the right, (OFF) position. The switch light and buzzer will turn OFF.

OPERATING PROCEDURE

Inspect The Work Area

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

Look for sharp drop-offs or rough terrain. Have underground utility lines (gas, electrical, water, sewer, irrigation, etc.) located and marked. Work slowly in areas of underground utilities.

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

Always check ground conditions before starting your work:

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

Basic Operating Instructions

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

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

IMPORTANT

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

I-2015-0284

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

Operating Near An Edge Or Water

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

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

Lowering The Work Equipment (Engine STOPPED)

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

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

Use the control lever to lower the boom.

Figure 157

The joystick lock switch disengages the hydraulic control functions from the joysticks when the console are raised **[Figure 157]**.

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

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

Use the control lever to lower the boom.

Lower the control console to engage the hydraulic control functions of the joysticks **[Figure 157]**.

Object Handling With The Lifting Device

The excavator must be equipped with the optional lift eye link (Item 1) **[Figure 159]**, the boom and arm load hold valves and the overload warning device option. See your Bobcat dealer for available Kits.

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2991-0714

NOTE: The lifting device maybe present on the attachment quick coupler. Always use for object handling, only couplers with the lifting device of sufficient capacity (Rated Lift Load).

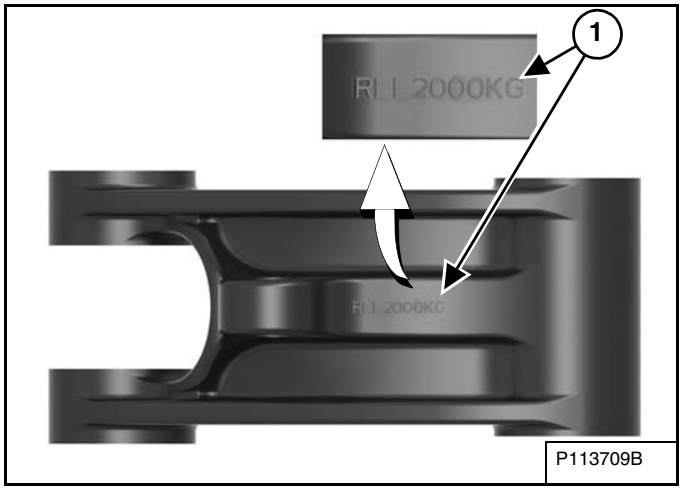
Do not exceed the machine's Rated Lift Capacity or the Rated Lift Load (RLL) of the lifting device (lift eye).

To determine the lift capacity changes, see the applicable lift capacity chart:

(See Rated Lift Capacity - Canopy With Light Counterweight on Page 172.), (See Rated Lift Capacity - Canopy With Medium Counterweight on Page 173.), (See Rated Lift Capacity - Cab With Light Counterweight on Page 174.), (See Rated Lift Capacity - Cab With Medium Counterweight on Page 175.).

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

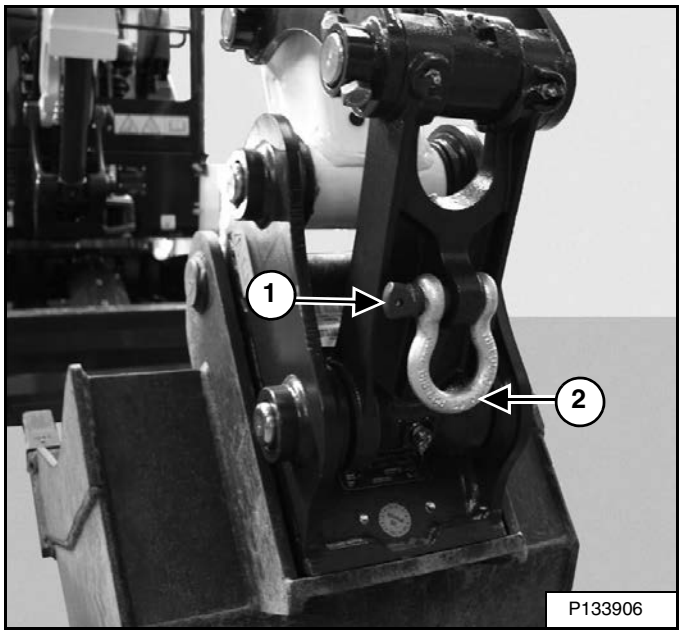
Figure 158



The maximum RLL (Item 1) **[Figure 158]** is shown on the lifting device.

Extend the bucket cylinder completely and lower the boom to the ground. Stop the engine. Exit the excavator. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 71.)

Figure 159

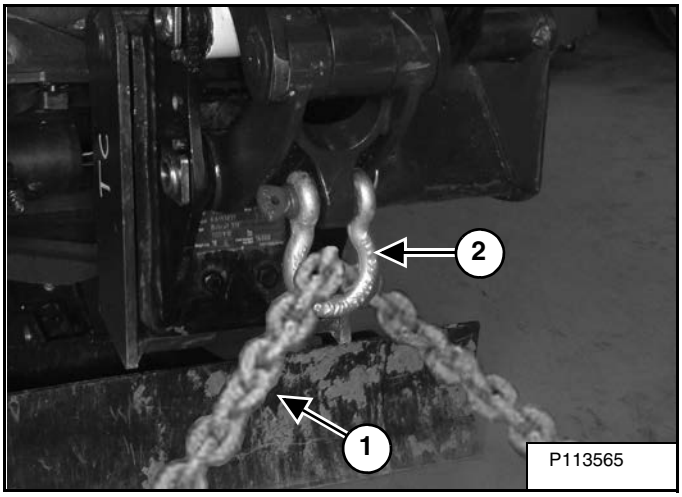


Install the clevis (Item 2) through the lift eye (Item 1) **[Figure 159]**.

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

Object Handling With The Lifting Device

Figure 160

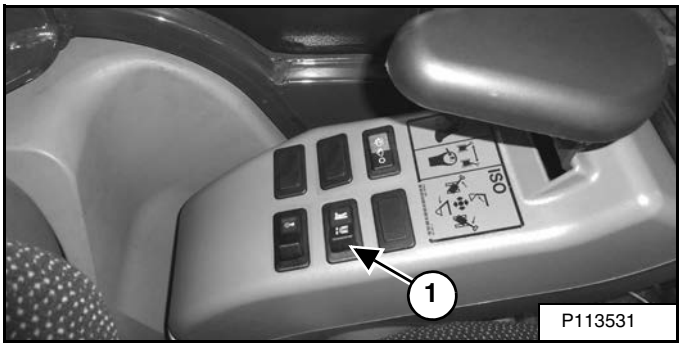


Install a lift chain (Item 1) (or other type of lifting device) through the clevis (Item 2) **[Figure 160]** and connect to the object to be lifted.

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 64.)

Figure 161



Press the switch (Item 1) **[Figure 161]** to the left to activate the overload warning device.

Figure 162

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 162]**.

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

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

Lift Capacity

The lifting capacities were calculated with a Standard Configuration Machine (machine equipped with a pin-on interface and no attachment). The weight of the attachment, the hydraulic clamp (if equipped), and different interface (if equipped), must be subtracted from the lift capacity to obtain the actual lift capacity.

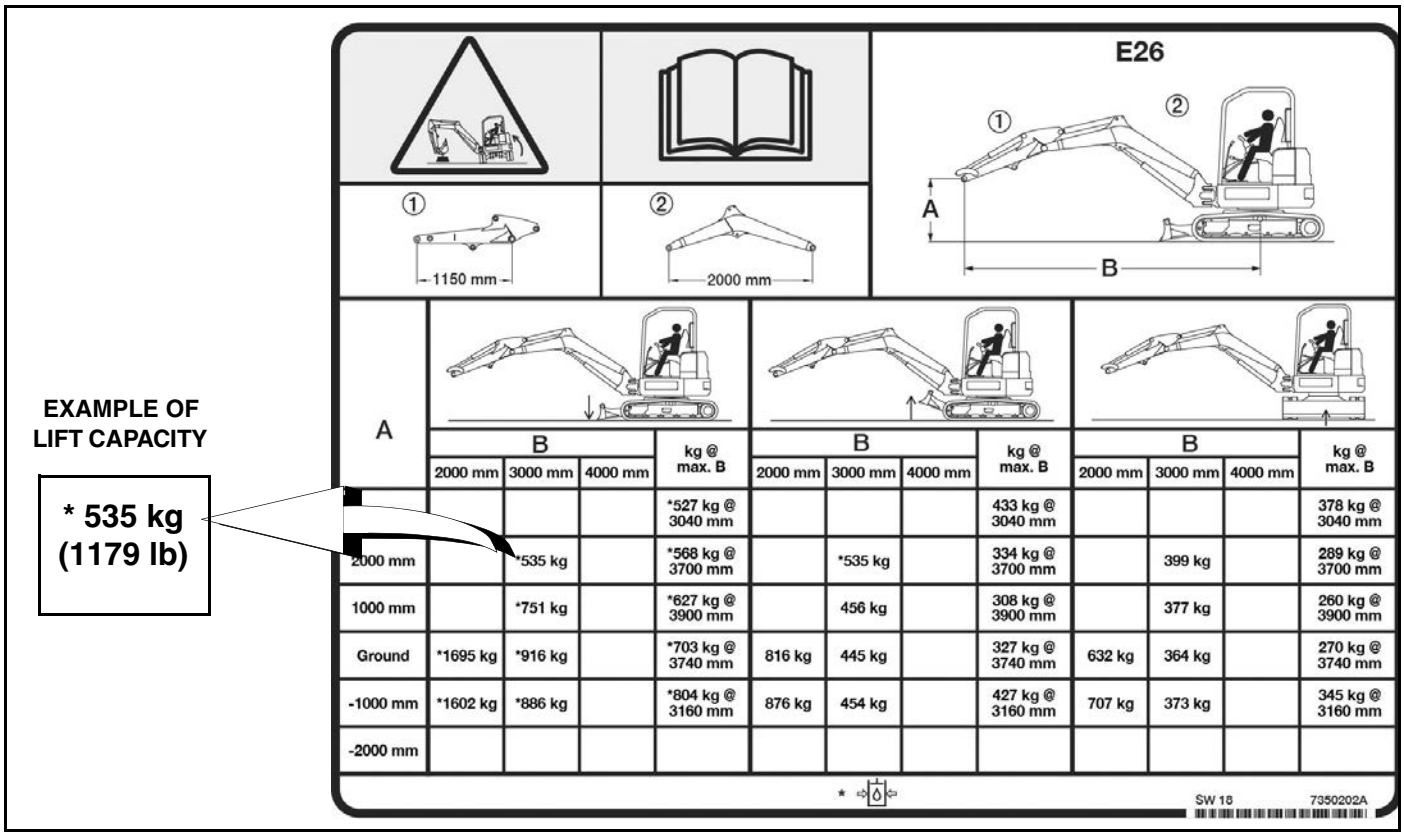
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2374-0500

Figure 163



A	B			kg @ max. B	B			kg @ max. B	B			kg @ max. B
	2000 mm	3000 mm	4000 mm		2000 mm	3000 mm	4000 mm		2000 mm	3000 mm	4000 mm	
2000 mm				*527 kg @ 3040 mm				433 kg @ 3040 mm				378 kg @ 3040 mm
		*535 kg		*568 kg @ 3700 mm		*535 kg		334 kg @ 3700 mm		399 kg		289 kg @ 3700 mm
1000 mm		*751 kg		*627 kg @ 3900 mm		456 kg		308 kg @ 3900 mm		377 kg		260 kg @ 3900 mm
Ground	*1695 kg	*916 kg		*703 kg @ 3740 mm	816 kg	445 kg		327 kg @ 3740 mm	632 kg	364 kg		270 kg @ 3740 mm
-1000 mm	*1602 kg	*886 kg		*804 kg @ 3160 mm	876 kg	454 kg		427 kg @ 3160 mm	707 kg	373 kg		345 kg @ 3160 mm
-2000 mm												

Detailed information about Quick Coupler and hydraulic clampweights can be found in documentation including its serial number plate. The following lists examples of the optional quick couplers and hydraulic clamp weights:

- Klac™ Quick Coupler = 28 kg (62 lb)
- German Style Coupler = 35 kg (77 lb)
- Mechanical Pin Grabber = 37 kg (82 lb)
- Hydraulic Pin Grabber Coupler HPG2 = 35 kg (77 lb)
- Hydraulic Clamp And Cylinder = 54 kg (119 lb)
- Optional Buckets and Attachments (See **NOTE** below)

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

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

Lift Capacity (Cont'd)

The following is an example for determining the actual lift capacity using the sample chart shown above **[Figure 163]**.

- Machine Position: Over Blade, Blade Down
- Lift Radius: 3000 mm (118.1 in)
- Lift Point Height: 2000 mm (78.7 in)
- Hydraulic Clamp and Cylinder
- Standard Bucket

1. Obtain Lift Capacity from Chart: 535 kg (1179 lb)

2. Obtain the weights of optional equipment that reduces the lift capacity of the machine (coupling interface, hydraulic clamp, attachment).

Optional Equipment Weights: Standard Bucket 42 kg (92 lb), attachment coupler system 28 kg (62 lb), Hydraulic Clamp and Cylinder 54 kg (119 lb)

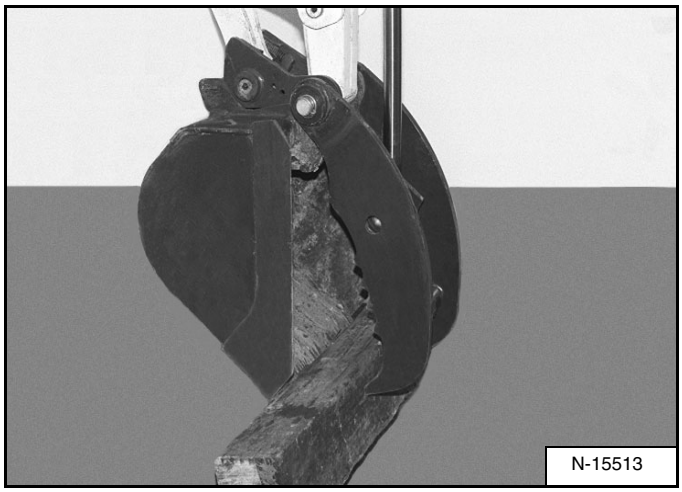
3. Calculate the actual lift capacity by subtracting the weight of any optional equipment from the lift capacity of the standard configuration.

535 kg (1179 lb) - 42 kg (92 lb) (standard bucket) - 28 kg (62 lb) (attachment coupler system) - 54 kg (119 lb) (hydraulic clamp and cylinder) = 411 kg (906 lb)

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

Using The Clamp

Figure 164



The optional lifting clamp attachment gives the excavator a wider range of use and mobility for debris removal **[Figure 164]**.

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

The lift capacities are reduced by 122 kg (270 lb) if the excavator is equipped with the optional lifting clamp.

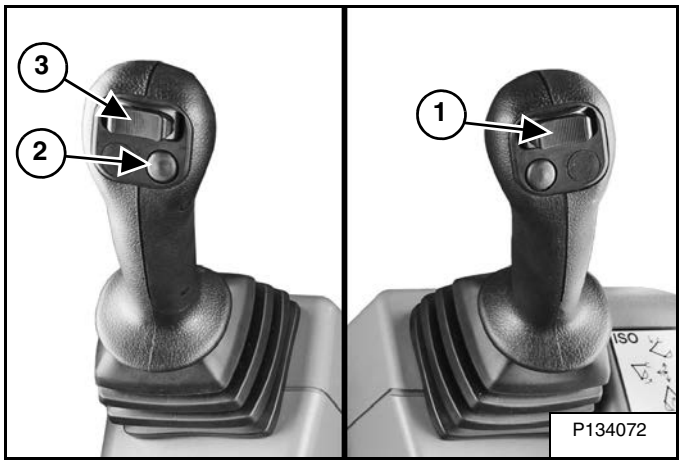
NOTE: Use care when operating the bucket and clamp functions on machines equipped with an attachment mounting system and without a bucket or attachment installed. Cylinder damage can occur due to contact between the attachment mounting system and the clamp when both cylinders are fully extended.

Using Primary Auxiliary Hydraulics To Activate Clamp

1. Engage the auxiliary hydraulics. (See Activating Primary Auxiliary Hydraulics With Standard Instrument Panel on Page 48.) (See Activating Primary Auxiliary Hydraulics With Deluxe Instrument Panel (Software Version 88.02 Or Below) on Page 49.) (See Activating Primary Auxiliary Hydraulics With Deluxe Instrument Panel (Software Version 88.03 Or Above) on Page 49.)

2. Set auxiliary flow rate to Mode 2 (standard instrument panel) or Medium Flow (deluxe instrument panel with old software) or 65 – 75% (deluxe instrument panel with new software).

Figure 165



3. Move the switch (Item 1) **[Figure 165]** on the right control lever to the right to open the clamp. Move the switch to the left to close the clamp.

Using Secondary Auxiliary Hydraulics To Activate Clamp

1. Engage the secondary auxiliary hydraulics. (See Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.02 Or Below) on Page 53.) (See Operating Attachments With Secondary Auxiliary Hydraulics (Software Version 88.03 Or Above) on Page 54.)

2. Press the button on the left joystick (Item 2) **[Figure 165]** to toggle to the secondary auxiliary hydraulics.

3. Move the switch (Item 3) **[Figure 165]** on the left joystick to the left open the clamp. Move the switch to the right to close the clamp.

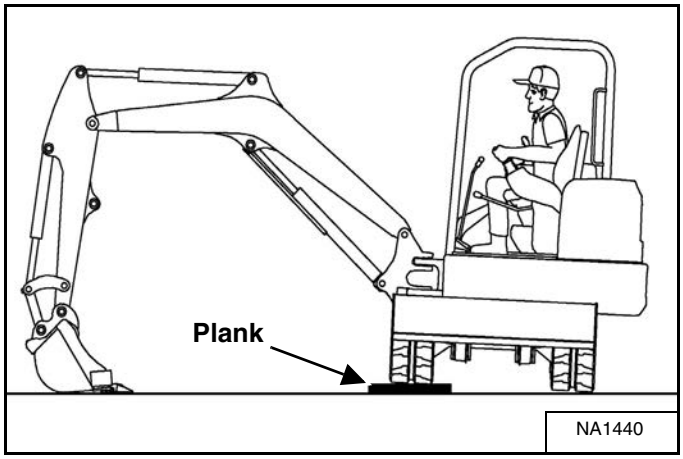
Driving The Excavator

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

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

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

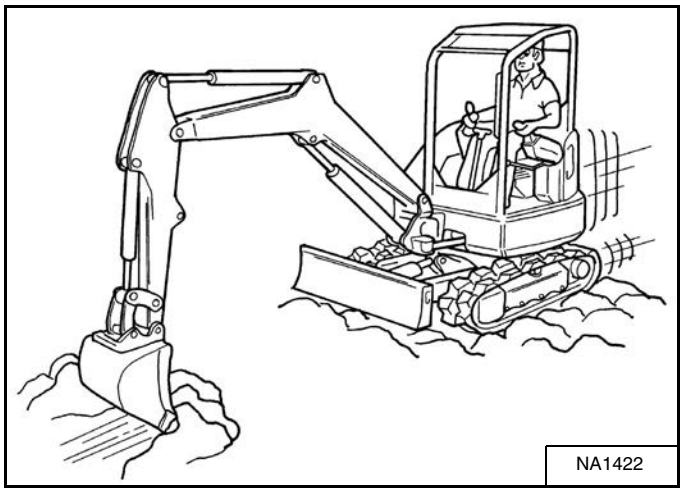
Figure 166



If one or both tracks have become stuck in soft or wet ground, raise one track at a time by turning the upperstructure and pushing the bucket against the ground **[Figure 166]**.

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

Figure 167



The bucket may also be used to pull the excavator. Raise the blade, extend the arm and lower the boom. Operate the boom and arm in a digging manner **[Figure 167]**.

Operating On Slopes

⚠ WARNING

AVOID INJURY OR DEATH

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

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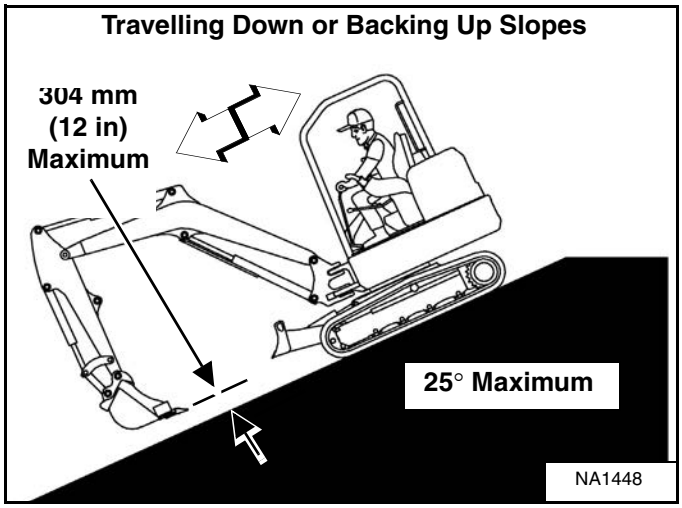
When going down a slope, control the speed with the steering levers and the speed control lever.

Figure 168



When going down grades that exceed 15 degrees, put the machine in the position shown, and run the engine slowly **[Figure 168]**.

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

Avoid travelling 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.

Operating On Slopes (Cont'd)

⚠ 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.**

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Figure 169

Travelling Up Slopes

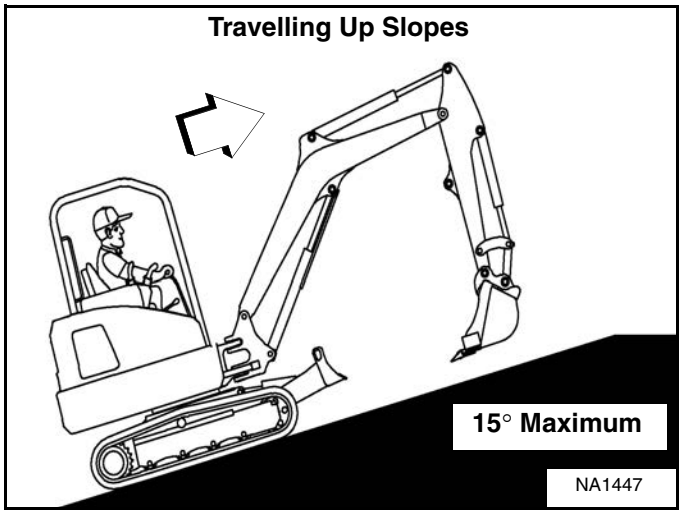
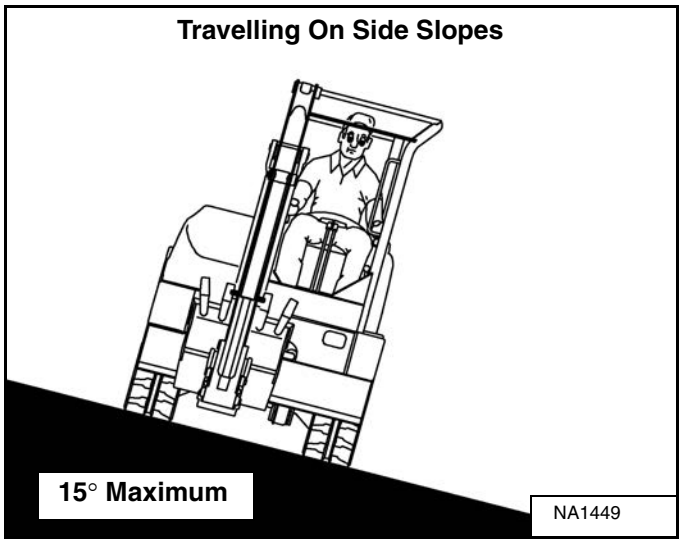


Figure 170

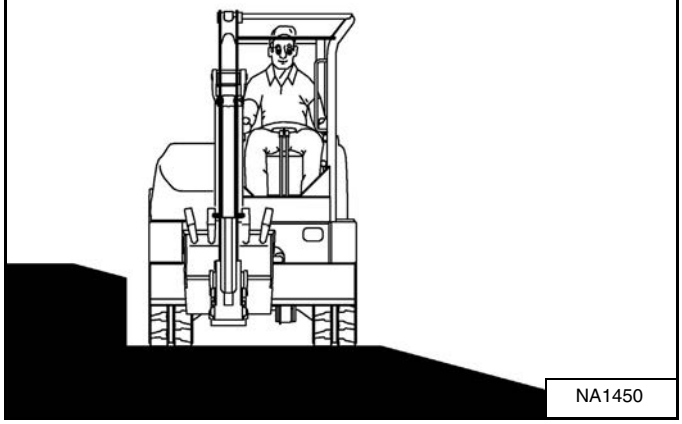
Travelling On Side Slopes



When travelling up slopes or on side slopes that are 15 degrees or less, position the machine as shown and run the engine slow **[Figure 169]** and **[Figure 170]**.

Figure 171

Recommended Position For Working On A Slope



When operating on a slope, level the work area before beginning **[Figure 171]**.

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

Do not work on slopes which are over 15 degrees.

Use a slow work cycle.

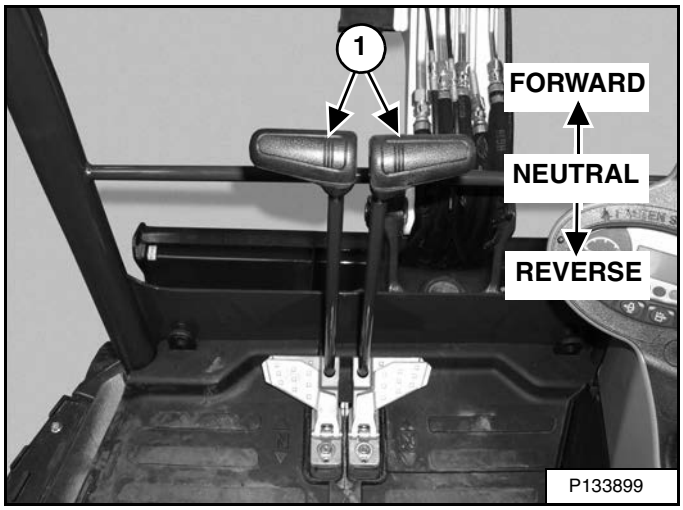
Avoid working with the tracks across the slope. This will reduce stability and increase the tendency for the machine to slide. Position the excavator with the blade downhill and lowered.

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

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

Operating On Slopes (Cont'd)

Figure 172



To brake the machine when going down a slope, move the steering levers (Item 1) **[Figure 172]** to the NEUTRAL position. This will engage the hydrostatic braking.

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

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

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

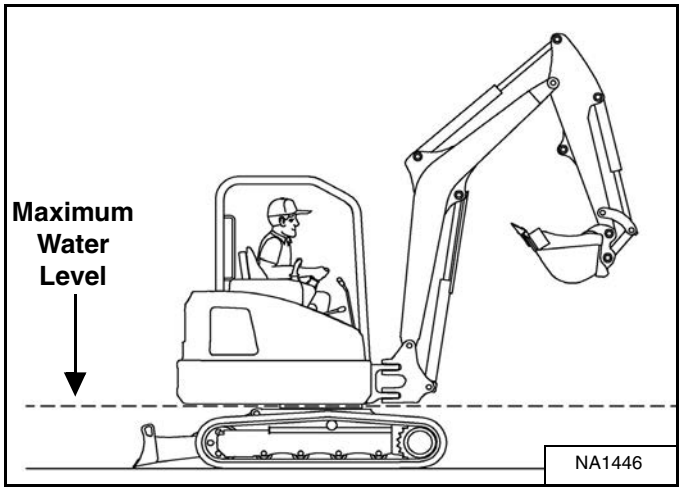
Use the control lever to lower the boom.

Start the engine and resume operation.

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 173



Do not operate or immerse the excavator in water higher than the bottom of the swing bearing **[Figure 173]**.

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

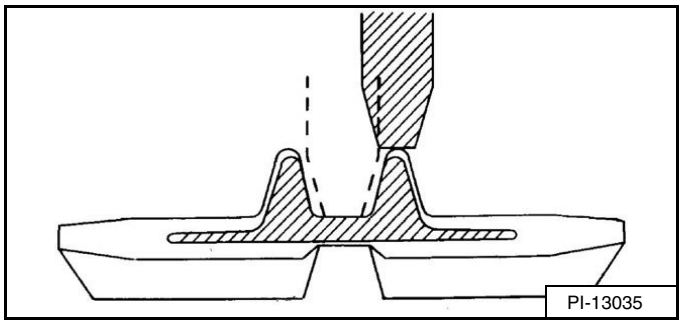
Water must be removed from the cylinder rods. If water freezes to the cylinder rod, the cylinder seals can be damaged when the rod is retracted.

Avoiding Track Damage

Mud and water should be removed from the machine before parking. In freezing temperatures, park the machine on boards or concrete to prevent the track or undercarriage from freezing to the ground and preventing machine movement.

Some Cause Of Track Damage:

Figure 174

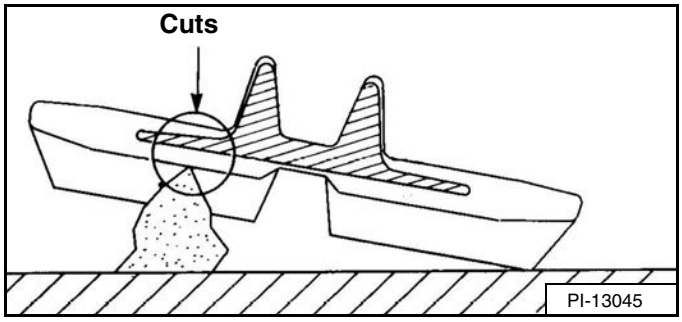


Incorrect track tension: When the rubber track is detracting, the idler or sprocket rides on the projections of the embedded metal **[Figure 174]** causing the embedded metal to be exposed to corrosion. (See TRACK TENSION on Page 142.)

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

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

Figure 175

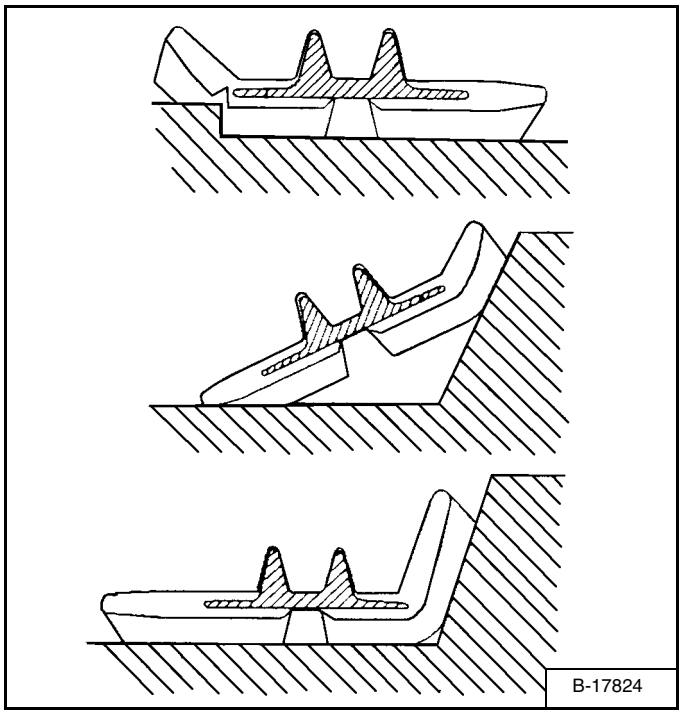


When rubber tracks drive over projections or sharp objects in the field, the concentrated forces applied cause cuts on the lug side rubber surface **[Figure 175]**. In case of making turns on projections, the lug side rubber surface will have an even higher chance to be cut. If the cuts run through the embedded steel cords, it might result in the steel cords' breakage due to their corrosion.

Avoid quick turns on bumpy and rocky fields.

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

Figure 176



When rubber tracks drive over sharp projections, intensive stress is applied to the lug side rubber surface, especially at the edges of embedded metals, causing cracks and cuts in the area around the embedded metals **[Figure 176]**.

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

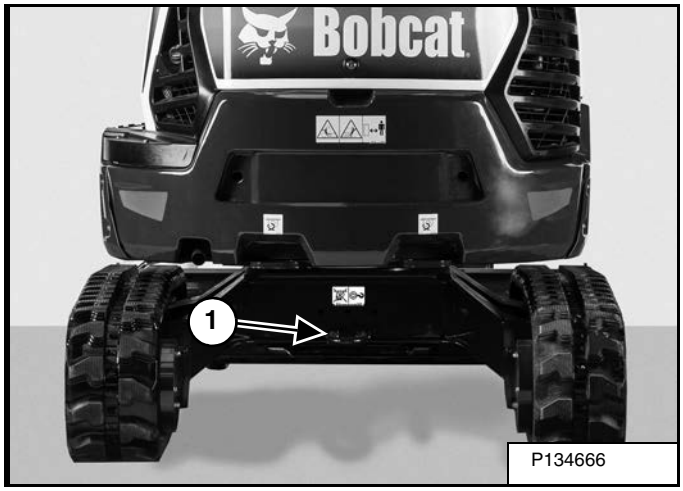
TOWING THE EXCAVATOR

Procedure

There is not a recommended towing procedure for the excavators.

The excavator can be lifted onto the transport vehicle. (See LIFTING THE EXCAVATOR on Page 101.)

Figure 177



The excavator can be skidded a short distance for service (for example, moving it onto a transport vehicle) without damaging the hydraulic system. (The tracks will not turn.) There might be slight wear to the tracks when the excavator is skidded.

Secure the towing chain to the loop located at the rear of the excavator (Item 1) **[Figure 177]**.

The towing chain (or cable) must be rated at 1.5 times the weight of the excavator. (See Performance on Page 176.)

LIFTING THE EXCAVATOR

Procedure

Figure 178

Before lifting, fully extend the cylinders of the bucket, arm, and boom. Raise the blade fully. Turn the upperstructure so the boom and blade are at opposite ends of the excavator as shown **[Figure 178]**.

Put all the control levers in NEUTRAL and stop the machine.

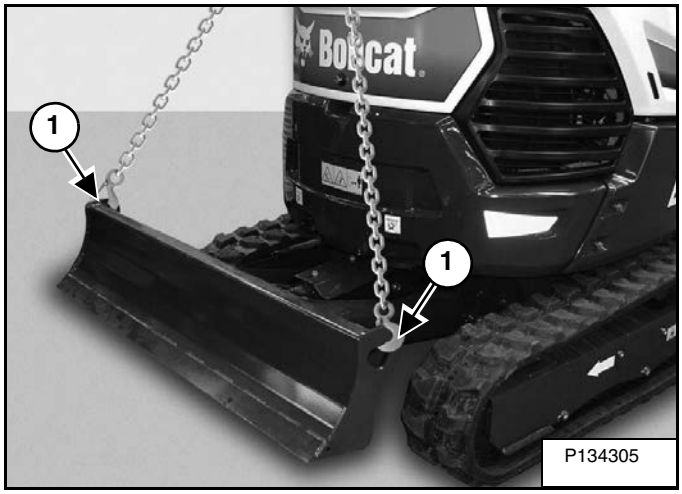
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2800-EN-0210

Figure 179

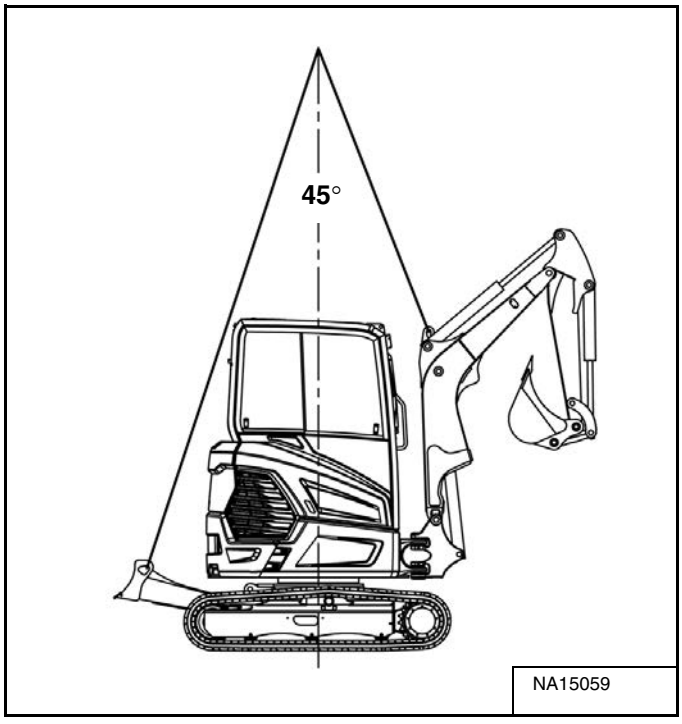


Fasten chains to the ends of the blade (Item 1) **[Figure 179]** and up to a lifting fixture above the canopy / cab. The lifting fixture must extend over the sides of the canopy / cab to prevent the chains from hitting the ROPS / TOPS.

Figure 180

Fasten a chain from the boom to the lift fixture (Item 1) **[Figure 180]**.

Figure 181



The excavator should remain as close to horizontal as possible while it is lifted. To prevent damage, the chains should not contact any part of the operator canopy / cab. The chains should be at an angle of 45 degrees **[Figure 181]**.

TRANSPORTING THE EXCAVATOR ON A TRAILER

Loading And Unloading

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

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

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

Use metal loading ramps with a slip resistant surface.

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

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

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

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

⚠ 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

Figure 182

Move the machine forward onto the transport vehicle **[Figure 182]**.

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

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

Stop the engine and remove the key (if equipped).

Put blocks at the front and rear of the tracks.

Fastening

Tie down the excavator to prevent it from moving when going up or down slopes or during sudden stops.

Tie-Down Points At The Front Of The Excavator:

Figure 183

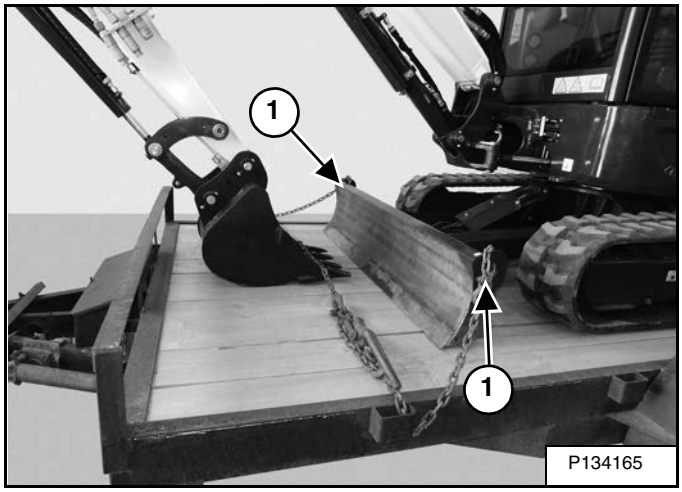
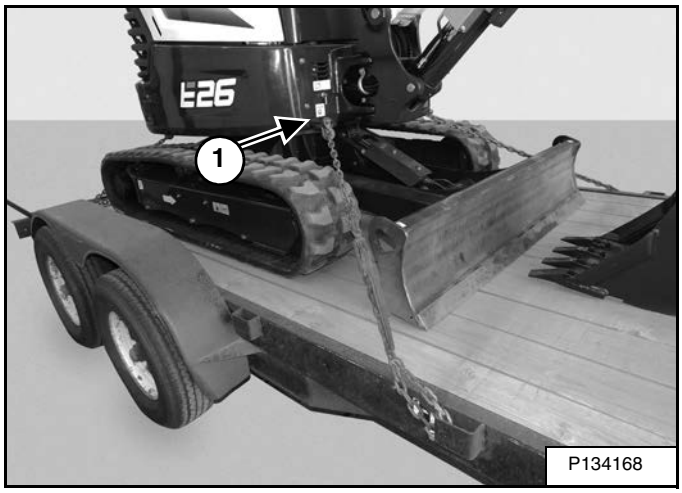


Figure 184



Fasten chains to the front corners of the blade (Item 1) **[Figure 183]** or to the tie down loops at the front of the upperstructure (Item 1) **[Figure 184]**.

Tie-Down Points At The Rear Of The Excavator:

Figure 185

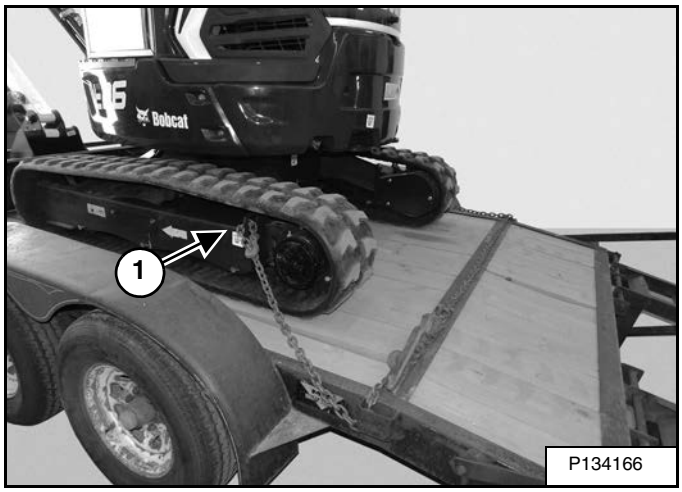
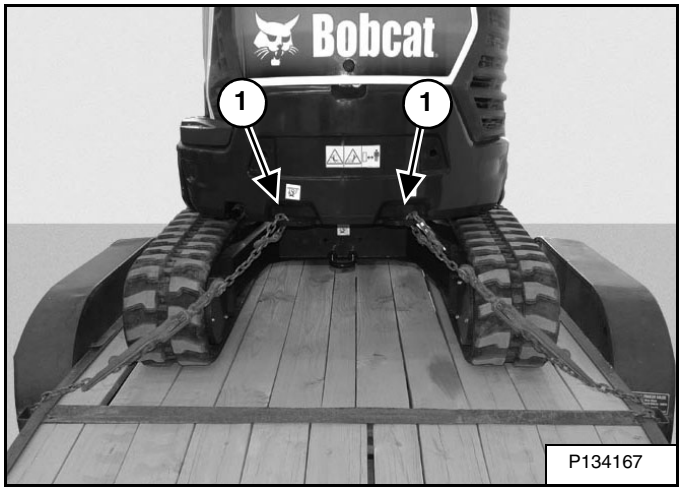


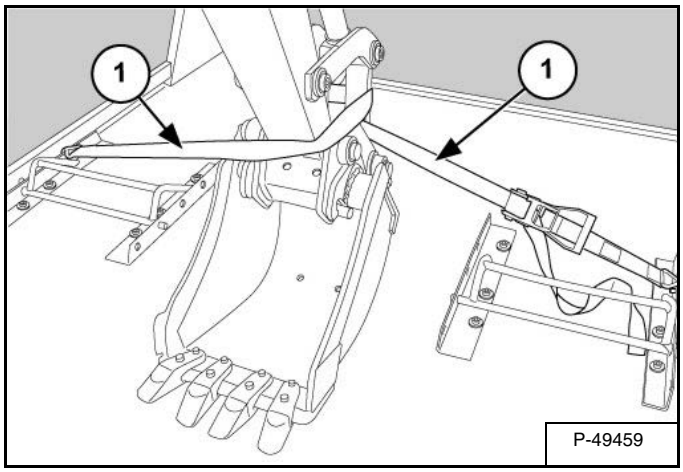
Figure 186



Fasten chains to the tie down loops at the rear corners of the track frame (Item 1) **[Figure 185]** or to the tie down loops at the rear of the upperstructure (Item 1) **[Figure 186]**.

Fastening (Cont'd)

Figure 187



Loop a chain (Item 1) **[Figure 187]** around the bucket link and to the trailer.

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

PREVENTIVE MAINTENANCE

MAINTENANCE SAFETY

WARNING

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

W-2003-0807

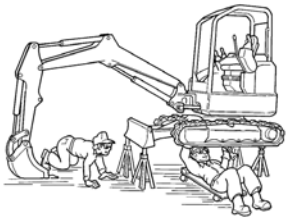
Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

CORRECT

P-90216

Never service the Bobcat Compact Excavator without instructions.

CORRECT



NA1428

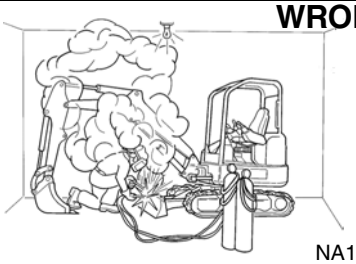
Use the correct procedure to lift and support the excavator.

CORRECT

NA1425

Cleaning and maintenance are required daily.

WRONG



NA1427

Have good ventilation when welding or grinding painted parts.

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

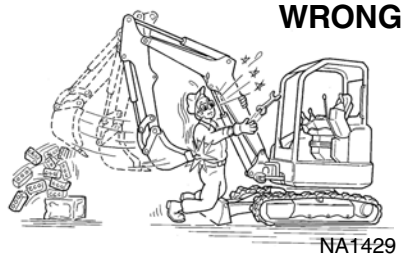
WRONG

NA1426

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

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

WRONG

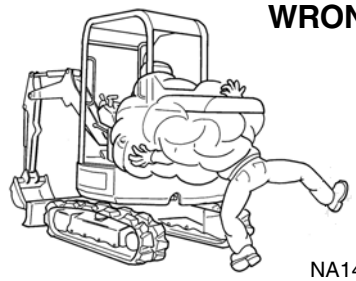


NA1429

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

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

WRONG



NA1430

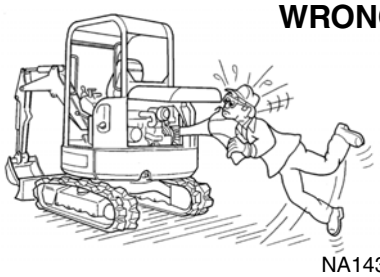
Stop, cool and clean engine of flammable materials before checking fluids.

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

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

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

WRONG



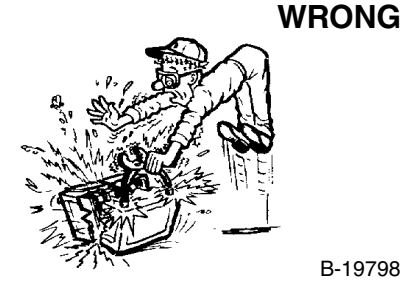
NA1431

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

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

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

WRONG



B-19798

Lead-acid batteries produce flammable and explosive gases.

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

Batteries contain acid which burns eyes or skin on contact.

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

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

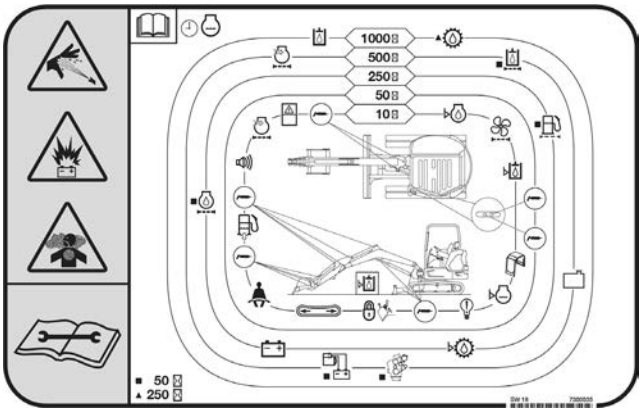
MSW38-0409

SERVICE SCHEDULE

Maintenance Intervals

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

The service schedule is a guide for correct maintenance of the Bobcat excavator.



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 127.)
- **Engine Air Filters and Air System** - Check condition indicator. Service only when required. Check for leaks and damaged components. (See Page 120.)
- **Engine Cooling System** - Check coolant level COLD and add premixed coolant as needed. (See Page 129.)
- **Seat Belt, Seat Belt Retractors, Seat Belt Mounting hardware** - Check the condition of seat belt and mounting hardware. Clean or replace seat belt retractors as needed. Clean dirt and debris from moving parts. (See Page 112.)
- **Motion Alarm and Horn** - Check for proper function (if equipped). (See Page 113.)
- **Control Console Lockout** - Check the control console lockout lever for proper operation. (See Page 111.)
- **Operator Canopy / Cab** - Check the canopy / cab condition and mounting hardware. (See Page 37.)
- **Operator Cab and Heater Filters** - Clean filters. (See Page 118.)
- **Indicators and Lights** - Check for correct operation of all indicators and lights. (See Page 31.)
- **Safety Signs** - Check for damaged signs (decals). Replace any signs that are damaged. (See Page 16.)
- **Hydraulic Fluid** - Check fluid level and add as needed. (See Page 138.)
- **Track Tension** - Check tension and adjust as needed. (See Page 142.)
- **Pivot Points** - Grease all machinery pivot points. Grease clamp (if equipped). (See Page 149.)
- **Attachment Coupler** - Check for damage or loose parts (if equipped). (See Page 147.)
- **Fuel Filter** - Drain water and sediment. (See Page 124.)

First 50 Hours

- **Fuel Filter** - Change filter. (See Page 124.)
- **Engine Oil and Filter** - Replace oil and filter. (See Page 127.)
- **Drive Belts (Alternator)** - Check condition. Replace as needed. (See Page 145.)
- **Hydraulic Filter and Case Drain Filter** - Replace the hydraulic filter and the case drain filter. (See Page 139.)
- **Alternator and Starter** - Check connections.

Every 50 Hours

- **Swing Bearing** - Grease swing bearing and swing pinion. Service every 10 hours when operating in water. (See Page 149.)

SS EXC E26-27 T4 S5 K - 0319

SERVICE SCHEDULE (CONT'D)

Maintenance Intervals (Cont'd)

Every 100 Hours

- **Spark Arrester** - Empty spark chamber. (See Page 141.)

First 250 Hours

- **Travel Motors (Final Drive)** - Replace fluid. (See Page 144.)

Every 250 Hours Or Every 12 Months

- **Battery** - Check cables and connections. (See Page 131.)
- **Fuel Filter** - Change fuel filter and pre-filter. (See Page 124.)
- **Travel Motors (Final Drive)** - Check fluid level and add as needed. (See Page 144.)
- **Engine Oil and Filter** - Replace oil and filter. (See Page 127.)

Every 500 Hours Or Every 12 Months

- **Engine Air Filters and Air System** - Check condition indicator. Service only when required. Check for leaks and damaged components. (See Page 120.)
- **Engine Cooling System** - Clean debris from radiator, fuel cooler and hydraulic fluid cooler. (See Page 129.)
- **Drive Belts (Alternator)** - Check condition. Replace as needed. (See Page 145.)
- **Hydraulic Filter, Case Drain Filter, and Hydraulic Reservoir Breather Cap** - Replace the hydraulic filters. (See Page 139.)
- **Alternator and Starter** - Check connections.

Every 1000 Hours Or Every 12 Months

- **Travel Motors (Final Drive)** - Replace fluid. (See Page 144.)
- **Hydraulic Fluid and Filters** - Replace hydraulic fluid and filters. (See Page 139.)
- **Engine Valves** - Adjust the engine valve clearance.

Every 24 Months

- **Coolant** - Replace the coolant. (See Page 130.)

SS EXC E26-27 T4 S5 K - 0319

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 the correct maintenance of the Bobcat excavator.

The Inspection Checkbook contains the following information:

- Doosan Bobcat EMEA s.r.o. Warranty Policy

- Doosan Bobcat EMEA s.r.o. Extended Warranty Policy

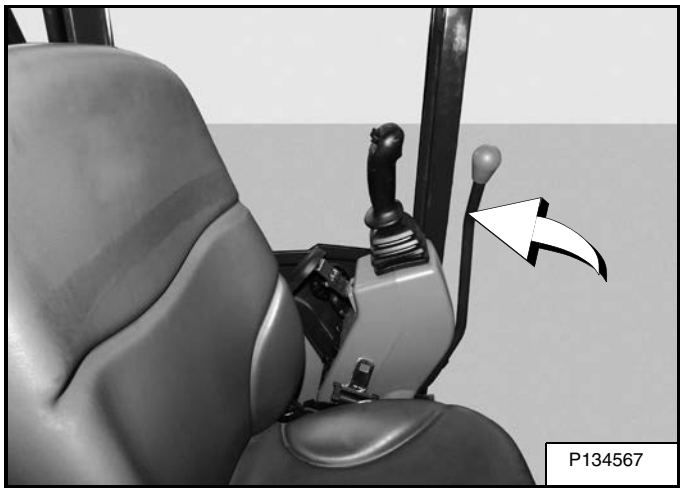
The inspection checkbook has to be filled in by the Dealer for any maintenance and service work of your Bobcat machine. This book may be required anytime by an authorised dealer or by Bobcat Europe, should be a breakdown occur on the Bobcat equipment.

Your dealer can order the Inspection Checkbook.
Part Number: 7296478.

CONTROL CONSOLE LOCKOUTS

Inspection And Maintenance

Figure 188



When the left console is raised **[Figure 188]**, the hydraulic control levers (joysticks) and traction system must not function.

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

Raise the left console **[Figure 188]**.

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

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

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

SEAT BELT

Inspection And Maintenance

⚠ WARNING

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

W-2466-0703

Check the seat belt daily for correct function.

Inspect the seat belt system thoroughly at least once each year or more often if the machine is exposed to severe environmental conditions or applications.

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discolourations due to ultraviolet UV exposure, dusty / dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor (if equipped), hardware or any other obvious problem should be replaced immediately.

The items below are referenced in **[Figure 189]**.

1. Check the webbing. If the system is equipped with a retractor, pull the webbing completely out and inspect the full length of the webbing. Look for cuts, wear, fraying, dirt and stiffness.

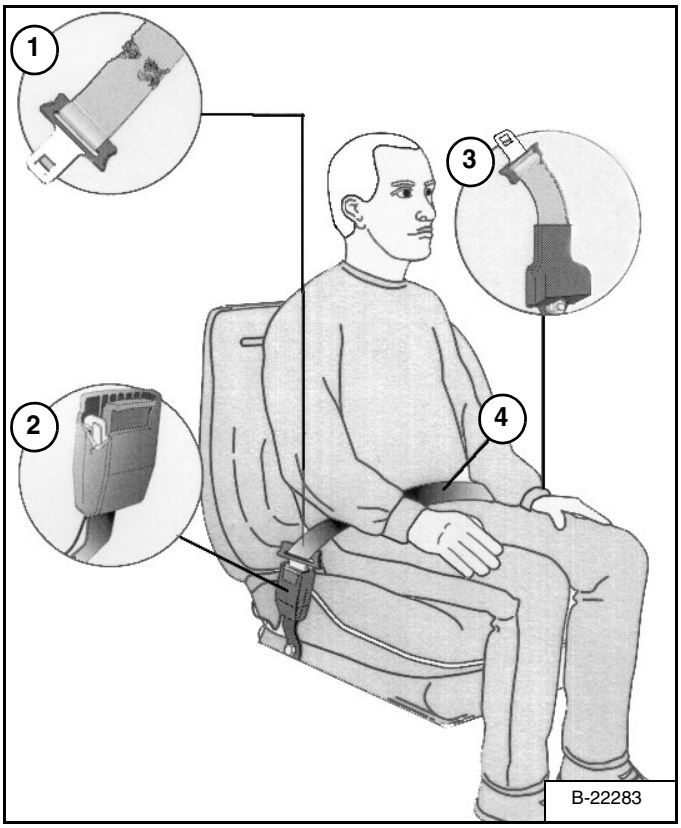
2. Check the buckle and latch for correct operation. Make sure latch plate is not excessively worn, deformed or buckle is not damaged or casing broken.

3. Check the retractor web storage device (if equipped) by extending webbing to determine if it looks correct and that it spools out and retracts webbing correctly.

4. Check webbing in areas exposed to ultraviolet (UV) rays from the sun or extreme dust or dirt. If the original colour of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength may have deteriorated.

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

Figure 189



MOTION ALARM SYSTEM

Description

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

Inspecting

Figure 190

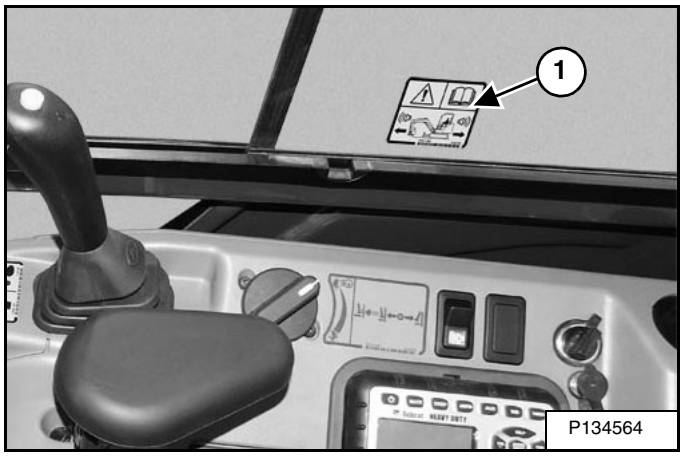
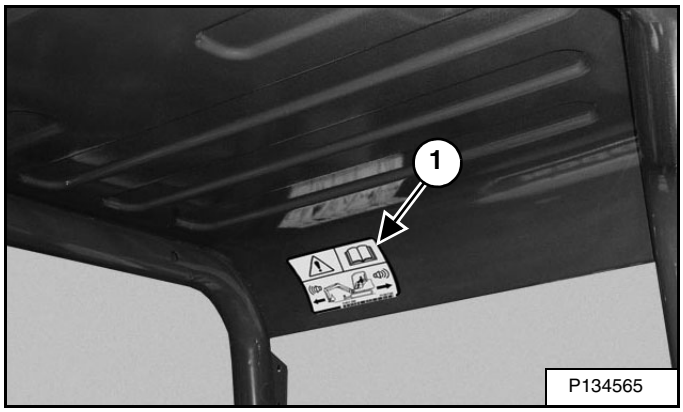


Figure 191



Inspect for damaged or missing motion alarm decal (Item 1) **[Figure 190]** (cab machine) or (Item 1) **[Figure 191]** (canopy machine). Replace if required.

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

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2050-0807

Sit in the operator's seat and fasten the seat belt. Start the engine. (See PRE-STARTING PROCEDURE on Page 64.)

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

Figure 192

Slightly move both travel control levers in the forward direction (until the machine is slowly moving forward) and then press the motion alarm cancel switch (Item 1) **[Figure 192]**. The motion alarm will shut off. With the machine still moving forward, move both of the levers to the NEUTRAL position, the motion alarm must sound.

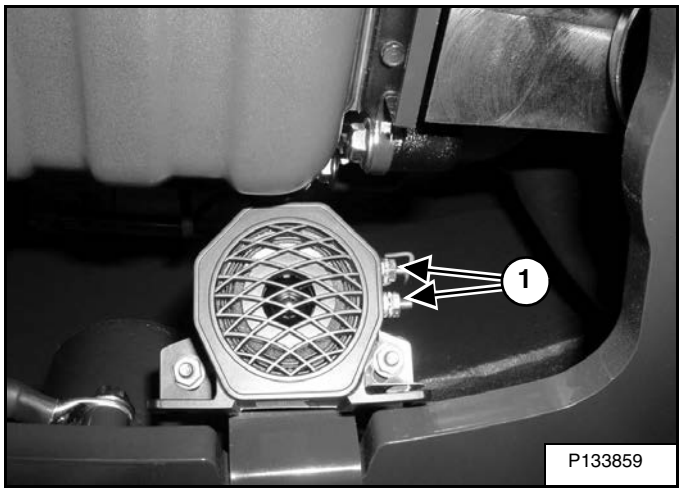
Slightly move both travel control levers in the reverse direction (until the machine is slowly moving backward) and then press the motion alarm cancel switch (Item 1) **[Figure 192]** (the switch icon will be illuminated when the motion alarm is deactivated). The motion alarm will shut off. With the machine still moving backward, move one of the levers to the NEUTRAL position, the motion alarm must sound.

Return both levers to NEUTRAL and turn excavator key to OFF position. Exit the excavator. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 71.)

Inspecting (Cont'd)

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

Figure 193



Inspect the motion alarm electrical connections (Item 1) **[Figure 193]**, wire harness, and motion alarm switch (Item 1) **[Figure 194]** for tightness and damage. Repair or replace any damaged components.

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

⚠ WARNING

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

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

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

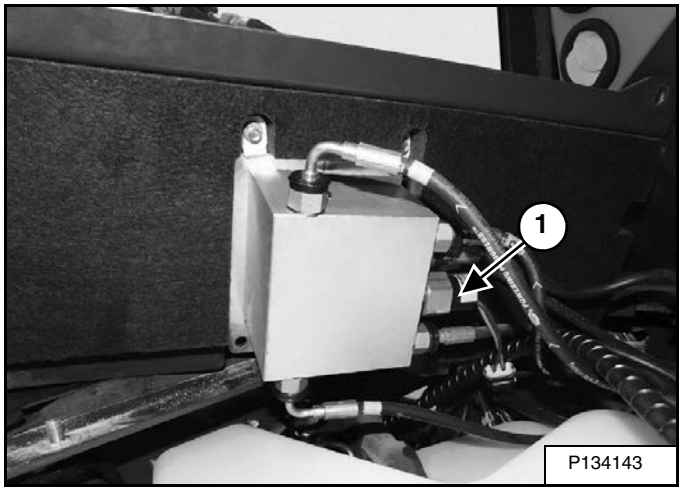
W-2786-0309

Adjusting Switch Position

The motion alarm switch (Item 1) **[Figure 194]** is located in the travel control valve located under the floorplate. Remove the floor mat and the floorplate. (See the Service Manual for the correct procedure.)

Remove the travel levers.

Figure 194



The switch (Item 1) **[Figure 194]** is non-adjustable. It must be fully installed into the travel control valve housing and tightened. Tighten the switch to 18 – 20 N•m (13 – 15 ft-lb).

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

TAILGATE

Opening And Closing

⚠ WARNING

AVOID INJURY OR DEATH

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

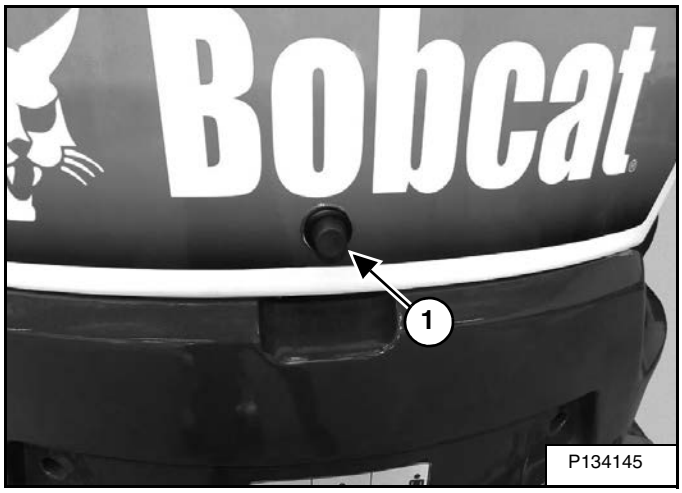
W-2012-0497

⚠ WARNING

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

W-2020-1285

Figure 195

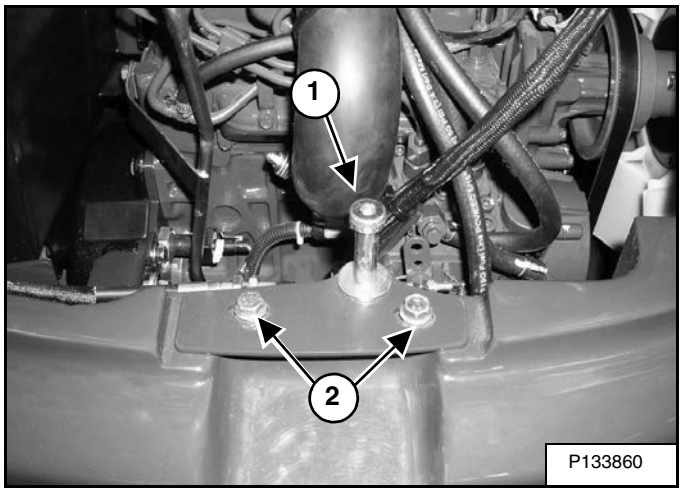


Push the black button (Item 1) **[Figure 195]** and pull the tailgate up.

Push firmly to close the tailgate.

Adjusting The Latch

Figure 196



The tailgate latch (Item 1) **[Figure 196]** can be adjusted by loosening the two bolts (Item 2) **[Figure 196]**, moving the latch, and tightening the two bolts.

Close the tailgate before operating the excavator.

RIGHT SIDE COVER

Opening And Closing

⚠ WARNING

AVOID INJURY OR DEATH

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

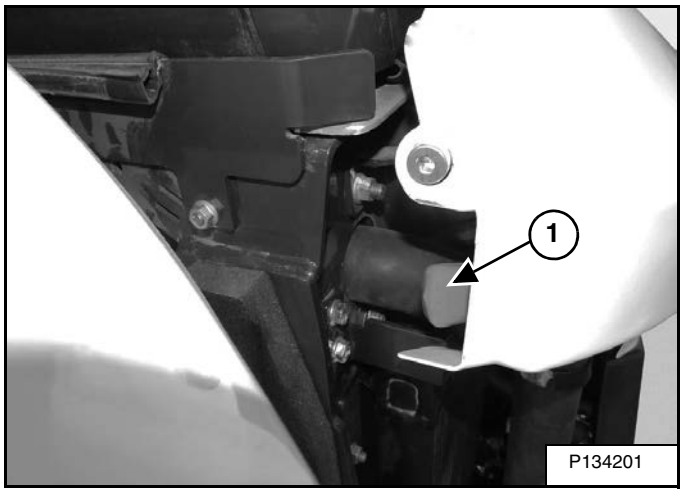
W-2012-0497

⚠ WARNING

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

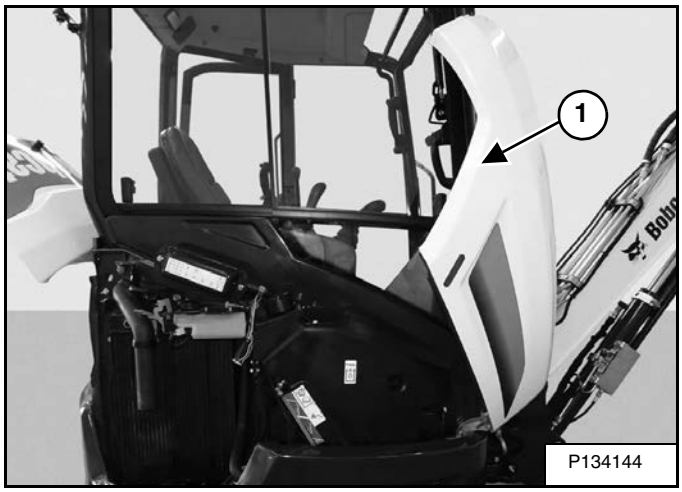
W-2020-1285

Figure 197



Open the tailgate to access the right side cover latch (Item 1) **[Figure 197]**.

Figure 198



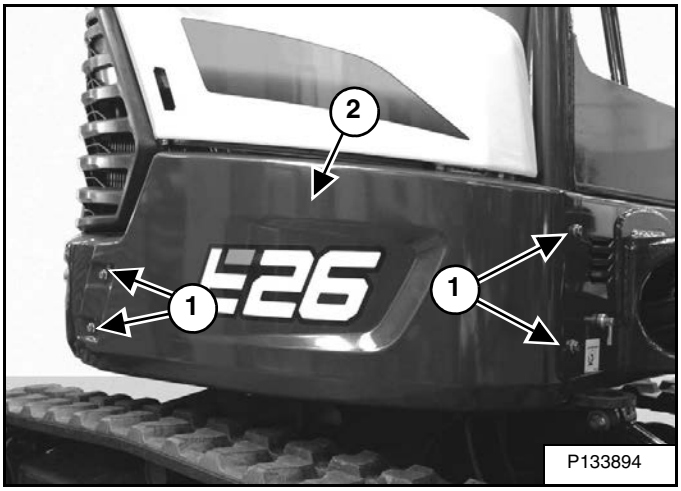
Pull the latch (Item 1) **[Figure 197]** toward the cover and lift the cover up (Item 1) **[Figure 198]**.

To close the right side cover, rotate the cover back until it is in the fully closed position and you hear the latch (Item 1) **[Figure 197]** snap into place.

RIGHT SIDE PANEL

Removing And Reinstalling

Figure 199



Remove the four bolts (Item 1) to remove the right side panel (Item 2) **[Figure 199]**.

Reinstall the four bolts (Item 1) to reinstall the right side panel (Item 2) **[Figure 199]**.

CAB FILTERS

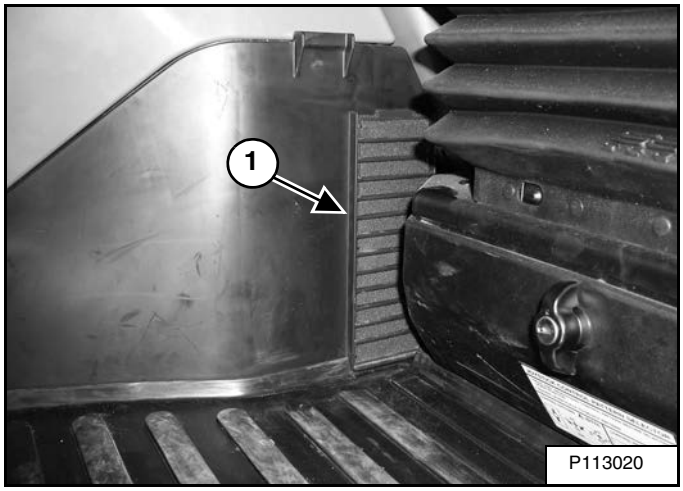
Cleaning And Maintenance

The recirculation filter and the fresh air filter must be cleaned regularly. (See SERVICE SCHEDULE on Page 109.)

The recirculation filter is located to the right of the operator seat and the fresh air filter is located under the right side cover.

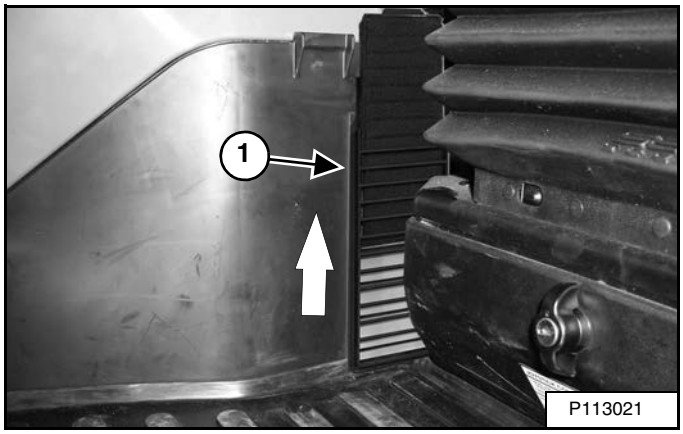
Recirculation Filter

Figure 200



The recirculation filter (Item 1) **[Figure 200]** is located to the right of the operator's seat.

Figure 201



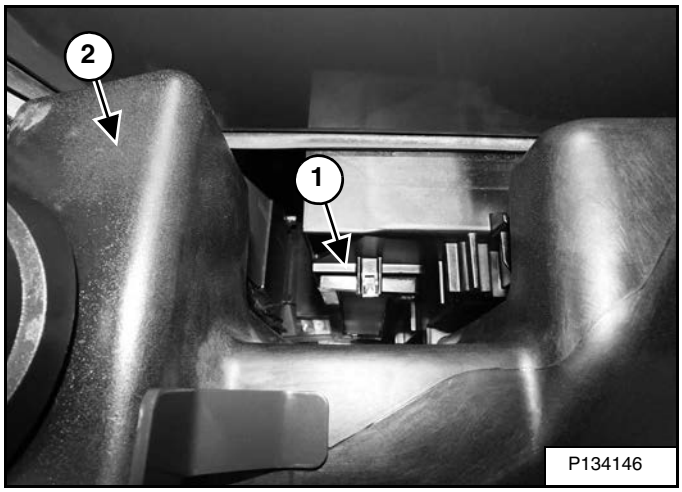
Pull up on the filter (Item 1) **[Figure 201]** until it is removed from the housing.

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

Installation: Position the bottom of the filter (Item 1) **[Figure 201]** into the housing and slowly push the filter down fully.

Fresh Air Filter

Figure 202



The fresh air filter (Item 1) is located behind the hydraulic tank (Item 2) **[Figure 202]** (view from the top).

Open the right side cover. (See RIGHT SIDE COVER on Page 116.)

Pull out on the tab (Item 1) **[Figure 202]** and remove the cover.

Pull the filter out of the housing.

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

Installation: Position the filter into the housing and slowly push the filter in fully.

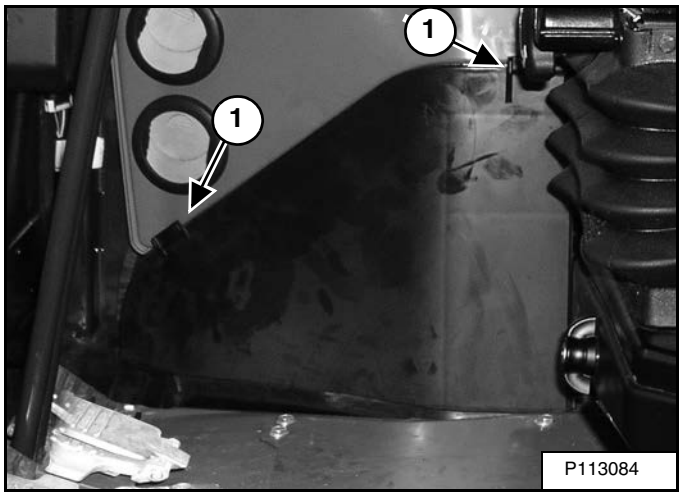
Place the bottom tabs of the filter cover into the frame and push the top in until the tab locks to the frame.

Cleaning And Maintenance

The inside of the heater housing needs to be cleaned regularly. Dust will accumulate over time inside the housing. A dusty heater coil will reduce heating efficiency. (See SERVICE SCHEDULE on Page 109.)

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

Figure 203

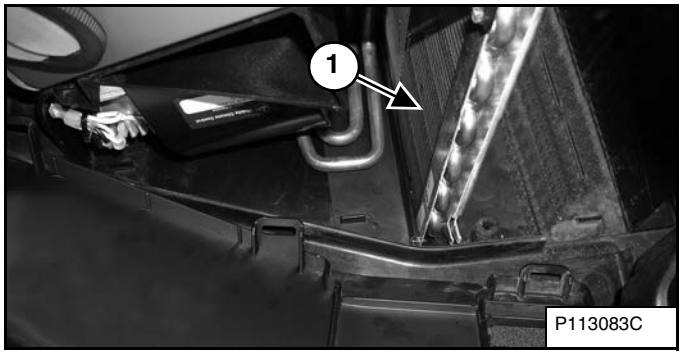


Remove the floor mat.

Pull back on the two latches (Item 1) **[Figure 203]** and remove the HVAC side cover.

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

Figure 204



Use a lower pressure air or a low pressure water stream to remove debris and to clean the coils (Item 1) **[Figure 204]**.

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

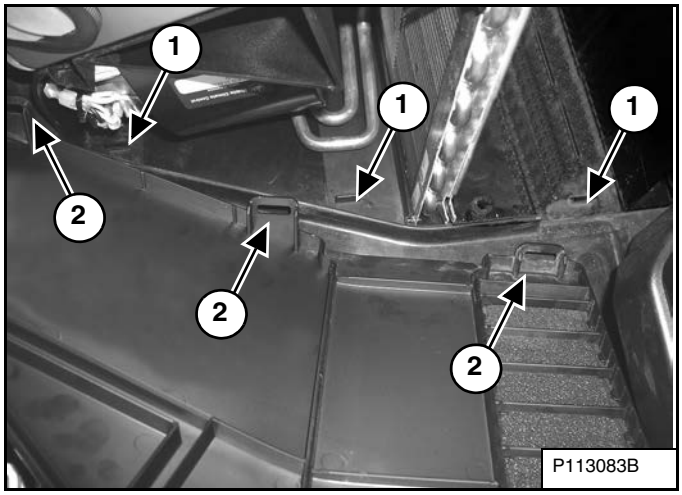
There are three rubber drain valves that allow condensation to drain from the housing during normal usage. These drain valve can get clogged with dirt and should be cleaned at the same time the housing is cleaned.

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

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

Reinstall the centre floorplate and close the right side cover.

Figure 205



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

Three tabs (Item 1) are on the bottom of the heater housing that the side cover retainers (Item 2) **[Figure 205]** fit into.

Position the side cover on the tabs and starting with the front edge of the side cover, position it into the front of the heater housing. Press on the front of the cover to secure the front latch (Item 1) **[Figure 203]**. Then press in on the top edge of the side cover and work back to the rear of the cover and secure the rear latch.

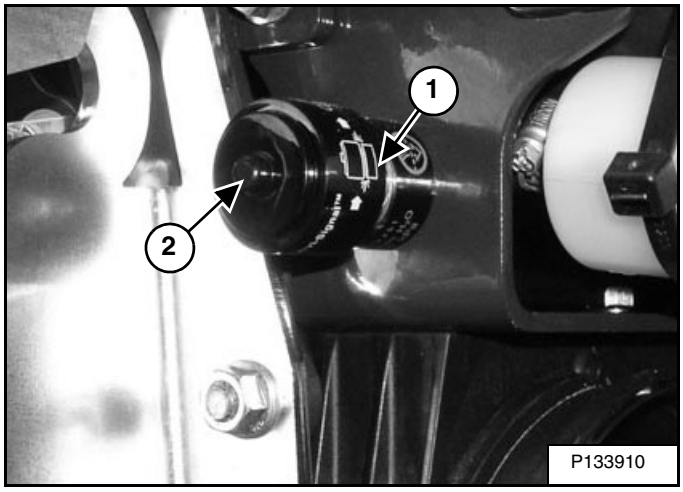
Reinstall the floor mat.

AIR CLEANER SERVICE

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 109.)

Open the tailgate. (See TAILGATE on Page 115.)

Figure 206



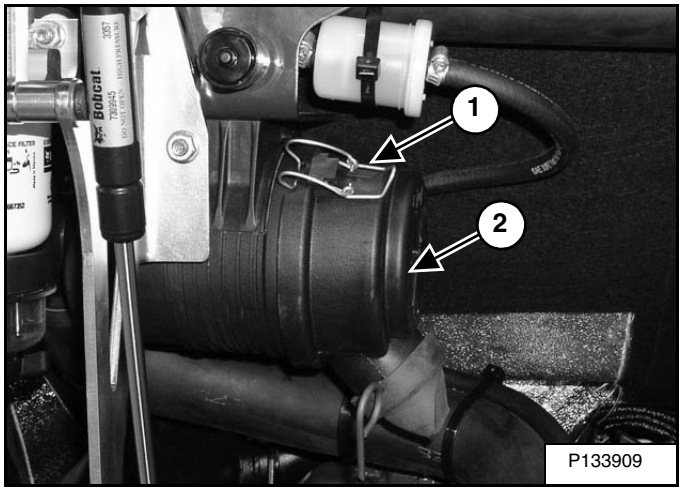
Check the condition indicator (Item 1) **[Figure 206]**. If the red ring shows in the condition indicator, the filter needs to be replaced.

Replace the inner filter every third time the outer filter is replaced or as indicated.

Replacing The Filter Elements

Outer Filter

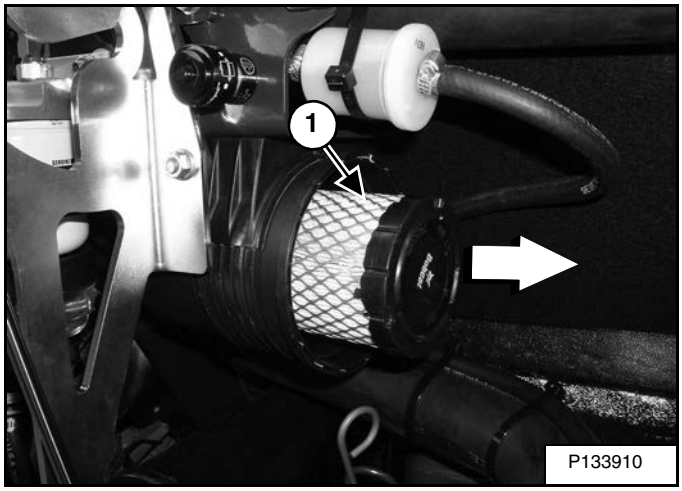
Figure 207



Open the two latches (Item 1) **[Figure 207]**.

Remove and clean the dust cover (Item 2) **[Figure 207]**.

Figure 208



Pull the outer filter (Item 1) **[Figure 208]** from the air cleaner housing.

Check the housing for damage.

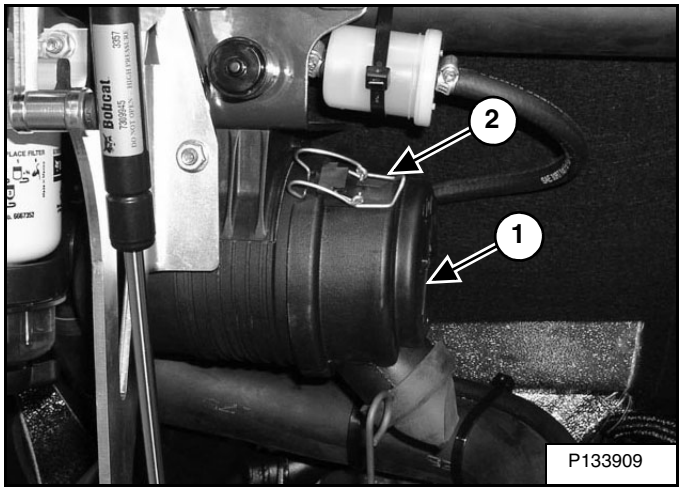
Clean the housing and the seal surface. DO NOT use compressed air.

Install a new filter.

Replacing The Filter Elements (Cont'd)

Outer Filter (Cont'd)

Figure 209



Install the dust cover (Item 1) **[Figure 209]**.

Make sure the dust cover is installed and engage the latches (Item 2) **[Figure 209]**.

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

After the outer filter has been replaced, press the button (Item 2) **[Figure 206]** on the end of the condition indicator.

Start the engine. (See STARTING THE ENGINE on Page 66.) Run at full rpm, then reduce engine speed. Stop the engine. (See STOPPING THE ENGINE AND LEAVING THE EXCAVATOR on Page 71.)

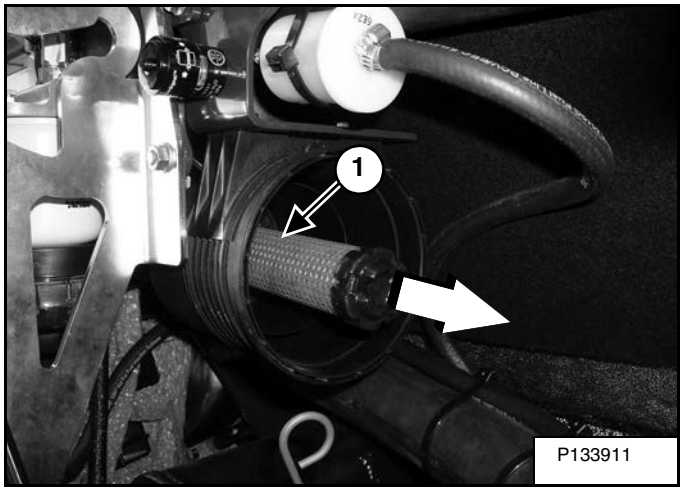
If the red ring (Item 1) **[Figure 206]** shows in the condition indicator, replace the inner filter.

Inner Filter

Only replace the inner filter under the following conditions:

- Replace the inner filter every *third* time the outer filter is replaced.
- After the outer filter has been replaced, press the button (Item 2) **[Figure 206]** on the condition indicator. Start the engine and run at full rpm, then reduce engine speed. Stop the engine. If the red ring shows in the condition indicator, replace the inner filter.

Figure 210



Remove the dust cover, outer filter and inner filter (Item 1) **[Figure 210]**.

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

Install the new inner filter.

Install the outer filter and the dust cover.

Press the button (Item 2) **[Figure 206]** on the end of the condition indicator to remove the red ring.

Close the tailgate.

FUEL SYSTEM

Fuel Specifications

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

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 which can cause corrosion and plugging of fuel system components.
- Use of biodiesel blend fuel may result in premature failure of fuel system components, such as plugged fuel filters and deteriorated fuel lines.
- Shorter maintenance intervals may be required, such as cleaning the fuel system and replacing fuel filters and fuel lines.
- Using biodiesel blended fuels containing more than five percent biodiesel can affect engine life and cause deterioration of hoses, tubelines, injectors, injector pump and seals.

Apply the following guidelines if biodiesel blend fuel is used:

- Ensure the fuel tank is as full as possible at all times to prevent moisture from collecting in the fuel tank.
- Ensure that the fuel tank cap is securely tightened.
- Biodiesel blend fuel can damage painted surfaces, remove all spilled fuel from painted surfaces immediately.
- Drain all water from the fuel filter daily before operating the machine.
- Do not exceed engine oil change interval. Extended oil change intervals can cause engine damage.
- Before vehicle storage; drain the fuel tank, refill with 100% petroleum diesel fuel, add fuel stabiliser and run the engine for at least 30 minutes.

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

Filling The Fuel Tank

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2063-0807

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2103-0508

Figure 211

Use the start key to unlock the fuel cap.

Remove the fuel fill cap (Item 1) **[Figure 211]**.

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

Install and tighten the fuel fill cap.

Clean up any spilled fuel.

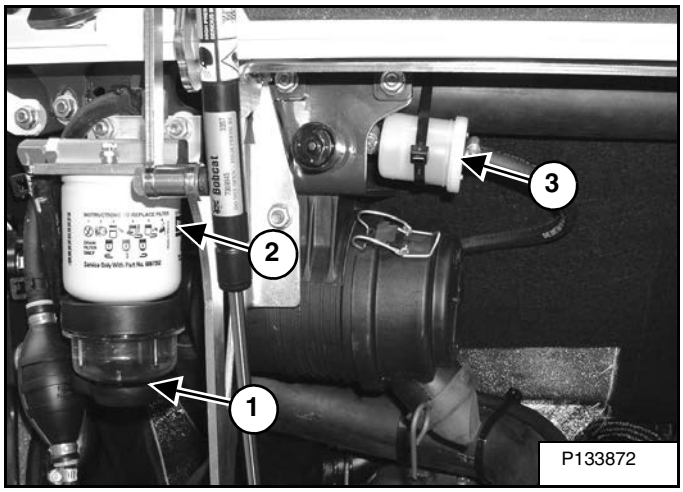
See the SERVICE SCHEDULE for the service interval when to remove water from or replace the fuel filter. (See SERVICE SCHEDULE on Page 109.)

Fuel Filters

Removing Water

Open the tailgate. (See TAILGATE on Page 115.)

Figure 212



Loosen the drain (Item 1) **[Figure 212]** at the bottom of the filter (Item 2) **[Figure 212]** to drain water from the filter into a container.

Inspect the fuel pre-filter (Item 3) **[Figure 212]** daily for moisture and contamination. Replace as necessary.

Clean up any spilled fuel.

Replacing Elements

Remove and replace the fuel pre-filter (Item 3) **[Figure 212]**.

Remove the filter (Item 2) **[Figure 212]**.

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

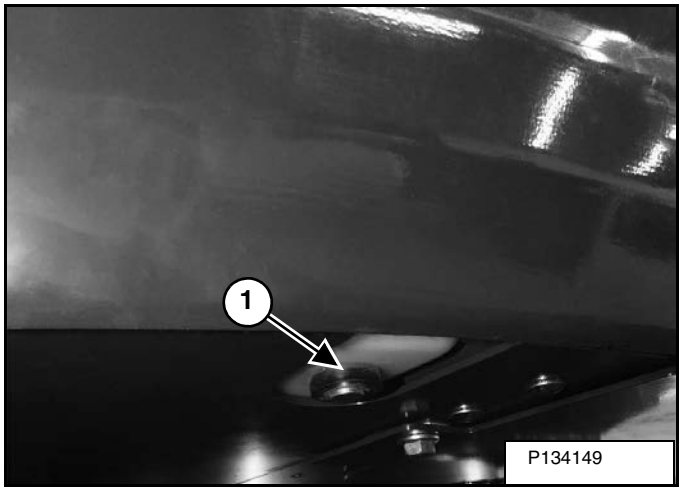
Remove the air from the fuel system. (See Removing Air From The Fuel System on Page 125.)

Close the tailgate.

Draining The Fuel Tank

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 109.)

Figure 213



Rotate the upperstructure so that the fuel tank drain plug (Item 1) is located between the rear tracks. Remove the drain plug (Item 1) **[Figure 213]**.

Drain the fuel into the container.

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

Reinstall the drain plug.

⚠ 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.

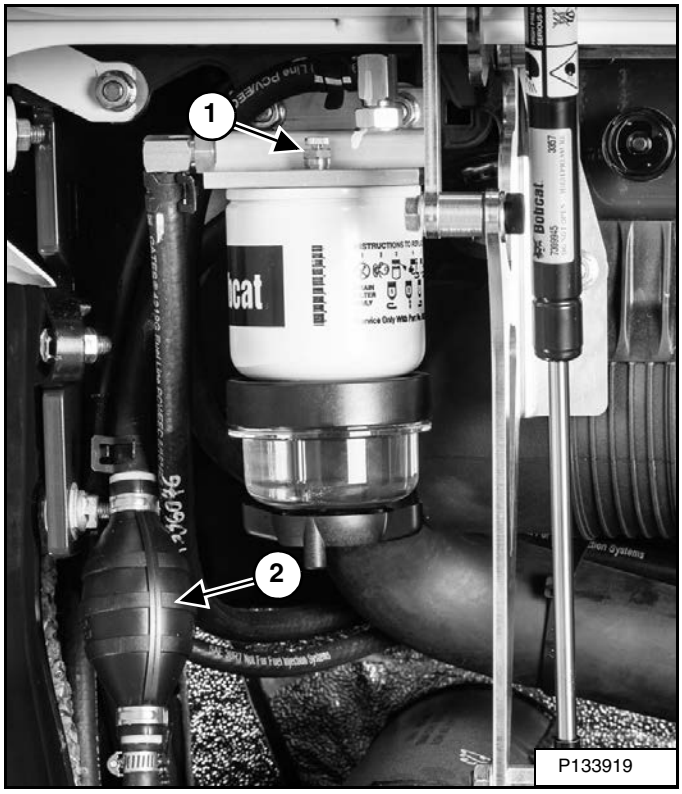
W-2072-EN-0909

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.

Open the tailgate. (See TAILGATE on Page 115.)

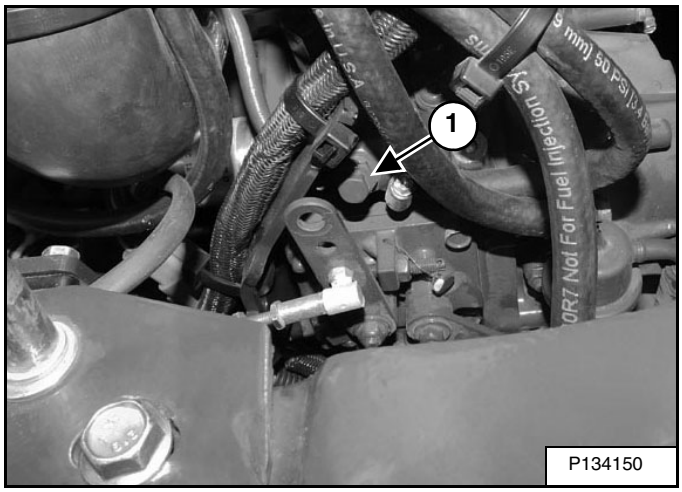
Figure 214



Open the fuel filter vent (Item 1) **[Figure 214]** and operate the hand pump (priming bulb) (Item 2) **[Figure 214]** until the fuel flows from the vent with no air bubbles.

Close the vent (Item 1) **[Figure 214]**.

Figure 215



Start the engine. It can be necessary to open the vent (Item 1) **[Figure 215]** (at the fuel injection pump) briefly until the engine runs smoothly.

Close the tailgate.

⚠ 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.

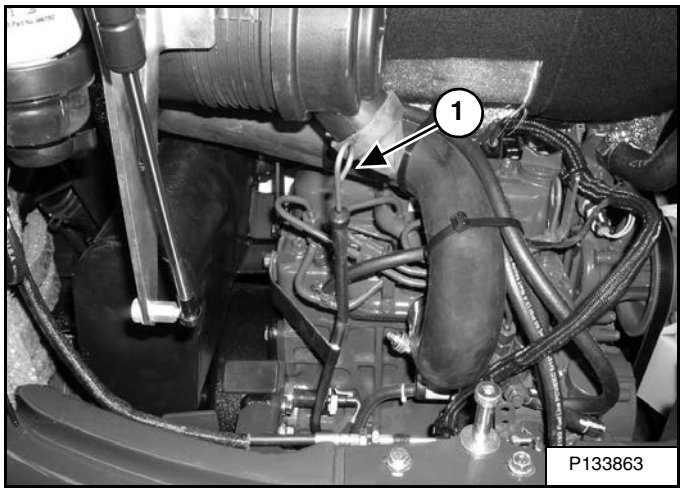
W-2072-EN-0909

ENGINE LUBRICATION SYSTEM

Checking And Adding Engine Oil

Check the engine oil after every 8 – 10 hours of operation and before starting the engine. (See SERVICE SCHEDULE on Page 109.)

Figure 216



Open the tailgate and remove the dipstick (Item 1) **[Figure 216]**.

Keep the oil level between the marks on the dipstick.

Use a good quality motor oil that meets the correct API Service Classification.

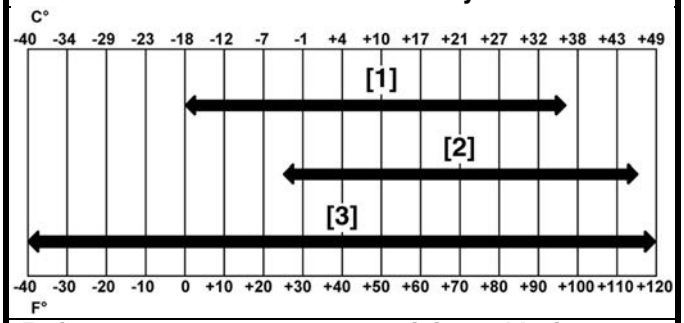
Close the tailgate.

Engine Oil Chart

Figure 217

ENGINE CRANKCASE OIL

Recommended SAE Viscosity Number



Refer to temperature range anticipated before next oil change

Must use API Category CK-4 or better, or ACEA E6 or better

Do not use API Category FA-4 engine oil

[1] SAE 10W-30
[2] SAE 15W-40
[3] Bobcat Synthetic Oil – SAE 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 Category of CK-4 or better, or ACEA E6 or better **[Figure 217]**.

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2103-0508

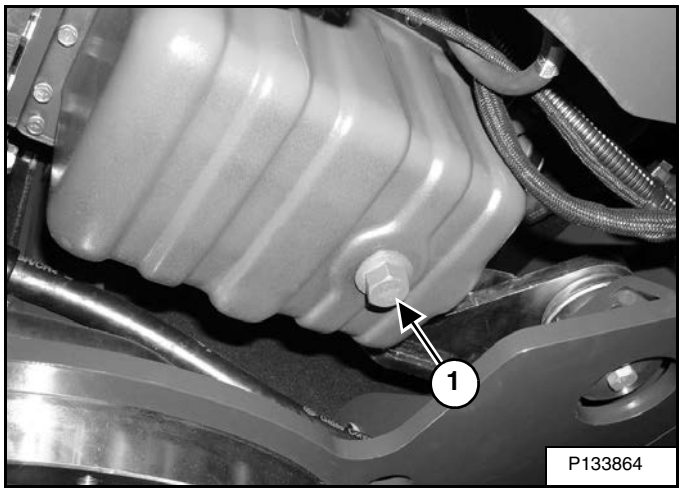
Removing And Replacing Oil And Filter

See the SERVICE SCHEDULE for the service interval for replacing the engine oil and filter. (See SERVICE SCHEDULE on Page 109.)

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

Open the tailgate. (See TAILGATE on Page 115.)

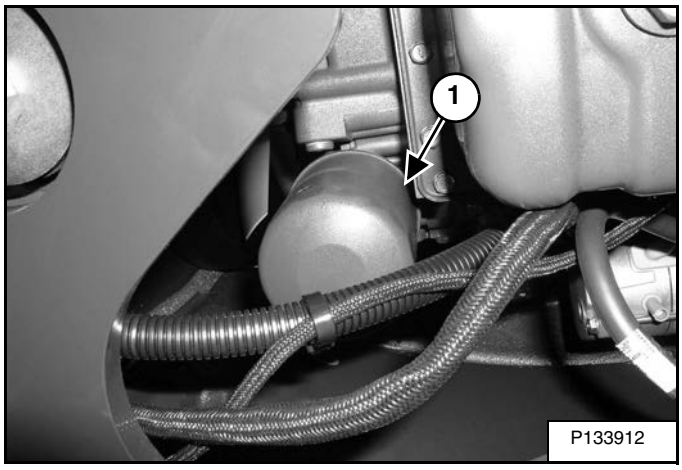
Figure 218



Place a container under the oil pan. Remove the drain plug (Item 1) **[Figure 218]** from the bottom of the engine oil pan.

Recycle or dispose of used oil in an environmentally safe manner.

Figure 219

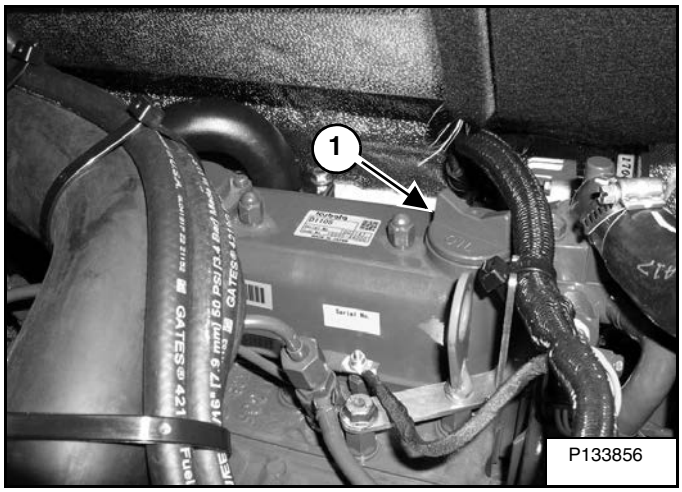


Remove the oil filter (Item 1) **[Figure 219]** and clean the filter housing surface.

Use a genuine Bobcat replacement filter. Put clean oil on the filter gasket. Install the filter and hand tighten.

Install and tighten the drain plug (Item 1) **[Figure 218]**.

Figure 220



Remove the fill cap (Item 1) **[Figure 220]**.

Put oil in the engine. (See Engine Oil Chart on Page 126.)

Install the fill cap (Item 1) **[Figure 220]**.

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.

Close the tailgate.

ENGINE COOLING SYSTEM

Cleaning

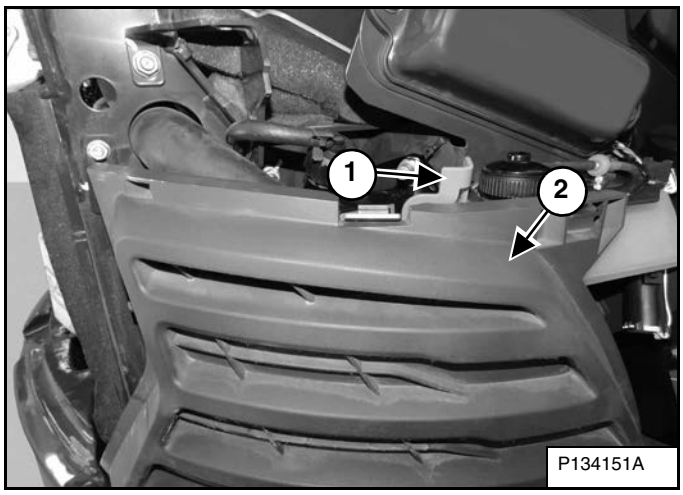
Check the cooling system every day to prevent overheating, loss of performance or engine damage. (See SERVICE SCHEDULE on Page 109.)

NOTE: Allow the cooling system and engine to cool before servicing or cleaning the cooling system.

Open the tailgate. (See TAILGATE on Page 115.)

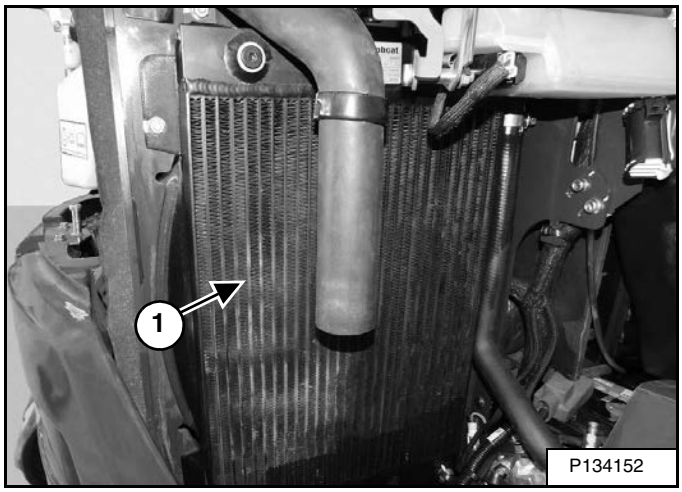
Open the right side cover. (See RIGHT SIDE COVER on Page 116.)

Figure 221



Push the lever (Item 1) and remove the rear side cover (Item 2) **[Figure 221]**.

Figure 222



Use air pressure or water pressure to clean the radiator (Item 1) **[Figure 222]** (both inside and outside surfaces). Be careful not to damage fins when cleaning.

Reinstall the rear side cover (Item 2) by sliding the bottom into place and snapping the top back into the lever (Item 1) **[Figure 221]**.

Reinstall the rear side cover.

Close the right side cover and tailgate.

Checking Level

⚠ WARNING

AVOID BURNS

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

W-2070-1203

⚠ WARNING

AVOID INJURY OR DEATH

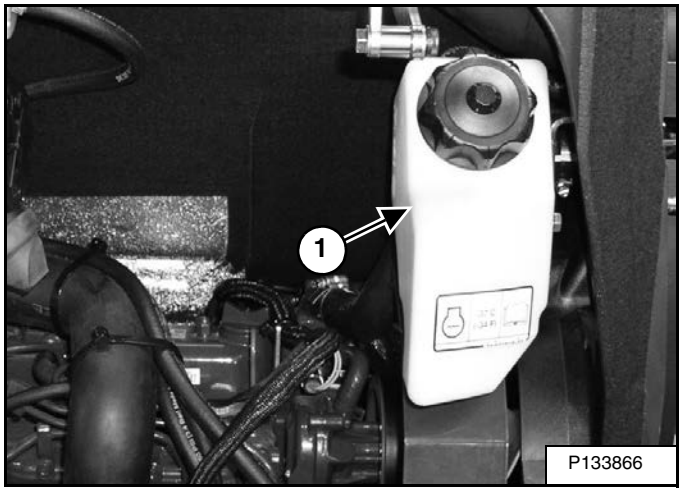
Wear safety glasses to prevent eye injury when any of the following conditions exist:

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

W-2019-0907

Open the tailgate. (See TAILGATE on Page 115.)

Figure 223



Check the coolant level in the coolant recovery tank (Item 1) **[Figure 223]**.

The coolant level must be filled to the COLD FILL line marked on the 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.

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

Removing And Replacing Coolant

See the SERVICE SCHEDULE for correct service intervals. (See SERVICE SCHEDULE on Page 109.)

⚠ WARNING

AVOID BURNS

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

W-2070-1203

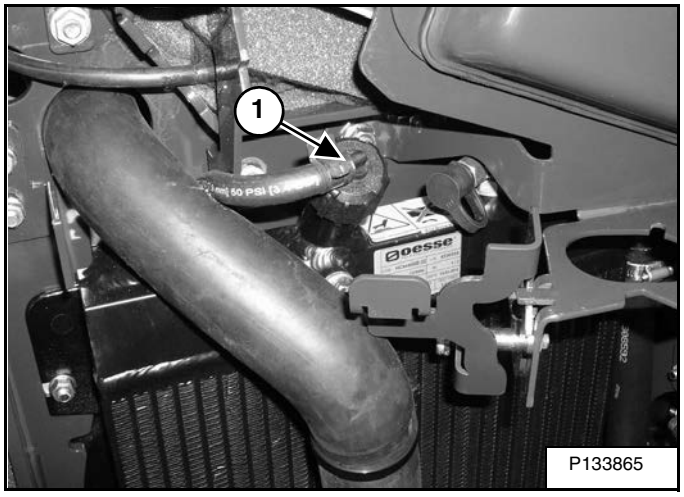
NOTE: Allow the cooling system and engine to cool before servicing or cleaning the cooling system.

Stop the engine. Open the tailgate. (See TAILGATE on Page 115.)

Open the right side cover. (See RIGHT SIDE COVER on Page 116.)

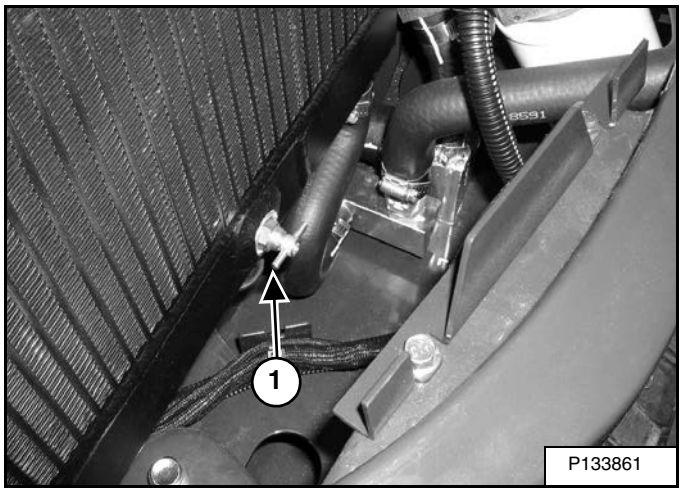
Push down on the lever (Item 1) and remove the rear side cover (Item 2) **[Figure 221]**.

Figure 224



When the engine is cool, loosen and remove the coolant fill cap (Item 1) **[Figure 224]**.

Figure 225



Install a hose on the drain valve at the bottom of the radiator. Open the drain valve (Item 1) **[Figure 225]** 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 Capacities on Page 179.)

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.

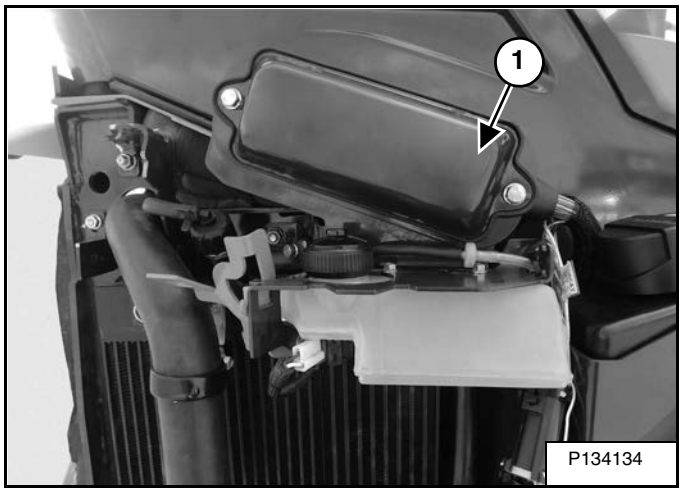
Add coolant to the recovery tank as needed.

Reinstall the rear side cover.

Close the the right side cover and tailgate.

Description

Figure 226



The excavator has a 12 volt, negative earth electrical system. The electrical system is protected by fuses located under the right side cover of the excavator (Item 1) **[Figure 226]**. The fuses will protect the electrical system when there is an electrical overload. The reason for the overload must be found and corrected before starting the engine again.

The battery cables must be clean and tight. Check the electrolyte level in the battery. Add distilled water as needed. Remove acid or corrosion from the battery and cables with a sodium bicarbonate and water solution.

Put Battery Saver P/N 6664458 or grease on the battery terminals and cable ends to prevent corrosion.

⚠ WARNING

AVOID INJURY OR DEATH

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

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

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

W-2065-0807

Fuse And Relay Location / Identification

A decal is inside the fuse cover to show location and amp ratings.

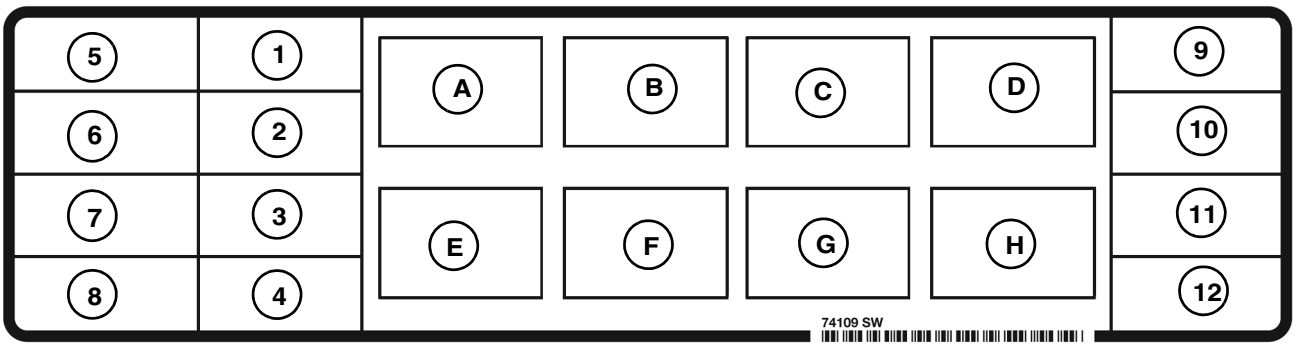
Remove the cover to check or replace the fuses and relays.

The location and sizes are shown in **[Figure 227]**.

Always replace fuses using the same type and capacity.

Fuse And Relay Location / Identification (Cont'd)

Figure 227

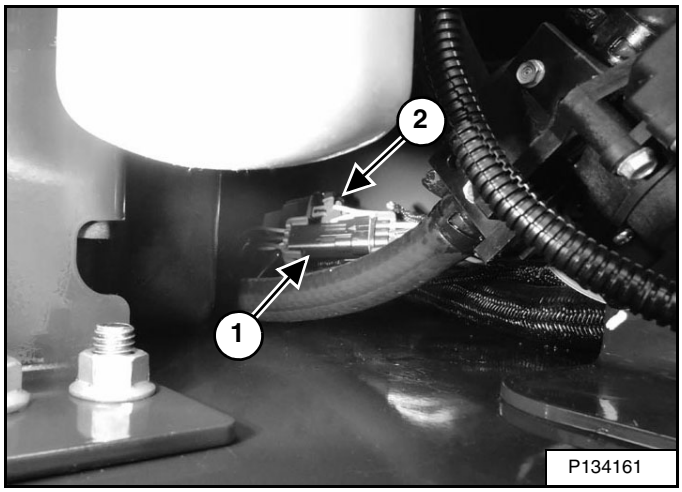


The location and sizes are shown in the table below and on the decal **[Figure 227]**. Relays are identified by the letter "R" in the AMP column.

REF	ICON	DESCRIPTION	AMP	REF	ICON	DESCRIPTION	AMP	REF	ICON	DESCRIPTION	AMP
1		Wiper / Washer	10	9		Panel / Display Controller	25	E		Fuel Shutoff	R
2		Switched Power	20	10		ACD Unswitched Power	25	F		Lights	R
3		Alternator Excite / Heater	25	11		Lights	30	G		Glow Plug	R
4		ACD Switched Power	25	12		Power Port	15	H		Starter	R
5		Auto Idle Controller (AIC) (if equipped)	20	A		Switched Power	R				
6		HVAC / Heater	40	B		Heater / HVAC	R				
7		Ignition	5	C		Lights	R				
8		Fuel Shutoff	25	D		Horn	R				

Fuse And Relay Location / Identification (Cont'd)

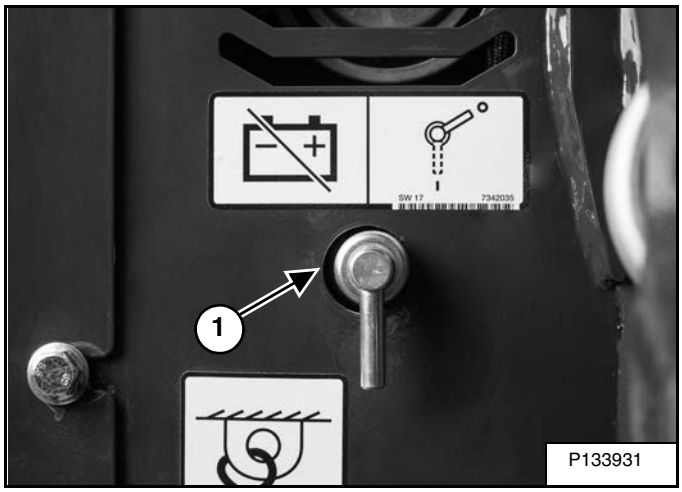
Figure 228



If the excavator is equipped with a motion alarm, there will be two relays located behind the case drain filter. The first (Item 1) is a backup alarm relay for the motion alarm. The second (Item 2) **[Figure 228]** is a motion alarm relay.

Shut-Off Switch

Figure 229



The shut-off switch (Item 1) **[Figure 229]** is located on the right front of the excavator.

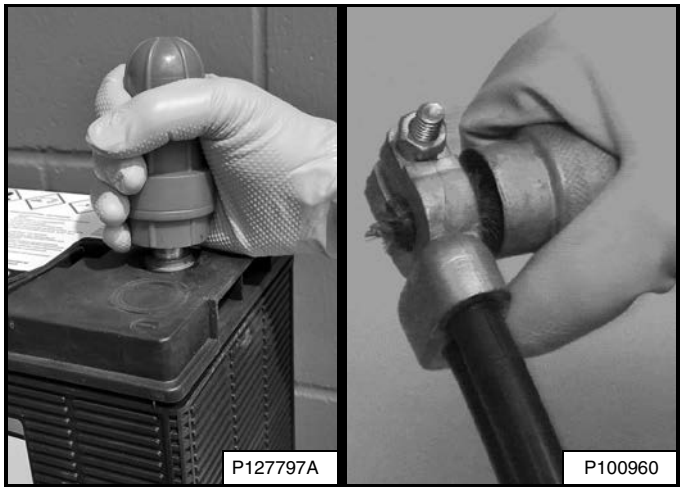
Rotate the switch (Item 1) anticlockwise to turn the switch to the OFF position, clockwise to turn to the ON position (shown here in the ON position) **[Figure 229]**.

Battery Maintenance

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 109.)

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 230



Simple steps for reliability and long battery life:

- Keep battery posts and terminals clean **[Figure 230]**.
- 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 135.)
- Check the battery state of charge every 30 days on machines that are not frequently used. (See Battery Testing on Page 135.)

⚠ 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

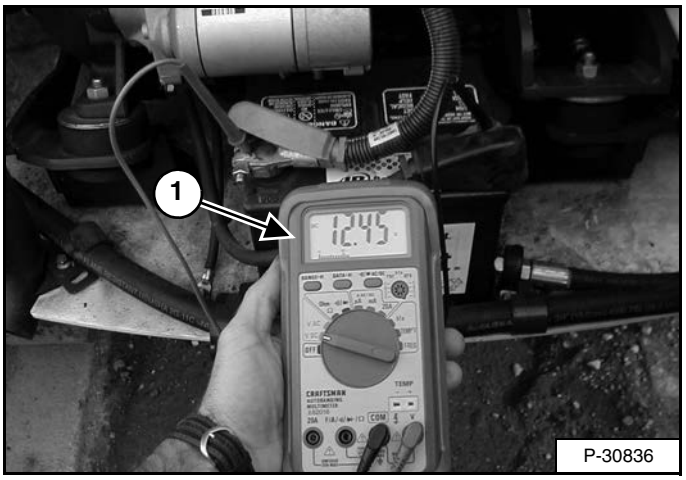
Use a good quality battery maintainer to keep the battery above 12.4 volts for machines that are not frequently used. Batteries below 12.4 volts must first be charged using a battery charger. Solar maintainers should have a minimum capacity of 10 watts to be effective.

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 231



The simplest and most common check to determine battery state of charge is to use a digital multimeter or voltmeter (Item 1) **[Figure 231]**.

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

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

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

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

Battery Charging

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

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

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

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

⚠ WARNING

BATTERY GAS CAN EXPLODE AND CAUSE SERIOUS INJURY OR DEATH

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

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

W-2066-0910

Using A Booster Battery (Jump Starting)

IMPORTANT

If jump starting the excavator from a second machine:

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

I-2060-0906

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

Be sure the key switch is OFF. The booster battery must be 12 volt.

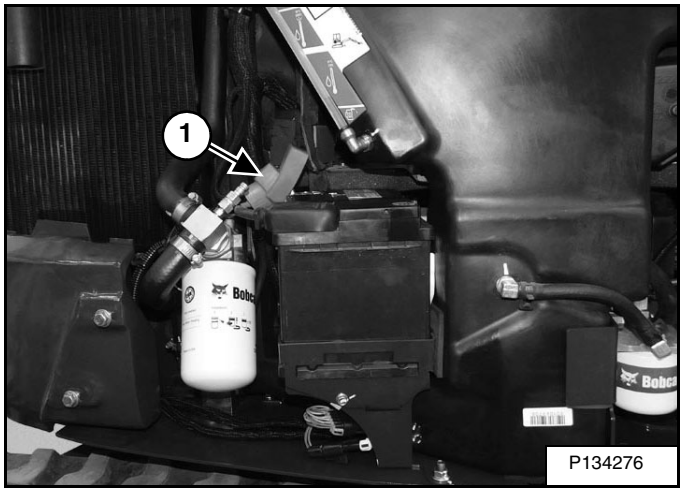
Open the tailgate. (See TAILGATE on Page 115).

Open the right side cover. (See RIGHT SIDE COVER on Page 116).

Remove the right side panel. (See RIGHT SIDE PANEL on Page 117.)

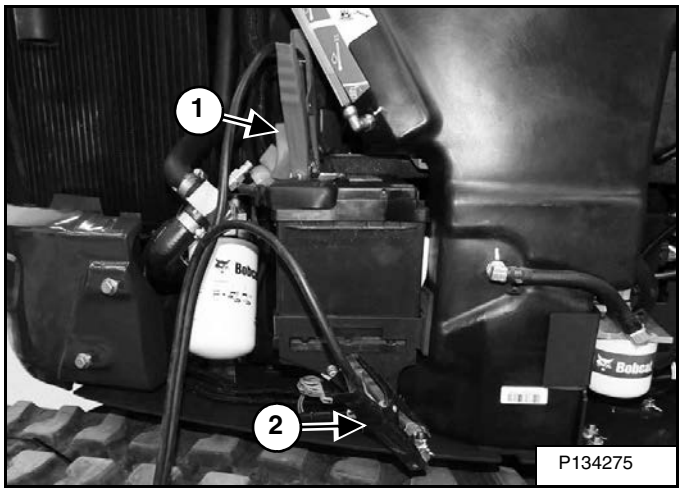
Remove the rear side cover **[Figure 221]**.

Figure 232



Remove the positive battery terminal cover (Item 1) **[Figure 232]**.

Figure 233



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 233]** of the excavator battery.

Connect one end of the second cable to the negative (-) terminal of the booster battery. Connect the other end of the same cable to a frame grounding point (Item 2) **[Figure 233]**.

Start the engine. After the engine has started, remove the negative (-) cable first (Item 2) **[Figure 233]**.

Disconnect the cable from the excavator positive terminal (Item 1) **[Figure 233]**.

Replace the positive battery cable cover.

Reinstall the right side panel and rear side cover.

Close the right side cover and tailgate.

NOTE: (See Cold Temperature Starting on Page 69.)

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

Removing And Installing The Battery

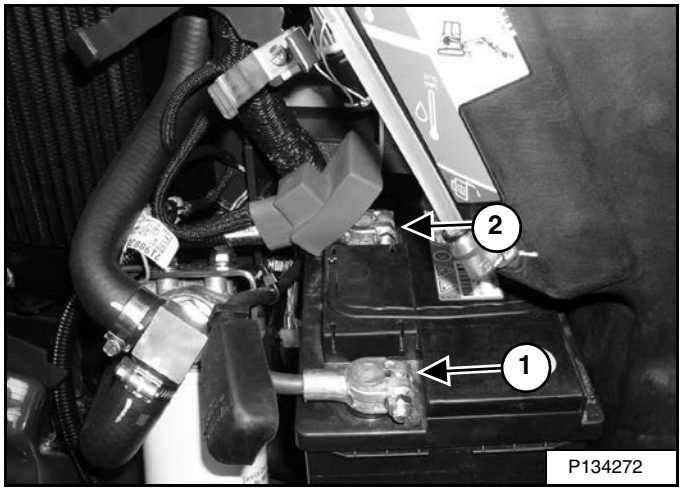
Open the tailgate. (See TAILGATE on Page 115).

Open the right side cover. (See RIGHT SIDE COVER on Page 116).

Remove the right side panel. (See RIGHT SIDE PANEL on Page 117.)

Remove the rear side cover (Item 2) **[Figure 221]**.

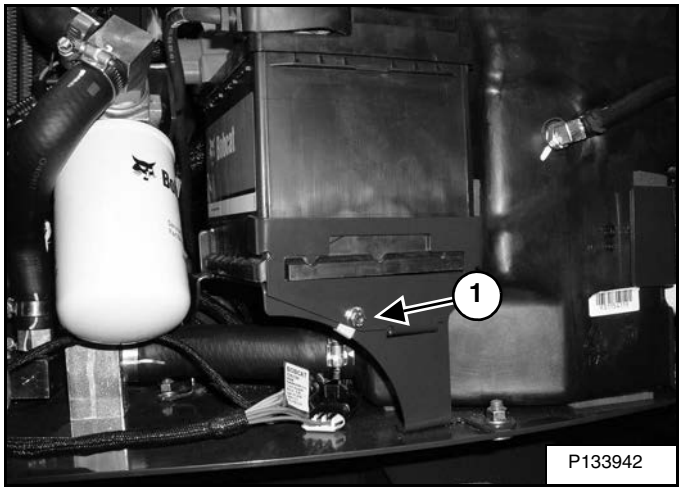
Figure 234



Disconnect the negative (-) cable (Item 1) **[Figure 234]** first.

Disconnect the positive (+) cable (Item 2) **[Figure 234]**.

Figure 235



Remove the bolt (Item 1) **[Figure 235]** and remove the hold-down clamp.

Remove the battery.

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

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

Connect the battery cables. Connect the negative (-) cable (Item 1) **[Figure 234]** last to prevent sparks.

Tighten the terminal clamp nuts to 7 N•m (5 ft-lb) torque.

Reinstall the right side panel and rear side cover.

Close the right side cover and tailgate.

⚠ WARNING

AVOID INJURY OR DEATH

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

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

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

W-2065-0807

HYDRAULIC SYSTEM

Checking And Adding Hydraulic Oil

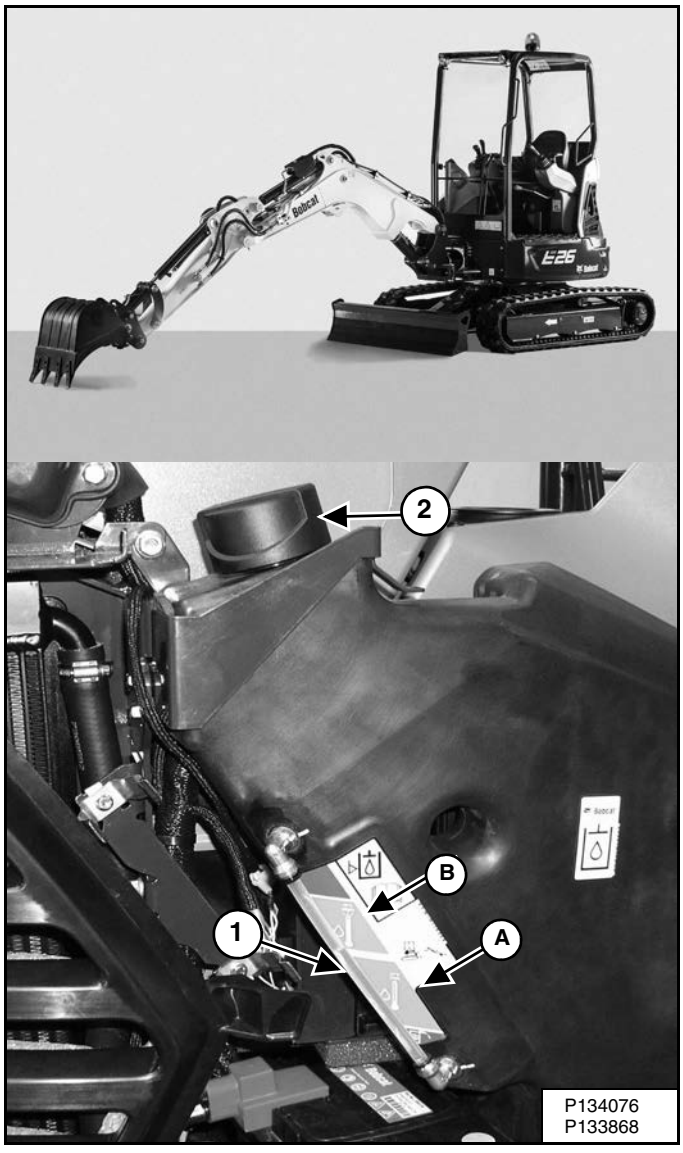
Put the machine on a flat level surface.

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

Open the right side cover. (See RIGHT SIDE COVER on Page 116.)

Remove the right side panel. (See RIGHT SIDE PANEL on Page 117.)

Figure 236



Park the machine in the position shown **[Figure 236]**. (The preferred method is to check the hydraulic oil when it is cold.)

Check the hydraulic oil level, it must be visible in the sight gauge (Item 1) **[Figure 236]**. The decal on the hydraulic tank shows the correct fill level.

A - Correct Oil Level COLD (Preferred)
B - Correct Oil Level HOT (Optional)

Clean the surface around the reservoir cap and remove the cap from the reservoir (Item 2) **[Figure 236]**.

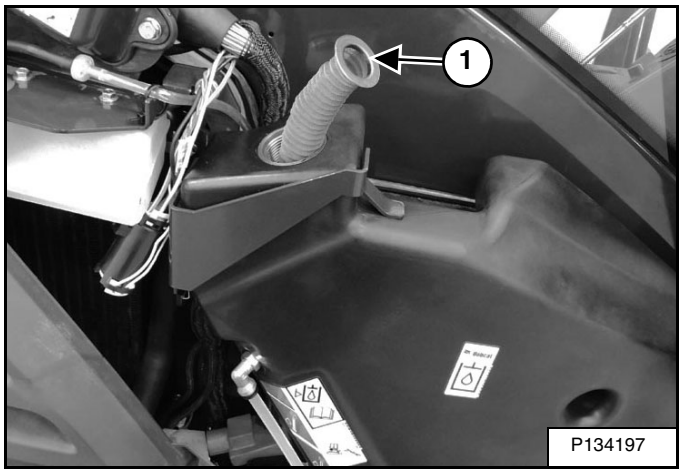
⚠ WARNING

AVOID INJURY OR DEATH

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

W-2103-0508

Figure 237



Check the condition of the fill strainer screen (Item 1) **[Figure 237]**. Clean or replace as necessary.

Be sure the screen is installed before adding fluid.

Add the correct fluid to the reservoir until it is visible in the sight gauge. (See Engine Oil Chart on Page 126.)

Check the cap and clean as necessary. Replace the cap if damaged.

Install the cap.

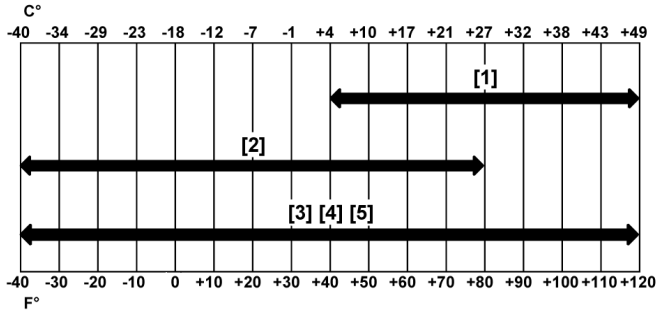
Reinstall the right side panel.

Close the right side cover.

Hydraulic / Hydrostatic Fluid Chart

Figure 238

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.)

⚠ WARNING

AVOID INJURY OR DEATH

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

W-2103-0508

Removing And Replacing The Hydraulic Filters

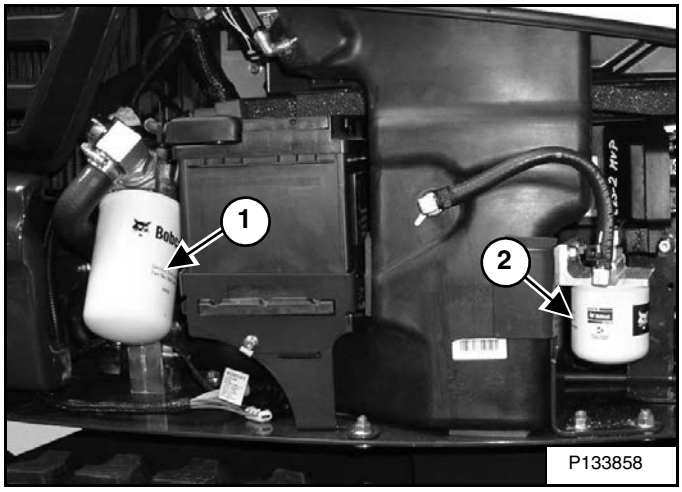
Hydraulic Filter

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 109.)

Open the right side cover. (See RIGHT SIDE COVER on Page 116.)

Remove the right side panel. (See RIGHT SIDE PANEL on Page 117.)

Figure 239



Remove the hydraulic filter (Item 1) **[Figure 239]**.

Clean the housing where the filter gasket makes contact.

Put clean hydraulic fluid on the gasket. Install the new filter and hand tighten only. Use a genuine Bobcat replacement filter.

Case Drain Filter

See the service schedule for the correct service interval. (See SERVICE SCHEDULE on Page 109.)

Remove the case drain filter (Item 2) **[Figure 239]**.

Clean the housing where the filter gasket makes contact.

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

Reinstall the right side panel.

Close the right side cover.

Removing And Replacing The Hydraulic Fluid

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 109.)

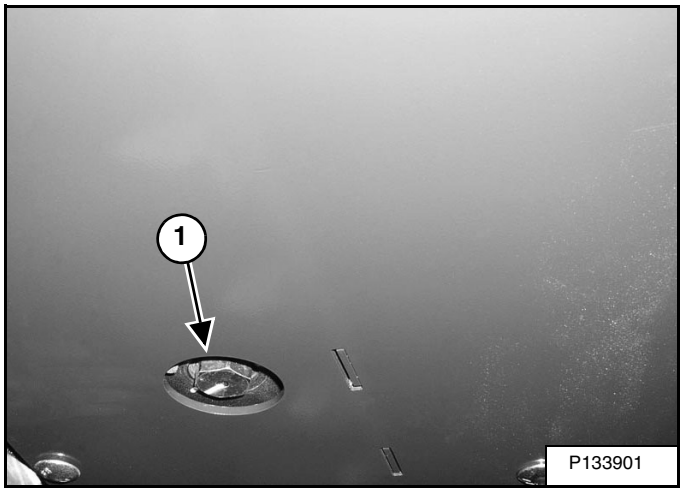
⚠ WARNING

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

Figure 240



The hydraulic oil drain plug (Item 1) **[Figure 240]** is located beneath the right side of the upperstructure.

Rotate the upperstructure so that the hydraulic oil drain plug (Item 1) is located between the tracks.

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

Open the tailgate. (See TAILGATE on Page 115.)

Remove the plug (Item 1) **[Figure 240]**.

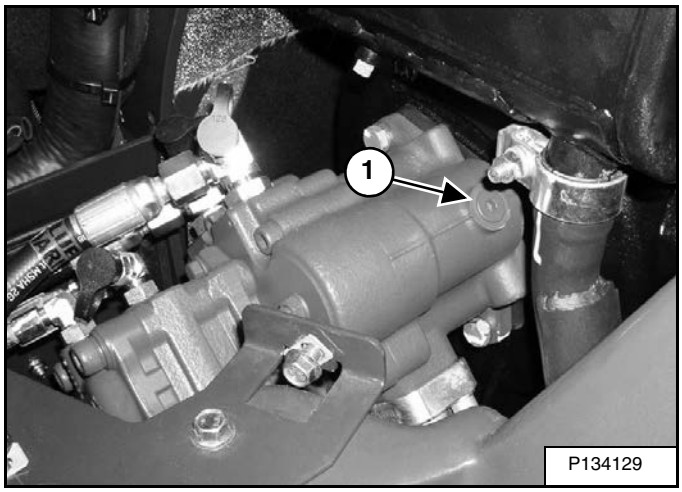
Drain the fluid into a container.

Recycle or dispose of the fluid in an environmentally safe manner.

Install the plug (Item 1) **[Figure 240]**.

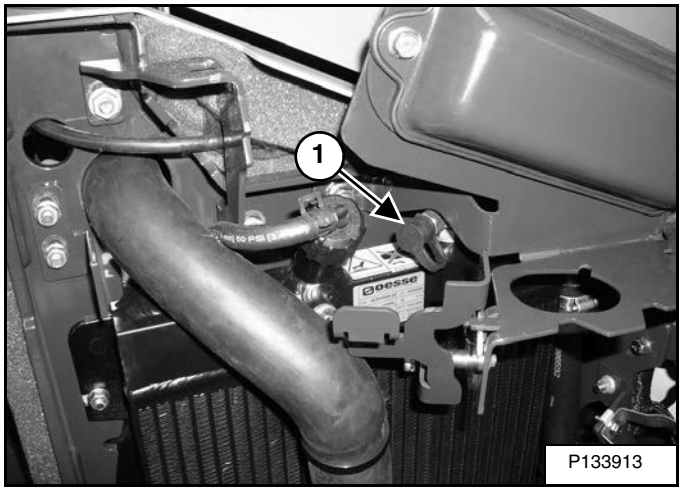
Add fluid to the reservoir. (See Checking And Adding Hydraulic Oil on Page 138.)

Figure 241



With the engine OFF, loosen the plug (Item 1) **[Figure 241]** on the hydraulic pump. Tighten the plug after a steady stream of hydraulic oil, free of any air bubbles, drains from the plug. **DO NOT RUN THE MACHINE WITH THE PLUG OPEN.**

Figure 242



There is also a port (Item 1) on the hydraulic cooler for bleeding air. Install a diagnostic coupler and hose on this fitting to allow air to be bled from the hydraulic system after the hydraulic oil has been replaced.

Start the engine and operate the machine through the hydraulic functions. Stop the engine. Check the fluid level and add as needed.

SPARK ARRESTER MUFFLER

Cleaning Procedure

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 109.)

⚠ 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

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

⚠ WARNING

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

W-2068-1285

⚠ WARNING

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.

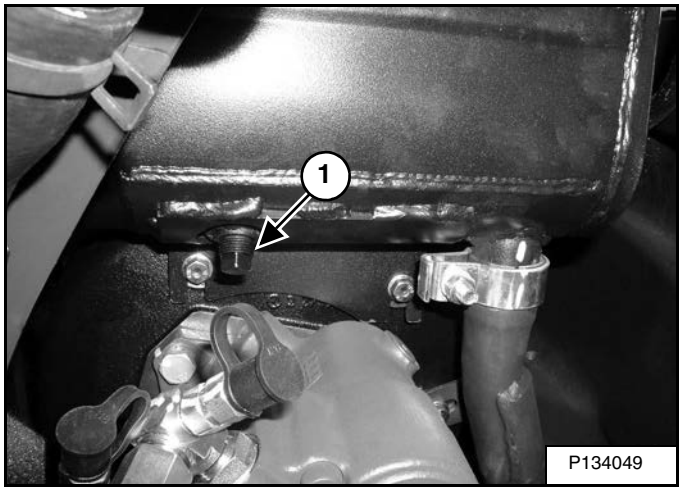
Failure to do so can cause injury or death.

W-2203-0595

Do not operate the excavator with a defective exhaust system.

Stop the engine. Open the tailgate. (See TAILGATE on Page 115.)

Figure 243



Remove the plug (Item 1) **[Figure 243]** from the bottom of the muffler.

Start the engine and run for about 10 seconds while a second person, wearing safety glasses, holds a piece of wood over the outlet of the muffler. The carbon deposits will be forced out of the muffler plug hole (Item 1) **[Figure 243]**.

Stop the engine. Install and tighten the plug.

Close the tailgate.

TRACK TENSION

NOTE: The wear of the pins and bushings on the undercarriage vary with the working conditions and the different types of soil conditions. It is necessary to inspect track tension and maintain the correct tension. See SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 109.)

Adjusting

Figure 244

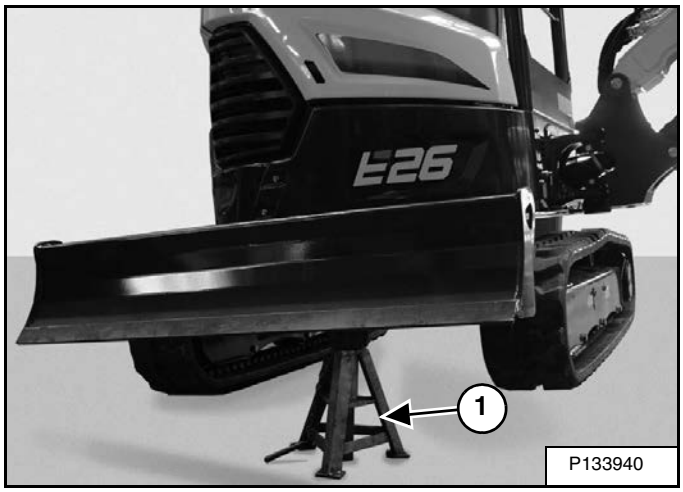
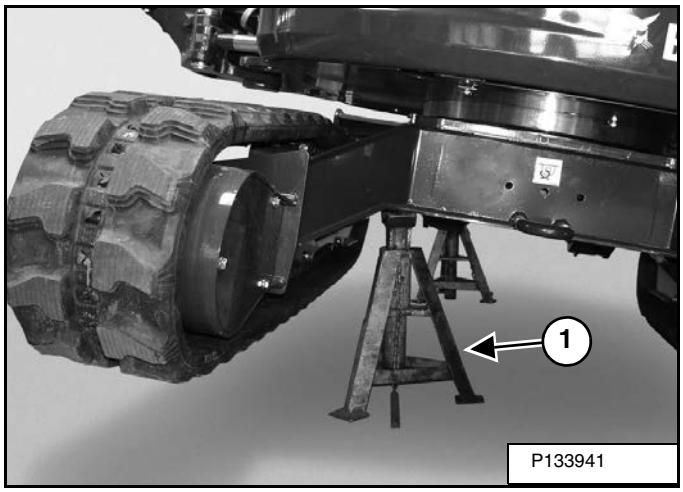


Figure 245



Raise the blade fully and install jackstands under the blade and track frame (Item 1) **[Figure 244]** and **[Figure 245]**. Raise the boom until all machine weight is on the jackstands.

Stop the engine.

⚠ WARNING

AVOID INJURY

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

W-2142-0903

Rubber Track Clearance

Figure 246

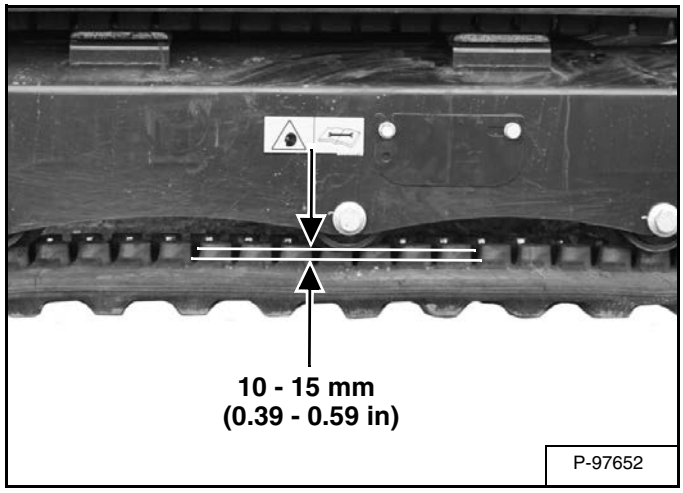
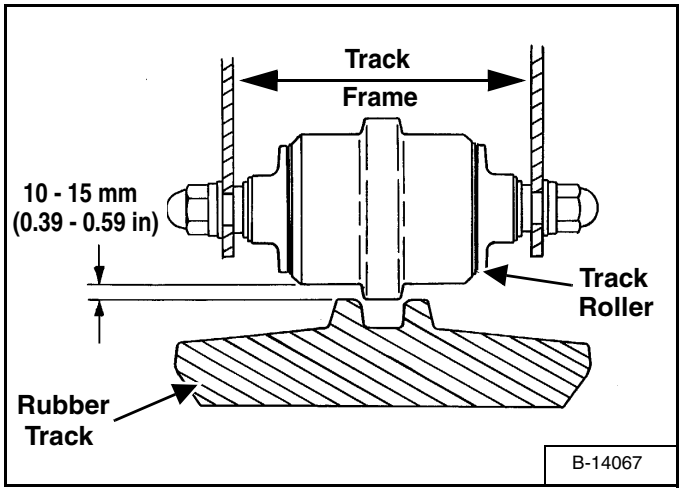


Figure 247

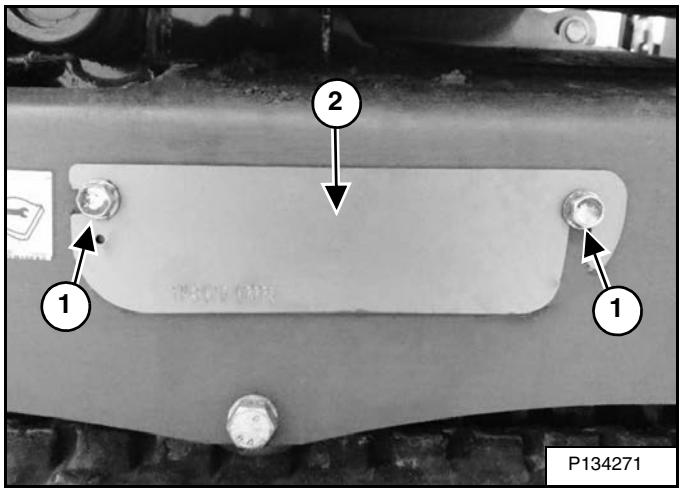


Measure the clearance at either middle track roller. Do not get fingers into pinch points between the track and the track roller. Use a bolt or a dowel of the appropriate size to check the gap between the contact edge of the roller and the top edge of the track guide **[Figure 246]** and **[Figure 247]**.

Rubber Track Clearance	10 - 15 mm (0.39 - 0.59 in)

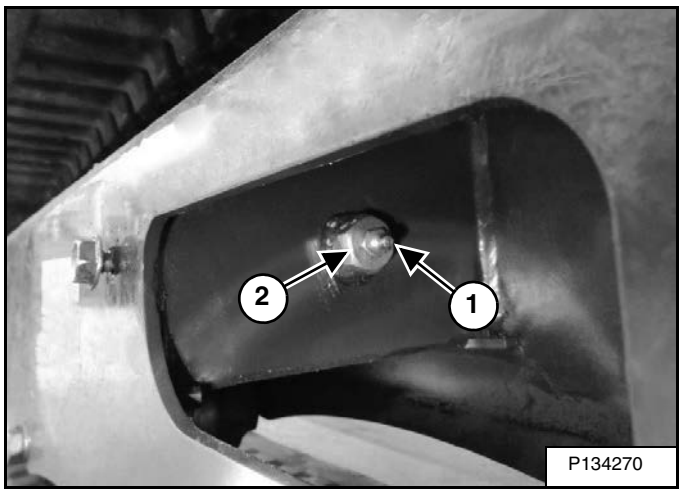
Adjusting (Cont'd)

Figure 248



Loosen the access cover bolts (Item 1) and remove the access cover (Item 2).

Figure 249



Increase Track Tension

Add grease to the fitting (Item 1) **[Figure 249]** until the track tension is correct.

Reinstall the access cover.

Decrease Track Tension

⚠ WARNING

AVOID INJURY OR DEATH

If grease fitting is removed before pressure is released, the fitting can come off with great force and cause serious injury or death.

W-2490-0104

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

Loosen the bleed fitting (NOT the grease fitting) (Item 2) **[Figure 249]** and release pressure until the track tension is correct.

NOTE: DO NOT loosen the bleed fitting (Item 2) [Figure 249] for more than eight turns.

Tighten the bleed fitting to 80 – 100 N•m (59 – 74 ft-lb) torque.

Replace the access cover and tighten the access cover bolts.

Raise the machine and remove the jackstands.

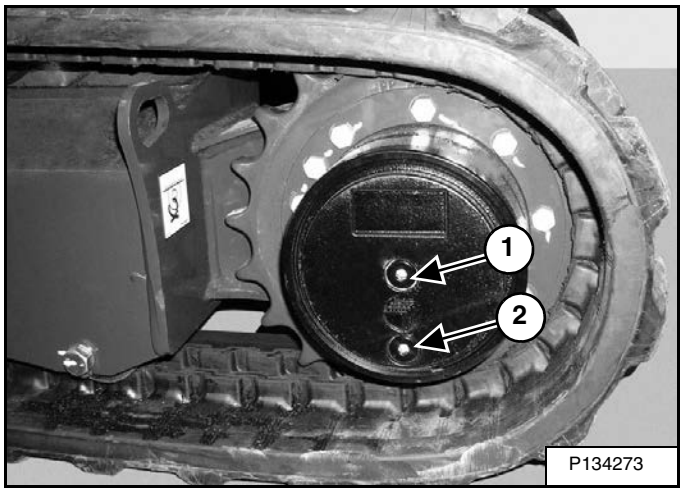
Repeat the procedure for the other side.

Dispose of grease in an environmentally safe manner.

TRAVEL MOTOR

Checking And Adding Oil

Figure 250



Park the excavator on a level surface with the plugs (Items 1 and 2) **[Figure 250]** in the vertical position as shown.

Remove the plug (Item 1) **[Figure 250]**. The lube level must be at the bottom edge of the hole.

Add lubricant (SAE 90W) through the hole if the lube level is low.

Removing And Replacing Oil

See the SERVICE SCHEDULE for the correct service interval. (See SERVICE SCHEDULE on Page 109.)

Park the excavator on a level surface with plugs (Items 1 and 2) **[Figure 250]** in the vertical position shown. Remove both plugs and drain the lubricant into a container.

⚠ 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

Install the bottom plug (Item 2) **[Figure 250]**. Add lubricant through the centre plug hole until the lube level is at the bottom edge of the hole.

Add lubricant (SAE 80W-90 API GL-5) through the hole if the lube level is low.

Install the plug (Item 1) **[Figure 250]**.

ALTERNATOR AND FAN BELT

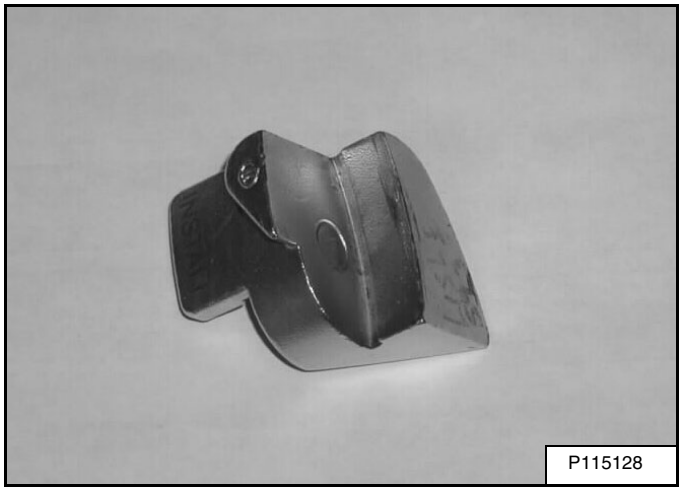
Belt Adjustment

The alternator and fan belt is a special maintenance-free type that is pretensioned over the pulleys. This belt eliminates the need for a tensioning procedure and does not require periodic adjustment. Contact your Bobcat dealer for replacement parts.

Belt Replacement

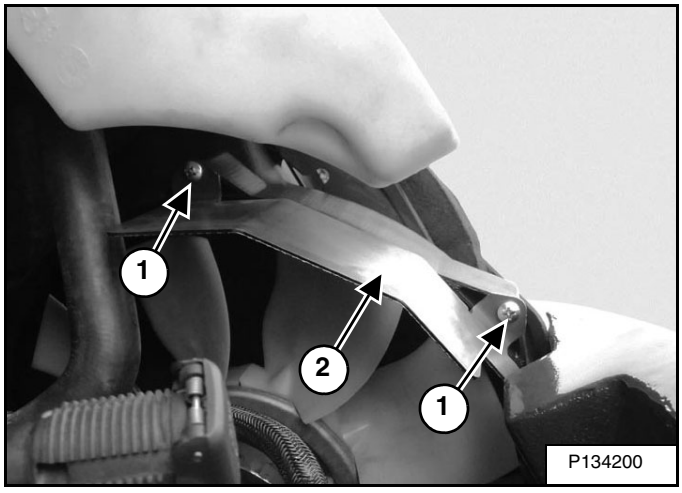
Stop the engine and open the tailgate. (See Opening And Closing on Page 115.)

Figure 251



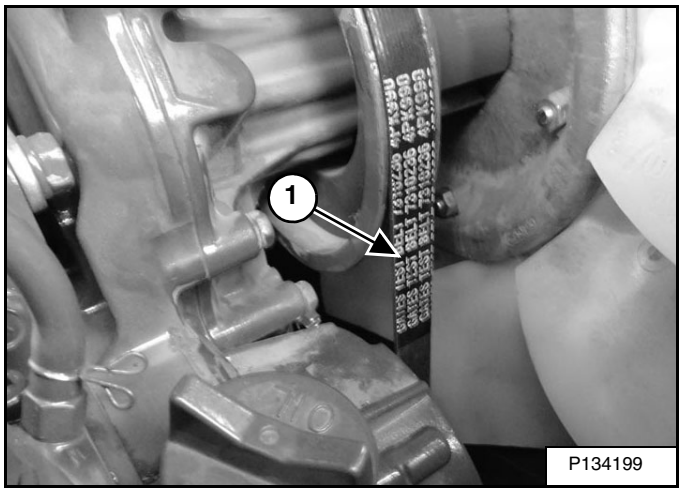
A belt tool **[Figure 251]** is required to install the new alternator and fan belt. See your Bobcat dealer.

Figure 252



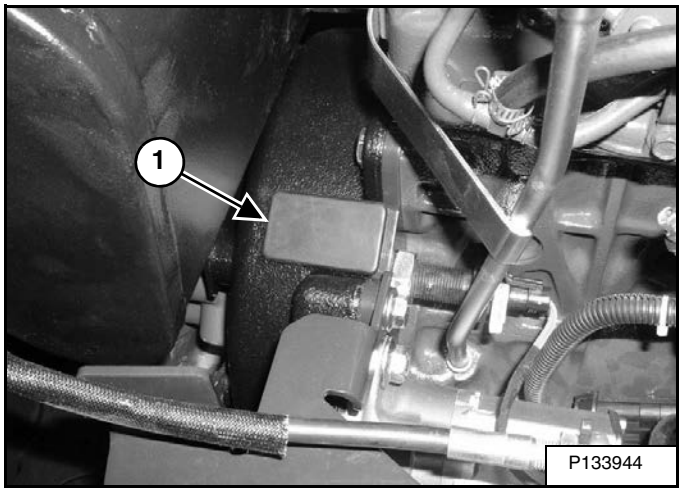
Remove belt shield mounting screws (Item 1) and remove the belt shield (Item 2) **[Figure 252]**.

Figure 253



Cut the old belt (Item 1) **[Figure 253]** and remove the belt from the pulleys. Inspect the pulleys for wear.

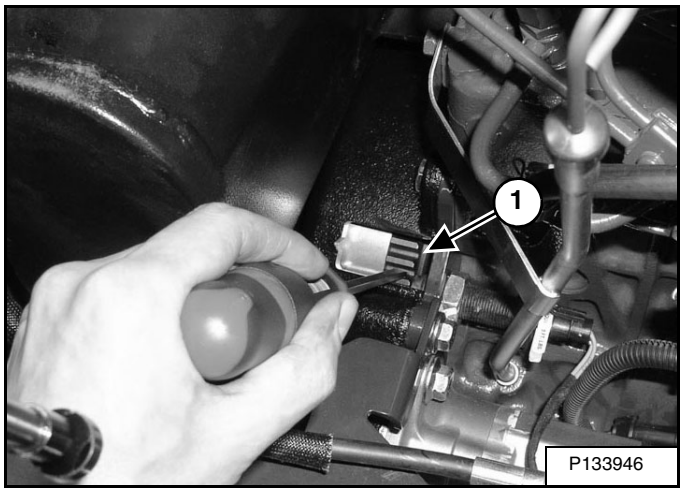
Figure 254



To access the flywheel, remove the plug (Item 1) **[Figure 254]** from the flywheel housing.

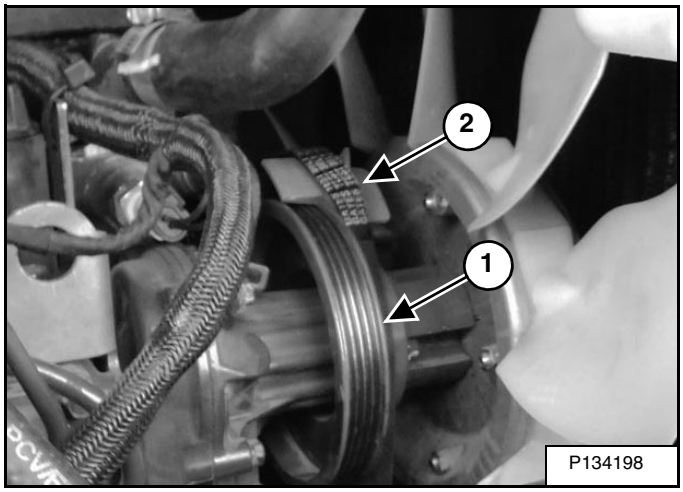
Belt Replacement (Cont'd)

Figure 255



Install a pry bar in the flywheel teeth (Item 1) **[Figure 255]**.

Figure 256



Install the belt on the crankshaft and alternator pulleys. Position the belt (Item 1) and belt tool (Item 2) **[Figure 256]** as shown here.

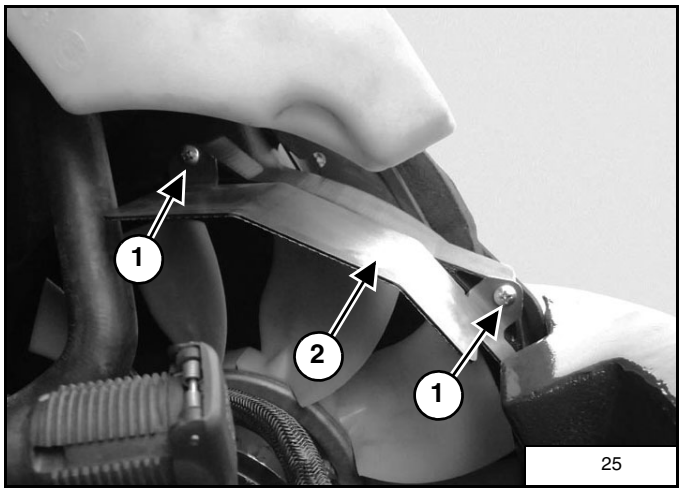
NOTE: Fan blades can be sharp, use care when installing the belt over the fan blades.

Use the pry bar to rotate the flywheel (Item 1) **[Figure 255]**. Continue to rotate until the belt is fully installed.

Remove the belt tool.

Install the flywheel plug (Item 1) **[Figure 254]**.

Figure 257

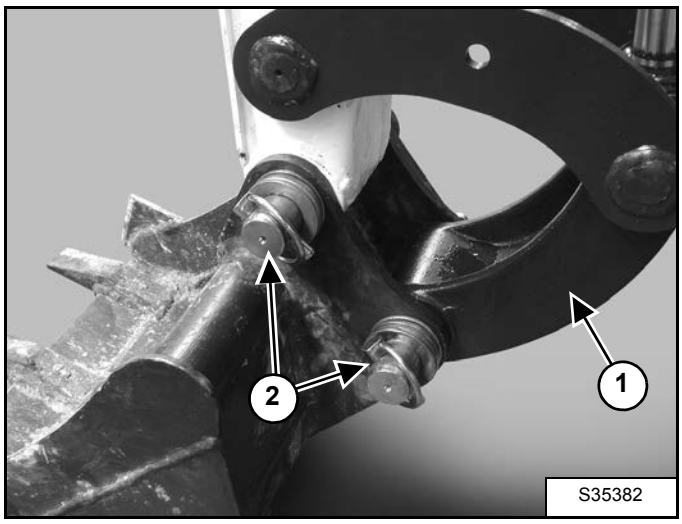


Install the belt shield (Item 2) with the two screws (Item 1) **[Figure 257]**.

Close the tailgate.

Bucket Link And Attachment Coupler Inspection And Maintenance

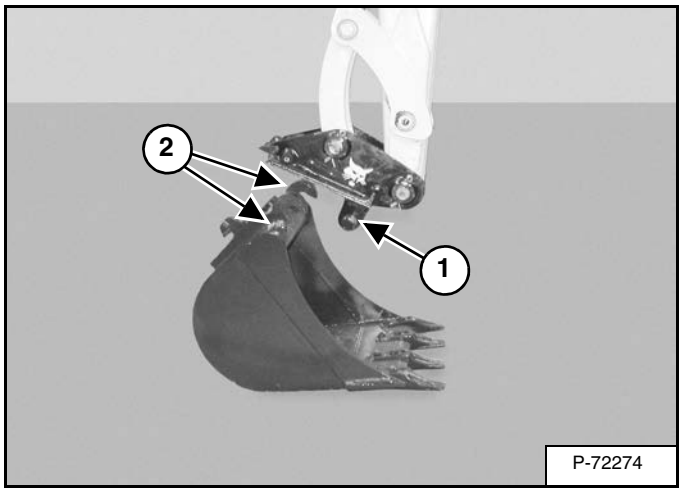
Figure 258



Inspect the bucket link (Item 1) for wear or damage. Inspect the attachment pins (Item 2) **[Figure 258]** for wear or damage.

Repair or replace damaged parts.

Figure 259

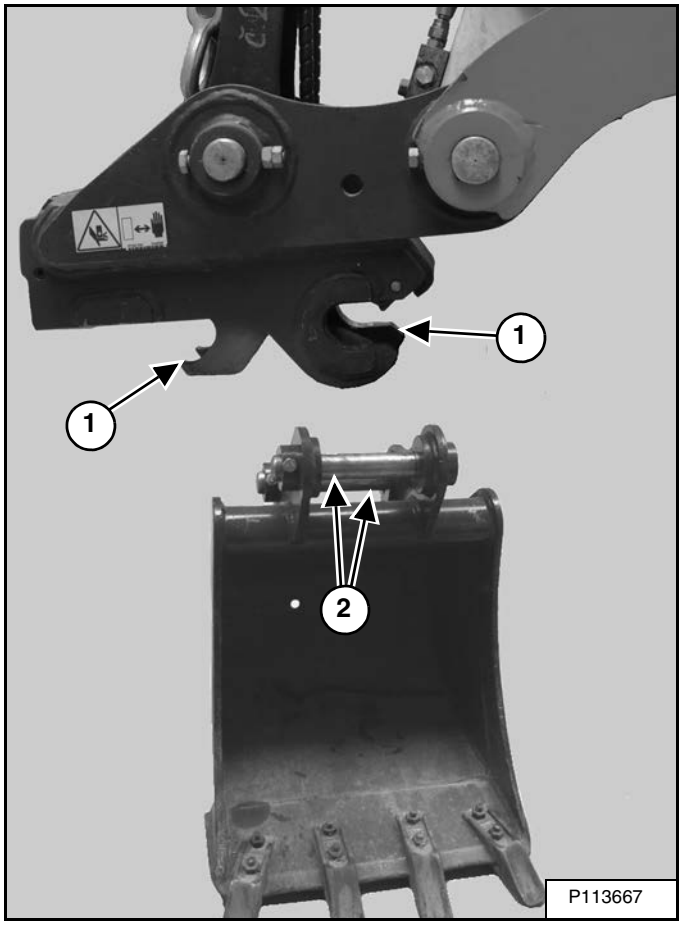


Inspect the quick coupler for wear or damage. Inspect the quick coupler pins (Item 1) and the hooks (Item 2) **[Figure 259]** (on the attachment) for wear or damage

Repair or replace damaged parts.

Bobcat Hydraulic Pin Grabber Coupler HPG2 And Attachment Inspection And Maintenance

Figure 260



Inspect the pin grabber clasps (Item 1) and the bucket pins (Item 2) **[Figure 260]** (on the attachment) for wear or damage.

Repair or replace damaged parts.

Pin Grabber Quick Coupler Troubleshooting

If the Pin Grabber Quick Coupler does not function correctly, the following components may need servicing. See your Bobcat dealer for service.

BUZZER / BLINK CODES	COMPONENT
1 beep / 1 blink (repeating)	Solenoid
2 beep / 2 blink (repeating)	Pressure Sender
3 blink (repeating)	Buzzer
Buzzer sounds / LED not lit	Switch LED

BUCKET

Bucket Teeth Removal And Installation

WARNING

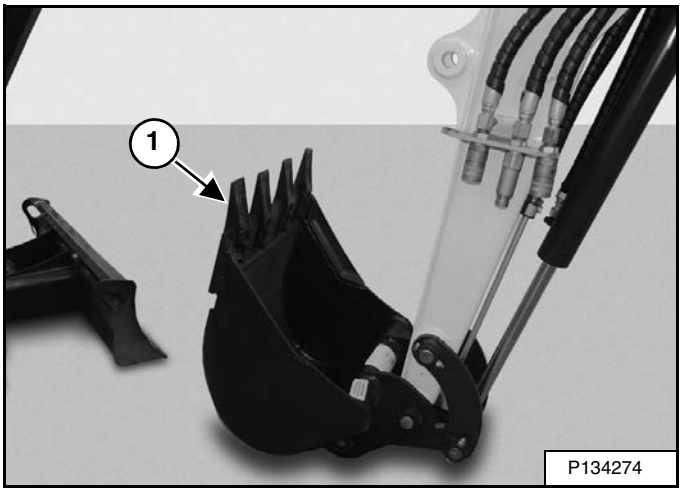
Wear safety glasses to prevent eye injury when any of the following conditions exist:

- **Pressurised fluids and springs or other stored energy components.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

W-2505-EN-1009

Lower the boom until the bucket is fully on the ground.

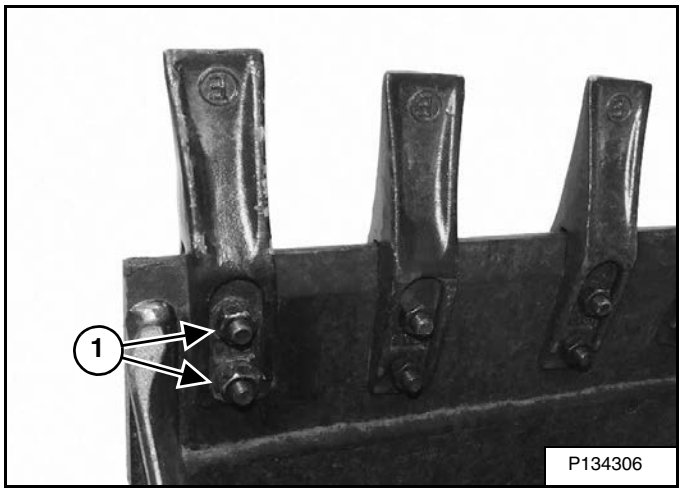
Figure 261



Position the bucket so the bucket teeth are pointed upwards at an angle convenient for accessing the teeth (Item 1) **[Figure 261]**.

Stop the engine and exit the excavator.

Figure 262



Removal: Remove a tooth point by removing the two bolts and nuts (Item 1) **[Figure 262]**.

Installation: Position the new tooth point on the bucket. Secure it with two bolts and nuts and tighten to 75 – 85 Nm (55 – 60 ft-lb).

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

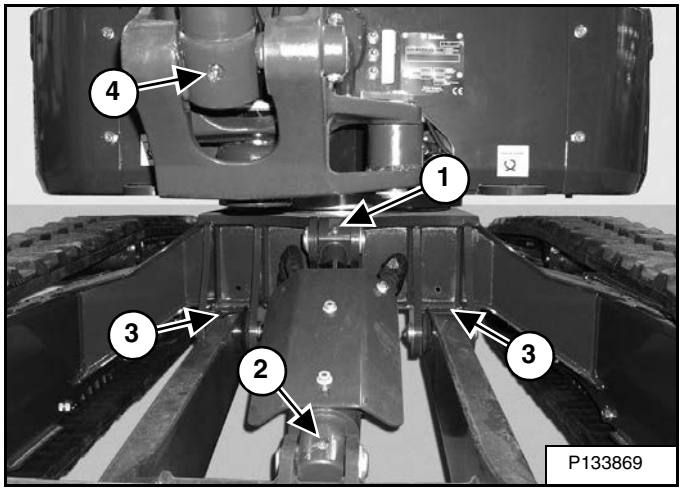
Lubrication Locations

Lubricate the excavator as specified in the service schedule for the best performance of the machine. (See SERVICE SCHEDULE on Page 109.)

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

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

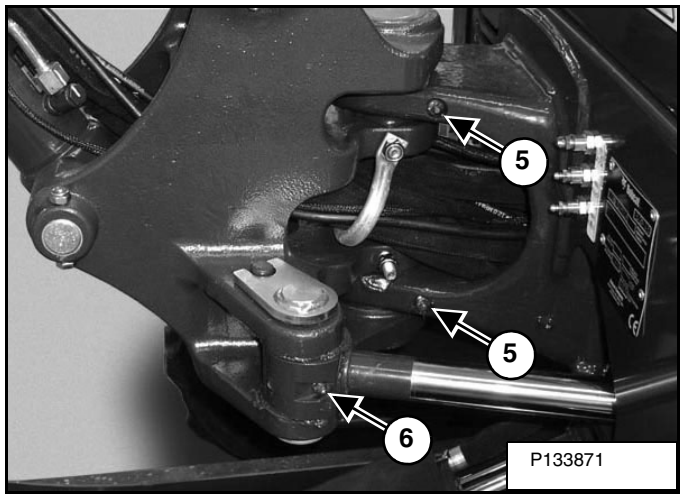
Figure 263



Ref Description (# of Fittings)

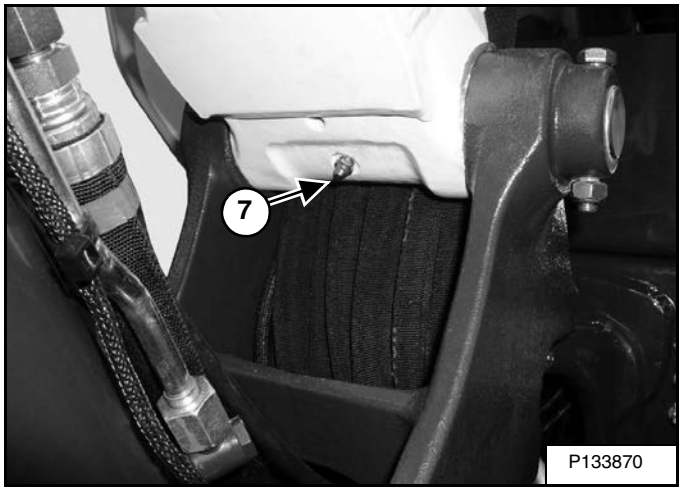
1. Blade Cylinder Rod End (1) **[Figure 263]**.
2. Blade Cylinder Base End (1) **[Figure 263]**.
3. Blade Pivots (2) **[Figure 263]**.
4. Boom Cylinder Base End (1) **[Figure 263]**.

Figure 264



5. Boom Swing Pivot (3) **[Figure 264]**.
6. Boom Swing Cylinder Rod End (1) **[Figure 264]**.

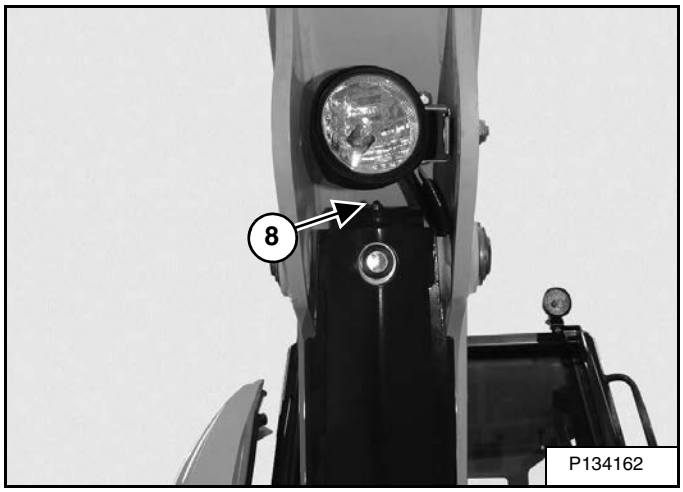
Figure 265



7. Boom Pivot (1) **[Figure 265]**.

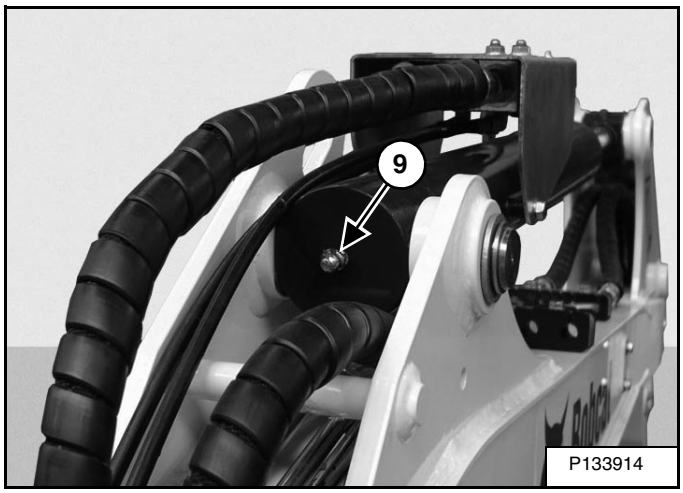
Lubrication Locations (Cont'd)

Figure 266



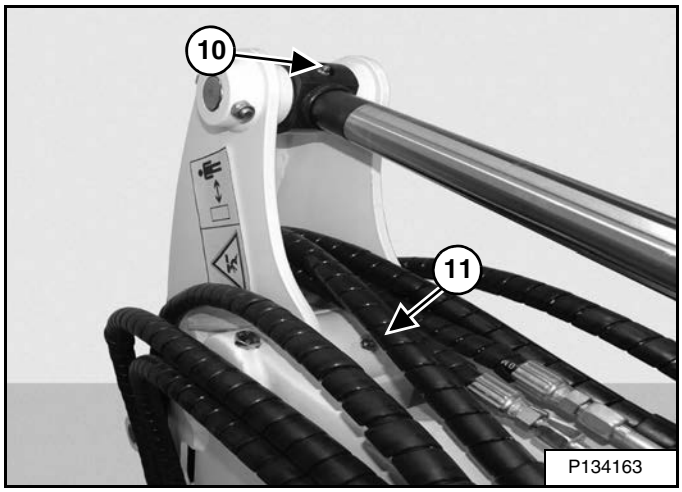
8. Boom Cylinder Rod End (1) **[Figure 266]**.

Figure 267



9. Arm Cylinder Base End (1) **[Figure 267]**.

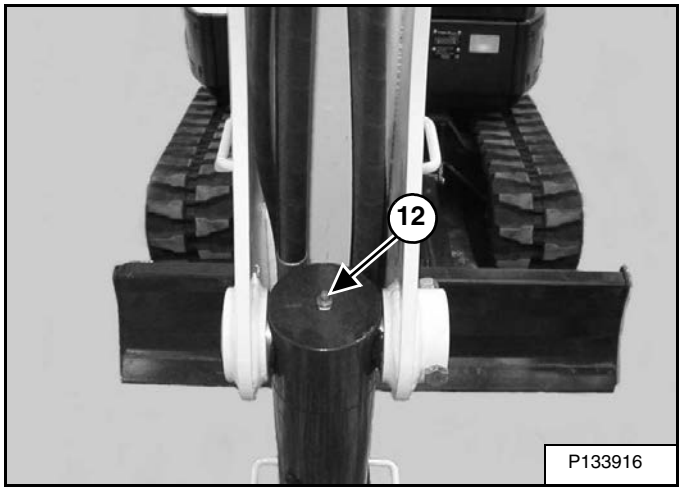
Figure 268



10. Arm Cylinder Rod End (1) **[Figure 268]**.

11. Arm Pivot (1) **[Figure 268]**.

Figure 269

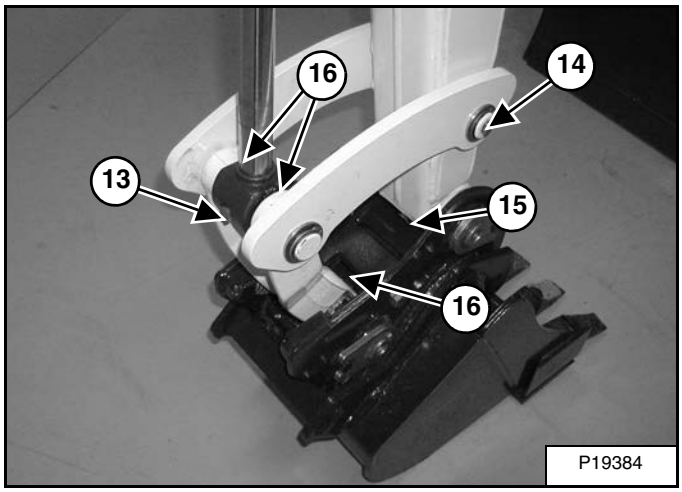


12. Bucket Cylinder Base End (1) **[Figure 269]**.

LUBRICATION OF THE HYDRAULIC EXCAVATOR (CONT'D)

Lubrication Locations (Cont'd)

Figure 270



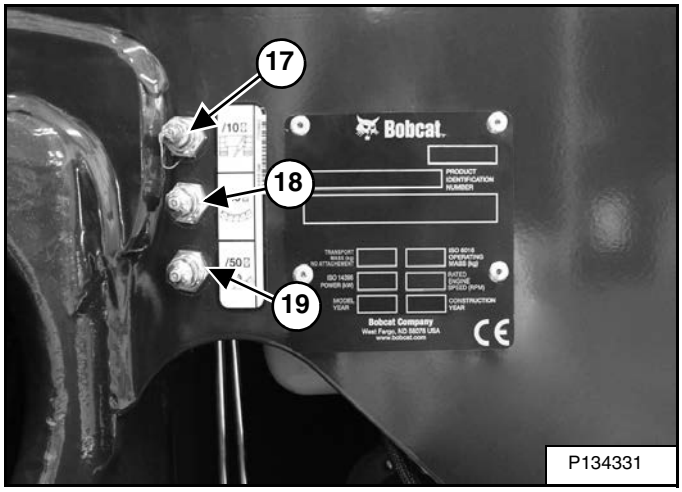
13. Bucket Cylinder Rod End (1) **[Figure 270]**.

14. Bucket Link Pin (1) **[Figure 270]**.

15. Bucket Pivot (1) **[Figure 270]**.

16. Bucket Link (3) **[Figure 270]**.

Figure 271



17. Boom Swing Cylinder Base (1) **[Figure 271]**.

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

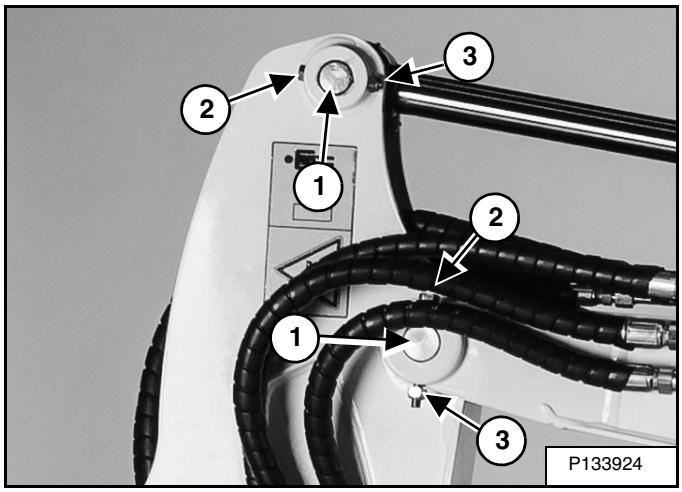
18. Slew Circle (1) **[Figure 271]**.

19. Slew Pinion (1) **[Figure 271]**. (Install three to four pumps of grease then rotate the upperstructure 90°. Install three to four pumps of grease and again rotate the upperstructure 90°. Repeat this until the slew pinion has been greased at four positions.)

PIVOT PINS

Inspection And Maintenance

Figure 272



The pivots and cylinders (Item 1) have a large pin held in position with a bolt (Item 2) and a nut (Item 3) **[Figure 272]** securing the pin.

Installation: After the nut (Item 3) and bolt (Item 2) **[Figure 272]** are tightened together, the bolt should be free to spin.

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 (For example: air cleaner, heater, etc.).
- Put all controls in NEUTRAL position.
- Remove the battery. Be sure the electrolyte level is correct then charge the battery. Store it in a cool dry place above freezing temperatures and charge it periodically during storage.
- Cover the exhaust pipe opening.
- Tag the machine to indicate that it is in storage condition.

Return To Service

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

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

SYSTEM SETUP AND ANALYSIS

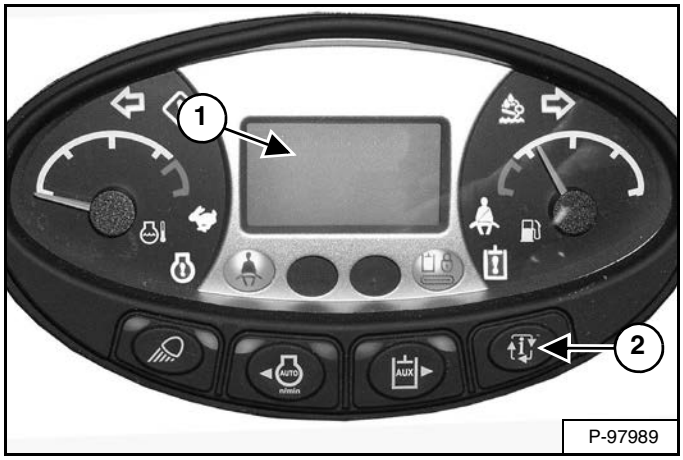
DIAGNOSTIC SERVICE CODES

Viewing Service Codes

The Service Codes will aid your dealer in diagnosing conditions that can damage your machine.

Standard Instrument Panel

Figure 273



Press the Information button (Item 2) to cycle the data display (Item 1) **[Figure 273]** until the service code screen is displayed. If more than one service code is present, the codes will scroll on the data display.

When no service code is present, **[NONE]** is displayed **[Figure 273]**.

NOTE: Corroded or loose earths can cause multiple service codes and / or abnormal symptoms. All instrument panel lights flashing, alarm sounding, headlights and taillights flashing, can indicate a bad earth. The same symptoms can apply if the voltage is low, such as loose or corroded battery cables. If you observe these symptoms, check earths and positive leads first.

Deluxe Instrument Panel

The last 40 codes stored in history can also be viewed using the Deluxe Instrument Panel.

	Press a scroll button (Item 1) repeatedly until the Active Warnings screen icon (Inset) is highlighted.
	The ACTIVE WARNINGS screen displays active service codes. Press **[9]** to view the next service code if more than one is present. Press **[4]** to display a history of service codes.
	The WARNINGS HISTORY screen will list the Service Code Number **(CODE)**, Hourmeter reading when the error occurred **(HOUR)**, and the User **(USER)** who was logged in to operate the machine when the error occurred.
Press **[9]** to view the next eight service codes. A total of 40 codes can be stored. When more than 40 codes occur, the oldest code will disappear and the newest code will be in the number 1 position.	
	Press the list number next to the service code for more detail. Press the left scroll button to back up one screen.

Service Codes List

CODE	DESCRIPTION
H0104	Boom Angle Sensor No Communication
H0204	Arm Angle Sensor No Communication
H0304	Bucket Angle Sensor No Communication
H0405	Angle Sensor Supply Short To Battery
H0406	Angle Sensor Supply Short To Ground
H0407	Angle Sensor Supply Open Circuit
H0705	Aux 4 Base Short to Battery
H0706	Aux 4 Base Short to Ground
H0707	Aux 4 Base Open Circuit
H0732	Aux 4 Base Overcurrent
H0805	Aux 4 Rod Short to Battery
H0806	Aux 4 Rod Short to Ground
H0807	Aux 4 Rod Open Circuit
H0832	Aux 4 Rod Overcurrent
H2521	Angle Blade Control Switch Out Of Range High
H2522	Angle Blade Control Switch Out Of Range Low
H2524	Angle Blade Control Switch Out Of Neutral
H2605	Angle Blade Base Solenoid Short To Battery
H2606	Angle Blade Base Solenoid Short To Ground
H2607	Angle Blade Base Solenoid Open Circuit
H2632	Angle Blade Base Solenoid Overcurrent
H2705	Angle Blade Rod Solenoid Short To Battery
H2706	Angle Blade Rod Solenoid Short To Ground
H2707	Angle Blade Rod Solenoid Open Circuit
H2732	Angle Blade Rod Solenoid Overcurrent
H2805	Diverter Output Short To Battery
H2806	Diverter Output Short To Ground
H2807	Diverter Output Open Circuit
H2832	Diverter Output Overcurrent
H2848	Diverter Multiple Input
H3128	Interrupted Power Failure
H3904	Left Joystick In Error
H3912	Left Joystick Thumb Switch Not In Neutral
H3913	Left Joystick Grip No Communication
H3916	Left Joystick No Communication
H3928	Left Joystick Internal Failure
H3948	Left Joystick Multiple
H4423	Secondary Not Programmed
H4497	Secondary Controller Programmed
H4621	5 Volt Sensor Supply Out Of Range High
H4622	5 Volt Sensor Supply Out Of Range Low
H4721	8 Volt Sensor Supply Out Of Range High
H4722	8 Volt Sensor Supply Out Of Range Low
H5705	Angle Blade Aux 4 Base Short to Battery
H5706	Angle Blade Aux 4 Base Short to Ground
H5707	Angle Blade Aux 4 Base Open Circuit
H5732	Angle Blade Aux 4 Base Overcurrent
H5805	Angle Blade Aux 4 Rod Short to Battery
H5806	Angle Blade Aux 4 Rod Short to Ground
H5807	Angle Blade Aux 4 Rod Open Circuit
H5832	Angle Blade Aux 4 Rod Overcurrent
H7404	Main Controller No Communication
H7604	Display No Communication
H7902	Door Unlock Error On
H7903	Door Unlock Error Off
H8002	Door Lock Error On
H8003	Door Lock Error Off
L0102	Lights Button Error On
L0202	High Flow Enable Button Error On
L0302	Auxiliary Enable Button Error On
L0402	Information Button Error On
L7404	Information Button Error On
L7672	Information Button Error On
LOWVLTG	Machine IQ Device Low Voltage
M0116	Air Filter Not Connected
M0117	Air Filter Plugged
M0144	Air Filter Derate Level 1
M0145	Air Filter Derate Level 2
M0216	Hydraulic/hydrostatic Filter Not Connected
M0217	Hydraulic/hydrostatic Filter Plugged
M0309	System Voltage Too Low
M0310	System Voltage Too High
M0311	System Voltage Extremely High
M0314	System Voltage Extremely Low
M0322	System Voltage Out Of Range Low
M0414	Engine Oil Pressure Extremely Low
M0415	Engine Oil Pressure In Shutdown
M0610	Engine Speed Too High
M0611	Engine Speed Extremely High
M0613	Engine Speed No Signal
M0615	Engine Speed In Shutdown
M0618	Engine Speed Out Of Range
M0710	Hydraulic Oil Temp Too High
M0711	Hydraulic Oil Temp Extremely High
M0715	Hydraulic Oil Temp In Shutdown

CODE	DESCRIPTION
M0721	Hydraulic Oil Temp Out Of Range High
M0722	Hydraulic Oil Temp Out Of Range Low
M0810	Engine Coolant Temp Too High
M0811	Engine Coolant Temp Extremely High
M0815	Engine Coolant Temp In Shutdown
M0821	Engine Coolant Temp Out Of Range High
M0822	Engine Coolant Temp Out Of Range Low
M0826	Engine Coolant Temp Out Of Range Low
M0909	Fuel Level Too Low
M0921	Fuel Level Out Of Range High
M0922	Fuel Level Out Of Range Low
M1121	Console Sensor Out Of Range High
M1122	Console Sensor Out Of Range Low
M1128	Console Sensor Failure
M1305	Fuel Hold Solenoid Short To Battery
M1306	Fuel Hold Solenoid Short To Ground
M1307	Fuel Hold Solenoid Open Circuit
M1402	Fuel Pull Solenoid Error On
M1403	Fuel Pull Solenoid Error Off
M1407	Fuel Pull Solenoid Open Circuit
M1428	Fuel Pull Solenoid Failure
M1605	Hydraulic Bypass Short to Battery
M1606	Hydraulic Bypass Short to Ground
M1607	Hydraulic Bypass Open Circuit
M1632	Hydraulic Bypass Overcurrent
M1705	Hydraulic Lock Valve Short To Battery
M1706	Hydraulic Lock Valve Short To Ground
M1707	Hydraulic Lock Valve Open Circuit
M1732	Hydraulic Lock Valve Overcurrent
M1802	Power Beyond Valve Output Error On
M1803	Power Beyond Valve Output Error Off
M1902	Power Beyond Valve Relay Error On
M1903	Power Beyond Valve Relay Error Off
M2005	Two Speed Primary Solenoid Short To Battery
M2006	Two Speed Primary Solenoid Short To Ground
M2007	Two Speed Primary Solenoid Open Circuit
M2102	Glow Plug Output Error On
M2103	Glow Plug Output Error Off
M2107	Glow Plug Output Open Circuit
M2128	Glow Plug Output Failure
M2202	Starter Output Error On
M2203	Starter Output Error Off
M2207	Starter Output Open Circuit
M2228	Starter Output Failure
M2302	Starter Relay Error On

CODE	DESCRIPTION
M2303	Starter Relay Error Off
M2402	Fuel Pull Relay Error On
M2403	Fuel Pull Relay Error Off
M2521	Load Sense Sensor Out Of Range High
M2522	Load Sense Sensor Out Of Range Low
M2602	Glow Plug Relay Error On
M2603	Glow Plug Relay Error Off
M2721	Throttle Primary Sensor Out Of Range High
M2722	Throttle Primary Sensor Out Of Range Low
M2805	Diverter Output Short To Battery
M2806	Diverter Output Short To Ground
M2807	Diverter Output Open Circuit
M3128	Interrupted Power Failure
M3204	Throttle Controller No Communication To Bobcat Controller
M3223	Throttle Controller Not Calibrated
M3228	Throttle Controller Failure
M3299	Throttle Controller Calibration In Process
M3304	Deluxe Panel No Communication
M3372	Display Software Incompatible
M3373	Display Software Outdated
M3702	HYD Exchange Output Error On
M3703	HYD Exchange Output Error Off
M3904	Jog Shuttle No Communication
M4028	Wrong ECU Detected
M4109	Alternator Voltage Too Low
M4110	Alternator Voltage High
M4204	Keyless Entry No Communication
M4304	Keyless Start Panel No Communication
M4404	Secondary No Communication
M4472	Secondary Controller Software Incompatible
M4473	Secondary Controller Software Outdated
M4621	5 Volt Sensor Supply Out Of Range High
M4622	5 Volt Sensor Supply Out Of Range Low
M4721	8 Volt Sensor Supply Out Of Range High
M4722	8 Volt Sensor Supply Out Of Range Low
M4802	Front Light Relay Error On
M4803	Front Light Relay Error Off
M5002	Front Light Output Error On
M5003	Front Light Output Error Off
M5205	Offset Base Solenoid Short To Battery
M5206	Offset Base Solenoid Short To Ground
M5207	Offset Base Solenoid Open Circuit
M5232	Offset Base Solenoid Overcurrent
M5305	Offset Rod Solenoid Error On

CODE	DESCRIPTION
M5306	Offset Rod Solenoid Short To Ground
M5307	Offset Rod Solenoid Open Circuit
M5332	Offset Rod Solenoid Overcurrent
M5421	Offset Control Switch Out Of Range High
M5422	Offset Control Switch Out Of Range Low
M5424	Offset Control Switch Out Of Neutral
M5505	Auxiliary Base Solenoid Short To Battery
M5506	Auxiliary Base Solenoid Short To Ground
M5507	Auxiliary Base Solenoid Open Circuit
M5532	Auxiliary Base Solenoid Overcurrent
M5605	Auxiliary Rod Solenoid Short To Battery
M5606	Auxiliary Rod Solenoid Short To Ground
M5607	Auxiliary Rod Solenoid Open Circuit
M5632	Auxiliary Rod Solenoid Overcurrent
M5721	Auxiliary Control Switch Out Of Range High
M5722	Auxiliary Control Switch Out Of Range Low
M5724	Auxiliary Control Switch Out Of Neutral
M5810	Fuel Temperature High
M5811	Fuel Temperature Extremely High
M5815	Fuel Temperature In Shutdown
M5826	Fuel Temperature In Shutdown
M6021	Left Control Switch Out of Range High
M6022	Left Control Switch Out of Range Low
M6024	Left Control Switch Out of Neutral
M6121	Right Control Switch Out of Range High
M6122	Right Control Switch Out of Range Low
M6124	Right Control Switch Out of Neutral
M6204	Load Moment Sensor In Error
M6221	Overload Warning Sensor Out of Range High
M6222	Overload Warning Sensor Out of Range Low
M6402	Switched Power Relay Error On
M6403	Switched Power Relay Error Off
M6505	ECU Power Short To Battery
M6506	ECU Power Short To Ground
M6507	ECU Power Open Circuit
M6604	ECU No Communication
M6702	HVAC Output Error On
M6703	HVAC Output Error Off
M6905	Dump Valve Short to Battery
M6906	Dump Valve Short to Ground
M6907	Dump Valve Open Circuit
M6932	Dump Valve Overcurrent
M7002	Switched Power Output Error On
M7003	Switched Power Output Error Off
M7007	Switched Power Output Open Circuit

CODE	DESCRIPTION
M7028	Switched Power Output Failure
M7423	Main Controller Not Programmed
M7472	Main Controller Software Incompatible
M7473	Main Controller Software Outdated
M7497	Main Controller Controller Programmed
M7604	Standard Display Panel No Communication
M7748	Key Switch Multiple
M7839	Hourmeter Changed
M8004	Cooling Fan Controller No Communication
M8005	Cooling Fan Short To Battery
M8006	Cooling Fan Short To Ground
M8021	Cooling Fan Out Of Range High
M8022	Cooling Fan Out Of Range Low
M8025	Cooling Fan Unresponsive
M8027	Cooling Fan CAN Error
M8028	Cooling Fan Failure
M8029	Cooling Fan Wiring Fault
M8030	Cooling Fan Controller Fault
M8302	Wait to Start Lamp Error On
M8303	Wait to Start Lamp Error Off
M8615	Engine Speed Derate In Shutdown
M8625	Engine Speed Derate Unresponsive
M9111	Fuel Filter Extremely Plugged
M9117	Fuel Filter Plugged
M9144	Fuel Filter Derate Level 1
M9145	Fuel Filter Derate Level 2
M9202	Fuel Lift Pump Error On
M9203	Fuel Lift Pump Error Off
M9287	Fuel Pump Failure Time Exceeded
M9309	Fuel Pressure Low
M9314	Fuel Pressure Extremely Low
M9321	Fuel Pressure Out Of Range High
M9322	Fuel Pressure Out Of Range Low
M9344	Fuel Pressure Derate Level 1
M9701	Turbo Prime Sequence Active
R3327	Display CAN Error
R3334	Display CAN Error
R3335	Display CAN Error
R3904	Jog Shuttle No Communication
R7404	Main Controller No Communication
R7492	Main Controller Authentication Failed
R9604	Radio No Communication
VRLOW VLTG	Machine IQ Device Very Low Voltage

CONTROL PANEL SETUP

Deluxe Instrument Panel

Icon Identification

Figure 274

ICON	DESCRIPTION
Mon, 17 Mar 3:45 PM	DATE / TIME
MINNY 234.5	USER / USER HOURS
Machine 353.5	MACHINE HOURS (HOURMETER)
	ACTIVE WARNINGS screen icon
	VITALS screen icon
	SERVICE screen icon
	AUTO IDLE Status icon
	ATTACHMENTS screen icon
	MACHINE SETTINGS screen icon
	DISPLAY screen icon
	HOME icon (Return to MAIN screen)
	LEFT SCROLL button RIGHT SCROLL button
ENTER	ENTER button

Vitals

	Press a scroll button (Item 1) repeatedly until the Vitals screen icon (Inset) is highlighted.
	Displays select system operating levels.
You can monitor real-time displays of: **Engine Speed (RPM)** **Engine Coolant Temperature** **System Voltage** **Hydraulic Fluid Temperature**	

The Deluxe Instrument Panel is easy to use. Continue to set your own preferences for operating / monitoring your Bobcat excavator.

Deluxe Instrument Panel (Cont'd)

Date And Time

	Press a scroll button (Item 1) repeatedly until the Display screen icon (Inset) is highlighted.
	Select **[1. CLOCKS]**.
	Select **[1. TIME]**.
	Use the keypad to enter time. Select AM / PM / 24hr. Press **[ENTER]** to continue.
	Select **[2. DATE]**.
	Use the keypad to enter date. Press **[ENTER]** to continue.

Languages

	Press a scroll button (Item 1) repeatedly until the Display screen icon (Inset) is highlighted.
	Select **[2. LANGUAGES]**.
	Select the desired language.

English / Metric Display

	Press a scroll button (Item 1) repeatedly until the Display screen icon (Inset) is highlighted.
	Select **[4. DISPLAY SETTINGS]**. Press **[1]** to cycle between ENGLISH and METRIC.

Deluxe Instrument Panel (Cont'd)

Auto Idle Time Delay

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[3. MACHINE PERFORMANCE]**.
	Select **[1. AUTO IDLE DELAY TIME]**.
	Use the keypad to enter the desired delay time between 4 and 250 seconds. Press **[ENTER]** to save and continue. Press left scroll button to exit without saving.

Job Clock Reset

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[1. USER SETTINGS]**.
	Select user.
	Press **[9]** to reset job statistics. Press left scroll button or **[0]** to exit without saving.

Deluxe Instrument Panel (Cont'd)

Alarm Clock Reset

	Press a scroll button (Item 1) repeatedly until the Display screen icon (Inset) is highlighted.
	Select **[3. ALARM CLOCK]**.
	Select **[1. OFF ONCE]**, Select **[2. ON Daily]** or Select **[3. ON WEEKLY]**.
	Select **[1. OFF / ON]**, Select **[2. TIME]** or Select **[3. DAILY]**.
	Use keypad numbers to set time. Select **[7. AM]**, Select **[8. PM]** or Select **[9. 24 hr clock]**. Select **[ENTER]** to save. Press left scroll to back space numbers.
	Press **[4]** to set alarm to sleep. (When pressed, display will return to main screen.) Press **[9]** to shut off alarm. Alarm will still be active for the next day alarm setting. (When pressed, display will return to main screen.)

ECO MODE

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[3. MACHINE PERFORMANCE]**.
	Select **[2. ECO MODE]**. ECO Mode will set the maximum engine rpm to be at 85% of the high idle setting. Example: If the machine maximum engine speed is 2450 rpm, when ECO Mode is enabled, the maximum engine speed will be approximately 2080 rpm.

Deluxe Instrument Panel (Cont'd)

Machine History - Log In Information

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	**MACHINE SETTINGS** is visible on screen. Select **[2. MACHINE HISTORY]**.
	Select **[1. LOG-IN INFORMATION]**.
	View User Log hours and last time / dated used. Individual information can be viewed and reset back to zero. Select user **[KEYPAD 1 - 9]** to access individual user.

Machine History - User Job Statistics

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	**MACHINE SETTINGS** is visible on screen. Select **[2. MACHINE HISTORY]**.
	Select **[2. USER JOB STATISTICS]**.
	View Job Statistics (Job Hours / Idle Time. Information can be viewed and reset back to zero.

Deluxe Instrument Panel (Cont'd)

Machine History - Overall Job Statistics

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	**MACHINE SETTINGS** is visible on screen. Select **[2. MACHINE HISTORY]**.
	Select **[3. OVERALL JOB STATISTICS]**.

Attachments

	Press a scroll button (Item 1) repeatedly until the Attachment screen icon (Inset) is highlighted.
	**ATTACHMENTS** is visible on screen. Press **[ENTER]**.
	Press **[4]** or **[9]** repeatedly until the desired Attachment is visible in the display screen.
	Information about the attachment, recommended auxiliary hydraulic flow and tips about attachment operation will be displayed.

PASSWORD SETUP (KEYLESS START PANEL)

Password Description

Master Password:

A permanent, randomly selected password set at the factory that cannot be changed. This password is used for service by the Bobcat dealer if the owner password is not known or to change the owner password.

Owner Password:

Allows for full use of the excavator. Must be used to change the owner password, or User 1 / User 2 password.

NOTE: By default, the owner password is the last five digits of the machine's serial number.

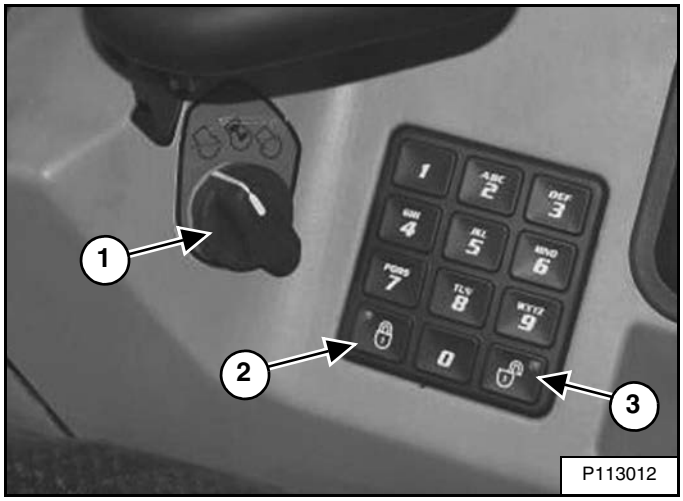
User 1 and User 2 Passwords:

By default, User 1 and User 2 Passwords are not set.

NOTE: The User 1 and User 2 Password cannot be used to change a password or to switch between the Locked / UnLocked modes.

Changing The Owner, User 1, And User 2 Password

Figure 275



Turn the start switch (Item 1) **[Figure 275]** to the ON position to turn on the excavator's electrical system.

Enter the five-digit owner password on the keypad if locked.

Press and hold the lock (Item 2) and unlock (Item 3) **[Figure 275]** keys for three seconds.

The display screen will show **[CODE]**.

The display screen will show **[OWNER]** for two seconds. Press the unlock key (Item 3) **[Figure 275]** to navigate between **[OWNER]**, **[USER 1],** and **[USER 2]**.

After two seconds, the display screen will show [**ENTER]**.

NOTE: The lock key's (Item 2) red LED and the unlock key's (Item 3) [Figure 275] green LED will flash during the procedure.

Enter a new five-digit owner, User 1, or User 2 password using the keypad. An asterisk will show in the display screen for each key pressed.

The display screen will show **[AGAIN]**.

Enter the new five-digit password again.

The display screen will show **[STORE]** if the password has been changed.

The display screen will show **[ERROR]** if:

- The second five-digit password is different from the first one entered.

  OR

- No number key was pressed for more than 20 seconds.

  OR

- "00000" was entered as the password.

NOTE: "00000" is not an acceptable owner, User 1, or User 2 password.

The system returns to its previous state. Either the lock key's (Item 2) red LED or the unlock key's (Item 2) **[Figure 275]** green LED will become solid.

PASSWORD SETUP (KEYLESS START PANEL) (CONT'D)

Password Lockout Feature

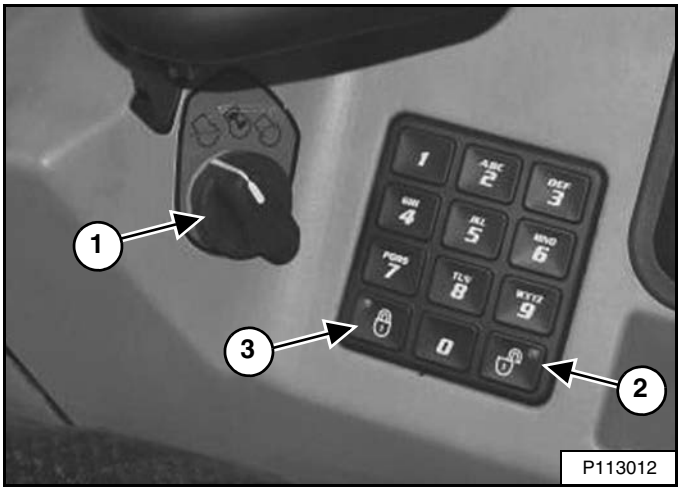
This feature allows the owner to unlock the password feature so that a password does not need to be used every time the engine is started.

NOTE: The password lockout feature does not function with the User 1 or User 2 passwords.

Turn the start switch (Item 1) **[Figure 276]** to the ON position to turn on the excavators electrical system.

Enter the five-digit owner password using the keypad.

Figure 276



Press the unlock key (Item 2) **[Figure 276]**.

The left panel display screen will show **[CODE]**.

Enter the five-digit owner password using the keypad. The unlock key green light will flash, then become solid.

The excavator can now be started without using a password.

NOTE: Use the following procedure to reset the machine lock so that the excavator requires a password to start the engine.

Turn the key switch to the ON position to turn on the excavators electrical system.

Press the lock key (Item 3) **[Figure 276]**.

The lock key red light will flash and the left panel display screen will show **[CODE]**.

Enter the five-digit owner password using the keypad. The unlock key green light will flash, then the lock key red light will become solid.

You must now enter the password every time to start the excavator.

PASSWORD SETUP (DELUXE INSTRUMENT PANEL)

Password Setup is available on machines with a Deluxe Instrument Panel.

Password Description

All new machines with a Deluxe Instrument Panel arrive at Bobcat dealerships with the keypad in locked mode. Locked mode means that a password must be used to start the engine.

For security purposes, your dealer may change the password and set the keypad in the locked mode. Your dealer will provide you with the password.

Master Password:

A permanent, randomly selected password set at the factory that cannot be changed. This password is used for service by the Bobcat dealer if the owner password is not known or to change the owner password.

Owner Password:

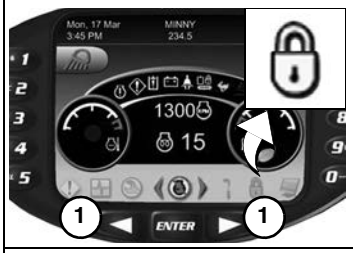
Allows for full use of the excavator and to set up the Deluxe Instrument Panel. There is only one owner password. The owner password must be used to change the owner or user passwords. The owner should change the password as soon as possible for the security of the excavator.

User Password:

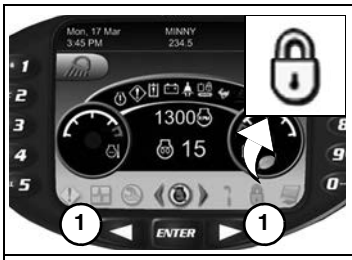
Allows starting and operating the excavator; cannot be used to change a password or any of the other setup features.

For the procedures to change passwords: (See Changing The Owner Password on Page 166.) and (See Changing The User Passwords on Page 167.)

Changing The Owner Password

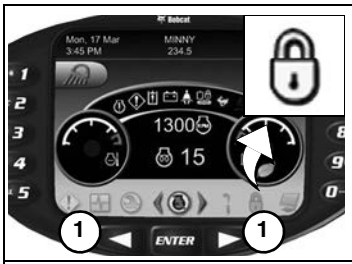
	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[1. USER SETTINGS]**.
	Select **[1. OWNER]**.
	Select **[2. CHANGE PASSWORD]**.
	Enter new owner password and press **[ENTER]**. You will be prompted to reenter the new owner password.

Changing The User Passwords

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[1. USER SETTINGS]**.
	Select user.
	Select **[2. CHANGE PASSWORD]**.
	Enter new user password and press **[ENTER]**.

Password Lockout Feature

This feature allows the owner to unlock the password feature so that a password does not need to be used every time the engine is started.

	Press a scroll button (Item 1) repeatedly until the Security screen icon (Inset) is highlighted.
	Select **[1. PASSWORDS / LOCKOUTS]**.
	Enter owner password and press **[ENTER]**.
	Select **[2. MACHINE LOCK]**.

NOTE: The procedure above can be followed to reset the machine lock so that the machine requires a password to start the engine.

NOTE: When the password is in UNLOCKED, no password is needed. The start switch is used to start the machine.

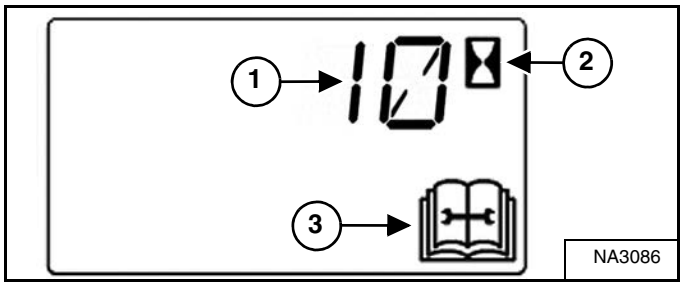
MAINTENANCE CLOCK

Description

The Maintenance Clock alerts the operator when the next service interval is due. *EXAMPLE:* The maintenance clock can be set to a 500 hour interval as a reminder for the next 500 hour planned maintenance.

Standard Instrument Panel

Figure 277



During machine operation, a 2 beep alarm will sound when there are less than 10 hours until the next planned maintenance.

The remaining hours before maintenance is required (Item 1) will appear in the data display for 5 seconds while the service icon (Item 3) and the hourmeter icon (Item 2) **[Figure 277]** flash.

NOTE: The display will show negative numbers after counting down to zero.

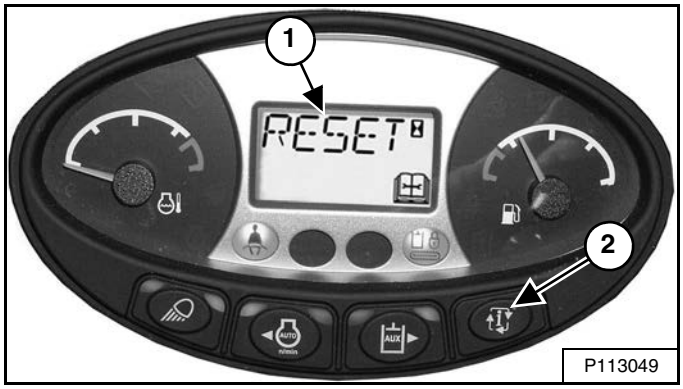
The display will revert to the previous display and will appear for 5 seconds every time the machine is started until the maintenance clock is reset.

Setup

See your Bobcat dealer about installation of this feature.

Reset

Figure 278

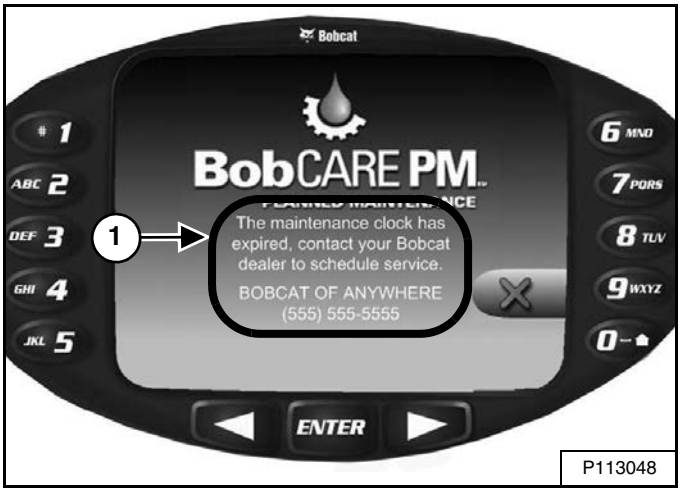


Press the Information button (Item 2) **[Figure 278]** until the display screen shows the maintenance clock.

Press and hold the Information button (Item 2) for 7 seconds until **[RESET]** (Item 1) **[Figure 278]** appears in the display screen.

Deluxe Instrument Panel

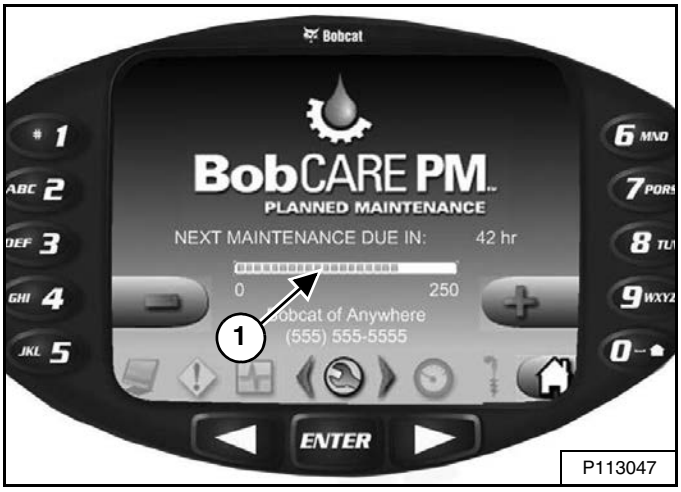
Figure 279



The Deluxe Instrument Panel (if equipped) will display a message (Item 1) **[Figure 279]** alerting the operator to service the machine.

This message will remain for 10 seconds and will appear for 10 seconds every time the machine is started until the maintenance clock is reset.

Figure 280



The Deluxe Instrument Panel (if equipped) will display a bar (Item 1) **[Figure 280]** showing the time remaining until next service. This bar will turn red when service is past due. NEXT MAINTENANCE DUE will change to MAINTENANCE PAST DUE and display the number of hours past due.

Keys **[4]** and **[9]** can be used to adjust the service interval when the owner is logged in **[Figure 280]**.

To reset the service clock after servicing the machine, press and hold key [1] **[Figure 280]** (when the owner is logged in) until the bar graph resets to 0 **[Figure 279]**.

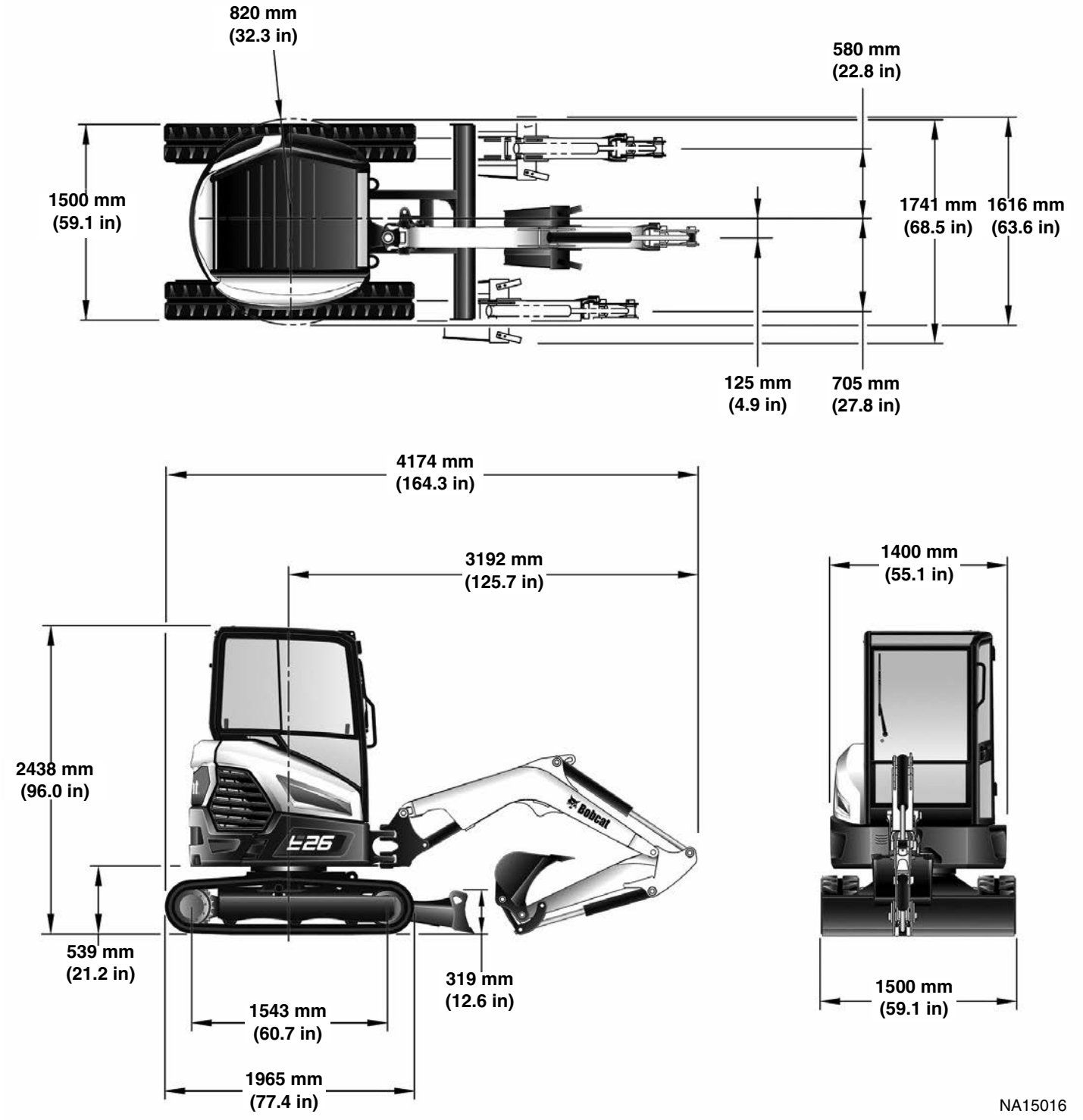
SPECIFICATIONS

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

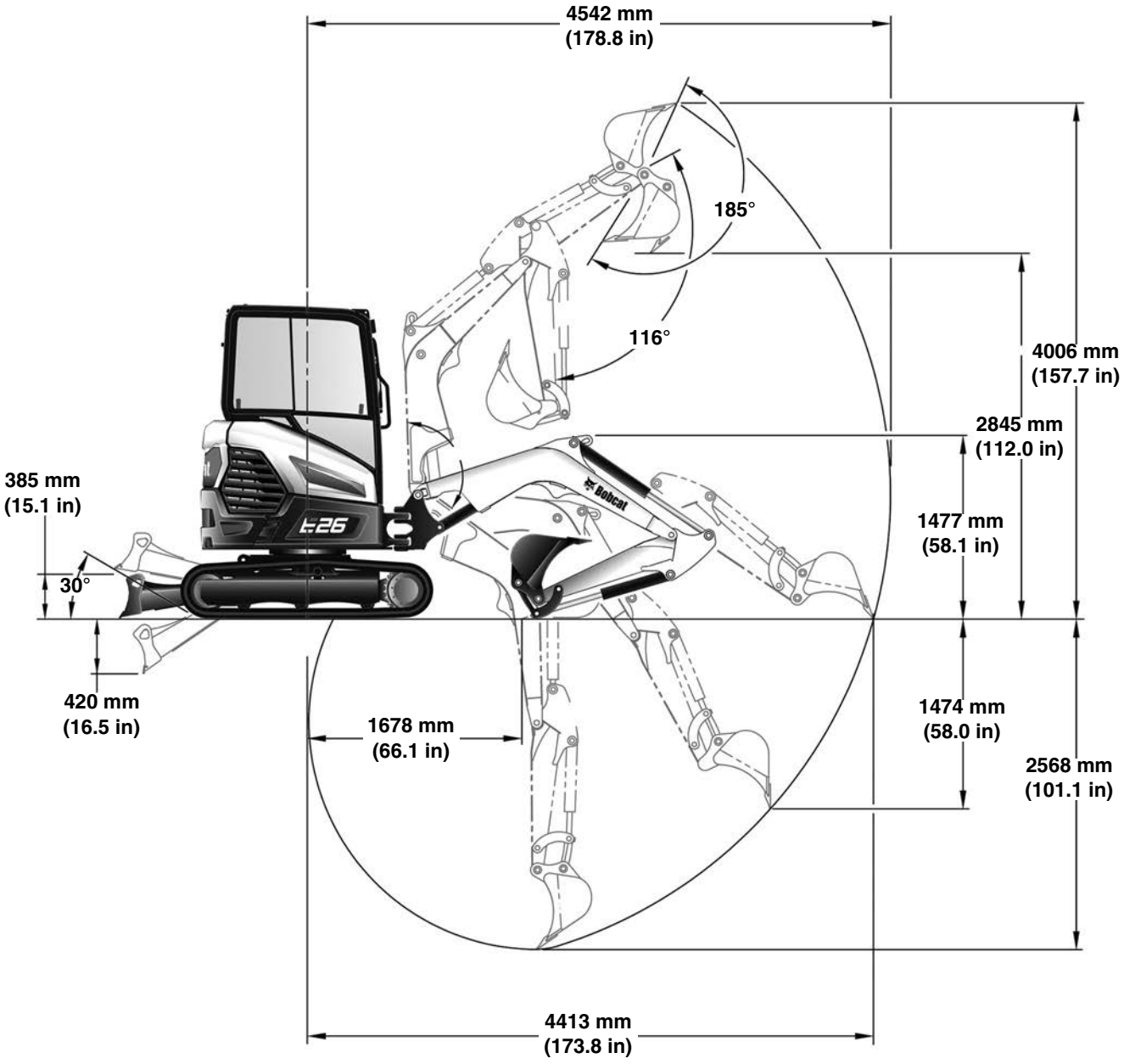
Machine Dimensions

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



Machine Dimensions (Cont'd)

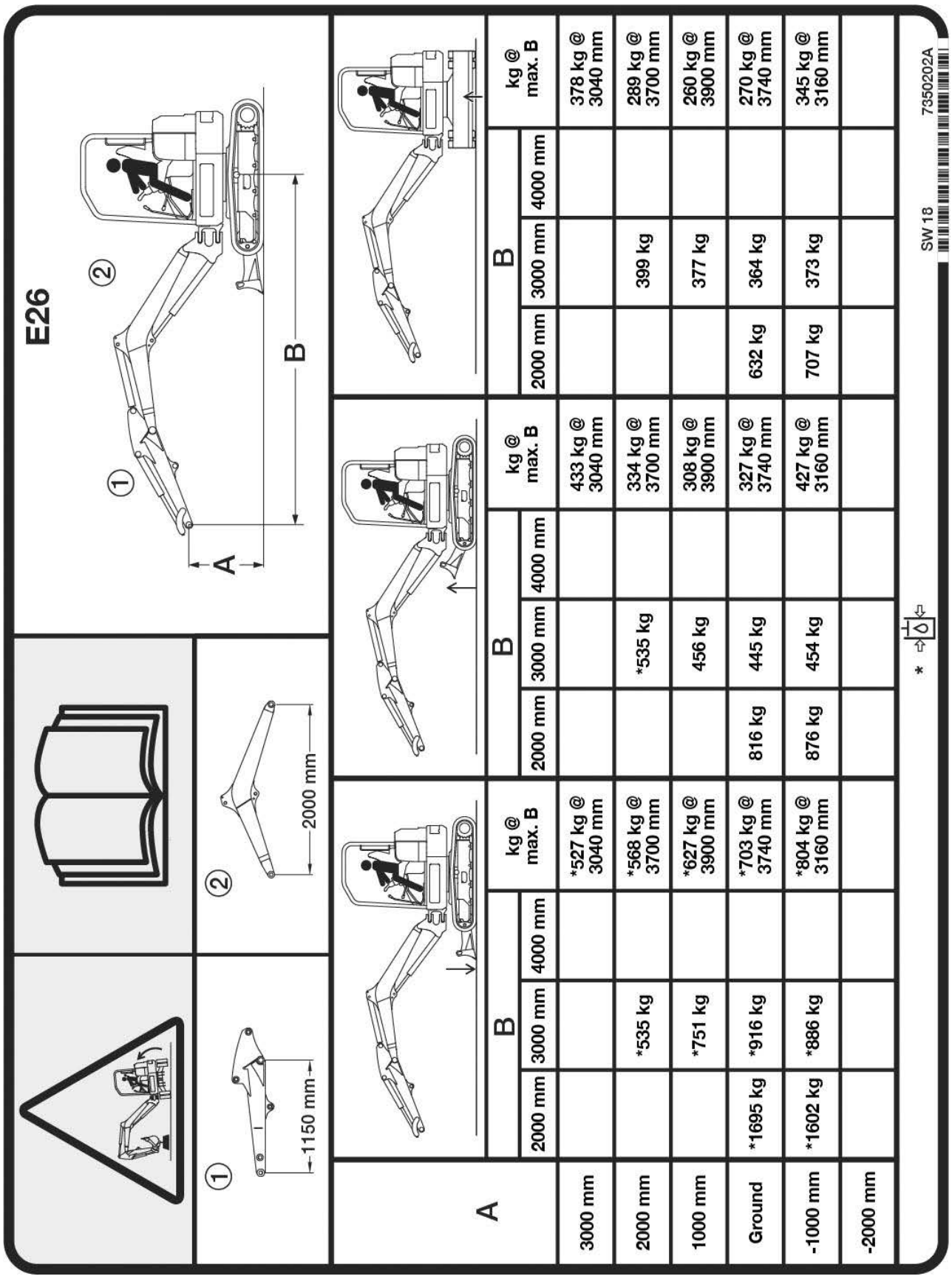
- Where applicable, specification conform to SAE or ISO standards and are subject to change without notice.



NA15017

Rated Lift Capacity - Canopy With Light Counterweight

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



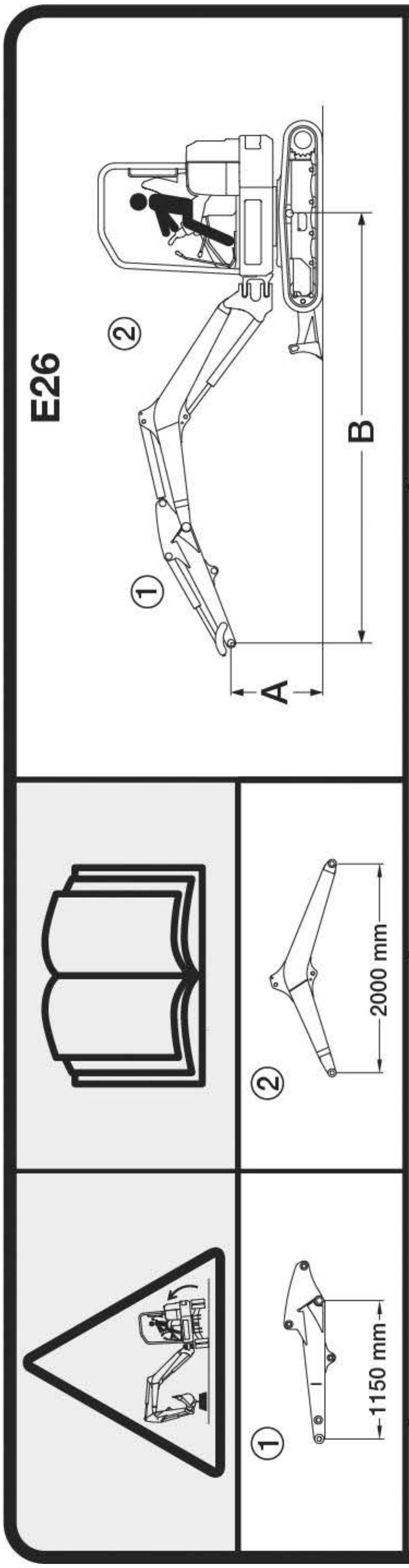
A	B				B				B			
	2000 mm	3000 mm	4000 mm	kg @ max. B	2000 mm	3000 mm	4000 mm	kg @ max. B	2000 mm	3000 mm	4000 mm	kg @ max. B
3000 mm				*527 kg @ 3040 mm				433 kg @ 3040 mm				378 kg @ 3040 mm
2000 mm		*535 kg		*568 kg @ 3700 mm		*535 kg		334 kg @ 3700 mm		399 kg		289 kg @ 3700 mm
1000 mm		*751 kg		*627 kg @ 3900 mm		456 kg		308 kg @ 3900 mm		377 kg		260 kg @ 3900 mm
Ground	*1695 kg	*916 kg		*703 kg @ 3740 mm	816 kg	445 kg		327 kg @ 3740 mm	632 kg	364 kg		270 kg @ 3740 mm
-1000 mm	*1602 kg	*886 kg		*804 kg @ 3160 mm	876 kg	454 kg		427 kg @ 3160 mm	707 kg	373 kg		345 kg @ 3160 mm
-2000 mm												

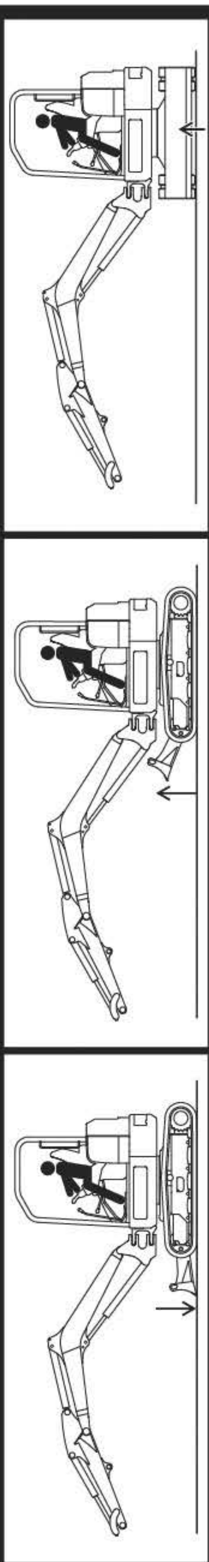
7350202

EXCAVATOR SPECIFICATIONS (CONT'D)

Rated Lift Capacity - Canopy With Medium Counterweight

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





A	B 2000 mm	B 3000 mm	B 4000 mm	kg @ max. B	B 2000 mm	B 3000 mm	B 4000 mm	kg @ max. B	B 2000 mm	B 3000 mm	B 4000 mm	kg @ max. B
3000 mm				*527 kg @ 3040 mm				*527 kg @ 3040 mm				416 kg @ 3040 mm
2000 mm		*535 kg		*568 kg @ 3700 mm		*535 kg		370 kg @ 3700 mm		438 kg		320 kg @ 3700 mm
1000 mm		*751 kg		*627 kg @ 3900 mm		502 kg		341 kg @ 3900 mm		416 kg		288 kg @ 3900 mm
Ground	*1695 kg	*916 kg		*703 kg @ 3740 mm	900 kg	492 kg		363 kg @ 3740 mm	700 kg	403 kg		300 kg @ 3740 mm
-1000 mm	*1602 kg	*886 kg		*804 kg @ 3160 mm	961 kg	500 kg		471 kg @ 3160 mm	775 kg	412 kg		382 kg @ 3160 mm
-2000 mm												

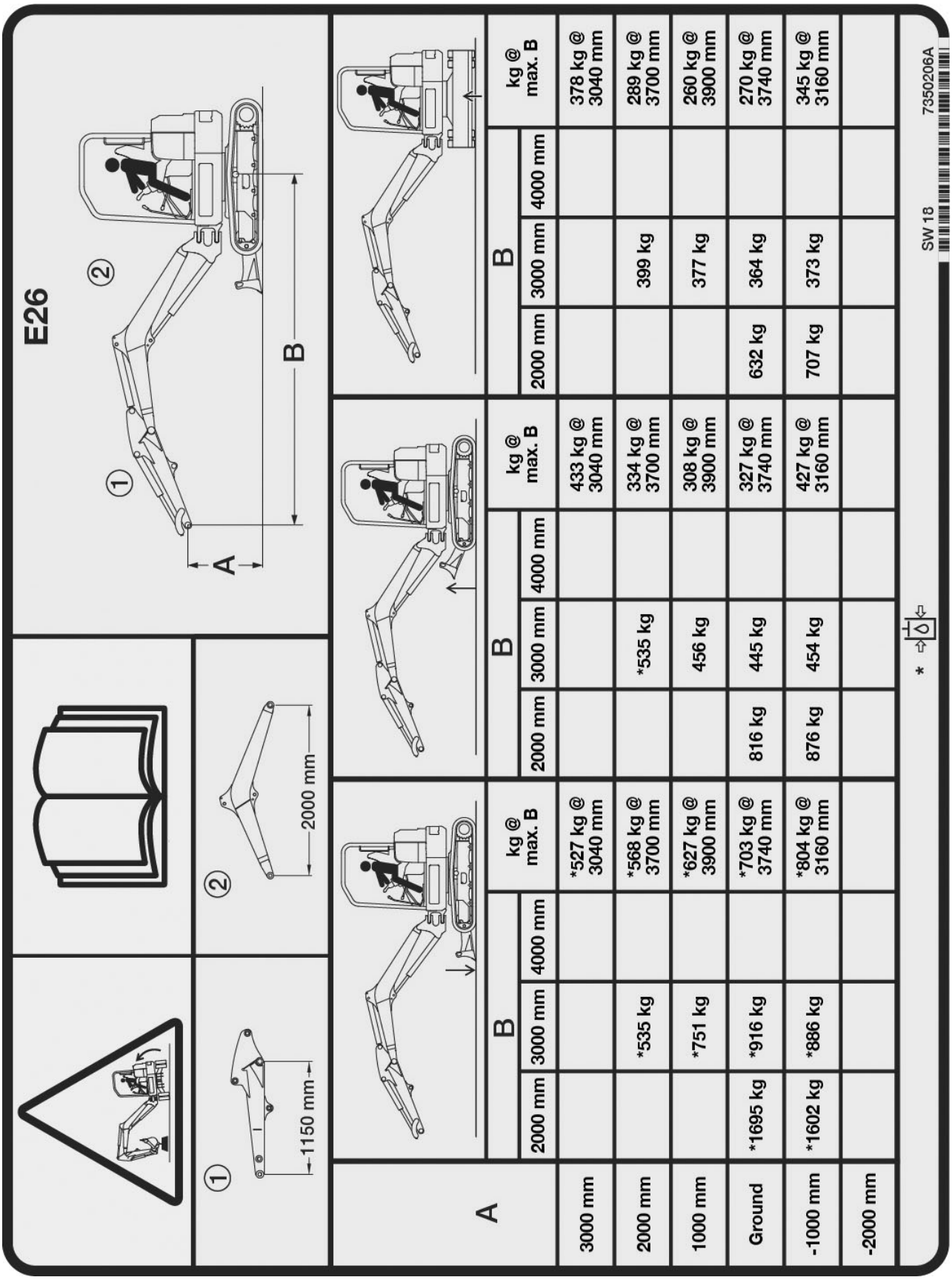
* SW 18 7350204A

7350204

EXCAVATOR SPECIFICATIONS (CONT'D)

Rated Lift Capacity - Cab With Light Counterweight

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

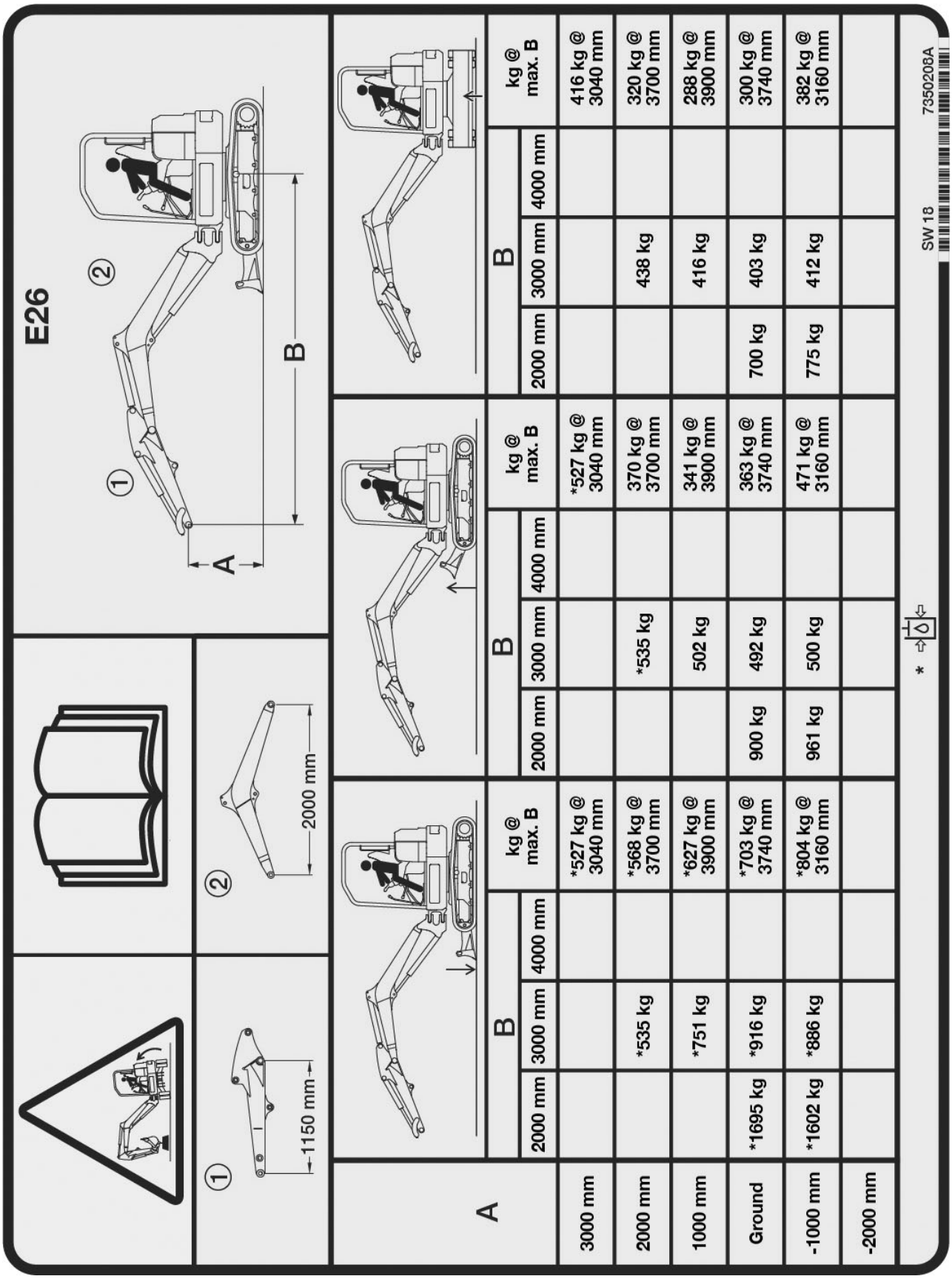


A	B			kg @ max. B	B			kg @ max. B	B			kg @ max. B
	2000 mm	3000 mm	4000 mm		2000 mm	3000 mm	4000 mm		2000 mm	3000 mm	4000 mm	
3000 mm				*527 kg @ 3040 mm				433 kg @ 3040 mm				378 kg @ 3040 mm
2000 mm		*535 kg		*568 kg @ 3700 mm		*535 kg		334 kg @ 3700 mm		399 kg		289 kg @ 3700 mm
1000 mm		*751 kg		*627 kg @ 3900 mm		456 kg		308 kg @ 3900 mm		377 kg		260 kg @ 3900 mm
Ground	*1695 kg	*916 kg		*703 kg @ 3740 mm	816 kg	445 kg		327 kg @ 3740 mm	632 kg	364 kg		270 kg @ 3740 mm
-1000 mm	*1602 kg	*886 kg		*804 kg @ 3160 mm	876 kg	454 kg		427 kg @ 3160 mm	707 kg	373 kg		345 kg @ 3160 mm
-2000 mm												

7350206

Rated Lift Capacity - Cab With Medium Counterweight

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



A	B	kg @ max. B	B	kg @ max. B	B	kg @ max. B
	2000 mm / 3000 mm / 4000 mm		2000 mm / 3000 mm / 4000 mm		2000 mm / 3000 mm / 4000 mm	
3000 mm		*527 kg @ 3040 mm		*527 kg @ 3040 mm		416 kg @ 3040 mm
2000 mm		*535 kg	*568 kg @ 3700 mm	*535 kg	370 kg @ 3700 mm	438 kg	320 kg @ 3700 mm
1000 mm		*751 kg	*627 kg @ 3900 mm	502 kg	341 kg @ 3900 mm	416 kg	288 kg @ 3900 mm
Ground	*1695 kg	*916 kg	*703 kg @ 3740 mm	492 kg	363 kg @ 3740 mm	403 kg	300 kg @ 3740 mm
-1000 mm	*1602 kg	*886 kg	*804 kg @ 3160 mm	500 kg	471 kg @ 3160 mm	412 kg	382 kg @ 3160 mm
-2000 mm							

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EXCAVATOR SPECIFICATIONS (CONT'D)

Performance

Operating weight (cab w/ heater, standard arm, standard blade, operator (75 kg) and standard bucket)	2608 kg (5750 lb)
If equipped with the following:	Canopy, subtract 118 kg (260 lb) Cloth or Vinyl Suspension Seat, add 13 kg (29 lb) Optional Counterweight, add 100 kg (220 lb)
Travel Speed (Low / High)	2,5 km/h / 4,3 km/h (1.5 mph / 2.7 mph)
Digging Force (per ISO 6015)	
With Standard Arm	Arm - 15690 N (3527 lbf) Bucket - 23720 N (5333 lbf)
Maximum Approved Attachment Weight	280 kg (617 lb)

Controls

Steering	Two hand levers (optional foot pedals)
Hydraulics	Two hand-operated joysticks control boom, bucket, arm and upperstructure slew Thumb switch controls auxiliary hydraulics and boom swing
Blade	Hand lever
Two Speed	Switch on blade lever
Boom Swing	Electric switches on joysticks
Auxiliary Hydraulics	Electric switches on joysticks
Auxiliary Pressure Release	Electric switch in right joystick
Engine	Engine speed control dial with auto idle feature, key or keyless start switch
Starting Aid	Glow Plugs - activated by start switch
Brakes Travel Service and Parking Slew Service Holding	 Hydraulic lock in motor circuit Hydraulic lock on motor Spring applied - hydraulic release

EXCAVATOR SPECIFICATIONS (CONT'D)

Engine

Make / Model	Kubota® D1105-E4B-BCZ-1 Stage 5
Fuel / Cooling	Diesel / Liquid
Horsepower (SAE Net) @ 2400 rpm	14,7 kW (19.7 hp)
Torque @ 2100 rpm (SAE)	67,3 N•m (49.6 ft-lb)
Number Of Cylinders	3
Displacement	1,123 L (68.5 in^3)
Bore / Stroke	78 x 78,4 mm (3.07 x 3.09 in)
Lubrication	Pressure System with Filter
Crankcase Ventilation	Closed breathing
Air Cleaner	Dual dry replacement paper cartridge with safety element
Ignition	Diesel - Compression
Low Idle Speed	1100 – 1250 rpm
High Idle Speed	2450 – 2550 rpm
Engine Coolant	Propylene Glycol / water mixture (53% PG / 47% water)

Hydraulic System

Pump Type	Engine driven, dual outlet, variable displacement, load sensing, torque limited, piston pump with gear pumps
Pump Capacity Piston Pump Gear Pump - 1 Gear Pump - 2	 2 x 30 L/min (2 x 7.9 U.S. gpm) 20 L/min (5.3 U.S. gpm) 6,75 L/min (1.8 U.S. gpm)
Auxiliary Flow	50 L/min (13.2 U.S. gpm)
Hydraulic Filter	Full flow replaceable, 3 micron synthetic media element
Control Valve	10 spool, parallel series type, open centre.
System Relief Pressure Slew relief pressure Blade, Boom Swing Boom, Arm, Bucket, Travel Joystick Control Pressure	 20600 kPa (206 bar) (2987 psi) 20600 kPa (206 bar) (2987 psi) 24000 kPa (240 bar) (3480 psi) 3200 kPa (32 bar) (464 psi)
Auxiliary Relief	18000 kPa (180 bar) (2610 psi)
Arm Port Relief Base And Rod End	29000 kPa (290 bar) (4205 psi)
Boom Port Relief Base And Rod End	29000 kPa (290 bar) (4205 psi)
Bucket Port Relief Base And Rod End	26000 kPa (260 bar) (3770 psi)
Blade Port Relief Base and Rod End	27000 kPa (270 bar) (3915 psi)
Main Hydraulic Filter Bypass	340 kPa (3,4 bar) (49 psi)
Case Drain	124 – 159 kPa (1,2 – 1,6 bar) (17 – 23 psi)

EXCAVATOR SPECIFICATIONS (CONT'D)

Hydraulic Cylinders

Cylinder	Bore	Rod	Stroke
Boom (cushion up)	69,9 mm (2.75 in)	41,4 mm (1.63 in)	546 mm (21.5 in)
Arm (cushion retract / extend)	69,9 mm (2.75 in)	41,4 mm (1.63 in)	492 mm (19.4 in)
Bucket	57,2 mm (2.25 in)	31,8 mm (1.25 in)	445 mm (17.5 in)
Boom Swing	69,8 mm (2.75 in)	38,1 mm (1.50 in)	385 mm (15.2 in)
Blade	82,6 mm (3.25 in)	44,5 mm (1.75 in)	170 mm (6.7 in)

Hydraulic Cycle Times

Bucket Curl	2,6 seconds
Bucket Dump	2,0 seconds
Arm Retract	3,1 seconds
Arm Extend	2,3 seconds
Boom Raise	3,8 seconds
Boom Lower	4,4 seconds
Boom Swing Left (60°)	3,7 seconds
Boom Swing Right (60°)	4,9 seconds
Blade Raise	2,4 seconds
Blade Lower	3,1 seconds

Electrical

Starting Aid	Glow Plugs
Alternator	12 volt, 65 Amp open frame w/ internal regulator
Battery	12 volt - 500 CCA @ -18°C (0°F)
Starter	12 volt; gear reduction 2,0 kW (2.7 hp)
Instrumentation	Fuel gauge, audible alarm, visual warning for engine functions and hourmeter
Lights	65 watt (Halogen), 20 watt (LED)

Drive System

Final Drive	Each track is driven by hydrostatic axial piston motor
Drive Reduction	41,9:1 two stage planetary
Gradeability	30°
Brakes	Hydraulic lock on motor

EXCAVATOR SPECIFICATIONS (CONT'D)

Slew System

Slew Drive	Gear pump connected to a planetary drive
Slew Circle	Single row shear type ball bearings with internal gear
Gear Reduction	159,5:1 (total), 21,5:1 (slew motor), 7,4:1 (slew bearing)
Brake	Spring applied, pressure released
Slew Speed	9,3 rpm

Undercarriage

Crawler Track Design	Sealed track rollers with boxed section track roller frame, grease type track adjuster with shock absorbing recoil spring
Width of crawler	1500 mm (59.1 in)

Capacities

Fuel Tank	34,4 L (9.1 U.S. gal)
Hydraulic Reservoir Only (centre of Sight Glass)	Tank Cap. 10,2 L (2.7 U.S. gal)
Hydraulic System (with Reservoir)	23 L (6.1 U.S. gal)
Cooling System with / without Heater	4,3 L (1.14 U.S. gal) / 3,9 L (1.03 U.S. gal)
Engine Oil and Filter:	3,6 L (3.8 U.S. qt)
Final Drive (each)	0,6 L (0.63 U.S. qt)

Tracks

Type	Rubber
Width	250 mm (11.8 in)
Number Of Shoes	Single Assembly
Number of Track Rollers (per side)	3
Ground Pressure	30,3 kPa (4.39 psi)

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 Directive 2006/42/EC - L_{pA}	80 dB(A)

DECLARED VIBRATION EMISSION VALUES In accordance with EN 12096	
Whole-body vibration per ISO 2631-1	0,11 m/s^2 (0.36 ft/s^2)
Hand-arm vibration per ISO 5349-1	0,50 m/s^2 (1.64 ft/s^2)

Temperature Range

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

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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Printed in Belgium

ALPHABETICAL INDEX

Contents of UK Declaration of Conformity

This information is provided in the operator's manual to comply with clause 1.7.4.2(c) of Schedule 2, Part 1 of The Supply of Machinery (Safety) Regulations 2008.

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

Manufacturer

Bobcat

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World Headquarters
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West Fargo, ND 58078-6000
UNITED STATES OF AMERICA

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Homologation Manager
Doosan Bobcat EMEA s.r.o.
U Kodetky 1810
26312 Dobříš
CZECH REPUBLIC

Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001

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	**92.6 dBA**
Guaranteed Sound Power	**93 dBA**

Description of Equipment
Type of Equipment: Excavator
Model Name: E26
Model Code: B4B8

Engine Manufacturer: Kubota
Engine Model: D1105-EF07
Engine Power: 15.4 kW @ 2400 RPM

Equipment conforms to UK Regulations(s) Listed Below

Supply of Machinery (Safety) Regulations 2008
Electromagnetic Compatibility Regulations 2016

Declaration of Conformance

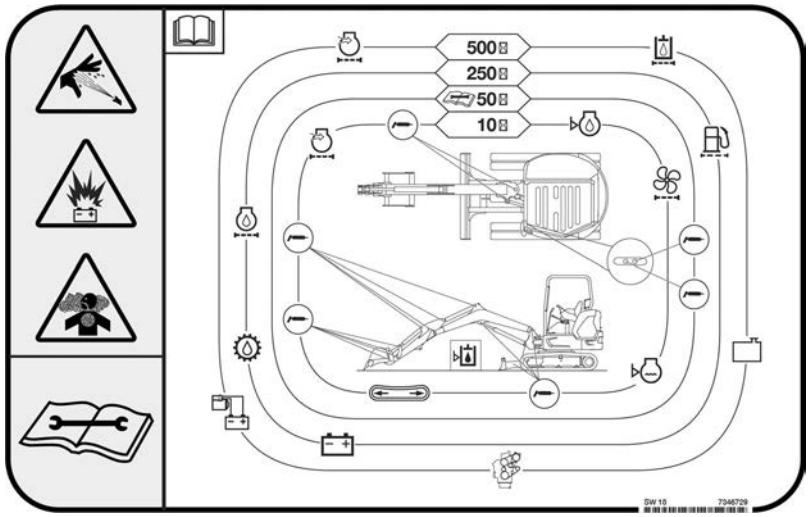
This equipment conforms to the requirements specified in all the UK Regulations listed in this declaration.

Effective From:

30 August 2022


Bobcat®

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	**Check Seat Belt**
Drain Contaminants From Fuel Tank	**Check Cab / Canopy**
Change Fuel Filter	**Empty Spark Arrestor Muffler**
Check Hydraulic Fluid	**Check Motion Alarm**
Change Hydraulic Fluid and Filter(s)	**Check Cab and Heater Filters**
Check Battery Cables and Connections	**Check Indicators and Lights**